

2010 BOONE COUNTY COMPREHENSIVE PLAN



PLANNING
FOR THE YEAR 2035

• Boone County Planning Commission • Burlington, KY •

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Adoption date: June 6, 2012

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ACKNOWLEDGEMENTS

The Boone County Planning Commission would like to thank all of the organizations and individuals who participated in this update of the Boone County Comprehensive Plan. The Planning Commission would also like to express its appreciation to former staff members Dave Geohegan (Director of Planning Services), Pat Russ (Administrative Assistant), and Adam Hartke (intern) for the work they did on this update.

CITIZEN PARTICIPATION

In July 2010, the Boone County Planning Commission authorized the Long Range Planning/Comprehensive Plan Committee to oversee the 2010 Boone County Comprehensive Plan update. At the beginning of the process, the Planning Commission sent information letters to over 70 organizations and many individuals that have been, or would likely be, involved in planning issues.

During the update of the Goals and Objectives, the Planning Commission held public workshops and Committee Meetings and appeared at various city and county public meetings. In May of 2011, following adoption of the Goals and Objectives by all legislative units, staff began researching and drafting the plan elements. Initial drafts of the elements were presented for review at Long Range Planning/Comprehensive Plan Committee meetings on the following dates: August 17, 2011 (Agriculture, Population, Preservation, Recreation and Open Space), September 26, 2011 (Business Activity, Economy, Public Services and Facilities, Transportation), October 27, 2011 (Housing, Environment), and February 3, 2012 (Environment – Revised, Land Use). Revised elements and individual requests for changes to the Land Use Map were presented at other committee meetings. As elements were approved for public release by the committee, they were made available in digital form on the Planning Commission's website, where comment forms were also posted. Hard copies of all drafts elements and maps were made available in the Planning Commission office.

A series of community workshops to present all draft elements and the Land Use Maps were held at various locations around Boone County on February 23, 27, and 29, 2012. A deadline for comments was set for March 14, 2012. Following review of all comments received throughout the process, a full draft of the plan was prepared and presented to the committee on March 21, 2012. One further deadline of March 30, 2012 for comments was set and on April 4, 2012 the Committee voted to approve the draft with a few minor changes and at the Business Meeting a date for the Public Hearing was set for May 2, 2012.

During the drafting of the Goals and Objectives and the elements of the Comprehensive Plan, the Long Range Planning/Comprehensive Plan Committee met numerous times. All meetings were open to public attendance and involvement and the committee chair invited comments from the public at every meeting. Numerous meetings were also held between staff and interested citizens and organizations. In addition to legal advertisements, the Kentucky Enquirer and Boone County Recorder newspapers pertinent stories, interviews, and meeting announcements throughout the process, in both print and online editions. This included a feature story in the Kentucky Enquirer devoted to the public workshops. The Planning Commission staff also maintained an email list of approximately 150 interested parties and utilized this list to provide information and updates as the update developed.

In order to satisfy KRS 100 and to promote regional planning, the Boone County Planning Commission has notified the following cities, counties, planning units about its 2010 Comprehensive Plan update.

**City of Addyston, OH
City of Aurora, IN
City of Cincinnati, OH
City of Elsmere, KY
City of Erlanger, KY
City of Independence, KY
City of Lawrenceburg, IN
City of North Bend, OH**

**City of Rising Sun, IN
City of Villa Hills, KY
Dearborn County, IN
Gallatin County, KY
Grant County, KY
Hamilton County, OH
Kenton County, KY
Ohio County, IN**

**Switzerland County, IN
Delhi Township, OH
Miami Township, OH
Whitewater Township, OH
NKAPC
OKI
NKADD**

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INTRODUCTION

This introduction to the 2010 Boone County Comprehensive Plan is provided to orient the reader to the process by which the Comprehensive Plan has been developed, as well as to provide a summary of each element. The reader is encouraged to review the detailed elements, including the Tables and Figures within each element.

PLANNING PROCESS

The Comprehensive Plan is formulated from an extensive and continuing planning process. The process includes four components. The first component is inventory, reconnaissance, and analysis of background information on existing and projected conditions affecting growth and development. The second component involves policy decisions by public agencies and bodies on how best to influence future growth and development. Third is the preparation and adoption of plans which embody the public policies; and, fourth, the development and refinement of tools to implement the plans. The process is continuous and evolving, as each of the steps is re-evaluated periodically to respond to changing conditions.

The Boone County Planning Commission is the public body charged with initiating and overseeing the comprehensive planning process in Boone County. The success of the process is largely dependent on those public agencies and bodies who can implement the plan through their day-to-day decision-making activities. Success is also dependent on the cooperation of the citizens of the community and developers who respect the Comprehensive Plan's intentions and seek to improve the Comprehensive Plan in accordance with changing community policies, goals, and objectives.

While this document is the statement of a plan at one point in time, its full value will be in its flexibility to respond to changing conditions and its evolution within the context of a continuing comprehensive planning process.

Reconnaissance

The Reconnaissance portion of the plan is an inventory of existing conditions in Boone County. The Reconnaissance material is included within ten planning elements. These are: Population, Environment, Economy, Business Activity, Housing, Recreation and Open Space, Agriculture, Historic Preservation, Public Facilities, and Transportation.

Goals and Objectives

The adopted planning Goals and Objectives for guiding preservation and development in the County are included in this document and are the basis for the remaining elements. They were developed and adopted by the Boone County Planning Commission; and adopted by the Boone County Fiscal Court and the legislative bodies of the Cities of Florence, Union, and Walton; prior to the writing of the remaining elements of the Comprehensive Plan.

Planning Process

The Comprehensive Plan was developed through a multi-stage process designed to integrate the Goals and Objectives, and to create consistency between the various elements of the Comprehensive Plan. The Reconnaissance material provided the foundation for the Comprehensive Plan.

From the conditions of the County, as outlined in the Reconnaissance, Goals and Objectives were formulated for each of ten elements. The Reconnaissance and the Goals and Objectives in turn set the direction for the recommendations contained in the Comprehensive Plan elements.

The final step in the Comprehensive Plan's multi-stage process is the Land Use element, which consists of text and a series of maps. The provisions of the previous ten elements are represented spatially and in detailed written form to project the County's land use by the year 2035. The Goals and Objectives of the previous ten elements are also considered in the remaining Land Use element. The Land Use element is also developed in

preparation for its chief implementation tool, the Zoning Regulations and Map, to which there is a sufficient degree of consistency.

Comprehensive Plan elements

The **Population** element describes the growth patterns in Boone County. The history of Boone County is explained, along with key population trends from 1960-2010. The Population element also demonstrates the changes in the age and sex distribution of residents, racial composition, migration, poverty levels, educational attainment, and in the number of households in Boone County. Population projections are later given from the Kentucky Data Center and from the Ohio-Indiana-Kentucky Regional Council of Governments, as well as from the Boone County Planning Commission. A summary of some of the findings are found toward the end of the Population element.

The **Environment** element contains an inventory of environmental factors pertinent to land use and land use decisions, including geology, soils, topography, streams and stream drainage, and water and air quality. The inventory extends to plant and animal life and habitat. This element also includes a summary of special studies and a description of land conservation tools that may be considered for Boone County. Impacts of development on the environment are considered toward the end of the element.

The **Economy** element examines the local economy in two components. The first component reviews the economic factors related to individuals in the county or resident work force such as, income, unemployment, poverty, types of jobs, commuting patterns, population and employment. The second component of this element examines economic factors related to the County in general. These factors are the types of jobs available, employment levels, the number of employees by industrial sector and employment trends. The element introduces the concept of Sustainability.

The **Business Activity** element examines the industry classifications of businesses in Boone County from 1998 to 2008. Comparisons are made between base and non-base industries. In addition, areas of future industrial and commercial activity are identified to supplement the Land Use element's recommendations. Overall, existing trends show that Boone County will continue to grow in both base and non-base industries, but mainly in the non-base sectors. The element discusses the nature of commercial and industrial development at specific locations in Boone County.

The **Housing** element contains three sections. The first section is an analysis of the housing market demand. The second section of this element includes a study of the current housing supply and planned housing development. The final section combines both findings of demand and supply in order to determine future housing needs of Boone County. Consequently, general areas of future residential development are identified to supplement the Land Use element's recommendations. Concepts, such as Neo-traditional and Open Space Subdivision styles of housing development are discussed in the element.

The **Recreation And Open Space** element is primarily an updated, condensed version of Boone County's 2006 Comprehensive Parks and Recreation Master Plan Update, supplemented with data and summaries from other previous studies. The element includes an analysis of the County's present and future population and both the supply and demand of county recreational facilities. Recommendations in the form of policies, strategies, and land acquisition are presented.

The **Agriculture** element includes begins with a farmland inventory, including statistics concerning the number of farms, amount of land devoted to farming, farm size, and farm ownership tenure in Boone County. Agricultural Districts and other farm assistance programs are discussed in this element, which also includes new data from a 2010 cost of community services study and survey of agricultural land owners. Impacts of development on farming are described, and future strategies for agricultural activity are presented.

The **Preservation** element discusses the County's historical, archaeological, architectural, and cultural resources, and outlines methods to preserve them. A history of Boone County is presented in the element. Discussions of National Register districts, cemeteries, and architectural styles are also included. Historic preservation plans and

documents are described, as are preservation incentives at all levels of government. A section describing the various local heritage organizations in Boone County was added in this update.

The **Public Facilities** element discusses the public facilities and services located within unincorporated Boone County and the Cities of Florence, Union, and Walton. Water distribution, sanitary sewage collection and treatment, gas, electric, municipal/public services, libraries, education, health care, law enforcement, emergency management, and public communications are described in detail. This element also presents current data and future expansion plans for each utility or public service. Conclusions are made as to the various facility impacts on the future land use pattern.

The **Transportation** element discusses the various modes of transportation used in Boone County. These modes refer to roadway systems, mass transportation, pedestrian/biking systems, railroads, the Airport, and water transport. The Transportation element describes the existing conditions of each mode and recommended future improvements. Important components of this element are access management control and Airport noise. The element contains findings of the 2006 Boone County Transportation Plan.

The **Land Use** element is the culmination of the preceding ten elements of the 2010 Boone County Comprehensive Plan. The Land Use element recommendations (both text and maps) are based upon the specific data and recommendations of the other elements of the Comprehensive Plan. Both the text and accompanying maps are consistent with each other, and both provide a written and graphic documentation for future development and preservation of the County in a 25 year planning horizon. The text of the Land Use element further details the impact of the other ten elements on the land area in Boone County. Compliance with the other elements of the Comprehensive Plan will result in the development or preservation of Boone County as specified in the Land Use element.

In the **Land Use** element, the existing land use and future land use classifications are explained. The Land Use element also includes development guidelines which relate to key development and preservation concerns: utilization of existing vegetation and topography, development layout/lot sizes/setbacks, buffering, landscaping, stormwater management and erosion control, access management, transportation and pedestrian network and design, signs, and historic preservation. Finally, both the text and maps of the Land Use element assure that the 2010 Boone County Comprehensive Plan is a guide for the future growth, development, and preservation of Boone County, Kentucky.

GOALS & OBJECTIVES

Pursuant to Sections 100.187 and 100.193 of the Kentucky Revised Statutes and other applicable laws, the following statement of Goals and Objectives has been prepared by the Boone County Planning Commission. Each Element of the Comprehensive Plan contains at least one goal which serves as a future desired condition or result, and is, therefore, described as an attainment not an action. Each goal for a planning element contains a series of objectives. An objective is an achievable action statement about where a community wishes to go. When an objective is met, the community is a step closer to reaching its goal. These Goals and Objectives are intended to be general but provide a solid framework for the remaining Comprehensive Plan Elements to be conducted. The Elements address specific land use impacts and provide recommendations regarding future growth within the planning unit. The Goals and Objectives help guide the formation of public policies, however, are not designed to solve specific problems.

OVERALL

Goal: Proper planning is achieved through accepted land use management tools and coordination with public infrastructure.

Objectives:

1. Boone County shall be viewed as an integral part of the Cincinnati Metropolitan Area.
2. Development issues shall be viewed in terms of promoting overall quality of life. Mixing of residential and other land uses shall be encouraged within appropriately planned and designed neighborhood developments.
3. Proper design principles shall be applied in development.
4. Future growth shall be accompanied by adequate infrastructure and services. Existing infrastructure and services shall be monitored, maintained, and improved as needed.
5. A public process of visioning should be utilized to recommend a theme or character for future land use planning and development design for specific areas of Boone County.
6. Boone County shall strive to achieve both a diversity and balance in land use. Land uses and zoning decisions shall strive to balance the rights of landowners with the rights of the general public in a fair and impartial manner.
7. The Elements of the Comprehensive Plan shall be interrelated and consider potential negative impacts and benefits of growth beyond the planning horizon.
8. The future land use plans shall be based on the research and analysis completed in all the elements.
9. Innovative development design methods shall continue to be pursued and supported through incentives.
10. The unique characteristics in each of the legislative units within Boone County, and the different development and infrastructure needs of each should be recognized and accommodated within the Comprehensive Plan Elements.

POPULATION

Goal: The needs of Boone County's population are measured and fulfilled through the provision of orderly growth.

Objective: Boone County's development policies shall not exclude or include segments of the population based on age, race, or socio-economic status.

ENVIRONMENT

Goal: Land use planning should protect natural systems (streams, wetlands, forests, etc.) essential to the safety, health, economic stability, and overall quality of life. **[Cities of Florence, Union, and Walton only]**

Goal: Land use planning should fully recognize natural systems (streams, wetlands, forests, etc.) that contribute to the public's safety, health, economic stability, and overall quality of life and carefully consider the impact of development upon such assets. **[Unincorporated Boone County only]**

Objectives:

1. An evaluation of the environmental factors identified in this Plan will be part of the review of the site being considered for development.
2. New development or redevelopment shall attempt to design sites utilizing existing topography and vegetation, and encourage preservation of the existing character of the land. Development design should minimize grading work as opposed to clearing the entire site. Existing trees and pasture land shall be evaluated during the design and construction process as a visual and economic benefit to the community.
3. Developmentally Sensitive areas and scenic areas shall be identified, mapped, and standards shall be established for the preservation and restoration of these areas. Developments that are proposed in any of these areas shall be carefully reviewed according to these standards to assure negative environmental impacts are minimized.
4. Development design shall consider natural or ecological systems, such as wildlife habitats, air, and water.
5. Developmentally Sensitive hillsides in Boone County must be given special consideration, and any proposed development on hillsides designated Developmentally Sensitive shall be carefully reviewed and monitored to adequately maintain the environmental integrity of the hillsides.
6. Watersheds shall be studied and monitored so as to prevent flooding and erosion and also promote habitats for wildlife.
7. Public environmental information and studies shall be accessible to the general public.
8. Areas possessing unique environmental characteristics should be preserved, used as passive or active recreational areas, or appropriately incorporated into development design.
9. Existing vegetation shall be considered as both an important site characteristic and a community resource.
10. Standards shall be established to specify methods during construction to properly manage the impacts of dust, erosion, noise, or other nuisances or environmental hazards. When problems are encountered the proper agencies will be notified and corrective measures taken.
11. The incremental effects of developments on the environment, including, but not limited to storm water, erosion, woodlands, streams, and views shall be evaluated and addressed with public involvement.

ECONOMY

Goal: Boone County shall have a sustainable economy that both restores and protects the environment and also brings forth innovation and prosperity with meaningful employment opportunities for all its citizens. **[Cities of Florence, Union, and Walton only]**

Goal: Boone County shall promote a vibrant and sustainable economy that encourages innovation and prosperity with meaningful employment opportunities for all its citizens and respects the physical environment. **[Unincorporated Boone County only]**

Objectives:

1. Employment opportunities shall be encouraged for the citizens of Boone County. **[Cities of Florence, Union, and Walton only]**

Boone County shall promote economic opportunities within the county that contribute to the overall economic health of its citizens and private enterprise. **[Unincorporated Boone County only]**

2. Base industries (agriculture, mining and manufacturing activities) and non-base industries (education, commerce, service, health, government, etc.) shall be promoted in suitable locations exemplifying how the county is a vital part of a strong regional, metropolitan economy.
3. The benefits of an international airport shall be optimized to promote appropriate economic development.
4. Support of local agriculture and local business products and services shall be encouraged.
5. The establishment of recycling programs and recycled materials industries shall be encouraged.
6. Maximizing energy conservation and the proper use of local renewable resources shall be encouraged.
7. Boone County shall seek an overall combination of land uses (residential, agricultural, commercial, industrial, public, transportation, etc.) that yields a balance between the public revenues generated from those uses and the public expenditures required to support those uses.
8. Telecommuting and home computer-generated business shall be encouraged where negative impacts to the neighborhood can be adequately minimized.
9. Tourism shall be explored as an economic resource while minimizing potential negative impacts.
10. The establishment of small business and incubator business assistance shall be encouraged.

BUSINESS ACTIVITY

Goal: Boone County businesses are developed in appropriate locations and are compatible with their surrounding areas.

Objectives: Compact, efficient development patterns shall be encouraged for business districts (e.g. industrial, commercial and office) with appropriately sized and well maintained buffer spaces between the business use and other land usage.

Commercial (Retail and Office)

1. Commercial uses shall be designed and located to coordinate with the surrounding land uses and shall have safe and effective access and ample parking spaces.
2. The large scale mixing of commercial and non-commercial uses shall occur in planned developments or in areas where consideration has been given to assure compatibility with surrounding land uses. The location of large scale commercial uses shall take into consideration existing or planned infrastructure conditions so as to protect the existing and future population and businesses. Small scale mixing of commercial uses within residential areas shall be carefully assessed and properly placed so as to enhance the neighborhood. Architectural Design Review and consistent sign standards shall be implemented on a corridor by corridor basis, when justified by legitimate land use planning principles.

3. Highway commercial uses shall be in close proximity to highway interchanges for maximum convenience and economy to the traveling public, while minimizing impact to the community in terms of traffic congestion, local commuting patterns and access.

Industrial

1. Industrial development shall be encouraged to locate near railroad lines, highways, the Ohio River, the Airport and on Airport owned land. Future industrial development must be located where infrastructure exists or is planned. Future industrial districts shall be identified in advance of residential development so that the potential impacts are known and can be addressed.
2. Effective site placement, architectural design and landscape design for industrial uses shall enable a favorable relationship with adjoining uses. Industrial nuisances such as smoke, dust, noise and odor shall be kept at a minimum, and site development and enforcement shall be carefully coordinated with necessary approvals of other regulatory agencies.
3. Provisions shall be made for proper control of industrial uses, which have processes or make products that could be hazardous to human life and property. (Examples of such products are explosives and flammable or corrosive chemicals). New and existing industrial uses shall comply with federal and state air and water pollution regulations.
4. Steps shall be taken to encourage sustainable commerce and production where waste products of one industrial production process actually become the raw materials for another.
5. Boone County shall evaluate and promote business and economic sectors of the future as well as explore ways to allow our existing industry to be competitive in a world economy.

HOUSING

Goal: Safe, environmentally sound, and sanitary housing exists for all Boone County residents.

Objectives:

1. A broad range of housing opportunities shall be provided which meet the needs and desires for all household types.
2. No housing policy shall have the effect of causing discrimination against any person on the basis of age, race, color, religion, sex, familial status, disability, or national origin.
3. The maintenance of sound existing housing, as well as, the rehabilitation of deteriorating housing shall be encouraged.
4. Housing supply in Boone County shall be balanced against present and planned commercial, industrial, and education needs. Primary and Secondary education capacity shall be evaluated during housing development review.
5. In order to offer the citizens of Boone County maximum choice in living environment, residential developments shall be judged primarily on the impact on infrastructure, buffering, and development design with only secondary consideration given to the type of dwelling units.
6. Residential development shall be regulated as to basic health and safety considerations, including: a) proper connections to appropriate public water and sanitary sewer service, sewage disposal units, and telephone and electric lines, and b) properly designed and constructed storm water drainage according to location and use.
7. Airport noise levels shall be evaluated when new residential development is proposed near the Airport. New

residential development shall not occur in areas with existing or proposed noise levels of 65 DNL or higher as identified on official Noise Exposure Maps adopted and approved by the Kenton County Airport Board and the Federal Aviation Administration, unless acceptable measures are taken by builders to reduce adverse noise impacts.

8. The interior street system of new residential developments shall insure continuity with adjacent built or planned neighboring areas. Residential developments shall be encouraged to provide interconnections between sections of their developments and with adjacent developments to promote safe and easy transportation access and a sense of neighborhood interaction. Based on certified traffic analysis, collector and sub-collector streets shall be evaluated to determine design without individual lot or driveway access. Lot and home buyers shall have access to approved plans regarding future connections. The interior street system shall also coordinate with and continue the evolving multi-modal transportation system (pedestrian and bicycle facilities, mass transit stops).
9. New or redeveloped residential areas shall be designed to establish clearly defined neighborhoods with a mix of retail, public, and recreational uses. Established neighborhoods shall be protected and enhanced, and deteriorated neighborhoods shall be regenerated.
10. Mixed use, higher density neighborhoods shall be encouraged near existing or proposed mass transit areas, commercial districts, and public facilities (i.e. parks) and also have convenient access to major streets and highways.
11. Clustering (increasing net density while not altering overall gross usable density) shall be promoted by appropriate incentives. Clustered housing or Open Space Subdivisions shall be permitted not only in planned developments, but in appropriately designed subdivisions under conventional zoning.
12. Residential developments shall be encouraged to plan and build in a manner which is compatible not only with the general housing density and design planned for the area but also with the existing conditions of the site, including the suitability of adjoining lands for appropriate access, and significant site features.
13. Where existing infrastructure, services, and the public school system are not adequate, development shall be phased to coordinate with the provision of these items.
14. Traditional and innovative design as well as mixed use options shall be encouraged throughout Boone County in order to accommodate market demands.

RECREATION AND OPEN SPACE

Goal: Adequate recreation facilities and programs are provided, significant natural features and historic sites are preserved, and open space is preserved.

Objectives:

1. Parks and open space shall be used to preserve scenic and natural areas of significant and unique qualities and provide activity centers close to or within established and developing residential areas. This land acquisition should be done in a timely manner to avoid increased land costs and loss of potential recreational land and open space to other land uses. Major view sheds shall be mapped to help identify scenic and natural areas.
2. Extra-regional or interstate tourist oriented-commercial facilities shall be allowed in appropriate areas when the final mitigated impact is minimal on other land uses.
3. Historically and culturally significant sites and structures of Boone County that are part of recreational or education facilities shall be protected. Park areas that make use of existing historic structures or features shall be encouraged.

4. Recreation areas shall be centrally located in their service areas and easily and safely accessible to the population groups they are designed to serve.
5. Major parks with an emphasis on accessibility shall serve each major area of Boone County. Legislative bodies shall be active in creating new parks.
6. Marginal development land that contains excessive slopes or is prone to flooding shall be considered for its value as open space, farmland, or recreation. The Ohio River shoreline shall be studied for its potential for recreational development. This development shall both retain the ecological integrity of the river area and create sustainable economic opportunities for the citizens of the county.
7. School and recreation facilities shall be combined in order to provide the mutual benefits of service, safety, convenience, economy and neighborhood strengthening.
8. The general public and landholding agencies shall be informed of the possibility of donating land, providing easements, and other conservation options available through organizations such as the Boone Conservancy for the provision of open space.
9. Agencies and organizations that administer parks, recreation, and natural areas in Boone County should coordinate programs, facilities, events, and information.

AGRICULTURE

Goal: Appropriate land for agricultural practices and agricultural related uses is protected due to its economic importance.

Objectives:

1. Specific areas, innovative land use planning concepts, and incentives shall be identified to encourage the preservation of existing agricultural lands.
2. Diversification of agricultural uses shall be encouraged. Markets for locally grown food crops shall be promoted.
3. The public services and infrastructure needs of agricultural land uses shall be generally compared to that of other land uses.
4. The impacts of adjacent residential development on existing agricultural operations shall be examined and addressed.
5. The needs of agricultural operations should be considered in public infrastructure improvements and services.

PRESERVATION

Goal: Significant historic buildings, structures and sites, archeological sites and natural features in Boone County are documented and preserved.

Objectives:

1. Priorities shall be established for the conservation, restoration, preservation and protection of natural features, historic buildings, structures and sites, archeological sites, and cemeteries.
2. An inventory of historic, archeological, funerary and natural resources shall be maintained.
3. Significant sites which meet established criteria shall be encouraged for nomination to the National Register of Historic Places.

4. Plans for new or redeveloped commercial, industrial, institutional and residential sites shall be reviewed and reasonable measures taken to ensure identification and protection of significant historical, archeological, and architectural sites including cemeteries.
5. The use of land use regulatory tools and incentives shall be encouraged to preserve significant sites.
6. Historically and culturally significant sites shall be identified for further study and/or scientific investigation.
7. The development of heritage tourism as a catalyst for historic preservation and non-intrusive economic development shall be encouraged.
8. Significant sites shall be requested or encouraged for inclusion under historic preservation zoning.
9. Historic sites and features shall be mapped and considered for inclusion in potential park land development to serve as an educational and recreational resource for the community.
10. The public and private sectors' awareness of historic preservation efforts and philosophy shall be encouraged.
11. Agencies and organizations involved in preservation and local history should coordinate their efforts.
12. The existing local historic landmark and district process should be utilized.

PUBLIC SERVICES AND FACILITIES

Goal: Safe, efficient and environmentally sound public services and facilities shall exist for all development.

Objectives:

1. Existing infrastructure and services (e.g. systems and facilities for: water treatment and distribution, wastewater collection and treatment, natural gas distribution, electric power distribution, communication lines, police and fire services and associated municipal buildings, schools, public roads and storm water management) shall be utilized efficiently. The phasing of proposed development shall demonstrate a means of addressing significant impacts on existing infrastructure and services.
2. New infrastructure systems shall be built to definite planned and balanced capacities and for definite urban and rural forms.
3. Priorities for growth within any individual infrastructure system shall be based on the predicted needs of specific areas as prescribed by the future land use projections of this plan. No infrastructure system shall commit the county to excessive growth by the system's expansion.
4. The efficient coordination of sanitary sewer, storm sewer, water, school, roads, and fire jurisdictions shall be promoted. This coordination shall be facilitated through computer technology, including Geographic Information Systems (GIS).
5. Public facilities and services shall be in locations that are accessible to the population being served. Public information shall be easily accessible through the Internet and similar technology.
6. Public sanitary sewer systems shall be strongly encouraged in place of individual treatment plants or septic systems. Opportunities for regional/combined stormwater management system(s) shall be examined and developed if appropriate.
7. Efficient communication between public service agencies shall be maintained or increased by using the latest technology.

8. Desirable library sites shall be within or near business or shopping centers, or other public facilities, which are located in close proximity to the surrounding residential areas. Libraries shall be accessible by means of public and private transportation and the Internet.
9. Fire stations shall be located near or along major arterials so that adequate ingress and egress can be provided.
10. The heaviest concentration of law enforcement, fire and rescue services shall be located near central business districts, large industrial areas, and near residential areas where the potential loss of life and property is greatest. Emergency response shall be coordinated with the Geographic Information System.
11. Barriers to fire station service, such as hills, rivers, flooding land, railroad tracks and yards, freeways, airports, shopping centers, and general traffic congestion, shall be avoided in selecting a site.
12. Creative ways of funding the expansion and improvement of public services and facilities shall be sought, and costs should be fairly distributed. Cooperative funding agreements between the private and public sectors shall be encouraged to fund future utility extension. It is essential that the legislative bodies establish a Capital Improvement Plan, to better manage growth in the county through appropriate phasing of new public infrastructure and to maintain and improve existing infrastructure and public facilities.
13. Adequate health care and emergency facilities shall be promoted at accessible locations.
14. The elimination of overhead utility services shall be encouraged.
15. A balanced approach shall be sought between an annual increase in revenue and an annual improvement in all services and facilities.
16. The public education system shall be improved as needed. Post-secondary educational facilities shall be explored, and an emphasis shall be placed on computer and communications technologies.
17. Installation of utilities and development around utilities shall occur in a manner that protects the safety of the general public. Wireless Communications (Cellular towers) and similar facilities shall not be obtrusive to residential or scenic areas, and co-location shall be implemented wherever possible.
18. The incremental effects of developments on public facilities and services shall be evaluated and addressed.

TRANSPORTATION

Goal: Boone County shall continue as a vital member of an evolving, regional transportation system that needs active cooperation between the private and public sectors to enable the transition to an economically and energy efficient yet environmentally sound and equitable multi-modal (automobile, rail, air, river, bus, bicycles, pedestrian) transportation system.

Objectives:

1. Planning for mass transit (e.g. bus service, rail, and shuttles) shall be encouraged.
2. Airport master planning and the community comprehensive plan shall be coordinated to allow greater efficiency in local and regional transportation systems.
3. Fuel consumption shall be minimized and alternative commuting such as carpooling, vanpooling, and bus ridership shall be encouraged.
4. Multi-modal interfaces such as Park and Ride Lots and pedestrian and bicycle accommodations on mass transit and at Park and Ride Lots shall be promoted.

5. Employer trip reduction incentives and flexible and/or staggered work hours shall be promoted.
6. Efficient coordination between all levels of government for transportation improvements shall be promoted.
7. Transportation facilities and services shall support opportunities for economic development.
8. Transportation facilities and services shall provide equitable levels of service to transportation disadvantaged and transit dependent people.
9. Mixed use, higher density neighborhoods shall be designed to accommodate safe pedestrian access to mass transit, major streets and highways, public facilities, and parks.
10. Transportation opportunities for pedestrians and bicyclists shall be provided by the development of a network of sidewalks, pathways and roadway lanes.
11. Priority shall be given towards maintaining, protecting, and improving the capacity and safety of the existing road system.
12. Existing and future arterial roadways shall be targeted for operational studies to address access management and signalization.
13. Air quality and noise impacts from transportation improvements and the existing network shall be minimized.
14. The movement of hazardous material transported through Boone County shall be monitored by the appropriate agencies.
15. The displacement of people, the relocation of businesses and community facilities, and the disruption of communities shall be minimized.
16. Roadways under County or City jurisdiction shall be designed to recognize the planned character of an area, and provide space for landscaping and entry features.
17. Development of mixed use designed to lessen vehicle travel shall be encouraged.

Goal: The local transportation system in Boone County shall be maintained and improved so that overall safety and level of service will be enhanced. Inefficiencies in the system will be identified and addressed. New land development shall be closely coordinated with the local transportation system to assure efficiency and continuity with the regional multi-modal transportation system.

Objectives:

1. Roadway capacity shall be preserved by enforcement of the access management policies and guidelines.
2. New connector streets shall be developed where needed and feasible thus lessening the total dependence on arterial, collector, and local streets. Existing connector streets shall be improved where needed.
3. Proper vehicular and pedestrian access to adjoining property shall be provided and/or retained when a property develops or redevelops.
4. Intersection improvements, signal system enhancements and maintenance, and other types of operational improvements shall be made.
5. Roadways shall be properly classified and designed.
6. Existing street systems, retail areas, parks, libraries, schools, etc. shall be studied to identify for deficient

pedestrian/bicycle facilities. Improvement plans shall be developed for areas of highest need.

7. Transportation Planning and development efforts shall provide for sufficient right-of-way to allow for road improvements or future roads.
8. New and improved roadways shall include pedestrian and bicycle facilities in order to meet Federal and State multi-modal transportation requirements. As a design consideration, preference should be given to bike and pedestrian paths that are separated from the roadway for safety.
9. The Boone County Transportation Plan shall be updated as necessary and the legislative bodies should establish a Capital Improvement Plan as an integral part of the Transportation Plan.
10. Creative ways of funding the expansion and improvement of the transportation system shall be examined.
11. Efficient coordination between local, county, and state jurisdictions for transportation improvements shall be promoted.
12. The Ohio River shoreline shall be studied to ascertain its potential for various land uses such as business, residential, resort and port operations, and to determine the needed surface transportation connections to such uses.

Goal: The interdependence between transportation systems and land use patterns is recognized and used to assure future development and redevelopment is planned with multi-modal transportation facilities.

Objectives:

1. Developers of planned, mixed-use neighborhoods shall design such projects so that residential, retail, office, and compatible light-industrial land uses can be served by transit stations or stops, pedestrian and bicycle facilities, open space, and public uses.
2. Transit corridors shall be recognized as attractors for new economic development.
3. Redevelopable and infill sites shall be encouraged to develop as walkable, mixed-use districts.
4. The incremental effects of developments on the transportation system shall be evaluated and provided for.
5. Traffic impact analysis should be used as a tool to address impacts to the existing roadway system.

POPULATION

INTRODUCTION

The socio-economic data available at the time of this writing is a conglomeration of data provided by the Kentucky State Data Center, OKI Regional Council of Governments, 2010 U.S. Census data, recent U.S. Census estimates, as well as the Boone County Planning Commission.

History

Boone County was established in 1798 and inhabited by 1,500 persons. From the early 1800's until the 1850's Boone County experienced relatively steady population growth. This population growth was related to the County's position on the Ohio River and the dominant form of travel at the time, the steamboat. The steamboat era resulted in the growth and prosperity of Boone County's river towns, such as Belleview, Petersburg, and Taylorsport. The inland crossroad towns of Burlington, Florence, Walton, Union, and Verona were dominated by farming activities and the harvesting of hardwood forests.

In the mid to late 1800's, Boone County's population growth began to stagnate and experience losses. The dominant form of travel was shifting from the steamboat to the locomotive. The rail lines that traversed Boone County only passed through Florence, Walton, and Verona. Accordingly those areas and towns that were served by the railroads prospered and gained population, while the unserved areas stagnated and lost population.

The 1940's marked the beginning of the automobile era, and Boone County subsequently reversed its decline in population into positive population growth. Boone County's population has increased dramatically since the early 1960's due in large part to the readily available transportation access provided by the interstates and related roadways, as well as from the airport. Unincorporated Boone County has experienced the greatest population growth, while the City of Florence is the Boone County city that has experienced the greatest level of population growth. Most of this growth is due to in-migration rather than natural population growth. **Table 2.1** describes Boone County's population by municipality since 1960.

TABLE 2.1 - BOONE COUNTY POPULATION BY MUNICIPALITY SINCE 1960

	1960	1970	1980	1990	2000	2010
Florence	5,837	11,457	15,586	18,624	23,551	29,951
Union	n/a	n/a	601	1,001	2,893	5,379
Walton	1,530	1,801	1,651	2,034	2,450	3,635
Unincorporated	14,573	19,554	28,004	35,930	57,097	79,846
TOTAL	21,940	32,812	45,842	59,579	85,991	118,811

Source: U.S. Census

The growth in Florence has been a result largely due to its location along the main interstate system in the northern Kentucky area (I-71/I-75), past annexations, and zoning map amendments on the west side of the city which allowed denser residential development. Union has seen increase as a result of the continued residential growth coming from the Florence area southward along the new US 42. Walton has also increased because of annexations and residential zoning map amendments mainly on the north and east sides of the city. The total population gain in the unincorporated county area was even greater for the 2000-2010 decade than in the 1990's.

Population Trends, 1960-2010

Since 1960, the population of Boone County increased from 21,940 to 118,811 persons in 2010. The sharpest increase, in terms of a recent decade growth rate, occurred between 1960 and 1970 when the population increased by 49.6%. The largest increase in numbers over a decade occurred in the 2000-2010 time period when the population increased by 32,820 people. The latter half of the 1990's through the end of 2008 reflected a housing and in-migration boom in response to low interest rates, increased sanitary sewer service, business

climate, and national building and lending trends. Since 2008, due to a slowdown in the economy, natural population growth in Boone County has continued to increase while in-migration has become less of a contributor to the population growth. **Table 2.2** shows the difference in the growth rate between the first half and the second half of the decade. Instead of growing at a rate of about 4,000 people per year as seen between 2000-2005, the second half saw growth at approximately 2,500 per year.

TABLE 2.2 - BOONE COUNTY RECENT GROWTH

	2000	2005*	2010
Boone County Total Population	85,991	106,272	118,811
Difference from past 5 years		+20,281	+12,539
People added per year average		4,000	2,500

*Sources: *KY State Data Center Estimates (University of Louisville) and U.S. Census*

Although Boone County only makes up a small percentage of the OKI regional population, it has been growing faster than any other county in the region (**Table 2.3**). Boone County has been the third fastest growing county by percentage in the Commonwealth of Kentucky behind Spencer County's 45% and Scott County's 42.7% (both with smaller overall population) from 2000 to 2010, and has had the third largest total population increase in the state for that same time period behind Jefferson and Fayette counties. The rural characteristics of neighboring Gallatin and Grant counties are evident in their growth rates of four percent and fourteen percent respectively for the same time period.

TABLE 2.3 – OKI REGION POPULATION CHANGE

	1990	2000	2010	Change 2000-10
Boone	57,589	85,991	118,811	38.2%
Campbell	83,866	88,616	90,336	1.9%
Kenton	142,031	151,464	159,720	5.5%
Butler	291,479	332,705	368,130	10.6%
Clermont	150,187	177,977	197,363	10.9%
Hamilton	866,228	845,303	802,347	-5.1%
Warren	113,909	158,486	212,693	34.3%
Dearborn	38,835	46,130	50,047	8.5%
TOTAL	1,744,124	1,886,672	1,999,447	6.0%

Source: U.S. Census

The majority of Boone County's population growth has occurred in the areas of Florence, Oakbrook, Burlington, Richwood, Hebron, Union, and more recently in the northern portion of the Walton area. **Figure 2.1** shows the 2010 Census Tract boundaries. **Table 2.4** lists the 2010 population in each census tract. The Census County Divisions (CCD), shown in **Figure 2.2**, remain unchanged from 2000 to 2010. Several Census Designated Places (CDP) have been added for the 2010 Census, as shown in **Figure 2.3**.

The three incorporated municipalities in Boone County (Florence, Walton, & Union) have experienced steady population growth since 1960. Florence, the largest city, has experienced the greatest increase. Florence's size is a reflection of its proximity to I-75 and related roadways. Its population has continued to increase through infill housing and annexations.

Even with the strong population growth in Boone County, some areas have experienced the opposite. For example, the airport area zones had lost population during the 1990s due to airport buyouts and the development of manufacturing and industrial parks.

Population Density

Population density refers to the number of persons per square mile of land area, and serves as an indicator of the degree of settlement in an area. As seen in **Table 2.5**, Boone County's population density has steadily increased in recent decades to become closer to that of its more urbanized neighboring counties and less like the overall rural characteristic of the state.

TABLE 2.5 – COUNTY POPULATION BY SQUARE MILE

	1960	1970	1980	1990	2000	2010
Boone	89	133	186	234	343	483
Kenton	741	794	841	874	905	986
Campbell	571	582	548	553	587	596
Kentucky Overall	77	81	92	93	101	109

Source: U.S. Census

OKI Traffic Analysis Zones (TAZ's) are also used to track population growth, primarily for transportation planning. **Figure 2.4** (2010 TAZ population density) shows that the majority of the higher density population in Boone County is located in the eastern portion of the County near the I-71/75 corridor. The established sections of Florence contain the highest population density up to 7.8 persons per acre (or over 5,000 per square mile). Many recent residential subdivisions have been developing at about 3 dwelling units per acre, which yields a density over 8 persons per acre. The lowest density areas are located in western Boone County. Most of these areas have less than one person per ten acres.

Daytime Population

Daytime Population is defined as the total number of people coming into the county (including those who do not leave the county) minus the number of people who leave the county. In 1996, Boone County had a day-time estimated population of 143,855 persons, which is double the night time population of the county at the time. Of the 88,719 non-resident people who came into the County daily in 1996, 34% came to work, 29% were airport travelers, 24.5% were retail customers, 9% were restaurant patrons, 2% were Turfway Racetrack patrons, 1% stayed in hotels and .5% were movie theater patrons. This information is included here to demonstrate that the Florence/airport areas in particular support much daytime employment, consumer, and travel activity. This increase in daytime activity requires public services just as the resident population does. There is great difficulty in coming up with a daytime population number because it is impossible to determine if people are being counted multiple times or not during the course of the day. Different methodologies have been employed in determining such figures; none of which a so-called accepted standard. When an agreed upon method of determining daytime population becomes the norm, the detailed study from 1996 will need to be updated.

Rural and Urban Population

U.S. Census classifies a county's population as either urban, rural farm, or rural non-farm. In 1940 Boone County's population was classified as completely rural and was considered primarily agricultural in character. By 1990, the urban portion comprised 61.3% of the population, the suburban (rural non-farm) portion comprised 36.4% of the population, and the rural farm portion comprised only 2.3% of the population. Since 1990, the U.S. Census' American Community Survey (ACS) indicates that the estimated rural vs. urban geographic boundaries have not been adjusted for each decennial census count, so that the figures provided in the census may provide little benefit to demographic analysis or planning efforts.

In a regional context, Boone County is less urban than neighboring Kenton and Campbell Counties but more so than the overall Commonwealth of Kentucky. This reflects the extensive residential subdivision development that has occurred in Boone County outside the official U.S. Census urban boundary.

Table 2.4 - 2010 US Census Tract Population
(see figure 2.1)

701	6,680
702	6,368
703.01	5,506
703.05	5,644
703.07	11,018
703.08	9,807
703.09	6,184
703.11	2,538
703.12	3,053
703.13	3,057
703.14	4,865
704.01	8,566
704.02	8,254
705.02	4,229
705.03	6,179
705.04	7,759
706.01	2,593
706.04	3,045
706.05	5,535
706.06	4,163
706.07	3,768
9801	0

Migration

Migration statistics are basic indicators of the economic situation within an area. Generally, if the local economic climate is poor, a negative migration is experienced as local residents relocate to areas with brighter economic situations. If the local economic climate is good, a positive migration is experienced as outside residents move to the area. Boone County experienced a period of stagnated and negative growth, or out-migration, from the late 1800's to the mid 1900's because the limited rail line service and the consolidation of farms enabled by machinery. However, from 1950 through 2010, Boone County experienced a significant positive migration rate due to the County's bright economic situation, the airport, interstate highways, desired residential amenities, its proximity to downtown Cincinnati, and the subsequent suburban growth patterns.

In a regional context, Boone County's positive migration rates higher than Kenton and Campbell Counties and the overall state. It should be noted that an area can experience negative migration but still have increases in population due to birth rates that compensate for the out-migration. A detailed look at recent Boone County migration (**Table 2.6**) reveals that the number of people moving into the county is greater than the number of movers within the county. Historically many new residents have come from Kenton County. **Table 2.7** shows that although the overwhelming percentage of Boone County residents were born in the U.S., over forty percent of the total population was born outside Kentucky. This is an indicator of strong in-migration over many years.

TABLE 2.6 – PERCENT MIGRATION JULY 2008 TO JULY 2009

Boone County Residence One Year Previous	Per Pop Over Age 1
Lived in Same House	84.5%
Lived in Different House in Boone County	7.0%
Lived in another Kentucky County	5.3%
Lived in Another U. S. State	3.5%
Lived Abroad	0.7%

Source: American Community Survey (ACS)

TABLE 2.7 – PLACE OF BIRTH, 2009 BOONE COUNTY POPULATION

Location	Percent
United States	94.9%
(Kentucky)	54.2%
(Another U.S. State)	40.8%
U.S. Territory or Abroad to U.S. Parents	1.0%
Another Country	4.1%

Source: American Community Survey (ACS)

Age and Sex Distribution

Boone County's median age in 2010 was 35.7 which is younger than the Kentucky median age of 38.1. Over time, the older age groups have increased their proportion of the total population. **Table 2.8** indicates that the 45-64 and 65+ age groups have increased in percentage in Boone County since 2000 while the younger age groups have decreased. As is the case nationwide, people are generally having fewer children while living longer.

Due to the strong presence of the 20-64 age group, the dependency ratio for Boone County is relatively low. The dependency ratio measures the number of dependent persons, defined as those that fall into the age groups of 0-19 and 65 and older, against the number of productive persons, defined as those who fall into the age group of 20-64. The closer the dependency ratio approaches 100, the greater the tax burden on the area's economy to provide necessary community facilities and services. The proportion of Boone County's male population, 49.5 percent, to female population, 50.5 percent, was essentially even in 2010. This is similar to previous decades.

TABLE 2.8 – AGE OF BOONE COUNTY POPULATION

Age	2000		2010	
	Number	Percent	Number	Percent
0-4	6,849	8.0	9,019	7.6
5-19	20,011	23.3	27,225	22.9
20-44	33,872	39.3	40,342	34.0
45-64	18,318	21.3	30,912	26.0
65+	6,941	8.1	11,313	9.5

Source: 2010 U.S. Census

Racial Composition

Boone County's population is relatively homogeneous in racial composition with the majority of the population defined as white (see **Table 2.9**). Boone County's 1980 non-white population (Black, American Indian, Eskimo, Asian, etc.) comprised 1% of the total population. The non-white population is rising slightly as the percentage of non-white population in 2000 was 4.8%, and in 2009 had increased to 6.6%. In a regional context, Boone County's 2000 percentage of 8.2% non-white population compares to that of Kentucky (12.2%), Kenton County (9%), and Campbell County (5.7%). Northern Kentucky as a whole has a relatively small non-white population.

The Hispanic population is not considered as a separate race by the U.S. Census Bureau. It is considered an ethnicity. According to the Census, in 2000 there were 1,702 (2.0%) Hispanic or Latino persons in Boone County of any race, and in 2010, there were 4,205 (3.5%).

TABLE 2.9 – RACIAL COMPOSITION OF BOONE COUNTY POPULATION

Race	2000		2010	
	Number	Percent	Number	Percent
White	81,822	95.2	109,050	91.8
African-American	1,306	1.5	2,992	2.5
American Indian	200	0.2	228	0.2
Asian	1,108	1.3	2,534	2.1
Other	1,555	1.8	4,007	3.4

Source: 2010 U.S. Census

Educational Attainment

Educational attainment is primarily measured in terms of the percentage of high school graduates among persons who are 25 years old and older. Boone County's percent of high school graduates increased between 2000 and 2010, as seen in **Table 2.10**. In 2010, Boone County's percent of high school graduates for persons 25 years old and older was higher than the state of Kentucky – 90.5 percent in Boone County to 81.9 percent in overall Kentucky, as was the percent bachelor's or higher degree – 31.9 percent in Boone County to 20.5 percent in overall Kentucky.

TABLE 2.10 – BOONE COUNTY EDUCATION DEGREES HELD, PERSONS AGED 25+

Level	2000	2010
High School	85.1%	90.5%
Associates	5.7%	8.8%
Bachelors	15.8%	18.8%
Graduate/Professional	7.1%	9.3%

Source: 2010 U.S. Census and ACS

Households and Family

The basic reporting unit, in terms of demographic data is the household. According to Census results and the American Community Survey (ACS), the average household size in 1990 was 2.85 persons, 2.73 in 2000, estimated to be 2.71 in 2005, and 2.75 in 2010. Household size has been projected by the ACS to level off near 2.66 in subsequent years. Household data is also discussed in the Housing Element.

A household can either be classified as a family household or a non-family household. A family household has been defined as two or more persons who are related by blood, legal adoption, or marriage. According to the 2010 U.S. Census, family households comprised 73.7 percent of the total number of households (down from 75 percent in 2000) and non-family households comprised 26.3 percent of the total number of households (up from 25 percent in 1980). Family households can represent married persons who are more likely to remain in the area in which they are currently residing. Non-family households generally represent single persons who are relatively transitory and career mobile.

The 2000 total number of families in Boone County was 23,435, which increased to 31,862 in 2010, at which time the percentage of families who were married couples totaled 78.5 percent.

Population Projections

Population projections are derived from statistical analysis procedures that consider both recent and historical population trends. Population forecasts for a political entity the size of Boone County are generally considered realistic. Population forecasts for political entities such as Florence, Walton, or Union are generally considered more tentative due to the possibility that annexations may affect the population growth.

Population forecasts for Boone County are derived from two main sources. The first source of population forecast is the Kentucky State Data Center at the University of Louisville. The Kentucky State Data Center provides the official population forecasts for Kentucky. The second source of population forecast is the Ohio-Kentucky-Indiana Regional Council of Governments (OKI). In addition, the Boone County Planning Commission staff updates population data based on residential growth, and has on occasion generated its own forecasts.

Kentucky State Data Center Forecasts

The Kentucky State Data Center's population forecasts for Boone County were made by utilizing the age-sex cohort survival population forecasting methodology. This particular methodology generates population forecasts for County residents by sex and age groups through the examination of the three components of population change: births, deaths, and migration. The age-sex cohort survival population forecasting methodology is the most commonly utilized population forecasting model and is considered to be relatively accurate. The Urban Studies Center has forecasted Boone County's 2010, 2020, and 2030 populations at 121,080, 153,545, and 186,373 persons respectively. These forecasts are larger than those from the 2000 Comprehensive Plan update where the Kentucky Data Center forecasted the 2020 Boone County population to be 139,000. These projections are lower, however, than those contained in the 2005 Comprehensive Plan because of the economic conditions and changes in the housing market of the past few years. With the release of the U.S. Census Boone County population of 118,811, the subsequent projections will likely be adjusted downward by the State Data Center.

OKI Traffic Zones Forecast

The Ohio-Kentucky-Indiana Regional Council of Governments (OKI) divided Boone County into separate transportation analysis zones (due to transportation being OKI's main planning function) and generated population projections for each zone through the year 2030. **Figure 2.5 and Figure 2.6 cartographically** show OKI's population projections for 2020 and 2030 using the traffic zones. **Table 2.11** summarizes the TAZ projections by region as shown on **Figure 2.7**.

Traffic zones around the airport have decreased in population due to past airport buyouts. The western and southern portions of the county as well the established portions of Florence are expected to increase only slightly. The expected high growth areas are Hebron, Burlington, the western portion of the Florence region, Walton, and Union. Over the next 25 years suburban growth of approximately eight persons per acre will continue to spread westward into western Boone County. Established sections of Florence will maintain their current densities. The

northern section of the County and the middle section including the Burlington and Camp Ernst Road areas will also experience an increase in population density. The land in the western portions of the county should remain rural at less than one person per 5 acres and less than 1 person per 10 acres in some areas. As with the State Data Center’s projections, these figures are likely to be reduced when OKI adjusts their numbers to take into account the economic slow-down of the past several years.

Table 2.11 - OKI TAZ "regions" population estimates

TAZ REGION:	2020	2030
Airport	4,141	3,886
Hebron	15,086	17,886
Burlington	29,155	34,538
Florence	32,385	34,153
Union	33,568	41,886
Richwood/Walton	22,085	27,761
western	15,184	20,468
southern	6,414	8,074
COUNTY TOTAL	158,018	188,652

source: OKI Regional Council of Governments

The northern and middle sections of the county are expected to increase by over 500 percent. The western portions of the county, as well as the established sections of Florence, are expected to only increase slightly. Areas around the airport are expected to decrease in population as the airport expands. All other areas of the county are expected to continue to grow significantly.

The OKI population forecasts for Boone County were made for each population analysis zone by considering three factors: (1) Housing changes for a given period of time in order to determine the proportion of individual population analysis zone growth relative to overall County growth; (2) The existing land uses; (3) The capability for future growth, based on location in the Cincinnati region, job growth, and infrastructure.

Determining the growth capability of a population analysis zone involved the physical constraints on available land and public facilities, Boone County planning studies, and local knowledge concerning the growth of Boone County. The population data compiled by the Boone County Planning Commission has been utilized in the Boone County Transportation Plan and other planning documents.

CONCLUSION

Boone County's rapid growth since 1940, although slowed over the last few years, is anticipated to generally continue through the year 2030 when OKI estimates 188,652 people will live in Boone County, compared to the 118,811 residents in 2010 according to the 2010 Census. As mentioned previously, these estimates will likely be adjusted down a bit to account for the recent conditions in the economy. Florence has also experienced rapid growth since 1940; however, its growth is anticipated to be modest in the future unless the city annexes additional residential areas. Boone County's percent of urban population is growing increasingly closer to that of Kenton and Campbell Counties. Some changes in population characteristics will affect housing and other features of the county. For example, Boone County is defined by a decreasing proportion of young and middle aged persons, while the median age will continue to grow older, and the percentage of Boone County's married couple households is anticipated to decrease. The county's population will continue to become more diverse in terms of race and ethnicity as well.

Geographically, Boone County's greatest areas of future population growth are anticipated to occur along KY 237 north of I-275, east of Camp Ernst Road and west of U.S. 42 through the Union and Richwood west areas. The western areas of Boone County are anticipated to experience modest population growth mainly in the form of non-subdivision single family residences and small, low density subdivisions.

The continuing low-density development in Boone County does not match some of the higher density residential land use areas recommended on the 2025 Future Land Use Map during the 2000 Comprehensive Plan update. The result in 2000 was that additional land outside the 2020 recommended urban land use areas was planned for suburban or urban development for the 2025 Land Use Plan. This was considered again during the 2005 update for the 2030 Future Land Use Map in light of existing and planned infrastructure. Boone County population growth, as projected by OKI and the KY State Data Center, can be accommodated beyond 2030 with currently allocated land. However, relatively level land will become shorter in supply if current development patterns continue. This basic analysis helps in forming recommendations for the other elements in this plan including the Land Use Element.

Figure 2.1 - 2010 Census Tracts

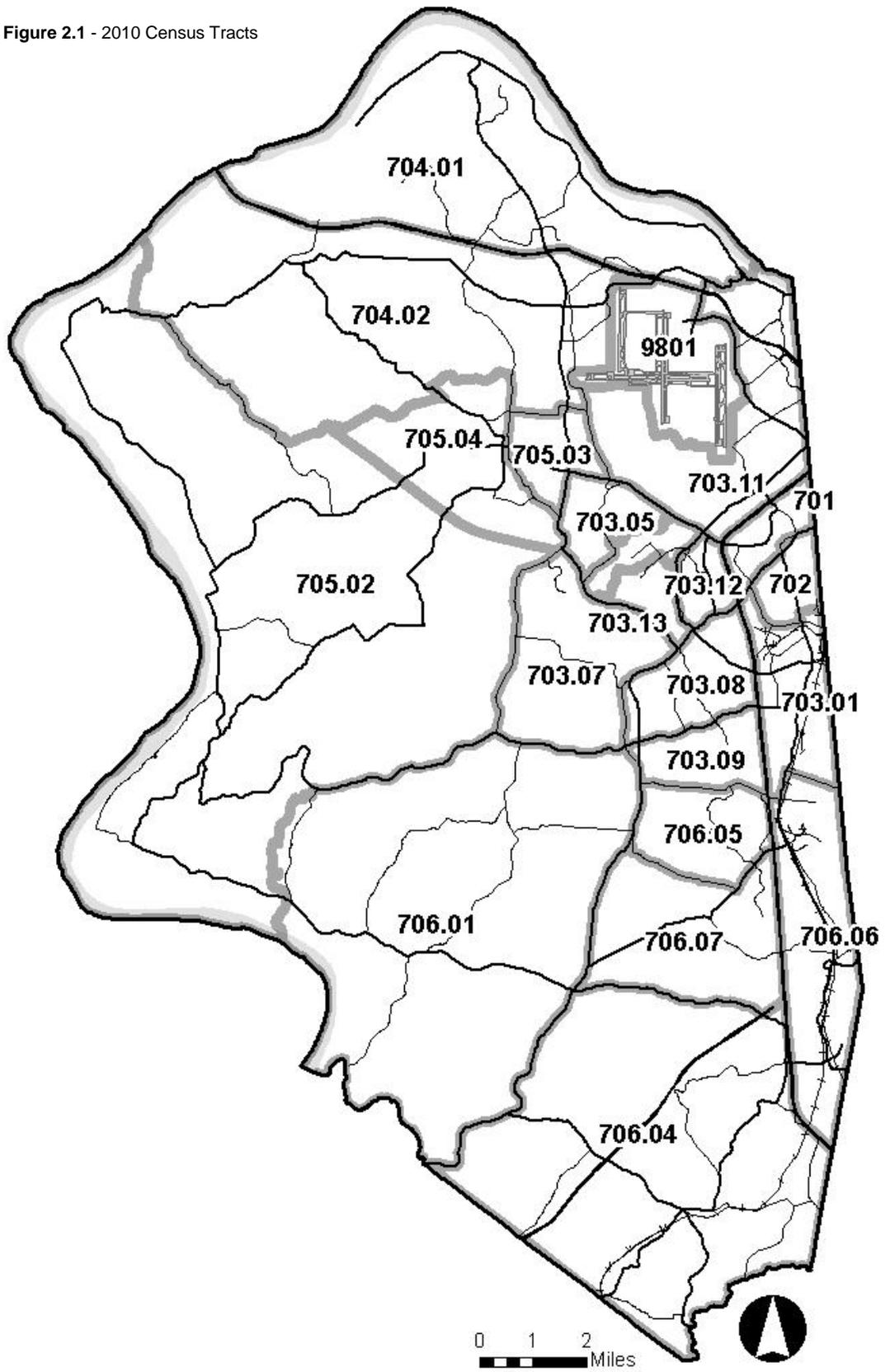


Figure 2.2 - Census County Divisions

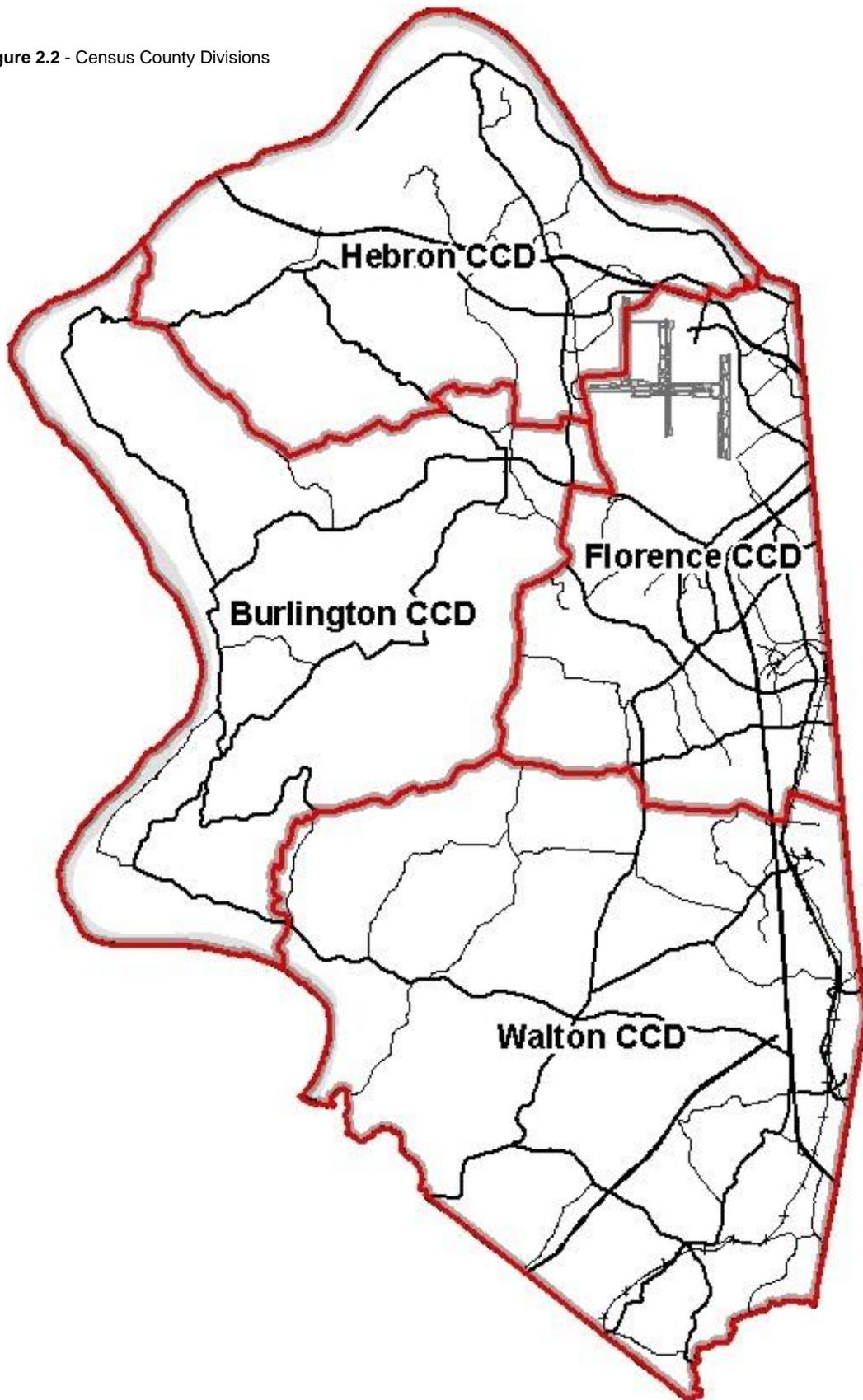


Figure 2.3 - Census Designated Places

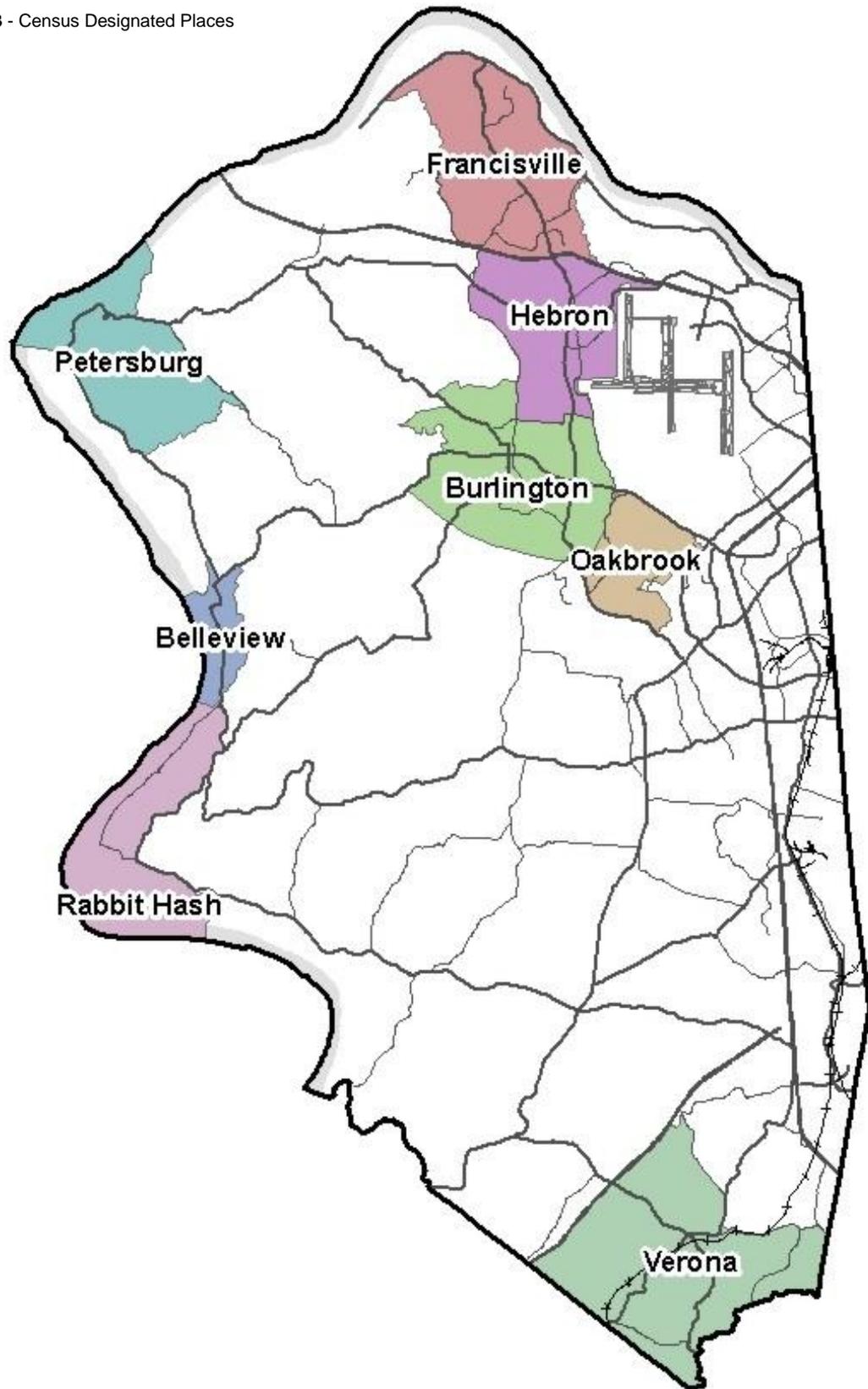


Figure 2.4 - 2010 TAZ Population Density

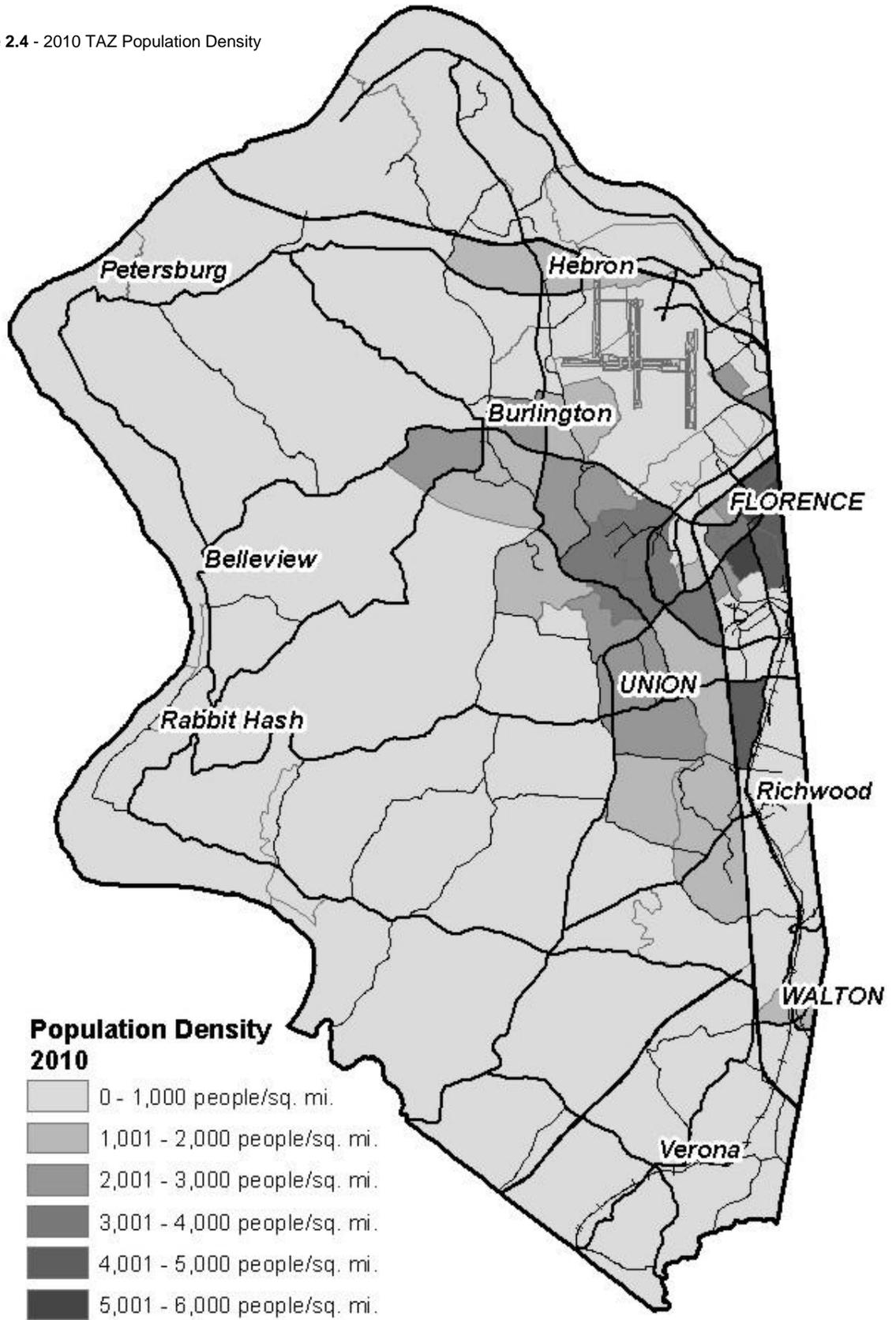


Figure 2.5 - 2020 TAZ Population

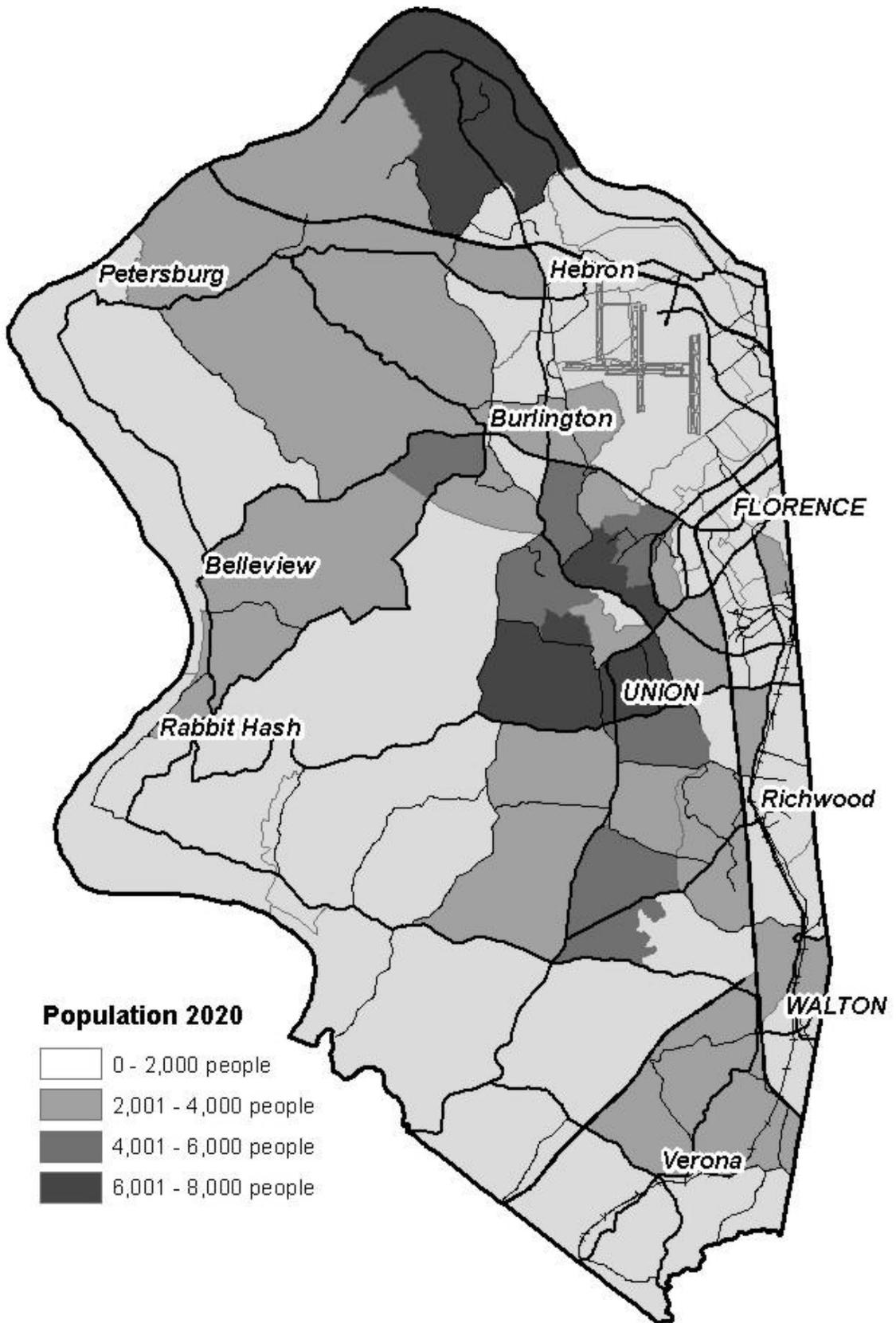


Figure 2.6 - 2030 TAZ Population

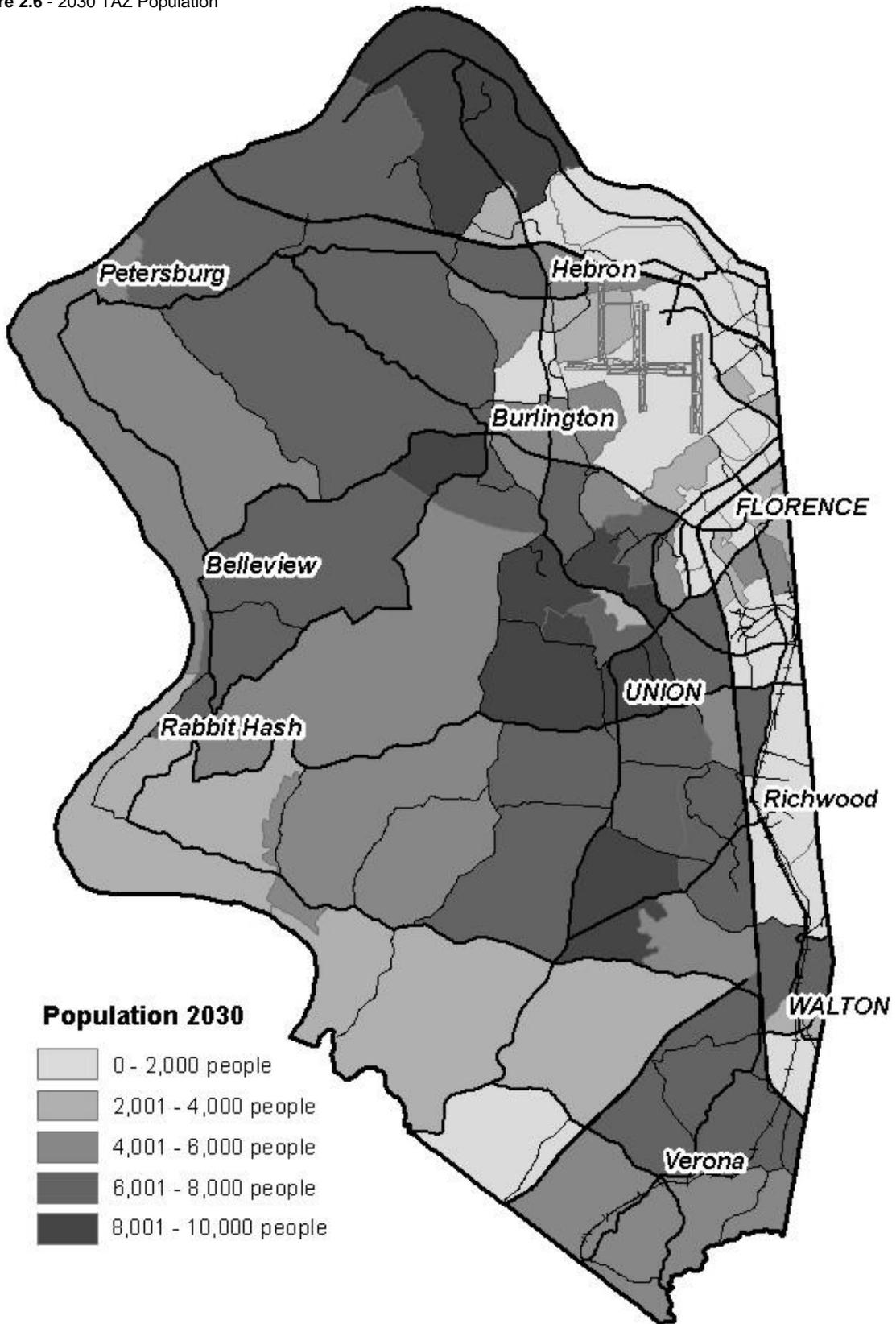
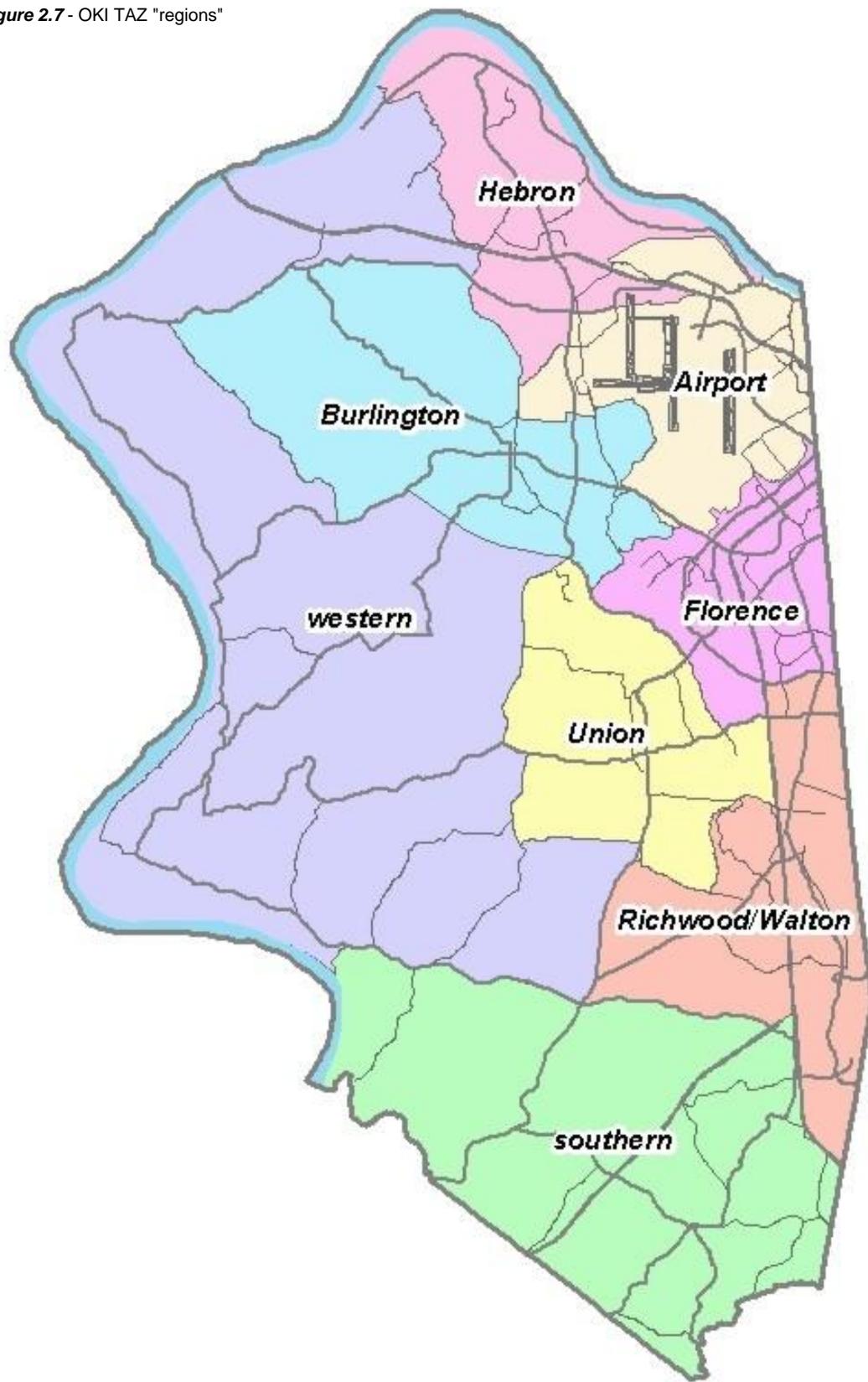


Figure 2.7 - OKI TAZ "regions"



ENVIRONMENT

INTRODUCTION

Environment is defined by Webster's Dictionary as "the circumstances, objects, or conditions by which one is surrounded" and "the complex of physical, chemical, and biotic factors (as climate, soil, and living things) that act upon an organism or an ecological community and ultimately determine its form and survival." These amenities also provide additional, less visible qualities, such as cleaner air, recreational areas, and wildlife habitat that are important to a community. Development has an effect on the physical and social environment of a community, and this can affect many of the characteristics which make the community unique or those qualities that its residents feel are important. Therefore, development should preserve and promote an overall high quality of life while allowing a reasonable economic return.

While it's true that Boone County is located less than 15 miles from downtown Cincinnati, has three interstate highways, an international airport, and a regional shopping mall, a significant part of the county can still be considered rural. This rural character is a desirable environmental quality which attracts people to become residents of Boone County. Prime agricultural land, woodland areas, scenic valleys, streams, and hillsides are the most significant environmental resources that exist in Boone County. This quality, which attracts many new residents, is often replaced by the development built to accommodate them. This element is prepared from an environmental perspective and is to be used as one factor in determining the future land use of this plan. This element establishes the fact that environmental impacts should be addressed up front rather than allowed to accumulate and therefore require much more expenditure in the future.

GEOLOGY

The University of Kentucky Geological Survey for Boone County indicates that interbedded shale and limestone layers are the predominant rock outcroppings, and alluvial and glacial deposits occur that overlay the limestone and shale. Some of the deeper limestone layers in the geologic column are pure enough to provide a stone resource for mining. These formations are approximately a thousand feet below the higher surface portions of Boone County.

One notable rock formation is the Kope Formation, which contains a large percentage of shale interbedded with limestone. According to the Kentucky Geological Survey, this formation has characteristics of poor drainage and soft shale which typically results in hillside slippage when exposed to the weather. The Cincinnati area is well known for landslides largely because of this formation. Kope is generally present at the surface along stream beds and the lower portions of the stream valley walls in Boone County. Maps prepared by the Kentucky Geological Survey show that this formation is most prevalent in the Big Bone Lick and southern portions of the county, but is also found on all major hillsides in the western and northern portions of the county.

Regarding gravel resources, the Existing Land Use maps in this and the previous Comprehensive Plans indicate that most mining has occurred along the riverfront areas of the county. A few areas were mined years ago, and have been reclaimed or allowed to revert to natural vegetation. A dedicated study examining how much gravel and sand resource may still exist in Boone County has not been conducted.

SOILS

Soils data are based upon the United States Department of Agriculture Soil Conservation Service publication Soil Survey of Boone, Campbell, and Kenton Counties, Kentucky, published in 1973. Soils are an important resource because they provide for agricultural production. They affect drainage, flooding, permeability, slope stability, siltation, as well as development practices and costs.

Alluvial Soils - Alluvial soils are composed of the remains of former stream beds and deposits of materials generated by natural water erosion. Such soils are found in designated flood zones of major rivers, and along the banks of tributary streams. Alluvial soils are highly permeable, subject to high water tables, and are usually connected with underground streams or aquifers. Alluvial soils are often highly erodible, serve as aquifer recharge areas, and should be addressed in development.

Permeability - Soil permeability is a measure of the rate and depth to which a soil absorbs water. Permeability rates are determined by the soil's porosity, slope, depth to bedrock, depth to seasonal high water table, vegetation cover, and other factors.

Almost all land in Boone County, except river and stream valley bottoms and a small number of isolated locations are subject to permeability limitations. Nearly half of the undeveloped land area within Boone County contains soils which have poor permeability (0.63 inches per hour or lower). This land area, which is primarily located within the southern and western portion of the county, has slopes of 20% or greater and is shown on **Figure 3.1** as Developmentally Sensitive (DS) areas. The land area which has a permeability of 0.63 to 2.00 inches per hour covers approximately 50% of the county and is primarily comprised of slopes of less than 20%. These areas are usually prime agricultural land or agricultural land of state-wide importance, and coincide with the parts of Boone County that are projected to experience residential development within the 25 year planning horizon. Severely impermeable soils are found primarily along ridgelines where the bedrock is near the surface and in low-lying areas where the water table is high.

Soils of poor permeability are subject to ponding and runoff since the soil cannot absorb concentrated storm waters. Nonporous surfaces of urban uses, on or adjacent to impermeable soils, can significantly increase the runoff volume, and aggravate ponding, erosion, and surface water pollution.

Depth to Seasonal High Water Table - Water filters through porous soil until it reaches a substratum material with nonporous characteristics, normally bedrock or clay deposits. Water so entrapped will back up toward the surface forming a ground water table, or flow through underground bedrock fractures or limestone deposits until it is collected and filtered back up through natural stream beds. In both circumstances, ground water is an important resource since it provides a naturally filtered water supply.

Soils of moderate water table depth are usable when subject to exacting design and performance standards. In Boone County, extremely high water tables occur in only a small number of thin belts along the Ohio River and a few other scattered areas. There are more areas of moderate depth water tables, concentrated primarily on ridgelines in the northeastern uplands of the county.

Strength of Soil - Soils vary considerably in compressive strength and stability. Sandy silts are the most stable; clays the least. Slope, depth to bedrock, vegetation cover and ground water drainage patterns are related factors which determine soil material use limits.

On flat to shallow sloped lands, all soils are usable for development (aside from water table limitations). Clay and silty clay soils, however, are particularly susceptible to mudslides when steeper slopes are present in areas with shallow bedrock depth and little tree cover.

According to the USDA Soil Survey (1989) all soils contain some form of limitation for urban uses. Ridgelines, stream beds of the lower reaches of major streams, sloping lands, and the upper reaches of stream valleys are the most notable. The rugged terrain in some of the western and southwestern parts of Boone County contains broad areas of poor soil conditions for development. More moderate conditions prevail in the gentler topography of the north and eastern portions of the county.

Depth to Bedrock - Major concentrations of extremely shallow bedrock depths are located in the northern portion of the county along the steep hillsides that overlook the Ohio River, and in some stream beds. The southeastern portion of the county between Walton, Richwood and Beaverlick also has a large area of shallow bedrock depth. In addition, the Gunpowder Creek Valley and Woolper Creek Valley have many areas which have shallow

bedrock depths. Most of the land in the northeastern portion of the county, which includes the airport and most of the City of Florence, does not contain this limitation for development.

Slope/Erosion - Erosion hazard is caused by the combined effects of soil material characteristics and slope. Different soil types are affected differently by slope. Steep slopes descending into stream valleys and bottom lands of small streams are highly erodible. These extend into the western and northern edges of the county. Less steep upper slopes near ridgelines are moderately erodible, while ridgelines, plateau, and large stream bed areas are free from significant erosion hazard.

Other factors contributing to erosion hazard at lower slope percentages include the absence of tree and ground cover, shallow depth to bedrock, low permeability, and shallow surface drainage channels. Erosion from improperly modified slopes can disrupt natural drainage channels, pollute surface water runoff, and cause mudslides.

Agricultural Values - The U.S. Department of Agriculture grades the agricultural potential of different soil types and assigns them to a capability classification. The classifications are based on the suitability of soils for field crops employing normal field management techniques. Prime agricultural land is important for the sustainability of a region. Furthermore, agricultural lands provide the majority of the open space within a community, as well as creating a visual identity that often defines the character of a community.

Topography - The unique glacial topography of Boone County offers many astounding vistas of the Ohio River and its bottomlands. The steep tree covered hillsides which parallel the river and creeks, as well as the valley bottoms themselves offer majestic countryside vistas of a quality not commonly found within 15 miles of a major city. The views and vistas of such natural beauty are arguably some of the most important amenities to residents within the county. They help to establish a quality of life desired by the residents of Boone County. It should also be recognized that Boone County has over 40 miles of Ohio River frontage of which the majority is adjoined with steep hillsides.

In Boone County there is a broad area of scenic value in the flood plains along the Ohio River, and along the valleys of major tributary streams on the western side of the county. Outstanding scenic areas include a series of cliffs along the Ohio River bordering the north edge of the county which affords dramatic views of the Ohio River and beyond. Notable man-made features such as individual historic homes/farm buildings and the towns of Burlington, Petersburg, Rabbit Hash, and Belleview/McVille also provide scenic amenities to the county.

WATER

Stream Tributaries - Glaciers determined the topography of Boone County and also created a vast network of streams which cover the entire county. As the land descends to the Ohio River, major tributaries are formed, including Mud Lick, Big Bone, Gunpowder, Lick, Middle, Woolper, Sand Run, and Elijah's Creeks. Also included are many smaller tributaries and intermittent streams. This natural drainage system provides an efficient storm water collection system, as well as a natural water supply. **Figure 3.2** shows the major stream tributaries in Boone County and defines the watersheds which are such an important resource for land use planning. Furthermore, natural drainage networks provide efficient storm water collection systems, and ultimately are the headwater system for a natural water supply.

Floodplains - Flood zones are defined by historical records of high flood water levels or by engineering estimates of the volume and channel changes which may affect, or be affected by urban improvements within the drainage network. **Figure 3.3** identifies the 100 year floodplains recently updated by FEMA which correspond to areas that were flooded during the 1937 flood.

Although the highest flood of record occurred on the Ohio River in 1937, it is not the worst that could possibly occur. Significant flooding has also occurred in 1945, 1964, and 1997. U.S. Army Corps of Engineers studies of the Ohio River Basin indicate that more critical combinations of storms and runoff can reasonably be anticipated to occur in the future.

Protective flood control structures do not alleviate all flood zone hazards. In fact, they may even increase high water levels upstream from a backwater dam, alter the natural channel through which a flooding pattern would be expected, or alter the water table and underground drainage pattern serving local areas.

In Boone County, the lands designated as flood zones include primarily bottom lands along the Ohio River and its major tributaries. However, minor tributaries typically experience flooding problems as more impervious area is created in each watershed. Portions of the upper Gunpowder, Woolper, Elijah's Creek, and Mud Lick watersheds frequently experience flooding. The most extensive flood zone area is the lower East Bend Bottom at the mouth of Gunpowder Creek. Spots of moderate flood hazard from possible dam breaks are located downstream from small dammed lakes scattered throughout the county.

The Boone County Building Department is the administrator of the National Flood Insurance Program (NFIP). The NFIP enables communities to buy insurance protection from losses due to flooding and is designed as an alternative to disaster assistance in order to meet the rising costs of repairing damage caused by flood events.

Water Quality - The Clean Water Act (adopted in 1977) includes goals, water quality standards, monitoring, controls, and revision of strategies. The stated goal of the Act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." An interim goal passed in 1972 by Congress established benchmarks for the year 1983 for protection and propagation of fish and wildlife and water recreation. As of 2004, 40% of the state's waters did not meet this goal. By statute, Kentucky designates water uses; water quality criteria have also been established to protect the uses. Anti-degradation, including minimum goals for each water body, is a required component of these standards.

The Kentucky Agriculture Water Quality Act was passed in 1994 to bring Kentucky into compliance with federal laws. The goal of the act is to protect surface and ground water from potential pollutants as a result of agriculture and forestry operations. The act did not establish any new water quality laws other than requiring that all agriculture and forestry operations of ten or more acres develop and implement a water quality plan by October 23, 2001. The Boone County Conservation District continues to assist in developing individual water quality plans. The water quality plan consists of best management practices (BMP) identified by the Kentucky Agriculture Water Quality Authority (AWQA) that keep non-point source or runoff pollutants such as sediment, animal waste, and fertilizers and pesticides from reaching our waterways. The AWQA asks landowners to address water quality issues in the areas of crops, farmstead, livestock, pesticides and fertilizers, silviculture, and streams and other waters. Not only are landowners required to install best management practices, they are also required to document their efforts to improve and protect the natural resources of the Commonwealth. By writing and carrying out a water quality plan, producers and landowners can be assured that they are helping to protect our water.

In 2007, SD1 entered into a Consent Decree with the US Environmental Protection Agency (USEPA) and the Kentucky Division of Water (KDOW) that utilizes an adaptive watershed management approach to address water quality in the streams of Northern Kentucky. This approach has been endorsed by USEPA as offering the greatest opportunity for identifying and prioritizing cost-effective and protective solutions to municipal government waste-water and storm water management obligations. As one component of this management strategy, SD1 delineated sixteen (16) major watersheds throughout Northern Kentucky for intensive study. Initial efforts focused on the collection and compilation of existing data for each watershed (i.e. water quality, topography, geology, land use, land cover, etc.), which resulted in the development of an individual Watershed Characterization Report (WCR) for each of the sixteen watersheds. These reports provided a starting point for further investigation into individual watershed condition. Additionally, SD1 undertook a large monitoring effort in order to establish a baseline of current conditions of the receiving streams within each of these watersheds. This effort included biological (fish and aquatic insect), water quality, hydrological, and physical characterization (hydromodification)

surveys at nearly 80 stations across Northern Kentucky. The results of these surveys are currently being analyzed, and are crucial to understanding the linkage between receiving stream quality and changes in watershed land cover/use at the local level. It is also important to highlight that preliminary results of these surveys indicate that the highest quality streams in Northern Kentucky reside in the lesser developed areas of western Boone County and that there is a direct relationship to stream quality and the amount of impervious surface within a watershed (consistent with findings across the nation), further emphasizing the importance of broadening the understanding of how land conversion can impact water quality. This information will also provide insight on how to lessen the impact of land use changes (i.e. minimize alterations of the natural flow regime) and should be used to optimize watershed management and planning efforts.

In accordance with Section 303 (d) of the Clean Water Act, the State of Kentucky has developed a list of water bodies that do not meet their designated uses and are declared impaired waters. Being listed as such, a Total Maximum Daily Load (TMDL) must be developed for these waters. A TMDL includes strategies and controls, and is designed to be regulatory. A TMDL is remedial, and is an option for the Division of Water if local communities do not noticeably improve or plan for improvements in stream quality. However, both Elijah's Creek and segments of Gunpowder Creek were listed for TMDL development in the 1998 report issued by the Kentucky Natural Resources and Environmental Protection Cabinet Division of Water. Since that time, TMDL's have been developed and approved by the Environmental Protection Agency - Region 4 for these two streams and there has been discussion of studying Woolper Creek and Sand Run Creek. Most of the pollution issues center around siltation, high nutrient levels, and low dissolved oxygen, while Gunpowder Creek in particular includes industrial sources and urban runoff issues. According to the Kentucky Division of Water, Gunpowder Creek and Elijah's Creek have been "severely impacted" by de-icing fluids used by the airport. The airport has implemented a glycol recovery and recycling system and an aeration system in attempts to decrease permit violations. Much of these facilities came on line early in 2004 and their success will be determined over time. An important consideration is that the creeks have been impacted by this pollution for many years and may require an extended period of time to recover even after the impact is decreased to an acceptable level because of pollution and anaerobic conditions within the stream sediment.

The Kentucky EPA Division of Water monitors and collects data within a basin management cycle of five years. This monitoring includes water quality and bacteriological sampling at 70 ambient stations statewide as well as rotating watershed locations, determination of least-impaired conditions, nutrient and trophic status of public reservoirs, fish tissue sampling, biological survey of streams, nonpoint pollution sources, BMP implementation, and Total Maximum Daily Load (TMDL) development. Data and reports, including the 2008 State Integrated 305b Report that contains Boone County in its study area, can be accessed at www.water.ky.gov. Parts of Double Lick, Garrison, Little South Fork, and Second Creeks are designated as outstanding resource waters. The EPA can require the State to develop strategies to help attain water quality standards, including TMDLs, Watershed Restoration Action Strategies, or other watershed-based strategies.

Storm Water Phase II is a set of requirements implemented by the EPA that include local permits to do the following as a minimum: public education/outreach, public involvement/participation, illicit discharge elimination, construction site stormwater controls, post construction stormwater management, and pollution prevention. These local stormwater programs were required to be implemented by March of 2008, and periodically undergo review by EPA. SD1 issues the permits within their stormwater service area for most of Northern Kentucky with the exceptions of the City of Florence and City of Walton. One method of addressing these issues is the Section 319 Nonpoint Source (NPS) Program that can be grant supported and is designed to produce best management practices (erosion control and stream protection). These programs have a 5 year focus and are to be updated every 5 years and can affect National Pollutant Discharge Elimination System (NPDES) permits. The Gunpowder Creek project is underway, and a Woolper Creek project is being designed. These projects are important because they enable strong citizen and land owner involvement. All of the efforts described above are designed to protect public health, drinking water supplies, stewardship, property values, and recreation/tourism.

The EPA is concerned about water quality in Kentucky and the issuance of permits, and may become more involved from a regulatory standpoint in the future. EPA rulemaking can replace the Kentucky regulations that have been found to be deficient. Local communities, land owners, and developers may be able to avoid much

federal intervention and maintain some local control over water quality measures if successful local initiatives are undertaken. The water characterization reports being prepared by SD1 for each major watershed in Boone County contain extensive valuable information.

The 2010 Northern Kentucky University (NKU) Center for Applied Ecology 'Stream and Wetland Restoration Program' annual report shows seven restoration projects in Boone County: Split Rock Conservation Park, Big Bone Lick State Park, Adair Wildlife Management Area, City of Florence Golf Course, Boone Woods Park, Sand Run, and a small stream segment behind Burlington Elementary.

PLANT AND ANIMAL LIFE

According to the Kentucky State Nature Preserves Commission, in 2009, Boone County had 31 animal and 8 plant species listed as Endangered, Threatened, or Rare. 5 of the 8 plant species were not located in any of the 7 other counties in the OKI region when compared to the Ohio Dept. of Natural Resources.

Wildlife Habitat - The capability of land to support wildlife is determined by types and patterns of vegetation, and by the supply and distribution of water. These factors are closely related to properties of soil types. The U.S. Department of Agriculture rates the potential of soils to accommodate three types of wildlife: wetland, woodland, and open land. Wetland wildlife requires soil conditions least capable of supporting urban uses. Woodland wildlife can exist within and adjacent to urban land uses, but is susceptible to habitat loss. Open land wildlife can be found within croplands, pasture and meadowlands, often adjacent to areas of urban use.

Preservation of wildlife habitats is utilitarian, as well as having social value. Various species of wildlife perform ecological functions necessary to control bacteria, plant, and insect growth in natural drainage areas. Some species of predator wildlife are required to control wildlife population cycles.

Woodlands - Woodlands are significant natural resources as well as valuable social landscape features. Trees improve the quality of life within a community by reducing the visual impacts between conflicting land uses, and by reducing noise, light, and air pollution. In addition, tree roots stabilize soils by reducing storm runoff volumes, velocity, and soil erosion. Tree roots also stabilize stream banks, and filter runoff before it reaches and pollutes streams. Woodland cover diminishes the effects of strong winds, filters air pollutants, adds humidity, creates shade, and provides specialized wildlife habitats, as well as providing a visual beauty to the landscape.

The slopes of stream valleys in the western portion and along the northern edge of Boone County are heavily wooded, while the eastern uplands have limited and scattered forest cover. While it is important to preserve the wooded areas in the less developed areas of the county, it is also imperative to protect the scattered vegetation remaining in the urbanized portions of the county and along major public roadways for both function and appearance.

As of 2009 Boone County contains approximately 58,651 acres of woodlands (see **Figure 3.4**) which is an increase of over 1,300 acres from 2004 as a result of expanding woodland areas in the western half of the county. Approximately 32,564 acres of woodland are located within areas of the county containing slopes over 20 percent. The remaining 26,087 acres of woodlands are located on slopes less than 20 percent and are considered to be easier to develop. These woodland areas primarily exist within the areas projected to experience growth within the 25 year planning horizon.

In 2002, the Northern Kentucky Urban and Community Forestry Council performed the Forest Quality Assessment For Boone County in order to determine tree canopy cover (see **Figure 3.5**). In 2003 the Boone County Forest Canopy Cover: Public Health and Safety Function Analysis and Development of Guidelines for Environmental Protection determined the size location and relative quality of forest canopy on tracts over ten acres in size in rural areas and five acres in size in incorporated areas. The document also describes many of the public health and productivity benefits of a healthy community-wide forest cover, and makes general recommendations on how Boone County should preserve and improve forest cover. It also serves as a resource

guide for property owners who want to know what is on their property. The methodology of the study identified forest cover as three crown size classifications, large, medium, and small, which correspond generally to the age and maturity of the forest. **Table 3.1** shows the summary acreage statistics for Boone County.

In 2002, 66% of the forest cover in the county was classified as small crown. This means the forest cover is largely a result of agricultural field areas being left fallow for twenty or more years, or routine timber harvesting occurring on the sites. The large crown forest areas comprised only five percent of the total forest and only 1.7 percent of Boone County's land cover, mainly on steep slopes and in stream corridors. Only one percent of the county's forest resources existed within incorporated boundaries.

Stormwater Runoff Reduction - Trees and soils function together to reduce stormwater runoff. Trees reduce stormwater flow by intercepting rainwater on leaves, branches, and trunks. Some of the intercepted water evaporates back into the atmosphere, and some soaks into the ground reducing the total amount of runoff that must be managed in urban areas. Trees also slow storm flow, reducing the volume of water that a containment facility must store.

The Florence and Boone County Urban Forest Boards continue to implement urban forestry projects and have projects planned for the future. To date, the Urban Forest Boards have been effective on publically-owned land or right-of-way.

Table 3.1 - Boone County Canopy Forest Cover

	Area in acres	% of County
Boone County	164,469	
Large crown canopy	2,865	2%
Medium crown canopy	17,398	11%
Small crown canopy	39,132	24%
Total canopy cover	59,396	36%

Source: Boone County Forest Canopy Cover Study, 2002

AIR

Boone County has the advantage of being southwest of much of the Cincinnati metropolitan area, so that the prevailing wind is away from the county. In general this results in better air quality in the county but it also means that any air quality issues originating in Boone County typically will impact other parts of the metro area. However, the fact that Boone County has 33 miles of interstate highways and an international airport will have an impact on the air quality in the county regardless of geographic spatial relationship to the remainder of the Cincinnati metropolitan area.

Congress adopted the Clean Air Act Amendments (CAAA) in 1990 as an attempt to address air pollution problems in the nation. Six major pollutants are regulated by the CAAA (sulfur dioxide, nitrogen dioxide, lead, carbon monoxide, particulate matter, and ozone). In April of 2004 the U.S. Environmental Protection Agency (EPA) classified the greater Cincinnati metropolitan area as basic nonattainment under the 0.084 ozone standard. This area of nonattainment included Boone County. In 2008, the U.S. EPA completed its review of the national air quality standard for ozone and replaced the 0.084 parts per million with a new 0.075 parts per million standard.

Furthermore, in December of 2004 the EPA designated the greater Cincinnati area as nonattainment under the annual fine particulate matter (PM2.5) standard. The particulate matter is dangerous especially to children and elderly as well as people with respiratory problems due to them being more prone to infection. In 2011 the EPA

announced that northern Kentucky, including Boone County, has been re-designated as a fine particulate matter attainment area.

Boone County should continue to work with the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) who develops strategies, programs, and plans that aim to improve the air quality in the greater Cincinnati region. Among these are the 2030 Regional Transportation Plan and the OKI Regional Clean Air Program.

SPECIAL STUDIES

Allen Fork Headwater Feasibility Study

In 2005 Boone County Public Works, in partnership with the Sanitation District Number 1 (SD1), commissioned a study to explore the potential for improving the management of storm water flows, restoring creeks and floodplains, and providing passive recreation opportunities throughout the headwater catchment of Allen Fork in Boone County, Kentucky. The project area is composed of the 684-acre upper drainage basin of Allen Fork and incorporates suburban development, light industrial development, public parklands, public and private school grounds, a YMCA recreational center, open woodlands, and major and minor roadways. It is bounded to the south by State Route 18 and divided north to south by North Bend Road (SR 237). The Cincinnati/Northern Kentucky International Airport lies immediately to the northeast and outside of the drainage basin. After exiting the project area, Allen Fork eventually flows into Woolper Creek and then into the Ohio River. The impetus for this effort was the Darlington Farms development, at the downstream limit of the project area, which was concerned about flooding and sedimentation of the development's artificial lake, formed by the impoundment of Allen Fork. This study, available through SD1, focuses on issues related to storm water volume and sediment production in the watershed.

Sand Run Creek Preliminary Ecological Study

As an example of this type of study, a Preliminary Ecological Survey of the Sand Run Creek Watershed in northern Boone County was performed in August of 1999. The Environmental Resource Management Center at Northern Kentucky University prepared this report to provide preliminary ecological information regarding existing wildlife habitats. The document examined plant species diversity, rare species, unique landscape features, ecosystem health, historical features, and potential long-term management opportunities. This project was prompted by the Boone County Fiscal Court as a result of land donations by an area developer, which raised the potential for a significant public recreation corridor. This Survey was also prepared in conjunction with the 2000 Boone County Parks and Recreation Master Plan analysis and recommendations. This study is available through NKU-CAE – <http://appliedecology.nku.edu>.

Western Boone County Study

The 1995 Comprehensive Plan recommended that a study of the western part of Boone County be undertaken so that before these areas begin to develop and the rural character is changed, a visioning process is undertaken which identifies how these areas should develop, and what characteristics should be preserved to foster and promote a quality of life desirable for future generations to come. During 1996, 1997, and 1998, the Western Boone County Study was prepared by the Boone County Planning Commission. Although never reviewed at a public hearing or adopted as an official planning tool or land use control document, it does contain valuable research in report form and suggests a series of specific corridor and area plans for specific locations in the western part of the county. The Planning Commission reviewed the findings of the report in August of 1998 and suggested that the study be accepted as a technical report and its recommendations be considered as future work projects for the Planning Commission. The study is not proposed as a land use regulatory tool by this Comprehensive Plan. This plan is available on the Boone County Planning Commission website for review at <http://www.boonecountky.org/pc/Publications/WesternBC.pdf>

Banklick Creek Watershed Analysis and Issue Characterization Project for Education and Outreach (BACE)

Based on a four-year, interagency prioritization process coordinated by the Kentucky Division of Water, the Banklick Creek watershed was designated as one of the three "highest-priority" watersheds in the Licking River

region in 2004. The severity of its water quality and quantity problems, the large number of stakeholders (land owners, businesses, and agencies affected by the creek's conditions), the high rate of projected growth, and the large number of water quality violations contributed to this designation. Most of the watershed is in Kenton County, however, a portion of the head waters area is in eastern Boone County, primarily east of Dixie Highway. The BACE project was designed to assist the Banklick Watershed Council to prioritize issues, set goals, and identify potential solutions to flooding and water quality problems. A major goal of the project was to establish the connection between forest cover, stormwater impacts, and landowner activities. The project has identified critical areas for protection and restoration and recommended many ways for individuals and agencies to positively affect water conditions in the Banklick watershed. This project's findings are important for Boone County because it creates a model for similar activity within watersheds, such as Gunpowder Creek, Mudlick Creek, Sand Run Creek, Elijah's Creek, Woolper Creek, and Middle Creek that either are or are expected to experience the same issues and potential solutions as the Banklick Creek. Positive results and implementation are occurring in the Banklick Creek valley, and this study should continue to be used as a model for other areas. Copies of this study are available at NKCAPC for reference.

IMPACTS OF DEVELOPMENT

This section addresses some of the impacts that development has on the environment in Boone County. Several factors have led to the growth the county has experienced over the past couple of decades and, as a result, the environment has also changed. The extension of infrastructure, such as water and sanitary sewer lines, determine the rate and location of growth as much as any other single factor. As Boone County's growth continues and environmental issues become more critical, issues such as water quality, air quality, noise and light pollution, stormwater, and decreased open space all can combine to affect the quality of life within Boone County.

SOILS

Soils - Erosion control is critical in preventing sediment from leaving sites experiencing development of any kind. As mentioned previously, special care needs to be taken when developing on alluvial soils due to their highly erodible nature and the fact that they often serve as aquifer recharge areas.

Permeability - Since soils of poor permeability will not filter water, neither will the soils filter or absorb septic effluent or other surface pollutants. An extreme health hazard can be created when such pollutants are directly mixed with storm and surface waters. When poor permeability is caused by high water tables, septic systems and general urban uses can transfer pollutants directly into the streams and the ground water supply. Major advancements have been achieved in Boone County by implementing the regional sewer system that has eliminated many individual treatment systems. Boone County Fiscal Court has assisted with the installation of sanitary sewers for existing subdivisions served by individual treatment systems by funding up to 1/3 of the assessment costs. This type of activity should be encouraged.

Poorly drained soils are subject to frost action and settling which can crack foundations, fragment roads, displace utility lines, and generally damage or impair urban improvements. Public sewerage, artificial drainage systems, special road bed fills and foundation designs can overcome some permeability limitations through increased cost and exacting design criteria.

Depth to Seasonal High Water Table - Areas of high water table are easily polluted since runoff from urban areas can pass pollutants directly into the ground water table. Heavy storms can also back the water table up to the surface and cause surface ponding and flooding. Urban uses provide additional storm runoff and aggravate this problem.

The depth to a particular area's water table should always be addressed before developing on it. As the ground water level gets closer to the surface, potential pollution and construction problems increase. Very shallow water table depths are risky areas on which to develop, and should not contain urban uses. High and moderate depths are developable.

Strength of Soil - Because all soil types are more subject to erosion when the ground cover is removed, erosion control measures are vital in preventing sediment from leaving the developing site. All soils will erode on moderately to steeply sloped lands, particularly where such lands have been cleared of tree and ground cover.

Depth to Bedrock - Like soil materials, bedrock characteristics have more impact when they occur with other factors, than when they exist alone. The presence of shallow bedrock conditions increase trenching and other utility placement costs. Select fill must sometimes be used to absorb storm runoff or provide pads for roadbeds, parking, and building foundations. While such actions are costly improvements, the resulting modifications are not environmentally hazardous. When shallow bedrock depths occur on impermeable flat lands, however, high water tables are likely to be created, which are subject to flooding and/or groundwater contamination. Steep slopes with shallow bedrock depths, Kope geologic formations, and unstable soils without tree cover are landslide prone. When these situations exist, the capability of the land to support urban uses without serious environmental hazards is minimal.

Slope and Erosion - Most soils within Boone County are considered to be highly erodible soils, therefore, during the construction of any site in which the ground cover has been removed erosion control measures are extremely important until such time as ground cover can be re-established. The sediment which is removed from sites diminishes the water quality, which not only affects drinking water, but inhibits the many recreational aspects that water provides, such as fishing. Sediment that fills in drainage channels can aggravate flooding and cause more property damage.

Agriculture Values - Farmlands in the path of urban growth have disappeared in recent years in metropolitan areas across the nation. Land that is good for farming; flat to gentle slopes, well-drained, cleared of dense vegetation, moderate to deep bedrock; also happens to be the most suitable land for urban development. Growing urban populations in our nation will increase demand for continued agricultural productivity, while they displace agricultural activity. Increased energy and transportation costs may also require urban areas to depend more on local agricultural production than before.

The suburban growth patterns found within Boone County are very similar to those found throughout the country. In 1994, 85,338 acres of land considered to be developable existed within Boone County, while in 2009, 59,661 acres were considered developable. Of the 2009 developable land acreage, 18,558 acres or 31.1% is considered prime agricultural land. Therefore, within the 25 year planning horizon portions of the most suitable agricultural land which remains within the county could be converted to other land uses, even if the relatively slow 2008-2011 development trend continues.

As pressures increase to develop the prime and state wide important agricultural lands of the county, the character of Boone County will be altered. Future studies and visioning efforts should determine whether Boone County will retain the rural identity of the county, or whether agricultural lands should be developed. If the agricultural lands should develop in a more urban manner, then standards should be established which attempt to preserve the unique character of these areas.

Topography - Scenic areas within Boone County that are identified by special study should be protected from insensitive development. Therefore, the river views will propel future development which can disrupt or destroy the scenic hillsides. There are extensive recommendations, prepared mainly by the Hillside Trust, that present accepted methodologies to influence new development design so that the hillside views are not changed dramatically. A study should be conducted to identify significant scenic areas, and to outline measures to be taken to preserve or enhance these views. The Geographic Information System (GIS) should be used as a tool to accomplish this task.

Criteria should be established which help define and map the scenic areas within Boone County. If these areas are to develop, standards should be created which outline the procedures and methods necessary to protect and minimize negative impacts to the scenic landscape. In addition, standards should be developed for the vast areas of Developmentally Sensitive land within Boone County. These standards should establish procedures for how these areas may develop without creating an environmental hazard.

Requirements for the control of dust, noise, dirt on public right-of-ways, and erosion in all public and private construction activity should be reviewed and revised where needed. In addition, the re-establishment of ground cover and reuse of resources such as removed trees for mulch, lumber, or firewood should be evaluated.

WATER

Stream Tributaries - Runoff from urban and agricultural uses add suspended soil particles and chemicals which lower water quality and consequently increase water purification costs. Runoff from land uses sited close to a stream's natural drainage channel can contaminate a stream's purity, fill stream channels with sediment, cause flooding and erosion, and damage the aquatic and animal life balance, thereby permitting uncontrolled algae and bacteria development.

Man-made storm drainage systems can be designed to handle stormwater runoff volumes and to contribute to groundwater recharge. However, such systems do not replace natural water filtering processes. Developments should look at a mix of man-made and natural stormwater mitigation measures and use structural solutions, such as detention basins and pervious pavement, with non-structural solutions, such as natural vegetation buffers along streams. Maximum runoff limits, as established through specific drainage basin calculations, can also keep stream pollution levels within manageable limits and reduce flooding.

Throughout Boone County, the effects of commercial and industrial development on stormwater conditions have long been understood. However, the potential cumulative stormwater runoff impacts from residential development occurring in Boone County cannot be overlooked by stormwater management officials. Even with required detention basins and other facilities that control the rate of stormwater flow, the overall amount of stormwater reaching the county's creeks is increasing as a result of new impervious areas. Because of the difficulties in implementing public regional stormwater detention, studies such as those conducted in the Banklick Creek watershed that suggest vegetation and buffer areas as one way to minimize storm runoff should become more common. Aside from regional detention, Boone County has made improvements in the upper Gunpowder Creek watershed that help water flow downstream. Sanitation District Number 1 (SD1) now administers stormwater management throughout most of the developed areas of Northern Kentucky. Two notable exceptions are the City of Florence and the City of Walton which plan to continue to operate their own systems. In the meantime, municipalities and counties continue to administer stormwater requirements and maintain public stormwater facilities for parts of the system.

Floodplains - As was learned in the 1993 Mississippi River floods and the 1997 Ohio River and Licking River floods, floodplains are not suitable for permanent urban uses. These areas must also be protected from urban improvements on adjacent lands which may alter drainage patterns and volumes. SD1 has been conducting watershed characterization reports in an attempt to quantify the impacts of impervious area on the condition of each stream. This information can be used for planning purposes. GIS can also be used to plan infrastructure and to help in emergency efforts. The Federal Emergency Management Agency (FEMA) recently updated its floodplain mapping. For decades, the Flood Insurance Rate Maps have been used by public agencies and citizens to determine many site related issues regarding flooding extent, precautions, and insurance needs.

Water Quality - Pump stations and the availability of sewer service could have a significant impact in the western portion of Boone County as it would allow it to develop at much greater densities. The Public Services and Facilities element explains this in greater detail, as well as identifying some of the incremental effects of development within these areas. Most of these western areas currently have a rural character. The rural character that many residents desire may be at risk if development within these areas is not sensitive to the environmental factors mentioned within this element.

PLANT AND ANIMAL LIFE

Woodlands - The Boone County Forest Canopy Cover Study examined in detail forest affects on air quality, stormwater management, floodplains, ground water recharge, erosion, steep slopes, and analyzed where the existing forest canopy lies in relation to future land usage and zoning. The study describes the benefits of tree canopies to offset the effects of impervious areas.

Tree cover is directly related to environmental quality. Maintaining a robust enough tree cover to function as green infrastructure reduces the need and expense of building infrastructure to manage air and water resources. Local agencies can use CITYgreen software to calculate the environmental and economic values of the ecosystem services that trees provide.

Wildlife Habitat - The loss of habitat can also result in animal control problems to residents and automobiles because of displaced animals searching for food and nesting areas. Woodland wildlife should be the primary concern in Boone County, because of the extent of woodland habitat and its vulnerability to urban growth. Corresponding with the pattern of woodlands, woodland wildlife habitats appear predominantly on the western side of Boone County, and diminish to small and isolated spots in the eastern and more urban portion of the county.

AIR

Air Quality - Low density land use requires people to travel much further distances to their places of employment, schools, shopping, and recreation. Across the United States experience has shown that existing road systems are becoming overwhelmed and congested with traffic, affecting the air quality of the county and the region. Federal regulations which include the Clean Air Act Amendments of 1990 (CAAA), the Transportation Efficiency Act of the Twenty-first century (TEA 21, follow-up legislation to ISTEA), and SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users) were created to limit the effect that increasing mobility in the future in metropolitan regions have on air quality. The effect that low density development has on the transportation system and how it relates to the federal legislation for the county and the region is explained in further detail in the Transportation Element.

According to OKI, vehicle emissions from transportation sources are projected to decrease as newer vehicles, meeting stricter federal emission standards, are incorporated into the fleet mix. **Table 3.2** compares different types of emission measurements in the three Northern Kentucky counties. VOC stands for Volatile Organic Compounds, CO stands for carbon compounds, and NOx stands for nitrogen compounds. New transportation facilities must undergo air quality analysis to attempt to forecast each facility’s impact on future air quality. OKI generally performs this analysis in concert with federal agencies.

TABLE 3.2 – Emissions Measurements; Northern Kentucky Counties

	2005	2008	2010	2015	2020
Boone County					
VOC	4.33	4.00	3.92	3.17	2.96
CO	47.20	44.46	42.36	37.41	38.21
NO _x	10.27	8.53	7.42	4.63	3.45
Campbell County					
VOC	2.52	2.29	2.21	1.74	1.55
CO	27.50	25.52	23.98	20.39	19.97
NO _x	5.98	4.88	4.21	2.54	1.81
Kenton County					
VOC	4.32	3.85	3.65	2.85	2.56
CO	47.19	42.76	39.54	33.68	32.97
NO _x	10.39	8.37	6.91	4.23	3.01
OKI KY Total					
VOC	11.17	10.14	9.78	7.79	7.09
CO	121.89	112.74	105.88	91.48	91.14
NO _x	26.64	21.78	18.54	11.40	8.27

Source: OKI and Kentucky Division for Air Quality

Furthermore, air traffic at the Cincinnati-Northern Kentucky International Airport will continue to be a factor in the air quality of Boone County. The airport anticipates an increase in cargo traffic and will be addressing this issue in their Master Plan update.

CONSERVATION TOOLS

LEED

The Leadership In Energy and Environmental Design (LEED) Green Building Rating System is an independent certification program that provides voluntary guidelines for developing high-performance, sustainable buildings. Created by the U.S. Green Building Council (USGBC), the program awards varying levels of certification to buildings that meet LEED rating standards in five major categories: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality. LEED standards exist for new construction as well as existing buildings and remodeling, and can be

applied to homes, commercial facilities and even neighborhood development. Architects, engineers, interior designers, landscape architects and facilities managers use LEED in developing new projects. When redesigning your home or office, you can look for LEED Accredited Professionals (LEED APs) who can implement LEED standards and help make your project a more sustainable building.

LEED has special rating systems that apply to all kinds of structures, including schools, retail and healthcare facilities. Rating systems are available for new construction and major renovations as well as existing buildings. The program is designed to inform and guide all kinds of professionals who work with structures to create or convert spaces to environmental sustainability, including architects, real estate professionals, facility managers, engineers, interior designers, landscape architects, construction managers, private sector executives and government officials. State and local governments around the United States are adopting LEED for public buildings of all kinds, and LEED initiatives at the US Departments of Agriculture, Defense, Energy and State drive activity at the federal level. In addition, various types of LEED projects are currently underway in over 40 other countries.

PDR and TDR

Transfer of Development Rights (TDR) and Purchase of Development Rights (PDR) programs are based on the concept that property owners have a bundle of different rights subject to reasonable local land use regulations. These include the right to use land, lease, sell and bequeath it, borrow money using it as security, construct buildings on it, develop it, or protect it from development. Normally all of these rights pass from seller to buyer; however, they do not have to. These types of programs allow the property owner to separate and sell their right to build on the land separate from the other property rights. A TDR program allows private interests to purchase these development rights to use on designated lands elsewhere. A PDR program allows the government or non-profit organizations to purchase the development rights with the responsibility to prevent development on the subject parcel(s) according to program objectives. As can easily be seen, both types of programs are voluntary and intended to pursue a community objective while offering the property owner an incentive regarding compensation for property rights. In these programs, there is not an outright sale of property but the sale or transfer of development rights. The property owner is capable of enjoying all the remaining rights on the property that have not been sold. For example, a farmer can continue an agricultural operation forever, while no, or a reduced number of houses, industrial development or other urban land use would be developed. These programs can enable considerable beneficial estate planning options and tax benefits for the property owner as well. TDRs are permitted by state law and referenced by the Boone County Zoning Regulations. They must be based on a fair and equitable appraisal formula for generating land values and exchange methods.

Kentucky has a Purchase of Agricultural Conservation Easement Program (PACE), however, generally, Boone County land is too expensive to make this program viable by itself. Some communities have used a designated tax, or leveraged PACE funds with a local bond.

Under direction of the Boone County Fiscal Court, in 2001/2002 the Boone County Planning Commission conducted a feasibility study of two growth management tools which have been employed elsewhere in the United States: 2002 Study of PDR and TDR for Boone County, Kentucky. The purpose of this study was to evaluate how PDR and TDR programs have been used by other communities and to determine whether either technique may be appropriate in Boone County. An Advisory Group composed of individuals representing a range of interested parties in Boone County was assembled for this study. The group was selected by the staff and created as a sounding board for varied interests, which range from farmers and residents to homebuilders and the economic development community. The project included a presentation of the PDR/TDR case studies by American Farmland Trust.

The characteristics of both PDR and TDR were explored at length using detailed case studies and data from current literature on the subject. Important issues and necessary implementation steps for both techniques were discussed in general terms. A "toolbox" of other land conservation techniques was also examined. This research was then assessed relative to Boone County. Together, data from existing PDR and TDR programs, a review of current literature, and an analysis of Boone County lead to the conclusion that PDR was a workable tool for Boone County at that time. However, land prices were found to be high enough in Boone County to make the tool

unlikely. The study also emphasized that PDR is only one of a number of tools designed to preserve open space and make farming viable. Some tools (PDR, Ag Districts, differential assessment for taxes) help make farming more lucrative. Others (zoning and Conservation Subdivision Design) encourage orderly and cost-effective growth in Boone County by concentrating development near existing or planned infrastructure and affecting the physical design of development. TDR was found not to be appropriate for Boone County because of lack of public acceptance of higher density development in the urbanizing portions of Boone County. As a result there was little potential for density receiving areas to allow the TDR formula to work.

CONCLUSION

While acting as an attraction to new residents, prime agricultural land, wooded hillsides, and stream corridors are the factors that are most impacted by new development. Future development in the county should utilize environmentally sound design criteria and Boone County needs to place a value on the mitigation of environmental impacts of development. Flooding caused by urban and suburban development is increasingly affecting both the major and minor tributaries. In the early 1990's relatively few creeks, such as Gunpowder and Elijah's Creeks experienced significant flooding, however, this Plan notes that many others now are partially affected, such as Sand Run, Woolper, Big Bone, and many smaller tributaries of the Gunpowder Creek watershed. Regional and local stormwater detention, as well as erosion control and enforcement, need to be addressed in more detail in local regulations. Soils in Boone County are generally not well suited for septic leach activity. Water line extensions must be carefully examined to determine its effect on water usage and resulting effect on septic performance. Stormwater regulations should be applicable to all types of development, and should be in effect before the undeveloped areas develop to prevent flooding, and costly stormwater control measures in the future.

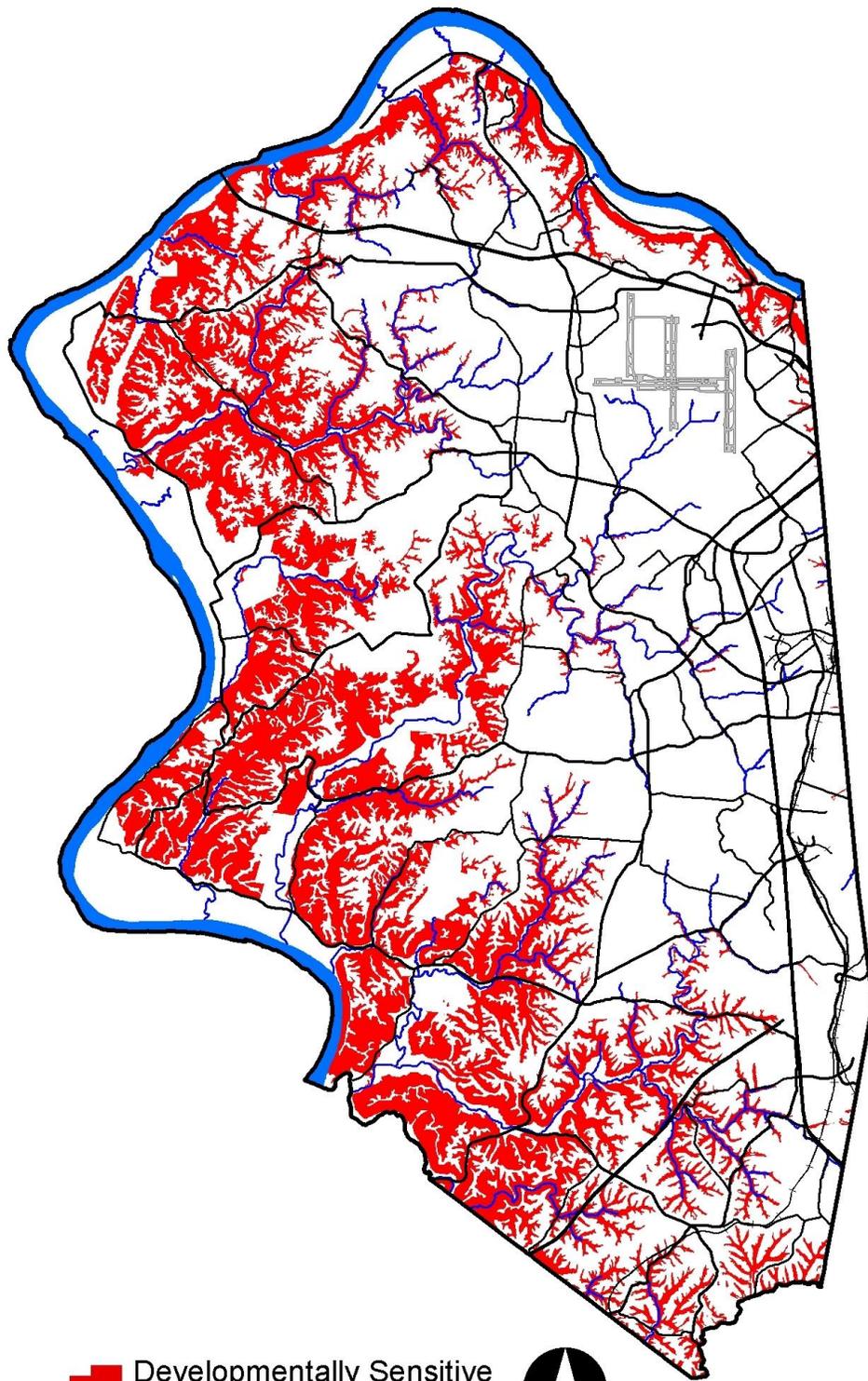
Development and environmental conservation can benefit each other instead of being treated as opposing factors. There are innovative tools that can provide incentives, tradeoffs, or simply good design to result in development patterns that make use of or conserve natural resources instead of building over them. These objectives can be achieved without excessive regulation. Special corridor studies should be conducted on a continuing basis to consider natural areas in Boone County for innovative development design, conservation, recreation, or preservation.

To anticipate what changes can occur to Boone County's environmental resources within the 25 year planning horizon a forecast of the county's future development patterns is needed. The Population, Housing, and Business Activity Elements of the Comprehensive Plan identify the areas of Boone County which are projected to experience rapid growth in the short range, as well as the 25 year planning horizon. In addition, these Elements generally identify the type of land uses which will develop within these areas. When examining where the growth of Boone County will occur, one needs to consider where the developable land is within the county. For example, the land areas which are located within flood plains or have slopes over 20% are considered to be developmentally sensitive, because of the environmental costs which can result from the development of these areas. Development should mitigate its impacts within these areas.

Low density residential development creates further environmental impacts. Direct impacts include decreases in air quality from increased automobile miles traveled, increased waste products such as yard waste in landfills, water quality issues from increased stormwater runoff containing many household and yard chemicals, and sanitary sewage. Indirect environmental impacts can include the extensions of public services, increased transportation distances for daily products, and a greater consumption of natural resources such as trees and oil.

Overall, land planning in Boone County should enable the developable lands to be developed at a higher density, thus reducing the need to develop the developmentally sensitive areas. This would be the most effective way of preserving the environmental characteristics of the rural portions of the county, while reducing the air pollution within the region and making mass transit more feasible and effective. Based on developed and non-developed acreage analysis it appears that significant additional development areas, particularly for residential development, do not need to be provided for in the 2035 Future Land Use Plan. This would be subject to review in future

Comprehensive Plan updates. As Boone County's development continues, design will become increasingly important. Attention to water runoff, traffic congestion, and visual impacts will require more attention so that the cumulative impacts of development on the environment can be addressed.



Developmentally Sensitive (DS)



0 1 2 Miles

Figure 3.1 - Developmentally Sensitive

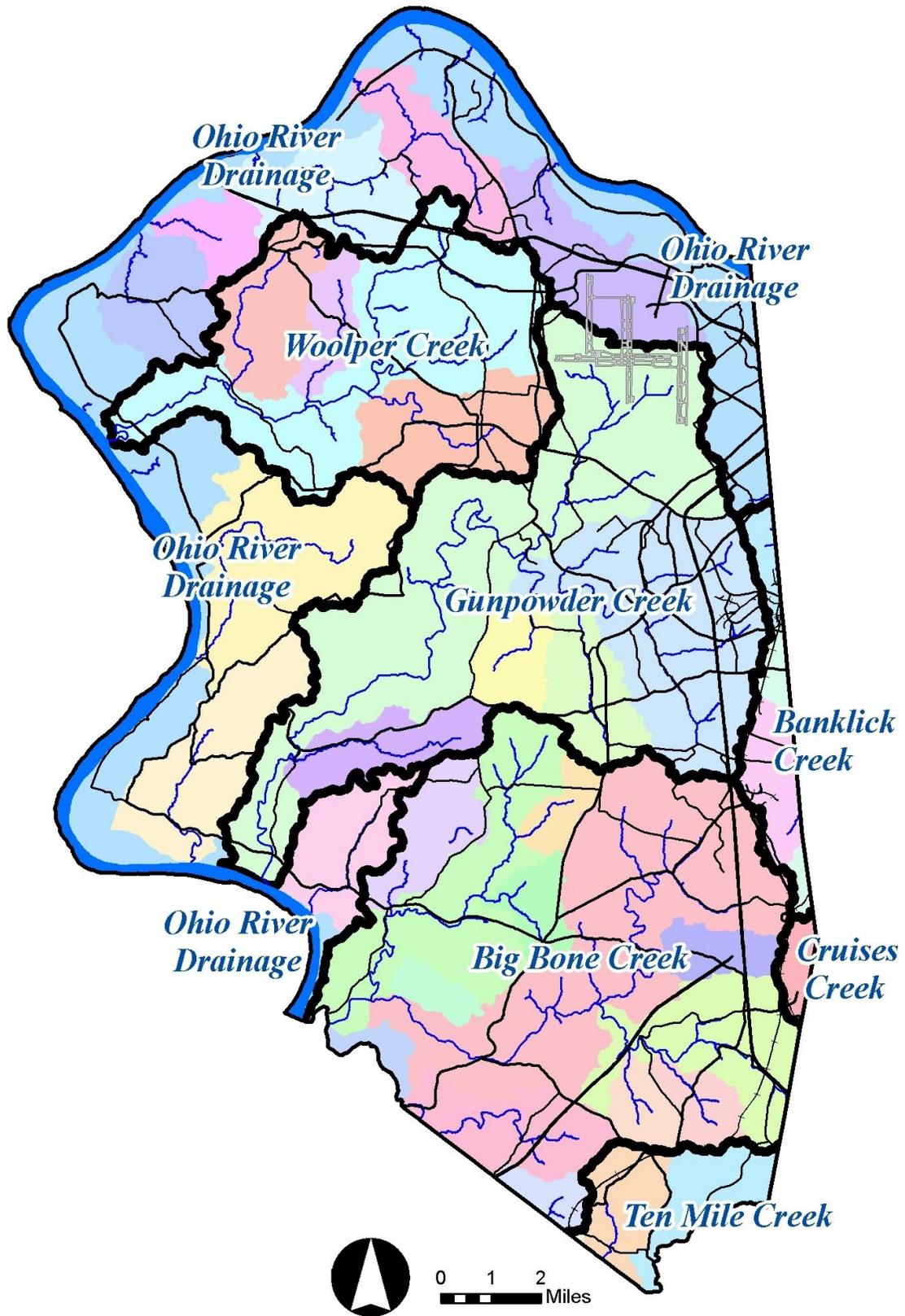


Figure 3.2 - Major Watersheds and Stream Tributaries

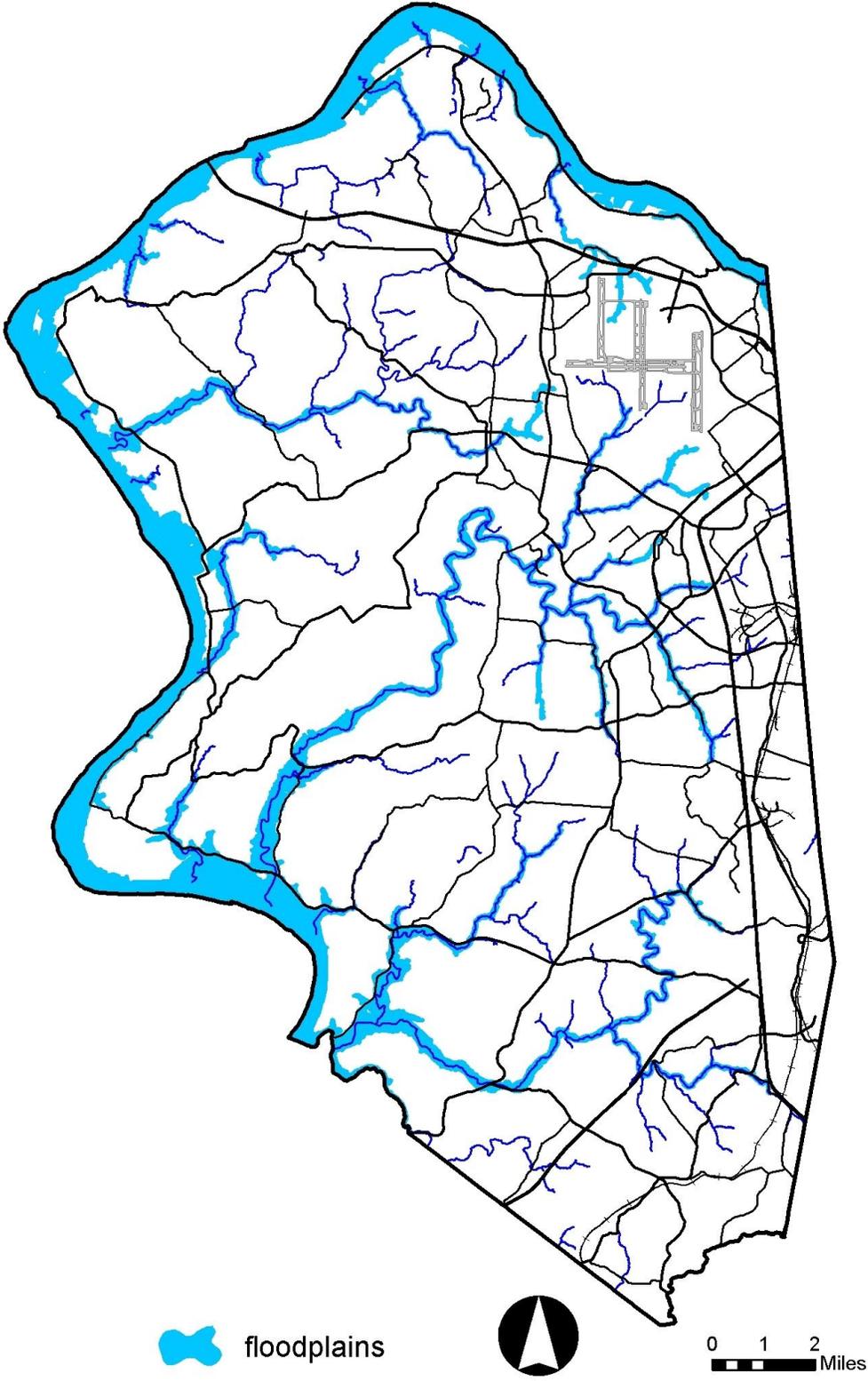


Figure 3.3 - 100-year Floodplains

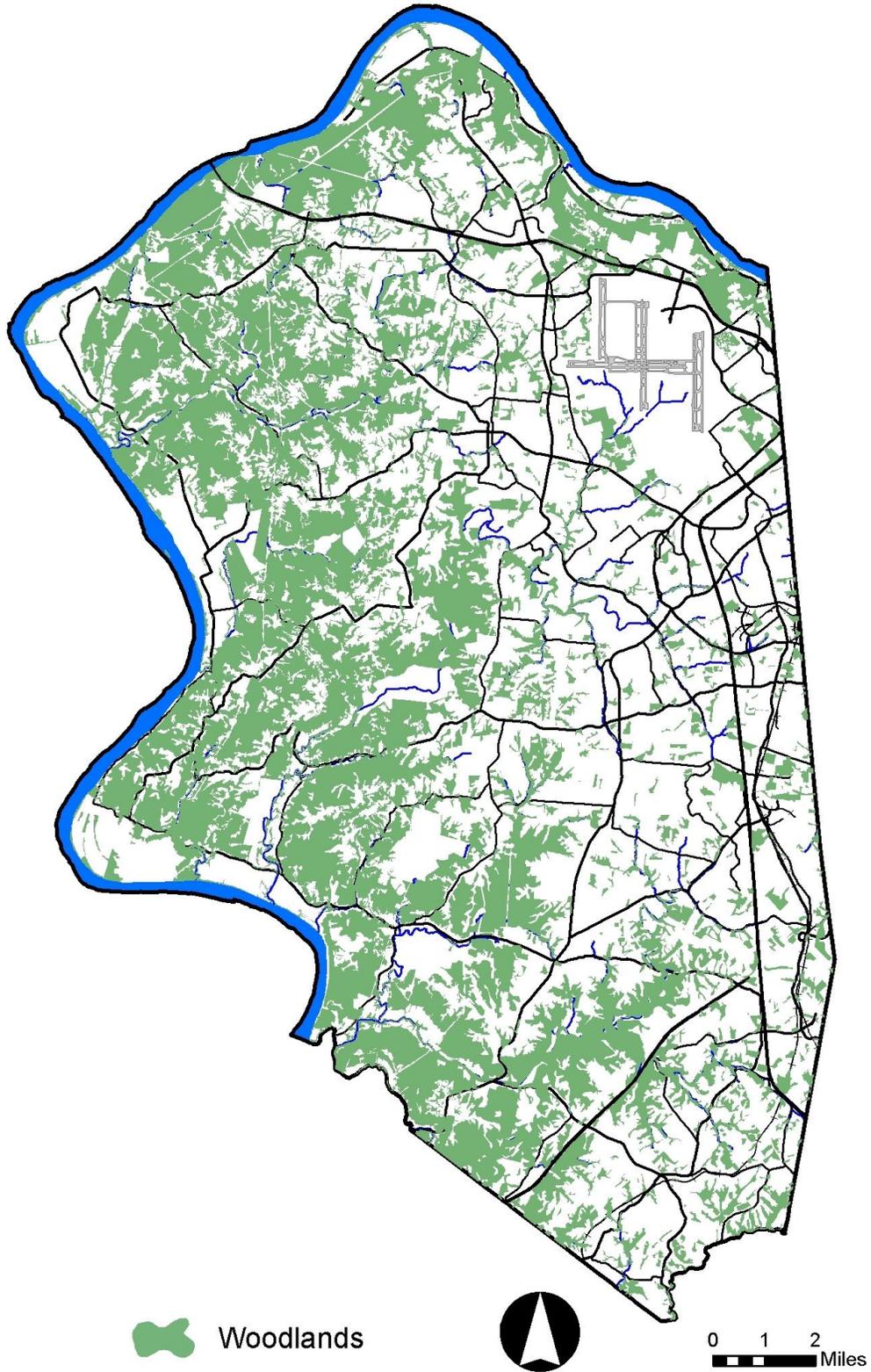


Figure 3.4 - Woodlands

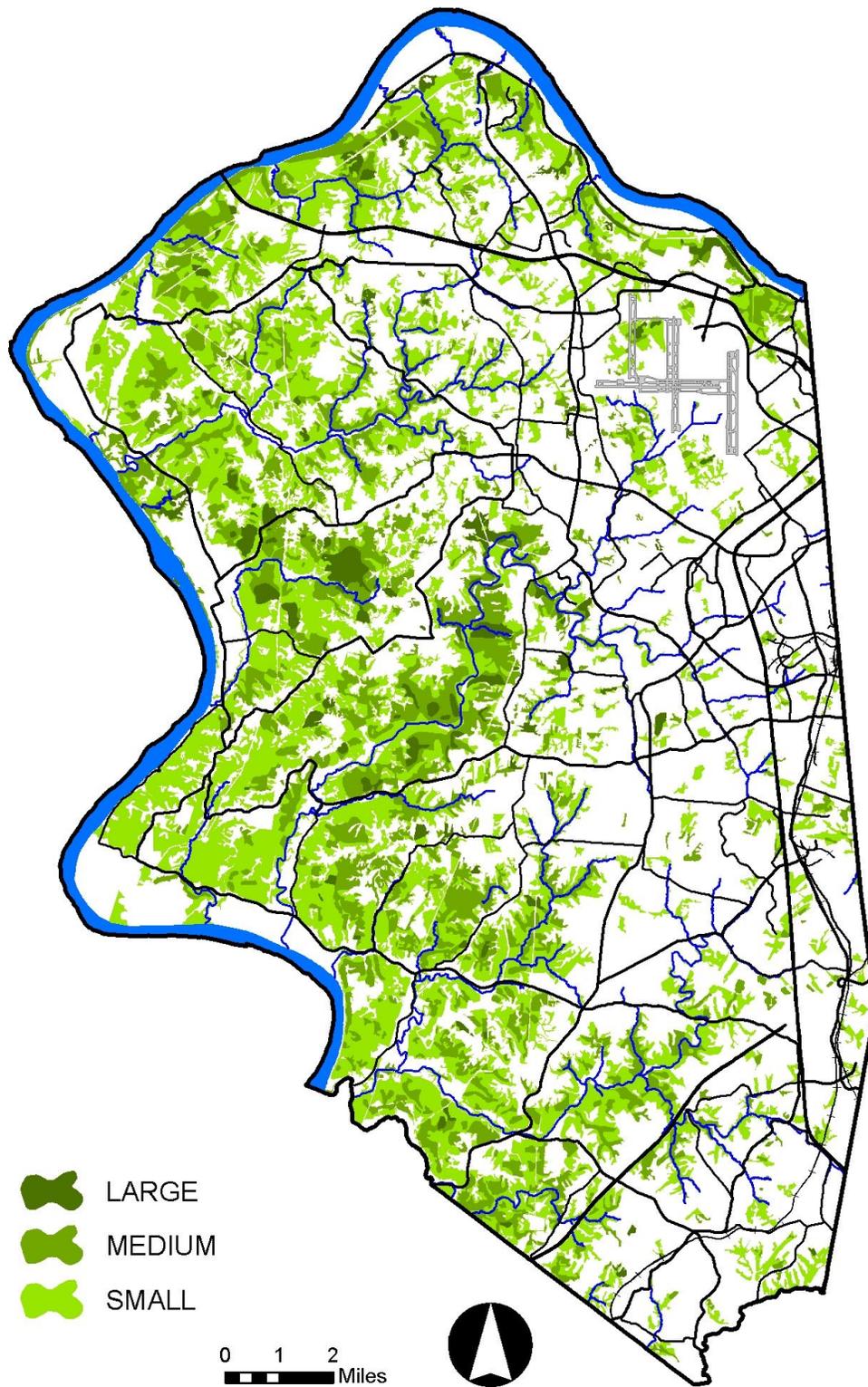


Figure 3.5 - Canopy Cover

ECONOMY

INTRODUCTION

This element examines Boone County's economic situation as it relates to individuals as well as the county in general. Characteristics such as income, unemployment, poverty, population, and employment, the type and distribution of jobs in the county, and commuting patterns are examined as they relate to Boone County's citizens and workforce. This element also examines economic factors related to the county in general such as the types of jobs available, employment levels (the number of employees by sector), and employment trends or major directions in county employment.

Income

From 1990 to 2010, the average income of Boone County residents (per capita personal income) increased steadily and was slightly higher than average personal incomes in the Northern Kentucky region (Boone, Kenton and Campbell counties) and even more so than the State of Kentucky as a whole. **Table 4.1** illustrates this growth and compares the county's per capita incomes with the region and state.

TABLE 4.1 PER CAPITA INCOME BY JURISDICTION

	1990	2000	2010
Florence	\$12,728	\$20,451	\$24,023
Union	\$15,001	\$27,626	\$33,034
Walton	\$10,617	\$17,296	\$19,476
Boone County Overall	\$13,576	\$23,535	\$29,010
Kentucky	\$11,153	\$18,093	\$22,515
United States	\$19,354	\$21,587	\$26,059

Source: U.S. Census, American Community Survey (ACS)

In a general sense, the steady increase in the per capita income of Boone County is representative of the steady monetary growth of the county's economy despite the recent downturn in the national economy. The latest available data on the average income of residents in Boone County reveals that, as a whole, it lies above the average per capita income for the Northern Kentucky Region (Boone, Kenton, and Campbell counties inclusive), as well as that of Kentucky. This generalization holds true for family and non-family households. **Table 4.2** details these findings.

TABLE 4.2 MEDIAN HOUSEHOLD INCOME CHANGE

	2000	2010
Boone County Overall	\$53,593	\$64,008
Kentucky	\$33,672	\$40,062
United States	\$41,994	\$60,609

Source: U.S. Census, American Community Survey (ACS)

As shown in **Table 4.1** and **Table 4.2**, Boone County's income levels are generally higher than state and national averages. The gap is larger for households, suggesting that average household size is larger in Boone County also. Incomes in the Union area continue to be the highest in Boone County.

Unemployment

During the period from 1982 to 2010, Boone County's lowest unemployment rate was 3.1 percent in 2000. The highest rate was 9.9 percent in 2010 due to the recent economic downturn. The unemployment rates for Boone County are presented in **Table 4.3**, along with those for Northern Kentucky, Kentucky, and the United States. Boone County's economy tends to fluctuate with the economies of the larger economic bodies. The

unemployment rates of the county more loosely follow the state and national trends, and consistently remain below the rates for both. Unemployment rates for 2010 are similar to those in the early 1980's, a recessionary period. A decade ago, the rate was at historically low levels. This means that Boone County has tended to fare better in terms of unemployment both during periods of national economic recession and growth.

TABLE 4.3 UNEMPLOYMENT RATES, PERCENTAGE

	1982	1990	2000	2009	2010
Boone County	9.5	3.4	3.1	8.0	9.9
Northern Kentucky	8.7	3.6	3.7	8.3	10.6
Kentucky	10.6	5.8	3.8	10.0	11.7
United States	9.7	5.5	3.6	8.5	10.6

Source: KY Cabinet for Human Resources, Northern KY Chamber of Commerce

Poverty

Poverty status for individuals and families in the United States is determined by the costs of food consumption for a family of three or more persons. The U.S. Department of Agriculture determined in 1955 that poor families of three or more persons will spend a third of their income on food. The poverty level or threshold was then set at three times the cost of this economy food plan. For smaller families or individuals, the relative cost of the "economy food plan" was higher to compensate for higher fixed costs in these smaller households. The U.S. Census Bureau uses these guidelines to create a table of poverty thresholds of income, based on family size and number of children less than 18 years of age.

The level of poverty in an area reflects, to a certain degree, the degree of economic stress in an area. The U.S. Bureau of the Census adjusts the poverty threshold annually as the Consumer Price Index (CPI) changes. The formulas for "poverty line" calculations are a function of the income necessary for a family of 3 or more to meet basic needs of healthy living, i.e., the food, shelter, and clothing required to preserve health. Other than annual adjustments per the CPI, the formula has not changed significantly in 40 years. The poverty rate represents the percentage of the population that is living at or below the established poverty line. Boone County's poverty rate was very low in 2000, providing an indication of a strong economy. The highest poverty rate since then was 8.1 percent recorded in 2009, reflecting the presence of a national economic downturn. The poverty rate has increased in recent years because of the economic downturn. **Table 4.4** demonstrates that Boone County's poverty rate consistently is lower than neighboring counties and the state overall. In 2010 Boone County had 9.2% of its citizens under the poverty level, compared to the statewide percentage of 18.9%. In 2010 the percentage of citizens below the poverty level was at 13.3% in Kenton County and 13.0% in Campbell County.

Table 4.5 compares the poverty levels of families for the years of 1980, 1990, 2000, and 2010. After holding steady for nearly 20 years, the past decade has seen an increase in the number of families who fall below the poverty level.

TABLE 4.4 – PERCENT POPULATION BELOW POVERTY LEVEL

	1980	1990	2000	2010
Boone	7.8	7.4	5.6	9.2
Kenton	11.0	9.9	8.9	13.3
Campbell	10.5	11.0	9.1	13.0
Kentucky Overall	19.3	19.0	15.8	18.9
U.S. Overall	13.0	13.5	11.3	15.3

Source: U.S. Census

TABLE 4.5 – POVERTY LEVELS BY FAMILY, 1979, 1989, 1999, 2009

Number of Families Below Poverty Level								
Year	With Children under 18				Without Children under 18			
	1979	1989	1999	2009	1979	1989	1999	2009
Florence	365	319	498	581	87	74	85	401
Union	3	12	11	28	2	0	3	14
Walton	31	71	31	59	10	9	6	26
Unincorporated	470	390	502	1,502	128	131	97	1,045
Boone County	869	792	1,042	2,170	227	214	191	1,486

Source: U.S. Census, American Community Survey (ACS)

The Population and Employment

Table 4.6 shows the total labor force (Boone County residents eligible to be in the labor force whether employed or not), the employment (number of jobs) in the county and the total employment figures for Northern Kentucky (Boone, Kenton, and Campbell Counties) for the years 1980 to 2010. Overall the county's labor force and employment have steadily increased over the years.

TABLE 4.6 – BOONE COUNTY LABOR FORCE AND EMPLOYMENT, 1980-2010

Year	Total Labor Force	Employment	N. KY Employment
1980	22,239	20,900	121,390
1985	25,600	24,038	127,933
1990	30,919	29,874	140,907
1995	37,980	36,160	146,510
2000	46,791	45,323	165,941
2010	64,234	59,153	183,538

Source: U.S. Census, American Community Survey (ACS)

Table 4.7 compares the Occupation of Employed Residents by Area for the years 1999 and 2010. This table clarifies the types of occupations of Boone County residents. It gives us an initial discernment of the social/economic profile of Boone County residents. From 1999 to 2010 county residents who worked in managerial/professional occupations increased by almost 60 percent. Across the board increases, except in construction/maintenance, are consistent with the pattern of more high-income wage earners migrating to Boone County. They have helped stimulate the dramatic growth in residential and commercial development in the county over the past 10 years. The increases in these categories are also consistent with the continuing trend toward two-worker families.

The Boone County resident worker population has become more "white collar" or professional in orientation than in the past. This has happened across the board in Boone County, not just in the unincorporated areas or Union, as might be expected. It is highly likely that many of these professionals commute outside Boone County.

Commuting Patterns

The relationship of county commuting patterns to the metropolitan region is a valuable tool for analyzing the county's economy, as well as its relationship to the region's economy and transportation systems. In 1980, the Bureau of the Census listed Boone County as having 9,047 resident workers. Of these, one-half worked within

the county and the other one-half commuted outside of Boone County. There were 23,589 resident workers by 2000, and the same ratio existed, with nearly half working outside the county. These job-related commuting patterns are termed transpositions.

Table 4.8 and **Table 4.9** show the transpositions of the labor force by decade. By comparing the commuting patterns for 1970 and 1980, it is clear that transpositions increased during this ten-year period, with non-resident county workers, a trend that began to reverse during the 1990's. In 2000, the resident county workers outnumbered the non-resident county workers. However, 2009 data shows that this trend reversed over the last decade until the non-resident county workers reached the highest recorded level just as there were fewer resident county workers. **Table 4.8** details the number of resident, nonresident, and resident out commuters for Boone County from 1970 to 2009. **Table 4.9** presents the statistics in **Table 4.8** (both resident and non-resident) as percentages. Based on the 2009 numbers in **Table 4.8**, Boone County's resident employee numbers decreased nearly 17% from 2000, whereas the number of non-resident workers more than doubled.

TABLE 4.7 – OCCUPATION OF EMPLOYED RESIDENTS; BY AREA FOR 1999 & 2010

<i>Occupation of Employed Residents</i>	Boone County	
	1999	2010
Management, Professional, & related	14,520	23,111
Service occupations	5,357	8,422
Sales & Office	13,647	16,258
Farming-Forestry-Fish	114	127
Construction-Extraction-Maintenance	4,047	3,474
Production/Transportation	7,368	8,108
TOTALS	45,053	59,500

Source: U.S. Census, American Community Survey (ACS)

TABLE 4.8 – BOONE COUNTY TRANSPOSITION, 1970-2009

	1970	1980	1990	2000	2009
Resident County Workers	4,099	9,047	14,102	23,589	19,575
Non-Resident County Workers	4,025	11,687	15,772	21,734	44,142
Resident Out Commuters	7,034	9,172	14,412	20,918	33,044

Source: U.S. Census, American Community Survey (ACS)/Local Employment Dynamic (U.S. Census)

TABLE 4.9 – BOONE COUNTY WORKERS BY PERCENT RESIDENT OR NON-RESIDENT, 1970-2009

	1970	1980	1990	2000	2009
Resident County Workers	50.4	43.6	47.2	52.0	30.7
Non-Resident County Workers	49.6	56.4	52.8	48.0	69.3

Source: U.S. Census, American Community Survey (ACS)

The exchange of workers continues to happen to the greatest degree between Boone County and Kenton County in Kentucky, and between Boone County and Hamilton County in Ohio. In 1990, 11,299 Kenton County residents worked in Boone County; by 2000, the number had increased to 17,053. The number peaked in 2007 at 17,634 but has since fallen off to 13,947 in 2009. In 1990, 3,044 Hamilton County residents commuted to Boone County to work; by 2000, the number had more than doubled to 6,505. By 2007, it reached 8,743, but fell to 6,838 in 2009. The amount of workers commuting to Boone from Clermont, Campbell, Kenton, and Dearborn Counties significantly outnumbers those commuting from Boone County to those counties, while Hamilton County is the only county that receives more workers than Boone County.

The counties immediately south of Boone County, Grant and Gallatin, continue their dependence on Boone County for jobs. This same phenomenon is now happening between Boone County and Dearborn County in Indiana. In 1990, there were 784 workers from Dearborn County commuting to Boone County. By 2000, it had almost doubled to 1,466. The significance of these numbers is that it indicates the strong economic ties Boone County has with the surrounding region. To some extent these other counties act as bedroom communities for Boone County, even though Boone County is a suburban county. The county's economic growth directly affects the counties to the south and Dearborn County in the north. The recent economic downturn has clearly impacted transpositions, both into and out of Boone County. Any future economic transformations in Boone County will have an impact on all surrounding counties.

Part of the explanation for the growth in employment has to do with the overall trend in the growth of industrial and commercial uses in suburban areas from 1970 to 2009. Much of this growth in Boone County was stimulated by the expansion of airport operations during the 1980's and 1990's. **Table 4.8** clearly illustrates the substantial overall increase of commuters on Boone County's roadways. There were 11,059 commuters (both non-resident workers and resident out workers) on Boone County's roadways in 1970. By 1990 that number had tripled to 36,000 commuters, increased to 42,652 in 2000 and stood at 77,186 in 2009.

Employment projections by the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) predict that there will be 108,049 jobs in Boone County by the year 2030. Light-rail and improved bus services could be in place by that time. Otherwise, traffic congestion on Boone County's roadways would be significant and could have the effect of limiting this expected growth in employment.

The questions that could be asked about present and future transpositions are "who commutes in and out of the county?" "Why?" According to the data in **Table 4.7**, the number of workers in Boone County increased by 14,447 people over the last decade. 8,591 of these workers, or almost 60% of the increase, are in the Management and Professional occupation category. This data implies that Boone County "imports" its professional workers, while the County's non-professional, lower-wage workers tend to be largely made up of Boone County residents. Further study with more detail looking at a cross section of occupation and commuting patterns would shed more light on this issue.

Transpositions are generally viewed negatively by transportation planners because a transposition most often means commuting in a single occupant vehicle (SOV). If the projected increase in employment as described above happens in Boone County and present commuting habits persist, it would result in similar increases in transpositions. If no changes in commuting habits are seen, or no major roadway capacity improvements or transit improvements (i.e. light-rail, feeder bus) are implemented, economic development could result in chronic congestion and increased pollution problems for the whole region. **Table 4.10** gives the trips to and from Boone County by location. The average daily commuting trips for the OKI region was 909,906 in 2000 and 1,017,575 in 2008, an increase of 10.6 percent.

TABLE 4.10 – BOONE COUNTY COMMUTING PATTERNS IN 2000 and 2008

	Trips from Boone County		Trips to Boone County	
	2000	2008	2000	2008
Butler	641	1,880	857	1,430
Clermont	350	1,120	1,422	3,190
Hamilton	8,351	21,860	6,505	14,540
Warren	242	430	337	580
Boone	23,589	31,930	23,589	31,930
Campbell	1,150	1,340	4,062	4,075
Kenton	8,220	11,270	17,053	16,735
Dearborn	350	1,470	1,466	3,230
TOTAL	42,893	71,300	55,291	75,710

Source: Ohio-Indiana-Kentucky Regional Council of Governments (OKI)

Employment Types

As described in the Business Activity Element, there are two categories of industrial activity, base and non-base. Base industries furnish the products which sustain society, such as those derived from agriculture, mining, and manufacturing activities. Non-base industries are users and marketers of base industrial products. These support or service activities have developed beyond the simple distribution of physical products to the provision of human services.

The two industry types are interrelated and interdependent. Base industrial activities are responsible for bringing outside income into a community. Non-base industries then circulate that income while providing the services necessary both for the operation of base industries and for daily activities of all residents in the community.

While base industries provide the foundation for a long term employment sector, base industry products, employees and families immediately generate the need for non-base support industries. This develops an urban growth cycle of population, products, and service, in terms of both volume and diversity. Growth may be considered to be an increase in volume. Base industries increase their activities and expand their employment rolls in response to market demand for their products. Such growth generates population increases and requirements for additional non-base services.

It is important to realize the constraints of the comparison. With the shift of the past few decades in the United States to a post-industrial economy, the base and non-base distinction no longer strictly follows traditional lines. Boone County's strong retail, office, and service sectors serve as a regional base and act as a regional draw resulting in significant outside dollars flowing into the county's economy. The U.S. Census and other data sources also change, combine, or split categories over time, which often makes data difficult to compare.

Furthermore, Boone County's economy is strongly tied to the Greater Cincinnati Metropolitan Area's economy. It is important to note that several factors outside the county have an important affect on the county's economy. However, despite these constraints the base to non-base analysis does reveal important aspects of the county's economic anatomy, and this comparison is useful in establishing the current status of economic factors.

Table 4.11 contains employment numbers for Boone County's major industries for 2005 and 2010. Of the represented industries, Agriculture/Mining, Construction, Manufacturing, and Transportation/Warehousing/Public Utilities are base industries, and Trade (wholesale/retail), Professional (finance, insurance, real estate, scientific, management, administrative, and information), Education and Health Care, Services (arts/entertainment, hospitality, and food), and Public Administration are traditionally non-base industries. Increasing numbers of services and public administration/real estate industries may be considered base employment in a post-industrial, metropolitan area.

Before 1960, a greater percentage of Boone County residents were employed in base industries than non-base industries. This trend began to change during the 1970's; by 1980, non-base industry employment accounted for nearly 60 percent of the total county employment. This shift in the major employment sector is partly due to the decreasing role of agriculture in the county's economy. In 1940, agriculture accounted for nearly 53 percent of the county's employment; by 1980 agriculture employed just over 2 percent of the county's workers, and in 2009 was approximately 0.04 percent, up from 0.027 percent in 2005. This trend is representative of the county's transition from a rural to an urban economy.

TABLE 4.11 –EMPLOYMENT BY MAJOR INDUSTRY IN BOONE COUNTY, 2005-2009

Year	Ag/ Mining	Constr.	Manuf.	Trans/Ware- housing/ Utilities	Trade	Prof.	Educ/ Health Care	Serv- ices	Pub. Admin	Work- Force (16+ yrs)
2005	158	3,827	7,364	7,813	10,872	8,402	8,494	9,019	2,349	58,298
2010	396	2,977	7,868	5,871	9,342	9,285	12,362	7,290	2,546	64,234

Source: U.S. Census, American Community Survey (ACS)

Employment Levels

According to the data, the top three industries are Educational/Health Care, Professional, and Trade, all non-base industries. 48 percent of the workers in Boone County were employed in one these three industries.

Some industries show evidence of being fairly volatile in terms of employment, with important shifts from year to year in the number of workers employed. Construction experienced the greatest shifts in numbers of employees from year to year, and Manufacturing likewise experienced substantial changes in the number of workers employed. The employment levels for Trade and Professional industries have demonstrated a steadier, positive growth. Again, the growth in these non-base industries has closely followed the regional pattern, in which the non-base industries did not experience the declines during periods of national recession that the base industries experienced.

This brief analysis of employment numbers again suggests that Boone County's economic complexion is shifting from the traditional prominence of Manufacturing and Trade to that of non-base industries such as Trade, Professional Services, and the Education/Health Care industries.

Employment Trends

Future trends should include a continuation in the growth of wholesale/retail employment, considering the planned redevelopment of the regionally-oriented commercial district in the Mall Road Area into a mixed use urban community and the continued expansion of the Houston/Donaldson commercial development. There should also be growth in manufacturing employment with the continued expansion of industrial development around the airport and along U.S. 25 near Richwood. The airport reported that aviation affiliated employment had expanded from 10,000 in 1994 to more than 15,000 in 2000. In 2005, the University of Cincinnati Economics Center for Education and Research estimated a total of 55,800 jobs in the region and has an annual economic impact of \$4.5 billion.

CONCLUSION

Economic Development and a Sustainable, Regional Economy

The late 1980's and the 1990's contained a resurgence of growth in manufacturing. However, this has not continued during the last ten years. The Northern Kentucky Tri-County Economic Development Corporation (Tri-ED), a non-profit corporation serving the three Fiscal Courts of Boone, Kenton and Campbell counties, is charged with recruiting companies into the Northern Kentucky region. Tri-ED has clearly been successful in recruiting firms into the industrial developments. In recent years, Tri-ED has also placed an emphasis on retaining existing businesses. The region's specific resources and strengths should be nurtured as catalysts for economic

development. Boone County, Northern Kentucky, as well as the whole Cincinnati Metropolitan region, should start taking the necessary steps, now, to make the transition to a sustainable, regional economy of the future. Furthermore, the establishment of small business and incubator business assistance should become a priority so as to encourage local businesses to start and grow here in Boone County.

A sustainable economy would be sustainable from generation to generation. It would not be as susceptible to national recessions or highly dependent on national expansions. A sustainable economy's engine would not be growth by any means, but instead, continuous innovation and regional cooperation and integration. A sustainable economy holds the promise that economic development, environmental preservation and restoration, and the evolution of a regional orientation (that is inclusive of central city and outer suburb) could all come together as coordinating parts of a continually renewing, economic system, which is competitive in the new world economy.

During the 1990's Boone County added a tremendous amount of warehouse and distribution centers. This type of use occupies significant amounts of land while not creating a significant number of jobs per acre. Adjacent counties and cities have expressed desire in attracting these types of employment opportunities. Boone County should work with Kenton and Campbell counties in order to appropriately locate these types of businesses.

To illustrate that we are already beginning to take the initial steps to create a sustainable, regional economy, some attributes of such an economy are characterized below, along with descriptions of Boone County's and the metropolitan region's actual "initial steps". Recommendations for the next steps to be taken by the county are then introduced.

A most important attribute for a metropolitan region with a sustainable economy is the development of an infrastructure of public transit, roads, bike paths, and pedestrian facilities, so that human-scale community is enhanced and options to auto travel are ubiquitous.

The Economy Element's Goals and Objectives describe other definite attributes of a sustainable, regional economy. These include support of local agriculture and patronage of local business products and services. Examples of local support for agriculture include the farmers' market in Burlington. The State of Kentucky has promoted this Farmers' Market as the ideal outlet for traditional tobacco farmers to sell alternative crops like fruits and vegetables and to help shorten the distances our foodstuffs are transported as well as enabling our local farmers.

Encouraging the establishment of recycling programs and recycled materials industries is another objective in the Economy Element that describes specific attributes of a sustainable, regional economy. Boone County has maintained a volunteer curbside recycling program for the community. Another step that could be taken would be maximizing the use of the local governments' purchasing power so that recycled products would be purchased. The State of Kentucky has instituted such a policy.

Maximizing energy conservation and the development of local renewable resources are also two other attributes of a regional, sustainable economy. Duke Energy is now promoting energy conservation that includes recommendations for replacing normal light bulbs with long-life, energy-efficient, fluorescent bulbs, as well as, energy audits for homes that give homeowners tips on energy savings. Duke Energy is also promoting a program for conversion of government, school bus, taxi, or delivery fleets to natural gas vehicles.

Overall quality of life and local economic health can be assisted by the presence of a strong pedestrian and bike system that connects neighborhoods, employment uses, retail, recreation facilities, government centers, and community identifiers such as historic sites. These systems or individual paths can give identity to an area of the county and encourage small business growth. Examples would include the Mary Ingles (historic pioneer) trail system along the Ohio River, a General John Hunt Morgan (Civil War) trail through the center of the county, or an airport perimeter multi-use trail system.

In conclusion, the county and metropolitan regions are already making the transition to a sustainable, regional economy out of necessity. There are many further steps to be taken by all levels of society. What are now

viewed as environmental problems (e.g. energy inefficient construction methods) will actually become opportunities for new, innovative sustainable businesses (e.g. retrofitting older structures for energy conservation).

In the last 25 years, Boone County has experienced rapid population and job growth. New jobs have been created in many employer classifications or sectors of the economy. Furthermore, job growth has occurred with various size industries. The strength of Boone County's economy has been its diversity and its growing global influence. As a result of the past job growth and recent economic downturn, it is recommended that a detailed study or analysis of Boone County's economy be performed to provide an accurate profile of Boone County businesses and labor force, employment trends, workforce readiness, etc. Such a study would also evaluate the strengths and weaknesses of current industry types and their potential for expansion. It could also be used to recruit target industries suitable to Boone County and its local workforce. City/County officials will then be able to use this information to promote job growth within their jurisdiction and provide direction on incentive programs to expand existing businesses or recruit new ones.

BUSINESS ACTIVITY

INTRODUCTION

The Business Activity Element examines the industry classifications of businesses in Boone County as opposed to the Economy Element which focuses more on the economy in general as it relates to individuals and to the county on the whole. Comparisons are made between Boone County, the Cincinnati Metropolitan Area, and the State of Kentucky. In addition to the inventory and comparison of Boone County industry classifications, areas of future business activity in Boone County are listed. The areas of future business activity are divided into commercial, office and industrial activity. The text addressing the areas of future business activity is intended to provide a synopsis of anticipated business activity development in Boone County. This information is described in further detail in the Land Use Element.

Background

Boone County's economy and related business activity are part of the larger Cincinnati Metropolitan Area's economy. Recognition must be given that Boone County's business activity is closely tied to and inter-related to the larger Cincinnati Metropolitan Area's economy. The industrial, business park, and commercial development in Boone County has occurred hand-in-hand with expansion of the Cincinnati/Northern Kentucky International Airport and has provided the economic prosperity and exceptional quality of life experienced over the past several decades. Numerous factors indigenous to Boone County have allowed for it to lead the region in many growth and prosperity indicators. The continued economic vitality of Boone County is of great importance to the success of the entire northern Kentucky region.

The Business Activity Element primarily utilizes Bureau of Labor statistics compiled by the Northern Kentucky Tri-County Economic Development Corporation (TRI-ED). The Business Activity Element has historically examined the Standard Industry Classifications (SIC) of job providers in Boone County, and includes the years 1998 through 2000. Years 2001 through 2003, however, are published on the basis of the North American Industry Classification System (NAICS). Since the classifications are different, and there is some information not collected in 1998, as well as problems with other data, it is difficult to compare past years to 2001 and later data. For these reasons, this element contains a mainly recent data.

The two broadest standard industry classifications are base and non-base industries. The designation of job providers into base and non-base industries is a traditional methodology in the examination of an area's business activity. Base industries are responsible for importing outside income into an area. Non-base industries circulate income while providing the services necessary both for the operation of base industries and for the daily activities of all residents in an area. Historically, base industries furnish the products which sustain an area, such as those derived from agriculture, mining, and manufacturing activities. In the last decade the economy has changed so that some businesses once treated as services are now of such a scale that they are effectively a base industry. This has been apparent in the Houston Road corridor, where the scale of retail, services, and office has become large enough that it has begun to function as an economic entity all to itself, generating its own need for services. These new services then serve the commercial activity and the increased daytime population rather than directly serving the residential population. The future impact of this phenomenon is that any future regional and/or large discount-oriented commercial areas must be large enough in geographic extent to accommodate this increased need for service businesses. These businesses export a service to a regional or nation-wide market such as financial services. Non-base industries, on the other hand, are users and marketers of base industrial products. The two industry types are interrelated and interdependent.

While base industries provide the initial economic reason for an area's existence, base industry products, employees, and families immediately generate the need for non-base support industries. These non-base industries also require the services of other non-base industries. A growth cycle of population, products, and services is developed. The growth cycle is characterized by variations in industry volume and diversity. Base industries increase their activities and expand their number of employees in response to market demand for their

products. Such growth generates associated population increases and requirements for additional non-base industrial services.

BASE INDUSTRIES

Base industries include Agriculture, Mining, Construction, Manufacturing, and Transportation/Public Facilities. These are defined as follows:

Agriculture

Agricultural production and services (such as landscaping), forestry, and fisheries.

Mining

Extraction of naturally occurring minerals.

Construction

General contractors, operative builders, special builders, special trade contractors, land subdividers, and developers.

Manufacturing

Mechanical or chemical transformation of raw materials into components and the assemblage of components into finished products.

Transportation

Movement of people and merchandise from one place to another.

Public Facilities

Power plants, sanitary services, and other such facilities.

According to the U.S. Census Database of County Business Patterns (NAICS), in 2008, the total number of all business establishments in Boone County was 3,417, a decrease of 99 since the year 2003. The percentage of people employed in base industries decreased during the 1980's and 1990's, but has since remained steady with 40 percent of all employees in the county being employed in a base industry in 2009. Base industry establishments accounted for 34 percent of the total number of business establishments in the county in 2008, a figure that has also remained fairly steady over the years.

Table 5.1 lists the number of base industries and total number of base industry employees in Boone County from 1998 to 2008.

TABLE 5.1 - BOONE COUNTY BASE INDUSTRY ESTABLISHMENTS AND EMPLOYEES

	1998		2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.	Est.	Emp.
Agriculture	4	49	6	45	6	36	5	N.D.
Mining	4	45	4	38	N.D.	N.D.	3	N.D.
Construction	267	1,771	315	2,339	334	2,326	306	2,459
Manufacturing	187	12,731	194	11,516	191	10,690	185	13,077
Information	25	281	34	1,537	38	911	32	712
Trans./Warehouse	198	12,371	746	12,697	761	14,191	691	8,608
Total	687	27,248	1,299	28,172	1,330	28,154	1,222	24,856

Source: U.S. Census County Business Patterns (NAICS)

Tables 5.1 and **5.2** demonstrate how the Information and Transportation/Warehousing sectors have suffered from job loss in Boone County since the last comprehensive plan update, but has remained the same or slightly

improved statewide. A significant decrease in Cincinnati/Northern Kentucky International Airport operations is reflected in these numbers. Manufacturing actually increased in Boone County in the past decade, but decreased in Kentucky overall. **Table 5.3** shows modest increases in most types of Manufacturing in Boone County. This reflects that Boone County's development trends specific to Northern Kentucky are different than other parts of the state.

TABLE 5.2 - KENTUCKY BASE INDUSTRY ESTABLISHMENTS AND EMPLOYEES

	1998		2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.	Est.	Emp.
Agriculture	203	1,477	215	1,408	221	1,347	278	1,854
Mining	886	22,946	823	19,638	755	18,468	681	22,359
Construction	10,651	83,668	11,671	87,724	11,009	83,375	8,762	78,878
Manufacturing	5,012	320,214	4,931	292,594	4,633	265,961	4,107	247,611
Information	1,357	27,037	1,824	35,256	1,849	32,479	1,558	33,861
Trans./Warehouse	5,540	109,306	4,295	90,030	4,083	86,248	3,074	85,853
Total	23,649	564,648	23,759	526,650	22,550	487,878	18,460	470,416

Source: U.S. Census County Business Patterns (NAICS)

TABLE 5.3 - BOONE COUNTY NUMBER OF MANUFACTURING ESTABLISHMENTS

	2001	2003	2008
Food Products	8	6	8
Apparel and Textiles	6	6	2
Wood Products	5	4	4
Furniture and Fixtures	2	2	4
Paper Products	2	6	6
Printing & Publishing	11	12	18
Chemical Products	7	9	11
Petroleum & Coal	N.D.	2	3
Plastics and Rubber	12	14	18
Stone, Clay, & Glass	8	9	10
Primary Metals	4	2	3
Fabricated Metal Products	22	33	36
Machinery and Equipment	21	25	27
Transportation Equipment	10	7	9
Appliances, Electrical	2	3	5
Computers, Electronics	5	4	5
Miscellaneous	12	21	16
Total	137	156	185

Source: U.S. Census County Business Patterns (NAICS)

The number of Transportation/Public Facilities, Manufacturing, and Contract Construction businesses rose dramatically in the 1990's thanks to the strong economic market of the time. Since 2001, however, the airline industry has dropped in employment, leading to a drop in the overall category. Construction businesses have continued to rise, while other base industries have remained steady. Manufacturing businesses are generally considered the strongest multipliers for "spin-off" non-base businesses.

Base Industries Comparison, State of Kentucky

Table 5.2 lists the number of base industry businesses and total number of employees in the State of Kentucky from 2001 to 2008. Generally speaking, the decline in the number of the various base industry sectors in the state

was more dramatic than in Boone County. Fluctuations in the ratio of Construction businesses in Kentucky were similar to those described for the county during this period. The data in **Table 5.1** and **Table 5.2** demonstrate the importance of mining as a base industry in Kentucky as compared to Boone County. Finally, the number of manufacturing businesses in Kentucky rose during the 1990's, but has decreased since 2000. Boone County experienced an even greater increase during the 1990's, but has leveled off since 2000.

Manufacturing

The growth of Manufacturing businesses and employment in Boone County is an important indication of the economy of the area. As outlined previously, Manufacturing businesses, and other base industries, create the need for new non-base industries. Additional commercial and service businesses spin-off whenever base industries expand or new ones locate in Boone County. According to the U.S. Census County Business Patterns, of the 175 recorded manufacturing businesses in 2009, twenty-five had 100 to 249 employees, nine had 250 to 499 employees, and one had 500 to 999 employees. In contrast, only three of the recorded 278 Contract Construction businesses in 2009 had over 100 employees. In terms of income, the total number of employees in manufacturing in Kentucky fell 10.4 percent from 1998 to 2002, and fell an additional 17.5 percent from 2002 to 2009.. The total manufacturing payroll in Kentucky rose 1.2 percent from 1998 to 2002 (compared with 33.5 percent growth from 1992-1997) and rose 21.6 percent from 2002 to 2009. Therefore, the expansion or decrease of one Manufacturing business has an impact on Boone County's economy.

Manufacturing, as the major base industry employer, is further detailed and divided into 13 divisions. **Table 5.3** details these 13 divisions by giving both the number of firms and employees for each Manufacturing division. The totals for the 13 divisions are given for each year at the end of the table. These totals do not always equal the sum of the divisions due to disclosure rules.

Table 5.3 provides an indication of the growth of Manufacturing Industries in Boone County. Some types of Manufacturing, such as Rubber and Plastic and Non-electrical Machinery have experienced a steady growth both in the number of employees and the number of firms. Others, such as Fabricated Metal Products, have remained stable as far as number of firms, but have fluctuated greatly in the number of employees. Apparel, Petroleum and Coal Products, and Printing and Publishing are recent additions to Boone County Manufacturing Industries.

In 2009, the County Business Patterns shows that 17.5% of all Boone County employees worked in Manufacturing. This compares to 11.5% of all Cincinnati Metropolitan Area employees, 14.5% of all Kentucky employees, and 5.1% of all national employees. The Boone County percentage has slowly declined from a peak of 33.0% in 1973. This decline has paralleled declines in the percentages of manufacturing employees since 1969 in the Cincinnati Metropolitan Area, in Kentucky, and in the nation, however Boone County remains relatively stronger in manufacturing than the averages for the larger geographic areas.

The distributive share of earnings by Manufacturing employees has similarly declined. In 2009, Manufacturing jobs accounted for 25.4% of total earnings in Boone County, down from a peak of 41.6% in 1974. Manufacturing earnings accounted for 14.1% of all earnings in 2009 in the Cincinnati Metropolitan Area, down from a peak of 38.3% in 1971. Kentucky Manufacturing earnings were down to 17.4% of all earnings in 2009 from a peak of 27.6% in 1973. The national distribution of Manufacturing earnings was down from 28.9% in 1969 to 22.6% in 1997, and had fallen to 11.3% in 2009.

Transportation

One of the most significant increases in base employment in Boone County has been the transportation industry. The presence and expansion of the Cincinnati/Northern Kentucky International Airport has had both a local and a regional economic impact. In 1991, the Airport's employment level was approximately 8,700 with \$215 million paid in regional employee wages and benefits. Total employment in the region directly or indirectly related to ongoing Airport operations was 10,227 for full and part-time jobs in 1991. In 1991, 957,237 business and convention passengers arrived in the Cincinnati region by air. These travelers accounted for regional expenditures of approximately \$605 million and total business sales of \$1.2 billion. In 1993, the Airport's direct employment level rose to 9,933. By 1999, direct employment of the airport was over 15,000. The total economic impact from the Airport has risen from an approximate one-half billion dollars in 1981 to \$3 billion in 1993, \$3.9

billion in 2000, and \$4.5 billion in 2005. Finally, the total number of direct and indirect jobs associated with Airport economic activity has increased from 6,070 in 1981 to 60,100 in 1993, 69,000 in 2000, and over 100,000 in 2005. The number of area jobs to be supported in the year 2011 was originally projected to be 114,500, but this number exceeds what has actually occurred due to the decline in the size and services provided by the airport since 2001, especially during the past 5 years. With the significant changes at the Airport since 2005, CVG is in the process of updating its economic impact study (2010 conditions). The study is expected to be completed in 2012.

NON-BASE INDUSTRIES

Non-base industries include Wholesale Trade, Retail Trade, Finance/ Insurance/Real Estate and Services. These are defined as follows:

Wholesale Trade

The sale of merchandise to industrial, commercial, institutional, and professional businesses.

Retail Trade

The sale of merchandise to the general public for personal or household consumption, and services incidental to retail sales.

Finance/Insurance/Real Estate (FIRE)

Banking, credit services, and brokerage of real estate.

Services

Professional and personal services.

In 1997, the number of non-base industry businesses in Boone County was 1,596, which had risen to 2,195 in 2008. This represents 64.2 percent of all businesses in the county, down from 70.1 in 1989. The 41,572 (increased from 28,978 in 1997) non-base industry employees accounted for 62.6 percent of all workers in Boone County, up from 57.4 percent in 1989. The combined number of base industry and non-base industry businesses and employees do not total 100 percent due to unclassified businesses and employees.

Table 5.4 and **Table 5.5** detail the number of non-base industry businesses and the total number of non-base industry employees from 2001 to 2008 for Boone County and Kentucky, respectively. Historically in Boone County, these categories increased from 1970 through the 1990's but have since fluctuated. **Table 5.4** indicates how important retail and services industries are to Boone County's economy. Data in these categories must be handled with care because of differences in definitions from year to year.

TABLE 5.4 - BOONE COUNTY NON-BASE INDUSTRY ESTABLISHMENTS AND EMPLOYEES

	2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.
Wholesale Trade	282	4,834	317	5,851	184	5,270
Retail Trade	430	8,703	440	8,615	495	9,872
F.I.R.E.	275	4,897	279	6,092	334	5,204
Services	1,071	24,936	1,150	19,947	1,182	21,226
Total	2,058	43,370	2,186	40,505	2,195	41,572

Source: U.S. Census County Business Patterns (NAICS)

TABLE 5.5 - KENTUCKY NON-BASE INDUSTRY ESTABLISHMENTS AND EMPLOYEES

	2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.
Wholesale Trade	7,826	72,681	7,965	72,793	4,428	74,882
Retail Trade	17,232	217,969	16,503	212,454	16,024	230,483
F.I.R.E.	9,884	81,609	9,757	84,285	10,453	88,020
Services	46,388	809,722	45,981	828,798	40,767	653,680
Total	81,330	1,181,981	80,206	1,198,330	71,672	1,047,065

Source: U.S. Census County Business Patterns (NAICS)

Non-Base Industries Comparison, State of Kentucky

Table 5.5 details the number of non-base industry businesses and the total number of non-base industry employees in the State of Kentucky from 2001 to 2008. In general, retail and service sectors are stronger in Boone County than in the state overall. As with the base industry sector of the economy, the non-base industry sector in Boone County grew while it declined in Kentucky.

Retail Trade

With the continued development of the Mall Road area and Houston Road as regional shopping districts, Retail Trade has remained a major component of Boone County's economy. According to the U.S. Census County Business Patterns, the 2009 payroll for the 9,943 Retail Trade employees was \$213,745,000 or an average annual income of \$21,497 per employee. This payroll amount is considerably lower than the base industries. The number of Retail Trade employees, however, exceeded all other classifications except manufacturing in Boone County. In fact, 15.6% of all workers in the county worked in a Retail Trade business, however only 9.5 percent of total payroll was paid to Retail Trade employees. Because of the importance of Retail Trade to Boone County, it is further detailed and divided into 8 divisions. **Tables 5.6** and **5.7** detail these 8 divisions by giving the number of Retail businesses and employees for each of the divisions.

TABLE 5.6 - BOONE COUNTY RETAIL ESTABLISHMENTS AND EMPLOYEES

	2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.
Building, Garden Materials	25	544	44	801	42	678
Department Stores, Discount	18	2,243	21	2,175	25	2,356
Food Stores	39	1,277	41	1,126	46	1,000-2,499
Motor Vehicles and Parts	42	954	48	1,110	48	1,125
Apparel & Accessories	72	735	72	735	84	1,011
Furniture, Home Furnishings	32	324	30	332	27	322
Electronics and Appliances	20	409	24	297	28	395
Health, Personal Care	31	483	35	530	29	385
Gas Stations, Convenience	50	716	53	752	52	593
Sports, Hobby, Books, Music	27	499	32	510	34	495
Office, Gifts, Pets, Florists etc.	56	591	58	549	53	524
Deliveries, Internet	13	200	17	170	27	808
Total	425	8,975	475	9,087	495	9,692-11,191

Source: U.S. Census County Business Patterns (NAICS)

TABLE 5.7 - SELECTION OF BOONE COUNTY SERVICE ESTABLISHMENTS AND EMPLOYEES

	2001		2003		2008	
	Est.	Emp.	Est.	Emp.	Est.	Emp.
Restaurants, Bars, Hotels	200	5,390	213	5,306	274	6,322
Health Care, Social Services	173	2,670	182	3,238	228	4,139
Laundry, Hair, Beauty, Diet	58	725	61	664	84	813
Repair, Maintenance	84	801	78	830	93	736
Professional, Technical, Legal	172	1,163	198	1,162	231	2,920
Remedial, Waste Mngmt.	146	3,513	148	3,398	176	5,509
Management of Companies	22	628	20	637	20	637
Art, Entertainment, Recreation	27	638	30	599	48	925
Total of Select Sectors	882	15,528	930	15,834	1,154	22,001

Source: U.S. Census County Business Patterns (NAICS)

Table 5.6 shows growth in some types of retail, but decrease in others for 2008. This is the year that is generally accepted as the beginning of the latest economic recession. Increases in Service establishments and employees are larger than other industry sectors in Boone County.

In 2009, the County Business Patterns reported that 15.6 percent of all Boone County employees worked in Retail Trade, compared to 13.4 percent of all employees in the Cincinnati Metropolitan Area, 14.9 percent of all employees in Kentucky, and 12.9 percent of all national employees. The peak for the Boone County percentage was 25.8 percent in 1978.

Services

In 2009, the payroll in Boone County for the 14,007 Service employees (County Business Patterns) was \$302,440,000 for an average annual income of \$21,592 per employee. The Service average annual income is significantly lower than the average \$50,740 in the Manufacturing sector but comparable to the \$21,497 average annual income for Retail Trade employees. The number of Service employees has surpassed Retail Trade employees.

In 2009, the County Business Patterns indicated that 21.9 percent of all Boone County employees worked in the Service sector, compared with 39.1 percent of all employees in the Cincinnati Metropolitan Area, 39.0 percent of all employees in Kentucky, and 42.4 percent of all national employees.

RECOMMENDED AREAS OF COMMERCIAL ACTIVITY

Since the immediate Florence area figures so prominently in Boone County's commercial activity, this region has the momentum to continue dominating any expansion of commercial activity. Currently, "big box" retail has been overbuilt in the county. As a result, building vacancies and tenant changes are visible along the major commercial corridors in Florence. The market and infrastructure impacts of future large scale or regional commercial uses on the existing Florence commercial districts must be considered. Furthermore, it is important to encourage the reuse of vacant commercial buildings and ongoing maintenance and rehabilitation of older business districts, instead of creating new commercial districts. Four studies, the Houston-Donaldson Study, the Central Florence Strategic Plan, the Main Street Study, and the Mall Road District Study, have defined the scale and type of commercial uses in the City of Florence and surrounding area. The Houston Road area will mature with expansion of the retail and office base, and expansions of St. Elizabeth-Florence Hospital. The Main Street area will experience a rebirth as a result of an expanded population in the area and public improvements. Existing business districts need to be supported through market analysis and realistic recommendations. Overall the commercial economy of Boone County has become more diversified.

The City of Florence was the main sponsor of the Mall Road Corridor Study in 2002-2003. This study examined the market conditions for Mall Road, and developed a strategic plan based on demographic characteristics of the

trade area, competition, and traffic patterns. The plan includes traffic improvements, bike and pedestrian improvements, parking lot design, street furniture, tree plantings, signage recommendations, design standards, remedies for unsightly features, and drafted model changes to the zoning ordinance for the corridor. The overall goal of the study was to re-design Northern Kentucky's largest commercial area into a strong mixed use, urban community with extensive new commercial, office, entertainment, and residential development. A major component of the plan is to develop new urban buildings within the existing large parking lots and implement a grid street system to create a dense, active, successful, focal point for Northern Kentucky. In order to begin implementation, the City of Florence has moved ahead with the hiring of an Economic Development Coordinator, and has conducted meetings with area property owners and developers to begin implementation of the Master Plan. The City of Florence has requested the Planning Commission to a land use and zoning study. The Mall Road District is expected to be completed in 2011. It will include a series of recommendations involving land use, zoning, transportation, pedestrian access, parking, design review, signage, and business incentives.

Many problems with the location and arrangement of commercial uses have emerged, especially along the KY 18 and U.S. 42 corridors. Commercial developments along KY 18 and U.S. 42 west of Mall Road should not be regionally oriented nor should they attract additional traffic, but rather be served by the existing or future population of the area. A mix of commercial, office, and residential uses, along with limited access, should be encouraged along KY 18. Along the entire KY 18 corridor east of Burlington, there are traffic congestion problems that can be worsened by adding commercial access points.

The land surrounding the U.S. 42 area, southwest of Florence, will experience additional commercial growth towards the City of Union, but should be done on a smaller scale to mitigate any adverse impacts and to be compatible with surrounding land uses and densities. The U.S. 42 corridor toward Union will have a mixture of commercial, office, institutional, public facility and residential uses. As defined by the 2000 Union Town Plan, commercial development should occur in neighborhood business district form in specified locations instead of strip style commercial. The Union Town Center could be used as an example of planning efforts for other parts of the U.S. 42 corridor, as well as other corridors in Boone County. Ultimately, mixed use town centers should be developed at major crossroads throughout Boone County without commercial development along the roadways between the town centers. Street connectivity is critical in these types of corridors.

Commercial developments that occur in the KY 18 and U.S. 42 corridors should be limited in scale (e.g. building, intensity, use, etc.) and clustered to serve growing residential neighborhoods. Planned Unit Developments should be encouraged so that commercial construction is incorporated within new residential areas and designed properly. These commercial clusters should not function as an extension of Florence and Mall Road, but as distinct units serving the Burlington and Union areas. This principle should apply to the Limaburg area and surrounding area as well. The commercial development in this area should coordinate closely with the projected high and medium density residential development to form a more coherent community and create neighborhood centers rather than just a strip extending out of Florence. An example of this type of design is the Oakbrook Marketplace, which ties into the subdivision while serving a larger trade area.

The I-75/Mt. Zion Road Interchange should have commercial activity concentrated to the east of I-75 and along U.S. Highway 25. The type of commercial activity northeast of the interchange should serve the residential areas on Mt. Zion Road and along Dixie Highway, Gateway Technical College, and the Northern Kentucky Industrial Park. Street and parking lot connections are critical in this area to help traffic flow on Mt. Zion Road.

Highway related commercial activity is appropriate at the I-75/Richwood Road Interchange. However, such growth on the west side of the interchange should be adequately buffered from existing and planned residential uses. As the residential area of Richwood grows, especially with the development of the Triple Crown Country Club, neighborhood and convenience commercial uses should develop. These new uses should be oriented toward the residents rather than the highway travelers. Most of the highway commercial growth should take place east of the interchange, although this growth should not occur to the point of blocking industrial traffic from future planned industrial development along U.S. Highway 25. Commercial development in this area should be designed to serve nearby residential growth. Over time, the truck oriented uses should be replaced with other commercial development as the interchange transforms from a travel services area to a residential area. Tax

Increment Financing (TIF) is the process of allocating tax revenues from new development toward public improvements in a defined area. Boone County currently has two TIF districts located between Richwood Road and Chambers Road on the east side of I-71/75, which may be used to pay for public improvements in the area. In the future, other TIF districts may be formed by the legislative units.

The I-75 Interchange at Walton is capable of additional commercial growth as appropriate levels of infrastructure become available. However, even with recent improvements to the interstate and interchange, additional truck oriented commercial activity will be detrimental to the traffic conditions at this interchange. The area should contain commercial services that serve traffic and customers that are already on Mary Grubbs Highway, and that include interconnected driveway systems, extensive landscaping, and provide a suitable "front door" to the growing City of Walton. This especially affects the southeast quadrant of the interchange in the Service Drive area. In this way, the TA truck stop impacts on KY 18 in Florence can be avoided at this similar location. The additional commercial development should address the coordination and limitation of access points to insure safe access at the interchange and along Mary Grubbs Highway, Stephenson Mill Road and Walton-Verona Road. Good development design and landscaping will be important at this high visibility location. The Walton Town Center should continue to grow, serving both local residents and interstate travelers.

The Verona/I-71 interchange has been slow to develop to this point. However, the demand for commercial services will arise in the future. A detailed study involving citizens and land owners needs to be prepared for both the interchange area as well as the existing town of Verona to the southeast. This study is imperative in light of the development of the auto racing facility in Sparta to the south and its potential impacts on the interchange area. The racetrack facility could result in the need for commercial services at the interchange giving the county an opportunity to plan ahead for this development.

The Hebron area will experience additional commercial development along KY 237 and KY 20 as the northern area increases in population. The existing commercial center along KY 20, just east of KY 237, will probably not expand significantly because the new highways, I-275 and KY 237, have bypassed it. Commercial development in Hebron will center around the intersection of new KY 237 and KY 20 with a limited amount of convenience and neighborhood commercial uses north of the I-275 interchange to serve the SouthPark Industrial Park, Park West Industrial Park, and the growing number of residential subdivisions along North Bend Road. Park West is also the home of a Foreign Trade Zone (FTZ No. 47) which is an area exempt from Customs payment, taxes, and duties normally associated with international trade. Such FTZ's are designed to stimulate economic growth while encouraging companies to keep their operations in the United States.

With the amount of residential construction expected in the North River area, larger scale commercial developments, such as drug stores and grocery stores will be needed. Commercial development in this area should be designed to serve the northern part of Boone County. This commercial growth should coordinate with the existing and proposed industrial and residential developments, especially in terms of access.

The I-275/KY 212 Interchange should experience a decrease in airport related commercial activities due to the economy, as these services and activities may eventually be provided on Airport property. The existing airport related commercial businesses at the KY 20/I-275 Interchange should evolve into highway related businesses. This area could support office related businesses, particularly properties possessing panoramic views of the Ohio River. Additional commercial growth based upon the expansion of the airport, and subsequent industrial growth, will be located at the Mineola I-275 Interchange as evidenced by the Airport Exchange Business Park and the Circleport Industrial Park.

Other types of projected commercial activity include the eventual restoration and redevelopment of older commercial areas, developments and corridors. This includes sites along Dixie Highway, U.S. 42 (in Florence), KY 18 (in Florence), Dream Street, downtown Burlington, and Union. The Mall Road District Study addresses business vacancy issues, traffic circulation, and has presented a concept for a new image of the corridor.

The Petersburg Road/Idlewild Interchange area at KY 8 and I-275 is now experiencing traffic volumes on I-275 that could support some commercial activity in the future. Significant commercial will not occur, however, until

residential development occurs in the corridor as well as the expansion of sanitary sewer service. Parallel roads should be utilized to provide access to commercial developments. Particular concern should be taken in the design and development of the commercial businesses due to the existing topography and character of the surrounding area.

The various small communities should continue to serve the commercial needs of their surrounding areas, and any regulations or incentives that affect these areas should be designed to support small businesses. New businesses, as they are constructed or as existing structures are remodeled, should be developed with sensitivity to the historical character as well as the current character of the area. Tourism in the County should increase as a result of improvements to Big Bone Lick State Park, impacts of casino gaming in Indiana, and the increase in recent years of heritage tourism in Boone County. This industry is significant since Boone County consistently ranks near the top in the State in tourism dollars generated. Planning principles which guide commercial development in the more developed parts of the county should not be ignored. The Small Community of Burlington, for example, should be revitalized in terms of its commercial opportunities, especially those day-time services which would be available to the many users of the county seat. However, this redevelopment should be done with attention paid to existing traffic, parking, and pedestrian patterns. The 2000 Union Town Plan will provide concepts for other small communities in the path of new development.

In general, large residential developments may need to provide for neighborhood-scale commercial activities. Neighborhood commercial activities may include small grocery or convenience stores, family restaurants, professional offices or small retail operations of general merchandise. These neighborhood commercial activities should be scaled to serve only their surrounding residential subdivisions, and designed to fit in with their surroundings.

RECOMMENDED AREAS OF INDUSTRIAL AND OFFICE ACTIVITY

A critical need in Boone County is to protect future industrial land, because the access, infrastructure, and level land that make it favorable for industrial development are finite. Beyond 2035, Boone County may have difficulty in developing more industrial uses outside the airport, U.S. 25, and Walton areas. In general, areas planned for non-extractive industrial uses should not be changed to allow other land uses to develop. The Northern Kentucky Tri-County Economic Development Corporation has identified a need for industrial building sites that have the necessary infrastructure and zoning and are ready to develop.

Existing sites should also be examined to enable adaptive re-use or redevelopment of buildings. There are numerous older vacant industrial buildings and sites or underutilized commercial sites that provide redevelopment opportunities. These areas are often referred to as grayfields or brownfields because they have older structures or pavement that does not function as an effective business use.

Recent expansion and renewal of existing businesses that has occurred in the Northern Kentucky Industrial Park should continue to be encouraged for all industrial and office areas. Existing businesses can be supported through appropriate incentives or infrastructure improvements, just as new businesses often receive incentives for locating in the community. The planned improvements to Industrial Road are an example. Tax Increment Financing and similar mechanisms can facilitate business corridors, and the Gateway Technical College should be an impetus for redevelopment in this area. Any vacant property that does occur should be maintained properly to help the property be sold or leased.

The Northern Kentucky Industrial Park has the potential to expand along its southern boundary. The location of the county's population involved in manufacturing correlates well with this concentration of industry. The area southward to Mt. Zion Road should be reserved for the expansion of the Northern Kentucky Industrial Park.

The Richwood and Walton interchanges will serve an increasing amount of industrial traffic along the U.S. 25 and I-75 corridors. Most of the industrial activity should locate near the interchanges to minimize travel on non-interstate roads. The area between U.S. 25 and the Boone/Kenton County line contains industrial potential due to

interstate and rail access. Development of this area should utilize Old Lexington Pike as a frontage road to limit the number of access points onto Dixie Highway. The realignment of Old Lexington Pike with Richwood Road has made this area more accessible to the interstate. Business development to the east of Walton should be facilitated by major roadway improvements extending east from Mary Grubbs Highway and ultimately connecting with major thoroughfares in Kenton County - including KY 16 and KY 17.

The KY 237 and Mineola Pike I-275 Interchanges will experience continued industrial development in addition to the previously outlined commercial/office development. The mixture of uses should be carefully designed and planned to minimize negative impacts. The existing and future residential uses must be adequately buffered from the new development in these two interchange areas. Future office development is recommended for the Marydale area.

Future areas to consider for business park, office campus style development include the I-71 corridor in the Verona area and the Petersburg I-275 exit area. These areas need to be evaluated in more detail to make sure the impact on infrastructure and on residential uses are appropriate, and that the timing of development is correct.

Several future interstate highway interchanges have been discussed for Boone County including one on I-275 west of Hebron, one on I-75 south of Walton (possibly just across the county line), and another on I-71 between Walton and Verona. The implementation of any of the interchanges must be accompanied with a land use study that evaluates and protects future industrial and business park land. Service and highway commercial development should be minimal in order to preserve prime industrial or business park land.

Property on the north side of KY 20 and near existing Airport runways should be developed with a planned combination of industrial and office uses if existing and future land uses are properly buffered from adjoining uses. The area surrounding the Airport and Airport property should be closely examined to explore industrial and office development opportunities. This examination can be performed by using the Cincinnati/Northern Kentucky International Airport Master Plan and by conducting an Off-Airport Land Use and Zoning Study. Development of this area should occur with extreme sensitivity to the river view and to the steep slopes. The area to the west of the airport along Hossman Road may also be suitable for office oriented development if proper access and buffering can be accomplished.

The river bottom areas, especially the Petersburg and Belleview areas, will continue to support extractive industries such as sand and gravel mining, however, the remaining resource has shifted primarily from gravel to sand. These areas generally have poor road accessibility, although industries involved in processing bulk products could locate there to make use of river barge transportation. Future development or expansion of these industries should occur with sensitivity to the residential, recreational, and agricultural potential of the river bottom area, especially near Woolper Creek. Upon the disuse of existing sand and gravel operations, reclamation should occur. Other types of mining activities may occur in the future of Boone County, but only with an evaluation of its benefits and costs to the community, including its impact on existing businesses and residential/agricultural uses. Consistent with state law, large, concentrated agricultural production of livestock and similar operations should be treated in planning and land use regulations as an industrial use, not an agricultural use because of the potential noise, visual, traffic, and other impacts on surrounding land uses.

CONCLUSION

In 2011, the International Monetary Fund (IMF) forecasted that the GDP of the United States will fall below that of China by 2016. American companies are regularly outsourcing portions of their operations, especially to China. The intellectual talent and skilled workers needed to support this activity is being developed outside the US as well, to the point where jobs in some industries in the U.S. (e.g., skilled and experienced engineers and scientists in biotech and aerospace industries) remain unfilled, despite record unemployment. For America to continue to compete in this changing global economy, it will have to focus efforts in several areas, including educating and developing local talent and workforces, supporting local manufacturing, and encouraging foreign companies to invest locally.

HOUSING

INTRODUCTION

This element assesses Boone County's housing supply and presents a plan for future housing growth. The housing market is a basic economic operation which is regulated by demand and supply. Demand is comprised of all individuals within the county or wishing to enter the county. Births, deaths, migration, marital status, and a multitude of economic facts all have a profound impact on current and future demand. High interest rate periods, such as the early 1980's, usually decrease housing demand and building activity, and, therefore, increase occupancy rates. Low interest rates, a multitude of financing options, and job growth have combined with the availability of public regional sanitary sewer service from the mid 1990's to result in the greatest rate of housing construction ever experienced in the county. However, the housing industry has experienced a considerable downturn since the last update of the Comprehensive Plan. Despite this, Boone County has a home ownership rate of approximately 76%, which exceeds the national rate of 65%. Supply is responsive to demand and includes both existing and planned housing stock. Aside from the number of housing units, housing supply analysis is a study of the variety of housing types and the constantly changing market demand. This element contains three sections. The first is an analysis of Housing Demand, which is closely related to the Population and Economy Elements of the Comprehensive Plan. Second is a study of current Housing Supply and planned housing development. The last section, Meeting Housing Needs, combines major findings of demand and supply in order to determine future housing needs and to forecast housing growth by area of Boone County. It should be noted that all findings are macro in scale and are not intended to describe individual neighborhoods.

HOUSING DEMAND

Population Trends

Two major population factors affect the housing demand in regards to total numbers of housing units. These are the total population and the average household size. Except for institutions or other forms of group housing, households are defined as the person(s) occupying a housing unit. As a result, the number of households equals the number of occupied housing units, not the total number of housing units. For this reason, the number of households forecasted in the Housing Element is less than the respective number of housing units forecasted in the following Housing Supply section of the Housing Element. The difference in the two is represented by the overall vacancy rate of housing units. Total population, households, and people per household are shown in **Table 6.1**.

Table 6.1 shows that Boone County has not attained the 2010 population forecast of 121,080 made a few years ago by the State Data Center in Louisville, but is continuing to increase nonetheless. The people per household figures have continued to decrease each decade, but are expected to level off at some point in the next couple of decades. These figures are typically higher than the state or national average, reflecting the relatively young age statistics in the Population Element.

TABLE 6.1 BOONE COUNTY POPULATION AND HOUSEHOLDS

	1980	1990	2000	2010	2020	2030
Population	45,842	57,589	85,991	118,811	153,933	190,270
Households	14,848	20,127	31,258	43,216	57,870	71,530
People per H.H.	3.09	2.85	2.73	2.73	2.66	2.66

Source: U.S. Census; KY State Data Center estimate (University of Louisville)

Table 6.1 reveals an important trend where household sizes are continuing to decrease, but are expected to level off by 2020. The household projections are used as a general guideline for future housing need. Because they represent occupied housing units, the total number of housing units for any given year will be greater by the amount of the vacancy rate. Household characteristics also change as evidenced by the increase in single-parent families. The resulting housing needs impact the size, type, and location of units demanded by the population. Multi-family units near commercial areas often constitute the demand of singles or single-parent families and 'empty nesters'.

The demand for more affordable single-family and multi-family residences, generated by the commercial and industrial employment growth centers, has helped generate the development of many new subdivisions and apartment developments. New subdivision and apartment design has been uniform in suburban areas and has in the past offered little variation or innovation from one development to another. Recent development proposals have contained concepts that include landminiums, neotraditional single-family, and a greater variety of attached housing. Mixed-use, planned developments that provide a mix of housing options, commercial, office, and public uses with multiple transportation options (i.e. transit, pedestrian, park-and-ride) could be one strategy for meeting this demand (see Housing Densities in this element and the Land Use/Transportation Connection section in the Transportation Element). The local development community should be encouraged to examine other markets around the nation to uncover new trends that may be beneficial in Boone County.

Migration

Migration is another factor that affects the amount of housing needed for future residents. In Boone County, 44.8% of the residents lived in the same house for the 5-year period from 2005-2010. This is slightly above Kentucky's average of 43.4 percent (2010 ACS Selected Housing Characteristics for Kentucky). Union's percentage of persons who lived in the same house has historically been the lowest in the county.

One attractive feature of Boone County that encourages people to move here has been rapid growth in commercial and industrial jobs, although a slowdown has occurred since 2001. Office development has decreased in comparison to the 1980's, mirroring a regional and national trend. Industrial growth is strongest around the airport and along the I-75 corridor south of Florence. Commercial developments continue to expand in the Houston Road area, while the Mall Road area continues to add replacements for vacant stores.

These industrial and commercial areas, along with the airport, constitute permanent, regional employment centers, and are acting as attractions for new residential development to occur within commuting distances. Several expansions of the airport, during the 1980s and 1990s, brought an in-migration of new residents, thereby creating a greater demand.

Age Composition

With the exception of Walton, the County's incorporated areas and the unincorporated area, as a whole, have higher percentages of young and middle aged persons than Kentucky. Union has the highest youth and the lowest elderly percentages. Walton displays the lowest youth and the highest elderly percentages. **Table 2.10**, which appears in the Population Element, further shows the percentages for the remainder of the county and Kentucky. Boone County's population is becoming more elderly in proportion. This "graying" of the population will have an impact on housing demand. Many of these "empty nesters" will want to move out of their high-maintenance, large lot single-family homes and into condominiums, landminiums, or small lot single-family homes. This demographic shift, in part, engendered the recent development of the Elmcroft Senior Living center on Main St., in Florence, on the former site of the Florence YMCA.

Marital Status

Marital status is another demographic characteristic useful in determining housing demand. Single elderly individuals, married couples with children, and single individuals with children have different housing demands than young adult, single individuals. In general, married couples live in single-family houses, while other groups tend to reside in multi-family or attached dwelling units. The cities of Walton and Florence have lower marital status rates than Union or the unincorporated areas of the County.

Economic Factors

Economic variables of households also help determine housing demand in Boone County. Single family dwelling units tend to cost more than multi-family units. An exception to this are condominiums, which are owned dwelling units of a multiple unit structure. To summarize from the Economy Element, Boone County residents have relatively high income when compared to Kentucky averages, with Union being highest, followed by the unincorporated area, Florence, and Walton. According to the 2010 U.S. Census owner occupied dwelling units outnumbered renter occupied units in 2010 by approximately three to one. Duplexes and multi-family units tend to be renter-occupied while mobile homes are usually owner-occupied, but often located on rental lots.

An important factor in detached single-family housing development is the relative cost of a building lot. The rapid residential growth throughout the last 15 years has pushed the expense for developable land higher. This has strengthened the trend toward smaller residential lots as developers try to offset high land costs and provide a product which appeals to changing lifestyles. To date, these trends, as well as the slowing housing market, have resulted in very little attached housing or innovative clustering of detached dwelling units. The housing development industry faces many difficulties that affect the amount and price of housing. Recently, newer forms of single level attached housing have been constructed, where sometimes four dwelling units are joined by a hidden garage, and much attention is given to architecture and landscaping. The demand for detached single-family units is evident throughout Boone County, however, with the area between Burlington, Union, and Florence being the most active in terms of subdivision development. Innovative clustering techniques, which result in useable open space, may be helpful in meeting those demands.

Demand for multi-family housing has historically been in, or around Florence. The emphasis on new construction, however, has shifted to the unincorporated county. The continuing in-migration of a young, professional population combined with the increased growth of single-parent families and the overall graying of the population, means the demand for various multi-family housing options will continue in the future for Boone County.

Manufactured homes are an economical alternative to conventional and modular homes and have historically been in demand in the rural, western half of the county or in mobile home parks located mostly between Florence and Richwood. The zoning in the western portion of Boone County, however, often requires a minimum five acre lot size making this a less economical housing alternative with increased land prices. The heaviest concentration of mobile home parks is along the U.S. 25 corridor.

An economic variable essential to housing demand is the extent of poverty and areas where it is found. Summarizing from the Economy Element, Florence has the highest percent of individuals and families in poverty, followed by unincorporated Boone County, and Walton. Low cost housing needs to be located throughout the county so that it doesn't become more economically segregated. Housing assistance programs should be designed to help facilitate low cost housing in locations where it's needed.

Demand Summary

Of the five factors discussed that affect housing demand, the population trends and migration characteristics dictate the number of housing units needed. The age and marital status, and economic factors affect the types and locations of housing development. In general, the demand for housing has dropped off considerably since 2008 but is slowly rebounding. In the last 5 years, subdivision growth has continued at a much slower pace than historical levels. Over that time, the bulk of subdivision growth in the county shifted away from areas of past residential growth and towards Union and the north Hebron area.

HOUSING SUPPLY

Housing Type by Area

Table 6.2 indicates that the most densely populated, incorporated areas have the greatest amount of multi-family units. In 1990, with urbanizing areas in unincorporated Boone County, Florence had 56.4% of the multi-family units with approximately 34.1% of the gross population in the county. In 2000, with 27.4% of the population, Florence had 36.9% of the total multi-family units in Boone County. The proportion of area within the City of

Florence to the area of Boone County has increased with annexations. The amount of land in Florence, however, still comprises a very small area compared to the unincorporated county. In 2000, 52.7% of Florence's housing stock was comprised of multi-family, while Boone County increased from 16.5% multi-family units in 1990 to 29% in 2000, and 27.7% in 2010. The data shows that this trend appears to have leveled off because of the tremendous rate of small lot detached unit development occurring in several parts of the county. Housing data for cities is not yet available from the 2010 census. However, county-level data show that single family and multi-family housing continues to grow. Conversely, the number of mobile homes has dropped back to just below the number in 1990, a decrease of over 600 units since 2000. This is a result of the displacement of a few mobile home parks in Boone County that have occurred over the past 10 years.

The percentage of multi-family in the unincorporated area of the county increased from 16.5% to 29.2% from 1990 to 2000 while the percentage in Florence increased from 41.9% to 47.0% from 1990 to 2000. Much of this growth can be attributed to condominium development. 49.2% of the multi-family construction in Boone County and 43% of the multi-family construction in Florence in the same period were condominium units. Unincorporated Boone County has also maintained the highest percentage of mobile homes during this same period.

TABLE 6.2 HOUSING UNIT TYPES BY JURISDICTION

	Single-Family			Multi-Family (& SF attached)			Mobile Homes			Totals		
	1990	2000	2010	1990	2000	2010	1990	2000	2010	1990	2000	2010
Florence	4,209 30.2%	4,808 22.2%	N/A	3,060 56.4%	5,399 58.4%	N/A	31 1.6%	45 1.9%	N/A	7,300 21.9%	10,252 30.7%	N/A
Union	307 2.2%	867 4.0%	N/A	3 <0.1%	5 <0.1%	N/A	2 0.1%	2 <0.1%	N/A	312 1.5%	874 2.6%	N/A
Walton	548 3.7%	751 3.5%	N/A	240 4.4%	542 5.9%	N/A	12 0.6%	7 0.3%	N/A	800 3.8%	1,006 3.5%	N/A
Unincorp Boone	8,846 63.9%	15,260 70.4%	N/A	2,122 39.1%	3,593 38.9%	N/A	1,860 97.6%	2,351 97.8%	N/A	12,828 60.4%	21,219 63.6%	N/A
Total	13,910	21,686	33,307	5,425	9,239	11,056	1,905	2,405	1,897	21,240	33,351	46,260

Source: Boone County Building Inspection Data & U.S. Census

Housing Type by Municipality

It should be noted that the number of housing units increased in all the major housing construction types for each municipality, except multi-family units in the City of Union. County-wide, the percentage of total housing units that are single-family detached units, has decreased while multi-family units have increased in percentage. The City of Florence has a lower percentage of single-family units than other areas of the county.

In 1980, multi-family housing comprised 20.9% of the total housing units in Boone County. This percentage continued to rise as the county urbanized and stood at 25.5% in 1990 and 27.7% in 2000 (see **Table 6.3**). This was during a time of enormous growth in single-family housing development. This increase in multi-family housing happened primarily in the unincorporated part of Boone County. Since 2000, the percentage of multi-family decreased to 23.9. The percentage of mobile homes throughout the county has decreased steadily since 1990 and now stands at 4.1% of the total 46,260 housing units in the county in 2010.

Values

The median value of a single family housing unit in Boone County in 1990 was nearly \$74,300; by 2000 the value had risen to \$131,800. As of 2010 the median value was \$182,300. These figures include the cost of the structure, but not the land cost. According to the building industry a general rule of thumb is that the lot value is typically around one-fifth of the total home cost. The Home Builders Association has estimated the increase in local income, taxes, revenue, jobs, and overall local economic impacts in its Metro Area Impact of Homebuilding. The study was conducted in 2004 and was based on a model developed by the National Association of Home

Builders. The model captures the effect of the construction activity, the impact that occurs from construction activity earnings, and the impact of new home occupancy.

Table 6.3 PERCENT HOUSING UNIT TYPES BY JURISDICTION

	Single-Family			Multi-Family			Mobile Homes		
	1990	2000	2010	1990	2000	2010	1990	2000	2010
Florence	57.7	46.9	N/A	41.9	52.7	N/A	0.4	0.4	N/A
Union	98.4	99.2	N/A	1.0	0.6	N/A	0.6	0.2	N/A
Walton	68.5	74.7	N/A	30.0	24.1	N/A	1.5	0.7	N/A
Unincorporated	68.9	71.9	N/A	16.5	16.9	N/A	14.5	11.1	N/A
Boone County	65.5	65.0	72.0	25.5	27.7	23.9	9.0	7.2	4.1

Source: Boone County, Florence & Walton Building Inspection Data & U.S. Census

In 2003, 1,363 single-family homes were permitted in Boone County. The estimated one-year benefits to the metro area as a result of this construction included \$107.3 million in local income, \$9.9 million in taxes and other local government revenue, and 2,237 local jobs. The estimated recurring impacts in subsequent years include an annual impact of \$33.4 million in local income, \$4.8 million in taxes etc., and 754 local jobs.

In 2003, 394 multi-family units were permitted in Boone County. The estimated one-year benefits to the metro area as a result of this construction included \$22.6 million in local income, \$2.4 million in taxes and other local government revenue, and 459 local jobs. The estimated recurring impacts in subsequent years include an annual impact of \$9.7 million in local income, \$1.4 million in taxes etc., and 205 local jobs. U.S. Census Building Permit data for 2010 show that 392 single family unit permits were reported, along with 6 additional multi-family.

Average rental payments follow a similar pattern, being highest in the unincorporated parts of the county where the relatively newer multi-family housing units are located. Rents in Florence remain high also because of the high demand and the convenience of the location.

Age

According to the 1990 Census, 6.8% of Boone County's housing stock was constructed before 1940. The rapid growth in new housing development becomes very apparent considering that the 1980 Census showed 12% of the County's housing stock was built before 1940. In contrast, the 2010 totals indicate that 49.7% of all Union housing units, and 25.2% of all Boone County housing units were constructed between 2000 and 2010.

Table 6.4 indicates the total number and percent of housing units constructed during four time periods. Over 77% of all existing housing units in Boone County were built after 1969. It is clearly evident that Boone County's overall housing stock is not very old. However, the houses of the early subdivisions of the 1950s and 1960s should see a major transition in ownership patterns as the original owners proceed from retirement to old age and consider the need for other housing options (i.e. condominiums, retirement homes).

The statistics in **Table 6.4** show that over half of Boone County's housing units were constructed during the 1990's and 2000's, including 82.6% of the units in Union. Walton contains the highest percentage of pre-1940 units, while continuing to grow primarily on the north end of town with annexations. Florence has also continued growth on land annexed over the last couple of decades.

TABLE 6.4 HOUSING UNIT AGE BY MUNICIPALITY

	1939 & Earlier		1940-1989		1990-1999		2000-2010		Total
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	
Florence	246	1.7	7,090	48.7	2,986	20.5	4,244	29.1	14,566
Union	9	0.5	305	16.8	597	32.9	901	49.7	1,812
Walton	213	15.9	588	44.0	254	19.0	282	21.1	1,337
Unincorp.	999	3.4	12,026	40.4	10,192	34.2	6,542	22.0	29,759
All County	1,467	3.1	20,009	42.1	14,029	29.6	11,969	25.2	47,474

Source: U.S. Census, Boone County GIS – not counting demolitions

Growth Patterns

The City of Florence has grown mainly through annexation of new development property to the west and south. Plantation Pointe and Orleans Subdivisions are prime examples of new developments annexed into the city primarily for urban services such as sanitary sewer. Infill and redevelopment will occur in the central parts of Florence.

Important public improvements in the City of Florence will impact the quality of life of its citizens in the future. These public improvements are exemplified by the Florence Nature Park, the new Stringtown Park, the Florence/Boone County skate park, the Florence Family Aquatic Center, South Fork Park, Ewing Boulevard, the Florence City building, Main Street Improvements and Plan, and the implementation of the 2002 Pedestrian/Bike Path Plan.

The other major residential growth area in the county has been the North Hebron area. Tree Tops, Thornwilde, Wyndemere, Deer Creek, and Northpointe Subdivisions have experienced growth since the 2005 Comprehensive Plan, and new subdivision activity has begun off of Graves Road. This area will continue to fill in, especially with completion in 2010 of the reconstruction of North Bend Road (KY 237), although most of the developable land is accounted for, and remaining undeveloped land contains rough terrain. Since the end of 2006, Boone County GIS indicates that 262 housing units have been built in the North Hebron area (north of I-275), while 292 have been constructed in Hebron (south of I-275). In North Hebron, this activity is spread fairly evenly across several subdivisions while the activity in Hebron has occurred in Sunchase Meadows and Sundance Estates. The Williams Road corridor should be considered in the long range planning for this area as a future residential growth corridor if water, sewer, and access can be provided.

Occupancy

Overall, the county had a 6.3% vacancy rate in 2000. **Table 6.5** provides a further analysis of the occupancy rates since 2000 for active residential subdivisions by housing type. Multi-family housing in Florence and Walton have had low vacancy rates, revealing the high level of demand for these units in these areas. However, the vacancy rate for multi-family housing units in unincorporated Boone County often is higher because of the number of new units that are available.

TABLE 6.5 PERCENT HOUSING OCCUPANCY

	2000		2010	
	Owner	Rental	Owner	Rental
Boone County				
Kentucky	97.7	92.1	93.6	90.7
	93.4	88.5	89.2	90.5

Source: American Community Survey 2010

Other Characteristics

Other characteristics of the housing stock include heating, bathrooms, kitchen facilities, telephones, water source, and sewage disposal. This discussion is based on the 2010 Census. Only about 2% of the homes in the county are without any heating units. While this value is very low, every household should have some sort of heat. Only 1% of the homes are without complete kitchen facilities. There are some homes without telephones; however, in the age of wireless communication, this condition will increasingly be one of convenience rather than poverty.

In general, the supply section concludes that the existing and planned housing units will meet the growing population's need as developers become increasingly aware that Boone County is one of the top building opportunity areas in the Cincinnati metropolitan area and in the State of Kentucky.

MEETING HOUSING NEEDS

The remainder of the Housing Element is devoted to examining ways the county can meet housing needs. The Goals and Objectives of this Plan advocate a planned effort to meet the broad range of housing needs and desires of the present and future populations. The Housing Element is coordinated with the Plan's other elements in order to provide a framework for the Future Land Use Plan.

Population Needs

The major reason for Boone County's rapid population growth is in-migration. Often the higher income families (or new population) locate in the developing rural areas of the county. While this is practical because they can afford the estate lifestyle and cost of transportation over greater distances, this spatial phenomenon separates people of different income levels. A variety of housing opportunities within the established urban areas and within developing areas would encourage some of the higher income residents to reside there and thus encourage mixing of different income levels. Therefore, single-family housing should remain an ingredient of the urban areas instead of being targeted only for rural or suburban areas. Large, left-over parcels in urban service areas are well suited for planned residential development that includes high density housing. However, established single-family housing areas in urban settings should not experience an influx of multi-family or duplex construction unless adequate buffering or proper development design can be provided. Housing for the elderly population or for those who are handicapped needs to be located near public transit, commercial areas, and public facilities.

Existing Supply

Housing stock that has redeeming qualities or that can be rehabilitated without much effort or expense should be retained. Additional residential development should reinforce this existing housing stock wherever possible. In some cases, existing houses should be incorporated into new subdivision design. There are concentrations of older housing stock in need of restoration or rehabilitation in many of the established small communities, including areas like Belleview-McVille, Burlington, Constance, Hebron, Petersburg, Stringtown, Taylorsport, Union, Verona, and Walton.

Housing Types

Although single-family homes are by far the most numerous, they continue to decrease in their percentage of total Boone County housing. Most new construction of single-family housing will take place on the outer rings of growth. The Union area has a high percentage of single-family housing. Nearly 83% of all units in Union were constructed between 1990 and 2001. The focus of new housing has been in the Union Town Plan area since 2005 and this trend will likely continue for the foreseeable future. Large lot areas, including Union, will see multi-family construction, although this higher density development should occur close to highway arterials and urban services and be sensitively developed in terms of building height, setbacks, mass, and visual impact. Throughout Boone County, high density developments should be close to thoroughfares to achieve a gradation of building site dimensions and land uses outlined in the Future Land Use Plan.

Multi-family housing developments should have convenient access to commercial districts or should provide their own supporting commercial uses. The developments should be designed to offer the shortest trips to the most people. High density residential developments help to hold down the cost of individual units due to many

variables including lower land cost per unit, lower land development cost and building unit costs per unit. Clustering of the dwelling units allows this by requiring less site work and utility construction. Better design can correlate with more density, and walkable, multi-modal communities. This also provides a supply of affordable housing for county residents.

Modular housing is becoming a major factor in the nationwide housing supply. Boone County and Kentucky in general have not seen the influx of modular housing that has occurred in other areas of the country. The Northern Kentucky housing market matured enough in the 1990's that more types of modular housing are appearing. Modular homes add to the variety of housing supply, and can lower the cost of construction to help offset rising land costs. Currently, modular houses are permitted in any residential zoning district in Boone County, and can occur separately or in a subdivision, unless regulated by private deed restrictions or restrictive covenants. Modular housing is typically brought to the building site in several components, and its construction is inspected on site by the local building inspector under the respective State Building Code. These units should not be confused with manufactured homes, more commonly referred to as mobile homes, and/or double-wide mobile homes. Mobile homes are inspected in the factory under the Federal Mobile Home Construction and Safety Standard (H.U.D. Code).

The percentage of duplex units in Florence was only 3.2% in 2000. This has decreased in recent years largely because of low interest rates and the boom in single-family construction. Duplexes are often more successful than multi-family housing in blending in with single-family residential surroundings. Therefore, when buffering is minimal between single-family housing areas and proposed multi-family units, an appropriate transitional area of duplexes may be designed.

It is important to offer a variety of housing units, not only in terms of economics, but also because of the county's demographics. As stated previously, the youthful population, divorcees, and elderly often select a multi-family unit or manufactured home to satisfy their housing needs. In the case of the young, this housing provides their first independent housing unit. In order for Boone County to retain its youth, the county must provide both jobs and housing, otherwise, an out-migration of the young and educated population will occur. Divorcees often select multi-family housing immediately following a separation. Elderly select these units for reasons usually related to economics and the need for a secure environment near their daily needs. The variety of multi-family housing includes nursing homes, retirement housing, apartments, townhouses, and condominiums all ranging greatly in price per unit. These types of units are increasing in demand outside of the established urban areas. As the county's population ages and land values rise, the need for higher density residential and planned unit developments will likely increase.

Assisted Housing

The Section 8 Housing Rental Assistance Program began in 1975 with an allocation of 110 certificates. This program is operated by the Assisted Housing Department in Boone County and helps low to moderately low income families pay their rent. That department also assists 20 families with a home ownership program. The tenant pays 30% of their gross monthly income towards their rent. Deductions are incorporated such as medical expenses for the elderly and disabled, and qualified child care expenses for families. As of 2011, the county has an allocation of 978 vouchers. There are approximately 185 landlords renting units under this program. There are more vouchers in the City of Florence than in the unincorporated county, however, the proportion has been decreasing over time.

Affordable Housing and Homelessness

The previous section discussed the need for a variety of housing units for the special needs of specific demographic groups: young, unmarried adults, divorcees, and the elderly. A high percentage of these groups need truly affordable options other than traditional single-family homes. In order for Boone County to retain its youth, the county should strive to provide jobs and a variety of attached housing, as well as innovative clustering of detached dwelling units.

During the last decade, housing construction in Boone County has occurred mainly in the mid-value range, with some high-end for both single-family and multi-family housing. However, attempts at more affordable single-

family or apartment construction often meet with localized hostility. Creative site design and architecture can help overcome some of this resistance. Historically, the existing rental market is not adequate to meet the need as evidenced by the *Northern Kentucky Housing Needs Assessment* (October 1993, prepared by Northern Kentucky Housing & Homeless Coalition/Northern Kentucky Housing Partnership). This report stated that because of demand, the Boone County Section-8 program had a waiting list of over 300 people with an estimated wait of one and a half to two years. This has improved dramatically; now the average waiting period is only two months.

In 1991, the Boone County Task Force on Homelessness published a report that recommended a holistic approach that would coordinate the existing services and agencies already providing for the needs of the homeless. The report also stated the following:

Some needs are not currently being provided for and should be addressed. An example of such a need is the alarming and growing need for affordable housing in the Boone County Community. In terms of percentages of total housing, available housing at the low and moderate end of the cost continuum is actually shrinking in Boone County. This trend needs to be reversed.

The report recommended that the county facilitate affordable housing development through non-profit housing organizations, such as Habitat for Humanity. It also stated that the key to solving homelessness is affordable housing. It recommended possible land reservations by developers, creation of a non-profit land trust, tax incentives, and the adjustment of zoning codes towards smaller lot sizes and higher densities to encourage the development of affordable housing.

The Kentucky Housing Corporation's 2010 Kentucky Statewide Point-in-Time Count of Homeless Persons lists Boone County's total homeless population as 116, of which 74 were children. In terms of total homeless individuals, Boone ranked third in Region 3, behind Kenton and Campbell counties, but ahead of the other 11 counties in the region. The homeless count is grouped by level of shelter as follows: *Emergency* refers to temporary housing for people who do not have a place to stay, *Transitional* is time-limited (e.g., 24 months) housing provided with a goal of transitioning residents to permanent housing, and *Unsheltered* refers to places not meant for human habitation (cars, parks, etc.). Of Boone County's total 2010 county, the majority (n=101) were considered Transitional homeless. The balance of the count represented Emergency homeless (n=4) and Unsheltered (n=11) individuals. Among children, 72 were living in Transitional housing and 2 were Unsheltered. The percentage of homeless children in Boone County (62.1%) is much higher than the 2010 statewide average of 18.4%.

Housing Densities

High density residential areas should be located sufficiently near and with convenient access to major streets, highways, and shopping and public facilities. A progression of densities of residential uses from high (multi-family) to low (single family) shall be encouraged. Where traditional progressions of high to low net density are not possible through creative development design, an appropriate and attractive visual transition should be achieved. This could include existing vegetation or new landscaping and/or fencing. Existing vegetation (such as wooded fence rows) should be retained as much as possible to provide buffer strips and stormwater filters. This serves a dual purpose in that woodland is becoming relatively scarce in the eastern uplands of the county, and these areas buffer different land uses. Housing that is proposed on smaller, remnant tracts needs to be carefully designed.

Housing development density has become an issue of concern to many existing residents in established, large lot subdivisions in suburban Boone County. Many of these areas developed during the 1960's to the 1980's when land prices were relatively low, few utilities were present, the surrounding land was agricultural, and urban/suburban development had not yet extended out to these areas. Many of these older subdivisions contain two-acre lots or larger. By contrast, most new subdivisions in Boone County are developing at around three units per acre and sponsor sewer construction if sanitary sewer is not currently available to the site. The issue arises when these new higher density subdivisions are proposed near established low density areas and centers mainly around development impacts on infrastructure and the residential character of the area.

In order to support the densities needed to sustain mass transit as proposed in OKI's Regional Transportation Plan, and to foster new affordable housing options, average minimum densities should be encouraged for mixed-use, planned developments. This would allow a variety of housing types but also enable a logical progression of intensities. The highest residential densities would be in the activity centers of these mixed-use developments. The Mall Road Study presents the opportunity for such development in that predominantly commercial area. These activity centers would also include neighborhood commercial, employment, and public uses, as well as transit stations or stops.

Open Space Subdivision Design

The design of true open space housing development should be encouraged as an alternative to the conventional subdivision divided entirely into ownership lots. To accomplish this, densities within portions of a site can be increased while the overall intensity on the site can remain basically the same. Topography, vegetation, and public improvement costs reduction should be incentives for open space design. Provision is made in the zoning and subdivision regulations for true open space design to occur under existing zoning. By increasing densities and clustering on portions of a site, these planned developments will preserve green space and/or provide space for public facility or recreation opportunities. The overall intensity of units per acre on the whole site becomes the issue to consider when evaluating public services and relationship to the Future Land Use Map. All residential developments should be designed to preserve and utilize natural site features wherever possible.

The most common method of designing a residential subdivision in suburban areas like Boone County is to calculate the most lots that can be fit within the geometric shape of the development site and modify according to efficient street layout and grading needs. To achieve true open space subdivisions, however, the review process needs to include more pre-application meeting work and preliminary plans need to be designed in the following steps:

1. Evaluate the subject site for natural/historic areas or views that make the site special;
2. Set these areas aside to be designed into the development;
3. Select home building sites to take advantage of access to these features or views;
4. Design a road and utility system to serve the planned homes;
5. Create lot lines to encompass the home sites, leaving the features under common ownership for recreational or green space purposes.

Open Space Subdivision design should be encouraged by creating incentive programs. A detailed study should be conducted involving the development community, land owner interests, and local government to review the existing ordinance, revise as necessary, and determine the incentives and geographic areas in which to encourage this type of residential development. A density bonus could be considered as a possible incentive. However, the ordinance standards should also be strengthened and a minimum size requirement of an open space subdivision considered. The selection of geographic areas during the study process should be based on specific criteria.

Transit Oriented Developments

An excellent model for mixed-use, planned developments is the concept of Transit Oriented Developments (TODs). The Land Use/Transportation Connection part of the Transportation Element discusses the important transportation attributes of TODs if transit hubs or centers were to develop in Boone County. This includes multi-modal aspects (i.e. facilities for transit, automobile, pedestrian, and bicycle are provided) and inter-modal aspects (i.e. there is an easy access and transition for users of one mode of transportation to another).

TODs would also offer attractive and affordable housing options. The range of housing options could vary from apartments above commercial uses in the activity centers (up to 30 dwelling units/acre); nearby garden apartments (10 to 20 dwelling units/acre) and condominiums (6 to 15 dwelling units/acre); small-lot single family houses (at 7-10/dwelling Units/acre); and finally, at the edge of the development, standard lot, single-family houses (at 3-4 dwelling units/acre). All sections of a TOD development are directly connected with a prominent pedestrian system, and are easily accessible to commercial and public land uses.

Airport Noise Impacts on New Residential Development

Since the opening of the north/south Runway 18L-36R in 1991, airport noise impact on existing residential development has been a topic of discussion between the airport and the community. The Supplemental PART 150 Study's Noise Mitigation Program addressed the noise impacts generated by the 1991 runway and the extension to the east/west runway, 9/27. The most recently adopted, year 2004, FAR Part 150 Study Update recommended a new Noise Compatibility Program (NCP). This Program is discussed in the Transportation Element.

The Airport Master Plan, currently being updated, still considers an additional future runway. This east/west runway on the southwest side of the airport near Burlington may ultimately end up being removed from the Airport Master Plan. An east/west alternative would likely impact many residential subdivisions as well as the National Historic Register District in Burlington and three school facilities.

It is important that the construction of new residential development, that would be built in areas impacted by high airport noise levels (65DNL plus), should have stipulations that would mandate that builders in these developments construct their buildings with materials that would reduce excess noise from the outside. The general guidelines for new residential construction within 65 DNL or greater is that it should be built with enough sound insulation to provide an outdoor to indoor Noise Level Reduction (NLR) of at least 30 decibels, and 35 decibels if the outside area is within 70 DNL.

A SUSTAINABLE BUILT ENVIRONMENT FOR THE FUTURE

The planning horizon for this comprehensive plan is 25 years into the future. The future overall pattern of development, as well as the specific building techniques, materials used in construction, and the design of communities, should evolve into a built environment that is sustainable from generation to generation. The pattern of development should be more compact, with most development being built in the mixed-use, transit-oriented model described in this element and in the Transportation Element. However, financial burdens of such development must be considered, especially in light of the downturn in the housing industry seen over the past several years.

The housing industry has undertaken market driven conservation measures (i.e. "green movement") in building design and construction, including energy efficient doors, windows and appliances, low water usage toilets, greater insulation features in house wrap and wall batt, OSB wallboard and plastic lumber, and improved HVAC systems. Additionally, most new homes tend to be built on much smaller lots. Many builders also include a landscaping package in the overall price of the new home. However, added to the sustainability model would also be the use of indigenous building materials that could include locally produced lumber products and even rammed earth. Use of indigenous materials would have the intrinsic advantage of creating a new local building material supply industry, as well as substantial energy savings from not having to transport materials from distant parts of the country. Another important part of the sustainable model would be the siting and design of new buildings so that the renewable energy of the sun would be maximized. Older buildings should be retrofitted with insulation and solar technology to become energy efficient.

GEOGRAPHIC HOUSING ISSUES

The following findings should be considered during the planning of the Future Land Use Element:

North River/I-275 corridor area - North Bend Road has been upgraded to better serve development in that corridor, including the continuation of Thornwilde and the new Rivers Pointe Estates. The flat North Bend Bottom area and other river bottoms should be reserved primarily for their present agriculture, or for appropriate residential, recreational, or employment uses that further enhance the riverfront resource without placing development in flood prone areas. Hillside development guidelines should be followed in this area to properly locate structures and avoid complete clearing of natural vegetation along the tops of hillsides so that development

does not overwhelm the public view. The Williams Road area should be evaluated in the Land Use Element for future residential growth, if infrastructure can be provided.

Hebron/Idlewild area - The new north/south airport runway has eliminated several existing subdivisions from the KY 20 corridor, east of Hebron. These include the Laurel Drive area, the part of Hickory Glen Subdivision south of Conner Road, Sycamore Drive, and Ada Lane. The growth along KY 20 in the Bullittsville area will continue. As demonstrated in Burlington where many Ethan's Glen residents relocated to subdivisions in that area, some Laurel Subdivision and Hickory Glen Subdivision residents may have relocated to new subdivisions west along KY 20.

Turfway/Mineola area - Rolling Green Acres Subdivision contains only a few houses after airport buyouts, and the zoning is industrial. The Bel-Aire Acres Subdivision area is currently zoned residential, but is planned for Business Park uses in the long term. Although the Marydale property along Donaldson Road and Houston Road is mostly planned for office development, some high density residential uses could be mixed in to provide a transit oriented center.

Florence/Burlington area - The undeveloped land on the southwest quadrant of KY 18 and KY 237 would be an excellent site for a transit-oriented, mixed-use planned development, even with the planned future urban interchange at this location. New subdivisions throughout the west Florence and Burlington areas should provide interconnections between their developments and adjacent developments to promote safe and easy transportation access. Overall, the KY 18 Corridor represents a prime opportunity to promote high density residential uses in a transit corridor.

Petersburg/Belleview/western Boone County area - The existing road conditions in this area are not suitable for large scale residential development. The historic character of Petersburg, Belleview, and McVile should be preserved. Localized Transfer of Development Rights programs or a new type of zoning could be investigated for areas immediately surrounding these towns to continue the grid pattern of the towns while resulting in little housing development on the hillsides or bluff areas. Open Space Subdivision design should be the norm rather than the exception in this area. Sewer for these town expansions should go to the nearly completed Sanitation District Number 1 (SD1) Western Regional Water Reclamation Facility, but not serve additional areas.

Florence/U.S. 25 corridor - Florence has taken steps, particularly through annexation, to include new developments in its housing supply. Beyond 2030, however, it will be difficult for the City to continue to grow geographically as the center of the county becomes fully developed and extensive infrastructure is in place. Florence has to continue to stabilize and improve older housing stock. There will likely be a major transition in ownership patterns for the houses of subdivisions built during the 1950s and 1960s, with an accompanying trend of remodeling and renovation to better serve the needs of the new owners. A plan should be conducted by the Planning Commission and City of Florence that inventories and determines methods of keeping good maintenance and vitality in these older single-family subdivisions. This plan should include a detailed survey of housing stock, property valuation survey, analysis of landlords and property ownership, and the length of residency. Any infill housing that occurs should fit in with the existing character of the area. The plan must contain specific implementation steps to be taken to keep neighborhoods clean, well kept, and safe. South of Florence to Mt. Zion Road, industrial development, associated with the Northern Kentucky Industrial Park, will be predominant. South of Mt. Zion Road, the expansion of existing and the building of new mobile home parks have constituted most of the housing units in this area. However, apartments near the Mt. Zion interchange shows that residential development momentum is greater west of I-75. Near Richwood, single-family residential development will be limited to the immediate Maher Road area. This road should be upgraded if significant residential developments are planned.

Union/west Florence/west Richwood area - The factors that helped fuel growth in this area include the improvements to U.S. 42 from Florence to the Ryle High School campus near Frogtown Road; the extension of water and sanitary sewer lines, access to the interstate highway system, and the vast amount of developable land. The Union Town Plan sets the stage for development in this area as sanitary sewer has become widely available. Areas west and south of the Union Town Plan area, along U.S. 42, Hathaway Road, and Longbranch

Road, contain an existing agricultural, horse farm, and estate residential character. Planning efforts, such as the Union Town Plan should be conducted in these areas. Street connections between developments and to arterials are critical in this central part of Boone County. The connections shown in the Union Town Plan need to be continued outside the study area to the next logical properties and arterial roadways. The Frogtown Road and Richwood Road corridors have experienced significant residential construction with very little improvement to the existing roadways. Triple Crown sets a good example with its central, limited access boulevard that connects these two state-maintained roadways. However, other existing roads in the area, such as Hicks Pike and Chambers Road are designed for less traffic. Significant improvements to these roadways will be needed to support extensive growth. Future development in this area should be sensitively designed to minimize impact on existing low density residential land uses, and connecting routes that take traffic off existing roadways should be encouraged. Boone County should be encouraged to work closely with the Kentucky Transportation Cabinet to improve existing roadways.

Rabbit Hash/Beaverlick area - Future growth around Rabbit Hash should be predominantly single-family but should respect the historic character of the area. Typical suburban subdivision development that is occurring in the Florence and Union areas is not appropriate for this part of the county. Open Space Subdivision Design is one way to accomplish these objectives. The Ohio River views and significant hillsides that may become attractive to builders should not be developed to the extent that the rustic character of the area is lost.

Walton/Verona area - Walton has annexed several areas north and west of the city to provide public water service and experienced significant subdivision development during the last decade. Verona will see mostly single family homes, and some small subdivision activity.

CONCLUSION

The areas of greatest projected population growth are in the Richwood/Union area, the Burlington area, south along I-75, and in the northern Hebron area. The western and southern sections of Boone County are projected to experience less population growth and less of a housing need. As noted previously, there is a desire of the population to live in rural areas that are convenient to the centers of commercial activity. This suggests a continuation of the outward movement of housing construction from the general Florence area. This movement is accelerated directionally by major thoroughfares such as KY 18, KY 237, US 42 and interstate interchanges. Residential development should occur near established urban or suburban areas. This will be an increasingly important issue as public water service is planned and implemented for the western parts of Boone County. For residential development to occur in these outlying areas, adequate and proper infrastructure must be provided, and impact on the natural environment must be minimized. If significant residential, large lot subdivision development does occur in some of these western areas, roads and other infrastructure will have to be improved.

Development in established areas takes advantage of existing services and minimizes future strain on the transportation network. The Public Facilities Element shows the existing and planned water lines and other services which will influence the locations of new residential construction. The plans for sanitary sewer for Boone County are of particular importance when high density residential development is reviewed. Stormwater management is becoming a key issue with the extensive residential development in the county and needs to be addressed creatively to solve runoff and erosion problems, while creating visually appropriate facilities.

If public water and sanitary sewer infrastructure is implemented in currently rural areas, there would be demand for suburban subdivision densities. Just because one form of public infrastructure has been improved, however, does not mean the area is ready for suburban development. Other forms of infrastructure must also be provided as necessary. It is possible that some areas of the county are not suitable for suburban or urban density, or may be suitable later in the twenty-five year planning horizon. Development phasing is an option to enable the timing of new development to correspond with the provision of adequate infrastructure. In addition, new subdivision development should include design considerations and gradation of lot sizes (or both) to lessen the impact on the character of the area. "Bands" of residential lot sizes may be a model to consider in order to ensure compatibility. This is particularly true in areas of agricultural zoning and could include larger lots or green space along the main

road(s), larger lots or a buffer along adjacent low density residential uses, strategic open space, and detailed attention to the orientation of housing units. The bottom line is that infrastructure partners must work together and correlate improvements in order to ensure capacity.

In general, residential development has occurred at a lower density than planned in the Future Land Use Plan over the last several comprehensive plan updates in Boone County. The development has predominantly been in a limited variety of product, typified by mid-range value single-family subdivisions at approximately three units per acre. The demand for this product will remain strong throughout the 25 year Comprehensive Plan planning horizon with some attached housing designed into larger planned developments. However, Boone County should remain open to potential changes in the market and design of housing in the coming years as the demographics and economics of the county change. Increased density does not necessarily negatively impact the quality of a community or nearby home values. Neotraditional, true mixing of unit types, connection to green space, and similar concepts of neighborhood design have been considered by the development industry in Boone County. These newer concepts are needed to enable the development industry and local government to address density concerns and strengthen the sense of community, as well as meet the housing demands of a changing population.

RECREATION AND OPEN SPACE

INTRODUCTION

Most of this element is an updated summary of the 2006 Comprehensive Parks and Recreation Master Plan Update, Boone County, Kentucky. The element discusses the need for parks and open space and presents findings of previous studies which have some bearing on the issue. It includes data on the numbers, types, and acreages of parks in Boone County and recommendations for future parks and open space as presented in the 2006 master plan update.

PREVIOUS STUDIES

Natural Areas Inventory of Boone and Gallatin Counties, 1989

This study, completed by the Kentucky State Nature Preserves Commission developed an inventory of Potential Natural Areas (PNA's) for the two counties. The study used a four step process which included (1) reviewing existing information such as flora and fauna, soils, geology and physiology and conducting interviews with knowledgeable persons within the study areas, (2) analyzing maps and aerial photographs, (3) conducting aerial surveys, and (4) conducting ground surveys. This process led to the identification of 55 PNA's in the two counties. Of those 55 PNA's, four received a significant designation and two received a notable designation. The final recommendations of the author were that these notable and significant designated areas should be protected in the future from possible development.

Western Boone County Study, 1998

Recognizing that the access, topography, urban services river frontage and general character are quite different in Western Boone County (WBC) than Eastern Boone County, the purpose of this study was to recommend a different way to develop this area in a manner consistent with its distinct characteristics. The study recommended that the Planning Commission should, through a list of projects, take a more pro-active approach and regulatory approach to addressing the future of WBC. Most of the recommended projects were designed to work directly with the land owners and affected people on a smaller scale. The study concluded that the traditional planning approach of a large land use plan and extensive regulations is not the best way to guide the future of WBC. The proposed list included the following projects that relate to the delivery of parks and recreation services:

- Form a non-profit Recreation Foundation (which had already been recommended by other planning efforts) and conduct an active search for riverfront public access/recreation properties. The focus would be toward county acquisition or tax benefit/contribution through the Recreation Foundation.
- Develop a preservation plan for the Middle Creek Valley through concentrated property owner meetings and discussions.
- Begin a process where Boone County and the Planning Commission take an active role in approaching the State Tourism Cabinet to create a plan for Big Bone Lick State Park:
 - Re-plan the park layout and theme.
 - Consider expansion plans for the park, including a land connection to the Ohio River.
 - Involve Tri-Ed because the parks are a quality of life issue for Northern Kentucky.
 - Explore potential for including corporate retreat facilities.
- Design a conceptual path system connecting large green areas and stream valleys of Western Boone County.

Natural Areas Inventory

The Boone County Conservation District asked Dr. Bill Bryant with Thomas More College to review the 2000 Boone County Parks and Recreation Master Plan Study and to recommend which natural areas in Boone County should be considered under this inventory. Dr. Bryant's priority list for areas of concern in Boone County includes:

- Middle Creek Valley – Highly significant and once proposed for trail connecting these lands.
 - Boone County Cliffs State Nature Preserve and surrounding lands.
 - Dinsmore Woods State Nature Preserve and surrounding lands.
 - Split Rock – Illinois glacial material of historical significance.
- Bald Point – off Hathaway Road, near Camp Michael Boy Scout Camp – glacial material and prairie remnants.
- Steep Gut Creek (on maps listed as Steep Creek) – area owned by Don Stites – Illinois glacial material, steep alluvial soils and unique vegetation.
- Petersburg – Indian mound areas.
- Big Bone Lick State Park – land around the park.
- Elijah’s Creek – Carter Dolwick Preserve owned by the Hillside Trust and surrounding lands.
- Intact forested slopes along the Ohio River – should be kept in forest due to underlying Kope formations and possibility of slides.
- Beech-Maple forest communities – virtually gone from this area. There were some remnants on East Bend Road, privately owned, and also a section near the interchange of I-75 and I-71, privately owned.

2002 Florence Pedestrian/Bicycle Plan

This plan was requested by the Florence City Council in order to update the 1992 Pedestrian and Bike Path Plan. Some of the recommendations in the 1992 Plan have been implemented by the City of Florence. The City of Florence needed a formal strategy on which to base its capital decisions. This Plan provided that strategy based on impartial, technical data and needs assessment. This plan recommended that sidewalk improvements are more important than providing bicycle circulation system in the early stages of the plan implementation.

In general, this Plan assumed that all parts of Florence should be evaluated as to pedestrian/bike needs and that existing or future connections to adjacent parts of unincorporated Boone County should be planned. The major planning steps included:

1. Develop a list of sidewalk needs.
2. Develop criteria and score each project.
3. Adjust results of weighting process based on known projects and emergency situations.
4. Develop a bike circulation network.
5. Examine overlap between pedestrian and bike network recommendations.

This Plan contained specific recommendations based on both scientific formula and on real world considerations. Even though this document included small scale map reproductions of the entire city, the information is readily available at any level of detail through the Boone County Geographic Information System (GIS). The Plan provided a guideline for the City of Florence to make decisions, and also enabled the staff of the City to draft realistic work programs for each fiscal year. Its implementation will help ensure that Florence remains the center of activity of the area, and maintains a high quality of life.

Comprehensive Parks and Recreation Master Plan Update, 2006

The 2006 Comprehensive Parks and Recreation Master Plan Update replaced both the 2000 Boone County Parks and Recreation Master Plan and the 1989 Boone County Open Space Master Plan.

The purpose of the Boone County Parks and Recreation Master Plan was to identify parks and recreation needs throughout the county and to develop strategies that could be implemented to provide services consistent with the existing potential resources and demands of the area. There are several reasons why this Master Planning effort, additional planning, and the future of Parks and Recreation in Boone County are important. First, local governments in Boone County manage approximately 1,894 acres of land designated for parks and recreation purposes. The schools operate several additional areas of campus and recreational area. Boone County cooperates with the Cities of Walton and Florence in the operations of parks within their jurisdictions. These agencies have the responsibility to manage this land in an efficient manner that is consistent with the health, safety and welfare of the community. Also, for many residents, parks provide their only access to active recreational opportunities in the natural environment. Furthermore, the quality of a community’s parks and recreation system is viewed as one of the indicators of the overall quality of life. Property values around parks

tend to be considerably higher than other areas, thereby making an annual contribution to the community in the form of higher property tax revenues, as well as additional profits to the owners at point of sale. More valuable properties also tend to be maintained at a higher level, improving the appearance of the communities. And lastly, parks preserve important cultural and natural features for future generations to enjoy.

The Needs Analysis contained in the 2006 Plan includes the following elements:

- An analysis of the participation levels of programs offered by the Parks and Recreation Department.
- The classification of existing Parks and Recreation facilities into standard park classifications.
- A discussion of the Parks and Recreation area needs by park types (see **Table 7.1**).
- A discussion of the geographic distribution of parks and recreation facilities.
- A summary of the public workshops.
- A summary of the parks and recreation surveys that were accomplished in 1996 and 1999.
- A facility needs analysis based upon accepted standards and guidelines and past experience of the Consultant.
- A summary of the overall parks and recreation facility needs.

TABLE 7.1 – PARKS AND RECREATION NEEDS BY PARK TYPE

PARK TYPE	MINI-PARK	NEIGHBORHOOD	COMMUNITY	COUNTY	SPECIAL USE	LINEAR	TOTALS
EXISTING DEVELOPED ACRES	23.7	128	158	221	495	0	1,025.7
RECOMMENDED ACRES PER 1000 POPULATION	0.5	2	2.5	5	N/A	N/A	10.0
RECOMMENDED ACRES : 2005	51	204	255	510	N/A	N/A	1,020.0
2005 SURPLUS (+) OR DEFICIT (-)	-27.3	-76	-97	-289	N/A	N/A	- 498.3
RECOMMENDED ACRES: 2010	60.95	243.8	304.75	609.5	N/A	N/A	1,219.0
2010 SURPLUS (+) OR DEFICIT (-)	-37.25	-115.8	-146.75	-388.5	N/A	N/A	- 688.3
RECOMMENDED ACRES: 2020	79	316	395	790	N/A	N/A	1,580.0
2020 SURPLUS (+) OR DEFICIT (-)	-55.3	-188	-237	-569	N/A	N/A	- 1,049.3
RECOMMENDED ACRES: 2030	94.3	377.2	471.5	943	N/A	N/A	1,886.0
2030 SURPLUS (+) OR DEFICIT (-)	-70.6	-249.2	-313.5	-722	N/A	N/A	-1,355.3

Source: 2006 Boone County Parks and Recreation Master Plan Update

Based on the Needs Analysis, including parks classification system and survey results, the 2006 Plan concluded the following:

- General shortage of park land in the areas of Hebron and north of I-275, the southern part of Florence to Richwood and Union and the Verona areas.
- The need for a wide variety of specific recreation facilities in primarily the same locations.
- The strong desire for more open space and land to be preserved as future green space and some land to remain as natural areas.
- The development of non-traditional activities such as a dog park, hobby park, and others.
- The realization that, as the population grows dramatically, the demand for park land, recreation facilities and programs will also need to expand dramatically to meet the County's demands and expectations.
- High demand for all types of trails including jogging, walking, nature, bicycle and horseback.

- Demand for open space for the future.
- Demand for indoor activities including an indoor swimming pool, youth center, gymnasium and other activities.

The vision for the future for Parks and Recreation in Boone County, included in the 2006 Parks Master Plan Update, and as determined from the surveys, workshops, community input, and the Consultant's recommendations, is as follows:

- Land is acquired for the development of parks in the areas that currently need parks and also land will be set aside for the expansion of these parks as the population grows.
- Land will be acquired to be preserved as open space.
- Develop a system of greenways, hike and bike ways, and linkages that connect the parks, schools, playgrounds, neighborhoods, and green spaces throughout the County. **Note:** *This recommendation has been met with tremendous opposition in recent years culminating in the defeat of a proposed Greenways Plan in 2009.*
- Unique or significant natural areas of Boone County are studied and preserved.
- The parks are developed for the most needed park and recreation facilities that were identified through the public input process.
- Indoor recreation facilities are developed to allow increased programming by the Boone County Parks and Recreation Department and to provide for the recreation and fitness needs of Boone County residents.

As of 2006, there were 1,906 acres of park land throughout the County. Of this amount, 973 were considered developed and another 384 acres were scheduled for development on land already acquired. Once that land is developed, it will result in 70% of park land being developed. The 2006 plan recommended a goal of a maximum of 50% of the park land to be developed. Of the existing land owned by the County for parks, acreage at England Idlewild, Waller-Stephenson Mill Park, Sperti Woods, and Camp Ernst will remain undeveloped. This results in about 428 acres of land that is currently owned that will remain undeveloped. **Table 7.2** lists all the existing and proposed parks recommended in the 2006 plan. The total development includes 1,643 acres. This acreage, added to the existing 973 acres, results in a total of 2,616 acres of park land that will be developed in the future. **Note:** *as of 2011, there are 1,882 acres of park land in Boone County.* To maintain a 50% undeveloped amount of property, an additional 2,188 acres will need to be acquired in the future.

The 2006 Update recommends 1,668 acres of new parks throughout the County and recommends that the County should establish a goal of limiting development of park land to 50% of the total park land owned by the County; the remainder to serve as open space and green space for the future. New parks that are proposed would be a mixture of neighborhood parks, community parks, county parks and special use parks that would be strategically located to provide convenient access to all residents of the County.

Recommendations for County Parks as stated in the plan included the following:

- Expansion of Central Park. The plan recommended expanding the park to the west across Camp Ernst Road onto the 117-acre former Seven Hills Property. That property has since been acquired by the Cooperative Extension District and is being developed. The Plan also recommended acquiring approximately 100 acres adjacent to the park on the east side of Camp Ernst Road and developing a master plan for the property to include a new entrance to the park, other amenities, and trail connections to Longbranch Elementary and Cooper High School.
- Expansion of England-Idlewild Park to include acquisition of (or easement on) approximately 80 acres to the west of the park and perhaps also to the east into the former Ethans Glen subdivision. A master plan for this park was completed in 2003.
- Expansion of Boone Woods Park to the east along Route 237. A master plan was completed in 2003.

Recommendations for Special Use Parks as stated in the plan included the following:

- Riverfront park and boat access in both the Belleview and Petersburg areas.
- Acquire and develop land for a Hobby Park somewhere in the county.
- Develop horse trails in the vicinity of East Bend Power Plant.

Recommendations for Major Facilities and Other issues as stated in the plan included:

- Develop family outdoor aquatic centers at the site of the existing Union Pool and a new southern facility in a park in the Richwood area.
- Develop a multi-generational community and recreation center to serve the southern portion of the County.
- Develop an indoor sports complex in central or southern Boone County.
- Develop indoor aquatic facilities in conjunction with Boone County Schools for competitive use and also provide a family aquatic center in the new indoor recreation center in the southern portion of the County.
- Develop athletic field complexes for baseball, soccer and other rectangular sports fields.
- Provide picnic areas at all new neighborhood, community and county parks.
- Develop a county wide greenway and trails plan.
- Develop the land across Camp Ernst Road from Central park to expand the Boone County Arboretum as a regional attraction with gardens, visitor center, education facilities and trails.
- Expand program offerings to include indoor programming, nature education programming and more as facilities are developed to support these activities.
- Develop a new southern maintenance base and satellite maintenance facilities at Hempfling Park, Waller-Stephenson Mill Park and Union Park, as the park system expands.

Florence Area Land Acquisition and New Parks

The City of Florence Parks and Recreation Needs Assessment and Park Land Evaluation Study, which was completed in May of 2001, identified several potential properties for expansion of parks in the Florence area.

- Expand the Florence Nature Park with approximately ten acres of land surrounding this facility.
- Acquire and develop the McEvoy Site as a new park in southern Florence. A Concept Plan for the site is included in 2006 plan.
- Study the 73-acre Baird Property located off Old Route 42 in western Florence and the 13-acre Glenn Rose site in eastern Florence for potential development as city parks. A Concept Plan for the Baird site is included in the 2006 Master Plan Update.

Significant Natural Areas Study

The 2006 Plan recommended that the County perform a study of all of the watersheds and significant natural areas in the County to determine the most desirable areas to preserve. Several of the watershed areas have been studied and preliminary indications include recommendations to preserve many of the watersheds for natural areas. Some specific items on the priority list include the Split Rock area, the Bald Point area within the Gunpowder Creek watershed and the Steep Gut Creek area along the Ohio River. Some areas were identified as priority areas due to strong development pressures placed on them, including the Sand Run Creek watershed, the North and East Gunpowder Creek watersheds, and the Woolper Creek/Ohio River quadrant area. Other areas recommended for preservation include the Ohio River waterfront near Federal Hall (just south of the I-275 Carroll Cropper Bridge), expansion of the Middle Creek watershed including the lands adjacent to Middle Creek Park and the lands adjacent to Boone Cliffs Nature Preserve. Boone County acquired both the Dinsmore Woods and Boone Cliffs Nature Preserves from the Nature Conservancy in 2009.

The 2006 plan also identified the north/west Gunpowder Creek area, south Gunpowder Creek watershed, and East Woolper Creek watershed as priority areas for preservation. The plan noted that “The Boone Conservancy may pursue lands in these significant natural areas. Their priorities should be the protection of significant natural features followed by the riparian corridor for preservation, waterway protection and the development of greenways and trails followed by the acquisition of significant pieces of farmland and other properties that may be available in these areas. These acquisitions could be in a variety of methods. These could include fee simple purchase, purchase of development rights, scenic easements, conservation easements, and greenway and trail easements.”

TABLE 7.2 – 2006 NEW PARK DEVELOPMENT SUMMARY

PARK TYPE	PARK/SITE NAME	ACRES
NEIGHBORHOOD	Big Bone Landing addition	5
	Florence Expand Nature Center Site	10
	Florence Glen Rose Site	13
	North Pointe	5
	Subtotal	33
COMMUNITY	Boone Woods east addition	10
	Bullittsville Community Park	25
	Boone Conservancy Land	45
	Erpenbeck-Plantation Pointe	20
	Frogtown Park	25
	Green Mountain Baseball Complex	44
	Hopeful Church Road Area	50
	McEvoy Site	50
	North Bend Road Area	25
	Southwest Burlington	25
	Union Park	45
	Subtotal	364
	COUNTY	Central Park east addition
Central Park Seven Hills area		117
England-Idlewild west addition		80
Ethans Glen addition		100
Future Union addition		150
Hempfling		89
Richwood Park		100
Waller-Stephenson Mill future addition		100
Waller-Stephenson Mill Park		225
Subtotal		1,061
SPECIAL USE		Belleview River Park
	Hobby Park	50
	Petersburg River Park	5
	Power Plant Horse Trails	150
	Subtotal	210
TOTAL		1,668

Source: 2006 Boone County Parks and Recreation Master Plan Update

PREVIOUS PARKS AND RECREATION SURVEY RESULTS

1996 Survey

A survey was completed in 1996 with the results printed in the 1997 report entitled “A Strategy for Meeting Boone County’s Recreation Future” which was prepared by the Boone County Planning Commission and the Boone County Parks and Recreation Department. This project was overseen by a citizen group formed specifically for this purpose. This group, known as the Recreation Advisory Committee, provided guidance in preparation of the report. A survey was mailed to 1000 randomly selected Boone County residents. The results of the survey indicated that a combination of state and local taxes with 28% and land donation of 24% were most preferred

funding methods. The most utilized park in Boone County was Boone Woods with 51% of the survey respondents indicating they used this park. This survey found that 30% of the respondents believed that an indoor swimming pool was needed and 27% believed that an outdoor swimming pool was needed within Boone County. The other 'most needed outdoor facilities' included bike trails and horse trails.

1999 Survey

A survey was included in the July issue in the "What's Happening" newsletter which was sent to every household in Boone County. In addition, this survey was handed out at the Boone County Fair. A total of 595 surveys were returned through these methods. In addition, four thousand surveys were distributed through the Boone County School System and completed by school students and their families. The survey results guided management recommendations and produced a summary of parks and recreation needs that was updated by the 2006 plan.

2006 Survey

The most recent Parks and Recreation Survey of Boone County residents was conducted in January through April of 2006. The survey was web-based but promoted widely through other media and direct mailings to residents without computer access. Just over 1,100 households responded to the survey, representing an estimated 3,300 county residents, with the highest number of responses came from the Florence and Burlington zip codes.

The 2006 survey gathered data on residents' use of and satisfaction with existing parks, maintenance, and programming but also asked residents about future needs. Some, but not all of these data, may be relevant to land-use planning. Respondents for the most part were at least "Somewhat Satisfied" with current facilities. However, 64% replied that they did not feel that existing facilities were adequate to serve Boone County's future needs. A similar number (65%) replied that they were Somewhat or Very Likely to support additional taxes to meet projected future needs. About ¼ of responses (24%) indicated that they were not likely to support new taxes. Concerning needs for outdoor facilities, the top 10 responses were for Open Space (85%), Jogging/Walking Trails (84%), Hiking Trails (82%), Bike Trails/Paths (80%), Picnic Shelters (79%), Children's Playground (78%), Open Picnic Tables (76%), Environmental Education Center (71%), Fishing Lake (69%), and Outdoor Aquatic Center (64%). The most needed indoor facilities included a Youth Center (74%), Gymnasium (72%), Senior Citizen Center (71%), Exercise Equipment (70%), and an Indoor Swimming Pool (70%).

Nature Parks, Greenways, and Bike Trails

The acquisition of the nature parks, greenways, and the development of the bike trails that are identified in the 2006 Plan are also very important in providing the quality of life that is desired in Boone County. However, the defeat of the 2008 Parks Tax Referendum by a 67% to 33% vote (46,531 votes total) and the decision to withdraw the Boone County Greenways Plan from consideration by the Boone County Planning Commission in 2009 has essentially removed this as a priority. Instead, the legislative units should concentrate on the funding for the basic parks and recreation services that are recommended in this Plan.

THE BOONE CONSERVANCY

In late 1999, The Boone Conservancy was created upon recommendation of the county Parks and Recreation Task Force. The Boone County Parks Master Plan recommended the creation of such a foundation ten years prior. The Boone Conservancy is a non-profit 501©(3) organization with the purpose of assisting in the Master Plan by working with all sectors of the community who recognize that planning for appropriate land conservation improves the quality of life and increases economic prosperity in Boone County.

The Conservancy consists of a twenty four member volunteer Board of area residents, including landowners, farmers, business leaders, developers, local government and individuals who share the vision and mission of conserving some of Boone County's unique natural resources for future generations. The Conservancy has established bylaws and identified priority project areas. It is also a member of the national Land Trust Alliance and a member of the Kentucky Land Trusts Coalition.

The Boone Conservancy raises funds through grants, private foundations, fundraising events and donations from private individuals and corporate entities. The Boone Conservancy accepts donations of land meeting certain specific criteria that advance its mission. The organization does not have condemnation or eminent domain powers.

The conservancy works as a facilitator in bringing together partners interested in conservation in Boone County. In appropriate projects that fit within The Boone Conservancy's conservation mission, the organization works collaboratively with other county, local and state entities to achieve conservation of a particular area. Much of The Boone Conservancy's work is focused in the major watershed areas of Boone County.

The Boone Conservancy currently holds conservation easements on approximately 29 acres (28 along Gunpowder Creek and 1 in Walton Park) and owns approximately 175 acres in the Middle Creek watershed. The land will either remain in its natural state or be developed as park land open to the public for educational purposes such as: bird watching, plant identification, establishment of wildlife habitat and native plant species or recreation such as: hiking, fishing and horseback riding.

CONCLUSION

Since the completion of the 1989 Boone County Open Space Plan, the 2000 Boone County Parks and Recreation Master Plan, and its 2006 update, major improvements have been made including the development of England-Idlewild Park, Central Park, Conrad Park, Gunpowder Creek Nature Park, and initial development of Waller-Stephenson Park. The land for most of these parks was the result of taking advantage of opportunities that presented themselves during site development. Boone County today is faced with the reality of providing parks and recreational opportunities to a population base that is continuing to grow. At the same time, revenues and resources become more and more limited. Therefore, the Boone County Fiscal Court and City Councils are forced to make difficult decisions regarding services to be provided and techniques to be used to develop, finance, operate, and maintain park areas, facilities, and recreation programs. Boone County will be in much better condition to serve its citizens with park land if they can take a more pro-active approach to meeting future needs.

AGRICULTURE

INTRODUCTION

The Agriculture Element of the Boone County Comprehensive Plan describes the significance of the number of farms, the amount of land devoted to farming activity, and the average size of a farm in Boone County. The Agriculture Element traces the history of farm production in Boone County and offers conclusions based on this data. Much of the updated information for this element comes from the “Agricultural Profile: Boone County, Kentucky” included in the Boone County Conservation District’s 2010 study titled Rural Treasure – The State of Boone County Agriculture. The Agricultural Profile is itself largely an analysis of data contained in the USDA’s 2007 Census of Agriculture, which was released in 2009. Also included in Rural Treasure are the results of a “Survey of Agricultural Land Owners in Boone County” and a “Boone County Cost of Community Services Study,” both of which are summarized later in this element.

Farmland Inventory

A farm, as generally defined by the U.S. Department of Commerce, Bureau of the Census, is any place from which \$1,000 or more of agricultural products were sold, or normally would have been sold during the census year. Recent reports on the number of cultivated acres in Boone indicate that there were 44,176 acres in crops in 2002. By 2007 that number had fallen to 35,832.

Prime Farmland and Farmland of Statewide Importance

Estimates by the U.S.D.A. Natural Resources Conservation Service indicate that 38,794 acres of Boone County land are classed as Prime Farmland as of 2008. Prime Farmland is defined in the National Soils Handbook based on criteria of crop production potential, land availability, and climate. According to the Soil Conservation Service Soil Survey (1973 and 1989), historically, much of the best farm soils were located in the eastern half of Boone County, however, development has displaced many of these areas. The following soil series comprise the prime farmland in Boone County: Ashton, Avonburg, Boonesboro, Wheeling, Huntington, Egam, Lindside, Newark, Nolin, Captina, Chavies, Faywood, Jessup, Licking, Negley, Nicholson, and Rossmoyne. Low to moderate slope is an important factor in this classification as well. Soils of Statewide Importance encompass an additional 23,987 acres and include the following soil series: Brashear, Captina, Chavies, Faywood, Jessup, Licking, Negley, Nicholson, Rossmoyne, Wheeling, and Woolper. This soil classification includes soils and slopes of less ideal conditions than the prime farmland areas.

Farms and Farm Tenure

As **Table 8.1** shows, 59% of the population of Boone County lived on farms in 1940. Since then, the number and percentage of people living on farms in Boone County has decreased drastically. In 2007, less than 1% of the estimated 112,459 Boone County residents lived on farms. From 1940 to 2007 the county population increased by 101,639 people, while the population of those living on farms decreased by 5,349.

This rapid population growth has been gradually reducing the amount of available farmland. It has also reduced the amount of land zoned primarily for agriculture use. This phenomenon of farmland reduction is an on-going process, and is assisted by the location of new sewer and water lines as they encroach into existing farming regions. The sewer and water lines increase pressure on the existing farmlands to develop for industrial and suburban residential developments.

TABLE 8.1 – PERCENT LIVING ON FARMS

YEAR	COUNTY POPULATION	FARM POPULATION	% LIVING ON FARMS
1940	10,820	6,406	59.2%
1950	13,015	5,561	42.7%
1960	21,940	5,750	26.2%
1970	32,812	3,916	11.9%
1980	45,842	2,425	5.3%
1990	57,589	1,350	2.3%
2000	85,991	1,100	1.3%
2002	93,616	1,088	1.2%
2007	112,459	1,057	0.9%

Source: 2007 U.S. Census of Agriculture & American Community Survey Estimates

Table 8.2 compares the number of farms and farmland in Boone County since 1900. Between 1959 and 2007, the county lost 522 farms consisting of 46,472 acres. In the 25-year period from 1982 to 2007, 280 farms totaling 30,640 acres were replaced by suburban development, non-farming activity, or farms that became inactive. The average farm size was up to 110 acres, after having dropped from 124 acres in 1978 down to 101 acres in 2002. In 2007, Boone had more farms containing on average 22 more acres each compared to Campbell and Kenton counties. Between 2002 and 2007, total farmland acreage in Boone County declined just 0.2%; but declined 8.5% in Kenton County and 6.0% in Campbell County. Farm acreage in Kentucky rose 1.1% during the same period. **Table 8.3** further describes Boone County farms by size in acres since 1909.

Table 8.2 and **Table 8.3** indicate the decrease of farms and farmlands as development of Boone County has occurred. The Boone County Extension Service expects the number of farms to reverse the trend and begin to increase, although most of them likely won't increase in acreage due to land use changes from agriculture to other uses. Livestock numbers have also been decreasing. In 1982, Boone County had over 16,500 cattle. By 2007 the number had dropped to 9,291 and further to an estimated 8,900 in 2009 (USDA, NASS, 2011). Hogs and pigs peaked at 13,100 in 1970, but have continually dropped since, with 2007 totals of just 59. Nationally, livestock production has risen, but this increase is attributed to larger, consolidated farms. Boone County, however, is distinctly an area of small farms, and is not sharing in this increased livestock production.

Even with the amount of development occurring, Boone County remains important in terms of agriculture. Through 2008, Boone County ranked within the top 76 counties or better out of the total 120 Kentucky counties in many of the major crop and livestock categories, including corn, soybean, tobacco, hay, cattle, and hogs. In terms of cash receipts, Boone's ranking was near the middle of the state for Crops (52), Livestock (63) and Total cash receipts (64).

In Boone County, 96.5% of the farms (658 farms) are classified as Small Family Farms with less than \$250,000 in sales (BCCD 2010). Of the 658 Small Family Farms in Boone County, 41.5% (n=273) are classed as Residential/Lifestyle Farms where the operator reports their primary occupation as something other than farming. The next largest farm category (28.6%) in the county is Retirement Farms (n=188). Both of these patterns are seen in the other two northern Kentucky counties and across the state as well.

Further analyses of the 2007 Census of Agriculture show that Boone County is tracking with national trends in terms of farmer age. Between 2002 and 2007, the average age of the Boone County farmer increased from 56.6 to 57.9 years. Regarding tenure, the numbers in Boone County vary somewhat from those of Kenton, Campbell and the state as a whole, with larger percentages of full ownership and tenants seen in Boone (see **Table 8.4**).

TABLE 8.2 – FARM NUMBER AND ACREAGE

YEAR	FARMS	TOTAL ACRES	AVG. SIZE (ACRES)
1900	1,598	149,191	93
1909	1,540	145,693	95
1919	1,831	151,242	83
1929	1,563	149,159	95
1939	1,443	146,424	102
1949	1,314	134,105	102
1959	1,204	121,222	101
1969	1,245	126,706	102
1978	847	104,882	124
1982	962	105,390	110
1992	798	80,864	101
1997	783	83,258	106
2002	743	74,915	101
2007	682	74,750	110
Kenton*	481	42,544	88
Campbell*	535	47,335	88
Kentucky*	85,260	13,993,12	164
		1	

Source: 2007 U.S. Census of Agriculture (* 2007 data)

TABLE 8.3 – FARM SIZE BY ACRES

ACRES	1909	1919	1929	1939	1949	1959	1969	1978	1982	1992	1997	2002	2007
1-9	158	283	132	125	111	128	200	90	136	100	78	65	54
10-49	439	549	437	369	356	328	353	240	324	301	261	307	308
50-179	720	773	758	728	636	555	485	345	321	278	227	265	204
180-499	211	220	228	210	206	183	183	140	149	96	101	88	97
500-999	11	5	8	9	4	10	20	30	30	18	19	12	11
1000+	1	1	0	2	1	0	4	4	2	3	5	6	8
TOTAL	1540	1831	1563	1443	1314	1204	1245	849	932	798	691	743	682

Source: 2007 U.S. Census of Agriculture

TABLE 8.4 – FARM TENURE PERCENTAGES

TENURE	BOONE	KENTON	CAMPBELL	KY
Full Owners	80.6%	77.3%	76.8%	76.8%
Part Owners	14.7%	18.7%	22.1%	19.4%
Tenants	4.7%	4.0%	1.1%	3.8%

Source: 2007 U.S. Census of Agriculture

Agricultural Zoning Districts

The Boone County Zoning Regulations contain two agriculturally oriented zoning districts: Both the Agriculture (A-1) and Agricultural Estate (A-2) allow all agricultural uses, as well as sales of agricultural products. The Agriculture (A-1) zoning district covers about 49,500 acres of the county. This zoning district lies primarily within the rural western half of the county. Agricultural Estate (A-2) covers about 47,500 acres of the county and lies mainly between the A-1 zoning areas and the developed eastern portion of the county. Both districts allow residential construction; the A-1 requires a five acre lot size and the A-2 requires a two acre lot size. Together the two districts cover approximately two-thirds of the county's 164,120 acres (see **Figure 8.1**).

Agricultural Districts

Agricultural Districts are administered by the Boone County Conservation District, under the Kentucky Division of Conservation, and allow farmers to form special areas where commercial agriculture is encouraged and protected. They are totally different and distinct from local zoning districts, and are designed to protect agriculture as a viable segment of the state's economy and the land as an important and valuable natural resource. The Agricultural District law, KRS 262.850, is aimed at protecting the best agricultural land for food and fiber production and discouraging its conversion to non-agricultural uses. The program was enacted in 1982 and amended in 1984 and 2000. Agricultural districts offer members the following protection under the law:

- The right to have their land assessed by the local property valuation administration at the land's agricultural use value;
- Protection against involuntary annexation;
- Deferred assessment of fees for water service extensions until the land is removed from the agricultural district and sold for non-agricultural purposes;
- The right to request that the local soil and water conservation district board hold a public hearing on the proposed taking of land under condemnation proceedings initiated by certain utilities.

Districts also benefit members by making them a higher priority for state cost share assistance, a higher ranking in Kentucky Purchase of Agriculture Conversion Easements (PACE), and eligibility for federal tax benefits for PACE applications.

To form an Agricultural District, the land must be composed of 250 contiguous acres and may contain tracts, lots, or parcels that total not less than ten (10) acres, or less than five acres if in horticulture production. The land must meet a state definition of agricultural land as defined in KRS 132.010. The program is entirely voluntary, and landowners can withdraw from the district at any time. In 1995, Boone County had a total of five of these agricultural districts which totaled 3,343 acres. In 2004, there were 13 districts comprising 6,770 acres and there are currently 16 districts encompassing 8,179 acres of land owned by 80 families (BC Cons. District Annual Report 6/30/10).

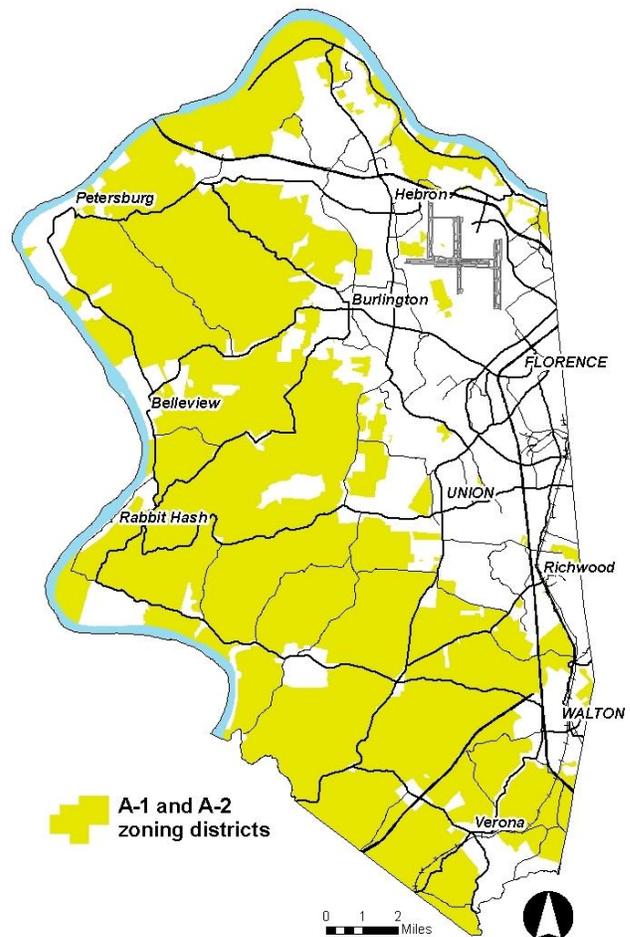


Figure 8.1 - Land zoned A-1 or A-2

Farm Assistance Programs

As mentioned in the Environment Element, the Kentucky Agriculture Water Quality Act, passed in 1994, protects surface and ground water from potential pollutants as a result of agriculture and forestry operations. The act did not establish any new water quality laws other than requiring that all agriculture and forestry operations of ten or more acres develop and implement a water quality plan by 2001. An Agriculture Water Quality Committee comprised of the Conservation Districts of Boone, Kenton, and Campbell counties meets as needed to assist in developing individual water quality plans. As of June, 2010, a total of 534 water quality plan certificates have been received by the Boone County Conservation Districts (BCCD 6/30/10).

In addition to water quality, the Boone County Conservation District assists landowners with conservation measures under various programs. As of 2010, district staff are assisting nine farmers who have begun or completed Environmental Quality Incentives Program (EQIP) contracts under the Federal Farm Security and Rural Investment Act of 2002 (2002 Farm Bill). Program goals include reduction of soil erosion, reduction of non-point source pollution, and promotion of habitat conservation for at-risk species. EQIP has helped fund nearly \$255,000 in conservation practices on 2,685 acres in Boone County. Under the Food, Conservation, and Energy Act of 2008 (2008 Farm Bill), “21 contracts have been obligated for \$374,161.12 on 12,481.2 acres” (BCCD 6/30/10). In addition to the EQIP program, eight other Boone County landowners are implementing conservation practices on 1,256 acres under either the Federal Conservation Security Program or Wildlife Habitat Improvement Program (WHIP). As of June 1, 2010, the conservation district reports that conservation plans have been written on 2,400 acres, soil quality improvement practices have been applied to 1,312 acres of cropland, and water quality improvement practices have been applied to 1,599 acres in Boone County (BCCD 6/1/10).

2010 Survey of Agricultural Land Owners in Boone County

The Boone County Conservation District sponsored a survey of agricultural land owners. The results were included in their study titled Rural Treasure: The State of Boone County Agriculture which was conducted by an independent researcher, with the assistance of Conservation District staff. Of the total distribution of surveys, 340 valid surveys were received. The return rate of 20.4% was considered “above average” by the researcher. The surveys sought to elicit data on farmer and farm demographics and tenure, as well as respondent opinions on farmland preservation and future plans.

The typical survey respondent is a 62-year old male with some college with an annual income between \$50,000 and \$100,000. However, less than \$1,000 of that income comes from agriculture and he is employed at least part-time off the farm. While respondent income levels from agriculture ranged to over \$300,000, 88.0% of respondents (292 of 332) reported making \$10,000 or less annually from agriculture while 2.1% (7 of 332) reported annual earnings from farming in excess of \$50,000. The 340 respondents collectively own 48% (17,356) of Boone County’s cropland, although 62.4% of this land is in active production. Most respondents had learned farming as children and had been farming for at least 20 years. The survey asked farmers to classify their type of farming in the form of self-perception (**Table 8.5**), their future plans regarding farming (**Table 8.6**), farmers’ views on the importance of farming (**Table 8.7**), and their willingness to participate in farm incentive programs (**Table 8.8**).

TABLE 8.5 – FARMING TYPE BY SURVEY RESPONDENT SELF-PERCEPTION

PERCEPTION	% OF 299	NUMBER
Livestock Producer	35%	104
Equine Owner/Manager	14%	41
Tree Farmer	13%	40
Produce Farmer	8%	25
Commodity Farmer	8%	24
Hay Farmer	8%	23
All Other (Gardener, Nursery, Bees, Tobacco, etc.)	14%	42

Source: 2010 Survey of Agricultural Land Owners in Boone County

TABLE 8.6 – FUTURE PLANS OF SURVEYED FARMERS

FUTURE PLANS FOR AGRICULTURAL LAND	% OF 335	NUMBER
Pass to relation (undecided)	34%	114
Pass to relation (farming)	26%	87
Sell to non-farmer	20%	68
Pass to relation (non-farming)	11%	38
Sell to farmer	4%	13
Other (Undecided, Conservation, No Answer)	5%	15

Source: 2010 Survey of Agricultural Land Owners in Boone County

TABLE 8.7 – SURVEYED FARMERS VIEWS ON AGRICULTURE

VIEWS ON AGRICULTURE	AGREE	DISAGREE
Ag Lifestyle and culture is important	90.0%	4.4%
Pass Farmland should be preserved	85.3%	9.1%
Farmland preservation has a positive impact	85.6%	8.8%
Maintaining Ag lifestyle difficult due to economic pressures	82.9%	9.7%
County becoming too urban	80.0%	13.8%
Future generations should be able to farm in Boone County	80.3%	10.3%
Land is solely a real estate investment	35.3%	54.4%
Don't want land restrictions now	87.9%	6.8%
Don't want land restrictions in the future	86.8%	7.9%
Willing to explore loose land use restrictions	44.4%	47.6%
Willing to explore strict land use restrictions	42.9%	48.2%

*Source: 2010 Survey of Agricultural Land Owners in Boone County (*305 to 322 responses)*

TABLE 8.8 – SURVEYED FARMERS WILLINGNESS TO PURSUE FARM INCENTIVE PROGRAMS

POTENTIAL INCENTIVES OF PROGRAMS	ENCOURAGE	DISCOURAGE
Improved ways to inherit farms	80.9%	4.1%
Preservation of farming culture	77.1%	7.6%
Environmental benefits	77.1%	7.1%
More/improved farmers' markets	76.5%	6.8%
Tax incentives	75.9%	7.1%
Preserve rural aesthetics	75.0%	8.2%
Expose children to Ag way of life	74.7%	8.8%
Incentives from conservation programs	71.5%	12.1%
Conservation of green space	71.5%	12.6%
Knowledge that farmland is being preserved	71.2%	11.8%
Preserve informant's land	55.6%	24.4%
Restrict how land is used	27.1%	56.2%
Potential decrease in land resale value	20.3%	59.4%

*Source: 2010 Survey of Agricultural Land Owners in Boone County (*262 to 284 responses)*

2010 Boone County Cost of Community Services Study

The Boone County Cost of Community Services Study was included in the Conservation District's Rural Treasure as a stand-alone report completed by Associate Professor Alison F. Davis, UK Department of Agricultural Economics. The analysis employed a methodology used by the American Farmland Trust in hundreds of communities in the US. The purpose of the study was to answer the question: "Do property taxes and other revenues generated by residential land uses exceed the amount of publicly-provided services required by them?" The study used tax data to define three land use classes: Residential, Commercial and Farmland. The county budget for Fiscal Year 2009 (7/1/09 – 6/30/10) was analyzed to determine the amount of revenue generated and expenditures used by each land use class. The results are presented in **Table 8.6**.

TABLE 8.6 – BOONE COUNTY REVENUES/EXPENDITURES BY LAND USE CATEGORY (FY 2009)

LAND USE CATEGORY	REVENUE %	EXPENDITURE %
RESIDENTIAL	64.8%	93.9%
COMMERCIAL	32.3%	5.0%
AGRICULTURE	2.9%	1.1%

Source: 2010 Boone County Cost of Community Services Study

CONCLUSION

It is apparent that future development of the county's rural areas will occur. In order to protect those who want to continue to farm, tax structures, planning efforts, Purchase of Development Rights (PDR), incentive programs, conservation easements, and utility expansions should be explored. A combination of these tools should be used instead of concentrating on a single solution.

New residential developments in agricultural areas should be closely correlated to adequate infrastructure. The proposed rural water line improvements through the rural areas of the county may be seen by property owners and developers as an encouragement for low density residential development to occur in mostly agricultural areas. However, other infrastructure, including sewer, adequate roads, fire hydrant water pressure, storm water management, fire and rescue, and law enforcement are necessary to support residential development in the long term. This adds to the cost of providing community services. Agriculture, on the other hand, enables an economic use of the land, and requires relatively little infrastructure support or public expenditure. Boone County needs to be careful not to allow residential development in areas without adequate existing or planned infrastructure to fragment existing agricultural land uses. When this type of development does occur, compact efficient land use development patterns should be encouraged to assure the availability of lands in the county for agricultural use. New residential development is further addressed in the Housing Element.

The impacts of residential growth on existing agricultural land and agricultural operations are now known. New residential development often means that nearby farmers have to deal with trespassing, vandalism, and complaints regarding agricultural odors and noises. Many farmers also lease land or cooperatively farm certain fields or share equipment that are distant from their main farm. It has become increasingly difficult and dangerous for farmers to drive or pull equipment to another location because of increased suburban traffic, and basic lack of understanding on the part of motorists on how to pass, and reluctance to wait for agricultural equipment.

The Boone County Farm Bureau was instrumental in implementing a county ordinance that offers some protection for farmers from neighbor complaints on agricultural odor and noise. The Bureau created a Grievance Board that helps mediate issues in order to lessen the need to go to court. So far the Board has been successful in its mission, and can also provide assistance to a farmer dealing with trespassing or vandalism. The Board will likely become more active as residential growth extends into agricultural areas. This plan encourages farmers to list their property in an official Agricultural District. Furthermore, mechanisms are in place in the Boone County Zoning Regulations (Section 3158) and the Boone County Subdivision Regulations (Section 308) to help minimize negative impacts of development locating next to farmland.

Public improvements can also impact agricultural operations. Roadway improvements should be designed to accommodate wide farm machinery in the case of guard rails, storm water culverts, bridges, embankments, and sight distance at intersections.

Consistent with State law, large, concentrated agricultural production of livestock and similar operations, sometimes known as “mega-farms” should be treated in planning and land use regulations as an industrial use, not an agricultural use because of the potential noise, visual, traffic, and other impacts on surrounding land uses.

Agricultural land has value in addition to the actual production of goods and services, according to the Boone County Conservation District. It has benefits for storm water filtration, ground water recharge, flood reduction, soil retention, wildlife habitat, air purification, historic sites, scenic corridors, as well as the economic benefit of visual community character.

Diversification of crops would also preserve existing farmlands as the tobacco industry is threatened with an uncertain future. Farmers have been evaluating alternative crops as the tobacco market decreases. Such crops would include herbal crops, hay, timber (wood products), textile industry, aquaculture, vegetable and fruit produce, and medical industry crops.

A good farmer’s market network should supplement the successful Boone County Farmer’s Market to link producers with grocers and customers. Participating in farmers markets may also help farmers get in contact with purchasers of alternative crops for such uses as medical, research, and others. The “demand” for a particular product would be put in contact with potential suppliers. This would also promote a more regional distribution of crops and other agricultural-related products as local companies could contract out with local farmers for alternative crops to meet their needs. Furthermore, there may be a need for alternative livestock, such as bison and ostrich that can be met by the local farmers instead of having items shipped into the area. A good farmers market network can help the sustainability of the region as local farming and agricultural needs are met by local suppliers. This plan recommends that settlement money be used to create a “clearinghouse” type of organization that matches grocery markets and plant nursery operations with local growers of produce and horticultural products. In this way local growers may be stimulated to produce more of these goods to supply the steady and growing demand of these markets. As a result, the residential and commercial growth of Boone County can support a strong agricultural market in concert with urban land conversion.

PRESERVATION

INTRODUCTION

The Preservation Element discusses Boone County's historic, architectural, cultural, and archaeological resources and outlines ways to preserve them. This element places these resources in their appropriate historic contexts in order to explain their significance. Boone County's historic, cultural, architectural, and archaeological resources greatly enhance the quality of life for all county residents and give the county a sense of identity, making their preservation essential.

The preservation strategies developed for these resources are distinct from those for recreational and open space resources. Maintaining and developing recreational areas and open spaces is the responsibility of local governments, whereas historic preservation in Boone County is essentially a grass roots endeavor with direction or guidance supplied by the appropriate county agencies. For these reasons and those discussed in the preceding paragraph, a separate Preservation Element is included in the Boone County Comprehensive Plan.

BOONE COUNTY HISTORY

The earliest occupants of Boone County, referred to as the Paleo-Indian culture (c. 9500 – 8000 B.C), consisted of a highly mobile existence dependent upon the hunting of large game animals. Later people, referred to as Archaic peoples (c. 8000 – 1,000 B.C), developed a more diversified subsistence strategy based on choices from a variety of local options. A third time frame, the Woodland period (c. 1000 B.C. - A.D. 1000) contained the use of cultivated plants as the major subsistence strategy. A more sedentary lifestyle, and larger groups of people characterize this period. The Late Prehistoric Period (c. A.D. 1000-1700) of the central Ohio Valley, known as Fort Ancient, reflects an elaboration of Late Woodland subsistence activities and social organization. Settlements were large villages located in valley bottoms. Some of the major sites located adjacent to or near the Ohio River were fortified; many had central plazas or courtyard areas. Smaller sites, possibly representing seasonal hunting camps, were located on tributary streams.

Perhaps the first European to visit Boone County was a Frenchman who sailed down the Ohio River in 1729. He highlighted primeval Boone County on his chart with an inscription in French that translates "where they found the bones of an elephant." Thus, Big Bone Lick became one of the wonders of the world.

That Frenchman was followed a decade later by Captain Charles de Longueil who was credited with the first investigation of that area. His account of the huge bones of dead mammals provided incentive for further exploration and attracted the attention of the British and early American colonists. The salt deposits at Big Bone Lick had long been known to the American Indians and, in 1755, Mary Draper Ingles, the first recorded European woman to visit this region, escaped from her Shawnee captors while they were boiling water from the lick to make salt.

France claimed the Ohio Valley until the end of the French and Indian War, and a veteran of the war, Captain Thomas Bullitt, led surveyors to this territory in 1773 when it was a part of Fincastle County, Virginia. In 1789, over a decade after the first settlement in Central Kentucky, John Tanner, a Baptist preacher from North Carolina, established Tanner's Station where Petersburg is today. Tanner's Station was the first settlement in this region, and others rapidly moved in. The community's name was changed to Petersburg in 1814. These pioneers occupied tracts of land above and below Tanner's Station. Many came from central Kentucky, now Woodford and Scott counties, and in 1794, seven persons founded the Bullittsburg Baptist Church in the North Bend Bottoms above Tanner's Station. Other early settlers in the area were Captain Jacob Piatt and Captain John Brown, both of whom were from New Jersey and Revolutionary War veterans.

Many pioneers during this first period of settlement migrated from Virginia. A large portion of them were of German ancestry and came from the Germanna community in Madison County, Virginia. Eleven people from that place arrived in 1805 under the leadership of Ephraim Tanner. The following year, they organized the Hopeful

Lutheran Church in the east-central part of the county. Other families came after them and settled in Florence and Hebron (named after Hebron, Virginia).

When Boone County was officially established in 1799 (having been created by the Kentucky Legislature in 1798), less than two hundred men owned all of the land and the population was 1,500. On June 17, 1799 the first county court decided to locate the county seat on a seventy-four acre site donated by Robert Johnson and John H. Craig. The town was originally called Craig's Camp which was changed to Wilmington and then renamed Burlington in 1816.

Despite Boone County's proximity to Cincinnati, its nineteenth century development was largely isolated from that of its large urban neighbor. Early in its history, Cincinnati became the chief urban focus for the central Ohio River Valley because of its reputation as a fortified settlement offering protection from Indian attacks, its role as a stopping point for westward bound settlers, and its large floodplain suitable for expansion. The population of Cincinnati in 1800 was 750, while that of Boone County was 1,534, but between 1800 and 1820 the population of Cincinnati took the lead.

The Kentucky cities along the Ohio River that were successful gateways to central Kentucky were either closer to the geographic center of the state, such as Maysville and Carrollton, or opposite the Ohio from Cincinnati, such as Newport and Covington. Even Boone County's potential advantage of having a major transportation corridor, the Dry Ridge Divide, pass through its border seems to have had a minimal effect on the county's economic growth until recent years. The crossroads town of Florence was established at the intersection of roads from Covington to Louisville and Lexington. Ten miles from Covington, it was thus the first stagecoach stop. However, in the late 1880's, the town of Erlanger was established across the county line from Florence. The railroad promoted the sale of land near its right-of-way, and Florence despaired. Its population fell off 24 percent at the turn of the century, and remained so until 1930. With the completion of the first railroad through the county, the town of Walton held great promise as the county's primary railroad town, but its growth dwindled even before the Great Depression. Young and old left farms for work in the city, and shopping "over the river" became the popular thing to do. With the advent of the automobile, long, tiresome journeys to the city, through Constance or the Dixie Highway (new U.S. 25) through Florence, became short and enjoyable. It became possible to work in town and live in Boone County. It was the beginning of a new era.

Between 1920 and 1940, Boone County lost 21 percent of the number of its farms and 3 percent of the farmland acreage. The average farm size fluctuated little throughout the twentieth century: 93 acres in 1900 and 102 acres in 1969. Today, county acreage devoted to agriculture is steadily decreasing. In 1946 the airport for Cincinnati was dedicated in northeastern Boone County. The population of Boone County grew by twenty percent from 1940 to 1950. With the construction of Interstates 71 and 75 in the 1960s, Boone County became one of the fastest growing counties in the nation.

Boone County's population reached 10,000 by 1840 and fluctuated between there and 13,000 for more than a century (see **Figure 9.1**). The population began to rise consistently in the 1950's and has been doubling approximately every 20 years since 1960.

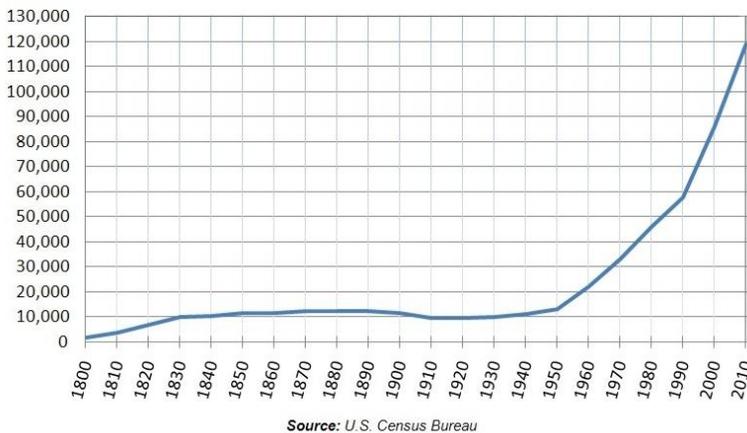
PHYSICAL SETTING

Located in the largest bend of the Ohio River a few miles downstream from Cincinnati, Boone County is the northernmost county in Kentucky. For forty-two miles the Ohio River bounds the county on the north and west. As in most sections of the outer Bluegrass region of Kentucky, the land in Boone County is gently rolling to steeply hilled. Boone County's economy has historically been dominated by agriculture: corn, wheat and especially tobacco continue to be the principal cash crops. However, residential, commercial, and industrial growth are continuing to change the once rural landscape of Boone County.

There are several significant natural and archaeological sites documented in the county. The natural sites are, for the most part, the result of the glacier's presence in the area. The archaeological sites represent the different periods of occupation by native aboriginal cultures. Boone County has a substantial number of log structures and

a wide variety of vernacular building types. It also has a significant group of houses near the river with links to Ohio River Valley Greek Revival architecture and several valuable variants of mid-19th century revival styles. Many of the historic resources are farmsteads, but urban houses, commercial and industrial buildings, churches and schools are represented as well.

Figure 9.1 - Boone County Population (1800-2010)



The land is drained by numerous small streams that flow westward into the Ohio River from headwaters along the Great Ridge, or Dry Ridge Divide. This major feature runs north-south just inside the eastern boundary of the county and has long served as a major transportation corridor connecting Cincinnati and Lexington. The completion of the Greater Cincinnati Airport in Boone County in 1946 and of I-75 in the 1960s has accelerated the suburban growth that began about 1950. This growth in population and the postwar rise of industry dominates the northeastern section of the county. Industrial growth is expanding in southern Boone County, especially around

Walton, while the western portion remains relatively untouched by the more intrusive forms of 20th century culture. These rural sections have retained much of their 19th century character, marked by an almost total concentration on agricultural activities.

INVENTORY OF GEOLOGICAL, ARCHAEOLOGICAL, AND ARCHITECTURAL SITES

Geological/Natural Sites

The bedrock of Boone County is primarily limestone and shale. Along with the parent material, glacial deposits occur in the northwestern section of Boone County. It is this region that was covered by early glaciation but untouched by later glaciers. It is estimated that as much as one-fourth of Boone County is covered by glacial tills and associated alluvial deposits. The remnants of two terraces are visible along the Ohio River (Boone Cliffs & Split Rock). Ravine and valley deposits are comprised of glacial gravels, sand and silt, along with alluvial deposits (glacial deposits in Woolper & Gunpowder creeks). Boone County is noted for its numerous mineral springs, the most famous of which is Big Bone Lick. The saline water of the springs arises from the Saint Peter sandstone layers.

Archaeological Sites

Over 565 archaeological sites have been identified in Boone County. Many of these sites have not been thoroughly surveyed and studied. Much more identification, research, and analysis remains to be done. Several Boone County archaeological sites have been placed on the National Register of Historic Places, including Big Bone Lick State Park (encompassing just over 500 acres), possibly one of the most significant Paleo-Indian sites in this part of the country. Also listed are Arrasmith and Cleek-McCabe, two Fort Ancient sites, Rogers, a Woodland mound and habitation complex, and Reeves Mound, from the Adena culture, (currently owned by the Archaeological Conservancy). Also potentially eligible but not listed yet are a multiple period Fort Ancient village site in Petersburg and the ruins of a grist and saw mill on Gunpowder Creek.

Archaeological sites in Boone County are known to include (but are not limited to) cemeteries, the communities or camps of native American Indians, the remains of demolished or deteriorated buildings, former community sites (now obscured on the surface), former industrial sites such as grist mills, former commercial sites such as toll houses, sites of Civil War activity, and the yards of existing historic structures.

Boone County has been the focus of archaeological investigation by professionals and amateurs for many years. Identification of archaeological sites began early and focused on reporting the presence of cemeteries and

earthworks. In Archaeological Survey of Kentucky, Funkhouser and Webb (1932) listed thirteen sites for Boone County. Eight mounds, one complex of two mounds, one mound and cemetery complex, one fort, one village, and one village and cemetery complex were listed.

During the Works Progress Administration (WPA) era (1938-1941), seven Adena mounds and a Fort Ancient mound and village site were excavated. In the 1950s the Northern Kentucky Archaeological Society, largely under the direction of Ellis Crawford, conducted investigations in Boone County, most notably at the Rogers mound and village.

Paleo-Indian artifacts are found in private collections and have been informally reported from the Rogers site and others throughout the county. Paleo-Indian tools have also been recovered from several sites west of Big Bone Lick. By the middle of the Archaic Period, the environment in Boone County was much as it is today. There is abundant evidence of an Archaic presence in Boone County. However, there is still much still not known about specific patterns of Archaic adaptation to the local environment. The presence of a Woodland population is indicated by the numerous mounds, many of which are associated with the Adena tradition, such as the National Register listed Reeves Mound in the northern part of the county. Small to large villages and hunting camps are the site types defined for Fort Ancient.

The National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, and the Procedures of the Advisory Council on Historic Preservation require that impact assessments must be conducted for construction involving Federal licensing or funding. In compliance with these acts, archaeological surveys have been performed in Boone County since 1968. In conjunction with these requirements, projects involving road construction, airport expansion, power plant development, sewer lines, cell towers, and U.S. Army Corp of Engineers permits have required archaeological survey and, at times, extensive testing. Survey and testing of archaeological sites has continued in the 1990's, reflecting the rapid commercial growth and increase in population which have occurred in the Cincinnati metropolitan area.

Since the 1730s, Big Bone Lick has been noted as a place where bones of extinct megafauna could be found. At the salt springs of Big Bone, the remains of many animals have been found where they were entrapped in the mire. Sloths, horses, tapirs, deer, elk, moose, reindeer, caribou, musk ox, bison, peccary, mastodon, mammoth, and bear have been identified. Preliminary paleontological research, completed at Big Bone in the 1960s, by the University of Nebraska has never been properly reported, and the artifacts recovered remain in Nebraska. Very little archaeological research has been completed at Big Bone Lick. In the summer of 1993, local archaeologists from 3D Environmental Services noticed an important archaeological feature, on the steep bank of Big Bone Creek, in danger of being destroyed by erosion. They obtained emergency permits from the State Office of Archaeology, and the Department of State Parks, and through a combined volunteer and pro-bono effort, the site was excavated and analyzed.

Properly interpreted, Big Bone Lick State Park has the potential for becoming a unique education site. In 2009, Big Bone Lick was designated a National Natural Landmark and a National Historic Landmark nomination is under preparation at this time. The first phase of a new museum at Big Bone Lick was dedicated in November, 2004. Subsequent phases of construction depend on funding through the State Department of Parks. Ongoing archaeological and paleontological research remains the core of the facility's interpretive mission. It has been estimated that the development of this site as an archaeological "theme" state park would triple tourist visitation and provide non-invasive economic development for western Boone County.

In 1990-92, extensive archaeological research took place at Petersburg. Previously identified sites, 15BE6, 15BE6A, and 15BE6B, were studied in detail during this three year project. The project was funded by a Certified Local Government grant from the Kentucky Heritage Council, and matched by funding from the Boone County Fiscal Court. The project had a dual goal of completing scientific and historical research, while providing public education about Boone County's heritage as well as archaeological methods. Over 1,200 school children and adults benefitted from on-site visits, workshops, and classroom presentations.

In 2004, archaeologists from the Kentucky Heritage Council, Kentucky Archaeological Survey and University of Kentucky returned to the Petersburg Site following the accidental discovery of human remains during construction

of a house foundation. These organizations were assisted by the volunteer efforts of nearly 20 trained archaeologists. Over a period of 10 days, 35 prehistoric burials representing 38 individuals were excavated from the area impacted by the house foundation. While analysis of the remains and associated artifacts is ongoing, their recovery has already started to redefine archaeologists' understanding of the Fort Ancient occupation in the Ohio Valley. The cemetery excavation was a key element of the interpretations of late prehistoric life presented in The Prehistoric Farmers of Boone County, Kentucky (2006). While the location of this significant prehistoric burial ground in Petersburg has now been confirmed, the full extent of the cemetery remains unknown. This has planning implications for future sub-surface excavation throughout Petersburg, including installation of water lines, construction of basements and similar projects.

Also, in 1992, archaeological survey was completed in a variety of areas throughout the county. This research focused on previously identified but not documented sites reported by county residents and amateur archaeologists. Approximately 25 previously unrecorded sites were documented during this project. A Certified Local Government project completed in 1996 identified and documented Indian burial mounds throughout the county. The accurate mapping of these sites will ensure their protection from development under Boone County's Cemetery Preservation Plan. More recently, additional archaeological survey work has been conducted in the watersheds of Gunpowder Creek (2007), Mud Lick (2007) and Woolper Creek (2007 and 2008). These projects have led to the discovery of a number of potentially significant archaeological sites, primarily dating to the historic period. In 2008, an intensive survey of the Gaines Tavern Site in Walton produced a much better understanding of the site's archaeology, which in turn led to the expansion of the property's National Register boundary and including of archaeology as one of the site's criteria for listing.

As part of an ongoing comprehensive architectural survey the Crisler-Gulley Grist and Saw Mill site on Gunpowder Creek was identified in 1993. Through a Kentucky Department of Local Government Community Rivers and Streams Grant, the site was nominated to the National Register, and a traveling exhibit and student handbook about the mill site were prepared.

Cemeteries

Boone County has numerous small family cemeteries. An inventory of known cemeteries is maintained by the Boone County Historic Preservation Review Board. All known cemetery locations are also mapped in the Boone County GIS. Cemetery location and burial information is shared with the Boone County Public Library, which is the community's most accessible genealogical resource. The Historic Preservation Review Board should be notified and involved in any matter affecting the preservation of a family cemetery. The Boone County Cemetery Preservation Plan, approved in 1990 and codified in the Boone County Zoning Regulations (2008, Section 3166) and Boone County Subdivision Regulations (2010, Section 315(f)), offers recommendations to preserve these cemeteries and to limit the development surrounding them. This plan was one of the first of its kind in the country, and has been widely copied throughout the nation.

Cemetery preservation remains important in Boone County. In 2002, a thesis prepared by a graduate student in community planning studied the issue, comparing cemetery preservation strategies and results in Boone County with those of Cobb County, Georgia. The thesis compiled information about Boone County cemeteries that have been relocated and/or preserved in place as a result of the cemetery regulations adopted in 1990. The thesis made a number of recommendations, including the formation of an organization dedicated to cemetery preservation, with authority to review site plans and zone change applications. Among other recommendations, the thesis suggested that all cemetery relocations be managed by a licensed archaeologist and that Boone County develop an Adopt-a-Cemetery Program. In 2003, a cemetery advocacy group (Johnson-Wilson Cemetery Stewards Association) formed in Boone County. The Historic Preservation Review Board partnered with the non-profit private organization on several projects, including a cemetery restoration grant project, prior to the dissolution of the non-profit in 2009.

Currently, Boone County's archaeological sites, particularly the Indian mounds are threatened by pot hunters. These people indiscriminately dig up mounds and other sites to find artifacts which they then sell or keep for themselves. Such amateurish invasion of these sites destroys valuable scientific evidence. Consequently, any information the sites may have yielded on Boone County's history is lost forever.

Architecture

Just as Boone County's major transportation corridors did not guarantee commercial growth, so the Ohio River and the Dry Ridge Divide did not ensure a substantial body of high style architecture for Boone County. Despite its location on main routes of architectural communication, Boone County was minimally affected by changes in stylistic tastes and by the flow of builders, artisans and architects into the Ohio River Valley and the Bluegrass region of Kentucky. With rare exceptions, the builders and architects are unknown. Most of the structures with stylistic pretensions are found along Highway 42 (Old Louisville Road), in the Burlington county seat, and along the Ohio River.

The initial architectural survey of Boone County was conducted in 1976-1977 by the Kentucky Heritage Council (or KHC, then known as the Kentucky Heritage Commission). The survey documented 353 resources and was comprehensive in that every passable road was traveled. Twentieth century resources, barns and outbuildings, and simple vernacular structures were largely neglected. In 1979, the KHC published the results of that survey in Survey of Historic Sites in Kentucky: Boone County. In 1988, all of the original 353 resources surveyed were re-examined, and 60 principal structures, along with related contributing buildings, were listed on the National Register of Historic Places through a multiple resource area nomination. In 2000, 14 individual Boone County properties were listed in the National Register of Historic Places as an addendum to the 1988 Multiple Resource Listing. A new Multiple Properties Documentation Form entitled Historic and Architectural Resources of the County of Boone, Kentucky, 1789-1950 was also developed. In 2005, 10 more Boone County properties were listed individually in the National Register as part of a project sponsored by the Review Board. Criteria for inclusion in the National Register are based upon local historical and architectural significance as defined in the National Register Standards and Guidelines within the contexts defined by the 2001 Multiple Properties Documentation Form.

In 1992, a comprehensive architectural survey, funded by a county matched Certified Local Government grant, began in Boone County. Completed in 1996, this survey created an inventory of all Boone County buildings and structures, fifty years old or older, with historic and/or architectural significance, primarily in a local context. The final report, titled Comprehensive Architectural Survey of Boone County, Kentucky, also made recommendations for potentially eligible National Register Historic Districts, especially in Petersburg, Belleview, Rabbit Hash, Verona and Walton. This inventory includes agricultural buildings, ruins, and bridges, as well as houses, businesses, and public buildings. Since 1996, the inventory has been continually updated, primarily as a result of publicly funded development projects, including road construction, airport expansion and cellular tower installation. As of 2010, 1,582 Kentucky Historic Inventory numbers have been assigned in Boone County, although the true number of sites documented since the survey in the 1990's is estimated to be 1,550. Of those, approximately 225 have been lost (primarily to demolition) putting the current estimated number of properties in the Historic Inventory at 1,325. The inventory provides a foundation for the county-wide Preservation Plan, which was adopted in 1999, and gives the Historic Preservation Review Board documented evidence of the wealth of historic resources found throughout the county. This information is used in the review of plans for development, by citizens completing historic or genealogical research, and as a guideline for future historic preservation projects and initiatives in Boone County.

In 2002, the Boone County Historic Preservation Review Board published Historic Structures of Boone County, Kentucky. The book is a follow-up to the KHC's 1979 Survey of Historic Sites in Kentucky: Boone County. Based on information recorded during the mid-1990s survey, Historic Structures showcases 192 of Boone County's historic properties. The book is a glossy paper bound volume with black and white photographs. It is available for sale to the general public through the Boone County Planning Commission and all of the images in the book are available online at the Boone County Public Library's website.

Kentucky Historic Resources inventory forms, as well as the final report are public information and copies can be obtained from the Boone County Historic Preservation Office, or the Kentucky Heritage Council in Frankfort. The location and basic information about each inventory site is maintained in the Boone County GIS. Some of that information, including site location, is readily available to the public through the online Boone County GIS Interactive Mapping Services. The locations of known cemeteries are also available through the GIS system. Copies of architectural inventory forms may be obtained through the Kentucky Heritage Council or Boone County

Preservation Office. Copies of Cemetery forms may be obtained from the county's Historic Preservation Office or from the Boone County Public Library. All cemetery information recorded by the county Historic Preservation Office is shared with the Library, which serves as the main source of genealogical information in the county.

Burlington National Register Historic District

Burlington, the county seat of Boone County, was originally listed in the National Register of Historic Places in 1979 as a grid rectangle of 74 acres comprising the original town in its entirety. The original district was bounded on the north by Temperate Street, on the east by Orient Street, on the south by Torrid Street, and on the west by Ohio Street (now Water Street). By the early 2000's, the 1979 nomination had become outdated and questions had been raised about the relevance of the district boundaries and the period of significance. More importantly, the number and location of contributing historic properties discussed in the original nomination was unclear. The Burlington National Register district (see **Figure 9.2**) was revised in 2005 and the boundary redrawn to reflect current National Register criteria. The revised National Register District consists of a mixed-use concentration of 33 acres containing a total of 71 resources, 63 of which were previously listed in the National Register. Of the buildings in the district, 38 are residential, 8 are commercial, 3 are religious, 1 is a former school, 17 are residential dependencies, and 2 are public institutional buildings (the Old Courthouse and the Old Clerk's Building). The Burlington National Register Historic District is locally significant under National Register Criterion A for its reflection of patterns of politics/government in Boone County and under Criterion C for architecture, which includes fine examples of Greek Revival, Federal and Bungalow styles. The period of significance extends from c. 1790 to c. 1950.

In spite of Burlington's small size (approximate pop. 350), architectural styles span a rather wide range. Several early vernacular 19th century houses remain, although artificial siding and layers of alterations conceal some of the original fabric. North of the courthouse are three sizable Federal style residences, with later Greek Revival influences, that date from 1820-35 and share certain similarities. The Greek Revival is well represented in public buildings by the former county clerk's office (completed 1854) and in residential architecture by the brick Foster-Sandford House on North Jefferson Street. Late nineteenth century architectural influences are seen in residential and commercial structures throughout the Historic District.

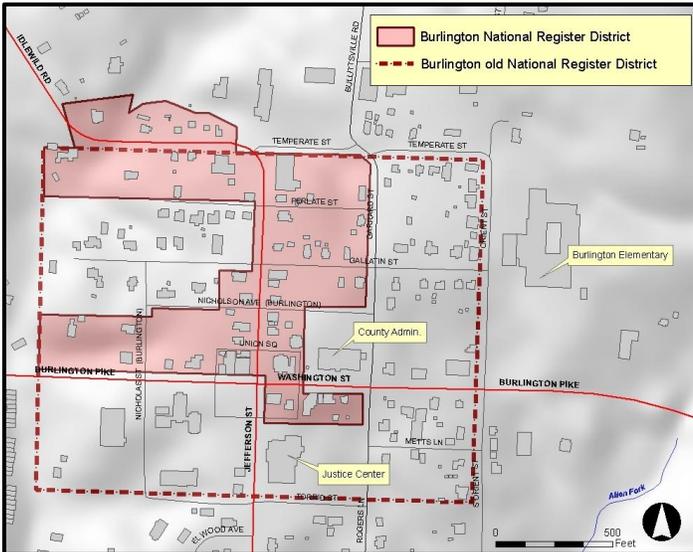
Rehabilitation and adaptive reuse of National Register buildings in Burlington began in the early 1990's, with the pace of activity increasing in the early 2000's. Most of this activity has been in the form of private sector projects along North Jefferson Street, with the rehabilitation of three restaurants, a Bed & Breakfast Inn, and several other shops specializing in crafts, books and/or antiques. Public involvement has included the rehabilitation by the county of the former Burlington Presbyterian Church (which had been a body shop) as a maintenance garage and a substantial exterior rehabilitation of the Old Courthouse in 2003.

The 1889 Boone County Courthouse is arguably the centerpiece of the National Register District. It is the third courthouse to occupy the same site and was designed by the McDonald Brothers of Louisville. This architectural firm designed an estimated 30 courthouses built during the late 19th Century across the lower Midwest and Southeastern United States. Recent research has shown that the McDonald Brothers reused nearly identical plans on more than a dozen of their courthouse designs. Courthouses identified in Kentucky, Indiana, Illinois, and Texas bear remarkable resemblance to the Old Boone County Courthouse, which has a nearly identical twin in Bandera, Texas. While apparently successful in selling courthouse plans, the McDonald Brothers' courthouses typically have leaky roofs and are prone to structural problems placed on them by oversized clock towers. In fact, the original clock tower of the Old Boone County Courthouse was so heavy that it began to compromise the underlying load-bearing brick walls within a few years of its construction. The clock tower was replaced in 1898 with the present cupola, which was designed by the renowned Cincinnati architectural firm Samuel Hannaford and Sons.

The Burlington Historic District presents a crucial preservation challenge. Efforts should be made to insure that a mixture of governmental, commercial, and residential activity continues to function in Burlington. Burlington has the rare opportunity to capitalize on its unique architectural landscape, small town charm and rural atmosphere. Poorly designed new construction, already apparent in several Burlington locations, will destroy this valuable character. The town's historic buildings should be rehabilitated and adaptively reused to meet the realities of a

rapidly changing county, and the challenges of the 21st century. A positive step in this direction was the development in 2002 - 2003 of the Burlington Town Strategic Plan. The plan's mission statement is "to energize the central town of Burlington into a healthy business and residential center of Boone County by using the public services, special events activity, and historical character of the town as a foundation." The plan includes recommendations designed to enhance the infrastructure, streetscape, architectural design, marketing and tourism potential of Burlington. Several recommendations, including the above mentioned update of the National Register District nomination, have already been implemented.

FIGURE 9.2 – Burlington National Register Historic District



The landscapes of Boone County are made up of a wide variety of natural and historic resources. Efforts should be made to integrate these resources with current development patterns, not as stagnant entities but as productive and contributing county assets. The county has reached a point where historic preservation should receive more attention than in the past. Management strategies should include the preservation and conservation of natural and historic sites. These strategies may not only involve the preservation of historic buildings, but instead focus on the retention of cultural landscapes and characteristics.

In 2008, a Preserve America Communities Grant (for \$22,500) was used to complete the Burlington Wayfinding Project. With these funds, the county upgraded street signage in the Burlington Historic District, installed wayfinding maps, and acquired

interpretive bronze plaques for 20 historic buildings. The county also built an information kiosk modeled after the 1853 Boone County Clerk's Building. Panels on the kiosk interpret the history of Burlington and Boone County. It also has a section for tourism brochures and maps of the self-guided walking tour of the town, keyed to the bronze plaques.

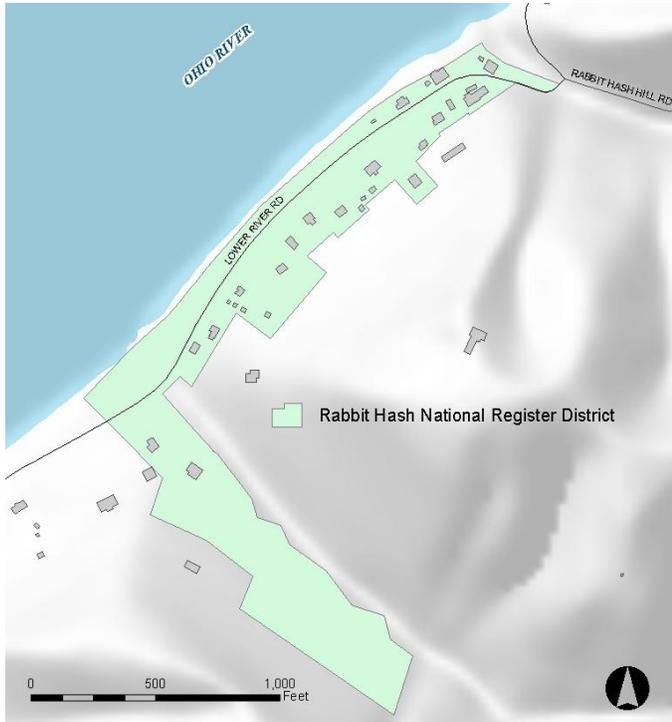
In Burlington, Union, and throughout the county, it is imperative that more of a balance between old and new be encouraged and supported. Boone County deserves to retain its own unique identity as it continues to grow and prosper.

Rabbit Hash National Register Historic District

The Rabbit Hash National Register was listed in December, 2003. The nomination was funded by a public-private partnership between the Boone County Planning Commission and Rabbit Hash Historical Society. The Rabbit Hash National Register District (see **Figure 9.3**) is anchored by the Rabbit Hash General Store, a widely recognized community landmark which has been in continuous operation since c. 1831. The district encompasses approximately 33 acres, including the General Store and 11 other primary structures. The district extends from Parks Branch just north of the General Store south across Little Ranty Creek to 10410 Lower River Road - the late 19th Century Thomas Marshall House. The General Store and the late nineteenth century Italianate B.C. Calvert House were listed individually in the National Register in 1989.

Rather than focus on architectural significance, the Rabbit Hash nomination asserts that "the Rabbit Hash Historic District is significant in the area of community development in the context of 'Boone County River Towns, c. 1814-1945.' Rabbit Hash is important because of its continuous use as a commerce, transportation and communications center for the surrounding rural population. The relative isolation of Rabbit Hash, in relation to other primary towns of Boone County, and its close connection to Rising Sun, Indiana, allowed it to resist change and to retain its significance as a river town and a community gathering place. Its modest and unassuming character, organic form and vernacular buildings are typical of small river communities in Boone County. Its buildings are well-preserved and few modern intrusions mar the landscape."

FIGURE 9.3
Rabbit Hash National Register Historic District



The creation of the Rabbit Hash National Register District is one of many preservation initiatives in that community in recent years. The most important of these was probably the \$250,000 bequest of a long-time resident to the Rabbit Hash Historical Society, which created a substantial endowment for the organization. The group has since put the interest toward significant preservation projects, including acquisition of 3.5 acres of Rabbit Hash (including the General Store and 7 other buildings, which are designated a Boone County Local Historic District), erection of signage and a historic marker in town, and rehabilitation and maintenance of historic buildings. Rabbit Hash remains one of Boone County's most well known tourist destinations and was the subject of a full-length documentary film entitled "Rabbit Hash: Center of the Universe." In 2004, Rabbit Hash joined Boone County on the list of 50 Kentucky communities recognized by the Federal government as Preserve America Communities.

The popularity of Rabbit Hash as a unique tourist destination has resulted in some noise and traffic impacts which the Rabbit Hash Historical Society is attempting to address. The future success of the society's efforts could serve as an example for other historic places in Boone County should they experience heavy visitation in the future.

Walton South Main Street National Register Historic District

Walton was founded in the mid-1790s and prospered in part due to its association with Abner Gaines, who built a striking Federal style brick residence (Gaines Tavern; National Register 1980) at the north end of town c. 1814. In 1818, Gaines founded the first stagecoach line carrying mail and passengers between Cincinnati and Lexington on the Lexington Pike. In the 1920s this route was rebuilt as the Dixie Highway and designated US 25. Main Street in Walton now follows US 25. In the late 1860s and mid-1870s, two railroads were built through Walton. The town grew rapidly and became the railroad center for Boone County. Walton developed as a classic linear railroad town, bounded by rail lines to east and west of Main Street. A business district flourished along Main Street, with residential neighborhoods to the north and south. A small industrial and warehouse district grew up beside the L&N tracks, and worker housing was built near the Southern Railroad depot. A tornado swept through the town in 1956, and a 1971 fire damaged parts of the business district. Walton lost its pre-eminent position among Boone County cities in the 1950s as the post-World War II suburban boom took hold.

The Comprehensive Architectural Survey of Boone County (1996) noted that the residential district on South Main Street in Walton had good National Register District potential. In 2004, a National Register Historic District nomination was prepared for the residential portion of South Main Street and the district was approved the National Park Service in early 2005. The nomination was funded by a Federal Survey and Planning Grant administered by the Kentucky Heritage Council with local matching funds from the City of Walton and Boone County Fiscal Court. In a separate project in 2005 using the same grant program, three residences on (or adjacent to) North Main Street in Walton were nominated and listed in the National Register.

The Walton South Main Street Historic District (see **Figure 9.4**) is a linear district straddling Walton's primary thoroughfare - US 25. The 31-acre district includes 47 primary buildings, mostly residences built between c. 1900 and 1925. Colonial Revival, Tudor Revival, Craftsman/Bungalow and American Foursquare are the most common architectural styles/types in the district. Churches located within the district include the 1949 Walton Christian Church and 1922 Walton Methodist Church, which blends Tudor Revival and Craftsman elements. Also

included are three houses previously listed in the National Register: the Bruce Wallace House, the Edwards House and the Chandler House. The district is bounded by Depot Street on the north and the Norfolk Southern overpass on the south. The nomination asserts that the Walton South Main Street district is significant under National Register Criterion A in the area of Community Development from 1868 to 1950. The City later purchased bronze plaques to honor every historic property in the South Main Street district.

FIGURE 9.4
Walton S. Main Street National Register Historic District



More recently, the City acquired the Abner Gaines House and has just finished rehabilitating it as the Gaines Tavern History Center. Walton's ongoing dedication to the celebration of its history has earned the City Boone County Preservation Awards in 1999, 2005, and 2007. Continuation of the mixed-use development that characterizes Walton Main Street is encouraged by a special Walton Downtown District in the Boone County Zoning Regulations. While design guidelines exist for Florence Main Street, the Walton Downtown District focuses on encouraging a mix of land uses rather than on regulating aesthetics.

Main Street in Walton is the most intact and functional historic downtown in Boone County. Like Burlington, new development along Walton's Main Street should be carefully reviewed to encourage development that is compatible with the mixed-use character of this historic downtown. Rehabilitation and adaptive reuse of historic structures should be strongly encouraged. In 2010, the Boone County Historic Preservation Review Board prepared a draft set of design guidelines for Walton's Main Street Business District although they were not adopted by the City.

PRESERVATION AND LOCAL HISTORY ORGANIZATIONS IN BOONE COUNTY

No single agency is responsible for all preservation activities in Boone County. Rather, preservation and

local heritage initiatives are undertaken by a number of organizations whose interests and scope range from site-specific to county-wide.

Boone County Historic Preservation Review Board (BCHPRB)

The BCHPRB is a seven-member volunteer board, appointed by the Boone County Fiscal Court, whose mission is "To lead and educate Boone County government and its citizens in the preservation and protection of Boone County's prehistoric and historic resources." The board was established when Boone County became a Certified Local Government (CLG) in 1986 and, with staff assistance from the Planning Commission, oversees historic preservation policy in the county. Their responsibilities include monitoring projects that require Federal Section 106 Review, enforcement of the county's cemetery ordinance, survey and documentation of historic and prehistoric resources, reviewing National Register nominations, providing technical assistance to owners of historic properties, and providing heritage education to both children and adults, and developing publications about local heritage. The board meets monthly and sponsors special events such as the annual Boone County Preservation Awards, occasional cemetery preservation workshops, and special tours.

Boone County Historical Society (BCHS)

This private non-profit organization originally formed in 1960 to advocate for a state park at Big Bone Lick. The group re-formed in the late 1980's, with start-up assistance from the BCHPRB. The society's mission is "to develop awareness and promote appreciation of the history of Boone County." To this end, the group meets regularly in the Old Boone County Clerk's Building, which they maintain as a small museum of local history. On alternate months, the society sponsors presentations on a wide range of topics relating to local history. The society also hosts special events such as an annual Boone County Heritage Day.

Boone County Public Library (BCPL), Local History Department

At this time, the Local History Department of the BCPL is arguably the most active and wide-reaching organization in the county dealing with local heritage. The Local History Department collects all available information on the history of Boone County and its families and as a result, the BCPL has the most comprehensive collection of historical information on Boone County. The collection includes personal letters and diaries; church records and research from local historians; digital photographs of families, events, and buildings; and donated family files, county records, and cemetery transcriptions. The collection is available at the Main Branch in Burlington and much of the collection is available through the online catalog. One-on-one local history and genealogy reference service is available by appointment. Staff also provides local history reference service via email, phone and mail.

Historic Burlington Business Association (HBBA)

The HBBA formed in 2009 to "recognize and promote the Town of Burlington, Kentucky and the businesses located in the Town, for the general public benefit and good of the community" (HBBA Articles of Incorporation). The group, which is comprised of local businesses meets monthly supports two annual events: the Burlington Sidewalk Chalk Festival and A Burlington Christmas. In 2010, the HBBA generally supported the draft design review guidelines proposed for Burlington and expressed interest in staying involved in future developments of design review in the town.

Rabbit Hash Historical Society (RHHS)

The RHHS is another of the county's private non-profits dedicated to the preservation of a localized area. The group's mission statement is "the continued preservation and maintenance of the historic hamlet we all know as Rabbit Hash, Kentucky, for future generations to enjoy." The RHHS has been very active for many years in Boone County and continues to build a lengthy list of preservation accomplishments, including listing of Rabbit Hash in the National Register and also as a Preserve America Community, establishment of a Local Historic District in the town, ongoing fundraising and upkeep of the town's key significant buildings, which includes the c. 1831 Rabbit Hash General Store, operation of a small museum, and development of a visual arts center. The group also sponsors regular events ranging from monthly barn dances to the annual Rabbit Hash Old Timers' Day. The group has garnered international attention thanks in part to its use of unique fund-raisers where donations buy votes (\$1 per vote) for the town's mayor. To date, the election has led to a succession of 3 canine mayors – Goofy (2000), Junior (2004), and Lucy Lou (2008), and funds have been put toward building maintenance and rehabilitation in Rabbit Hash and the nearby East Bend Methodist Church.

Friends of Big Bone (FOBB)

The Friends of Big Bone is "a non-profit organization whose purpose is to promote, preserve, research, and memorialize the history and prehistory of the Big Bone Lick Valley." The group focuses primarily on public and private education, has developed two educational packages for classroom use and sponsors presentations about the heritage of Big Bone Lick and related topics. The FOBB played an important role in the Bicentennial Commemoration of the Lewis and Clark Expedition and they continue to raise funds and advocate for improvements at Big Bone Lick State Park.

Dinsmore Homestead Association

The Dinsmore Homestead Foundation formed in 1987 to acquire and preserve the James Dinsmore site. The group maintains the c. 1842 Greek Revival house and its original furnishings, numerous outbuildings, surrounding acreage, and a collection of nearly 90,000 pages of family letters, journals and business records. The group operates the Dinsmore Homestead as a living history farm with regular tours from April 1 to December 15 and a

variety of special events ranging from Derby Day at Dinsmore, a summer concert, and fall harvest festival to a week-long Pioneer to the Past Day Camp.

PRESERVATION STRATEGIES FOR BOONE COUNTY

Historic Preservation efforts in Boone County should focus on creating a balance between new development and preserving the history and character of Boone County. This could include strategies such as adapting a historic building for a modern commercial or retail use, including an existing building, usually a single family residence, in plans for a new subdivision, or a creative building design that blends with the existing landscape. Much of the success of such an effort depends on educating the public, including elected and appointed county officials, and residential and commercial developers, about the benefits of historic preservation. Increased awareness of the work of the Historic Preservation Review Board is an important part of the educational process.

The Historic Preservation Review Board has coordinated a comprehensive survey of all buildings or structures fifty years old or older in the county and Multiple Resource nominations to the National Register of Historic Places. These documents include historic contexts and themes for historic and related resources, which place buildings in their proper historic or architectural perspective and help in evaluating their significance. The survey results were used as the basis for a Boone County Preservation Plan, completed in 1999. The Plan provides specific guidelines and recommendations as well as pertinent background information for implementing a successful preservation program in Boone County.

The 2000 Boone County Comprehensive Plan recognized heritage tourism as a significant means of promoting historic preservation in Boone County and recommended that the county's Historic Preservation Review Board work with the public and the Planning Commission to complete a Tourism Plan to guide development of the tourism industry in Boone County. Historic properties in the county such as Burlington's National Register Historic District, the Dinsmore Homestead, Big Bone Lick State Park, and the town of Rabbit Hash are currently popular tourist destinations. Route 8, from the historic Anderson Ferry west, is a popular bike and pleasure drive route with scenic views and picturesque local farms. The Ohio River corridor, from Petersburg to Big Bone Lick, includes a wide diversity of significant natural and historic sites that should be protected from insensitive development. Properly handled, this corridor, including the Big Bone Lick-Middle Creek Scenic Byway, a designated Kentucky Scenic Highway, can provide the resources for a substantial tourism industry in Boone County.

In 2002, the Boone County, Kentucky, Heritage Tourism Plan was developed and adopted by the Historic Preservation Review Board. The plan was written by Review Board and Planning Commission staff with assistance from a professional consultant and guided by an Advisory Group of residents, business owners, representatives of key agencies, and other interested parties. The Vision Statement of the Plan is to "enhance the economic climate in Boone County while preserving the quality of life, protecting scenic, historic, cultural, archaeological, and recreational resources, and emphasizing tourism promotion and collaboration."

The Heritage Tourism Plan recognized that heritage-oriented businesses and organizations have operated for some time in Boone County, although there had never been a strongly coordinated effort to market and conserve Boone County heritage or utilize potential heritage tourism markets. Potential markets identified in the plan include the Cincinnati, Dayton, and Columbus, Ohio, metropolitan areas, southeast Indiana, central Kentucky, and the rapidly growing population of Boone County. The plan argues that the economic benefits of heritage tourism can be realized if an area's heritage is conserved and shared with visitors from these (and other) market areas.

The Heritage Tourism Plan catalogued Boone County's numerous heritage resources into seven categories: historic, cultural, natural, recreational, scenic, archaeological, and agricultural. These resources are "considered representative, unique, irreplaceable, or distinctly characteristic of" Boone County, Kentucky.

The plan proposed Conservation and Preservation goals, Economic Development Goals, and Specific Marketing Objectives, as well as a prioritized list of recommendations. Many of the recommendations in the plan were implemented, including development of the Boone County Heritage Tourism Council, creation of a heritage tourism website (www.boonecountyheritage.org), and printing and distribution of 3 editions (totaling over 67,000

copies) of the Boone County Heritage Tourism Map. The Heritage Tourism Council met on a regular basis for nearly two years before disbanding in late 2005.

The Historic Preservation Review Board should study and design a Local Landmarks Program to recognize significant historic buildings throughout the County. Design review guidelines, administered by the Review Board, should be established for these properties. Design review guidelines help to preserve the historical integrity and strengthen the aesthetic value of a building or site. The Review Board has established design review guidelines in conjunction with a zoning district for Florence's Main Street. Although this area is not a traditional historic district, the guidelines are intended to preserve the existing historic character of Main Street and strengthen its viability as a pedestrian corridor. Further study and extensive community education needs to be undertaken to determine exactly what areas in Boone County would benefit most from design review guidelines. In 2004, the Review Board began discussing the possibility of establishing a local landmark district in Burlington.

The preservation of significant archaeological sites also contributes to the quality of life in Boone County. However, the issues involved in preserving these sites differ from those for historic buildings and structures. The locations of archaeological sites should not be made public. Such sites, once their locations are generally known, could be desecrated by pot hunters and then any information they may have yielded is lost forever. Kentucky law prohibits the desecration of burial sites and cemeteries but enforcement of these statutes is difficult. Action on the local level is essential to the preservation of Boone County's archaeological sites. The Boone County Planning Commission and the Boone County Historic Preservation Review Board have developed the Boone County Cemetery Preservation Plan (which includes Indian burial sites) in response to this need. Its ongoing implementation represents a significant step forward in the county's preservation efforts. Community educational efforts, beginning with our schoolchildren, should focus on the importance of archaeological sites, and responsible action related to their preservation. The Historic Preservation Review Board must remain proactive in identifying and documenting significant archaeological sites in Boone County.

Boone County should also encourage groups such as the Archaeological Conservancy, Kentucky Heritage Council, Boone Conservancy and Hillside Trust to acquire easements through purchase or donation on lands with significant sites. The Historic Preservation Review Board should work with private property owners and the Kentucky Heritage Council toward the donation of preservation easements for important archaeological sites. The Boone County Planning Commission should require developers to conduct archaeological surveys of development sites where human burials, either prehistoric or historic, are suspected.

Because of Boone County's Certified Local Government (CLG) status, the Boone County Fiscal Court has received \$194,195 in grants through the Kentucky Heritage Council between 1986-2009 for historic preservation activities. Some of the projects include: a comprehensive architectural survey of Boone County and subsequent publication of Historic Structures of Boone County, Kentucky, the National Register nomination for Big Bone Lick State Park, archaeological surveys of numerous properties around the county, a GIS cemetery mapping project, an elementary level heritage education curriculum, cemetery preservation workshops, and numerous individual and district nominations to the National Register of Historic Places.

FEDERAL INCENTIVES FOR HISTORIC PRESERVATION

Investment Tax Credits

The Tax Reform Act of 1986 permits owners and some leaseholders to take a 20-percent income tax credit on the cost of certified substantial rehabilitation of certified historic structures for industrial, commercial, or rental residential purposes. The law also permits a 10-percent credit for substantial rehabilitation of non-historic structures built prior to 1936 if the post-rehabilitation use is nonresidential. In neither case can the credit be included in the depreciable basis.

Generally, the work must be completed within two years, although it may be phased over a maximum five-year period, if the development plan is initially conceived and presented in that manner. The credit is taken when the project (or the phase) is completed and put to use. The rehabilitated property is depreciated using the straight-line method over 27.5 years for residential property and over 31.5 years for nonresidential property.

For buildings eligible for the 10-percent credit, there is a strictly applied requirement that specific percentages of external walls and internal structural framework be retained. Taxpayers who sell rehabilitated property within five years are subject to recapture of the tax credit at the rate of 20 percent for each year less than five. There is no recapture after five years.

In Fiscal Year 2009, there were 25 projects in Kentucky completed to successfully earn federal tax credits with investment totaling \$15,891,053. Kentucky ranked tenth in the nation in numbers of successfully completed projects.

Certified Historic Structure

A Certified Historic Structure is an individually listed structure in the National Register of Historic Places, or a structure certified by the National Park Service (NPS) as contributing to a registered district.

A registered district is one listed in the National Register, or designated under a state or local statute that has been certified to contain criteria that will substantially achieve the purpose of preserving and rehabilitating buildings of significance to the district. In addition, the district must be certified as substantially meeting all the requirements for listing of districts in the National Register.

A certified rehabilitation is a rehabilitation certified by NPS as being consistent with the historic character of the property and, where applicable, the district in which it is located. NPS refers to the Secretary of the Interior's "Standards for Rehabilitation" in certifying rehabilitations.

To qualify as substantial, the cost of rehabilitation must equal or exceed the adjusted basis of the property or \$5,000, whichever is greater. To calculate the basis, the following equation is used: cost of property, plus capital improvements, less the value of the land, less depreciation. Investment Tax Credit projects should be encouraged in Boone County as a means of promoting historic preservation.

Federal Tax Deduction for Easement Donations

Federal tax laws also offer property owners a federal tax deduction for easement donations. A donation must be made "in perpetuity" to a qualifying agency - usually a nonprofit organization or a government body. In an easement donation, the owner gives up certain potential development rights; thus, the receiving agency can place restrictions on future changes to the structure. In exchange, the owner can get a substantial tax deduction, based on the difference in the value of the property before and after the restrictions. Use of this incentive is highly technical requiring substantial knowledge of federal tax laws. Individuals interested in easements should consult their tax attorney or accountant.

However, the Boone County Historic Preservation Review Board and its staff should have a working knowledge of how easements benefit property owners. They should publicize and promote easement donations as one part of an overall preservation strategy for the county. For more detailed information on easements, see state incentives.

STATE INCENTIVES FOR HISTORIC PRESERVATION

Kentucky Historic Preservation Tax Credits

In 2005, Kentucky became the 26th state to enact a state-level tax credit program supporting the rehabilitation of historic structures. The first round of credits was approved in March, 2006. Like the Federal program, the Kentucky credit program requires National Register listing or eligibility as a prerequisite. However, the State program differs from the Federal program in several ways, most notably that credits are available for residences. For owner-occupied residential properties, 30-percent of qualified rehabilitation expenses is offered as a state tax credit. A minimum investment of \$20,000 is required and the total credit is capped at \$60,000. For all other properties, 20-percent of rehabilitation expenses may receive credits, with a \$20,000 minimum investment, and total credit not to exceed \$400,000. These credits can be transferred to a financial institution. Kentucky has designed their application process and paperwork so that applications for the 20-percent commercial tax credit can be used to simultaneously apply for the 20-percent Federal tax credit for income-producing properties. As of April, 2009, the Kentucky Heritage Council had approved 79 tax credit projects from 24 counties, including 58 for the 20-percent tax credit (commercial/other) and 21 for the 30-percent tax credit (owner-occupied residential).

The approved projects represent \$49,705,604.02 in proposed private investment for historic rehabilitation.

Easements

An easement is a legal document through which a property owner grants limited rights in his or her property to another. Easements for driveways and utilities have existed for some time. Conservation easements, under Kentucky law, can now be utilized to protect natural, scenic or open space areas and natural resources or to preserve historically and architecturally significant properties and archaeological sites. Such an easement limits the right of the owner to alter the historic or natural character of the property. Because the easement is given in perpetuity, it continues to protect the property even after ownership changes hands.

The restrictions included in an easement are up to the property owner and organization holding the easement. Generally, in the case of a historic building, the easement restricts changes to the facade and blocks demolition. Easements can also be used to protect significant interior spaces and prevent subdivision of the land upon which the building sits. The owner does not give up title to the land, nor the right to sell, lease or mortgage the property. Any property owner may grant a conservation easement to protect and preserve a historic building or land. Any governmental body empowered to hold an interest in real property or a non-profit organization involved in the preservation of natural and historic resources may accept such an easement. The benefits to the owner are that 1) the historic property is protected, 2) the owner receives a one-time tax deduction as a charitable contribution, 3) inheritance tax can be substantially reduced, and 4) his or her real estate taxes are decreased. The Kentucky Heritage Council will currently accept easements on National Register eligible property and already holds an easement on one property in Boone County. Other organizations holding conservation easements in Boone County include the Archaeological Conservancy, Hillside Trust and Boone Conservancy. The continued use of conservation easement programs should be encouraged for Boone County.

LOCAL INCENTIVES FOR HISTORIC PRESERVATION

Loan Program

The following information from the National Trust for Historic Preservation describes how to develop a loan program and the positive impact it can have on historic preservation in a community.

"Establishing a loan program can encourage local banks to participate with preservation groups to finance the rehabilitation and reuse of privately-owned historic properties, provide below-market interest rates for historic preservation projects, attract other financial contributions and provide an ongoing source of local capital for historic preservation.

A revolving fund can be defined as a pool of capital created and reserved for a specific activity such as historic preservation, with the restriction that the monies are returned to the fund for similar real estate development activities. A revolving fund may be initiated with seed money from a variety of sources including grants from corporations, foundation, government agencies and individuals, and loans from banks and other lending institutions. Loan pools are established to accomplish similar goals, but the funds are disbursed once and repaid to the lender; they do not revolve back into the fund. Lenders, however, often are more willing to continue making loans for preservation purposes if their experience with the loan pool is positive.

In considering the establishment of a revolving loan fund or loan pool, an organization should assess and clearly define the need for the fund (identify the target population and area as well as existing financing resources, and determine why lending is not currently occurring), establish goals and objectives for it and identify potential funding sources. Once these items have been addressed and appropriate organizations and individuals have had an opportunity to comment, the management entity should be identified and the specific lending criteria, terms and conditions, loan disbursement process, marketing strategy and funding sources should be defined."

More research needs to be done to determine the feasibility of such a program for Boone County. It would require the cooperation of local banks and local government. Potentially, the Boone County Historic Preservation Review Board would review the proposed rehabilitation work. If the work is approved, then the loan application is submitted to the participating financial institution for its approval and disbursement of funds. This type of program

could be part of a bank's Community Reinvestment responsibilities, and would encourage a greater balance between historic rehabilitation and new development in Boone County.

CONCLUSION

Most of the recommendations contained in the Preservation Element derive from the Boone County Historic Preservation Plan (1999) which is designed to clarify the role of historic preservation efforts in Boone County. The Preservation Plan provides information and suggests guidelines for recommendations of the Historic Preservation Review Board to the Boone County Planning Commission and the four legislative units concerning historic preservation issues.

Citizen education about the value of historic preservation in Boone County is an important key theme of the Preservation Plan, as reflected in the first Goal. This Goal provides mechanisms and strategies for improving the availability of information about historic resources in the county, as well as establishing objectives that focus on the importance of heritage education in local schools and throughout the community. Increased awareness of the economic, cultural and aesthetic benefits of historic preservation for Boone County will strengthen community participation and interest in preserving tangible reminders of their heritage.

Since Boone County Fiscal Court and the Cities of Florence, Union, and Walton have limited authority in Historic Preservation issues, the Preservation Plan does not propose specific regulatory measures for the protection and preservation of historic resources. Rather, it provides guidelines which the Historic Preservation Review Board can use in making decisions and recommendations regarding potential impacts to historic resources. The Plan suggests further ways historic preservation can be a part of the planning process by continuing to partner with the Boone County Planning Commission. The Preservation Plan also outlines research questions that support specific Goals and Objectives. The Historic Preservation Review Board may consider these issues when planning future preservation projects or looking for additional funding sources to support preservation endeavors throughout the county.

The goals of the Boone County Preservation Plan consist of the following:

- Promote historic and prehistoric resources as a viable part of the county's lively past and vibrant future.
- Identify historic and prehistoric resources as valuable assets to the county and to its citizens.
- Protect historic and prehistoric resources from physical threats, which endanger their preservation.
- Preserve historic and prehistoric resources through a variety of economic and other programs.

The preservation or occasional relocation of family cemeteries is a recurring issue as developers attempt to maximize land usage in Boone County. Under certain circumstances, the preservation of such cemeteries is regulated by Boone County Zoning Regulations. However, there are two ways to legally move a cemetery under Kentucky law, neither of which is subject to local ordinance or zoning. Therefore, it is critical that the Historic Preservation Review Board, state offices, funeral directors, coroners, the Planning Commission and Boone County work closely with property owners to: 1) find viable alternatives to cemetery relocation or 2) ensure appropriate treatment of cemeteries (and any affected relatives) proposed for relocation).

The Historic Preservation Review Board must work toward achieving a greater public awareness of the benefits of historic preservation for Boone County, and the critical role it plays in the quality of life in this county. In fact, the Board has begun to consider the need for a brief, but detailed study to determine specific actions that can raise the overall awareness of preservation efforts. Historic preservation is not only over nearly two hundred buildings listed on the National Register, it's not only thousands of annual visitors to the Dinsmore Homestead and Big Bone Lick State Park, or the celebration of Old Timers Day in Rabbit Hash; it is the preservation and protection of the very roots of Boone County's success. Through advocacy and coordination with numerous agencies and citizen groups, the importance of preservation efforts should be highlighted, not left as an afterthought. A high profile way of promoting historic resources is to create a public pathway system around a resource or connect the resource to other county features or population centers. Historic preservation goals must be integrated into planning, economic development, and governmental strategies in order for Boone County to build upon its' successes throughout the 21st century.

PUBLIC SERVICES AND FACILITIES

INTRODUCTION

This element discusses the public facilities and services within unincorporated Boone County and the Cities of Florence, Union, and Walton. Water distribution, sanitary sewage collection and treatment, gas and electric supply, municipal/public services, education, health care, and public communications are the services discussed. This element presents current data and provides insight into future expansion of these services. Several conclusions are also presented as to the various facility impacts on the future land use pattern.

WATER DISTRIBUTION

Within the geographic areas of the three Cities and the unincorporated County, there are seven different public water distribution systems. These current systems are the Boone County, City of Florence, Boone-Florence, City of Walton, Bullock Pen, Gallatin County, and Northern Kentucky districts. The Boone-Florence District exists primarily to convey water from the City of Cincinnati District to Boone County and the City of Florence. The major service areas of all the systems are depicted on **Figure 10.1**. Public water service should be correlated between these districts to use common mains and avoid duplication of services. If it makes sense from an efficiency standpoint to serve areas across political boundaries then districts should be encouraged to do so. As shown on this map, broad areas of the east and northeastern parts of the county are currently served by public water. The remainder of the county is currently dependent on cisterns or occasional wells.

Boone-Florence Water Commission

This Commission was formed in order to deliver a supply of water to the Boone District and the Florence District within Boone County. It has contracted with Cincinnati Water Works for a supply of 30 million gallons per day. During 2002 and 2003, major facilities were constructed, including a transmission main under the Ohio River and pumping station near Anderson Ferry, several large transmission mains in the eastern and northern portions of Boone County, and a 2 million gallon storage tank next to Ryle High School near Union. Other tanks include one on Dixie Highway in Richwood and one in the Hebron area. The Commission also maintains most of the water towers throughout the county. There is future potential for another storage facility in the U.S. 25 corridor, further south in the county. As a result of the formation of this Commission, the Boone County and Florence Districts no longer obtain their water from the Northern Kentucky Water District which now serves as a backup source of water.

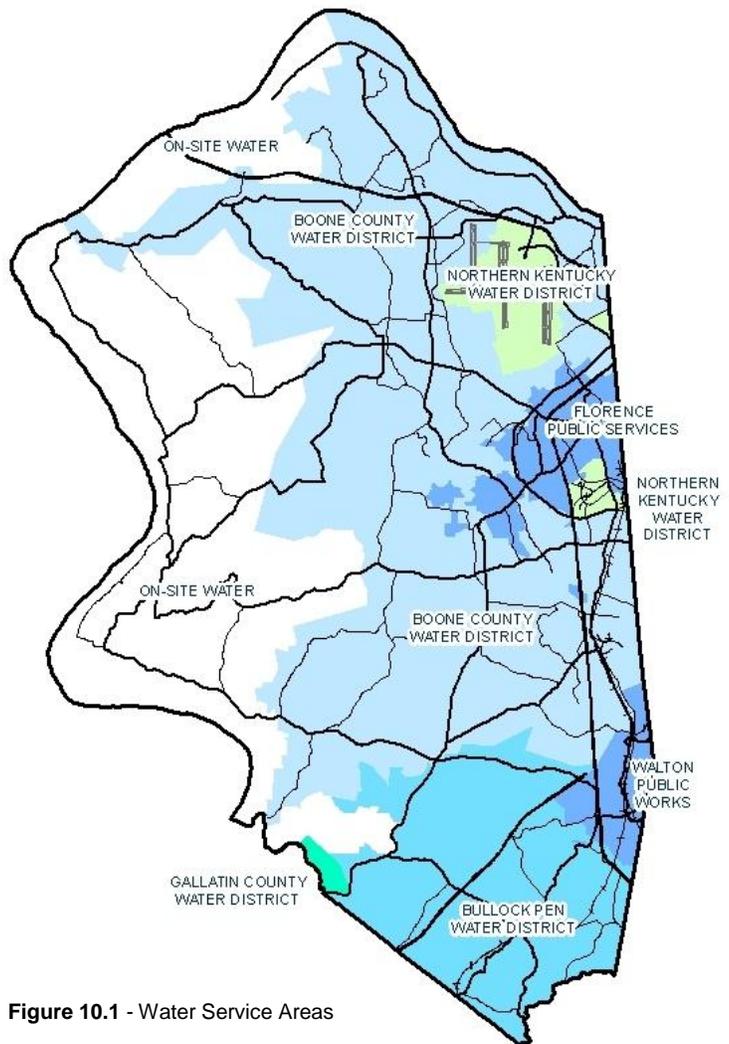


Figure 10.1 - Water Service Areas

Florence Water District

The City of Florence provides treated water service to all areas within the corporate limits of Florence and some land areas adjacent to the city. The Boone-Florence Water Commission began to deliver water to the City of Florence in late 2003, thereby alleviating supply limitations that were becoming a problem with the amount of new development.

Current storage capacity in the Florence system is 3.5 million gallons with three existing water towers. Average daily water usage within the system is approximately 3 million gallons. Since 1995, the city has concentrated on creating loops in water service areas to improve pressure and service. Several annexations by residential developers in the U.S. 42 corridor, west of Florence, have extended water service in that area but have not yet required major main extensions.

Boone County Water District

The Boone County Water District provides water service to areas contiguous to the City of Florence, the Hebron and Bullittsville area, the Burlington area, the City of Union and surroundings, and the area southward from Florence to Richwood. This District also currently obtains all of its water from the Boone-Florence Water District, which in turn contracts with Cincinnati Water Works via a transmission main under the Ohio River. This main went into service in late 2003 and eliminated supply problems in dry months.

Current storage capacity within the county system is 8.5 million gallons in water towers and tanks owned by the Boone-Florence Water District and located at Graves Road, the Ryle campus, and U.S. 25. The old water towers in Hebron and at Frogtown Road have been removed. An average daily use of approximately 7.1 million gallons is currently supplied by the District.

The Boone County Water District primarily serves the east-central portion of the county. This coincides with the more populated and growing areas of the county. Since development usually occurs more rapidly where new water lines are placed, good planning and growth management policy would be to not encourage water line extension in environmentally sensitive areas or areas planned for farmland preservation. Land owners in an Agricultural District receive a deferred assessment of fees for water service line extensions until the land is removed from the District and sold for non-agricultural uses. Public water districts have a responsibility to provide cost-effective water service. When there is existing demand in rural areas, the placement of water lines has historically not been a realistic growth management tool. It is difficult to argue that residents should not receive the health and safety benefits of public water supply in the name of growth management.

The Boone County Fiscal Court has been implementing the rural water expansion plans for most of Boone County. Initiated in 1999, this program was based on the fact that Boone County has less water service area for its residents than many other Kentucky counties. As a result, many rural areas of the county are now able to connect to the public water supply. Although the initial intention of this project was to provide water to existing residents, it may have significant potential impacts on growth in Boone County, particularly the western Boone County area. The rural water program indicates 65-70 miles of water main construction along the primary roadway corridors of western Boone County. Future side extensions would be based on assessments. The program is funded by general obligation Revenue Bonds.

The Fiscal Court has constructed water lines in the Rt. 20/Idlewild Road area and the Big Bone Road/Rice Pike/KY 338 corridors (Phase I). Phase II included water line construction on KY 20, East Bend Road and Big Bone Church Road. The rural water program was transferred from Boone County Fiscal Court to the Boone County Water District in June, 2010. The Land Use Element considers the possibilities of this water line construction and how land use regulation should be designed in its creation.

One common phenomenon of water line construction in rural areas is the change in habits of the residents. Households that are served by a cistern or well often exhibit a conservative use of water. When these households receive a continuing, inexpensive supply of water from a public system, water use habits often change. The increased use of water has an impact on existing septic systems by aggravating soil saturation problems. A common solution to this problem is often the public outcry for public sanitary sewer service to the

area. The impact of sanitary sewer facilities on county growth patterns is well known and is described later in this element. In this way, the community needs to begin to realize that, although water lines do not always directly affect growth, they can trigger a series of changes that lead to growth. Likewise, the construction of a water line, by itself, does not entitle an area of the county to develop.

During development of the Land Use Element, and in planning efforts after the adoption of this 2010 Comprehensive Plan, Boone County, as a community, needs to carefully create incentives and regulations to properly guide development in the areas affected by new water line construction. Creative ways of structuring future property assessments and blending them with planning efforts could provide a development pattern for Western Boone County that is different from typical suburban sprawl.

A prime example of the effects of water main construction on the development patterns of an area is the 12 inch main along North Bend Road. Since its construction in 1987-88, major developments have been approved in the Hebron-North River area. Sanitary sewer service for this area has resulted partly from public expenditure and partly from private construction. The effect has been that the overall momentum of development in this area has been increased. Now, with the addition of Northpointe Elementary school and road improvement designs for North Bend Road, this has become a prime example of how other infrastructure must be developed when a new water main is extended to a lightly developed area.

Walton District

The City of Walton currently provides water service to areas within the incorporated limits of the city and adjoining areas to the north of the city along Dixie Highway (U.S. 25), Old Lexington Pike, and west to the Bullock Pen Water District. Previously the city treated its own water for their supply. However, during the early 1980's the city contracted with the Northern Kentucky Water District for their water supply. By this agreement, the city is limited to a maximum daily supply of 1.5 million gallons of water. Currently, the system is not at capacity with average daily usage of 476,722 gallons and a storage capacity within the two water towers that total 500,000 gallons.

Since the Walton Water District has contracted for a large supply and uses relatively little of it, there is great potential for expansion. Although some of Walton's water supply is transported from the city by private water-haulers, the immediate Walton area will experience moderate population growth. This increases the supply available for industrial development.

Bullock Pen District

The Bullock Pen Water District currently serves an area around Verona and southward to Grant County and Gallatin County. The Bullock Pen Lake provides the water source for this system. Any further extension of these water lines in a northwest direction would encounter rougher topography in the Mud Lick Creek area, some of which has limited suitability for development. This area of the county is not expected to experience dramatic growth, but will see some residential construction in the general Verona interchange area. However, the Bullock Pen Water District does have some opportunity for expansion toward Walton. Any further expansion of this system can have the same land use impacts as discussed earlier under the Boone County Water District. The effects on water usage habits within the Bullock Pen District area could be significant because there is no public sanitary sewer system present. To compound this situation, the Environment Element shows that the soils present in this area have severe limitations regarding leach fields for private septic systems.

Gallatin County Water District

This District serves a small area along South Fork Church Road where U.S. 42 intersects the county line.

Northern Kentucky Water District

The Northern Kentucky Water District, formed from a merger of the Kenton County Water District and the Campbell County Water District in 1997, provides water service to portions of Boone, Kenton, and Campbell Counties. In Boone County they currently provide water service to the Cincinnati/Northern Kentucky International Airport, the Northern Kentucky Industrial Park, and some adjacent areas. The Northern Kentucky Water District maintains three water treatment plants along the Licking and Ohio Rivers with a net capacity of 64 million gallons per day (mgd). Expansion of the District within Boone County is not expected considering the current system has

excess capacity remaining and will be able to meet future needs. The Northern Kentucky Water District serves as a backup to the Boone-Florence Water Commission.

SANITARY SEWAGE COLLECTION AND TREATMENT

Sanitary sewage collection and treatment in Boone County includes three public systems: City of Florence, City of Walton, and Sanitation District Number 1 (SD1). Sanitary sewage collection and treatment also includes private package treatment plants and individual on-site septic systems. The public sewer systems usually serve large areas or clusters of developments, and private treatment plants usually serve one development.

Private, on-site systems, including leach fields, generally discharge into the soil for natural decomposition. In general, Boone County's soils are poor at accepting these discharges, and stream pollution often results. These systems also require larger lot sizes, often resulting in inefficient use of land. In recent years, regulatory agencies, such as the Northern Kentucky Health District, have required new home sites in on-site system areas to provide for two leach areas – an initial system that is designed to last for some years, and a future leach area that could be constructed at such time as the initial system fails.

Public Sewer Systems, though historically necessary for proper county growth, are expensive to install, operate, and maintain. Even more than water supply lines, sewer systems greatly influence where development occurs. Sewers must be considered for their environmental impacts, not merely for treatment plant discharges but also for their influence on future development. Sewers should be extended only to areas that can support substantial development so that most efficient use of the services is made. Development of collective sewer systems for the low density uses outside urban areas is usually not economically feasible. Individual package treatment systems have historically accommodated development in these areas, but are now generally discouraged because of their environmental impacts. This is especially true where rough terrain or other major building limitations are present.

The last decade and a half have seen a significant transformation in sewage treatment in Boone County. The following passages describe the public sanitary sewage treatment systems.

Florence

During the early 1980's, the City of Florence improved their sewer system by connecting into the Sanitation District Number 1 of Campbell and Kenton Counties. By connecting the Florence system, the Commission eliminated its treatment plant, and could expand and improve its system and services. Before committing to these improvements, the Florence system was at its capacity for treatment of 2.1 million gallons per day and involved the use of eighteen lift stations throughout the city. This system required much operating maintenance and repair. Subsequent improvements included the removal of most of the stations. Ultimately, the system connects to the Sanitation District's system and the Dry Creek Sewage Treatment Plant. **Figure 10.2** shows the sewer service areas throughout the county. The Fowler's Creek pump station is planned to be removed as part of major improvements being made in the area by SD1 (discussed below). Sewage will ultimately flow by gravity to the proposed Western Regional Water Reclamation Facility upon its completion.

Sanitation District No. 1 (SD1)

Since 1995, a dramatic change has been that the SD1 has taken over the former Boone County Sewer District. The Boone County District system had been operating under the 1989 Boone County Water and Sewer Master Plan Report. The focus during the 1980's was to obtain public ownership for as many of the private package treatment plants as possible to enable eventual consolidation and elimination of them. The report recommended a coordinated strategy to acquire and consolidate the numerous individual package wastewater treatment plants, expansion of the wastewater collection lines network, and the treatment of collected wastewater. The report proposed two wastewater treatment plants, located in the North Bend Area and Gunpowder Creek Area, to provide wastewater treatment for service areas. After the adoption of the report, Boone County Fiscal Court entered into an agreement with SD1 to treat Boone County wastewater at the Dry Creek Wastewater Treatment Plant. The capacity of the Dry Creek Treatment Plant is 46.5 million gallons per day with the effluent being discharged into the Ohio River at Anderson's Ferry. The average flow at this plant is 35 million gallons per day.

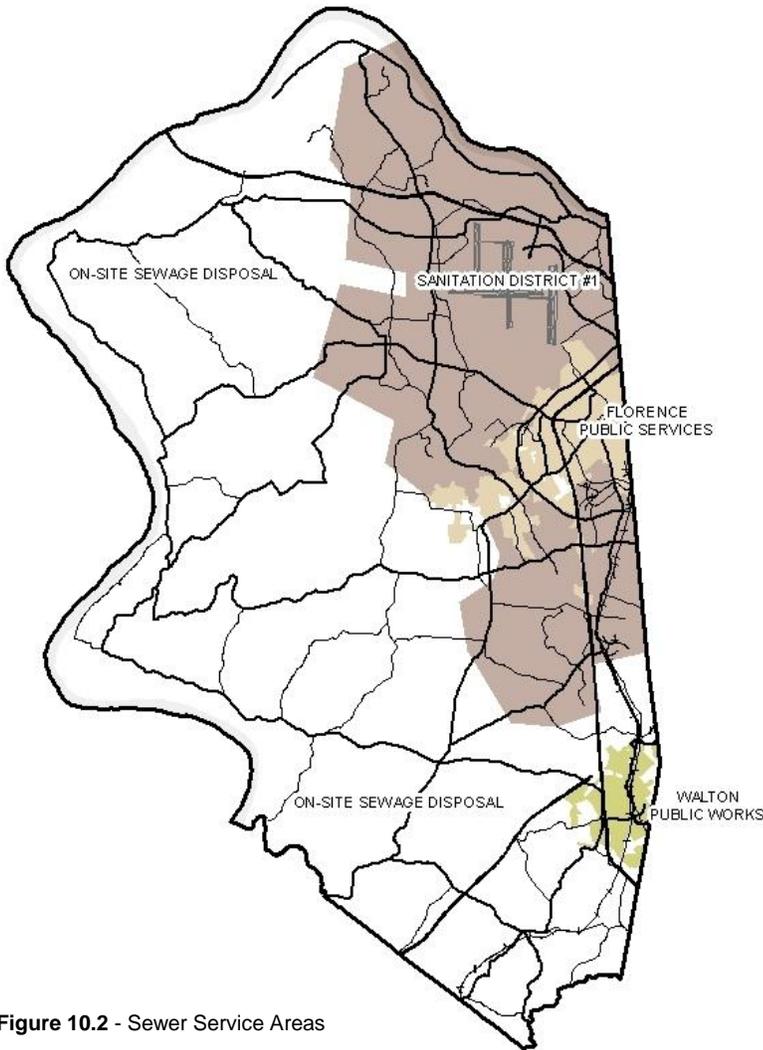


Figure 10.2 - Sewer Service Areas

The Fiscal Court's actions eliminated the need for the two proposed treatment plants in Boone County. Later agreements resulted in the Sanitation District constructing the major sewage transmission lines, while the Boone County District was responsible for the maintenance of the existing system. Finally, the agreement was reached for SD1 to serve Boone County. Since many of the individual collection systems that have been removed were in poor operating condition, the consolidation of these systems into the regional system benefitted Boone County's environment and public health.

In 1995, SD1 commissioned the preparation of a 20-year Regional Facility Plan, completed in 2000. A portion of the plan addresses efforts to improve existing sewer systems. The most significant improvement recommended by this plan, to affect Boone County, is the construction of an entirely new sewage treatment plant on the Ohio River. During 1998 and 1999, there was much discussion about the location of such a plant. Several sites were considered, and finally the District selected a site north of Belleview on the river. As of 2011, the Western Regional Water Reclamation Facility is nearing completion. The collection system is being constructed concurrently with the Reclamation Facility and includes a gravity flow tunnel and new gravity mains. The major sewage collection point for most of the Boone County service area and about fifteen percent of Kenton County is the new tunnel

portal adjacent to the YMCA facility on Camp Ernst Road. The Conveyance Tunnel bore was completed in late 2010, one year ahead of schedule. The tunnel is over six miles long, approximately twelve feet in diameter, and up to 300 feet below surface. During 2011, the planned sewer pipe is to be installed within the tunnel, will measure 8.5 feet in diameter, and is projected to carry ten million gallons per day at startup. The Reclamation Facility is anticipated to be operational in 2012, and is anticipated to reduce sanitary sewer overflow volumes by 60 million gallons annually. Upstream of the tunnel, existing sewer mains in the Gunpowder Creek valley have been upgraded in size. Kelly Elementary School has been discussed for possible sewer service via a direct line to the Western Regional Water Reclamation Facility, and there is a possibility that with some private improvements the town of Belleview could be served as well. However, in general the Western Regional Water Reclamation Facility is not intended to spur new development in western Boone County.

The Sanitation District has stated that the 1995 Boone County Comprehensive Plan was used to develop the Regional Facility Plan, and that a slightly increased capacity over the 2020 Future Land Use Plan was designed. Although this represents some progress in agencies working together, the proposed improvements in the District's final plan would create growth impacts greater than the 1989 Boone County Water and Sewer Master Plan Report or an expansion to the Dry Creek Treatment Plant. The Future Land Use Element of this plan should contain creative ways of utilizing the future availability of sewer to develop a town and rural land use pattern instead of extending eastern Boone County style of development into Western Boone County.

Some additional capacity has been designed into the system to safeguard public investment; however, the District has not intended to serve all of Boone County with this planned system. Sewer transmission facilities are being designed to accommodate a 20-50 year planning horizon. The District has recognized that the major growth corridor in Boone County is toward the south. Even so, most of the Verona and I-71 areas of the county are not shown as being served in SD1's 20-year plan. Outlying areas in the I-71 corridor and the western parts of Boone County could be served in the future, but are not shown in the 2000 Regional Facility Plan. Gravity trunk mains could be built in major creek valleys if significant future development is allowed to occur in these outlying areas. The Sanitation District has adopted a policy that encourages gravity sewer lines as opposed to a series of pump stations to serve new development. This may become an important issue as development proceeds further west into the major creek valleys of the county. Developers must pay for the facilities to become part of the system if less than 40 homes are served by a proposed pump station. SD1's 20-year plan must be updated in the future if certain changes occur in the community.

Boone County, as a community, needs to be careful that sewer service areas are developed in an efficient manner, and that all sewer service areas are not over-developed. For Boone County to develop properly in the future Land Use Planning and Infrastructure Planning must continue to be closely intertwined. As the Environment and Agriculture Elements show, the sewer pump stations that have been constructed are promoting future development in broad new areas. Construction of future sewer facilities should reflect community and Planning Commission involvement because of the inherent relationship between Infrastructure and Land Use. Government agencies should continue to work together to define future growth areas as well as to encourage and fund significant infrastructure in those regions.

It is important to put the relationship of the sanitary sewer system and Boone County's growth into perspective. The rapid growth in the unincorporated areas of the county had occurred until the mid 1990's without a coordinated sewer system. Now that such a system is available, future growth rates are difficult to estimate. The sewer pump stations constructed in the early 1990's were designed to serve watershed areas. Therefore, future development can access them through private investment and construction of sewer lines that may include additional pump stations. The Sanitation District has passed a resolution that the improvements in the Regional Wastewater Treatment Plan are not intended to encourage additional development beyond what has been planned for the area. Although public expenditure for sanitary sewer systems can be viewed as a positive and efficient way of getting out in front of future development, it is important to realize that the need for other new services, such as police, schools, and planning will be accelerated. As a result, it can be inferred that the quicker Boone County develops, the quicker the cost of providing public facilities and services increases.

Walton

The City of Walton provides wastewater treatment at its plant for users within the corporate limits. The current capacity of the Walton facility is 850,000 gallons per day. The average daily flow into the plant is around 300,000 gallons into Mud Lick Creek. The City of Walton also has a 50,000 gallon per day plant serving the Walton Industrial Park, and the current flow is around 8,000 gallons per day.

Union

The City of Union transferred their sanitary sewer collection system to SD1 in the mid-1990's. All of Union's sanitary waste water goes to the Dry Creek Treatment Plant.

Private Sewage Treatment

Package plants generally serve only one user, usually a business, industry, or school. Others serve a residential subdivision or mobile home park. Many are privately owned and operated, and are inspected by the State of Kentucky, Department of Environmental Protection, and the Division of Waste Management regarding maintenance and effluent discharge. There are now fewer private package treatment plants in Boone County that serve individual users and developments than there were in 1990.

Individual septic systems are historically the prevalent method of wastewater treatment in developing areas like Boone County. Other than the above mentioned areas of public or private collection systems, all of the remaining areas of Boone County continue to rely on the use of a septic tank or similar individual systems. Even though the

Burlington, Hebron, and Union areas contain many such systems, they should experience little additional septic tank construction in the future with the expansion of sewer service in the area and the limited capability of some of the soils to accept septic tank discharge. Septic tanks will likely remain prevalent for low density residential uses in rural areas of the county; however, there are biological treatment alternatives available.

Recent Ideas Surrounding Sanitary Sewage Treatment

Marsh systems and greenhouse or living aquatic systems can provide localized wastewater treatment in parts of Boone County, with necessary permits. These systems can provide effective treatment, but require more land area than conventional treatment plants. These systems may be considered for concentrated outlying development in Western Boone County but should be designed to be maintained by a responsive agency.

STORM WATER MANAGEMENT

The rapid development of Boone County has resulted in a large increase in pavement and roof coverage of land area. These impervious surfaces have the effect of increasing both the amount and rate of storm water runoff over the pre-development conditions. Often, existing storm water pipes and stream channels are unable to handle this increased storm water flow, resulting in property damage, loss in water quality, and potential injury.

Since there are so many different types of development impacting each drainage system, public storm water management systems represent the most effective and consistent method of establishing a coordinated approach to handling storm water runoff problems. The service areas of the different agencies handling storm water in Boone County are shown in **Figure 10.3**. The City of Florence has conducted extensive study in this area and produced a Storm Water Management Plan during the late 1980's. In 1992, the city created a Storm Water Management Division under the Florence Water and Sewer Commission, and instituted a storm water assessment that applies to all businesses and residences within the city limits. The Public Services Department is responsible for storm water management in the City of Florence. The Boone County Public Works Department has historically provided storm water management for Boone County Fiscal Court, as well as for Walton through an inter-local government agreement. The City of Union has taken on its own storm water management since the last comprehensive plan update. A Storm Water Management Plan for the Upper Gunpowder Creek Watershed was completed during the 1990's. This plan is a logical extension of the City of Florence efforts into a highly impacted area of the unincorporated county. Some of the recommended improvements have been completed, and currently the watershed is being studied by the Boone County Conservation District through a 319(h) Nonpoint Source Implementation Grant.

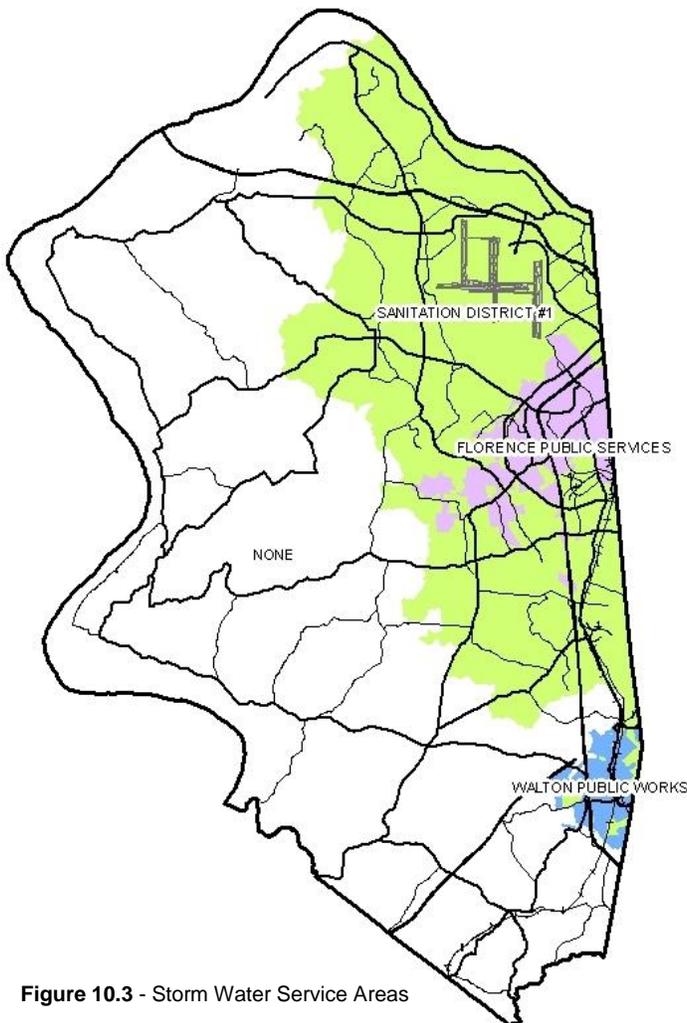


Figure 10.3 - Storm Water Service Areas

In 1999, the United States Environmental Protection Agency (EPA) developed National Pollutant Discharge Elimination System (NPDES) Phase II rules to address small municipal separate storm sewer systems (MS4s), which serve communities of less than 100,000 people in urbanized areas. The EPA has delegated responsibility for the MS4 program to the Kentucky Energy and Environment Cabinet, with specific Phase II regulation oversight provided by the Kentucky Division of Water (KDOW). The purpose of these regulations targets the control of storm water runoff, with the ultimate goal of improving the quality of surface waters that are currently impacted by this runoff. Under this rule, each individual community is required to submit an application for a National Pollutant Discharge Elimination System (NPDES) permit to the State.

In response to requests from Northern Kentucky communities, and in an effort to comply with these requirements in a cost effective and efficient manner, SD1 entered into interlocal agreements with local governments in Northern Kentucky, accepting responsibility to undertake permitting requirements and to implement a regional storm water management program to comply with EPA regulations. SD1's regional storm water management area resembles the sanitary sewer service area for Northern Kentucky, affecting approximately 40 percent of unincorporated Boone County, and excludes the cities of Florence and Walton. The boundaries of the service area have been delineated by the KDOW, and are eligible for re-evaluation at the end of each five year permit cycle based on factors such as growth and impacts on water quality. The SD1 storm water drainage system consists of the facilities (detention ponds) and/or infrastructure (previously owned and maintained by individual cities or counties) that convey storm water from the paved surface of public streets and roadways, beginning below the elevation of the street grate or storm water inlet. Cities and counties maintain ownership and maintenance responsibilities for culverts and ditches along public streets, as well as the associated street curbs, gutters, curb inlets, and street grates. SD1 reached a similar transfer agreement with Boone County Fiscal Court in late 2010 to accept ownership, operation, maintenance, and capital improvements of storm systems in the SD1 service area.

Additionally, and in order to fund the storm water management program, SD1 initiated a storm water surcharge for properties in the service area. In order to encourage the use of best management practices, SD1 has established a credit policy for non-residential (i.e. commercial and industrial) properties. Also, within the overall SD1 service area, SD1 has completed a storm sewer inventory, created a single set of storm water rules and regulations, developed a land disturbance permit process for activities greater than one acre in the service area, begun detection and elimination of illicit discharges and initiated a public education program.

In April 2007, a Consent Decree negotiated between SD1 and the U.S. Environmental Protection Agency (USEPA), the Kentucky Energy and Environment Cabinet, and the U.S. Department of Justice became effective that outlined an accelerated program of activities designed to further improve water quality and ensure compliance with the Clean Water Act primarily through the abatement of sanitary sewer overflows (SSOs) and combined sewer overflows (CSOs). Understanding that SSOs and CSOs are not the sole source of impairment for Northern Kentucky streams and rivers, and that multiple sources are impacting local waterways, SD1 proposed the country's first watershed management based Consent Decree. Traditionally, most Consent Decrees focus solely on SSOs and CSOs, with an emphasis on gray infrastructure solutions (treatment plants, storage tanks, etc). SD1's watershed approach identifies the characteristics of individual waterways and considers CSOs and SSOs along with other sources impacting waterways (such as storm water runoff). This approach allows for the use of new technologies such as "green" infrastructure and watershed controls (i.e. wetlands) as well as traditional gray infrastructure solutions. This integrated approach (which will be reviewed and evaluated every 5 years) is designed to address both wet and dry weather sources of pollution, eliminate SSOs, comply with CSO policies, and lead to greater improvement in water quality and public health.

As a core component of the watershed based approach, detailed characterizations have been conducted by SD1 of 16 major watersheds in Northern Kentucky. These studies, known as Watershed Characterization Reports (WCRs) provide valuable information, such as current water quality impacts, potential pollution sources, location of potentially sensitive areas, and allow for better prioritization of project implementation. Additionally, SD1 has formed a Watershed Community Council to allow for public input and has partnered with the Boone County Conservation District (and several other local agencies, including the Planning Commission) to initiate intensive watershed studies in two major and rapidly developing watersheds in Boone County (Gunpowder and Woolper

Creek). Such plans are crucial to future planning needs and also to recognize the responsibility of both the private sector and government in addressing existing problems and avoiding future problems.

NATURAL GAS DISTRIBUTION

Duke Energy supplies natural gas in parts of Boone County. Currently much of the northeastern part of the county, the City of Florence, the City of Union, and the City of Walton are receiving natural gas service. Three major natural gas transmission lines pass through Boone County. All of these pipelines are located generally in the eastern half of the county. Installation and improvement of gas lines usually require an increase in residential or industrial concentration to be feasible.

ELECTRIC POWER DISTRIBUTION

Electric power distribution is broadly provided by Duke Energy Kentucky and Owen Electric Cooperative. Some overlap within residential subdivisions and commercial developments exist. Duke currently operates the East Bend Power Plant, a coal powered plant. This facility is located along the Ohio River in the western part of the county. The Ohio River serves this facility by supplying the cooling water and the transportation for coal delivery via barges.

Owen Electric purchases its wholesale power from the East Kentucky Power Cooperative in Winchester, Kentucky. East Kentucky Power operates three generating stations and three renewable energy plants of its own and has interconnections with Kentucky Utilities, Duke Energy Kentucky, Louisville Gas and Electric, and Tennessee Valley Authority. This network provides the power reliability that a developing area needs.

Of all the above mentioned distribution and collection systems of the public infrastructure, electric power would offer the least limitations for urban development throughout the county. Electric and gas lines generally follow development instead of preceding it. Electric lines are versatile and can be extended to accommodate new development. For these reasons, these services do not have a great impact on directing residential development to specific areas. The fact that some industrial enterprises try to locate near energy sources should influence the placement of these facilities. From the stand point of sustainability, energy efficiency and the development of alternative energy sources are needed to keep the greater Cincinnati region economically competitive. The efficiency of many renewable sources of power, such as wind, solar, geothermal, and biomass continues to improve. Further advancements in fuel cell technology is one example of a recent development that may impact the methods of generating electrical power on-site as opposed from a centralized source and carries to end users over a network of transmission and distribution lines. The other sources of power mentioned above will be offered to area businesses and residents and their impact will need to be addressed.

MUNICIPAL/PUBLIC SERVICES

Public Facilities services such as law enforcement, fire and rescue services, and other services provided by municipal and county agencies are vital to Boone County. Consolidation studies have been conducted by private consultants to examine the advantages and disadvantages of combining some city and county services, including law enforcement and utilities.

Law Enforcement

The City of Florence has their own police force, while Union and Walton utilize the services of the Boone County Sheriff. Florence currently has a police force of over 61 officers including 2 bicycle patrol officers. Florence has a fleet of 62 patrol cars and a new SWAT truck. The remainder of the county, including the City of Union and the City of Walton, is served by Boone County Sheriff Department, which now has substations at the Union City Building and Walton City Hall. The Boone County Sheriff's office contains 128 law enforcement personnel including 10 bicycle patrol deputies. The Sheriff maintains a fleet of 87 patrol vehicles, 1 SWAT van, and 1 SWAT

armored vehicle. The City of Florence Police Department has their office in the Florence Government Center. The county Sheriffs' offices are located in the public safety campus just outside Burlington. The Cincinnati/Northern Kentucky International Airport has a separate force of officers and several dispatchers for the Airport and vicinity.

Fire and Rescue

Florence has historically been the only fire district in Boone County where there are full-time staff members for fire fighting. However, since 1990 the Burlington, Hebron, Walton, Union, Point Pleasant, Verona, and Belleview Fire Departments have all added full-time or part-time paid personnel. Petersburg is currently the only remaining department in the county that has no paid positions and functions totally through volunteer participation. Firefighting equipment and personnel are also available at the Greater Cincinnati International Airport. The Airport currently has a full-time force of 59 persons and two stations. All fire departments in Boone County with the exception of Petersburg are staffed with Advanced Life Support (ALS) personnel. Petersburg has a Mutual Aid Agreement for ALS services with the Hebron Fire Department.

Figure 10.4 shows the district boundaries of all Fire Districts in the county as well as the location of the fire stations. Several fire districts, such as Burlington, Hebron, Pt. Pleasant, Union, Florence, and Walton have experienced increasing demands for fire protection as a result of the county's growth. This is expected to continue over the planning period. Full-time fire personnel and paramedics will increasingly be necessary in each of these growing districts. This is especially important as new schools, residences, churches, commercial, and industrial and other facilities are built that operate during the daytime hours.

The Boone County Fire Chiefs Association has constructed a county wide fire training facility within the Boone County Public Safety Campus in Burlington. The Association also continues to operate a fire investigation team. Fire departments are increasingly using automatic aid to assist each other and to meet national standards for emergency response.

With the rapid growth of Boone County and the accompanying major roadways, transportation of hazardous materials and the emergency response to leaks and accidents will become increasingly important. Fire and rescue departments must be equipped and trained to deal with such emergencies. To coordinate emergency response, new communication and data systems have been implemented at the communications center at the Florence Government Center. This incorporates the Boone County GIS and should in the future continue the progression toward mobile graphics terminals and automated vehicle location technology for emergency response vehicles.

With increasing traffic congestion on the major interstates, increased air traffic, increased resident population and daytime employee population of Boone County, a trauma unit will be necessary to deal with potentially large emergencies. This unit should be somewhere near I-75 and near the

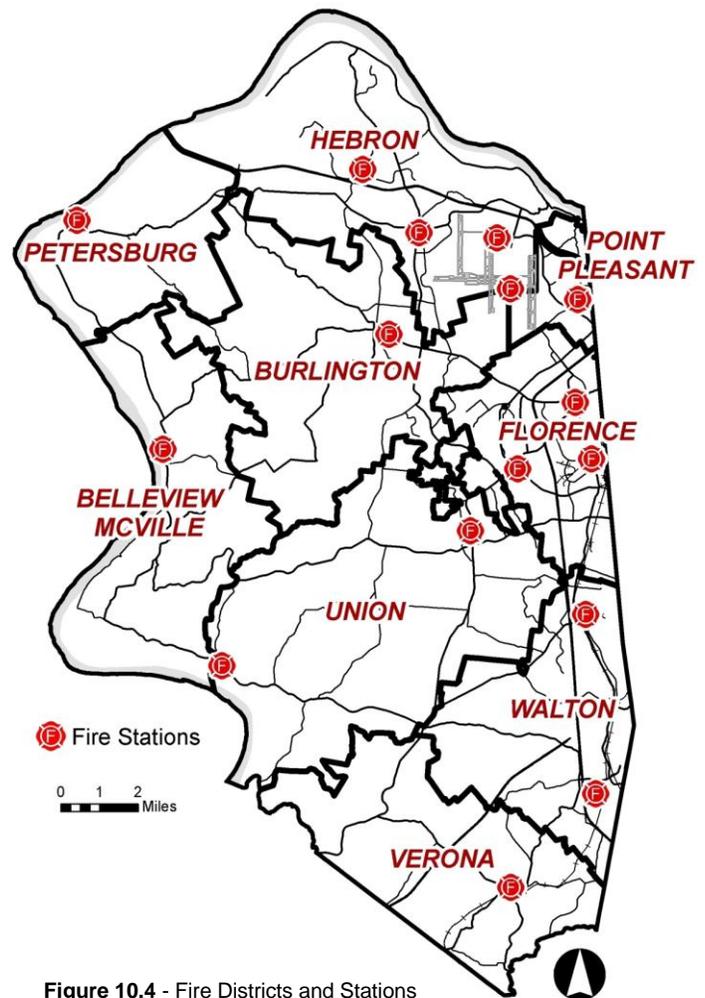


Figure 10.4 - Fire Districts and Stations

Florence area. Currently, trauma situations are flown by helicopter to the trauma unit at University Hospital in Cincinnati. Lastly, a new trend of urgent care facilities are appearing across the region which provides 24-hour care that may not be deemed an emergency. It is anticipated that these facilities will continue to appear in Boone County. In addition, Homeland Security has become an issue since 9/11, and emergency response needs to be designed with this issue in mind. In addition, a new truck was purchased with funds from Homeland Security that allows for a more efficient response to emergency calls involving weapons of mass destruction (WMD) and hazardous materials. Personnel from all departments have been trained to respond with this unit as part of a regional response team.

Emergency Telecommunications

Telecommunications, or the transmission of signals containing voice or data over a distance, is essential for public safety. In 2010, Boone County Public Safety Communication Center (PSCC) upgraded the microwave backbone that exists between the PSCC and the radio transmission towers throughout the county. This upgrade provides sufficient bandwidth for current operation and should meet future bandwidth needs.

The Federal Communications Commission (FCC) issued a federal mandate to narrow-band the spectrum of radio frequency currently used by police, fire, EMS and public services in Boone County. The published deadline for this mandate is January 1, 2013. PSCC as well as other public safety entities like police, fire, EMS, and public services continue to upgrade radio equipment to meet the narrow-banding mandate. The need for interoperable communications between police, fire, EMS and public service has been identified in a significant number of incidents throughout the United States. A fully functional interoperable communication model does not currently exist in Boone County.

Much work could be done to improve telecommunication and dispatch. The current technologies employed throughout the county presents problems with interoperability, radio coverage, expansion and future growth. Bringing police, fire, EMS and public services together in the same radio frequency would aid in interoperable communication. Moving toward a 700MHz, 800MHz, or similar system would certainly aid in interoperable communications, expansion and future growth. Although this is not an action that should be undertaken without serious consideration and input of all stakeholders as different technologies present different problems. For example, digital radio communications don't always bode well in high background noise environments like fire incidents. If a common radio frequency spectrum is established, consideration should be given to enact legislation that would require bi-directional amplifier installation for improving radio coverage in buildings of considerable size or building material make-up.

The County Judges Executive of Boone, Campbell, and Kenton Counties engaged in conversation in 2010 to discuss regional communications. Each of the counties encounters similar hurdles when it comes to radio communications, emergency dispatch, etc. A regional approach to clearing these hurdles will be determined at a later date.

Municipal/County Offices

Each of the municipalities within the county operates their offices out of a city or municipal building. Each municipal building provides a central location within the community for public services. A municipal complex on Ewing Blvd. houses the City of Florence offices as well as other government agencies. Expansion of this complex could include even more public services and needed meeting facilities which would serve the entire community.

Boone County Government Administrative offices were originally spread throughout the town of Burlington providing no central location for services. Although the Boone County Administration Building was completed in 1982, it is experiencing severe space limitations. Some agencies began to move out of the building, beginning the decentralization process again. The new justice center, jail, and sheriff's building have relieved the space problems and Boone County has begun to see the re-centralization of county offices and services once again.

The Boone County Planning Commission is an important agency that is a vital tool for the community in dealing with rapid growth. Boone County is in a beneficial situation in that the Commission is a joint planning commission and is responsible for directing land use and development for all of Boone County, including the three cities of Florence, Union, and Walton. As a result, the four legislative bodies operate under the same Comprehensive Plan and consistent regulations.

The Planning Commission has historically functioned mainly by reviewing development plans and managing growth, with the assistance of four boards of adjustment. The overall goal for land use regulation in Boone County is a balance between the right of the property owner to utilize their land for economic purposes with the protection of public health safety and welfare. The chief tool for accomplishing this task has been zoning regulations and subdivision regulations, but the future likely holds new methods of regulating land use, solving problems, pursuing opportunities, and affecting infrastructure provisions. The Boone County Geographic Information System (GIS) was developed through the 1990's and 2000's, and increases communication and cooperation between public and private organizations. GIS data and analysis will continue to be important in Boone County, and will be increasingly connected through wireless and cellular technologies.

EDUCATION

There are two public school systems in Boone County, the Boone County School District and the Walton-Verona Independent School District. Each system offers education for grades 1 through 12 along with kindergarten classes. Both districts excelled in the Kentucky Core Content Test with Boone County placing sixth in the state for county districts and Walton-Verona finishing fourth of all the state's independent districts. Throughout Boone County there are also several private/parochial schools. The Boone County Success By 6 program has been in existence for over 5 years and is now improving the quality of life for children and families in Boone County. The Boone County Human Services Department also runs the aging tax board. These functions are important for the quality of life of Boone County residents.

BOONE COUNTY SCHOOL DISTRICT

The Boone County School District currently operates 22 schools within the county. These schools are listed in **Table 10.1**. The Boone County District had an enrollment, as of the beginning of the 2000-2001 school year, of 13,167 in grades kindergarten through 12. This figure is now nearly 19,000, representing a 44 percent increase. Because of the dynamics of population migration in and out of Boone County, the usual population pyramid approach to forecasting future enrollments is often not reliable. The school district has to examine many factors in addition to natural population increase including future land uses as foreseen by this Comprehensive Plan. **Table 10.1** details the current enrollment of and the designed capacity of each school.

Elementary Schools - Longbranch Elementary and Mann Elementary have both been constructed since the 2005 Comprehensive Plan update. Burlington, New Haven, Ockerman, and Florence elementary schools have recently undergone additions and renovations. Enrollment is generally greater than the designed capacity, even with classroom additions and mobile classrooms. Concentric locations of elementary schools have made the distribution of students more difficult without transporting children excessive distances. Recent major redistricting efforts have utilized the Boone County GIS, which is also being used in the planning for the most efficient locations for new schools in the future as the Boone County student population continues to grow.

Middle Schools - The middle schools are all operating at or near capacity. Although they are all located in the eastern section of the county, they are strategically placed so that the rural sections of the county (south and west) are directly accessible by road.

High Schools - Two high schools in the county are operating over capacity. These schools are Boone County High School and Ryle High School. Conner and Cooper high schools are right at capacity. Like the middle schools, the high schools are located in the most populous areas with convenient road access to most of the county.

Table 10.1 - Boone County School District

SCHOOL	2000	2011	DESIGN CAPACITY
Burlington Elementary	628	886	825
Collins Elementary	566	608	650
Erpenbeck Elementary	798	666	850
Florence Elementary	528	662	625
Goodridge Elementary	549	845	775
Kelly Elementary	306	247	450
Longbranch Elementary	-	744	750
Mann Elementary	-	839	750
New Haven Elementary	629	719	750
North Pointe Elementary	462	1,042	975
Ockerman Elementary	639	750	800
Stephens Elementary	621	740	875
Yealey Elementary	597	626	750
Elementary sub-total	6,323	9,374	9,825
Camp Ernst Middle	-	953	1,033
Conner Middle	1092	1,026	700
Gray Middle	780	981	886
Jones Middle	447	647	933
Ockerman Middle	728	849	700
Junior High sub-total	3,047	4,456	4,252
Boone County High	1,341	1,400	1,100
Conner High	1,216	1,213	1,266
Cooper High	-	986	1,000
Ryle High	1,240	1,556	1,500
Senior High sub-total	3,797	5,155	4,866
Total	13,167	18,985	18,943

WALTON-VERONA SCHOOL DISTRICT

Enrollment growth has historically been relatively slow in the Walton-Verona Schools. This school system operates an elementary school just west of Verona and a high school in Walton. While population growth projected for that area is not anticipated to be dramatic, the enrollment numbers for the district have increased at a much higher rate over the past decade. The Walton-Verona school system had a year 2011 enrollment of 1,520 students from pre-school through 12. This enrollment represents a 51 percent increase since 2000 when the enrollment was 1,006 students. The grade configuration has changed recently in the Walton-Verona School District. Elementary now consists of pre-school through 4th grade; middle school includes 5th through 8th grades; and the high school is comprised of 9th graders through the 12th. Current additions to the existing Middle School and High School campus in Walton will accommodate the near term growth in the district.

Due to limited bonding potential, Walton-Verona is not planning on a new high school at the Verona interchange anywhere in the near future. Instead, they will be utilizing the Walton campus for middle and high school for the foreseeable future. Land is set aside in the Verona Park for the long range construction of a new school building. This property currently contains the sports facilities for the district. In the meantime, the addition to the existing complex will accommodate the increase in students.

PUBLIC EDUCATION PLAN

Facilities Plan - In 1991 the Kentucky Education Reform Act (KERA) was passed by the Kentucky General Assembly to totally revise the public educational system in Kentucky. Consequently, both school districts are attempting to comply with KERA requirements. In addition, the Boone County School District adopted a Master

Educational And District Facility Plan in 2003 for the needs of the District. That plan was updated in 2007. State law requires school districts to develop and adopt a Master Educational Facilities Plan and to update it every 4 years based upon needs. Boone County Schools and Walton-Verona Schools recently updated their 4-year plans. The current plans for both districts are available at their respective Board of Education offices for review.

An overview of the future educational needs is concentrated on the central portion of the county where the greatest population growth is occurring. As the center of the county becomes more densely populated, more classroom space in the form of new schools or expansions of existing buildings will be necessary in growth areas. The current strategy of school location in the Boone County District is to distribute the location of new schools where areas are experiencing population growth.

The next five to ten years represents an important time period for building expansion of both school districts. Continuing industrial development in Boone County increases the tax revenues available to education. However, continuing residential development can increase the needs impacts on the system. The education system must closely coordinate its efforts with land use planning activities. Correlation of school size and location with approved residential development, as well as the Future Land Use Map, will be a major focus of the school district's efforts. This is especially apparent with the elementary schools in the district which are currently overcrowded. A strategy of the school district is to disperse new school facilities out from the central urbanized Florence area through the use of the Boone County GIS in order to minimize student travel time and problems with traffic congestion.

Because of Boone County's growth, new school facilities should be strategically located in the transportation network and near residential areas they are designed to serve. Besides being easily accessible to new growth areas, this can enable future redistricting to avoid overcrowding. Aside from elementary school construction, the major improvement to the school system will be a planned fourth high school. Future expansion of the Boone County Vocational School or construction of additional facilities will be necessary as the county becomes more urban. Transportation activities can also have a negative impact on the education system. This is apparent with airport noise impacts on several Boone County schools. Noise mitigation measures, including sound insulation, should continue to be implemented where necessary.

In terms of land acquisition, suitable land donation to the school district by Boone County land owners should be encouraged, as well as the provision of suitable land within planned developments or subdivisions, as long as the sites are somewhat level and strategically located to avoid future redistricting problems. The Boone County Zoning Regulations Planned Development Article and the Boone County Subdivision Regulations should be considered for revisions to facilitate such donations or lease arrangements for suitable school sites. Erpenbeck Elementary and Northpointe Elementary are two examples of schools built through these types of efforts.

In addition, both school districts should continue to work with the Boone County Parks and Recreation Department in providing joint use facilities. This can be beneficial in terms of land costs, maintenance costs, and provision of facilities. This is also recommended in the Boone County Parks and Recreation Master Plan.

Private Schools

Currently, seven private or parochial schools exist in Boone County:

- **St. Paul School** - U.S. 25 (Dixie Highway) Florence; Enrollment - 625; Grades K-8.
- **Mary, Queen of Heaven Elementary** - Donaldson Road at Turfway Road; Enrollment - 260; Grades PS-8.
- **Immaculate Heart of Mary School** - KY 18; Enrollment - 540; Grades PS-8.
- **St. Joseph Academy** - Needmore Street, Walton; Enrollment - 300; Grades K-8.
- **Heritage Academy** - U.S. 42, Florence; Enrollment - 357; Grades K-12.
- **St. Henry District High School** - Donaldson Rd; Enrollment - 540; Grades 9-12.
- **Assumption Academy** - Beaver Road; Enrollment - 40; Grades K-12.

Private schools ease part of the pressure placed on the public schools as new residents come into the county. As the county continues to grow, new private schools can be expected to emerge. The Covington Diocese has conducted a facilities plan which includes a future high school and grade school in Boone County. This plan

encourages these schools as long as they meet or surpass the standards of public schools. These schools can be expected to be built in conjunction with religious institutions.

Colleges/Trade Schools

At present, there is the Gateway Community & Technical College at the I-75/Mt. Zion Road interchange which opened in 2005 and includes the Center for Advanced Manufacturing that opened in 2010. There are several private business and trade schools located in the Florence area. These are not regional campuses, but primarily serve individuals from the immediate Northern Kentucky area. As the population of the county grows, expansion of these schools or construction of new schools can be expected. Furthermore, the continued increase in industrial activity indicated that Boone County would be an ideal location for a state technical college. Any new college or trade schools should locate in urbanized areas that are easily accessible to their students.

Visual and Performing Arts

The Northern Kentucky Arts Council produces visual arts displays and theater shows at the Carnegie Arts Center in Covington. The last few years have seen National Endowment for the Arts funding to help the state-wide Kentucky Council operate in the face of the overall economic conditions. The Council is overseen by the Kentucky Tourism, Arts and Heritage Cabinet (renamed in 2008). The Northern Kentucky Symphony and Stained Glass Theatre troupe perform in Kenton and Campbell counties. This indicates a need for the growing population of Boone County to have greater access to the arts in general.

During 2010, the Union Theatre Group began to offer for-pay play performances. The Group reached an agreement with Ryle H.S. for the use of the school auditorium, but has expressed a need for permanent stage and educational facilities. Such facilities could also offer opportunities for other groups to perform and provide arts education. The planned Union Town Center may be an effective location in the future.

Libraries

The Boone County Public Library is an important educational asset that provides educational resources and services to the community as a whole. The library has grown to serve the needs of a rapidly growing county. Starting in a temporary storefront in Florence in 1973, the library now includes six locations in Burlington, Florence, Hebron, Petersburg, Union, and Walton that house a collection of over 483,000 books, videos, DVDs, audiotapes, and CDs. The library is a presence in the community and this is reflected in the 4,786 programs, ranging from lectures to concerts, which were attended by over 73,559 people in 2011. The library also provides training classes, job fairs, and coordinates with public, private, and post-secondary schools and home schooling parents to provide programming and educational services.

Since the [2005 Comprehensive Plan](#), branches have opened in Petersburg and Burlington, and a remodeling has been completed at the Scheben Branch. The Main Library in Burlington has been noted for its architecture and modern amenities such as study rooms and enhanced children's and teen areas. The Main Library is also home to the Local History Department which serves as the county hub for genealogical and historical research.

The Library District is poised to continue to grow and tailor its services to the public as Boone County grows. The Library District has purchased land in Hebron and Walton for the eventual replacement of the branches currently serving those communities. In planning for the future, existing services as well as future services and programs will guide the development of facilities. As the demands of the 21st Century Boone County change so too do the services that the Library District provides.

HEALTH CARE SERVICES

St. Elizabeth Florence is currently the only hospital in Boone County. This hospital is located in Florence on Turfway Road, with access to I-71/75. The hospital is a full service facility with 177 beds and a 24-hour full service emergency unit. The hospital added 36,000 square feet improving the emergency and outpatient services. Major expansions, including medical office facilities, will be needed in the future. The county's medical services are presently well concentrated in the urbanized areas. As the county's residential growth extends to the

south and west, the placement of additional medical services will have to reflect this growth pattern. There is the potential to expand public health care facilities due to the growing population and business expansion.

The **Boone County Health Center** was previously located on Woodspoint Drive. However, a larger facility was constructed in 1988 on KY 18 in Florence to replace the Woodspoint center. The former Health Center building is now used for a Senior Citizens organization and Adult Learning Center. The Griesser Farm development on KY 18 west of Burlington is proposed to contain an assisted living component in addition to the residential development.

The following are private medical care facilities in the Florence area:

- **Bridgepoint Care and Rehabilitation Center**, located on Woodspoint Drive, is a 150 bed facility with 100 intermediate care and 50 skilled care beds.
- **Florence Park Care Center**, located on Burlington Pike in Florence, is a 150 bed facility with 120 intermediate care and 30 skilled care beds, as well as 200 assisted living.
- **Gateway Rehabilitation Center**, located on Merchants Street in Florence, contains 40 private rooms, overnight family accommodations, and an outpatient center. It provides several types of therapy, radiology and lab services.

PUBLIC COMMUNICATIONS

The written medium involves one weekly newspaper (the Boone County/Florence Recorder) and one daily newspaper (Kentucky/Cincinnati Enquirer). The visual medium involves several television stations located in Cincinnati and cable television. In addition, Insight Communications provides cable TV in Boone County.

Wireless Communications

In 1998 the Boone County Planning Commission conducted a study on cellular towers, the regulations concerning them, and actions that Boone County could take to address impacts. The purpose of this study was to provide an informative document on the wireless communication industry, investigate the effects of this technology on Boone County, and develop a stance on how to regulate this industry while reaping the benefits of this technology.

This study and Kentucky Revised Statutes (KRS) 100.985 - 100.987 are the foundation of Section 3197 of the Boone County Zoning Regulations ("Regulations for Wireless Communication Facilities and Services"). Among other things, Section 3197 of the Zoning Regulations defines the application process and procedures for building new wireless communications facilities, provides design guidelines for new towers, and addresses the co-location of antennas on existing structures.

The Boone County Planning Commission has noticed a trend over the last several years that most of the new tower applications are for taller towers located in rural/agricultural areas. Largely, wireless providers are co-locating on existing towers and other structures near our Interstate highways and city centers and are looking at providing contiguous coverage along our rural highways and underserved residential areas. Boone County Planning Commission staff believes this trend will continue as more citizens look to buy cell phones and I-phones and cancel their conventional land line services. As a result of these trends, Boone County Planning Commission staff is beginning to study the design guidelines found in Section 3197 of the Zoning Regulations and may be recommending changes to minimize the siting impacts of these taller towers on Boone County's citizens. Providing wireless communications throughout the county is essential for personal use and, more importantly, public safety.

WASTE MANAGEMENT

Garbage Collection

Garbage collection is currently contracted out to private firms. Waste collection in Boone County is handled by three companies: Rumpke Waste Services, CSI Waste Services, and Bavarian Waste Services. Bavarian owns

and operates a landfill on McCoy Fork Road on the west side of I-71 just west of Walton, KY. The 660 acre landfill has a site life that extends to the year 2052.

Recycling

Boone County may have reached the point in its development where large scale recycling of garbage is feasible, including curbside recycling service. Large scale recycling is a key component of the concept of sustainability, which is addressed in detail in the Economy Element. This plan supports recycling of materials for not only residential uses, but commercial and industrial as well. Recycling should be treated as an important part in a complete Solid Waste Plan for Boone County and surrounding communities. Recycling efforts need to also include a continual search for economic markets for materials. A well known innovative example of recycling has been instituted in Curitiba, Brazil. Residents exchange recycled goods for bus fare vouchers. Other methods of promoting recycling as a central function in the community would include convenient facilities for composting. Recycling drop-off sites in Boone County are handled by Boone County Public Works Department and are offered for free. Boxes are located in several different locations and at schools throughout the county.

CONCLUSION

Public officials are finding nationwide that in most communities revenues are not keeping pace with resources needed to provide services. In the suburbs, this is largely a result of the inefficient pattern of low density development, while in the central cities this is a result of losing resources to the suburbs. This is also why such controversial topics like development moratoriums and impact fees have received nationwide attention over the last several years.

It is well known that currently Boone County has low tax rates compared to more urbanized communities in the metropolitan area. Boone County Fiscal Court's budget situation has been positive from past growth in revenue from commercial and industrial development. To accommodate rapid growth Boone County Government needs to determine whether or not taxes and other revenues adequately pay for public services and identify the deficiencies as the first steps in preparing an effective Capital Improvement Plan. The costs of providing public facilities and services for different suburban land uses should be determined. Property values can also change where public improvements have been made, and some development directly results from publically-provided infrastructure. With a slow growth period, there is a chance for the public sector to catch up on some infrastructure needs.

TRANSPORTATION

INTRODUCTION

The Transportation Element reflects the changing context of Boone County's transportation network. The text of this element is broken down into three sections: 1. Regional Transportation System (Boone County as an integral part of the Cincinnati metropolitan region), 2. Boone County Transportation Plan, and 3. Transportation/Land Use Connection.

1. REGIONAL TRANSPORTATION SYSTEM

The Region - The first Transportation Goal emphasizes that the transportation network of the county is a significant component of a regional, metropolitan transportation system. As shown in **Figure 11.1**, this Greater Cincinnati metropolitan region includes eight counties in three states: Ohio, Kentucky, and Indiana. The responsibility for transportation planning within this region rests with the Ohio-Kentucky-Indiana Regional Council of Governments (OKI).

OKI's Regional Transportation Plan provides a good history and overview of the transportation network for this region:

Transportation facilities have always been important to this region's growth and prosperity. In the late 1700's, the Ohio River supported Cincinnati's emergence as the gateway to the West, a point of convergence for people and goods. In the 1800's, the Miami and Erie Canal and the railroad system established the Cincinnati area as a commercial and transportation center.

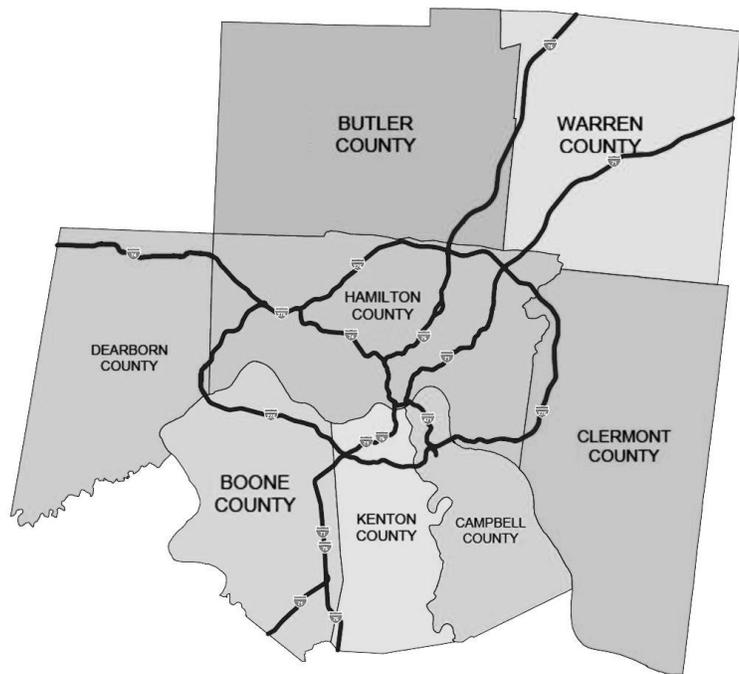


Figure 11.1 - Greater Cincinnati metropolitan area

Today, the region's transportation network includes five interstate highways, an international airport, and a web of arterial highways. As one of the most heavily multi-modal networks in the country, the region's transportation system is invaluable both to the health of the region's economy and the mobility of the population.

Boone County is an integral element of the regional transportation system because three of the region's five interstate highways traverse the county, the international airport is located in the county, and the Ohio River borders over half of the county. Boone County's intergovernmental connections with the regional, metropolitan transportation system are maintained through our Metropolitan Planning Organization (MPO), which is OKI, and the Kentucky Transportation Cabinet (KTC).

OKI & Regional Transportation Planning - OKI has been the designated MPO for the Cincinnati metropolitan region since 1964. According to the Federal Aid Highway Act of 1992 and subsequent amendments, OKI has had statutory responsibility for planning and coordinating all aspects of transportation planning on behalf of local governments within its region, with the cooperation of the Ohio Department of Transportation (ODOT) and the Kentucky Transportation Cabinet (KTC).

Since this region qualifies as an urban area (over 50,000 population), OKI has had to maintain a comprehensive planning process for transportation improvement projects. This process includes developing and periodically updating a long-range, regional transportation plan and developing a prioritized capital projects list (Transportation Improvement Plan-TIP). OKI also maintains data management (e.g. population projects, traffic counts) and other planning services (e.g. access management) that assist local governments' transportation planning endeavors specifically, and generally, the overall regional planning efforts.

The Regional Transportation Plan addresses and makes recommendations for what the transportation needs of the region will be in the future (the 2004 adopted plan forecasts to the year 2030). Work on the 2040 Regional Transportation Plan Update has recently been started. The recommendations of the long range plan and other capital projects are prioritized into a four-year schedule called the TIP-Transportation Improvement Plan. The TIP is the region's plan for major transportation improvements in the metropolitan region. It is the mechanism through which local governments prioritize specific projects that will receive federal funding. When the TIP receives final approval by OKI's Executive Committee, it then is recognized as the policy document that directs transportation improvements in the OKI region.

Increased Roadway Capacity, Increased Automobile Travel, and Air Quality - The primary objective of transportation planning in most metropolitan regions, including the OKI region, from the early 1960s to the present was the increase in mobility of automobile drivers by increasing roadway capacity. This was done by either improving roadways or building new roadways. While mobility of automobile drivers seemingly increased during this period, the increase in air pollution problems caused by increased automobile travel was undeniable in most metropolitan areas, including the Cincinnati region.

Since the 1970's, the federal government has attempted to improve air quality in metropolitan regions with the Clean Air Acts, but with little success. This legislation mandated auto manufacturers lower the emissions produced by the automobiles they manufacture. However, during this same period, total vehicles miles traveled (VMT) by automobile increased tremendously. Most of this increase in VMT was caused by individuals driving alone, which defines single occupant vehicles (SOVs). Undoubtedly, much of the increase in VMT is attributed to longer daily commutes to work.

The increase in VMT was greatly facilitated by the completion of the interstate highway system in the 1970's, as evidenced in this region by the completion of I-275, the circle highway around Cincinnati. The highway system also further encouraged low-density suburban land development.

Table 11.1 shows the national trend of increasing automobile travel has recently begun to decrease according to the U.S. Department of Transportation's *2009 Nationwide Household Transportation Survey*. Comparable data is not available for the Cincinnati metropolitan region. However, all indications suggest that the travel trends in our region are similar.

Nationally, a 2009 survey conducted by the Research and Innovative Technology Administration (RITA) Bureau of Transportation Statistics showed that 88 percent of all daily trips take place in personal vehicles. That number has remained basically the same since 1990. Furthermore, 91 percent of commuting trips occur in personal vehicles. Americans average 3.8 trips per day per person at a distance of around 36 miles per day. A third of those trips were for family errands; another third for social or recreation; and the remainder were for other purposes including commuting trips. In addition, the average American spends 55 minutes a day driving a distance of 29 miles per day. The average trip distance is 9.7 miles. 57 percent drive cars; 21 percent drive vans or SUVs; 19 percent drive light trucks.

Table 11.1 – NATIONAL TRAVEL TRENDS

Data per Household	1969	1977	1983	1990	1995	2001	2009
Daily VMT	34.01	32.97	32.16	49.76	57.25	58.05	54.38
Annual VMT	12,414	12,035	11,739	18,161	20,895	21,187	19,850
Daily Vehicle Trips	3.83	3.98	4.07	5.69	6.34	5.95	5.66
Annual Vehicle Trips	1,396	1,443	1,486	2,077	2,321	2,172	2,066
Number of Vehicles	1.16	1.59	1.68	1.77	1.78	1.89	1.86

Source: U.S. Department of Transportation. 2009 Nationwide Household Transportation Survey.

Dispersed Suburban Development and Congestion - Low-density land development began to occur throughout the country with the migration of World War II veterans and their young families to the sub-divisions of single family homes built during the 1950's and 1960's. It continued during the 1960's and 1970's with the movement of commercial uses to the suburbs and the development of large regional shopping centers. Also, during the 1970's and 1980's, and continuing to the present, many manufacturing, office, and other uses relocated in the suburban areas. Boone County has been, and continues to be, impacted by all of these phases of suburban land development.

This dispersed, low-density pattern of suburban development, coupled with limited transit services, necessitates travel by the automobile in Boone County. Like other growing suburban areas of metropolitan regions, Boone County has also experienced acute and chronic traffic congestion on its interstate highways and primary arterial roadways. Of course, this congestion has contributed to the air pollution problems of the overall OKI region.

A solution, during the past few decades, for alleviating this congestion has been to add another lane to the roadways or build new roads, thus "increasing capacity". However, the dilemma has been that when capacity was increased congestion was relieved for only a short time period before returning at even greater levels. The multiple improvements to KY 18 in the Mall Road and Houston Road area exemplify this "congestion, increased capacity, and return to congestion effect" in Boone County.

To address this phenomenon, Congress decided in the early 1990's to take a different tact in dealing with metropolitan air pollution and traffic congestion problems. It decided to link its clean air legislation with its transportation legislation. Now all future transportation projects must conform to air quality standards and contribute in reducing motor vehicle emissions, thereby improving air quality. Increasing mobility, in the future, will be realized by improving mass transit and pedestrian options and improving capacity in the existing roadway system.

The CAAA, ISTEA, TEA-21 And Their Impacts - The Clean Air Act Amendments of 1990 (CAAA), the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Efficiency Act of the Twenty-first Century of 1998 (TEA-21) were the legislative acts that Congress undertook to assure that increasing mobility in the future in metropolitan regions would not have a concurrent, detrimental impact on air quality. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) is the most recent law, enacted in 2005. OKI's 1993 Regional Transportation Plan explained the impact of the CAAA and the ISTEA on transportation planning as follows:

For transportation planning, the CAAA is a significant driving force. The CAAA recasts transportation planning as a process for improving air quality as well as mobility. It challenges transportation officials to find ways to reduce emissions from motor vehicles, to increase use of alternatives to single occupant vehicles (SOVs), and to reduce SOV travel in order to help achieve air quality standards by 1996. From now on, the region's transportation plans, programs, and projects must conform to State Implementation Plans (SIPs) for air quality. For highway projects involving new or expanded capacity, federal funds will not be available unless the proposed project will result in an overall reduction of automobile emissions. The reconstruction of U.S. 42 in 2004 is an example.

The CAAA's impact on the OKI region results from the region's ozone problems. Ozone is one of the pollutants for which the EPA has defined national ambient air quality standards (NAAQS). Based on health impacts, the NAAQS specify allowable pollutant concentrations and exposure limitations. Although ozone is beneficial in the upper atmosphere, it is harmful to breathe near ground level.

Ozone, also known as smog, is not emitted directly into the atmosphere but is formed when precursor emissions--volatile organic compounds (VOCs) and oxides of nitrogen--react in the presence of sunlight. Nearly half of the VOCs from man-made emissions are from mobile sources (primarily vehicle emissions from cars, trucks, and buses). VOCs are also emitted from stationary sources (primarily industries) and area sources (individually insignificant sources that have a cumulative impact, e.g., lawn mowers, consumer solvent use, farm equipment).

The OKI region was one of 96 urban areas in the country identified as not meeting ozone standards. The severity of each area's ozone problems is the basis for its classification as marginal, moderate, serious, severe, or extreme. Cincinnati was identified as a moderate non-attainment area. Areas with more serious problems are required to take more numerous and more stringent actions to attain the NAAQS but have more time to do so than areas with less severe problems. Any area that failed to meet the NAAQS by its 1996 deadline was supposed to be bumped into a more stringent classification with stricter compliance requirements. In December 2004 the area was still listed as a non-attainment area.

The ISTEA, and later TEA-21, replaces the Federal Aid Highway Act of 1962 and all of its subsequent amendments. The primary goal of this law seeks to develop a national intermodal transportation system with logical interconnections between different transportation modes (i.e. light-rail connections with major airports). The law also promotes the secondary goals of simultaneously reducing energy consumption and air pollution.

OKI's regional transportation plan further defines the new direction of this legislation. "ISTEA shifts planning emphasis away from expanding highways and toward constructing a multimodal system in which transit, rideshare, bicycle and pedestrian facilities can offer a viable alternative to single-occupant vehicle travel. It calls for transportation planning to reduce travel demand rather than just manage travel demand; it addresses the transportation system's performance as well as its capacity."

Another important change with ISTEA and TEA-21 is that the decision-making authority for projects is shifted away from the federal government to the states and localities. Coupled with this change is an emphasis on planning. In urban areas, the Metropolitan Planning Organizations (MPOs) and the state transportation agencies both must develop long-range plans and three-year plans (or TIPs) which identify funding for the projects.

Metropolitan Planning Organizations (MPOs), such as OKI, have been given increased influence for deciding how federal dollars will be spent in their regions. According to OKI, the long range planning process now includes attention to land use, travel demand and congestion management, intermodal connectivity, methods to improve transit service, and expanded travel by other modes.

OKI's Regional Transportation Plan - The Cincinnati region's Metropolitan Planning Organization (MPO) the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) updated the Regional Transportation Plan in 2008. The plan is required to be updated every three years. In May 2011 work began on the update to this plan. The Clean Air Act Amendments (CAAA) and the Transportation Efficiency Act (TEA-21) defined the context and direction for the plan. Some actions arising from these planning efforts include:

- use of alternative fuels;
- expansion of transit systems to include light rail and commuter rail, in addition to bus system improvements;
- "smart" highway surveillance systems to reduce delay, vehicle emissions and accidents;
- projects to promote bicycle and pedestrian travel that reduces vehicle trips;
- travel demand strategies such as employee commuting programs;
- corridor studies to further define recommended actions; and
- regional committees to deal with long range issues of land use, financing, and transit expansion.

The Act also required the formation of the Commission on Land Use, Commission on Transit Institutional Restructuring, and the Commission on Transportation Financing.

Implementation of the Regional Transportation Plan will have dramatic, long-term impacts on the residents of Boone County. The greatest of these will involve changes in future land-use patterns necessitating different development approaches. OKI's strategy for future land use development calls for more compact development that includes well-planned, attractive, and dense residential areas, with various multi-family types and smaller lot sizes for detached houses.

This plan also suggests a mixture of land uses that would include neighborhood retail, public uses (i.e. libraries, post offices, parks), and day care. These compact developments would be served by extensive bicycle and pedestrian facilities, thereby reducing the need for many local automobile trips. Also, these developments would have the appropriately high densities that are needed to enable efficient transit service, thus enabling the residents to take transit for the commuting trips to their employment.

The transition to this more compact land use pattern would involve changing municipal zoning and subdivision codes to allow mixed-use and encouraging consistent development of pedestrian and bicycle facilities. OKI's strategy for implementing this change in land development is presented below in the discussion on the Commission on Land Use.

The Commission on Land Use - The Commission on Land Use, which formed during 2000, includes representatives from local and county planning commissions, City of Cincinnati, the OKI Board of Trustees, and others possessing interest in land-use and transportation matters. OKI foresees that the recommendations of the Commission on Land Use should become the policies that would promote the compact land use patterns that foster travel by transit, bicycle or walking. These policies would then be reviewed by the various counties and municipalities for possible use in their zoning and subdivision regulations.

In 2002, the Commission developed a regional vision through extensive public involvement. It identified 28 critical challenges or fundamental policy concerns. These were organized into six general categories: transportation, public facilities and services, natural resources and open space, housing, economic development, and land use. A draft report, describing details of these issues has been issued in 2005, which indicates that OKI will provide and encourage adoption of model ordinances, processes, and techniques to local communities that further the Commission's mission and vision. OKI has no authority to implement policies at a local level, but can affect future transportation projects.

The future pattern of land-use should involve developing at a higher density with a mix of residential, commercial, public and industrial uses. Development will be served by multi-modal and inter-modal transportation facilities. Good pedestrian and bicycle access to transit facilities should become the norm. A better description of this more compact land use pattern will be presented in the final section of this element-LAND-USE/TRANSPORTATION CONNECTION.

The Cincinnati/Northern Kentucky International Airport - The Cincinnati/Northern Kentucky International Airport (CVG) got its start in the early 1940s as a training field for military pilots. As World War II drew to a close, the military relinquished control to the Airport Board in neighboring Kenton County, which sought to create a civilian airport on the land in Boone County. The first commercial flight, an American DC3 – landed at CVG in January 1947. From 1947 CVG continued to grow and expand to serve the local Region. Delta Air Lines selected CVG as its Hub in the 1980s and continued to increase service through 2005, growing CVG to be its second largest hub. Additionally, DHL chose CVG as its home for its North American Hub in the 1980s.

The continued growth and expansion of CVG over the years has required the relocation and closure of roads, as well as the removal of residential and business structures around the airport for construction. During this growth period, the Airport conducted a series of Master Plan Studies and FAR Part 150 Noise Compatibility Studies to balance the operational needs of the Airport with the surrounding community. **Table 11.1** provides a snapshot of these studies through 2005 and some of the major projects implemented from each study.

The 2005 Master Plan recommended two alternatives. One alternative involves making improvements and/or changing operational procedures to existing runways and taxiways to increase airfield capacity. The second set of alternatives includes runway construction. The two main alternatives that appear to meet the future capacity demand forecast include a potential north-south runway located on the east side of the airport, and an east-west runway located south of the existing east-west runway in the area of KY 237 near Burlington. If the airport does not meet or exceed capacity projections during the planning horizon, then it may choose to not build the runway or defer such a decision to a later planning horizon. Either of these alternatives will significantly affect industrial, residential, commercial, public, and recreation land uses, as well as result in the re-routing of significant roadways. In the east-west alternative, seven residential communities would have to be acquired. At this time, no preferred alternative has been selected. Thus, this issue must be addressed in the 2010 Update of the Boone County Comprehensive Plan as well as the next Airport Master Plan Update. According to county records, the Airport owned 7,200 acres in 2011. The Airport needs to consider the long term impact on these areas for the benefit of Boone County and not just for the region.

Table 11.1 - Airport Studies

Study	Major Projects
1956 Master Plan Study	Extended Runway 18/36 (original north/south runway) to 8,600 feet; Closed Runway 13/31.
1964 Master Plan Study	Extended Runway 18/36 to 9,500 feet; Development plans for a new terminal expansion began.
1973 Master Plan Study	New Terminal expansion opened; Runway 9R/27L and 18/36 were reconstructed.
1984 Master Plan Study	New north/south runway 18L/36R was constructed and opened in January 1991; Runway 9L/27R was closed; Terminal expansion continued.
1990 FAR Part 150 Noise Compatibility Study	Implemented daytime and nighttime noise abatement operational flight procedures; Implemented land acquisition and sound insulation programs in noise impacted area (noise levels greater than 65 DNL) around the airport.
1994 Master Plan Study	Runway 9/27 extended to 10,000 feet in 1994 and to 12,000 feet in 2004; Runway 18R/36L extended to 11,000 feet; New Runway 17/35 (now named 18R/36L) opened December 2005.
1998 FAR Part 150 Noise Compatibility Study	Continued daytime and nighttime noise abatement operational flight procedures and land use programs.
2004 FAR Part 150 Noise Compatibility Study	Continued daytime and nighttime noise abatement operational flight procedures and land use program.
2005 Master Plan Study	New Terminal 3 Security Screening Building constructed and opened in 2009; Identified 2 future Runway Alternatives.

Figure 11.2 and **Figure 11.3** depict the 2004 and 2010 approved noise exposure maps and noise contours approved in CVG's 2004 Noise Compatibility Study. These contours are currently in effect. As described in the Housing Element, new residential development should only be permitted in the 65 DNL noise contours if structures are designed to be compatible with noise impacts.

The previous Master Plan Update, prepared in 2005, was based upon conditions known at the time and laid the foundation for future development at CVG through 2025. Since the completion of the 2005 Master Plan, the U.S. aviation industry has experienced unpredicted changes, such as the worst economic downturn since the Great Depression, record high fuel prices, multiple network carriers reorganizing under Chapter 11 bankruptcy protection, legacy airline consolidation, increased security measures and processes, advancements in technology of airline check-in procedures, and the evolution of airline fleets.

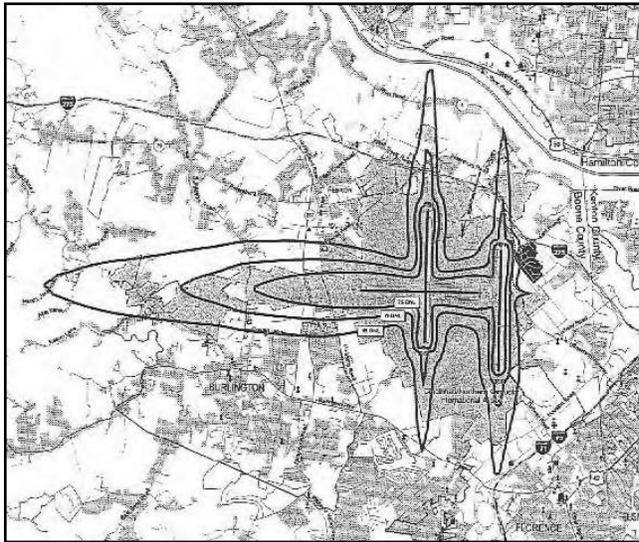


Figure 11.2 - 2004 Noise Contours

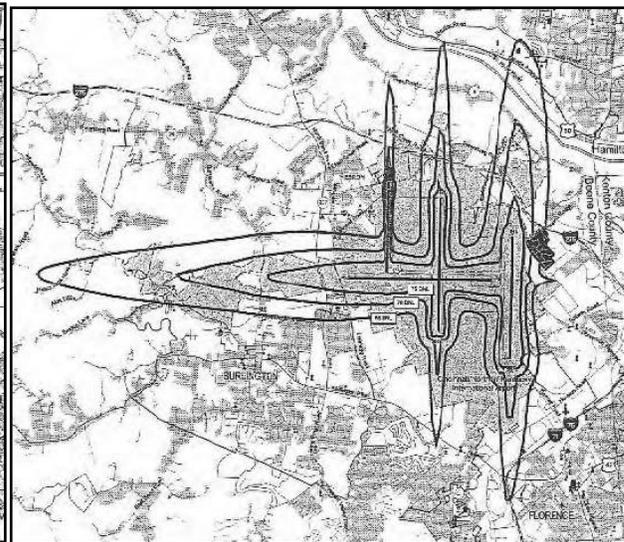


Figure 11.3 - 2010 Noise Contours

The 2010 Master Plan Study Update is critical to the future operation and development of the Airport. The Airport is the largest landowner and one of the largest employers in Boone County. It also has regional significance for providing air travel to businesses and consumers in Kentucky, Ohio, and Indiana. Coordinating planning efforts between the Airport, the Planning Commission, and the legislative units is important to explore business opportunities, infrastructure expansion (e.g. roads and utilities), and land use compatibility issues in order to remain competitive in the global economy and to retain an efficient community transportation system.

These events have resulted in a significant change in current and anticipated demand and the future operational model at CVG. In response to these changes, CVG is in the process of conducting a Master Plan Study Update that is expected to be completed in 2012. The 2012 Master Plan Study Update will consider the possible impacts of a potential operational transition through 2035 from a dominant single carrier-large hub airport to a competitive multi-carrier environment. It will also identify and evaluate strategic business opportunities in an ever changing economic environment through 2035. The information identified through the master planning process will also ensure the continued operation of a safe, efficient, and environmentally compatible airport. The Master Plan will recommend cost-effective improvements in accordance with FAA standards, taking into consideration the local, regional, national and international dynamic nature of the aviation industry. The study involves a series of stakeholder meetings to engage the community in the master planning process. Updated information and feedback will be available regularly online at www.cvgairport.com/plan during the process.

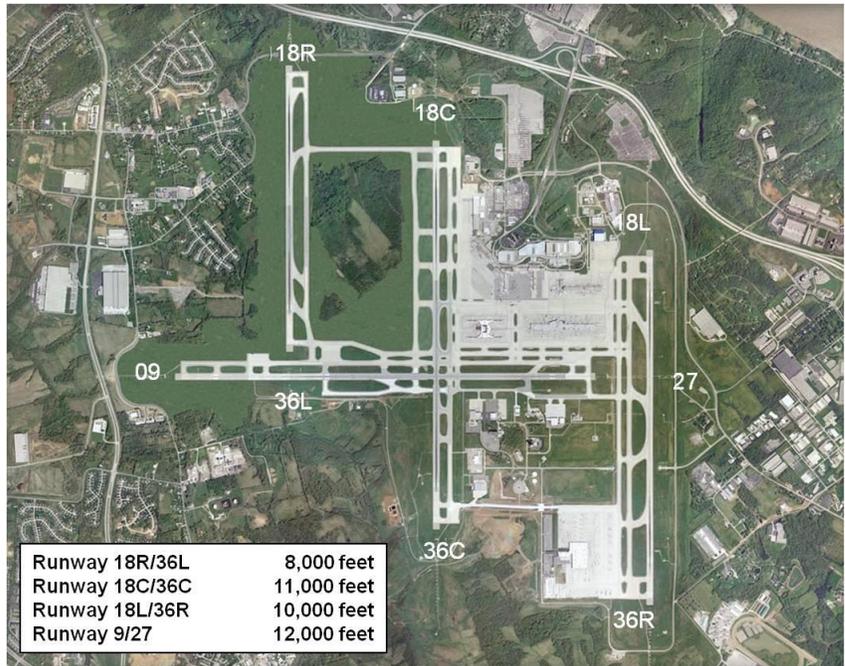
Currently, CVG is the Tri-State Area's primary airport and one of the nation's major centers for transportation by air. CVG continues to distinguish itself, and serve a major role in the aviation system, as the only dual hub (passengers and cargo) airport for the region - providing a higher level of air service for local travelers and businesses than the surrounding airports. Additionally, CVG is the only airport in Ohio, Kentucky, and Indiana that provides non-stop trans-oceanic service connecting the Tri-State to the World. CVG's airfield is comprised of three north/south runways and an east/west runway (**Figure 11.4**). CVG currently offers approximately 191 daily departures to 53 non-stop cities (compared to 670 daily departures in 2005), including non-stop international service to Paris, Toronto, and Cancun. CVG is currently served by seven carriers including, Air Canada, American Airlines, Continental Airlines, Delta Air Lines (including regional affiliates), United Airlines, USAirways, DHL, and USA3000.

Figure 11.4 - CVG Runways, 2011

Railroad - Rail service in Boone County is provided by two rail lines, the Norfolk and Southern Railroad and the CSX Railroad. Only the eastern portion of the county, specifically the area east of I-75/71, has rail service. The tracks located in the county do provide service to all points in the United States.

In addition to individual companies, freight rail service is provided to three industrial parks in Boone County: Northern Kentucky, Richwood, and Walton. The railroad companies can provide design services to individual users needing rail service. In fact, the Southern Railway participated in the design of the Walton Industrial Park.

At present, the railroads do not expect to expand the railroad network to other parts of Boone County. The topography and expense involved make such an undertaking very unlikely. However, it is expected that new users will be adequately served by the existing tracks. The presence of two major interstate highways, a federal highway and two rail lines in the same corridor create a unique and favorable situation for future industrial areas along the eastern edge of Boone County.



River Transport - The Ohio River comprises approximately one half of Boone County's border. As one of the major rivers in the United States, the Ohio River is part of a vast river transportation network. The 40 mile river shoreline of Boone County has historically been under-utilized by river traffic for docking or storage.

At one time there were three ferry crossings in Boone County. The Anderson Ferry, in the Constance area, is the only vehicular ferry still operating in the county.

The Boone County river shoreline presently lacks the appropriate infrastructure of roadways and rail service needed to accommodate a large river port facility. However, Boone County's Ohio River shoreline is viewed as an undeveloped resource for the county. Therefore, it shall in the future be studied to ascertain its potential for various land uses such as business, residential, resort and port operations, and to determine the needed surface transportation connections to such uses.

2. BOONE COUNTY TRANSPORTATION PLAN

The Boone County Transportation Plan was first adopted in 1996, as recommended by the 1995 Boone County Comprehensive Plan. It constituted a multi-modal transportation plan for the year 2020 with a thoroughfare plan component and a long range Transportation Improvement Program (TIP) component. The transportation plan has served as a guide for long range transportation improvement decisions. The thoroughfare component has assisted in the preservation of rights-of-way and corridors for transportation facilities and established a consistent framework for the design of new transportation facilities. The Transportation Plan was updated in 2006, with a planning horizon of 2030.

The Boone County Transportation Plan views Boone County as an integral part of the Cincinnati Metropolitan region, while also recognizing it as a dynamic community in its own right. It includes a detailed automobile/truck, bicycle and pedestrian thoroughfare plan, and a transit plan. The transportation plan is intended as a step toward developing a formal Capital Improvement Plan (CIP) for the four legislative units in Boone County. Although the

preparation of the Boone County Transportation Plan was recommended in the Goals and Objectives of the Boone County Comprehensive Plan, it is a separate document.

The Transportation Plan is not an amendment to the Comprehensive Plan. Rather, it is intended to be one of many planning tools utilized during the review of applications submitted for development in the county. The plan informs all persons, public and private, of the anticipated road, transit, bike, and pedestrian improvements that will be necessary to accommodate the growth expected through the planning horizon. This plan has helped the county and cities to identify project funding.

The preparation of the 2006 Transportation Plan was guided by a stakeholders group that included many public agencies and citizens. The project was prepared by a consultant, and administered by OKI on behalf of the Boone County Fiscal Court. A project development web site was created to encourage maximum public involvement. The plan was prepared to enable the county to be proactive in accommodating future growth and development. The goals of the plan are:

1. Develop a transportation system plan that is compatible with existing and future land use.
2. Improve the existing system through safety and operational improvements.
3. Identify funding shortfalls and develop strategies to address these shortfalls.
4. Recommend policy changes that will better enable the county to respond to development pressures.

The plan is comprised of two components: 1) a short term Operational Improvement Plan that involves relatively low-cost, easily-implemented safety and operational improvements; and 2) a prioritized long range Transportation Plan consistent of major projects and strategies.

Planned roadway improvements in the KTC six year plan should be related to the future land use map. The intention is to better correlate development and infrastructure. The future planned improvements are included with the map to show how the future land use plan for certain areas can be supported by roadway infrastructure. The Future Land Use Map is to be consulted for land use recommendations, and does not constitute an official transportation map, nor commit to the location and timing of improvements.

The Plan - The 2006 update of the Boone County Transportation Plan includes transit and bike components, and incorporates pedestrian recommendations. The Transit Authority of Northern Kentucky (TANK) maintains a Strategic Plan and periodically evaluates specific corridors for transit needs. Part of the TANK Plan recommends that the organization work with local and regional planning agencies to promote transit sensitive land use and Smart Growth Initiatives.

The 2006 Transportation Plan also updated the capacity needs and recommendations that the roadway system must have to handle existing and future traffic volumes. Similar to the 1996 Transportation Plan, a computer model has provided valuable information about future needs. The Stakeholders Group made qualitative changes based upon "real-world" knowledge in arriving at a final list of needed projects. The 2006 update of the plan considered the constrained financial condition of the State of Kentucky, and the limited roadway improvement funding that existed for the short term at that time. Available funding is even more limited in 2011.

TANK Transit Network Study (2006) – The final report of this plan, completed in mid-2006, contains several recommendations relevant to Boone County. The plan recommends the development of two Major Transitways – one along the I-75/71 corridor and another on the I-471 corridor. The I-75/71 Transitway would include new hubs in Florence and at CVG, which would connect via HOV or Bus Rapid Transit (BRT) lanes to TANK's existing Covington Transit Center. Several potential locations for the proposed transit hub at CVG are mentioned generally in the plan, but specific sites are not identified. Conversely, since the Transit Network Study was adopted, TANK has acquired property in the vicinity of Height Blvd. and Mall Rd., presumably for the future development of Florence Transit Hub. The proposed Florence hub would result in modification of several existing bus routes that currently serve Florence, Burlington and Walton. Eventually, TANK envisions the Florence Hub as the western end of a Cross-Town transitway that would connect to the TANK hub in Kenton County and east to a hub at NKU.

KY Transportation Cabinet Six-Year Plan - The Six-Year Highway Plan is a bill enacted by the Kentucky state legislature to program funding for specific roadway improvements throughout the state. The plan schedules design, right-of-way acquisition, and construction money in phases for each roadway project. It is updated and re-enacted every two years by the Kentucky Transportation Cabinet. The plan is dependent upon the financial condition of the State of Kentucky. The following list is a summary of the major improvements presently planned for Boone County roadways as indicated in the Six-Year Plan:

- Reconstruction of Pleasant Valley Road (KY 237) from U.S. 42 to Rose Petal Drive – Construction underway.
- Reconstruction of Pleasant Valley Road (KY 237) from Rogers Lane to KY 18 – Construction 2012.
- Reconstruction of Pleasant Valley Road (KY 237) from Rogers Lane to Rose Petal Drive – Not funded.
- Construction of South Airfield Road – Construction underway.
- Phase II of Mall Road Reconstruction – Construction underway.
- Ramp from Mall Road to southbound I-71/75.
- Additional left turn lane from U.S. 42 to Mall Road – Construction 2013.
- Construction of Limaburg Access Road from North Bend Road (KY 237) to Limaburg Road – Construction 2011.
- Richwood Road (KY 338) Add turn lane from Paddock Drive to Triple Crown Blvd. – Construction 2011.
- Reconstruction of I-75/Mt. Zion Road Interchange – Construction 2015/2016.
- Reconstruction of I-75/Richwood Road Interchange – Construction 2016.
- Addition of lanes to I-75 from Mt. Zion Road to U.S. 42 – Construction 2013.
- Reconstruction of Mt. Zion Road from I-75 to Old Union Road – Not funded.
- Reconstruction of I-275/KY 20 Interchange at CVG Airport – Not funded.
- Reconstruction of U.S. 25 from Industrial Road to Richwood Road – Not funded.

In 2010, the State of Kentucky enacted a 2 year construction plan (2010-2012) with an update planned in 2012 for a 2 year cycle (2012-2014). Many projects are shown on paper to have funding intended for certain time periods, but the funding has not been available. As a result, the timing of proposed state and federal roadway projects is often estimated or unknown.

The need for long term maintenance and rehabilitation projects to be listed in the 6 year plan for planning and funding purposes is a subject that should be visited by KYTC. Currently, these projects are not as high visibility as new construction, and therefore often get pushed back leading to a costlier repair in the future.

The Boone County Fiscal Court has contributed funding toward the design of several State roadways including the Frogtown-Richwood Connector and North Bend Road. These actions generally make a project more attractive to the State as well as accelerate a project's schedule of implementation. Similarly, private land owners have in the past dedicated right-of-way needed for reconstruction or improvement of State roadways. Boone County also extended Conrad Lane to Idlewild Road and has begun construction of the South Airfield Road at KY 18 and the relocation of Oakbrook Drive. In order for Boone County to keep up with roadway improvement demands, a consortium of state and local government, developers, builders, and land owners is needed. The Cayton Road extension (Hopeful Church to Mall Road Connector) is a successful example. Local Project Agreements (LPA) represent cooperative funding agreements between KYTC and local governments.

Summary of the 2006 Boone County Transportation Plan Recommendations -

The following is a list of Operational Improvements that are intended to improve operating conditions and level of service on existing roadways. Details can be found in the 2006 Transportation Plan.

- US 42 at Rice Pike sight distance
- KY 18 & KY 237 intersection lane improvements
- US 42 & KY 237 intersection lane improvements
- KY 18 & KY 842 intersection lane improvements
- US 42 & Mall Rd intersection lane improvements
- KY 18 at KY 338 (Jefferson St) signal study
- KY 18 at Taylor Dr east signal study
- KY 18 Access Management study
- KY 18 speed study

- KY 18 at Merchants/Greenvview/Ridge signal coordination
- KY 237 and Gateway Blvd signal study - completed
- KY 237 and Conrad Ln lane improvements - completed
- KY 18 at Bankers St signal study
- KY 18 at Commerce Dr signal coordination
- US 42 & Ewing Blvd intersection pedestrian improvements
- US 42 at I-75 corridor study
- Mall Rd at Plaza Blvd signal study – completed as part of Mall Rd. reconstruction
- Mall Rd at Mall Rd Center geometrics – completed as part of Mall Rd. reconstruction

The following are Recommended Capacity Projects in the 2006 Transportation Plan. Some of these are new facilities, and others are improvements to existing facilities.

- Mall Rd extension to Woodspoint Dr.
- KY 338, Richwood Rd, widening
- I-75/US42 Interchange reconstruction
- I-75/Turfway Rd Interchange reconstruction
- Camp Ernst Rd reconstruction and extension at south end to U.S. 42
- I-275 Interchange at Graves/Williams Rd
- Graves Rd improvements
- KY 536, Hathaway Rd improvements
- Rice Pike improvements
- Hicks Pike improvements
- Frogtown Connector extension to Beaver Rd
- Frogtown Connector extension to Mt. Zion Rd
- Beaver Rd improvements connected to Camp Ernst extension system
- US 42 widening to I-71
- Frogtown Rd improvements
- Richwood Church Rd improvements
- Spiral Blvd to Cavalier Ct cross interstate connector
- KY 20 improvements west of Hebron
- Gunpowder Rd improvements
- I-75/I-71 interchange modifications and connector road to KY 16
- Bullittsville Rd improvements
- KY 212 Ohio River Bridge
- Maher Rd - Frogtown Connector
- Longbranch Rd improvements – partially implemented
- Mineola Pike improvements
- US 25 improvements from Richwood to Walton

Upcoming Roadway System Needs

The 2006 Boone County Transportation Plan contains a working list of current, capacity and safety traffic issues (hot spots) throughout Boone County that have been identified by the public, local governments, and the Boone County Planning Commission. This list is updated as conditions change and improvements are implemented.

The purpose of this list is to identify relatively low-cost improvements that can be made over time through various funding sources in order to keep the road system operating effectively and safely. They represent capacity and safety concerns where roadway improvements may not be planned, or where major roadway improvements are expected to be delayed. Improvements at these hot spots can help achieve an acceptable level of service on roadways for a period of time before major improvements are planned to occur. Some improvements may save money by helping to alleviate the need for future high cost projects. For the purposes of this list, bike and pedestrian improvements are mentioned if they can be evaluated for potential transportation benefits, or a traffic-related safety issue is identified.

This list represents a preliminary list of traffic needs, and is not prioritized. This list contains potential improvements in all four legislative units of Boone County, and can be used to support grant requests and other funding efforts. All potential projects need to be evaluated, approved, and coordinated with the Kentucky Transportation Cabinet, since most of the roadway facilities are state owned and maintained. Research will be needed on accident statistics and other detailed characteristics of the entries on this list.

Traffic Safety Committee

This committee meets regularly at Boone County Public Works and was formed as a way to share information between agencies about traffic safety problems, primarily on county roads. It is chaired by the County Engineer and also includes representatives from the Boone County Sheriff Department's Traffic Division, the Boone County Planning Commission, and the Public Works' Engineering and Sign Divisions. The majority of the Committee's work involves identifying and responding to localized issues including speeding, signage and signalization, parking, sight distances, crosswalks and maintenance issues. Solutions range from conducting speed studies, increasing enforcement, or adjusting speed limits to adding signage/signals, installing speed humps or turn lanes. Cases involving roads outside county jurisdiction are forwarded to the proper governing authority with the committee's recommended action.

While most of the problems brought to the committee's attention are localized, others occur throughout varying locations in the county. An example would be the increased auto use for transport to/from schools has resulted in circulation problems on campuses and surrounding road systems, especially at area high schools. Further, the expansion of school systems has increased bus traffic, generating concerns about bus safety on two lane roads across the county. School bus safety is of particular concern Kentucky 18 and Kentucky 20, which experience high volumes of gravel truck traffic throughout the day.

Street Connections

The Boone County Subdivision Regulations contain specific criteria for evaluating potential street connections between developments and adjoining property. The Boone County Planning Commission maintains conceptual maps of possible future street connections for public review as well as to assist the Planning Commission in the development plan review process. These are working maps that change as communities develop.

In addition to already planned improvements, certain geographic areas must develop both an interconnecting collector and local street system, as well as improved routes or connections to the interstate system. Some of these connections will be developer-built. The recommended connections listed here are in addition to existing GIS street connection layer information being used on a daily basis. Individual building lot access to these connector routes should not occur, and the connectors should be designed to serve side streets. Existing examples include Oakbrook Drive, Wetherington Boulevard, Fox Run Drive, Triple Crown Boulevard, Hanover Boulevard, Thornwilde Drive, and Steeplechase Drive. Some connections may need to be three lanes to adequately serve turning movements. These planned connections are based on future land use planning, and are important for the 2030 Future Land Use Plan to develop property. Details regarding the recommended connections can be seen in the 2005 Boone County Transportation Plan. A summary of the connections follows:

- Litton Lane to Graves Road
- Southpark Drive to Elijah's Creek
- KY 237 to Elijah's Creek Road to new KY 20 (south of I-275)
- KY 212 to new KY 20 (south of I-275)
- parallel road system on the north side of I-275 between Graves Road and the Petersburg Interchange and connection to Williams Rd.
- suitable street connections between Bullittsville Road, KY 20 and KY 237
- South Airfield Road to KY 237 at Conrad Lane
- north south route connecting KY 18, Idlewild Road, and KY 20 west of Burlington/Bullittsville area
- interconnection of the Long Branch/Camp Ernst Area with the Pleasant Valley Road area, including the ability to cross the Gunpowder Creek valley
- Pleasant Valley Road to Hopeful Church Road
- improvement of Rosetta Drive and connection to I-75 ramps at Mall Road or similar
- southbound entrance ramp from Mall Road to I -75

- north/south and east/west routes between Longbranch, Hathaway, Camp Ernst and U.S. 42
- north/south and east/west routes between Rice Pike, Hathaway, Big Bone, and Double Eagle/US 42
- Weaver to Beaver Connector implementation by phase
- Richwood Road to US 42 route parallel to Hicks Pike
- Richwood Road to Beaver Road
- Industrial collector system between Richwood Interchange and Chambers Road, parallel to US 25
- Chambers Road to KY 16
- Stephenson Mill Road to Verona Mudlick, parallel to I-71
- Mary Grubbs Hwy extension to Kenton County

The most critical issue is to determine a mechanism to enable the acquisition, or reservation of future rights-of-way to preserve routes for future roadway routes before development occurs in the alignment. Street connections are critical but must be designed to minimize driveway and pedestrian conflicts.

Pedestrian and bike improvements should be included in all the above projects, and should include a high profile pedestrian/bike path system entirely around the airport, and an Ohio River bank system.

Pedestrian/Bike Path Plans

The 2002 Florence Pedestrian and Bike Plan concentrates mainly on the City of Florence, but also addressed some extensions of the network into the county in the West Florence area. It was conducted under the guidance of a joint city/county coordinating committee. The plan recommends that the sidewalk system in the City of Florence be completed where voids exist, that a network of designated bike lanes and routes be established in the City, and that several bike paths and lanes extend into the county. The 2006 Boone County Transportation Plan contained a planned network for the unincorporated county, Union, and Walton areas. It is important to note that small sections of the network can be constructed in preparation for later connections or continuations. Where possible, bike and pedestrian facilities should be separate pavement from the roadway. However, there are instances where attached bike lanes are desired by the State Transportation Cabinet or needed for restricted right-of-way, or similar reasons. Since 2005, KYTC has begun to implement Practical Solutions design in its projects. In general this is a cost-saving approach, and includes the provision typically of separate multi-use paths on each side of new/reconstructed state highways instead of the previous design that included a bike lane, curb, and concrete sidewalk. This has the effect of not only saving cost, but provides bike and pedestrian-friendly amenities apart from the high speed vehicle movements. The general concern and design issue that needs to be addressed properly in these facilities is the safety of bike and pedestrian movements at driveways. These types of facilities are generally safer to use in residential corridors than in commercial corridors where driveway traffic is far greater.

Freight

According to the OKI Regional Freight Plan (2011), over 323 million tons of freight flow through the region annually. Approximately one-third of this total is inbound to major businesses such as Toyota and AK Steel. More than 80% of the region's freight moves by truck and I-75 is one of the country's heaviest truck corridors. Global carriers FedEx and DHL located in Boone County are the key players in freight at CVG, which itself is a significant factor in the movement of freight in the county and across the region. Freight also moves through the region via rail and the Ohio River. OKI believes that improvements in rail capacity by CSX and Norfolk Southern and the 2014 Panama Canal expansion will contribute to an increase of freight movement in the region to 487 tons/year by 2040. The region (as well as Boone County) is well served by having four available transportation modes for freight travel: road, rail, river, and air. However, OKI suggests that challenges relating especially to rail congestion and highway freight capacity should be addressed in order for the region to fully realize its potential in coming years.

In order for Boone County to capitalize on the forecasted increase in regional freight, the OKI Regional Freight Plan recommends a number of improvements. Chief among these is the CVG Air Cargo Park (Est: \$50 million), which is identified as an immediate need. Regarding road improvements, the plan recommends improving the I-

75 interchanges at Richwood Rd. (Est. \$22.7 million) and Mt. Zion Rd. (Est. \$19.7 million) in the near future and identifies the improvement of Gunpowder Road from US42 and Mt. Zion Rd (Est: \$21 million) as a long-term need. Concerning Ohio River freight, OKI recommends further study of a New Ohio River Crossing (Est. \$350,000) between the Carroll C. Cropper and Brent Spence bridges. This crossing would connect western Hamilton County with Boone County and, in conjunction with a Barge/Inland Waterway Study (Est. \$250,000), address the access issues which currently hinder the development of port facilities along the river in Boone County.

Funding Opportunities

Since many road improvements have been planned but not implemented because of funding difficulty, the 2006 Transportation Plan revised strategies for raising money. In addition, travel time, fuel, and money can be saved through telecommuting. Incentives should be considered to increase the amount of telecommuting that occurs, thereby lessening the amount of road improvement that is needed in some circumstances. The 2006 Transportation Plan examined gasoline tax, tolls, and/or electronic road pricing and similar ideas as partial solutions to the funding issues in its Financial Assessment section.

Since most of the major roadways in Boone County are state owned and maintained, Boone County continues to be dependent on state and federal money for improvements to these roads. Under TEA-21, the proposed improvements must be on the OKI region TIP to be funded. Because there are so many projects in need of funding statewide and region-wide, the OKI and KTC priorities for project funding usually do not address all the needs of the local community. In fact, there are not enough funds to cover these needs. Boone County has reached a threshold in its development that it no longer enjoys the provisions of the multi-lane facilities such as KY 18 and KY 237 being in place before the development occurs. The county is now faced with rapid development on a road system that is not designed to serve it, and without the future commitments on the TIP to build it. The following sections from the 1996 Boone County Transportation Plan present major types of funding opportunities that have been considered or may be considered in the future:

State and Local Funding Sources

State funds provide Kentucky with the means to construct, maintain, and repair state, county, and rural roads, many of which do not or cannot receive federal funding. One of the largest sources used for funding these roadway systems comes from the County Road Aid and Municipal Aid Program.

The following alternatives may be able to be utilized for additional funding for roadway improvements and maintenance. Several of these items are successfully used by other states to provide supplemental or additional funding for the roadway system.

Road Levies - On roads where state funding is not available, Boone County could consider establishing a county wide road levy. This levy, collected with county taxes would establish a fund that would provide monies for roadway improvement and maintenance.

Bonds and Gasoline Taxes - The State of Ohio has established a bond program, the State Capital Improvements Program (SCIP), and a Local Transportation Improvement Program (LTIP). The LTIP raises its funds through a one cent per gallon gasoline tax for roadway funding. Funds from the SCIP and LTIP are distributed by the Ohio Public Works Commission on the basis of population among the 19 public works districts in Ohio. In this area, Hamilton County, Ohio is a district in and of itself while Butler, Clermont and Warren Counties, Ohio are another one of 19 districts. The 2006 plan notes that a one cent per gallon local fuel tax in Boone County would generate nearly \$1 million of revenue annually. However, this funding mechanism is not currently allowed under Kentucky law and would require enabling legislation.

Traffic Impact Fees - Over the past several decades, many states have been working for alternative revenue sources for funding roadway improvements. As a result, a growing number of states are passing traffic impact fee enabling legislation that shifts the burden of paying for capital facilities to new development. Currently,

Lexington/Fayette County has an extraction fee that can be used for roads. Louisville Metropolitan Government established a similar fee. Impact fees are one-time fees charged to developers to help cover their projects' need for additional infrastructure capacity. The courts have developed three general guidelines to establish traffic impact fees. The first two items establish the impact fee. The third item provides a guideline for the allocation of impact fee revenues. The three guidelines are:

1. There is a reasonable relationship between new development and the need for new roads;
2. The amount of the fee is limited to the new development share of the cost of road improvements;
3. The development will benefit from the use of the fees to construct new roads.

Court decisions have established the following legal guidelines for impact fee development:

- Impact fees are to be predicated on the improvements made necessary by new growth, not improvements made necessary prior to the adoption of the impact fee.
- To minimize the risk of overcharging, an alternative method for calculating an individual's impact fee should be provided. This allows prospective feepayers to calculate a fee based upon the unique aspects of their projected impacts rather than using a standard fee schedule adopted by the government.
- A time limit should be placed on government's use of the impact fee. If the time limit has expired (typically six or seven years), the feepayer can request a refund from the government.
- It is desirable for districts or zones to be created in an impact fee system so that a geographical relationship between the fees paid and the improvements implemented can more readily be demonstrated.

For the implementation of a traffic impact fee, the following procedures are suggested:

Implementation Procedures and Issues - To adopt an equitable schedule of transportation impact fees, several key steps will have to be undertaken. These include:

1. **Develop a transportation plan.** Regardless of whether the impact fee system is to be an improvements-driven or a standards-based system, sound public policy argues that an understanding of transportation improvement needs be established. In an improvements-based system, this plan is essential for the calculation of the cost per trip. In a standards-driven system, the unit construction cost and capacity are natural outgrowths of this plan. This was accomplished in the 1996 Boone County Transportation Plan, and is being reinforced in the 2005 update of the plan.
2. **Adopt traffic demand variable rates.** Three demand variables are found in a standards-driven transportation impact fee: trip generation, trip length, and percentage of new trips. In an improvements-driven system, trip generation and, in some cases, percentage of new trips are considered. Most communities rely on the Institute of Transportation Engineers' (ITE's) Trip Generation Manual for trip generation data. When local trip generation data has been collected for specific land uses, this has been substituted for ITE data. Also, most ordinances allow the developer to provide land use-specific data if they believe either of the following to be true—the land use they are proposing is not represented in the impact fee schedule; or the land use they are proposing is in the impact fee schedule but the trip generation rate is inappropriate. Both trip length and percentage of new trips are typically based on traffic studies, and both can be challenged in an independent impact fee calculation.
3. **Establish accounting procedures.** Impact fees must be maintained in separate accounts from all other revenues, including individual districts' fees, if applicable. Typically, the funds are expended on a first-in, first-out basis. The use of impact fees for ineligible expenses, such as operations and maintenance, must be spent in District A or, in some rare instances, on a project outside District A that will benefit the feepayers in District A.

Tax Increment Financing Districts (TIF) - TIF is the process of allocating increases in property or wage tax revenues resulting from new development to a special fund to be used to pay for public improvements to an area as defined by an established boundary. It is currently permitted under Kentucky statutes. Districts may exist for a 20-year period, after which they sunset. The local government may issue bonds to finance public improvements prior to development in order to encourage upgrading of property in a certain area. The revenues that are

allocated to the special fund as redevelopment occurs can then be used to retire the debt established by the local government. This technique has been found to be an effective means of encouraging growth in a particular area without burdening the public with the excessive costs of new improvements. A tax increment financing district would utilize all increase in taxes from the new development for roadway improvements within that district. Boone County currently has two TIF districts established in the Richwood Area. To date, special wage assessments on new jobs in one district have generated \$250,000 that was put toward the extension of water to the site. As additional revenues are collected, the county will evaluate other projects, including contributions to the reconstruction of the I-75/338 (Richwood) interchange. Other TIF districts may be created in the future in order to attract development and create jobs.

Special Assessment District - A special assessment district is an area designed to enable revenue to be collected from those properties that will directly benefit from the specific public improvement. Special assessment districts are a tool that is authorized for use in all 50 states.

For example, a special assessment district can be established for the modification of a highway interchange that would encompass all surrounding properties which directly benefit from the increased safety and convenience that interchange would provide. Unlike a tax increment financing district that only takes the increase in property tax from property improvements, special assessment districts assess properties within an established district and impose a special tax over a predetermined length of time. Special assessment districts can be established for projects such as interchange reconstruction, new roads, road widening, and access improvements.

The legal basis of special assessment districts is the taxing power of the governmental entity. However, special assessments are not taxes; they are a shifting of improvement costs to a relatively small group of property owners in return for publicly constructed improvements that would directly benefit their property. Most states have procedures for implementing special assessment districts which are established in the enabling legislation.

Issues to research when establishing a special assessment district boundary are:

- The district boundaries should be established such that the proposed improvements benefit all properties being assessed within that district at least to the amount assessed;
- Properties outside the district should not derive any benefit from the improvement, or at least not to the same extent that those properties within the district are receiving; and
- The district should be established to encompass all willing participants and exclude any unwilling property owners when possible.

Maintenance of roads built through the Special Assessment Legislation is usually performed by the state or local government as the roads are dedicated to those bodies after completion of construction. Mall Road in Florence is a local example of a roadway built through an assessment district.

Additional funding options mentioned in the 2006 Transportation Plan include the following:

Local Option Sales Tax - Local sales taxes are used elsewhere in the country to generate revenues for locally-provided government infrastructure and services. However, this mechanism is not currently enabled by Kentucky law. The 2006 plan notes that a 1 cent local sales tax would generate \$12 to \$13 million in annual revenue.

Local Occupational Payroll Tax - This funding mechanism is allowed by Kentucky statute. Boone County currently has a 0.8 percent payroll tax (capped at \$373 per year), which goes into the County's General Fund. An additional 0.15 percent tax (\$25/year cap) supports mental health/retardation and elderly services. The 2006 plan observes an increase in the existing local payroll tax could be considered with proceeds being transferred to the Public Works Fund.

Accommodations Tax – The 2006 plan noted that an increase of 1 or 2 percent in local accommodation taxes, which currently total 5 percent (city and county combined), could generate revenue for infrastructure improvements in the county.

Utility Fees – These fees are charged to owners of residences and businesses to help pay for public utilities. An incremental rate increase could be used to fund infrastructure improvements.

Parking Fees – A county-wide parking fee could be imposed on all paid public parking facilities in Boone County, but the additional revenues generated would likely be small.

Vehicle Registration Fees – Like Sales Taxes, this mechanism is not currently enabled under Kentucky law, but it could be used to generate funds for local infrastructure.

Roadway Functional Classifications

The recommended Functional Classification of roadways in Boone County consists of an integrated system of interstate, arterial, collector, and local streets. Their delineation serves to specify how a roadway is intended to operate, therefore, the minimum design standards for new construction and major facility upgrades.

Interstates connect major metropolitan areas, provide high levels of mobility, and accommodate trips over long distances.

Arterials provide mobility, by carrying high traffic volumes on a continuous network with no stub routes, but very little direct land access.

Collectors and Sub-Collectors focus on mobility and land access by carrying local traffic over short distances and distributing traffic to arterials and/or to local streets (short- and medium-distance trips). This category may also include frontage roads when used adjacent to arterial facilities. The 2005 Transportation Plan update further divides these roadways into Urban, Rural Major, and Rural Minor Collectors.

Local Streets and Roads focus on land access rather than through trips, and include all other public roads.

One of the major aspects related to Functional Classification of roadways is the degree to which access is provided to adjacent land uses. Within Boone County, access management and access controls along existing facilities, particularly Collector Streets, are an important component of implementation. Residential subdivision connector roads in the sub-collector and collector classifications should be designed to serve subdivisions without on-street parking and individual driveway access. Public safety should be an important feature. Existing examples of this in Boone County include Oakbrook Drive, Wetherington Boulevard, Triple Crown Boulevard, and Steeplechase Boulevard.

3. THE TRANSPORTATION/LAND USE CONNECTION

Land Development and Transportation Use since World War II

The existing land-use pattern in Boone County is the result of a combination of some dynamic trends that have impacted the suburban areas of most major metropolitan areas during the last 45 years. The pursuit of the American Dream of home ownership, realized by World War II veterans with their purchase of single-family homes in new subdivisions, began the process of a more dispersed, suburban settlement pattern.

The G.I.'s were facilitated in the pursuit of their dreams by the Veteran's Housing Authority's (VHA) programs that financed houses at low interest rates on long-term mortgages. Many of the early subdivisions along KY 18 and U.S. 42 in Florence were built to accommodate the desires of G.I.'s and their families to move out from the inner city areas of Covington and Newport.

The construction of the interstate highway system during the 1950's, 1960's, and 1970's was another federal program that promoted development at the edges of the old central city. Major commercial/retail uses in the form of regional shopping centers were developed at the cross roads of interstate highways and older spiral, arterial roadways. Florence Mall, still the only regional shopping center in Northern Kentucky, was developed during the 1970's at the intersection of I-75/71 and KY 18.

Factories migrated from the central city since they were no longer tethered to the railroad lines along the Millcreek Valley. These factories and warehouses were almost always built as very large, single story structures near the interstate highway system. The long-haul tractor trailer, traveling the interstate highway system, replaced the train and its rail car as the primary means for moving manufactured goods. The Northern Kentucky Industrial Park was the initial prototype of this form of industrial development in Boone County, while Park West International is a more recent example.

Along with increased home ownership, there was also a substantial expansion of automobile ownership for the World War II veterans (much beyond their parent's generation). Probably this was initially considered an affordable luxury for the veterans and their families. However, because of the dispersed nature of the land use pattern and the separation of industrial, commercial, and residential uses historically mandated by zoning, the luxury of automobile ownership quickly became an absolute necessity. Travel by automobile became and still is the primary means of transportation in Boone County.

Planned Unit Developments-A Prototype for Residential Development

Many of the early residential subdivisions in Florence did not have sidewalks, but utilized a traditional or modified grid pattern for the layout of the streets (e.g. Grand Avenue, Edward Avenue, Roger Lane, and Circle Drive). Later subdivisions (e.g. Stonegate Meadows), did provide sidewalks, but used multiple cul-de-sac streets connected to internal collector streets, resulting in decreased connectivity.

In the late 1970's and early 1980's, a new prototype of residential development arrived in Boone County-the Planned Unit Development (PUD). Primary examples are Oakbrook, Triple Crown, and Plantation Pointe Subdivisions. This form of development is characterized by being divided into "pods" of separate housing types - i.e. apartments, condominiums, single family houses, and including a commercial area. The "local" streets of the "pods" are connected to an internal collector street, such as Oakbrook Road.

Oakbrook is often used as an example of better than usual pedestrian facilities, exemplified by the meandering pedestrian pathway along Oakbrook Road. Plantation Pointe, Farmview, Steeplechase, Orleans, Thornwilde, and Triple Crown are later examples. However, the pedestrian facilities within the different "pods" are sometimes insufficient within the multifamily areas. Again, because of the separation of the different "pods", automobile travel continues to be necessary for most trips.

Future proposed residential development in Boone County will primarily continue as a system of cul-de-sacs connected to local streets, which then connect to collector streets (in both small and large subdivisions). In other large scale developments, more Planned Unit Developments (PUDs) and Cluster Subdivisions with "pods" connecting to internal collector streets have been approved. Both of these models of residential development will continue to assure that the primary means of transportation for residents will be by automobile.

Recent Growth Patterns

In the past 20 years, regional commercial development has expanded beyond the Florence Mall to include major developments in the form of large national, chain stores along Mall Road and in the Houston Road area. There has also been increased development of local-oriented commercial development, in the form of strip malls located along major arterial roads such as U.S. 42 and KY 18. Industrial development continued to expand south from the Northern Kentucky Industrial Park along U.S. 25 and at other intersections of the interstate highway, such as the Hebron and Mineola I-275 interchanges.

These commercial and industrial expansions have increased chronic traffic congestion problems on the arterial and collector roads. Improvements on these roadway systems have helped alleviate the congestion problems, as clearly exemplified by a series of improvements on KY 18 and Mall Road. The road improvements mean expanded capacity and therefore greater access. Greater access encourages additional development, which brings more traffic, and ultimately, increased congestion.

The Future: Integrating Transportation and Land Use

If Boone County continues to develop in this same low-density, dispersed form of development, which mainly accommodates travel by the automobile, it would almost certainly guarantee chronic traffic congestion, increased air pollution problems and negative impacts on the quality of life for residents of the county.

The first section of the Transportation Element, the Regional Transportation System, describes the need for the Cincinnati Metropolitan Region to evolve, in the future, to a more "transportation-sensitive" land-use development pattern. Spurred by the federal legislation such as the CAAA and TEA-21, OKI's most recent regional transportation plan has established a regional Commission on Land Use that would generate recommendations and policies that may be implemented in local zoning ordinances that would "promote land use patterns consistent with plan objectives to minimize the need for new highway construction and foster travel by transit, bicycle and walking."

A different type of planned development, one that will facilitate the evolution to a more "transportation-sensitive" land-use development pattern, is advocated in the first objective of the third goal the Transportation Element's Goals and Objectives. Unlike the usual form of suburban development of the last 40 years that adhered to the separation of uses, this new type of planned development would incorporate a mixture of uses including residential, retail, office, light-industrial, public parks, and other public uses in a tastefully-designed, compact development. The City of Florence is pursuing this style of development for the Mall Road area with the goal of restoring that area as the most vibrant commercial district in Northern Kentucky. The other defining element of this new type of planned development is that it will be served by an interconnected, multi-modal transportation system.

This system would include appropriately located transit stations or transit stops within walking distance (a quarter mile) of all residential areas. There would be well-designed pedestrian and bicycle facilities that would connect to the transit stations or stops. The bicycle facilities could include bike lanes or routes on roadways and bike lockers at the transit stations. Pedestrian facilities should be built along streets, wherever possible, and should provide an attractive, safe and direct route to the transit stops. As the Union Town Center develops as a center of relatively dense development, transit service should be expanded.

The roadway system within a Transit Oriented Development incorporates a traditional or modified grid pattern, thus allowing multiple access routes, unlike normal suburban development where residents must travel by vehicle from local to collector to arterial road. Arterial streets should be located at the periphery of the grid system assuring that regional traffic will bypass the developments. Arterial streets would then cease to be barriers to pedestrian travel.

Transit Oriented Development (TODs)

The "planned, mixed-use neighborhoods" are exemplified by the planning concept of Transit-Oriented Development (TOD). A Transit-Oriented Development has been defined as: *a mixed-use community within an average 2,000 foot walking distance of a transit stop and core commercial area. TODs mix residential, retail, office, open space, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, foot, or car.*

Ideally, these Transit-Oriented Development Centers should be located at least a mile from one another to assure an adequate market area for the commercial uses. These developments would also serve the existing and future single-family, residential areas with new opportunities for nearby neighborhood shopping and with transit ridership, by park and ride lots.

The actual development process for these Transit-Oriented Developments would necessarily deviate from the normal single parcel for single use form of development. Though there could be sites, owned by a single entity, that could be developed this way, typically there will be more than one parcel and thus multiple ownership. A Specific Area Plan would be agreed upon and developed for the site requiring meticulous cooperation and coordination between the private and public sectors. It is possible for multiple developers to be involved in the site, building different sections.

To create a TOD, specific design guidelines and development standards for the site would have to be prepared that would replace the standard zoning regulations. Also, financial plans would have to be developed to assure that public improvements, including roads and parks, are developed in a timely manner, and that the costs distributed equitably to the participant private developers and public entities.

These Transit-Oriented Developments will not replace typical residential, commercial, or industrial development. However, with the appropriate siting of these developments, the existing land-use pattern of dispersed, low-density development could be reorganized into a more "transportation-sensitive" land-use pattern. This "transportation-sensitive" land-use pattern would give more options (i.e. transit, bicycle, walking) for travel than the just the automobile for all the residents of the community. Transit-Oriented Developments would offer a mix of housing types and real affordable housing options to its residents (also addressed in the Housing Element). TODs would also offer stronger community identity for residents with its incorporation of public spaces and uses.

The most appropriate area for siting TODs in Boone County would be within the proposed transit service areas and along the light-rail transit alignments. TODs would allow the expected, future growth of this area to happen in a more compact fashion, and also be connected to the future, regional inter-modal transportation system. Two specific sites were described in the Housing Element as being excellent locations for Transit Oriented Developments: the Marydale property on Houston-Donaldson Road and the undeveloped land on the southwest quadrant of the KY 18 and KY 237 intersection. Site selection and planning should consider the recommendations of the 2006 TANK Transit Network Study.

I-71 Corridor Transportation Study

OKI conducted a Major Investment Study (MIS) for the I-71 corridor from Florence and the Airport to Kings Island in Ohio. The study was approved in August of 1998, and OKI has proceeded to study specific priority segments of the corridor. The study was directed by the I-71 Study Oversight Committee, and was intended to identify a preferred mode of transportation for future improvements throughout the corridor. The study recommended Light Rail Transit (LRT) as the preferred mode. A tentative alignment was also selected. Other transportation modes considered include a No-build option, Transportation Systems Management (TSM), Busway, and High Occupancy Vehicle Lanes (HOV), as well as combinations of these options. Simultaneously, Metro and TANK will be expanding the regional bus system as recommended in the I-71 Study. This includes new buses, additional routes, park-and-ride lots, and a restructuring of transit service to serve the light rail system.

Some Environmental Impact Statement (EIS) and Preliminary Engineering efforts have been conducted for Phase I of the light rail system between 12th street in Covington and Pfeiffer Road in Cincinnati. Later phases of the light rail system could be developed as extensions in future years, however, local communities have not supported light rail in ballot measures. Since public sentiment has not supported light rail, and this transportation mode is very expensive, increased bus service or personal rapid transit modes appears to be more economical, efficient, and realistic.

A key issue for Boone County is the proposal of two alignments, Florence and the Airport. Although the Airport is an obvious endpoint/destination for the system, this Comprehensive Plan notes that Florence could potentially generate much demand (ridership) for the system, and therefore, should be studied closely as to which of these alignments is more important to the system. For the Florence alignment, special attention is needed at rail crossings of Donaldson Highway, Turfway Road, and KY 18 to ensure that traffic congestion is not worsened.

Northeast Boone County Major Investment Study

OKI conducted this study to address a critical area in the county identified in the 1996 Boone County Transportation Plan process. It was the first step in the implementation of various transportation improvements that had already been recommended in the Transportation Plan, the OKI Looking Ahead: 2020 Metropolitan Plan, the KYTC 6-Year Plan, and the Airport Master Plan. The study was coordinated by a planning committee comprised of Boone County citizens and business people, and various agency representatives. The study's main purpose was to develop a consensus and support for the prioritization of the improvements.

The final three prioritized recommendations were:

1. The widening of North Bend Road (KY 237) north of I-275.
2. The improvement of the I-275/KY 212 interchange at the airport and the construction of new ramps and a new interchange with Donaldson Highway.
3. Construction of the South Airfield/Burlington Bypass from Zig Zag Road to I-275.

Secondary recommendations included:

- Construction of a connector roadway between Cavalier Boulevard and Woodspoint Drive (over I-75/71)
- Construction of a connector roadway between the South Airfield/Burlington Bypass and Houston Road.
- Addition of a partial interchange between Petersburg Road and I-275 west of the airport.

The following funding alternatives were recommended for project financing:

- Passenger Facility Charges
- Airport Parking Fees
- Car Rental Tax
- Local Occupational Tax
- Development Impact Fees
- Accommodations Tax
- County Sales Tax
- Vehicle Registration Fee
- Motor Vehicle Gas Tax

The study did not evaluate the concept of a new Ohio River bridge in the northernmost part of Boone County nor did it make any recommendations concerning this possible project. However, for the purposes of this Comprehensive Plan, potential impacts of such an improvement could include the following:

- Labor pool accessibility.
- Increased automobile and truck traffic from Western Hills and River Rd (Cincinnati) seeking easier access to interstate system and airport via I-275.
- The need for additional lanes on the proposed reconstruction of North Bend Road.

CONCLUSION

Boone County has outgrown the current road system due to population and business growth and because of the lack of timely funding over the last decade. However, relatively minor, strategic improvements can achieve significant increases in level of service if designed correctly. The Kentucky Transportation Cabinet is often intent on building major roads or reconstructing existing roads into major multi-lane facilities to answer the community's needs. The planning horizon for such improvements is the year 2040 for current design efforts. This correlates with the planning horizon for the Boone County Comprehensive Plan, and reflects the close relationship that is needed between land use and transportation planning. In light of changing economic conditions of the last several years, and the projection of similar conditions into the future, this concept is particularly important.

The development of Boone County over the last two decades has been lower in density than what would be needed to support a significant level of mass transit. School transportation needs to be evaluated for general changes in methodology as the land use pattern of the county, road conditions, and travel habits of the public all continue to change.

Transportation planners and public officials need to realize that safety and capacity projects often overlap and benefit or replace each other. This approach can fulfill the public's needs and save money at the same time by designing projects for a specific time period and implementing them in a timely fashion.

A typical situation in suburban communities like Boone County is the presence of extensive sidewalk networks (miles) within the interior of each subdivision, however, the absence of sidewalk or path facilities that connect subdivisions – even those immediately adjacent to each other. The reconstruction of roads by KYTC will provide some, but not all, of these connections over a long period of time. The connection of existing and planned pieces of the network provides true benefit and cost effectiveness of all the many developer-built sidewalks.

LAND USE

INTRODUCTION

This Comprehensive Plan is intended to be a tool for the management of growth and development in Boone County. The growth of the county can have positive benefits for the present and future population if it takes place within the context of a comprehensive plan which recognizes and integrates the various elements that comprise Boone County. This growth management is directed by the Goals and Objectives of this plan, which recommend the efficient use of land resources, physical improvements, public facilities, and protection and enhancement of the natural and social environment. These Goals and Objectives require that growth and development be coordinated and well-planned.

The Land Use Element of this plan recognizes that growth will occur in portions of Boone County. This plan utilizes a 25-year planning horizon for future land use recommendations, and further, the document is mandated to be reviewed and/or updated every five years. This element contains land use classifications for the existing and future land uses, text regarding the future land use for the entire county as divided into 28 sections, and a map identifying specific future land use patterns throughout each of these sections. This plan is a tool designed to enable officials in Boone County and the Planning Commission to manage the location and timing of the various types of development, to assure adequate and fiscally responsible provision of infrastructure and public services in order to assure that adjoining land uses are compatible, and to assure that negative impacts to the environment are minimized. The various types of development will demand different levels of infrastructure as a major component of the Land Use Element. The OKI Land Use Commission has identified many of the regional impacts and cost issues associated with suburban development. The Commission's 2010 report presents regional issues, trends, conditions, goals, objectives, and policies for Transportation, Public Facilities and Services, Natural Systems, Housing, Economic Development, and Land Use sectors. The report contains a policy plan that encourages local governments and planning agencies to pursue more concentrated land use patterns, more efficient transportation decisions, prompt and coordinated public services provisions, mixed-use development design, diverse housing choices, environmental protection, fiscally responsible decisions, and cooperation with other jurisdictions. Implementation of such practices will be at the discretion of local officials.

Urban service areas are those parts of the county where public services, infrastructure, and community facilities are available or planned to support an intense urban development pattern. This is not to say that all of the land within the urban service areas should be developed; there remains a need to protect or maintain some land as open space within these higher density areas. Urban service areas should contain water supply systems, sewage treatment, utilities, police and fire protection, schools, recreation facilities, and easy access to major transportation routes. Future urban service areas, or the expansion of existing urban service areas, should develop where land resources are available and demand is sufficient to assure efficient utilization of proposed public services and infrastructure. Development of future urban service areas should be permitted when adequate services are provided as part of the development or when full public services are made available. Until such services are provided, future urban service areas should only contain low density development, which is compatible with the ultimate planned land uses, but not dependent on full urban services. Areas not anticipated to experience substantial urban growth are planned for less intense, rural development which will create little or no demand for urban services. Any extension of services to these areas could commit them to development and should be undertaken carefully.

The Land Use Element is intended to provide general guidelines for all future development and to permit the management of growth in Boone County. This plan anticipates that growth management will be achieved by specific land use regulation tools, including zoning and subdivision regulations, specific land use studies (corridor studies, area studies), public land ownership and land-banking, restrictive covenants, easements, environmental regulations, recognition of the benefits of vibrant business activity and the housing industry, cooperative agreements with public and private organizations, etc. This should be coordinated with the construction of public infrastructure and the provision of public services. All sites should be designated for the appropriate land use and density of development to assure efficient use of infrastructure and services. Where existing infrastructure and

services are not available, the developer of a site must demonstrate that adequate services will be provided, assuming that the development is appropriate through the evaluation of other land use considerations.

The development of this Land Use Element incorporates the existing and projected noise contour information related to the operation of the Cincinnati/Northern Kentucky International Airport, described in the Transportation Element. The projected noise contours may vary over time, thus impacting the type and location of appropriate land uses around the airport, and the contours are currently being updated through the airport's master plan update and associated noise studies. The Airport Master Plan and its ongoing update includes detailed recommendations for land use on airport property. This plan is currently being updated. The profound and important relationship between the operation of the Cincinnati/Northern Kentucky International Airport and Boone County necessitates a careful, cooperative effort between the two entities to assure that aircraft flight routes are coordinated to avoid noise impacts on existing and future residential areas and public land uses. Sufficient public processes are needed to keep citizens and businesses advised of airport development and activity. Future land acquisition plans should be made known to property owners as soon as possible to enable them to anticipate and adjust their plans for their property. Residential development, in particular, should not occur in noise impacted areas, unless it meets federal guidelines for construction practices.

This Land Use Element is the culmination of the preceding ten elements of the Boone County Comprehensive Plan. The Land Use Element is based upon the previously approved Goals and Objectives of the Comprehensive Plan and upon the following elements: Population, Environment, Economy, Business Activity, Housing, Recreation and Open Space, Agriculture, Historic Preservation, Public Facilities, and Transportation. For these reasons, the Goals and Objectives for the preceding ten elements of the comprehensive plan also constitute the Goals and Objectives of the Land Use Element. The Land Use Element recommendations are based upon the specific data and recommendations of the other elements of this comprehensive plan. Compliance with the other elements of this plan will result in the development of Boone County as specified in the Land Use Element.

EXISTING AND FUTURE LAND USE CLASSIFICATIONS

The existing and future land uses in Boone County have been identified in this element with basic classifications. These classifications, based upon the type and density of use, are described below. For the purpose of these land use classifications, density is defined as: gross density - the average number of units per acre for the entire acreage of a development. Except where noted, the classifications pertain to both the existing and future Land Use Maps.

Agriculture (A) (2009 Existing Land Use Map only) - Agricultural activity and abandoned, overgrown fields that have not yet reverted to woodland, and vacant or future development areas within the urbanized portion of the county.

Woodlands (W) (2009 Existing Land Use Map only) - Mature wooded areas of greater than one acre. In some cases it is pre-empted by established recreation uses on the map.

Rural Lands (RL) (2035 Future Land Use Map only) - Wooded, agricultural, recreational, or low density residential uses of up to one dwelling unit per two acres for the 25 year land use plan. Residential construction in Rural Lands does not occur in a formal subdivision.

Developmentally Sensitive (DS) (2035 Future Land Use Map only) - Areas that have an existing slope of twenty percent or greater for a height of 20 meters (67.6 feet), or have unique soil or flooding characteristics which limit the ability of an area to support urban development, or contain significant wooded areas, creeks, wildlife habitat, or other natural features that are important to a site's stability and visual character. In addition, developmentally sensitive areas may, in the future, be defined and protected due to historical or visual importance. Any development on land identified as Developmentally Sensitive must be carefully assessed by the developer and the Planning Commission to determine the ability of the land to support the proposed project. The land use priority for areas designated Developmentally Sensitive is preservation of the existing environment, as opposed to

development of the land. This shall act as a guideline for any project proposed in Developmentally Sensitive areas; specific sites designated as Developmentally Sensitive require more detailed inventories of soil, slope, wildlife habitat, vegetation, and other possible physical constraints as part of the development plans. These inventories shall be used, along with engineering studies, to determine whether an area designated Developmentally Sensitive can be developed in a fashion which is sensitive to the existing site characteristics. The Developmentally Sensitive areas of Boone County have been identified by utilizing United States Department of Agriculture Natural Resources Conservation Service (formerly Soil Conservation Service) data and mapping, through the Boone County Geographic Information System (GIS). The degree of accuracy of these areas is intended to locate general areas of concern. Actual site assessments will determine the exact boundaries of Developmentally Sensitive areas in Boone County at the time of development.

Rural Density Residential (RD) - Low density residential uses of up to one dwelling unit per acre.

Suburban Residential (SR) - Single family housing of up to four units per acre. This classification does not preclude low density or estate residential developed as a formal subdivision.

High Suburban Density Residential (HSD) - Single-family and/or attached housing of up to 8 dwelling units per acre. This classification is typified by townhouse, condominium, and zero-lot line development, and also pertains to existing mobile home parks.

Urban Density Residential (UD) - Attached housing, generally condominiums or apartments, of over 8 dwelling units per acre.

Public/Institutional (P) - Government offices, schools, libraries, churches, cemeteries, fairgrounds, maintenance areas, etc.

Transportation (T) - Airports, major four lane roads, interstates, and interchanges.

Recreation (R) - Public and commercial outdoor recreation including golf courses, parks, race tracks, private reserves, wooded areas that serve an established recreation use, etc.

Commercial (C) - Retail, corporate and professional office, interchange commercial, indoor commercial recreation, restaurants, services, etc.

Industrial (I) - Manufacturing, wholesale, warehousing, distribution, assembly, mining, and terminal uses.

Business Park (BP) - A mix of office warehouse, research, office, and light industrial uses in a park-like, office campus setting with large building setbacks, low floor area ratio, integrated pedestrian and recreation facilities, constant architectural and signage theme, extensive landscaped areas, and attractive entrance treatment. This land use is recommended for high visibility areas and transition areas between industrial and residential land uses.

FUTURE LAND USE DEVELOPMENT GUIDELINES

There are a number of general development guidelines which are applicable to all future growth in Boone County, regardless of type or scale. These guidelines are intended to mitigate the impacts of growth on the existing land uses, adjoining properties, public infrastructure, and the quality of life and safety in the County. These guidelines represent some of the items which the Planning Commission includes in the review of all projects proposed for Boone County. These guidelines are detailed below.

Utilization of Existing Vegetation and Topography

Developments in Boone County should begin with an assessment of the existing site features to determine positive and useful attributes, as well as features which should or can be preserved. Development design should

incorporate the use of these attributes for the benefit of the development and the County as a whole, rather than leveling an entire site to meet a pre-conceived project design. Development plans should identify such areas, and delineate disturb limits to protect those areas that have been defined. True Open Space subdivision design should be considered to blend new subdivisions in with areas that have a rural character.

Development Layout, Lot Sizes, and Setbacks

As described in the Goals and Objectives, different development densities can occur in Boone County as long as the development is designed in a proper manner and the infrastructure exists or is planned to support the development. The Goals and Objectives also acknowledge that fluctuations in the economy and housing market should be considered when evaluating the uses and design of developments.

Business, commercial, or industrial parks should be designed and developed to allow future residential or other uses to access through them where the corridor may extend to large developable tracts or may provide a future road connection. A roadway that is suitable for mixed use development should serve side streets for businesses rather than serving individual businesses directly, include an urban curb and gutter design, and provide pedestrian amenities and green space along the right-of-way. In this way, future residential development could be developed beyond the initial development, but be readily marketed.

Sanitary sewer issues have larger impact on where development occurs than do the other types of infrastructure in Boone County. The presence of sanitary sewer has a direct impact on the lot sizes of residential development in particular. Most residential development in outlying areas without access to sewer service typically develops on lots that are larger than an acre. In fact, septic system permits almost always require residential lots of greater than one acre to accommodate leach areas. On the other hand, the presence of public sanitary sewer facilities have normally resulted an increased demand for more dense single-family residential development. This development often occurs roughly in the range of three dwelling units per acre - which typifies single family projects in Boone County at this time. There is little development occurring in Boone County between these two general density levels. As pointed out in the Housing Element, this phenomenon often results in different housing and lot characteristics adjacent to each other. In these conditions, proposed residential developments that have smaller lot sizes than surrounding land uses are recommended to utilize the following design mechanisms to address the impacts on existing development.

The proposed development should consider in its design a band of larger lots and setbacks along the affected perimeter of the site adjacent to existing development to provide an adequate transition.

The proposed development should consider a band of development along the existing main roadway in which the houses face the main road to appear rural, and where the lots in this band are larger than those in the balance of the proposed development. Building setbacks and lot frontages should imitate existing setbacks along the road.

Highly visible portions of the proposed development site should consider green space. The style of green space, including tree types, fencing or other similar features should imitate the existing road corridor views. Grandiose subdivision entryways may not be appropriate depending on existing conditions in the corridor.

These recommendations are site specific and should be evaluated on a case-by-case basis. There may be other design mechanisms not identified here that may work in some instances.

Buffering

Developments in Boone County must recognize the potential impacts upon adjoining land uses and incorporate a transition of land uses, building setbacks, and/or landscaping to minimize these impacts. Potential impacts include visual, noise or vibrations, odors, dust, smoke, and light. Buffering to mitigate these impacts should be an integral part of the design of proposed projects; existing site features should be used in meeting this guideline. Developments should provide buffering along public roadways, to soften the visual impact. Appropriate wooded areas and stream valleys should remain as open space within developments and between developments. Developments proposed adjacent to planned or established open spaces should provide pedestrian access where appropriate. Natural green space benefits the community as well as encourages developers to create

innovative development designs through clustering of buildings and impermeable area. Typically, buffering is required and provided between unlike land uses; however, as the development of Boone County fills in previously rural areas, different lot sizes and designs of residential development sometimes impact each other. Where an appropriate gradation of lot size and setbacks cannot be designed into a proposed residential subdivision development of a significantly higher density than existing adjacent residential uses, deliberate vegetation buffering may need to be incorporated into the design to help protect low density residential areas. Buffer areas should use and supplement existing site features where possible.

Landscaping

Developments in Boone County must include landscaping to accompany the proposed project. Retention of existing healthy vegetation is considered a component of landscaping and is encouraged. This landscaping should be designed to improve the public view of a development, and should be incorporated into parking lots and other vehicle circulation areas, as well as within open spaces and around structures. Landscaping is intended to minimize the visual impacts of the development from adjoining properties and roadways. The amount of heat absorbed by impervious cover from sun radiation is decreased by landscaping, which reduces energy costs. Landscaping helps purify the air of harmful pollutants, thus reducing health impacts. It also helps reduce the quantity and improve the quality of storm water runoff, including temperature. The use of bioretention islands (water filtering basins) and grass swales should be used where possible in place of raised islands. Native species are often heartier than nursery stock and should be used wherever possible to minimize pesticides and other high impact forms of maintenance. Developments along major roadways in Boone County must include landscaping between the development and the right-of-way in order to promote the aesthetic appearance from the roads and to facilitate the compatibility of differing land uses.

Stormwater Management and Erosion Control

Developments in Boone County must recognize the potential impacts of stormwater runoff. Developments must design and incorporate adequate provisions for the channelization and control of the rate of stormwater flow on and from the site. One goal of local storm water programs should be to minimize the amount of storm water generated by decreasing the amount of pavement and encouraging green rooftops. Creating less runoff by increasing on-site infiltration is a method of managing runoff.

Control and mitigation practices for erosion associated with developments must be provided. At a minimum, developments must seed and mulch all graded areas and provide siltation controls. Stormwater management and erosion control measures must be concurrent with site work in order to be effective. Stormwater management officials must also consider the cumulative effects of increased development runoff in watersheds.

Access Management

Developments in Boone County must recognize the potential impacts of associated traffic on adjoining properties and transportation systems. The need exists to protect the capacity of the existing roadway network, and to plan improvements to accommodate new development and travel patterns. Access management provisions include the coordination of curb cuts, adequate corner clearance and site distance for access points, adequate space between access points, shared access points and parking facilities, provisions for access connections to adjoining properties, and dedication of public right-of-way. In subdividing property, arterials or collectors should not be used for direct access to lots, rather a system of local streets should feed into the collector and arterial system. Connections between and within commercial and industrial developments allow for more efficient provision of transit service.

Transportation and Pedestrian Network

Developments in Boone County must be designed, where appropriate, to improve the County's transportation network system of roadways, and functional classifications must be used in the planning for and designing of new developments. Collector roadways should be extended and developed to provide for the safe movement of traffic through and between subdivisions. Development along existing arterials and collector roadways should not have direct driveway access, but be served by a local street. Appropriate road connections should be constructed to provide alternate routes for traffic to and through specific projects and to enhance the capacity of existing streets. The traditional grid system can provide an alternative to typical suburban design. Parallel and frontage roads

should be used to minimize impacts of individual sites on collector and arterial roadways. Appropriate pedestrian networks should be incorporated into the design of developments which will generate or experience significant pedestrian use. These networks should not only provide internal paths, but should provide connections to adjoining uses where appropriate. Public open space and recreation sites should be connected to each other by bicycle and pedestrian paths where appropriate. Transit Oriented Development (TOD) is discussed in detail in the Transportation Element, and should be examined as a future direction in Boone County development patterns.

Design, Signs, and Historic Preservation

Developments in Boone County should give consideration to the overall design of the area. Site, landscape, and building design should be a primary concern at the early stages of the development, with an emphasis on the aesthetic impact of the proposed use. The minimal use of signs is encouraged; signage should be adequate to identify a specific development, but should not be used as a means to compete for motorist attention. The objective is to avoid the confusion and/or distraction of motorists, and to avoid the potential negative impacts of signs on the visual appearance of a development or corridor. Overhead utility lines should be placed underground wherever possible, and junction boxes screened from public view. Neo-traditional residential and commercial development should be encouraged to provide quality development that blends with the natural or historic character of parts of Boone County. This Comprehensive Plan encourages the restoration, renovation and/or adaptive re-use of historically significant structures in Boone County.

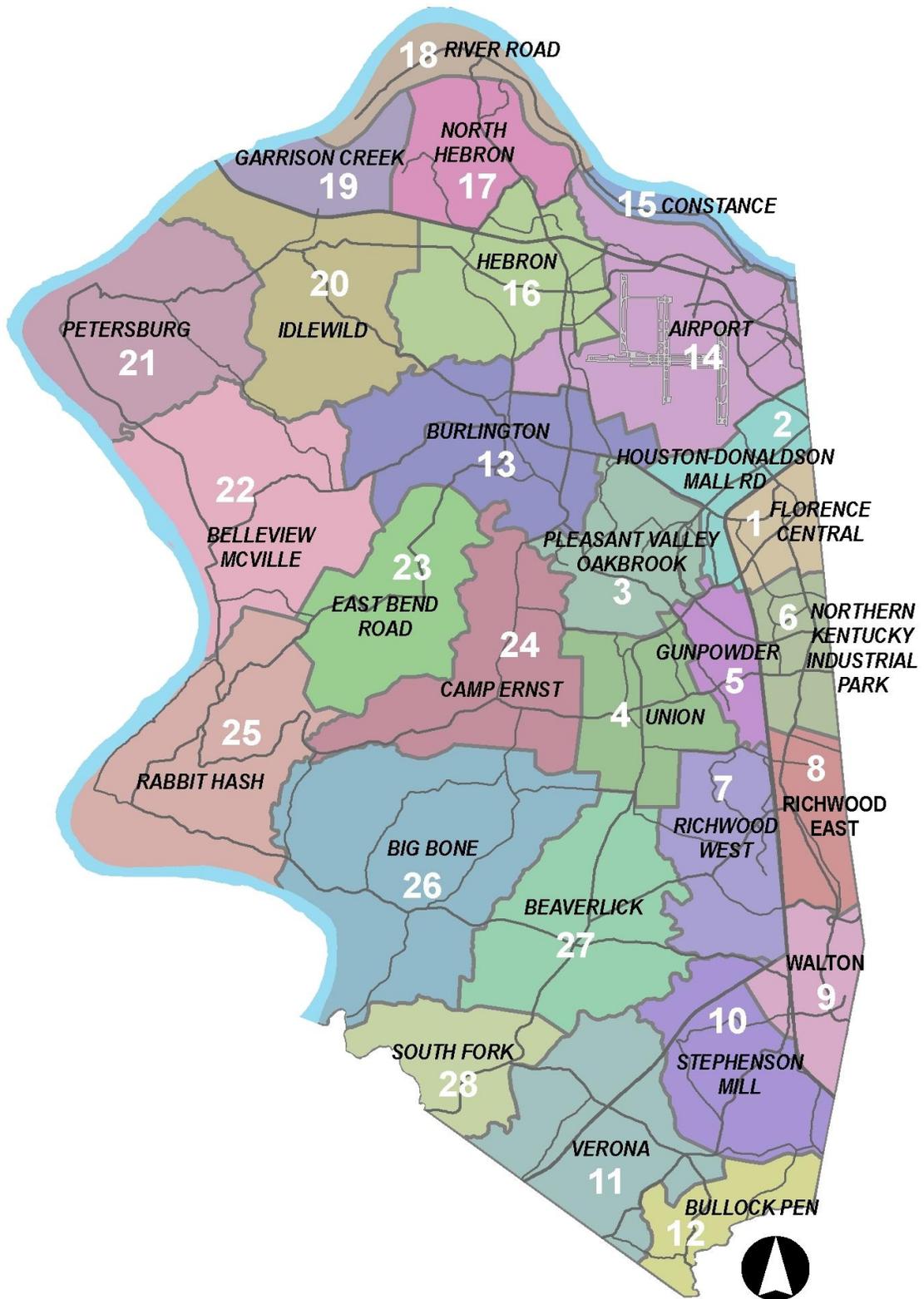
The proper application of these guidelines helps, in part, to achieve an overall objective of this Comprehensive Plan. This goal states that proper future growth management for Boone County is implemented. As a minimum, proper design and development must include the consideration and application of the above guidelines.

LAND USE MAPS

An Existing Land Use Map, accurate to September of 2009, and a Future Land Use Map have been produced with the use of the Boone County Geographic Information System (GIS) program. The maps are intended to be used in tandem with the accompanying text below; the future land use boundaries are approximate and subject to refinement and interpretation by the Planning Commission and county legislative bodies. The text and map should be used as a tool to aid in managing growth in Boone County. It is important to consult the Land Use Element text to learn of timing or phasing issues that may be present in a particular corridor. The Future Land Use Map may indicate future land uses for a particular area, however, the area may not be ready for development until certain infrastructure is in place or another area develops first. It is critical to note that the Future Land Use Map is a 25 year projection, and is not intended to commit all areas to development immediately. In some areas, phasing may be used to make sure development is supported by infrastructure, and in others development may be delayed until planned infrastructure is provided. This Comprehensive Plan recognizes that there is much coordination that occurs between the Planning Commission, state and local governments, utility commissions, school districts, the development community, emergency services, public works, recreation departments, transportation agencies, and numerous other public services whenever a land use or infrastructure decision is reached. Primarily, this existing process involves direct contact with affected groups during zoning map amendment reviews. This process is beneficial to correlating land use and infrastructure provisions, and should be reinforced. Groups providing these services should consult the Future Land Use map on a periodic basis and whenever they plan for future infrastructure needs and improvements. Since the Planning Commission administers land use regulations, but does not control infrastructure improvements, it is critical that groups that do provide public facilities and services participate in the public review processes, such as zoning map amendment reviews. If this becomes difficult, then a revised system may be needed in the future.

This Comprehensive Plan provides a 25 year outlook for land use, while zoning is typically treated as a five year tool. The zoning map communicates what immediate uses can occur on property based on infrastructure and other considerations. The Future Land Use Map should not be used as a zoning map. Unlike the zoning map, it does not portray land use regulations parcel by parcel. The Future Land Use Map is one tool used to guide the formation of zoning regulations.

Figure 12.1 shows the geographic areas corresponding to the Land Use text.



CONCLUSION

LAND USE PLAN GEOGRAPHIC AREAS

1) FLORENCE CENTRAL

The City of Florence developed from an aggregate of residential subdivisions, and is the main population concentration of Boone County. Florence did not develop in the traditional manner of cities, with established areas of concentrated commercial, industrial, and residential uses; instead, the uses were intermixed. For instance, the city's central business district is not in a precise location, but rather is a combination of suburban business districts. This factor, above all others, has molded Florence into a suburban city.

The city contains a valuable asset in its Main Street area. The Florence Main Street Zoning Study, which was adopted by the City in 1994, identifies the uniqueness of this area and ways of improving the vitality and visual appearance of Main Street. With careful planning and protection, development of old Stringtown could transform this area into a pedestrian-oriented center. The City of Florence has helped the area by constructing a streetscape and addressing utility issues. The zoning study should be reexamined in the near future to determine the effectiveness of the study and whether the scope of the study should be expanded to incorporate additional areas within the Main Street Study. New buildings in the study area must be designed and located to reinforce the area's character identified in the Study.

The Turfway Road area between U.S. 25 and KY 18 will see some redevelopment as a result of the reconstruction and widening of Turfway Road. Access management guidelines need to be adhered to. Development in the area west of I-75 should follow the guidelines of the Houston-Donaldson Study. Likewise, the Dream Street Study should be followed for its area. The Parkway Corridor Study was written in 2008 as the Central Florence Strategic Plan. It is a land use study and zoning document that encompasses the area bound by I-71/75 to the north and west, Shaun Alexander Way and Russell Street to the east, and Industrial Road (near Carole Lane) to the south. The overall study area is divided into eight unique sub-areas or neighborhoods, and outlines land use and zoning recommendations, transportation improvements, architectural and design requirements, and signage.

Light rail may in the future connect to major employment areas such as the airport, Mall Road, Houston Road, the Northern Kentucky Industrial Park, and concentrated residential areas. The development of a transit hub adjacent to Mall Rd. was proposed in TANK's 2006 Transit Network Study, an action which would likely have an impact on land use in the area. Much of Florence's future growth will occur from annexation; however, the City should balance this annexation growth with high density infill and redevelopment growth along the major transportation corridor of the City. As described in the Housing Element, the condition of older housing in Florence should be specifically addressed. Florence should continue to enforce codes affecting the condition of properties in residential areas and in older business districts. Minimum standards are needed for building maintenance and design purposes. The concept of Transit Oriented Developments should be explored within the City of Florence. Higher density residential development should occur where it can serve as a buffer between industrial or commercial intrusion on single-family residential areas or where it is easily accessible. Examples of the former include development along Industrial Road and west to the interstate, and near the Turfway Interchange. Examples of the latter include the Village Parke Condominiums on the old Florence Drive-In site. Overall, a mixing of uses can be accommodated within the City of Florence and the existing residential communities can be protected if proper buffers and design are incorporated into the developments. The redevelopment of property into commercial uses must be carefully designed in order to minimize impact of adjacent residential property. Any airport runway expansion in the future may have impacts on the existing residential areas of Florence.

In summary, growth in this section of Boone County must be balanced among three major land users, commercial, industrial, and residential development. Growth in one land use must consider the location of existing and planned developments of the other two.

2) HOUSTON-DONALDSON/MALL ROAD

The Mall Road area was recommended (through the 2002 Mall Road Corridor Study) to become a new urbanism corridor. The current planning effort for the area, the Mall Road District Study, calls for a dense, well designed, urban style of development that should occur over time. Residential development may be a part of this urban area, but should be located to minimize noise impacts from the interstate and airport. The entire area of Steinberg Drive, Rosetta Drive, Connector Drive, and the I-75 Mall Road ramps should be planned in detail to provide mixed use development that includes a good road connection and traffic circulation between the Pleasant Valley Road corridor and I-75. Regionally-oriented growth should be confined to Mall Road and Houston Road, and should not expand on to U.S. 42, KY 18 or Hopeful Church Road. However, the highway-scaled, automobile-oriented appearance of this growth should be minimized through the provision of pedestrian improvements, smaller facilities within outlots in conjunction with larger strip-style centers, multiple, scattered parking areas in lieu of large central parking areas, and street trees along Mall Road. This growth should also include multi-modal transportation amenities, an idea which has been furthered by TANK's proposed transit hub at a site on the west side of Mall Rd. Any commercial development in the Houston Road area should be consistent with the recommendations of the Houston-Donaldson Study. The Study recommended an employment district to include a mix of office, commercial, and industrial uses for the existing Houston Road corridor, with a preferred emphasis on office development along I-75 and high-technology industrial uses west of Houston Road. The development of the southern portion of the corridor has been more commercial in nature, and contains less office or industrial than recommended in the Study. The northern portion has experienced office, commercial, industrial, and education development.

Commercial development in this section should remain near the arterial roads or close to the interstate. These consumer service and traffic-oriented developments must be contained to specific areas adjacent to the arterial roads and interstate. The coordination of curb cuts and parking lot connections in the already developed areas must occur in order to maintain a reasonable ease of travel along these roads. Undeveloped tracts of commercial land should connect to and coordinate with any adjoining commercial, office, or industrial development in existence. Where no development has yet occurred, provisions for Access Management must be made for future development. This includes the use of frontage roads as well as parking lot connections and shared curb cuts.

Regionally-oriented commercial development should be confined to Mall Road and the Houston Road area. A large tract of land with commercial and residential potential is only partially developed on Mall Road. This property, referred to as the Berkshire Farm, should be developed in a cohesive planned manner, both internally and as it relates to other developments in the area. Ingress to the site should be encouraged primarily from Mall Road, with access from U.S. 42 limited to right-turn-in only. To maintain the ease of traffic on Mall Road, frontage roads, common parking areas, and shared curb cuts should occur in the undeveloped areas. The visual appearance of commercial areas in general, and of Mall Road in particular, should be enhanced through the design of buildings, landscaping, signs, and arrangement of buildings. Attention to aesthetic impacts of proposed developments should be part of all phases of the review process. The Mall Road District Study recommends a new direction for Mall Road that included the potential for more entertainment uses, high rise condominium, mixed use, and residential development. This is currently being implemented as part of the Mall Road District Study.

Development along U.S. 42 from Mall Road to the Ewing Boulevard area should continue to be a mixture of professional and local, traffic-oriented commercial activity. The area east of I-75, north of U.S. 42, and south of KY 18 shall continue to be developed in a cohesive manner to form a city center for Florence. The Parkway Corridor Study, which was originally developed for this area, was updated and replaced by the Central Florence Strategic Plan in 2008. The intent of this plan was to further develop the city's central neighborhoods and to link existing and/or planned business, civic, recreational, entertainment, and residential attributes of the study area together to create a vibrant, inter-related city center.

The development of the South Airfield Road connection will also affect the Houston Road area as a connection to this new road will be made to the intersection of Houston and Spiral Drive. Commercial development and Business Park or Industrial uses could occur as a result. Further study on this area needs to occur now that the road has become a reality.

3) PLEASANT VALLEY/OAKBROOK

This section of Boone County includes some of the western growth areas of Florence, including Hopeful Church Road and KY 18. It also contains some of the most rapidly growing residential areas in the county, particularly from KY 18 south to Union.

Hopeful Church Road should continue to serve as a residential corridor. Some small scale neighborhood commercial services may be appropriate at a strategic location in the corridor. It should be scaled to serve the Hopeful Church Road and Cayton Road areas, designed with a residential-compatible look to the buildings and site, and without freestanding signage. Access management is important to avoid turning movement conflicts on Hopeful Church Road, and some road improvements may be necessary to support this development. The proposed commercial land uses on KY 18 should be planned with careful Access Management, including continuous parallel roadways. Development should create commercial clusters rather than strip centers which parallel KY 18. These commercial uses must also be designed to be compatible with existing and proposed residential developments along KY 18.

The large area between Hopeful Church Road and Oakbrook Road, south of KY 18 to Pleasant Valley Road, should continue to develop in a Suburban Residential fashion. The area must develop with local access and limited access collector road connections as a high priority. These should include the connection of Cayton Road to Pleasant Valley Road; and, an east-west connector between Pleasant Valley Road and Hopeful Church Road, south of Stonegate Meadows. These collector road extensions should not allow parking or driveway access in order to facilitate the movement of traffic through the area, and should include multi-modal elements such as pedestrian paths and bike lanes, and bus stop areas. The Pleasant Valley Road to Hopeful Church Road connector should be located and designed to serve large amounts of traffic. This area is planned for High Suburban Density residential to help facilitate the roadway and be compatible with a significant traffic corridor.

Access Management at the intersection of U.S. 42 and Pleasant Valley should include access roads to serve commercial developments. Mixed-use development, that has commercial uses focused along U.S. 42 and that has varying types of residential uses, should occur to the southwest of this intersection on both sides of U.S. 42. The intensities of these commercial uses, in terms of building intensities, the size and style of individual structures, and the range of uses permitted, should begin with a broader range of commercial uses near the intersection and gradually decline to smaller-scaled office and institutional uses in the vicinity of Farmview Subdivision and the Florence/Union corporate boundary. Creative building layout and orientation should be used in lieu of strip-style commercial development, and Planned Development Overlay Districts should be utilized. All development in this area should be viewed as part of an entryway to both the Cities of Florence and Union.

The remaining portions of this section of Boone County should develop in a Suburban Residential manner. Major subdivisions in the area should provide internal connector roads with no driveway access or parking. Improvements to Fowlers Creek Road and bridges over Gunpowder Creek could provide connections from subdivisions along U.S. 42 and Pleasant Valley Road to the Longbranch and Camp Ernst Road area; these connections should be aligned with existing or planned intersections on U.S. 42 and Pleasant Valley Road. The Kentucky Transportation Cabinet is continuing design work on the KY 237 and KY 536 corridors.

4) UNION

This section of Boone County contains the City of Union and a substantial portion of Hathaway Road and U.S. 42. In general, this section should experience considerable residential growth due to Union's current residential nature, growth associated with the City of Florence, and improvements to U.S. 42. For these reasons, the 2000 Union Town Plan was prepared by the Boone County Planning Commission, City of Union, and Boone County Fiscal Court. The plan's recommendations are shown on the 2035 Future Land Use Map and also affect the Boone County Zoning Regulations.

New subdivisions should be developed with connecting roads providing alternative routes for residential traffic and decreasing the impact on major roadways. Road connections should include multi-modal elements such as pedestrian paths and bike lanes, and bus stops; Wetherington Boulevard is an example. Further road connections that prohibit driveway access and street parking should occur between U.S. 42, Camp Ernst Road,

Longbranch Road, and Hathaway Road. Hathaway Road needs special attention to protect this important east-west route. Water and sanitary sewer infrastructure should accompany such road connections and extensions as to prevent premature, estate-style residential development, and to prevent frontage subdivisions that result in poor access management. Development proposals shall be carefully evaluated relative to the area-wide road network and any necessary contributions to the network.

Improvements to Mt. Zion Road, between the Union city center and the interchange, should be accompanied by water and sewer improvements to accommodate the anticipated residential growth. Since the last Comprehensive Plan update, Mann Elementary School opened at the Ryle High School campus, as Erpenbeck Elementary had reached capacity. The school campus should continue to develop as a community amenity and activity node.

All major residential developments should provide recreational facilities, or other public facilities, through cooperative efforts between developers, legislative bodies, and other agencies/ organizations. These facilities should be designed not only to serve the residents of the specific subdivision but, where appropriate, to serve surrounding populations in order to mitigate the impacts upon existing facilities. This section of Boone County should develop as a major population area, and sites for recreation and other public facilities should be planned and obtained before prime sites are no longer available or become too costly.

5) GUNPOWDER

The area south of the Saddlebrook Farms Subdivision along Weaver Road, has developed in an Urban Density Residential manner consistent with this subdivision, with adequate buffering for adjacent to single-family residential uses. Commercial uses should not expand along the west side of the interstate beyond the self storage facility, and the Lion's Park site should remain as a recreation area.

Vacant parcels and existing residences along the south side of U.S. 42 near Dilcrest Drive and Bentley Court may be appropriate for Urban Residential if the developer(s) can demonstrate that proper access management, architecture, and buffering can be provided. An extremely well-designed, low-impact professional office use may be considered for this area, however, the potential developer must submit detailed buffering and building design plans, and demonstrate that the project would establish a positive focal point for the U.S. 42 corridor in addition to minimizing visual, traffic, and stormwater impacts on adjacent residential uses. All developments must provide for connecting parking lots or a frontage road. In addition, right-turn lanes may be required for each development. Development must accommodate plans for double left turn lanes from U.S. 42 to Mall Road. Due to the high visibility of the lots and the need to minimize traffic distractions, minimal signage is recommended.

The U.S. 42 corridor between the Weaver Road/Hopeful Church intersection and the newly rebuilt Pleasant Valley/Gunpowder intersection has developed commercially over the last decade. Vehicle stacking problems during rush hours and conflicting left turn movements have become significant problems on this section of roadway. Frontage road and interconnecting parking lots are necessary here to allow vehicles to access existing and future traffic signals. Through redevelopment of the former Boone Kenton Warehouse site and adjacent parcels, access to Weaver Road should be implemented, as well as well-planned access to U.S. 42. If improvements are made to Gunpowder Road from U.S. 42 to Mt. Zion Road, more intense land uses could be examined for the property behind Wentz Drive as well as the possibility of having access to Gunpowder Road. If commercial development occurs in this area, it should primarily be accessed from U.S. 42.

The vacant parcel on Weaver Road between the Grammas strip center and the Weaver Road fire station should develop as a low traffic professional office use. This part of Weaver Road is not suitable for commercial driveway access. In addition, a connector road should be completed from Mt. Zion Road to Weaver Road along the west side of I-75. South of this area should remain Suburban Density Residential in nature. Existing tree stands should be preserved to establish the contrast of this area from the Northern Kentucky Industrial Park, and to decrease noise impacts of I-75 and the airport.

6) NORTHERN KENTUCKY INDUSTRIAL PARK

This section contains the Northern Kentucky Industrial Park, which is the largest park in the metropolitan region. Expansion and continued development of this employment center has slowed some, but is expected to continue over the study period of this plan. The residential areas to the north of the Park prohibit any expansion in that direction, and industrial expansion should not occur west of the interstate. Development should occur along the east side of the interstate, however, this development should retain the existing tree line to buffer the uses from residential development on the west side of the interstate and to hide the outside storage and parking areas from public view from the interstate. Industries should continue to locate and expand along Industrial Road into Kenton County, and along the length of Empire Drive. The industrial park should be encouraged to expand to the south along the Empire Road Connector and the Weaver Road to Sam Neace Boulevard. In addition, development should continue along U.S. 25 and Weaver Road, and near the railways. Tracts of developable land exist in the area and development depends only upon public utility expansion and an improved road network, including upgraded railroad crossings. The Park is experiencing some building vacancies and signs of being dated, however, the recently completed Industrial Road widening and reconstruction is expected to give the area new life.

Industrial uses, similar in nature to the Northern Kentucky Industrial Park, should expand southward to Mt. Zion Road, between I-75 and U.S. 25. The presence and proposed expansion of Gateway Community and Technical College will encourage development of this area including other public and institutional uses around the campus. Street and parking lot connections are critical in this area. To the east of U.S. 25 manufacturing and distribution uses should occur. Southward expansion of industry should be tempered by important locational factors, such as appropriate access to the interchange and connections to existing or planned industrial parks. Industrial development to the east of U.S. 25 and the railroad must be accompanied by improvements to important access roads, such as East Mt. Zion Road and East Frogtown Road. Development at the Mt. Zion interchange should be planned in such a way as to not greatly impact the existing and planned Suburban Density Residential uses in the area. KY 536 (Mt. Zion Rd.) is planned for major widening, which will make this corridor a major arterial route from Boone County, through Kenton County, to Campbell County. Reconstruction of the Mt. Zion/I-75 Interchange is expected in 2015/16 and, while the reconstruction of Mt. Zion from I-75 to Old Union Road is still in KYTC's Six Year Plan, it is not yet funded.

The northwest quadrant of the interchange is the ideal location for urban and higher density residential development. The church use provides a more appropriate transition between the urban density residential and the planned suburban density residential to the west. This would be compatible with the residential character of the area, and should provide housing opportunities for employees of the Florence urbanized area, as well as providing a limit to over-expansion of commercial activity towards Union. The Mt. Zion Road to Weaver Road connector road is needed to provide a parallel route to I-75 as well as enable this growing residential area to access Florence without impacting U.S. 42. It should be located and designed to carry significant traffic volume.

Commercial activity associated with the interchange should be concentrated on the east side of the interstate. Access for these commercial uses should be coordinated so that all development can easily access traffic signals. All commercial development should be planned with attention to possible traffic impacts, because this interchange will serve an increasing volume of residential, commercial, and industrial traffic.

South of the interchange, between the interstate and U.S. 25, should develop in a variety of residential uses. The undeveloped land south of Mt. Zion Road is appropriate for Urban Density residential development or attached affordable housing. Innovative design and affordable construction should provide a good alternative to the mobile home parks that dominate the area, and which create negative visual impacts on the U.S. 25 corridor. Permanent attached housing is also preferable to mobile home park development because less site preparation is necessary and more open space can be retained. Mobile home development should not extend south of the intersection with Maher Road. The planned reconstruction and widening of U.S. 25 will create the potential for redevelopment in much of this corridor. Mixed use development with prevalent interconnections is recommended. Industrial growth can occur around the northbound I-75 rest stop, but should provide a buffer to hide outside storage and pavement areas from the rest stop and interstate. The U.S. 25 and Frogtown Road intersection should support locally-oriented commercial uses, however, special attention should be given to controlling and coordinating

access points with this area. Multiple street connections are critical in the area south of the Mt. Zion interchange and west of I-75 to avoid burdening specific connections with too much traffic.

7) RICHWOOD WEST

Development to the southwest of the Richwood Interchange must continue the Grand National Boulevard connection to Chambers Road. Triple Crown Subdivision provides an important road connection between Richwood Road and Frogtown Road. Other connections between Richwood Road and Frogtown Road need to occur. The southwest quadrant of I-75 and Frogtown Road, adjacent to the Frogtown-Richwood Connector Road (KY 3203), should develop as High Suburban Density residential to provide a logical transition of density and a buffer between the major roadways and single family development to the west. However, this area should not include a continuation of the existing mobile home park. Any attached housing in this area must be designed to complement adjacent single-family residential. The reconstruction of the I-75/Richwood Road Interchange is expected to occur in 2016 which may lead to the need for additional retail and office uses. The remaining undeveloped land on the southwest quadrant of I-75 and Richwood Road is shown as Business Park and Urban Residential. The Business Park area along Richwood Road should develop as an attractive office campus project that provides an appropriate entrance to the Steeplechase to Chambers Road residential corridor. Any business development along Grand National Boulevard must include proper ingress and egress, and provide for needed modifications to the roadway and/or its intersection with KY 338.

8) RICHWOOD EAST

The growth of this section will be impacted in several ways. There are several major influences behind the anticipated growth, including the Northern Kentucky Industrial Park to the north, the Mt. Zion interchange, Weaver Road, development pressures along U.S. 25, the extension of public sanitary sewer service, and the Southern Railroad Line. Because of the development pressure all necessary types of infrastructure should increase in scale. This area is bisected by U.S. 25, a major corridor for growth, extending from urbanized Florence to Walton. The fact that it runs parallel to I-75, and is located between the interstate and the railway, makes it an ideal transportation connector. Because of the various existing and future land uses along U.S. 25, it will carry a high volume of mixed traffic types. For this reason, any traffic-intensive or truck-oriented uses shall locate near connections to the interstate, and access management shall be an important consideration on all development along U.S. 25. The Kentucky Transportation Cabinet is designing a major widening of U.S. 25 south to Richwood Road.

Since the last Comprehensive Plan update, Boone County has established two TIF districts in the Richwood Area. Revenues from wage assessments in one district have generated \$250,000 to extend water to the site. As additional revenues are collected, the county expects to evaluate other projects, including contributions to the reconstruction of the I-75/Richwood Rd. Interchange.

Maher Road should not serve industrial traffic because of its design and its dangerous intersection with U.S. 25. Maher Road should remain an enclave of residential uses, and no industrial access should be provided along this road. Industrial uses abutting this residential area must be planned with adequate buffering for the existing and future residential development. The industrial area to the south of Maher Road should be accessed via Frogtown Road, and the possibility of extending East Frogtown Road to connect with Maher Road should be explored because of the better visibility at the railroad crossing and intersection with U.S. 25. The frontage along U.S. 25 is suitable for a mixture of commercial and light industrial activity with proper access management provisions.

Improvements are needed to the Richwood Interchange and to Richwood Road to increase capacity. The I-75/Richwood Road Interchange is slated for reconstruction in 2016. Commercial development around the interchange area is expected to remain and expand to serve local residents in addition to highway-related services. Intrusive highway related services should not impact the low density residential uses on the west, and be limited to the east side of I-75. The industrial development should primarily occur on the east side of U.S. 25, and south of the existing commercial area, as well as along Old Lexington Pike. Any intensive industrial uses proposed for Boone County should be directed to this area because of the distance from residential uses and the proximity to rail services. Old Lexington Pike should be upgraded as needed to serve as an access road for these industrial uses. Imperative to development of over 1,000 acres in Boone and Kenton counties south and east of

U.S. 25 and Richwood Road and east of Old Lexington Pike are improvements to the Richwood Interchange and the construction of a Single Point Urban Interchange (SPUI) with an underpass of the existing Norfolk & Southern rail line at the U.S. 25 and KY 338 intersection. Industrial uses fronting on U.S. 25 should be developed with attention given to adequate aesthetic design and landscaping to minimize visual impacts to the residential uses across I-75.

Commercial uses should develop in the northeast quadrant of the Richwood interchange, but further truck-oriented commercial uses in this area should be discouraged because of the existing traffic congestion and topographical constraints of the interchange. The commercial development northwest of the interchange will expand and extend along the interstate. The commercial areas need to be adequately buffered from the existing residential areas, and should not include uses which require outside display of products. The area to the north of the interstate commercial area and south of the existing mobile home park should develop as commercial uses that are consistent in design and serve the single family residential developments in this area. Care must be taken to mitigate any of the adverse impact of commercial development, due to the proximity of the interstate and residential uses. Commercial development along Richwood Road should be screened from the roadway, and serve the developing residential uses in the Richwood - Union area. Curb cuts should be limited and consolidated wherever possible.

The area east of I-75 and west of U.S. 25, from Richwood Road to Chambers Road, should develop as a Business Park. A buffer should be provided along Chambers Road to residential uses to the south, and no business park access should occur on Chambers Road. New industrial or business parks are planned in this area, and Dixie Highway will have to be improved south of KY 338. All developments should be interconnected by roadways to provide a parallel system to U.S. 25.

9) WALTON

The Walton area should experience gradual commercial, residential, and industrial growth. This growth should result primarily from the Walton Interchange, and its location near the intersection of I-71 and I-75. Walton lies along this regional interstate corridor, between Cincinnati to the north and Louisville, Lexington, and Frankfort to the south that is generally experiencing demand for industrial development. The extension of Mary Grubbs and development of the Walton Towne Center area will contribute to the growth potential of Walton not only in Boone County, but also into Kenton County to the east. The potential for a mix of uses including high density residential, commercial, office, institutional, and recreational in the Towne Center should occur. Light industrial is most appropriate in the south portion of the property and along the rail line.

The City of Walton is being surrounded by industrial development and zoning to the north, south, and west of the City. In the area of the former Walton Reservoir, between the county line and the railroad tracks, mixed use development with office campus and residential neighborhoods should complement a future road network. This road network is necessary for proper development of the area and should include a future major route toward KY 17 in Kenton County and a route to KY 16 in Boone County near the county line. Existing industrial developments in this area should continue to develop; however, some residential development is appropriate in the area if it has adequate access that is not industrial in character. Residential access through industrial areas should be accompanied by significant streetscape improvements. Residential developments need to be connected and be served by several ways in and out of this area. This would allow the central portion of Walton to experience residential growth in response to the employment growth and utility expansion in the area.

Suburban Residential development is occurring south of Chambers Road, between I-75 and U.S. 25. The rougher terrain, immediately adjacent to Chambers Road should include lower density residential development that minimizes traffic on this roadway, and fits into the landscape along this highly visible portion of the interstate corridor. The suitability of this area for residential use is enhanced by proximity to developing recreation areas, commercial services, and the Walton-Verona schools. Commercial development along U.S. 25 should also experience infilling, and should remain local in nature. A specific study has been conducted for Walton's Main Street to assess, and protect its historic resources and its small town character. Walton's Main Street is the most functional business district with a small town character in the county. South Main Street from south of the post office to the end of Old South Main Street is a National Register Historic District.

Mary Grubbs Highway and U.S. 25 to the Boone County line is a critical development area because of the recently completed extension of Mary Grubbs Highway to the east. The traffic and operational capacity of both Mary Grubbs Highway and U.S. 25 should be evaluated for possible improvements in the future as the Town Center project is built out and potential industrial development is created to the north and south of this area. Both of these roads are critical to the economic viability of the City of Walton. Some commercial uses may be appropriate at the front of this area if designed to serve growing residential uses in the area. Most development at this future high visibility location should be of a Business Park nature. Commercial development should also occur at the southeast quadrant of the interchange, and be designed carefully to provide a front door to the City of Walton. Business Park development should occur behind the commercial uses. Development at this location should not be oriented to truck-traffic. Attention should be given to the appearance of industrial uses from the interstate in this area, because it represents the southern entrance into Boone County. Residential uses to the south of the city and east of the interstate should not exceed the Rural Density classification unless adequate sanitary sewer and water services are extended. Intensive industrial development in the south Walton area should occur south of Boone Lake and west of U.S. 25 towards I-75.

The area south of I-71 and Beaver Road, and west of I-75 to Stephenson Mill Road is suitable for light industrial development; access to this industrial area should connect to Beaver Road and Stephenson Mill Road. Urban Density Residential is appropriate to act as a transition between the Suburban Residential and Industrial uses along Stephenson Mill Road. However, before these areas develop, improvements to Stephenson Mill and Beaver Roads will be necessary. In addition, improvements to the intersection of these two roads and the interstate will be necessary. Suburban Residential will be appropriate to the west of Stephenson Mill Road if the utilities are extended into this area. Commercial development of the northwest quadrant of the interchange should be of a type to serve the adjoining industrial area, while the southwest quadrant of the interchange will continue to be dominated by the Flying J development; however, traffic circulation improvements are needed at this specific location. As described in the Business Activity Element, there should be no further development of commercial uses oriented to truck traffic. The remaining area in this section should be Rural Density Residential or agricultural in nature.

10) STEPHENSON MILL

This section of Boone County contains the majority of the land between I-71 and I-75. There has been discussion regarding a possible future interchange on I-75 south of Walton, most likely to be located in Kenton County. Much of the land around Mud Lick Creek and its tributaries is Developmentally Sensitive and should experience limited single family construction. This section also contains the Bavarian landfill site. The land fill should not expand to the south because of the McCoys Fork Creek and should not expand to the north in order to avoid additional impacts on existing residential uses. The operation and area of the landfill should be evaluated by the Boone County Planning Commission and other appropriate public agencies in order to determine environmental and land use impacts associated with this use. Future land uses on the surface of the land fill area may include some forms of recreation activity, however, should not include industrial activity since the access to the area is through a residential corridor.

11) VERONA

This section of Boone County is characterized by the town of Verona and the I-71/KY 14 (Steve Cauthen Highway Way) interchange. Walton-Verona Schools has athletic fields in the front section of Waller-Stephenson Park on the south side of I-75/KY 14 interchange; future plans call for construction of a high school on the site. Local and interstate-related commercial development is appropriate around the interchange. This commercial district should primarily serve the Verona area. Adjacent to this development, south of the interchange, High Suburban Density Residential development can occur, although the area lacks public sanitary sewer. This would provide a higher density residential opportunity in this non-urbanized portion of the county. Access to this residential development should be by a road connection to KY 14 at an adequate distance from the interchange to avoid future traffic congestion. Additional residential development in this section of the county should be Rural Density in nature and should occur along the established roadways. Development along KY 14 should reinforce the rural estate character of Verona Commons Subdivision.

Residential development in the Verona area is encouraged by the availability of public water. The town of Verona should experience limited residential and commercial growth; neo-traditional and Suburban Density development should be encouraged immediately surrounding the town. Commercial development between downtown Verona and the interchange should be discouraged in order to preserve the small community nature of the town. As described in the Business Activity Element, a detailed study is needed for this area, particularly near the interchange, in order to coordinate the residential and commercial development as well as the infrastructure. At the same time, this study could examine the idea of utilizing performance standards as a means of achieving quality development design. Currently, the zoning in this area does not correspond with the Future Land Use Map. This should be evaluated during the county-wide zoning update or through a special study.

12) BULLOCK PEN LAKE

Much of the southern boundary of this small section of Boone County is formed by Bullock-Pen Lake. Any further residential development should be of a Rural Density nature and should occur along the existing roads. Continued residential development of the immediate lake area should be discouraged in order to protect the water resource and recreational uses of the lake. In general, little growth should occur in this section. The growth and development of the section of the county is tied to Verona and Walton. Any development in this section should be related to these towns. Further residential development around the lake should be discouraged, due to the lack of infrastructure and the importance of preserving Bullock Pen Lake as a water and recreation resource. Generally, this area should remain in Rural Density Residential and focus on agricultural uses.

13) BURLINGTON

This section of Boone County contains Burlington, part of new KY 237, and a significant portion of KY 18. KY 18 and KY 237 are important roads to all of Boone County; the primary function of these roads is to move traffic through the area, with direct access to specific properties being a secondary function. Intersections along KY 18 should continue the existing pattern of spacing of major access points of at least 600 feet. A parallel roadway network should be developed to provide access to properties fronting on the roadway. The construction of a Single Point Urban Interchange (SPUI) at KY 237 and KY 18 is scheduled for 2012 and a major new transportation connection is already underway in the form of South Airfield Road. How these two improvements will affect traffic flow and land uses on KY 18 should be examined and planned for.

Burlington proper will continue to experience growth-related pressures. The influence of residential subdivisions in the surrounding areas, and the associated traffic, will necessitate improved traffic controls and management, particularly at KY 18 and KY 338. Central Burlington includes a National Register Historic District. Historically important structures should be protected from development pressures, or be subject to appropriate adaptive re-use to retain the character of central Burlington. This approach is encouraged in historic Burlington by a limited design review process adopted in the [2008 Boone County Zoning Regulations](#). As Boone County grows, there will be a greater need for public facilities and services. The 2002 [Burlington Town Strategic Plan](#) addresses the unique transportation, parking, public facilities, historic preservation, and subdivision characteristics of the area. The new Boone County Justice Center and the Boone County Public Safety Center Complex have reinforced Burlington as the hub of local government activity. Some private investment, mainly in restaurant and shop uses, as well as the TEA-21 Transportation Enhancement Grant for sidewalks indicates momentum for investment in the town center. Appropriate architecture and placement of new or renovated buildings is critical to respect the established character of the town.

Development in the area around Rogers Lane should be carefully planned. The remaining portions of this section of Boone County should develop in a Suburban Residential fashion, with the exception of planned High Suburban Density Residential uses between Hickory Hill Subdivision and KY 18. Subdivision street connections are vital to this area around Burlington to give alternative routes for residents.

The developing residential area south of KY 18, west of Oakbrook Drive and east of Camp Ernst Road must include street connections that enable traffic generated by the area to travel in all four directions. This should allow Oakbrook traffic to proceed to KY 237 in the Rogers Lane area, and Shaker Run traffic to access KY 18 without traveling Camp Ernst Road or Oakbrook Road.

The south side of KY 18, between Camp Ernst Road and Burlington, should develop in a mixed residential and commercial fashion compatible with Camp Ernst Middle School. Commercial uses should be of a local service variety and should be evaluated as to traffic generation, visual impact and buffering. Strip commercial development should not occur, rather an innovative mixing of Office, High Suburban and Urban Density Residential uses, and some local commercial uses should be provided. This will create a transition into the residential development occurring along the Rogers Lane corridor.

All development along the south side of KY 18 toward Burlington must use Access Management, including parallel roads, shared curb cuts, and adequate turning-lane provisions in order to maintain safety on this high volume route. This area provides another excellent opportunity for high density residential and employment opportunity due to the intersection becoming a major crossroads in the county. This development should connect to Camp Ernst Road and include improvements to that road.

The intersection of KY 18 and Limaburg Road should also develop with locally-oriented commercial uses. Commercial development along the north side of KY 18, between Limaburg Road and Zig-Zag Road should serve local residential needs, and include office uses in order to avoid a continuous commercial strip. Existing pockets of mature wooded areas should remain intact to provide a visual transition into the industrial uses planned north of KY 18 and along South Airfield Road as indicated on the Future Land Use Map. Industrial development should be served by South Airfield Road as recommended in the Northeast Boone County Transportation Study and the Boone County Transportation Plan. Planned commercial and industrial development may be supplemented by other land uses along the north side of KY 18, however, all development must be interconnected, and connections must be provided to South Airfield Road as opposed to utilizing Old Limaburg Creek Road for primary access. The plan also recommends a roadway extending west from this connection to the KY 237/Conrad Lane area. The primary function of both roads should be to move traffic through the area, not to serve as access for adjoining parcels.

The construction of South Airfield Road opens up approximately 500 to 600 acres for potential industrial, office, and commercial development. Because some of this land is owned by the airport, it is beneficial for the property owners in the area to work with city and county officials in order to maximize development opportunities. A coordinated planning approach prior to developing this corridor will assure quality development, proper expansion of infrastructure, and new employment growth.

Limaburg Creek Road is inadequate to carry industrial traffic and intersects KY 18 at a dangerous location. The Future Land Use Map indicates a mixture of land uses along the KY 18 corridor and which will provide a transition into existing and planned public facilities uses near KY 237.

This section of Boone County contains parts of the Woolper Creek valley and the extensive Developmentally Sensitive areas associated with the creek. This area should nevertheless experience some population growth as the Burlington area continues to change from a rural community to a suburban community. The suburban growth around Burlington will be substantial, causing KY 18 and Idlewild Road to serve as higher volume collector roads. New subdivisions should locate in close proximity to Burlington proper. Any new subdivisions should develop internal road networks rather than using the existing roads as primary access; this will avoid congestion and allow adequate space for necessary road improvements. Road connections between KY 18 and Idlewild Road, between KY 18 and East Bend Road, and between Idlewild Road and Bullittsville Road should be made. Parts of the Woolper Creek valley should be preserved and included as part of the tourism/recreation potential of the area. To provide an appropriate entrance to the potential large western Boone County tourism area, KY 18 west of Burlington should maintain a rural appearance through unique subdivision design. As this area develops and anticipated school facilities are built, improvements to KY 18 will be needed, such as shoulders, reconstructed curves, improved sight distances, and sufficient intersection improvements in Burlington at KY 18 and KY 338. Suburban Residential Land Uses depicted on the 2035 Future Land Use Map in this area should not be developed until these conditions on KY 18 are improved, and adequate school capacity can be provided in the area. The balance of land in the western part of this section should remain largely undeveloped or agricultural uses, and suburban development should stay in the immediate watershed of the KY 18 sanitary sewer pump station. New residential subdivision development in the KY 18 corridor west of Burlington and east of Woolper

Road should be designed carefully to respect the rural character. As the Future Land Use Map indicates, the planned Suburban Residential land uses west of Burlington change abruptly in the corridor to Rural Density, Rural Lands, and Developmentally Sensitive further west. Future Suburban Residential development in this area needs to provide sections of lower residential density adjacent to these border areas. A true density step-down is needed beyond the frontage and setback transitional recommendations described in the Development Guidelines section of this element. Subdivision entrance areas and frontages along KY 18 should also be sensitively designed to retain the rural character of the area.

The area along and west of Bullittsville Road and within the year 2010 65 DNL noise contour level can continue to contain some Low Density Residential as well as Recreation uses. New construction should only occur if the residential structures are adequately sound-proofed. This should pertain to buildings within the 65 DNL described in the 2007 Part 150 Study update, which comprises the worst case scenario for noise impacts in this corridor. This impact would have to be completely restudied if the airport ever proposes any additional east-west runway configurations.

The intersection area of KY 18 and KY 237 is a high visibility area that already has an office orientation. The Kentucky Transportation Cabinet will construct a SPUI interchange here in 2012, where KY 18 would be a free-flowing route, and KY 237 would have an elevated intersection over the top of KY 18. Because of the central location, and the importance of the area, and the urban nature of the future road system, this area may be more suitable for a mix of office and commercial, rather than residential. Proposed development at this high visibility, central location should not be all retail, and should be comprised of at least one half office. A developer that proposes this concept on the northwest corner must show that it fits with the school uses near the site and does not create traffic issues in this area. Access Management is critical in this area, in fact access to KY 18 and KY 237 will be limited by the future ramp construction. A land use, infrastructure, and architecture study should be conducted for this urban interchange area.

The area bound by KY 18 to the south, KY 237 to the west, Limaburg Road to the east, and Conrad Lane to the north currently contains a variety of land uses. This area should continue to develop in a residential fashion, providing low to high density housing opportunities. The Main Branch of the Boone County Public Library is located in the area and should be complimented by new office development on the same side of KY 18. Area residential development should be linked to the library by direct pedestrian and traffic connections. The intersection of KY 18 and KY 237 should predominantly develop as an office-campus and institutional area with supporting commercial uses. Any access to Camp Ernst Road in this area must be accompanied by road improvements. Public Facilities uses should continue to develop at the southeast corner of the intersection. Much of this site has been paved and developed as the Boone County Farmers Market, but in the event of any future office or commercial development on the site, the development design should seek to incorporate existing woodland as a transition into existing residential and church uses.

Residential land uses within the west airport noise mitigation corridor may be appropriate only if adequately sound insulated. Sound insulation programs should take place for new construction within the current 65 DNL noise impact areas, beginning with the proposed worst-case noise impacts. The possibility of east-west alternative runway construction by the airport would profoundly affect this area, requiring the acquisition of seven significant residential neighborhoods. It would also affect three existing schools, several county offices including the new safety complex, and impact a National Register Historic District. The area road system, including KY 237, Limaburg Road, and any connecting routes to the future South Airfield Road would be interrupted.

14) AIRPORT

Riverview Subdivision and the residential area on Hunter Drive and Hetzel Drive have been purchased lot-by-lot by the airport, and should eventually redevelop into industrial uses to take advantage of the proximity to the interstate. The existing Bluebird Subdivision should remain residential and not experience piecemeal conversions to business uses. Future business uses may be appropriate if residential to business conversion is proposed on all of the subdivision area. The existing commercial parking lot facilities at KY 20 and KY 212 should eventually redevelop into office, hotel, convention, and travel related commercial uses. Commercial parking uses should be relocated onto airport property, in closer proximity to the airport terminals. Industrial development to the north of

KY 20 should not locate on any portion of the Developmentally Sensitive hillsides, and a buffer area for the preservation of those hillsides may be required. Throughout these hillside areas, stands of existing trees should be retained between individual developments.

The area along Hunter Road and Hetzel Drive should redevelop into a commercial nature. Some High Suburban Density residential growth should occur outside the flight path areas, on hilltops that have potential access connections to Point Pleasant Road. Along Point Pleasant Road itself and adjacent to I-275, some office development, consistent with the Airport Exchange Business Park, is appropriate. Traffic associated with this development should be directed toward the interstate. All development in this section must be carefully designed to minimize impacts on the Developmentally Sensitive hillsides, which should remain mostly wooded. Since the ridge top areas are also heavily wooded, the design of office and residential development should incorporate existing stands of trees.

Land to the north of Elijah's Creek Road, including the plateau area known as the Shor Property, should be developed in a Business Park fashion. Access to this area should be by a road connection to KY 20, through Airpark International, and may eventually include a connection to KY 237 at South Park Drive, along the I-275 right-of-way. Access to this area directly from Tanner Road or Route 8 is not desirable due to geologic formations, topography, vegetation, and scenic views. In its current condition, Elijah's Creek Road is not suitable for serving additional traffic. The road should be further improved to allow access to the Shor Property and permit redevelopment of the existing residential uses. Development of this area must be carefully planned, with great care taken in preserving and protecting the surrounding Developmentally Sensitive hillsides and existing vegetation clusters on the site. This will necessitate creative design and construction techniques, sensitive location of buildings, as well as the retention of existing vegetation along the bluff edges.

Due to the impacts of noise, industrial uses are recommended on the east side of Limaburg Road. A substantial land area is located in the east-west flight path, extending west of KY 237 to Bullittsville Road, and is suitable for Business Park development. No industrial access should occur to Bullittsville Road. The north side of Conrad Lane, shown as Industrial, should contain an extensive buffer area to protect the developing residential subdivisions to the south. Presently, a National Guard Center is being constructed on the north side of Conrad Lane east of Bullittsville Road. Planned Business Park development on Conrad Lane east of KY 237 should be accessed through industrial development to the north and not contain access to Conrad Lane, unless Conrad Lane is connected in the future to the South Airfield Road to the east. Due to the existing aesthetic qualities of this area, including rolling topography and stands of mature trees, the industrial development of this area should incorporate these features into planned site designs. In particular, existing areas of mature woods should remain intact to retain the character of the KY 237 corridor and provide a transition into adjoining residential areas.

This section of Boone County contains the I-275/Mineola Pike interchange, Mineola Pike, Donaldson Road, and Turfway Road. Major developments within this section include the Airport Exchange Business Park, Circleport I and III, the Mineola Industrial Park, Turfway Race Track, and part of the Houston-Donaldson area. This section of the County should experience a wide variety of substantial growth. This area will also be affected by the newly constructed South Airfield Road between the Mineola area and KY 18. To the north, the Mineola Interchange area has experienced, and should continue to experience, significant Business Park development. The Airport Exchange Business Park and Circleport Industrial Parks should continue to develop. As a result of this growth, the residential uses along Mineola Pike and Booneland Trail should eventually be redeveloped in a Business Park manner, similar to the adjoining uses. Rolling Green Acres should likewise eventually redevelop as Industrial uses. Because of increasing development, the road network in this section should be improved, including the widening of Mineola Pike and road connections across airport property to KY 18 and/or Limaburg Road. The Cincinnati/Northern Kentucky International Airport is considering alternative plans to construct a new north south runway in this area to operate as a pair with the existing 18L/36R runway. The new construction would be east of the existing runway, and therefore would require the relocation or displacement of Donaldson Highway, Mineola Pike, O'Hara Road, and Turfway Road, as well as existing industrial developments, a church, some low density residential uses, and a portion of the Turfway Racetrack operation. If this concept becomes a reality, a joint Airport/Boone County/City of Florence study needs to be conducted to properly plan this area.

A substantial portion of this section is within the Houston-Donaldson Study area. In general, this Study recommends light industrial uses in the O'Hara Road area, with limited commercial development at Turfway Road and Donaldson Highway. Existing clusters of residential uses along Donaldson Highway, between O'Hara Road and the county line, should redevelop in an integrated commercial fashion involving the combination of existing lots, consistent with the Study. The central portion of the Marydale property is recommended to follow the recommendations of the Houston-Donaldson Study, which is due to be updated. A plan for extensive office development and some support commercial development has been approved for much of the site. Portions of the property near Turfway Road have been planned to develop in a High Density Residential nature, however, the potential for a future airport runway in the area could mean that office or business park development would be appropriate. Between the extension of Houston Road and I-75, office uses are encouraged to expand. This important future employment area should be served by mass transit including light rail when available. The Turfway Park Racetrack should remain; property to the east, along I-75, should develop in a mixed office and commercial manner compatible with the racetrack and entertainment operations.

15) CONSTANCE

Below the hillsides, land uses in the Ohio River flood plain should remain agricultural, Rural Density Residential, or river related recreational. The western portion of this section of Boone County lies in the flight path of the 18-L north-south airport runway, and the associated noise is discouraging residential growth in those areas. Riverview Estates Subdivision should redevelop as light industrial uses.

The river bottoms in this section have very limited development potential, and should remain largely residential and agricultural in character, with occasional local commercial development. Although this area includes excellent industrial potential along the river, it does not enjoy adequate access. Future industrial development may become appropriate should the access issue be addressed. The Anderson Ferry service should continue as a service to automobile, bicycle, and pedestrian traffic, and represents a historic resource for Boone County. The eastern portion of this area has been identified as a possible site for a new bridge over the Ohio River; however, the physical constraints of the river valley and relationship to Boone County's road network combine to make this an inappropriate location for a bridge. The river bottoms in the Constance area would make excellent recreation areas over the planning horizon.

16) HEBRON

Subdivision activity should continue around Bullittsville and along Bullittsville Road, with High Density Suburban Residential and local commercial uses designed to reinforce the small town character. Residential development proposed to access Graves Road, including the portion south of I-275, must be accompanied by improvements to that road. Development to the east of Bullittsville Road and south of KY 20 should include a network of road connections and is a prime location for a residential collector road between Bullittsville Road and KY 20 that includes no individual driveways or lot frontages.

This section of Boone County is characterized by the I-275 and KY 237 Interchange and the established town of Hebron. Land to the north of the airport interchange lies directly under two of the airport's flight paths and, in some cases, is best suited for commercial, office, or industrial uses related to the airport. The Hebron area has been dramatically affected by the 18R north-south airport runway. Construction of this runway has displaced existing residential land uses, impacted public land uses, and relocated or closed roadways.

Some Business Park development is appropriate adjacent to the SouthPark project and I-275, with access provided by the extension of SouthPark Boulevard. Again, this development must be carefully planned to avoid negative impacts to Developmentally Sensitive hillsides near Elijah Creek. The Carder-Dolwick Nature Preserve is an indication of the importance of this valley as a natural area. The SouthPark project should represent the northern-most limit of industrial uses on North Bend Road. Land to the west of North Bend Road and south of Graves Road is suitable for High Suburban Density Residential development, which will provide a transition to the Suburban Residential densities in the Francisville area. This High Suburban Density Residential development must be clustered to make the most effective use of the land and preserve important natural features. In addition, because of the area's topography, the retention of existing wooded areas near Sand Run Creek provides the only appropriate transition area between Park West and planned residential development. Acreage next to the

interstate, at Graves Road, is appropriate for high-profile office uses in order to take advantage of visibility to interstate traffic and to provide a transitional use between the business park development to the east and residential uses to the west. Combined with a future parallel road north of I-275, a possible interchange at Graves Road should preclude any need to directly connect the Idlewild Interchange with KY 8.

On the south side of the KY 237 Interchange, additional industrial development should occur west of Litton Lane. A collector roadway should be developed along the southern border of this site, parallel to I-275. This roadway will provide access to the industrial property and to the possible future interchange at Graves Road. The southern boundary of this industrial development should terminate at KY 20 as shown on the Land Use Map. Industrial developments should be designed to direct truck traffic to collector roads and away from KY 20. The Industrial/Business Park shown south of I-275 in the Bullittsville area is dependent upon a future interchange in the Graves Road area. This development must be sensitive to the residential located to the south and should be accessed from the interchange and not via KY 20. This development must also be designed to fit into an established residential corridor. Design control will be important in this area. The existing and planned residential areas located on the east and west side of KY 237, north of KY 20, should remain, with an area of commercial uses around the KY 20 and KY 237 intersection to serve area development. The southeast quadrant of the KY 237 Interchange should develop in a Business Park manner on the acreage fronting on KY 237. The design of this development should include large building setbacks to be visually consistent with existing development on the southwest quadrant. The site is suitable for a Business Park or one large user similar to the existing industrial uses located along Litton Lane.

Property to the east of the interchange along I-275 possesses high visibility and is a suitable location for high-profile Business Park development similar to that occurring at the Mineola Interchange. The development of this Business Park area is dependent upon a road connection from KY 237, opposite Litton Drive to Elijahs Creek Road to allow all traffic associated with the development to directly access the KY 237 Interchange, and to serve future residential growth. This road should be connected to the relocated KY 20, near I-275 and near the runway tunnel, through industrial development. For industrial development to occur east of Elijah's Creek in this area, it must have either the direct KY 20 connection or the KY 237 connection described above. Industrial traffic should not utilize Elijahs Creek Road unless that road is significantly upgraded for its entire length. The Carder-Dolwick Nature Preserve should be protected and expanded if possible.

High Suburban Density and Urban Density uses in Hebron should remain near the intersection of KY 20 and KY 237. These uses must have adequate water and sanitary sewer service and should be accompanied by increased school capacity. These developments should utilize existing woodland as a buffer to the Suburban Density Residential uses. The small industrial park surrounding the Hebron Post Office should continue to develop to the limits indicated on the Future Land Use Map.

The property adjacent to the Public Library, on the north side of Cougar Path, should develop as various, clustered public facilities, and/or compatible commercial and office uses, to make use of the easy access to Hebron-Burlington-North Bend Road service areas. With the opening of the Main Library on KY 18, and the purchase of additional land along North Bend Road for a new library to serve the Hebron area, the future of the Lents Branch library is uncertain. The KY 20 and KY 237 intersection area should contain a variety of commercial and higher density residential uses to establish the location as a future service center connected to the older town of Hebron. Open space and landscaping should be an integral part of development design at this important Boone County intersection to give the appearance of coordinated development. Further Urban Residential uses planned behind the Hebron Commercial Mart development must utilize a site design that pays attention to building orientation and landscaping in order to enable an adequate visual transition from KY 20 and into older single-family areas to the north. These established residential neighborhoods will eventually be surrounded by commercial, industrial, and higher density residential development, and need some degree of visual protection.

The commercial uses at this intersection should be consistent in architectural design and landscaping with adjacent residential uses. The planned Urban Residential uses should not develop until adequate elementary school space is available. Small roads in the area are not suitable for serving subdivision or industrial traffic and must be upgraded or bypassed in such developments.

17) NORTH HEBRON

Some Suburban Residential and Rural Density Residential development should occur along the southern portion of Williams Road as a result of infrastructure improvements. Future road access to the KY 8 area from the Graves Road and KY 237 areas would be more suitable than the discussed connection of KY 8 with the I-275 Idlewild Interchange, because of topography and Developmentally Sensitive Areas. With planned public sanitary sewer improvements in the Sand Run Creek and Elijah Creek watersheds, including sewer lift stations, there will continue to be considerable growth pressures. Development should be clustered on the ridge top areas because of the limited capacity of the existing roadway network, the Developmentally Sensitive areas, and the importance of the stream valleys as greenbelts. Lower density development, such as Rural Density Residential, should provide a transition into the Developmentally Sensitive areas.

With the provision of adequate infrastructure, some Suburban Density Residential development and small amounts of attached housing may extend onto the ridge top areas. Development would need to retain the bluff line vegetation in order to minimize the visual and environmental impacts of residential development. Planned Development or clustered housing should be used to insure proper development of this area, due to environmental and site characteristics. Much of the remaining land in this section contains Developmentally Sensitive and scenic hillsides, and should stay wooded in order to create open space between future developments. The Sand Run Creek and Elijah Creek valleys should constitute such open space.

There are areas within this section of the County which are suitable for recreational uses, such as the 422 acre Traditions Golf Course on Williams Road. This section should experience considerable residential growth pressures especially around the golf course to the east. This development should not occur until adequate infrastructure is provided, including significant improvements to Graves Road. The area west of the golf course and north of I-275 should develop residentially, once adequate road access and utilities are available. As stated in previous sections, this development should not encroach on the developmentally sensitive areas.

Land in the Williams Road area, north of I-275, is suitable for some Suburban Density residential development now that Worldwide Boulevard is completed and water and sanitary sewer are available. A road connection from KY 8 to I-275 warrants further study to determine feasibility and potential impacts on Developmentally Sensitive areas. Such a connection may be more appropriate between the Idlewild interchange and Graves Road near and parallel to I-275. Limited Rural Density residential growth should occur along other roads in this section. Suburban Residential development cannot be adequately supported by the existing road system, and significant improvements to Williams Road would be necessary.

Conventional layout subdivisions should be discouraged because of their inefficient circulation systems and excessive site grading requirements. The stream valleys and ridge bluff edges in this section should remain in their current state to provide public open space for the residential development on the ridge tops. Overall, this section should experience growth because of its proximity to I-275 and the Burlington-Hebron areas.

In general, Suburban Residential development should be concentrated on land nearest to KY 237, as indicated on the Future Land Use Map. Unlike most developing areas of Boone County, the north river area contains only one primary means of access, being North Bend Road. In the event that a bridge is proposed between Boone County and Hamilton County, a full study of the impacts should be made. These impacts could include effects on labor supply and transpositions, increased truck traffic in Boone County, and impacts on existing and planned residential areas.

18) RIVER ROAD

This section of Boone County is characterized by KY 8, or River Road, and contains significant Ohio River frontage. Much of the topography is rolling, with Developmentally Sensitive hillsides. Because of the sensitive nature of these hillsides, the western portion of this section should remain wooded. The North Bend River Bottoms contain agricultural land and should remain in that capacity. Since the area is scenic, and the area's roadways are not suitable to serve large amounts of development, very limited Rural Density Residential growth should occur along KY 8. Some specialized agricultural uses should continue on the Ohio River flood plain area. The Recreation Element of this plan indicates this section is suitable for recreation uses; new recreational uses

are important because of the residential growth throughout Boone County. The current use of KY 8 by cyclists will likely continue and increase, and provisions for this recreational use should be considered as part of any future developments in this section of the County. Any connection of KY 8 to the Idlewild Interchange would adversely affect this phenomenon. Overall, this section should experience limited development because of the many Developmentally Sensitive areas and indirect access.

This section of Boone County has considerable Ohio River frontage, as well as an important residential development area along North Bend Road. Between Rivershore Farms and Taylorsport is a large river plain area that is suitable for athletic fields and similar recreation uses, exemplified by the Conrad Park and the Valley Orchards property to the southeast.

19) GARRISON CREEK

The Garrison Creek valley should remain intact as open space adjacent to Rural Density Residential growth, and should be considered for future outdoor recreation opportunities. The north side of the Petersburg Interchange at I-275 may be appropriate for future Office campus/Business Park land uses, however, all necessary infrastructure must be in place, and the development would have to ensure that an attractive, corporate character of development is presented toward I-275, considering this interchange is the first encountered by out-of-county and out-of-state traffic on the interstate. It has close proximity to the airport, as well as Indiana. Industrial uses or other uses that generate a lot of truck traffic are not appropriate here.

20) IDLEWILD

This section of Boone County contains the I-275 Idlewild Interchange, Idlewild, Bullittsville, and a substantial portion of KY 20. Portions of the area have public water service, but no public sanitary sewer, which will affect future density of development. The Idlewild interchange should see slow, highway-related, commercial growth, although the presence of the Answers in Genesis museum is likely to increase the rate the development of ancillary business in the area. This commercial development should occur on the southern half of the interchange because of the lack of visibility, established residential uses and church uses on the northern half. South of the interchange, Bullittsburg Church Road should be improved and serve as the only access to the commercial development from the KY 20 Bypass. The existing cement mixing plant should eventually redevelop as light industrial uses. The wooded swale south of this plant should remain as a buffer to existing and planned residential uses to the south. Access to commercial development on the southwestern quadrant must align with Bullittsburg Church Road. Idlewild proper is unlikely to experience major commercial or residential growth. Continued, gradual Rural Density and Suburban Density Residential uses should occur along KY 20 between Idlewild and Bullittsville. Street connections between KY 20, Idlewild Road, and Bullittsville Road through interconnecting subdivision developments are to be provided where possible. This plan recommends that the Idlewild Road area, in and around the year 2010 65 DNL contour level, continue as Rural Lands.

The High Suburban Density residential development shown on the Future Land Use map along I-275 is dependent on a new interchange in the Graves Road area and must be accessed from the interchange and Industrial/Business Park development described in the Hebron Area land use section.

21) PETERSBURG

This section of Boone County is characterized by the town of Petersburg and the western-most portion of KY 20. Much of the land is Developmentally Sensitive, undeveloped, or in agricultural uses. Petersburg could potentially be a resource for heritage tourism in the county due to its history and river frontage.

The extraction of gravel along the Ohio River in this area should continue at established sites; new locations for extractive operations should be discouraged so as to allow alternative uses, such as recreational and low density residential development. This should lead to an appropriate balance of uses along Boone County's substantial river frontage, including access for recreational uses. Inactive sand and gravel extraction sites along the river should undergo the reclamation process described in the Boone County Zoning Regulations, or be converted into recreation opportunities. The land to the north of Petersburg should be maintained for eventual low density residential, and recreational uses. There are also sites of archaeological significance in this section of the county which should be identified and preserved. In fact, the entire town and river plain area surrounding it, have high

potential for burial and village sites to be found by any type of modern construction. Public infrastructure installation and private construction need to be done carefully and under supervision of knowledgeable authorities. The existing pay fishing lake area and Taylor Creek should be considered for a future wildlife habitat area. Development in the Petersburg area should protect the scenic characteristics of the hillsides and river plains.

Petersburg must continue to contend with its isolation from the urban service areas of Boone County and poor accessibility during the winter months. Any reconstruction of KY 20 into Petersburg should occur for the purpose of serving residential and school-related traffic, rather than for use by industrial vehicles. The preservation of the historical buildings of this important Kentucky town should be a prime objective, and eventual development of a tourist industry is possible with adequate planning and administration. Small commercial services within the town should be provided and designed to reinforce and retain the small town character of Petersburg, along with the Petersburg Community Center and branch library. The areas in and around this town offer an opportunity for neo-traditional residential and small commercial development. With improvements to KY 20 and the provision of water and sewer service, the town could grow significantly. For this to occur, it must be in the form of formal and well designed neo-traditional development. Public water lines reached the southeastern edge of town in 2010, but have not yet been extended into the town grid.

22) BELLEVIEW/McVILLE

This section of Boone County is characterized by significant Ohio River frontage and the mouth of Woolper Creek. The river bottoms in this section contain prime agricultural land and existing gravel extraction sites. New extraction operations should be confined to sites adjacent to existing operations between KY 20 and the Ohio River. The redevelopment of former gravel extraction sites may be suitable for river related recreational uses accompanied by self contained clustered residential development. The hillsides should remain largely wooded, while the more level areas can continue to support agriculture. This area includes some of the best prime farmland in the county.

During the late 1980s a combination recreation and residential development was planned for the mouth of Woolper Creek, however, this project was abandoned, and the Corps Of Engineers conducted a partial reclamation of the site. The result has been the creation of a significant wildlife habitat that should ultimately become accessible to the public. This site has been shown in past OKI, NKADD, and Boone County recreation studies as suitable for a large county park or similar facility, and constitutes another potential resource within the western Boone County tourism area. Adjacent to the former marina site is the geologically significant formation known as Split Rock. Additionally, a study should be conducted to consider the Woolper Creek Valley, from the creek's mouth to the Ashby's Fork Road area, as a recreation/ environment preservation corridor. In 2008, NKU's Center for Applied Ecology completed a stream restoration project along Woolper Creek and its tributary Stone Creek. The project included: (1) plugging artificial channels that had been cut through an oxbow in Woolper Creek years before, thereby which restoring 4,300 feet of meander bend channels, (2) restoring over 2,000 feet of Stone Creek and a riparian buffer through a valley that had been filled and exhibited severe erosion, and (3) modifying basins constructed for marina, which are now in the process of reverting to 7 acres of wetlands. This portion of the valley is particularly important because of its geologic and vegetation characteristics. Sensitive development of the Woolper Creek tributary valleys is also necessary to protect the stream itself. Overall, this section should experience limited growth due to its isolation from major transportation routes and urban services as well as its value as a unique natural area and a component of Boone County's heritage tourism potential.

Sanitation District No. 1 of Northern Kentucky's Western Regional Wastewater Treatment Plant south of Woolper Creek is expected to go online in 2012. SD-1 intends this plant to serve the developing portions of Boone and Kenton Counties, although some of the Petersburg-Belleview area may be able to access the plant with private infrastructure and necessary approvals. Overall, the plant is not intended to encourage growth and development of this portion of the County. Because of the geological and natural resources present in this area, there should be some public recreation opportunity associated with the plant location and the service lines and easements that lead to the plant.

This section of Boone County contains the small communities of Belleview and McVile, and is primarily composed of river bottom area. The gravel extraction operations to the north of Belleview should remain, but should not extend east of KY 20, or adjacent to existing or planned recreation sites. The southern portion of this area, where mineral extraction has been concluded, should be considered for development as a river oriented recreational area, or wildlife habitat as part of the reclamation process.

Belleview and McVile proper should function as neighborhood centers for the surrounding area. The communities in this general area of Boone County have experienced some growth, in the form of the Kelly School in Belleview and the firehouse. Additional new local-scale commercial services may develop; existing buildings should be restored or replaced to meet the towns' residential and commercial needs. The cemeteries on KY 18 will hinder any development in that area, thus any growth should occur south or east of the towns. Overall, this section should experience slow residential growth along the major roads of the area, with neo-traditional residential or continuing agricultural uses on the river bottoms. Any commercial development in this area should occur within the town center of Belleview and McVile and not along the roadways outside the towns. These two towns present an excellent opportunity for residential to expand in a neo-traditional manner, as described for Petersburg. This development must carefully be carried out so that typical subdivision development does not alter the character of the area. With proper development in this fashion, the towns can become centers of activity for western Boone County.

The Middle Creek Valley comprises a major portion of the land area in this section. Substantial acreage is Developmentally Sensitive; it should remain mostly wooded to protect historical preservation and recreation uses in the area from the visual impacts of nearby residential development. Boone Cliffs is also located in this area and contains important geological formations which should be preserved. Additionally, this section contains the Dinsmore Homestead, Boone Conservancy, and three properties maintained by Boone County Parks, including the 75-acre Boone County Cliffs Nature Preserve, the 105-acre Dinsmore Woods Nature Preserve, and the 230-acre Middle Creek Park. These sites should likewise be preserved as they are valuable assets as tourism resources. The Middle Creek Valley should become a preservation corridor in order to protect and expand the existing nature preserves, passive recreation sites and historic sites. This area should be protected from major utility main construction, such as water and sewer, and from development pressure along KY 18, including extractive mining activity. KY 18 is the major access route to the area and needs moderate improvements to accommodate traffic without jeopardizing the region's rural characteristic. Boone County, private organizations and the citizens of the county should work together to insure that this important area is protected. Outside of the towns, this section should experience isolated growth of a Rural Density Residential character.

23) EAST BEND ROAD

This section of Boone County contains a substantial part of East Bend Road. The greatest amount of growth in this section should occur along East Bend Road, mostly in the form of Open Space Design Residential development. The location and number of driveways should be controlled, and where possible, driveways should be shared. This development will require the realignment and improvement of East Bend Road. The small community of Waterloo may receive some limited residential growth as a result of growth in the Belleview and Burlington areas.

24) CAMP ERNST

The western half of this section should remain undeveloped or in agricultural uses. Development along Hathaway Road, west of Camp Ernst Road, should be limited. Due to its scenic value, land along the creek and south of Hathaway Road may be suitable for passive recreational uses, as well as promoting tourism in the area. The Boy Scout campground should be protected as recreation land, and any adjoining land uses should be designed to be compatible with this facility. The entire Gunpowder Creek valley should be considered for a future corridor study to preserve this unique and important County feature as a greenbelt and passive recreation corridor. Residential development should remain along the existing roads, consolidating access points where appropriate. Rural Density residential should occur around Central Park to reinforce the existing character of the area.

25) RABBIT HASH

This section of Boone County contains Rabbit Hash, the intersection of KY 338/KY 536/KY 18, and considerable Ohio River frontage. The Rabbit Hash area, including the Rabbit Hash General Store, has become a significant tourist attraction and should continue as such without compromising its rustic and small town nature. Limited residential growth should occur along the major roads leading to this area. Formal subdivision developments are not recommended, in keeping with the existing character and lack of urban services. The junction of the state routes should provide local service needs that would be inappropriate within the established town of Rabbit Hash. Any commercial that may develop at this intersection should have a theme consistent with that of rustic Rabbit Hash. The land along KY 18 which is in crop production should continue in that capacity. Furthermore, the Developmentally Sensitive hillsides in this region should be protected. In general, growth in this area should be limited. Every attempt should be made to preserve the character of Rabbit Hash in light of its growing popularity and the gaming development across the river. The roads are currently not adequate to handle an increase in traffic to Rabbit Hash or to river access. Overcrowded tourist conditions include such impacts as noise, lack of parking, blockage of the street, trash, etc. should be addressed through strategic improvements defined by the 2004 Rabbit Hash Historical Society Task Force report. This location should not be considered for a future ferry location due to the condition of the roads leading into Rabbit Hash. Any potential ferry location should occur to the north of Rabbit Hash, possibly at a reclaimed gravel pit site.

This section of Boone County also contains the East Bend Power Plant and a substantial area of river bottom. The power plant has developed a large portion of this section, using much of the developable land. Two large areas to the east and west of the plant are in agricultural use and should remain. The rough terrain to the north of KY 338 is divided by three small creeks. Development of any kind in this area should be limited; industrial development is inappropriate because of poor access. The backwater area of Lick Creek, east of the power plant, should be examined as a potential wetland wildlife management area. Significant growth is not anticipated for this area because of its remoteness. The potential for tourism exists in this region due to archaeological sites and historic buildings.

26) BIG BONE LICK

This section of Boone County is characterized by several rural roadways, including KY 338 (Beaver Road), Riddles Run Road, and Big Bone Church Road. Even with the rural water line program, residential development will be slow and of a large-lot nature. Large lot subdivisions should provide for connections where appropriate to stream valleys and the future public recreation potential that they provide. It also contains the mouth of Gunpowder Creek. Due to the major creeks and tributaries, much of the land in this section is Developmentally Sensitive, and should be protected from development. Most of the growth in this area should be of a Rural Density residential nature, located predominately along Beaver Road. Some recreational uses may develop based on the amenities of Gunpowder Creek.

The area of KY 338 from Riddles Run Road to Big Bone Church Road may see the development of some seasonal homes as well as seasonal camping at Big Bone Lick State Park and Boone's Landing. Land between Ryle Road and Boat Dock Road should not be developed due to steep slopes and poor soil conditions. Big Bone State Park should be expanded in size and in quality. The property adjacent to Boone's Landing (known as Jane's Saddlebag) was recently rezoned to Recreation for recreation and tourism uses. KY 338 from U.S. 42 to Boat Dock Road could develop some limited commercial uses, consistent with recreation uses in the area. This possible development is not shown on the Future Land Use Map. Any requests for such uses should be examined carefully in order to ensure that they fit in with the rural and recreational character of the area as well as maintaining safety along KY 338.

This section of Boone County is dominated by several creeks, including Big Bone Creek, Mud Lick Creek, and the Big South Fork Creek along the Boone County/Gallatin County border. Most of the acreage in this section is Developmentally Sensitive, and should remain wooded. Residential development in this area is concentrated on Ryle Road, along the Ohio River. Ryle Road is subject to frequent slippage along the steep river banks; the resulting poor condition of the road limits future residential growth. The existing residential uses along Ryle Road limit potential public access to the river in this area. An effort should be made to connect Big Bone Lick State Park to the Big Bone Boat Dock. A possible future bridge to Gallatin County would provide an incentive for

additional river-related recreation facilities. It could also increase usage of Big Bone Lick State Park, making expansion of the park and connection to the riverfront area feasible. Overall, this section should experience very limited residential growth and be oriented towards river access and river recreation activities.

27) BEAVERLICK

This section of Boone County is characterized by a substantial portion of U.S. 42, Richwood Road, Hicks Pike, and Rice Pike area. This section will also be greatly affected by the reconstruction of U.S. 42. Suburban Residential Development of this section of the county is dependent upon the provision of water and sewer, and should not negatively impact the Big Bone Creek and Mud Lick Creek watersheds. The water and sanitary sewer services should not commit these two watersheds to extensive development. Even with the rural water line program, residential development will be slow and of a large-lot nature. It is important that residential subdivisions construct internal roadway systems rather than using the existing roads for primary access; these existing roads should serve as corridors to move traffic through the area. Substantial residential growth will compound crowded conditions at the New Haven Elementary School and will require expansion of school facilities. Beaverlick should remain as a small community with little growth. Any commercial development in this area should locate at the intersection of U.S. 42 and Beaver Road in Beaverlick.

28) SOUTH FORK CHURCH

This small section of Boone County is largely characterized by the border with Gallatin County. Growth should be minimal, in the form of Rural Density residential uses along U.S. 42.

