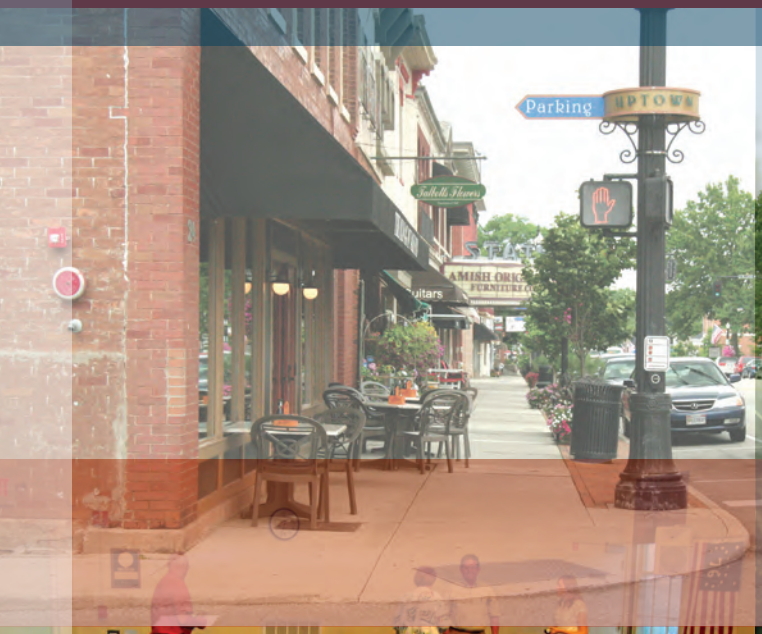
2012

BIG WALNUT WATERSHED PLANNING PARTNERSHIP

BALANCED GROWTH PLAN



morpc

Mid-Ohio Regional Planning Commission

The Mid-Ohio Regional Planning Commission (MORPC), 111 Liberty St., Columbus, OH 43215, 614-228-2663, in conjunction with the Big Walnut Watershed Planning Partnership, prepared this report with funding from the Federal Highway Administration and the Ohio Water Resources Council. The report reflects the views of MORPC and the partnership, which are solely responsible for the content.

U.S. Department of Transportation

Federal Highway Administration

Ohio | Water Resources Council

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ACKNOWLEGEMENTS

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A number of community representatives, stakeholders and citizens contributed to the development of the Big Walnut Balanced Growth Plan. A full list of the Big Walnut Planning Partnership participants is on page 4. MORPC would like to thank everyone who participated in this planning process and recognize the following individuals for also volunteering to serve on the Big Walnut Steering Committee:

Big Walnut Steering Committee

Bill Dorman, Village of New Albany

Stacy Boumis, Village of Obetz

Matt Brown, Franklin County Economic Development & Planning

Steve Morris, Village of Groveport

Charles McCroskey, Jefferson Township

Ryan Edwards, Licking County

Jeanna Burrell, Village of Galena

Allison Shaw, Metro Parks

Scott Sanders, Delaware County Regional Planning Commission

Rob Platte, Jefferson Township

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LIST OF ACRONYMS

BGI – Balanced Growth Initiative

BGP – Balanced Growth Planning

BLLUP – Best Local Land Use Practices

BMP – Best Management Practices

BWPP – Big Walnut Planning Partnership

CNS – Covenant Not to Sue

CO_2 – Carbon Dioxide

COTA – Central Ohio Transit Authority

CWA – Clean Water Act

DFIRM – Digital Flood Insurance Rate Map

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FHWA – Federal Highway Administration

FPA – Facility Planning Area

GIS – Geographic Information System

HSTS – Home Sewage Treatment Systems

HUC – Hydrologic Unit Code

IBI – Index of Biological Integrity

IMP – Integrated Management Plan

LID – Low Impact Development

MORPC – Mid-Ohio Regional Planning Commission

MPO – Metropolitan Planning Organization

MS4 – Municipal Separate Storm Sewer Systems

NFA – No Further Action

NHD – National Hydrography Dataset

NLCD – National Land Cover Dataset

NO_2 – Nitrogen Dioxide

NPDES – National Pollutant Discharge Elimination System

NPS – Nonpoint Source

NRCS – National Resource Conservation Service

NRHP – National Register of Historic Places

NWI – National Wetlands Inventory

O_3 – Ozone

ODNR – Ohio Department of Natural Resources

ODOD – Ohio Department of Development

ODOT – Ohio Department of Transportation

OLEC – Ohio Lake Erie Commission

ORC – Ohio Revised Code

ORDC – Ohio Rail Development Commission

OWDA – Ohio Water Development Authority

OWRC – Ohio Water Resources Council

PAA – Priority Agricultural Area

PCA – Priority Conservation Area

PCB – Polychlorinated Biphenyl

PDA – Priority Development Area

PRD – Planned Residential Development

PUD – Planned Unit Development

RR – Railroad

SO_2 – Sulfur Dioxide

SR – State Route

SWAP – Source Water Assessment and Protection Program

SWCD – Soil and Water Conservation District

SWMP – Storm Water Management Program

TBA – Targeted Brownfield Assessments

TDR – Transfer of Development Rights

TIP – Transportation Improvement Program

TMDL – Total Maximum Daily Load

TND – Traditional Neighborhood Design

USDA – United States Department of Agriculture

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

VAP – Voluntary Action Program

VMT – Vehicle Miles Traveled

WAP – Watershed Action Plan

WMPI – Watershed Management Priority Indices

WMPI-CPI – WMPI Conservation Priority Index

WPP – Watershed Planning Partnership

WQS – Water Quality Standards

EXECUTIVE SUMMARY

Balanced Growth Initiative:

- Watershed scale planning
- Voluntary
- Incentive-based

The Planning Process:

- Identify issue(s)
- Form Big Walnut Planning Partnership
- State goal(s)
- Define Priority Areas
- Select and weight criteria for identification of Priority Areas
- Local review of Priority Areas
- Identify implementation tools
- Local adoption of plan
- State endorsement of plan
- Implementation

Recommendations:

- Locally adopt plan
- Develop local comprehensive plan
- Update comprehensive plan every five years
- Incorporate Priority Areas into local community plans and zoning
- Integrate Implementation Tools where applicable and appropriate
- Continue participating in the Big Walnut Planning Partnership

The Mid-Ohio Regional Planning Commission (MORPC), an association of local governments in central Ohio, worked with the Big Walnut Planning Partnership (BWPP) to produce this Big Walnut Watershed Balanced Growth Plan. Balanced Growth is a voluntary, incentive-based planning process designed to protect Ohio's watersheds and facilitate local and regional economic development. The BWPP is made up of 31 communities and many watershed stakeholders that voluntarily agreed to direct the development of the Balanced Growth Plan while MORPC provided technical and administrative guidance.

Land use decisions transform and shape our communities in multiple ways. Growth and development are considered positive for many communities. Development can increase a community's tax base and provide employment opportunities for residents. However, growth can become costly over the long term if not carefully planned to maximize the return on infrastructure investments and protect critical environmental areas. The development of open space or farmland results in increased impervious surface coverage from roads and rooftops. This can negatively impact watershed health by causing greater quantities of stormwater runoff. Greenfield development can also place unnecessary financial burdens on communities if it requires substantial extensions of sewer, water, and road networks. In addition to requiring upfront infrastructure investments, the additional miles of roadway and added sewer and water capacity will be increasingly expensive to maintain over time. This plan addresses the following interrelated issues that influence the environmental and economic health of the Big Walnut Watershed:

Water Quality: The Big Walnut Creek Watershed is large and drains a very diverse landscape from the most rural farm fields to dense urban environments. As a result, water quality varies from exceptional warm water habitat in full attainment to limited resource waters in non-attainment of Clean Water Act standards. Big Walnut Creek is listed on Ohio's 2010 Section 303(d) list of impaired waters. Agricultural run-off, failing home sewage treatment systems, channel modification, and urban stormwater runoff contribute to water quality impairment of the creek and its tributaries. The entire watershed is within the Utica Shale boundaries that have the potential for development using horizontal drilling technology with hydraulic fracturing. Such development under existing methods would result in significant consumptive use of fresh water resources for the watershed.

Growth Management: Population growth is projected in the watershed, particularly in the central portion of the watershed, stretching from the northern end of Franklin County up through central Delaware and Licking County. Future development in the Big Walnut Watershed should be planned to minimize harmful impacts to the watershed, minimize the loss of important agricultural or environmentally sensitive areas, and maximize the efficient use of infrastructure.

Need for Regional Collaboration: Land use decisions made in one community will have impacts that are felt in the surrounding area. Natural features like rivers do not follow political boundaries; therefore, it makes sense to take a multi-jurisdictional approach when planning for water quality protection. The same can be said of economic activity where what happens in one community can impact its neighbors. Working together to secure economic competitiveness stands to benefit every community in the region.

Limited Fiscal Resources: There will be increasingly limited fiscal resources to support future development demands. Communities are encouraged to consider the full lifecycle costs of new development, including but not limited to the costs to extend and maintain services into new areas of the community. Cost savings could also potentially be achieved by partnering with neighboring communities to address shared concerns or provide services.

The BWPP has worked to address the aforementioned issues by identifying areas across the watershed that are critical for protection (Priority Conservation Areas), particularly well-suited for development or redevelopment activities (Priority Development Areas), or ideal targets for continued or expanded agricultural use (Priority Agricultural Areas). The Priority Areas were identified using a two step process. First, MORPC identified and mapped potential priority areas based on an analysis of objective criteria selected by the BWPP. Following the initial analysis of criteria, each community was asked to review the potential priority areas in their jurisdictions and make adjustments as necessary. Based on this community review, MORPC created Priority Area maps which could continue to be reviewed through the public comment period. Thus, the Priority Area maps in this plan are the result of both a watershed-wide technical analysis and a localized iterative review process. MORPC facilitated partnership discussions during the local review process to encourage consistency and communication between the BWPP jurisdictions.

The BWPP Balanced Growth Plan also includes a suite of implementation tools to assist communities in their efforts to address the issues facing the Big Walnut Watershed. This plan recommends that communities utilize these tools where appropriate in an effort to achieve watershed health, economic competitiveness, and agricultural productivity in line with this planning effort and the communities' wishes.

The designation of an area as a Priority Area does not mandate that the area be conserved, developed, or used for agricultural purposes. Incorporation of the Priority Areas into a community's comprehensive plan or local zoning is recommended but not required. When this plan is finalized, MORPC will work with the BWPP and the Ohio Water Resources Council to achieve state endorsement of the Big Walnut Balanced Growth Plan. State endorsement requires local adoption of the plan by at least 75 percent of the Big Walnut Watershed communities. Upon endorsement, participating BWPP communities will be eligible to access state incentives which are designed to promote activities consistent with the designated Priority Areas.

BACKGROUND

Purpose

This Plan is one of five Balanced Growth Plans being developed in contiguous watersheds in central Ohio as part of a voluntary, local response to a state initiative. The Ohio Balanced Growth Initiative was developed to protect and restore Ohio's watersheds. The Balanced Growth Initiative utilizes a watershed-wide approach for developing a plan that reflects local priorities and achieves protection of shared resources. Balanced Growth Plans are intended to complement local watershed action plans that focus on improving and protecting the physical habitat and chemical water quality of watersheds and their diverse plant and animal communities.

> *"Balanced Growth is a voluntary, incentive based strategy to protect and restore [Ohio's watersheds] to assure long-term economic competitiveness, ecological health, and quality of life."*
>
> - Ohio Lake Erie Commission

Stakeholders and community representatives in the Big Walnut Watershed have worked together to address the interrelated issues of water quality and economic competitiveness by carefully planning and designating Priority Areas that promote conservation efforts in areas that have significant ecological value, (re)development in areas that efficiently utilize and maximize return on existing infrastructure, and continued agricultural practices in the areas that are most valuable for agricultural activity due to historical, cultural, natural or human created traits.

Process

PARTNERSHIP FORMATION AND GOVERNANCE

In 2010, MORPC was awarded a competitive grant from the Ohio Water Resources Council (OWRC) to facilitate the development of a Balanced Growth Plan for the Olentangy Watershed. MORPC leveraged this funding with U.S. Department of Transportation Federal Highways Administration Surface Transportation Planning dollars to develop Balanced Growth Plans for four additional central Ohio watersheds, one of which was Big Walnut. MORPC then organized the Big Walnut Planning Partnership (BWPP) to provide guidance throughout the Balanced Growth Planning process. The BWPP, consisting of community representatives and stakeholders, directed the development of this plan while MORPC provided technical assistance, scheduled and facilitated meetings, and developed materials for the partnership.

Each participating community was asked to elect a representative to attend partnership meetings and work with fellow delegates in creating the plan. The representatives were

encouraged to share the progress made at the partnership meetings with colleagues and residents of their jurisdictions. Each community was given one vote for matters requiring a vote during the planning process. However, the partnership worked to reach consensus the majority of the time. Stakeholders were not afforded an official vote, but they were presented with opportunities to voice their expertise and opinions throughout partnership meetings and prior to any decisions being made.

BIG WALNUT WATERSHED PLANNING PARTNERSHIP

Big Walnut Community Representatives

While each community was granted only one vote for matters requiring a vote, communities were permitted to have multiple representatives attend and participate in meetings.

Bruce Langner, City of Bexley

John Carter, City of Columbus

Kevin Wheeler, City of Columbus

Bonnie Gard, City of Gahanna

Troy Euton, City of Gahanna

Steve Morris, City of Groveport

Bill Dorman, City of New Albany

Matt Hansen, City of Reynoldsburg

Frank Wiseman, City of Westerville

Lisa LaMantia, City of Westerville

Raymond Ogden, City of Whitehall

Joyce Jones, Village of Fulton

Jeanna Burrell, Village of Galena

Christie Ward, Village of Lockbourne

Linda Eisentrout, Village of Minerva Park

Stacy Boumis, Village of Obetz

David Martin, Village of Sunbury

Ronald Bullard, Berlin Township

Stewart Flaherty, Blendon Township

Joe Clase, Genoa Township

Charles Hann, Hamilton Township

Shannon Bush, Hamilton Township

Tom Spring, Jefferson Township

Derek Myers, Jersey Township

Jim Endsley, Jersey Township

Steve Volpe, Kingston Township

Susan Brobst, Madison Township

Lynn Stewart, Mifflin Township

Jim Hatten, Oxford Township

Ben Collins, Plain Township

Scott Sanders, Delaware County Regional Planning Commission

Matt Brown, Franklin County Economic Development & Planning

Ryan Edwards, Licking County Planning Commission

Patricia Davies, Morrow County Planning & Development

Big Walnut Stakeholders

Cotton Randall, Ohio Division of Forestry

Ryan Pilewski, Franklin SWCD

Kurt Keljo, Franklin SWCD

Cole Miller, Ohio EPA

Mike Sapp, Ohio EPA

Michael Hooper, Westerville Parks & Recreation

Allison Shaw, Metro Parks

Bill Resch, Friends of Big Walnut Creek

Don Glosser, Columbus Chamber

Will Kopp, Columbus State Community College

Judith Brachman, League of Women Voters

Jim Hilz, BIA of Central Ohio

Allen Prindle, Otterbein University

David Roseman, Friends of Alum Creek & Tribuaries (FACT)

Bill Myers, Friends of Big Walnut Creek

Al Harter, Friends of Big Walnut Creek

Bob Kyle, Friends of Big Walnut Creek

Mark Converse, Friends of Big Walnut Creek

Ed Miller, Delaware SWCD

Luanne Hendricks, Sustainable Westerville

Elizabeth Toman, Friends of Big Walnut Creek

Ramon Corpuz, Sierra Club

Bob Bostard, Friends of Big Walnut Creek

Early in the planning process, the BWPP agreed on a set of ground rules (see Appendix C) and determined the governance structure for the group, forming a steering committee to develop draft Priority Area criteria recommendations for the full partnership to consider.

Upon finalization of this plan, all partnership communities will be asked to pass a resolution to adopt the Big Walnut Balanced Growth Plan. If over 75 percent of communities in the Big Walnut Watershed (by number of communities, population, and land area) adopt the Big Walnut Balanced Growth Plan, the BWPP can seek endorsement from the state. If the plan receives state endorsement, all participating communities will be eligible for special state incentives that have been linked to the Balanced Growth Initiative (see Appendix B). More detailed information about the population and land area of the Big Walnut Watershed planning area by participating jurisdiction is available on page 52.

PUBLIC INPUT

Throughout the planning process, the public was invited to participate in a variety of ways. The original invitation to join the BWPP was broad and sent to a large number of community organizations, institutions, and businesses throughout the watershed. MORPC maintained a website specific to Balanced Growth Planning where regular updates, including the times and locations of all meetings, were posted. MORPC also sent out press releases to inform the public about Balanced Growth Planning in the Big Walnut Watershed and to invite broader participation in the planning process.

MORPC hosted public meetings at two key points in the planning process to gather input and feedback on the planning effort. The first key point was when the partnership agreed on goals, definitions, and the criteria that would be used to create draft Priority Area maps. The second key point was the completion of the Big Walnut Balanced Growth Plan draft text. At

these public meetings, MORPC staff presented information about Balanced Growth Planning and then invited attendees to comment and ask questions. More information about MORPC's public outreach process can be found Appendix D of this plan.

GOAL AND GUIDING PRINCIPLES

At their October 20, 2010 meeting, the BWPP developed and voted to approve the following goals to guide this planning effort:

A. Protect environmental resources.
B. Preserve the unique character of each community.
C. Promote sustainable development.

These goal statements are supplemented by the 10 Guiding Principles developed by the state to assist Watershed Planning Partnerships in their task of creating watershed-based Balanced Growth Plans.

STATEMENT OF HOW THE BIG WALNUT BALANCED GROWTH PLAN ADDRESSES EACH PRINCIPLE

1. Maximize investment in existing core urban areas, transportation, and infrastructure networks to enhance the economic vitality of existing communities.

Priority Development Areas encourage development in areas that are well served by existing infrastructure. Promoting development in these areas maximizes the efficient use of infrastructure and minimizes the need to extend infrastructure, which carries an upfront capital cost, as well as ongoing operations and maintenance costs. The criteria that were initially used to highlight these areas give greater weight to land in urbanized areas and land that is readily served by the existing sewer, water, and transportation infrastructure. Compact development and brownfield redevelopment are promoted in this plan as tools that can help communities make efficient use of existing infrastructure.

10 Guiding Principles for Sustainable Ohio Watersheds

ATTAINING A LIVING EQUILIBRIUM BETWEEN A STRONG, DIVERSIFIED ECONOMY AND A HEALTHY ECOSYSTEM

Activities in Ohio's watersheds should:

1. Maximize investment in existing core urban areas, transportation, and infrastructure networks to enhance the economic vitality of existing communities.
2. Minimize the conversion of green space and the loss of critical habitat areas, farmland, forest, and open spaces.
3. Limit any net increase in the loading of pollutants or transfer of pollution loading from one medium to another.
4. To the extent feasible, protect and restore the natural hydrology of the watershed and flow characteristics of its streams, tributaries, and wetlands.
5. Restore the physical habitat and chemical water quality of the watershed to protect and restore diverse and thriving plant communities and preserve rare and endangered species.
6. Encourage the inclusion of all economic and environmental factors into cost / benefit accounting in land use and development decisions.
7. Avoid development decisions that shift economic benefits or environmental burdens from one location within a region to another.
8. Establish and maintain a safe, efficient, and accessible transportation system that integrates highway, rail, air, transit, water, and pedestrian networks to foster economic growth and personal travel.
9. Encourage all new development and redevelopment initiatives to address the need to protect and preserve access to historic, cultural, and scenic resources.
10. Promote public access to and enjoyment of our natural resources for all Ohioans.

ADAPTED FROM THE LAKE ERIE PROTECTION & RESTORATION PLAN, 2000

2. Minimize the conversion of green space and the loss of critical habitat areas, farmland, forest, and open spaces.

This principle is addressed through prioritizing areas for conservation due to the presence of environmentally sensitive features such as habitats or features that serve important environmental functions like forest and open space. The designation of priority development areas is also conducive to minimizing the conversion of green space by shifting the focus of development targets to areas where development already exists or there is supportive infrastructure. Conservation development is a recommended tool that encourages preservation of green space in development by clustering development on the site and maintaining areas in their natural state. Tools like Transfer of Development Rights (TDR) recommended in this plan would allow landowners in an area that is not suitable for development to sell their development rights to be applied to land in an area that is suitable for higher density development. This exchange would simultaneously promote the preservation of land unsuitable for development, such as many natural areas, and allow for more compact development in appropriate areas.

3. Limit any net increase in the loading of pollutants or transfer of pollution loading from one medium to another.

Tools such as Low Impact Development, Woodland and tree canopy protection, and stream and wetland setbacks (see Implementation Toolbox beginning on page 55) all seek to allow nature to filter, absorb, and sequester pollutants. The tree canopy protection tool in this plan provides a detailed background of the benefits of urban trees with regard to pollution sequestration and recommends that communities maintain a healthy tree canopy to reap, among other things, the benefits of cleaner air and water.

4. To the extent feasible, protect and restore the natural hydrology of the watershed and flow characteristics of its streams, tributaries, and wetlands.

PCAs seek to conserve or preserve natural features such as the floodplain, natural land cover, and wetlands that serve hydrologic functions. Recognizing the key role the streams play in the health of the Big Walnut Watershed, the partnership included both the land adjacent to streams and the 100-year floodplain in the criteria that was used to help identify Priority Conservation Areas. Tools such as Low Impact Development (see page 63) encourage the preservation of the natural hydrology of a site by promoting on-site stormwater management while stream setbacks and stormwater management seek to reduce the impact of impervious surface stormwater runoff on our streams and wetlands. It is important to recognize that stream restoration activities could be applicable in any of the Priority Areas, including Priority Development Areas. For example, restoration and conservation funds could be used for the restoration of impaired smaller streams, including those that have been culverted or channelized.

5. Restore the physical habitat and chemical water quality of the watershed to protect and restore diverse and thriving plant communities and preserve rare and endangered species.

The partnership considered sensitive habitats, parks, wetlands, floodplains as well as land cover in their analysis of areas to be prioritized for conservation efforts. They also included “soil permeability score” as a criterion that recognizes runoff potential as a function of slope, soil water-storage capacity, distance to ground water and other factors. Areas that scored high in the analysis are candidates for conservation efforts to improve water quality and to reduce runoff. The inclusion of wellhead zones in the criteria for selection of PCAs is intended to address the issue of land use

change near groundwater intakes that can alter drinking water quality.

6. Encourage the inclusion of all economic and environmental factors into cost/benefit accounting in land use and development decisions.

The partnership selected a list of criteria for each of the three Priority Areas (PCA, PDA, and PAA). Through this process, the partnership considered a wide array of factors related to land use and development decisions. Ohio is a home rule state. That means land use decisions are locally controlled. Future land use decisions can use this information about priority areas, which already takes into account environmental and economic factors. Partnership members can accommodate growth while minimizing costs, benefiting their own utilities, the local and regional transportation system, and the health of the environment.

7. Avoid development decisions that shift economic benefits or environmental burdens from one location within a region to another.

The plan encourages cross-jurisdictional cooperation and information sharing to ensure that development decisions do not shift economic benefits or environmental burdens from one location within the region to another while encouraging cross-jurisdictional collaboration to share economic benefits (see page 97) and jointly address environmental burdens. Communities were encouraged to work with their neighboring jurisdictions during the review process to enhance cross-jurisdictional cooperation and ensure that burdens and benefits were not simply shifted elsewhere.

8. Establish and maintain a safe, efficient, and accessible transportation system that integrates highway, rail, air, transit, water, and pedestrian networks to foster economic growth and personal travel.

This plan encourages joint consideration of land use and transportation decisions to promote coordination whenever possible. Tools such as complete streets, compact development, exactions and impact fees, and comprehensive planning all address issues related to fostering a comprehensive transportation network either directly or through land use decisions. The complete streets tool in this plan encourages a complete transportation network that is pedestrian, bike, and transit friendly.

9. Encourage all new development and redevelopment initiatives to address the need to protect and preserve access to historic, cultural, and scenic resources.

The partnership's goal statements specifically state a desire to protect environmental resources while also preserving the unique character of the watershed communities. The existing historic, cultural, and scenic resources all contribute to the uniqueness of each community.

10. Promote public access to and enjoyment of our natural resources for all Ohioans.

Balanced Growth Planning encourages investments in our existing communities and infrastructure networks to create thriving livable communities. By creating thoughtful, targeted development, communities can seek to preserve the natural resources the region has to offer by minimizing the impact of development. This plan also specifically designates many natural areas that communities would like to target for conservation so that both current and future generations will be able to enjoy what the watershed and the region have to offer.

INDENTIFYING PRIORITY AREAS

A major feature of Ohio's Balanced Growth Initiative is the identification of areas which are most critical for protection (Priority Conservation Areas) or particularly well-suited for development or redevelopment activities

(Priority Development Areas). Communities engaged in this process may also identify areas that will be targeted for continued agricultural use (Priority Agricultural Areas) but it is not required. The BWPP decided to designate Priority Agricultural Areas due to the predominance of agriculture in portions of the watershed. Generally speaking, the Priority Areas can be described as follows:

- Priority Conservation Areas (PCAs) are areas which are locally designated for conservation, protection, or restoration.
- Priority Development Areas (PDAs) are areas which are locally designated for development or redevelopment.
- Priority Agricultural Areas (PAAs) are areas which are locally designated for the preservation and continuation of agricultural use.

The identification of Priority Areas should consider the 10 Guiding Principles for Sustainable Ohio Watersheds and be consistent with Balanced Growth's purpose of protecting Ohio's watersheds while also ensuring economic competitiveness. The BWPP worked together to designate Priority Areas throughout the watershed based on a two part process that started with an analysis of objective criteria developed and adopted by the partnership. Following the initial analysis of criteria, each community was asked to review the potential priority areas and make adjustments as necessary. An explanation of the criteria, the BWPP's Priority Areas definitions, and maps showing the designated Priority Areas begins on page 38 of this plan.

Regional Planning Context

OHIO'S BALANCED GROWTH PLANNING PROGRAM

This Big Walnut Balanced Growth Plan is one of five Balanced Growth Plans being developed in contiguous watersheds in central Ohio as part of a local response to the state's Balanced Growth Initiative. Balanced Growth Planning is voluntary and incentive-based. The State of Ohio has aligned a variety of technical and financial assistance programs to encourage communities to participate in Balanced Growth Planning. These programs will support watershed partnership communities in their efforts to prioritize areas for conservation and development. Communities that have participated in and locally adopted a state-endorsed Balanced Growth Plan will be eligible for these incentives, which may include additional points on state grant applications and more favorable financial terms on state loan programs.

In 2005 and 2006, the Ohio Lake Erie Commission (OLEC) funded four pilot projects in northern Ohio. The original round of grantees developed state-endorsed Balanced Growth Plans for the Swan Creek (Toledo area), Chagrin River (Cleveland area), Chippewa Creek (Cleveland area), and Rocky River Upper West Branch (Medina) watersheds.

Due to the success of these pilot projects, the program was expanded statewide and is now managed by the Ohio Water Resources Council (OWRC). The OWRC was formed in 1993 and written into state law (ORC 1521.19) in 2001. The council was created to "provide a forum for policy development, collaboration, and coordination among state agencies, and strategic direction with respect to state water resource programs."[1]

MORPC'S STRATEGIC PLAN

MORPC developed a new strategic plan in 2011 that seeks to provide a guiding framework for the work it does in central Ohio. The plan highlights the mission of the organization, which is to be the regional voice and a catalyst for sustainability and economic prosperity in order

[1] Ohio Revised Code. Title XV Conservation of Natural Resources. Chapter 1521: Division of Water. http://codes.ohio.gov/orc/1521.19

to secure a competitive advantage for central Ohio. The plan also emphasizes MORPC's role as a leader and resource to communities in central Ohio. The first of four strategic priorities identified in the framework is "Advancing Sustainable Prosperity." MORPC has several efforts underway, including Balanced Growth Planning, that address this priority. These efforts also include a multi-year planning effort called Shaping Our Future that will create a physical planning framework for the region. The following six goals have been established for the Shaping Our Future effort:

- Position central Ohio to attract and retain economic opportunity to prosper as a region and compete globally.
- Increase collaboration to maximize the return on public expenditures.
- Use public investments to benefit the health, safety and welfare of people.
- Create sustainable neighborhoods to improve residents' quality of life.
- Promote the reduction of per capita energy consumption and the production of energy from renewable local sources to increase affordability and resilience of regional energy supplies.
- Preserve and protect natural resources to maintain a healthy ecosystem.

The Balanced Growth Planning effort will be drawn from to assist in developing a planning scenario for Shaping Our Future.

MORPC'S METROPOLITAN TRANSPORTATION PLAN

One of the other efforts at MORPC that will help develop the regional planning framework, "Shaping our Future," is transportation planning. As the metropolitan planning organization (MPO) for the greater Columbus area, MORPC is required to conduct a continuing, cooperative, and comprehensive transportation planning process with a 20-year horizon that results in a Metropolitan Transportation Plan (MTP).

The MTP identifies transportation deficiencies, projects and strategies. It is updated on a four year cycle under federal regulations. MORPC coordinates the development of the MTP with communities throughout central Ohio and with other local, state and federal agencies. The MTP makes the greater Columbus region eligible to receive a large amount of federal transportation funding to improve, maintain and operate highways, public transit, bikeways, sidewalks, and related facilities.

Transportation and land use are connected. MORPC anticipates land use changes to help determine where new transportation capacity will be needed over the next 20 years. This is accomplished through extensive monitoring of local land use plans, supplemented by demographic and land suitability data sets, followed by extensive modeling. These data sets provided much of the technical basis for Balanced Growth Planning.

The MTP does not suggest changes to local land use plans. Balanced Growth Planning, through its priority area designations, has the potential to influence where development happens. Consequently, some areas of the watershed may not need additional transportation capacity. With Balanced Growth Planning reaching many communities in central Ohio, future MTPs may not need to account for as much new transportation capacity – a welcome trend in an increasingly constrained fiscal environment.

THE BIG WALNUT WATERSHED

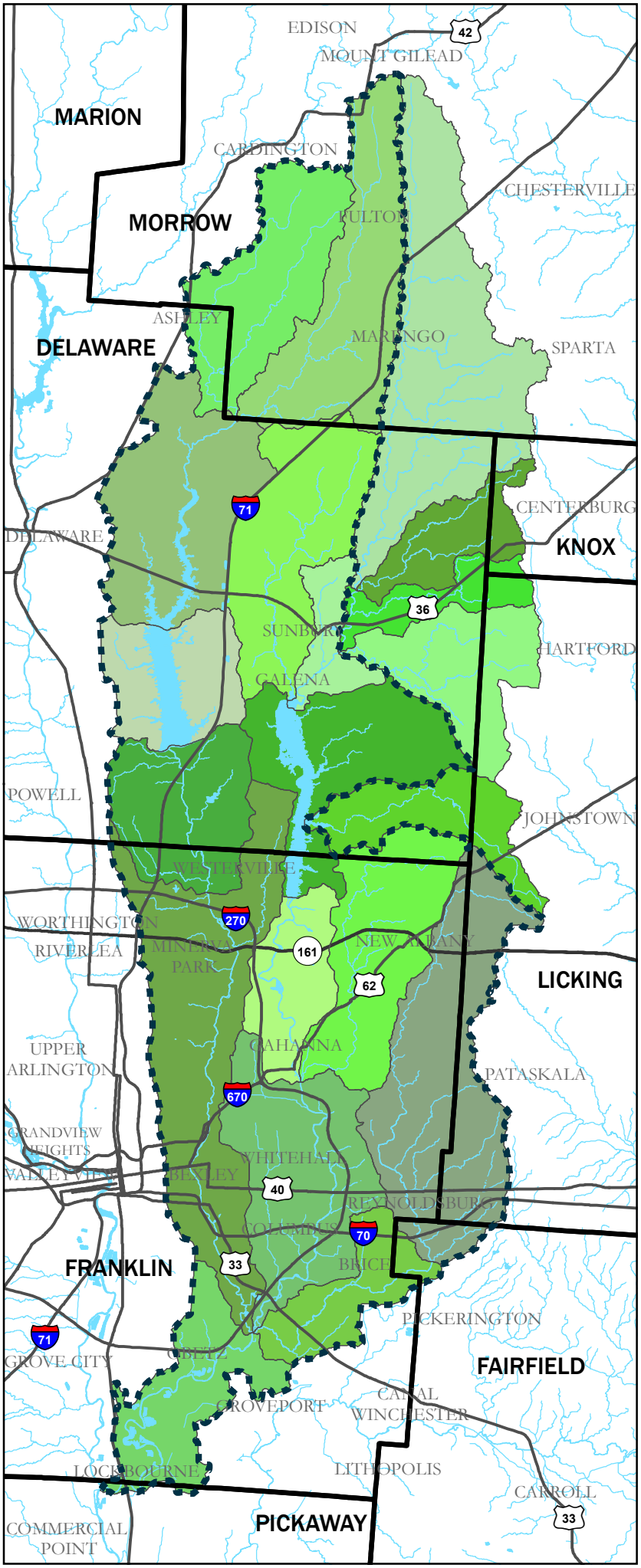
Territory Boundary and Size

The Big Walnut Watershed is located in Central Ohio and covers portions of Delaware, Fairfield, Franklin, Knox, Licking, Morrow, and Pickaway Counties. The full Big Walnut watershed system covers approximately 550 square miles.[2] It is part of the larger Scioto Watershed and originates in Morrow County, running south through Delaware County before emptying into the Upper Scioto River at the confluence near Lockbourne just south of the Franklin/Pickaway County line.[3]

The Big Walnut Watershed is broken into four 10-digit Hydrologic Unit Codes (HUCs), consisting of the Upper Big Walnut (05060001-13), the Upper Alum Creek (05060001-14), the Lower Big Walnut (05060001-15), and the Lower Alum Creek (05060001-16). Early on in the planning process, the planning area was narrowed down from the entire Big Walnut watershed system to a smaller planning area consisting of 15 contiguous 12 digit HUCs within the watershed. This adjustment was made based on the interest of watershed communities to be included in the Balanced Growth planning process. The 12 digit HUCs that make up the Big Walnut Balanced Growth planning area are depicted in Map 1.[4]

[2] Total Maximum Daily Loads for the Big Walnut Watershed. (2005). Ohio Environmental Protection Agency, Division of Surface Water.
[3] Ibid.
[4] The TMDL report for Big Walnut Creek uses an older 11 and 14 digit HUC numbering system. The 11 digit HUCs correspond to the 10 digit current numbers.

Big Walnut
Balanced Growth Watershed
HUC 12 Watershed Subdivisions



Legend

Big Walnut Watersheds HUC-12

- 050600011301
- 050600011302
- 050600011303
- 050600011304
- 050600011307

BWPP

- 050600011305
- 050600011306
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County Boundary

Major Roads

Water

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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March 2012

Political Composition

There are 31 political jurisdictions represented in the BWPP spanning across Delaware, Franklin, Licking, and Morrow Counties. The communities represented in the BWPP include several dense, urban neighborhoods in Columbus, the suburban areas surrounding the east side of Columbus and spreading north into Delaware County, growing villages, and a number of rural and agricultural communities.

When forming the BWPP, MORPC invited communities that had over 25 percent of their population or land area within the watershed to join the partnership. The 25 percent threshold was selected because numerous communities straddle the watershed boundary and MORPC wanted to include as much of the actual watershed as possible, understanding that jurisdictions which only had a small portion of their land or population within the watershed may not have a meaningful stake in the planning process.

The political composition of the BWPP was also influenced by the fact that the Big Walnut watershed shares boundaries with all of the other watersheds in which MORPC is facilitating the development of Balanced Growth Plans. Several jurisdictions straddle the Big Walnut and Walnut Creek Watersheds. Seven jurisdictions straddle the Big Walnut and Olentangy Watersheds. Of these seven, six were already participating in the Olentangy Watershed Planning Partnership that was six months into the planning process at the time of the Big Walnut Planning Partnership formation. All six of these communities had their entire jurisdictions included in the analysis area for the Olentangy Balanced Growth Plan. Oxford Township participated in both partnerships but elected to use the Priority Area map that was created during the Olentangy Balanced Growth planning process.

The population and land area data by jurisdiction for the Big Walnut planning area communities can be found in the appendix. Map 2 illustrates the geographic location of each of the Big Walnut Planning Partnership jurisdictions.

BIG WALNUT WATERSHED PLANNING PARTNERSHIP JURISDICTIONS:

Delaware County:

Village of Galena

Village of Sunbury

Berlin Township

Genoa Township

Kingston Township

Oxford Township

Franklin County:

Village of Brice

Village of Lockbourne

Village of Minerva Park

Village of Obetz

City of Bexley

City of Columbus

City of Gahanna

City of Groveport

City of Reynoldsburg

City of New Albany

City of Westerville

City of Whitehall

Blendon Township

Hamilton Township

Jefferson Township

Madison Township

Mifflin Township

Plain Township

Truro Township

Licking County:

Jersey Township

Morrow County:

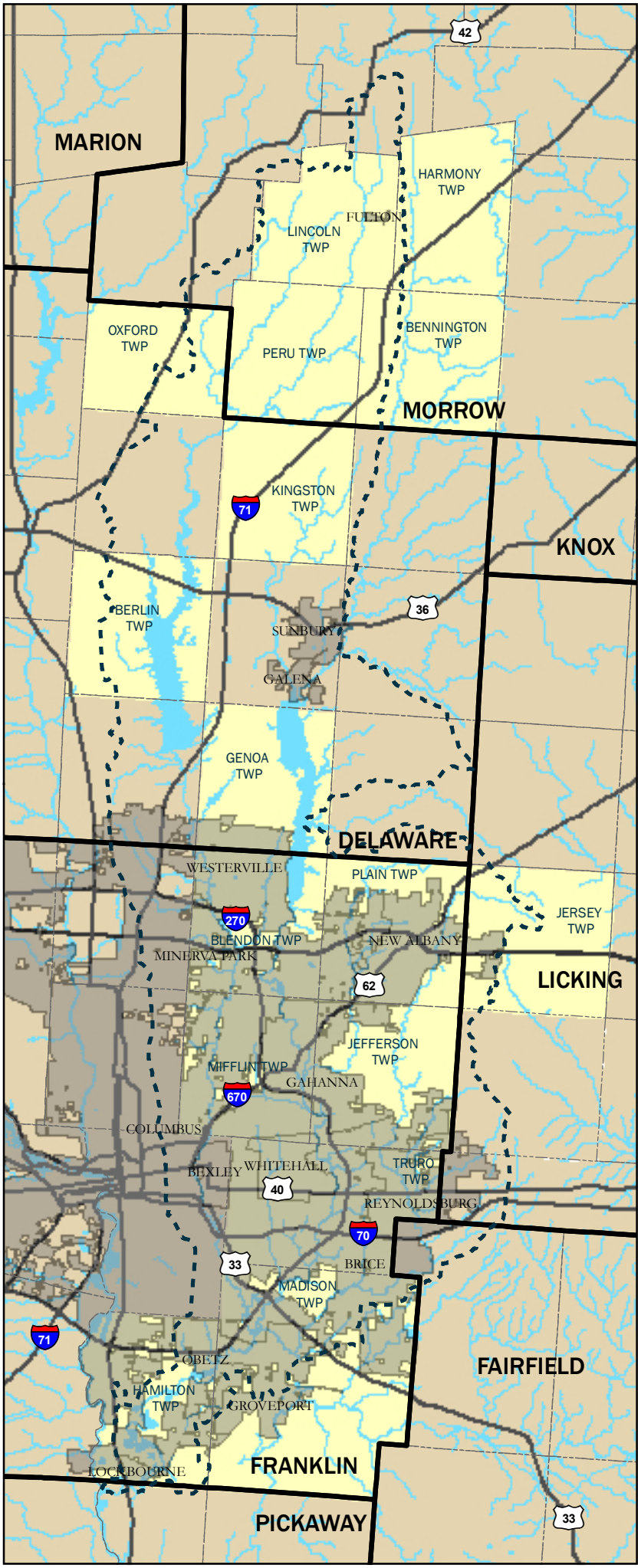
Village of Fulton

Bennington Township

Harmony Township

Lincoln Township

Peru Township



Big Walnut
Balanced Growth Watershed
Jurisdictions

Legend

- Big Walnut Watershed HUC-12
- Township Boundary
- Participating City/Village
- Participating Townships
- County Boundary
- Major Roads
- Water

City/ Village

Bexley
Brice
Columbus
Fulton
Gahanna
Galena
Groveport
Lockbourne
Minerva Park
New Albany
Obetz
Reynoldsburg
Sunbury
Westerville
Whitehall

Township by County

Delaware County
Berlin Township
Genoa Township
Kingston Township
Oxford Township

Franklin County
Blendon Township
Hamilton Township
Jefferson Township
Madison Township
Mifflin Township
Plain Township
Truro Township

Licking County
Jersey Township

Morrow County
Bennington Township
Harmony Township
Lincoln Township
Peru Township

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March 2012

EXISTING CONDITIONS

Water Quality

The Ohio Balanced Growth Initiative was developed to protect and restore Ohio's watersheds. In order to achieve this goal, it is important to understand the current conditions of the Big Walnut Creek Watershed and to review some of the key recommendations that have been prepared by the Ohio EPA, local watershed action groups, MORPC, and local jurisdictions to address water quality issues.

The U.S. Clean Water Act (CWA) requires the preparation of a Total Maximum Daily Loads (TMDL) report for all impaired waterways on the Section 303(d) list. The TMDL report details sources of impairment and lays out a process for achieving full attainment of Water Quality Standards (WQS), allowing removal of the water body from the 303(d) list. The TMDL report for Big Walnut Creek provides a summary for water quality based on the four 10-digit HUCs that comprise the entire watershed. [5] The planning area for this Balanced Growth Plan does not cover the entire Big Walnut Watershed system, but does include portions of each of the 10-digit HUCs comprising that system. Agricultural run-off, failing home sewage treatment systems, channel modification, and urban stormwater runoff all contribute to water quality impairment of the Big Walnut Creek and its tributaries.

The following background information on water quality in Big Walnut Creek is excerpted from the Ohio EPA 2005 *Total Maximum Daily Loads for the Big Walnut Creek Watershed*[6]:

Upper Big Walnut Creek *(Assessment Unit 05060001-130)*

This assessment unit consists of the Big Walnut Creek above Hoover Reservoir and its tributaries.

The Big Walnut Creek main stem in this area flows primarily through agricultural land, and influences on the water reflect that land use. The upper 10 river miles of the headwaters of Big Walnut Creek main stem are not meeting the aquatic life use designation. Biological performance in terms of the Index of Biological Integrity (IBI) and the narrative evaluation for aquatic macro-invertebrates fails to achieve the levels established in the WQS. The causes of this impairment are flow alteration, habitat alteration and siltation, the sources of which are attributed to crop production and direct alteration of the stream channel.

Recreational Use impairment is attributed to influences from livestock, and to potentially failing HSTS. This is supported by the pattern of excessive peak values of bacteria, which may be caused by runoff events.

Lower Big Walnut Creek *(Assessment Unit 05060001-140)*

This Assessment Unit includes the main stem of Big Walnut Creek below Hoover Reservoir to its confluence with Alum Creek and Blacklick Creek, and the tributaries to Big Walnut Creek in this area. The Assessment Unit also includes Blacklick Creek and its tributaries.

Big Walnut Creek Mainstem

The biological community performance decline downstream from Hoover Reservoir at RM 37.2 was attributed to the effects of the reservoir's hypolimnetic release. The fish and macro-invertebrate communities improved into the good to exceptional range by SR 161 (RM 34.9) and remained in full attainment of the designated aquatic life uses until its confluence with the Scioto River. Elevated nutrients at RMs 37.2 and 34.9, high bacterial counts from RMs 37.2 to 27.0 (E. coli as high as 23,000/100 ml at RM 28.3 and fecal Coliform as high a 20,000/100 ml at RM 28.3), and sediment

[5] The TMDL report is based on an older 11 and 14-digit HUC system that has been changed to 10 and 12-digits, respectively. The boundaries of the 11 and 10-digit HUCs correspond to the same areas.
[6] Total Maximum Daily Loads for the Big Walnut Creek Watershed. (2005). Ohio Environmental Protection Agency, Division of Surface Water.

contamination throughout this section (metals, PAHs, and pesticides) were indications of runoff from surrounding suburban areas.

The recreational use of the Big Walnut Creek mainstem in this assessment unit is Primary Contact Recreation (PCR). The recreational use bacteriological criteria are being met on an average basis, but the frequency and magnitude of peak events are exceeding the criterion for fecal coliform. Therefore, there is an impairment of the recreational use for the Big Walnut Creek mainstem.

Tributaries to Big Walnut Creek

Rocky Fork Creek was impacted primarily from runoff and siltation from increasing land development in the basin and from poorly treated sewage from failing HSTS and several small package plants. The biological communities in the upper part of Rocky Fork were performing as bad or worse than any time since the initial study in 1991 (Ohio EPA 1992). Sugar Run and Rose Run were showing varying degrees of impact from land development in the New Albany area.

Recreational use impairment is attributed to urban runoff and HSTS that do not adequately treat bacteria, resulting in peak bacterial concentrations that are above targets.

Blacklick Creek Mainstem

Causes of impairment in the Blacklick Creek mainstem were attributed to ammonia, nutrients, and organic enrichment. Sources of these pollutants were attributed to HSTS, and to point source discharges from wastewater treatment plants tributary to Blacklick Creek. Recreational use impairment was attributed to these same sources.[7]

Upper Alum Creek (Assessment Unit 05060001-150)

This assessment unit consists of Alum Creek and its tributaries upstream of Alum Creek Lake.

Alum Creek Main stem

The study area included 13 stations on the Alum Creek main stem from the headwaters at Cardington-East Rd. (RM 56.3) to near its confluence with Big Walnut Creek at Williams Rd. (RM 0.8/0.7). Seven stations were in FULL attainment of their existing or recommended aquatic life use designation, five were PARTIAL, and one was NON.

The biological communities in Alum Creek upstream from Alum Creek Lake were generally performing in the good to exceptional range.

Impairment in the upper Alum Creek watershed is attributed to habitat alteration and an unknown source. Upper Alum Creek is impaired for its recreational use for fecal Coliform due to the frequency and magnitude of high values.

***Lower Alum Creek** (Assessment Unit 05060001-160)*

This assessment unit covers the Alum Creek mainstem from Alum Creek Dam south to "Three Creeks" (the confluence of Blacklick Creek, Alum Creek, and Big Walnut Creek). Much of this stretch flows through highly urbanized parts of Columbus.

Alum Creek Mainstem

The recreational use of lower Alum Creek is impaired for both geometric mean and for frequency and magnitude of peak values for fecal Coliform bacteria.

Causes of impairment of the aquatic life use for the lower Alum Creek main stem are identified as siltation and habitat alteration, and the sources are identified as land development and urban runoff. Recreational use impairment is attributed to HSTS that do not adequately treat for bacteria.

The Big Walnut Creek Watershed has Watershed Action Plans for five sub-watersheds including: the *Lower Alum Creek Watershed Action Plan*, the *Upper Big Walnut Creek Watershed Action Plan*, the *Lower Big Walnut Creek Watershed Action Plan and Inventory,* the *Rocky Fork Creek Watershed Action Plan &*

[7] The Jefferson Township WWTP that is identified as one of the sources of impairment for Blacklick Creek was taken off line in 2003.

Inventory, and *Our Blacklick Creek Watershed Action Plan*. A diverse group of stakeholders developed each of these plans with participants representing local watershed groups, soil and water districts, local government, state agencies, regional planning agencies, land owners, and concerned citizens. These plans identify a number of actions that can be implemented to help the waterway achieve full attainment of Water Quality Standards. The recommended actions include:

- Limit stream access for livestock and seek alternative water access.
- Promote the use of conservation practices in agricultural areas of the watershed.
- Promote alternative ditch maintenance BMPs, i.e. over wide channel.
- Identify and improve failing Home Sewage Treatments Systems (HSTS).
- Ensure proper maintenance of HSTS through training and education.
- Minimize impervious surfaces and improve onsite stormwater retention and infiltration.
- Protect floodplains throughout the Big Walnut watershed.
- Encourage use of Low Impact Development (LID) techniques.

The Implementation Toolbox in this plan (beginning on page 55) includes tools that address the recommended actions of minimizing impervious surface and improving onsite stormwater retention, protecting floodplains, and encouraging the use of LID techniques. Still, other tools address the preservation of farmland across the watershed while encouraging the use of programs geared toward minimizing the environmental and water quality impact of agriculture.

Table 1. Ohio Water Quality Standards Components

Components	Description
Beneficial Use Designations • *Aquatic life habitats* • *Recreational Contact* • *Water Supply*	• Existing or potential uses • Every water body is assigned a designation by the state • WQS for full attainment vary according to beneficial use designation
Numeric Criteria	• Estimations of chemical concentrations • Degree of aquatic life toxicity
Narrative Criteria	• General descriptions of water quality goals
Anti-degradation Provisions	• Description of conditions under which water quality may be lowered

Land Use

Land use patterns vary widely in different sections of the watershed. The northern reaches of the Big Walnut Watershed planning area are predominantly agricultural. In Delaware County, land use patterns north of the Alum Creek and Hoover dam are also predominantly agricultural. The land south of the reservoirs in Delaware County is more suburban in nature. The Franklin County portion of the Big Walnut Creek Watershed is highly urbanized and densely developed. This section of the watershed is mostly built out. However, there is still potential for redevelopment and infill development projects.

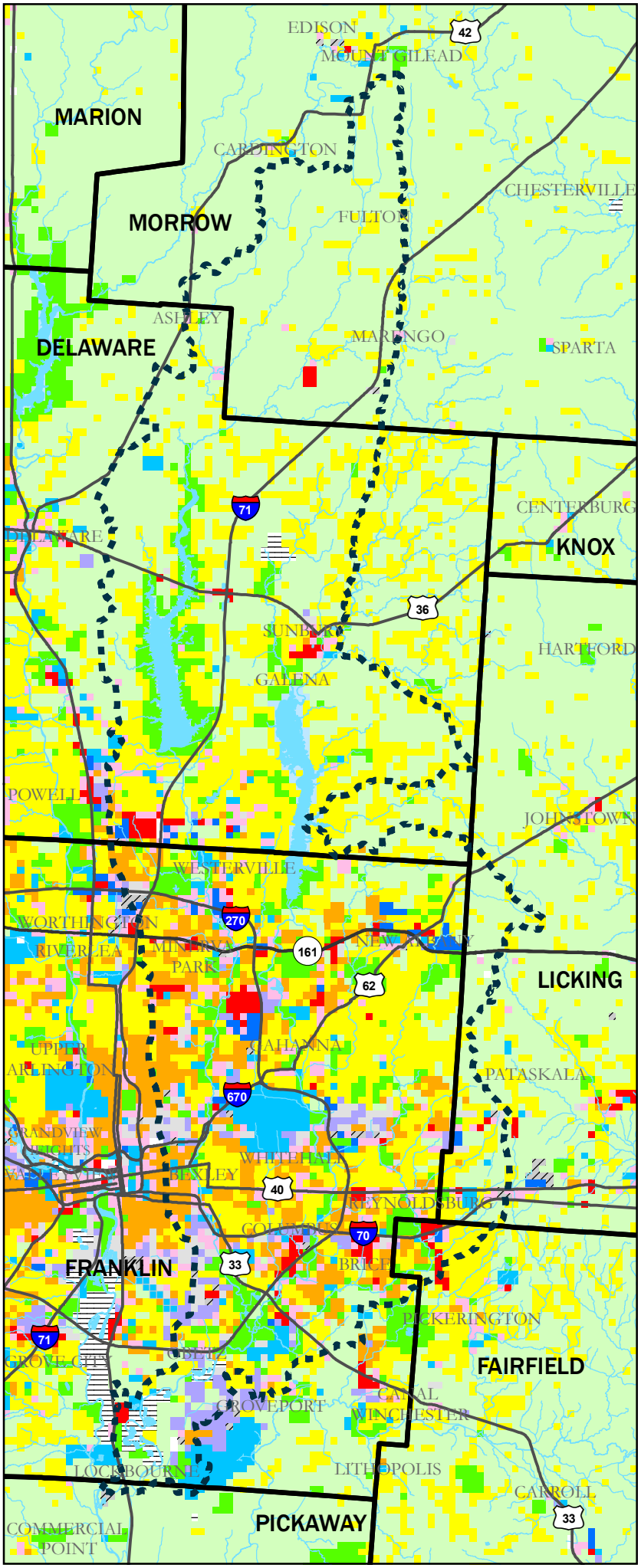
Over half of the Big Walnut Watershed planning area is developed, with 42 percent of the land area developed for residential use. A little over one-third, or 35 percent, of the land in the Big Walnut planning area is used for agriculture and 9 percent for open space. Table 2 provides more detailed information about land use in the Big Walnut Watershed planning area and Map 4 shows existing land uses across the watershed.

Table 2. Land Use in the Big Walnut Watershed Balanced Growth Planning Area

Land Use		Acres	% of Land
	Development Type		
Agriculture		98,760	35.0
Development	Public Use	8,960	3.2
	Commercial/Office	8,920	3.2
	Residential	118,800	42.2
	Industrial & Warehousing	11,440	4.1
	Total Developed Land	*148,120*	*52.6*
Quarry		2,280	0.8
Open Space & Parks		26,160	9.3
Other		6,480	2.3
Total		281,800	100

Source: MORPC Generalized Land Use Categories
Note: Uses summarized across 40 acre grid

Big Walnut
Balanced Growth
Watershed
Exisiting Land Use



Legend

- Agriculture
- Commercial
- Mixed Residential/ Commercial
- Office
- Light Industrial
- Industrial
- Open Space
- High Density Residential (5 units/acre or greater)
- Low Density Residential (Less than 5 units/ acre)
- Quarry
- Warehouse
- Public Service
- Big Walnut Watershed HUC-12
- County Boundary
- Major Roads
- Water

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March 2012

Natural Features and Resources

The Big Walnut Watershed planning area is large. At over 370 square miles, it includes a diverse set of land uses and resources with agricultural dominated rural areas in the northern and southern portions, dense urban areas in Franklin County, and rapid suburbanization in northeast Franklin County, southern Delaware County, and the Franklin/Fairfield/Licking County border section of the watershed along I-70.

One of the most critical resources of the watershed is drinking water. More than a half million people in northeastern Franklin County and southern Delaware County rely on Big Walnut Creek and its tributaries for drinking water. Hoover Reservoir and Alum Creek Reservoir were both created to ensure adequate water for the growing central Ohio region. Hoover is the primary water source for Columbus but can draw water from Alum Creek Reservoir via a connecting pipeline. Del Co Water and the City of Westerville have water supply intakes downstream of the Alum Creek dam. Map 4 shows drinking water protection areas for both surface water (corridor management zones) and groundwater (wellhead protection areas).

Beyond their use as a water supply, both of these lakes provide ample recreational opportunities. The City of Columbus has many parks and several boat ramps around Hoover Reservoir that allow for boating, fishing, and picnicking. However, swimming is not allowed and boats are limited to a 10 horsepower engine. Alum Creek Reservoir allows unlimited horsepower on boats, permits swimming, and offers opportunities for hiking, hunting, and camping on the surrounding 4,630 acres of state park lands.

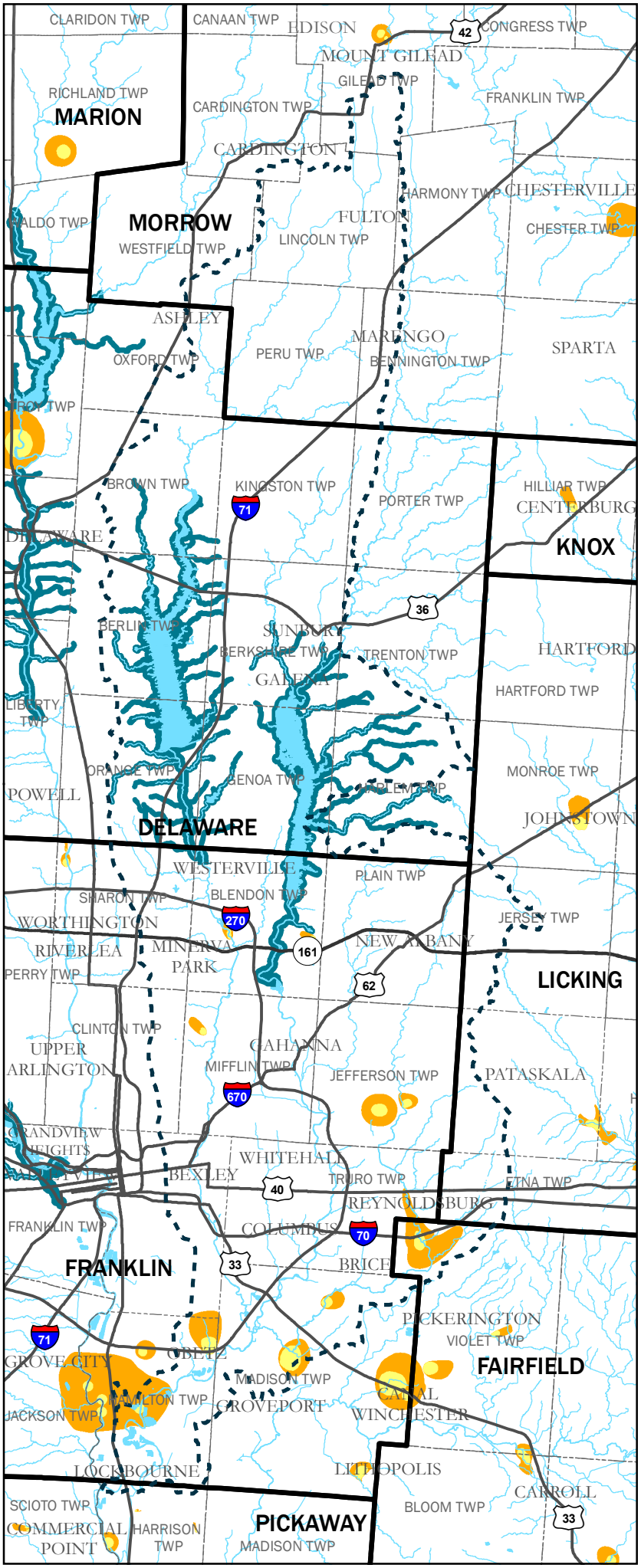
Like many of the streams in central Ohio, Big Walnut Creek, several tributaries, and their floodplains are benefitting from the development of greenways corridors. These greenways and their associated trails help connect communities to the stream and provide opportunity for recreation and enjoyment of the water. This includes a portion of the Ohio to Erie trail that brings many people from across the region to the area.

The Big Walnut Creek Watershed is also home to several Metro Parks; Blacklick Woods, Blendon Woods, Inniswood Metro Gardens, Sharon Woods, Three Creeks Park, and the new Rocky Fork Metro Park scheduled to open in 2013. The Blacklick Creek greenways trail connects Three Creeks Park with Blacklick Woods. The Big Walnut, Alum Creek, and I-670 greenways trails and a portion of the Ohio to Erie trail also cross the Big Walnut planning area. Each of these parks protect unique and critical natural areas within the watershed and provide valuable recreational opportunities that attract boaters, fishers, wildlife-lovers, hikers and more to the region.

Alum Creek Trail, one of the Central Ohio Greenways in the Big Walnut planning area

Big Walnut
Balanced Growth Watershed

Drinking Water Protection Zones



Legend

- Big Walnut Watershed HUC-12

Zones around Community Wells and Intakes

- 1 year Wellhead Zone
- 5 year Wellhead Zone
- Corridor Management Zone
- Township Boundary
- County Boundary
- Major Roads
- Water

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In addition to the parklands located within the watershed, forest cover is also abundant near the waterways and within the riparian areas of the Big Walnut Watershed. The Ohio Department of Natural Resources (ODNR) states that 31 percent of Ohio is forested; however, the majority of those resources are located in south and southeastern Ohio. According to the USGS Stream Stats website, 23 percent of the full Big Walnut Watershed system is covered by forests.[8] Woodlands are an important natural resource for a variety of reasons. They provide habitat for wildlife and rich recreational opportunities. They also serve the important function of cleaning our air and sequestering carbon, which would otherwise detrimentally impact our health and environmental well-being, from our atmosphere. Forests also permit greater water infiltration and pollution control. See the woodland and tree canopy protection tool on page 74 of this plan for more information on the economic benefits of this vital natural resource and the monetized value.

The Big Walnut Watershed, like much of Ohio, is fortunate to be home to fertile agriculture lands, producing vital crops like corn and soybeans. These fertile soils are essential to our local food economy. With an increased interest in local foods and a growing population in central Ohio, the value of fertile soils as a natural resource and asset that supplies a growing population with food is apparent.

A number of areas in southern Franklin County are actively quarried. These activities are expected to continue beyond the immediate future. It is important to recognize that there may be long-term possibilities for conservation efforts in these areas after they are no longer actively quarried.

According to the Ohio Department of Natural Resources Division of Mineral Resources Management, there are hundreds of oil and gas wells in the Big Walnut Watershed. The majority of these are located in Morrow County with a few in northeastern Delaware County. All of these wells are within older formations using traditional vertical well practices. The entire watershed is within the Utica Shale boundaries that have the potential for development using horizontal drilling technology with hydraulic fracturing. Such development under existing methods would result in significant consumptive use of fresh water resources for the watershed.

Cultural and Historic Resources

Over 800 historic sites are located within the Big Walnut Watershed planning area. They include sites on the Ohio Historical Inventory and National Register of Historic Places. The Ohio Historic Inventory program "...was developed to serve as an accurate and continuing record of the architectural and historic properties currently existing in the state. The Ohio Historic Inventory is used to record basic information on historic properties in Ohio."[9] "The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources."[10]

Most of the historic sites in the watershed are located in Franklin County. The highest concentrations are found within downtown Columbus and uptown Westerville and in their

[8] USGS stream stats computation for the Big Walnut Creek Watershed http://streamstatsags.cr.usgs.gov/gisimg/Reports/BasinCharsReport1060413_201235124854.htm

[9] Ohio Historic Preservation Office website http://www.ohiohistory.org/resource/histpres/toolbox/historicinventory.html

[10] U.S. Department of the Interior's National Park Service website http://www.nps.gov/nr/

surrounding neighborhoods. Clusters of historic sites are also found in Delaware County in Sunbury and in northwestern Brown Township near U.S. 42 and County Home Road.

Sanitary Sewer Infrastructure

Sewer infrastructure is a critical factor in determining areas suitable for development. Wastewater treatment is also a necessary consideration when addressing impacts to the health and quality of the Big Walnut Watershed. Planning for sewer service is part of the State's *208 Water Quality Management Plan.* [11] The following section describes the current sanitary sewer infrastructure in the Big Walnut Watershed. See page 33 for more information about future sanitary sewer infrastructure planning and projects and page 106 for using the 208 Plan as an implementation tool.

The City of Columbus sewer system serves much of the Franklin County portion of the Big Walnut Watershed with the main purpose of "capturing, conveying, and treating" wastewater. Columbus has been actively addressing combined sewer overflow. A major issue facing many older sewer districts with combined sewers is the limited capacity to carry both wastewater and stormwater during major storm events. The City of Columbus has been resolving this issue for the area served by its sewer system through a number of measures to address stormwater discharge from lines that carry both wastewater and stormwater. This 40-year $2.5 billion effort is intended to reduce negative environmental effects of combined sewer overflow and to improve the water quality of our streams.

Delaware County operates an extensive sewer system that covers most of the central portion of the county south of the City of Delaware/S.R. 36/37 and west of Hoover Reservoir. There are several pockets in this area where agreements have been worked out with the City of Columbus and Westerville to either treat effluent collected by those systems or collect and send to those municipalities' systems. Delaware County also operates a couple of land application systems in the I-71/SR 36/37 area. The newest is at the North Star development and there is another at the adjacent Bent Tree Golf Course Community. The Villages of Sunbury and Galena each operate small sewer systems as well.

The Morrow County portion of the watershed has limited areas serviced by central sewer. The Village of Fulton sends its sewage to the Village of Cardington via a force main. This results in pumping from the Big Walnut (Alum Creek) watershed to the Olentangy Watershed. The I-71/S.R. 61 interchange is serviced by a lagoon/land application system. The Village of Marengo is also served by a small waste water treatment system.

The Southwest Licking Water and Sewer District provides sewer service to the western portion of the City of Pataskala and the unincorporated portions of Etna Township that are within the watershed boundaries. They are currently in discussion with the cities of Reynoldsburg and Columbus to try and eliminate overlapping planning boundaries.

The northwest corner of Fairfield County within the watershed planning area receives service from either the City of Pickerington or Fairfield County Utilities. The entire portion has access to sewer service.

Transportation

Travel and goods movement in and through the planning area takes advantage of a strong surface transportation network. Interstate 270 serves as a bypass around Columbus for through traffic on Interstates 70 and 71. It also helps connect communities across the southern

[11] Additional information about the *208 Water Quality Management Plan* including sewer service areas and local sewer prescriptions can be found at Ohio EPA's website: http://www.epa.ohio.gov/dsw/mgmtplans/208Final2006Plan.aspx

portion of the planning area. Similarly, I-70 is an important east-west connection in and through the planning area. Its path parallels U.S. Route 40, also known as the National Road, which provided an early transportation connection for the planning area. I-71 cuts north-south across the planning area, paralleling State Route 3, also known as 3-C Highway, which was an important connection between Cleveland, Columbus and Cincinnati. Interstate 670 was the last link in the area's interstate highway system. In addition to interstate connections in and through the planning area, State Route 161 was upgraded to become a limited access expressway between I-270 and Newark. It improves the connection of New Albany and Licking County to the interstate system.

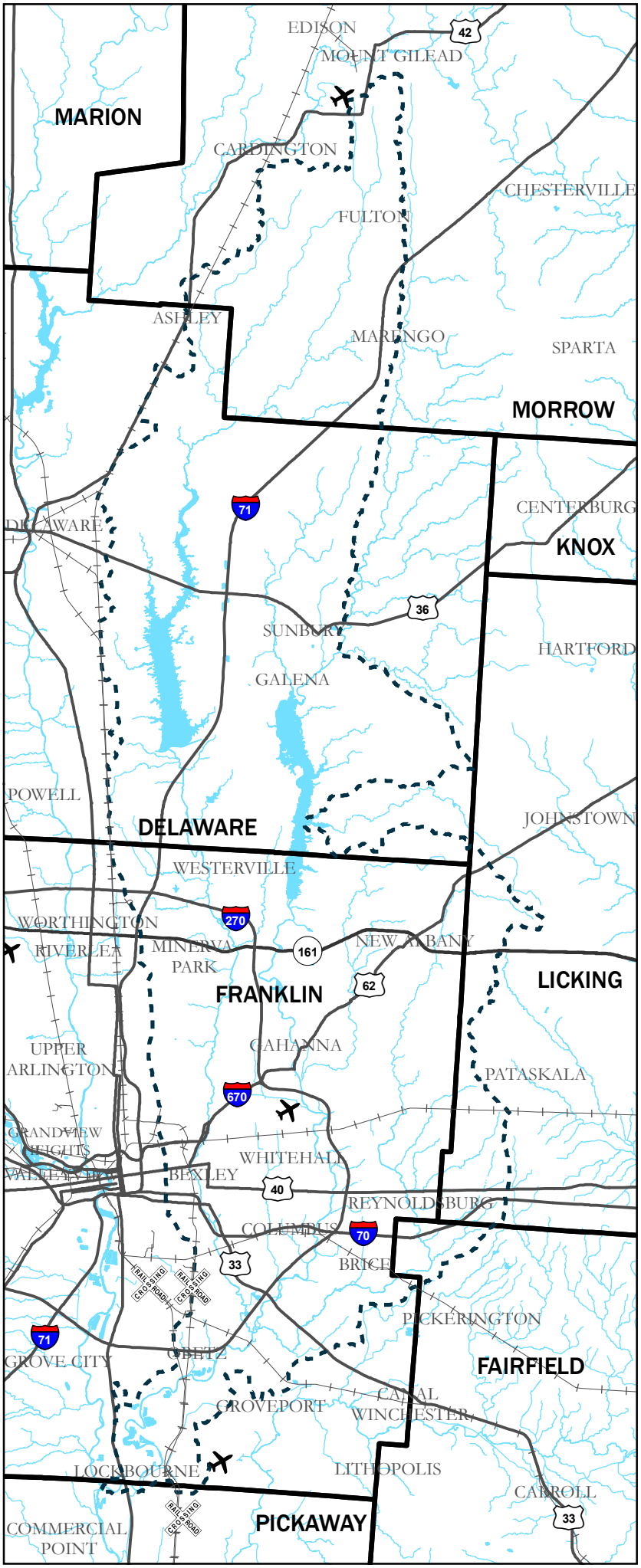
In addition to its capacity to move traffic through the area, this network of highways and expressways provides access to many parts of the planning area. It facilitates the longer trips between cities and villages in the planning area. However, the county, township and municipal roads complete the roadway network by providing access to almost all destinations in the planning area.

Two public transit agencies use this roadway network in the planning area. Delaware Area Transit Agency (DATA) serves all of Delaware County with its demand response system. "Demand response" refers to a system that dispatches transit vehicles to a destination upon request instead of a fixed schedule. The Central Ohio Transit Authority (COTA) has an extensive fixed route system that covers the Franklin County portion of the planning area. Express routes offer morning and evening service for working commuters. Local and crosstown routes offer more frequent service. One of the most popular routes, COTA's #1, runs up Cleveland Avenue through much of Franklin County's portion of the planning area. One of COTA's other popular routes, the #10 follows Broad Street east-west across the southern portion of the planning area.

Norfork Southern (NS) is one of the dominant Class I railroads east of the Mississippi. It has several lines in the southern part of the planning area. Historically, a variety of businesses took advantage of direct access to rail for goods movement. However, many of those spurs and sidings are gone, or are no longer maintained. The split up of Conrail has hastened the removal of these access points as system speed and efficiency are higher priorities. Depending upon the business model, larger users or a single point serving a collection of significant users combining for more frequent shipping needs may still find direct rail access possible and practical, especially as the cost of trucking goods increases.

The State of Ohio owns and leases out the Panhandle Line, which runs between Downtown Columbus and Mingo Junction on the Ohio River. Historically, this line connected through to Pittsburgh. Unlike NS and other Class I rail lines, businesses may have a much easier time obtaining access to this short-line for goods movement as there is less through traffic demanding speed and efficiency.

Port Columbus International Airport is the largest passenger airport in central Ohio. It provides 150 daily departures to 34 airports. The existing terminal served 6.4 million passengers in 2011; it has the capacity to serve 8 to 9 million per year. Recent improvements, such as the interchange between International Gateway and I-670, and planned improvements, such as the runway relocation to allow for simultaneous use of the north and south runways, will enable the airport to meet this capacity. Long-term plans include a new terminal facility that would enable the airport to serve more than 9 million passengers per year.



Big Walnut
Balanced Growth
Watershed
Transportation

Legend

- Big Walnut Watershed HUC-12
- Rail Yard/ Intermodal Facility
- Airport
- Railroad
- Major Roads
- County Boundary
- Water

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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Economy and Employment

Approximately 590,000 people live in the Big Walnut Watershed planning area. An additional 160,000 people are projected to live in it by 2035. The area currently hosts approximately 264,000 jobs with an additional 100,000 more jobs expected in the area by 2035.

The area includes a wide mixture of land uses and employment centers located in the east side of Franklin County and southern Delaware County. At the southern end lays the Rickenbacker International Airport and its surrounding industrial parks. Agricultural land is the predominant use in the north. Between Rickenbacker and farm land however lie dense residential communities and the distinct communities of Gahanna, New Albany, Westerville and Polaris in southern Delaware County.

Industrial uses include Rickenbacker Airport and the surrounding Global Logistics Park in the south, the Port Columbus international airport, and the Defense Supply Center in Whitehall. The watershed also includes the Easton Town Center, which has a regional scale retail center and thousands of square feet of office space, and Polaris, another regional retail center with substantial amounts of office space around it. In addition to the major employment centers mentioned above, St. Ann's and Mt. Carmel East hospitals are located in the watershed, as are a number of universities including Capital, Otterbein, and Ohio Dominican. I-270, I-70, and I-71 all cross through the area. Several other commercial corridors, including Broad Street, Hamilton Road, S.R. 3, and Cleveland Avenue, are also in this watershed.

Growth is expected throughout the watershed, including redevelopment of areas along the mid section of eastern Franklin County. Communities throughout the area are actively promoting economic development and redevelopment of existing neighborhoods. The Rickenbacker area, which has already been mentioned, has hundreds of acres zoned for warehouse and logistics related industries. Moving forward, older commercial corridors such as Morse Road, Brice Road, Hamilton Road, and S.R. 161 in the vicinity of I-71 will also provide opportunities for redevelopment. The City of Gahanna is investing in its technology park. New Albany is growing into Licking County where development along the relocated S.R. 161 corridor is expected to generate several thousand office jobs. The area east of Polaris in southern Delaware County includes several hundred acres that Westerville is marketing for corporate style office development, and there are commercial development interests in the area around the I-71 and U.S. 36 interchange that is located in the middle of Delaware County.

Map 6 shows the locations of the largest employers and Table 3 displays the percentage of employment by industry sector.

Map 7 is a map of potential growth areas, and Table 4 is a listing of the amount of new employment growth expected in the area.

Table 3: 2010 Employment Forecasts of the Big Walnut Watershed

	2010	2035	Change	Percent Change
Total Employment	264,228	366,742	102,514	39%
Office Employment	104,622	141,647	37,025	35%
Retail Employment	71,668	100,413	28,745	40%
Industrial Employment	50,533	65,822	15,289	30%
Other Employment	37,405	58,860	21,455	57%

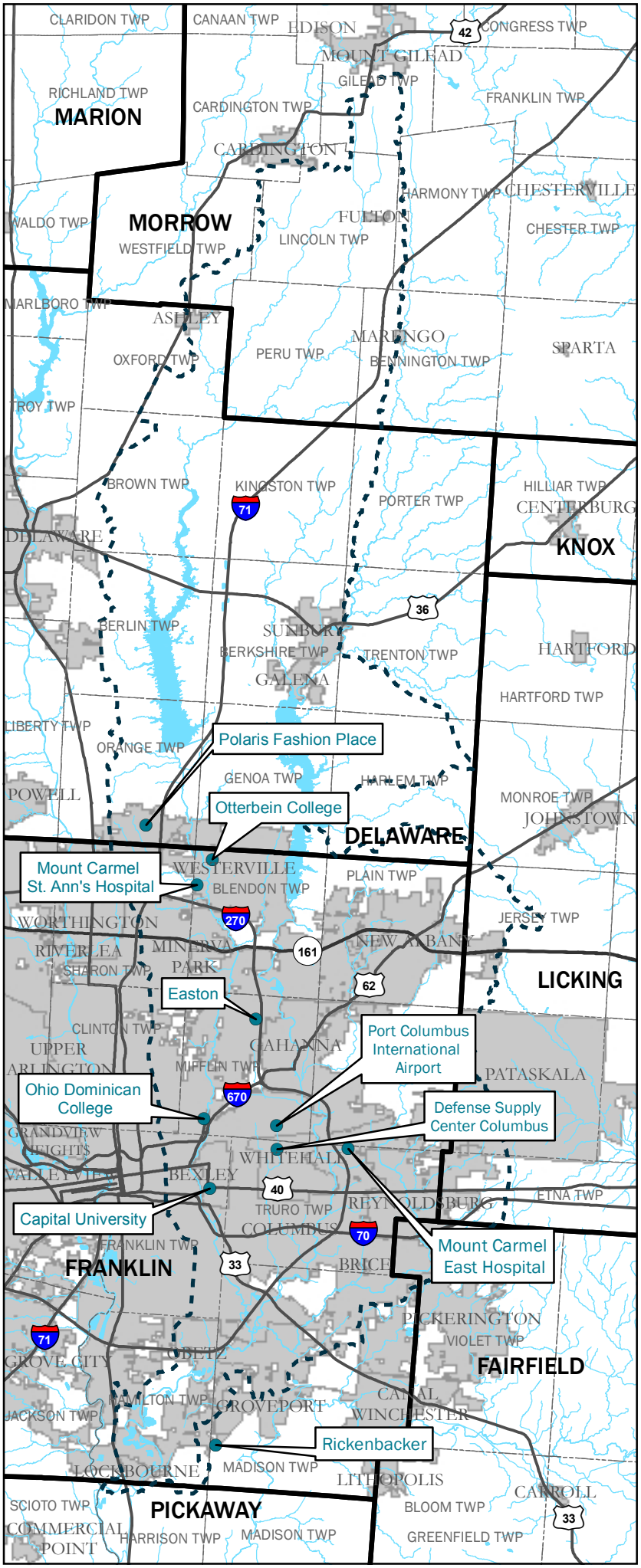
Source: MORPC Land Use Model 2010

Table 4: 2010 Employment Profile of the Big Walnut Watershed

Industry	% of Employment
Manufacturing	8%
Wholesale	5%
Retail	22%
Transportation	11%
Communications	0%
Finance, Insurance & Real Estate	13%
Service	21%
Education	7%
Medical	11%
Government/Non-Profit	2%

Source: 2009 QEW Employment File, Ohio Jobs and Family Services

Big Walnut
Balanced Growth Watershed
Major Employers



Legend

- Big Walnut Watershed HUC-12
- Major Employer
- Cities
- Township Boundary
- County Boundary
- Major Roads
- Water

N

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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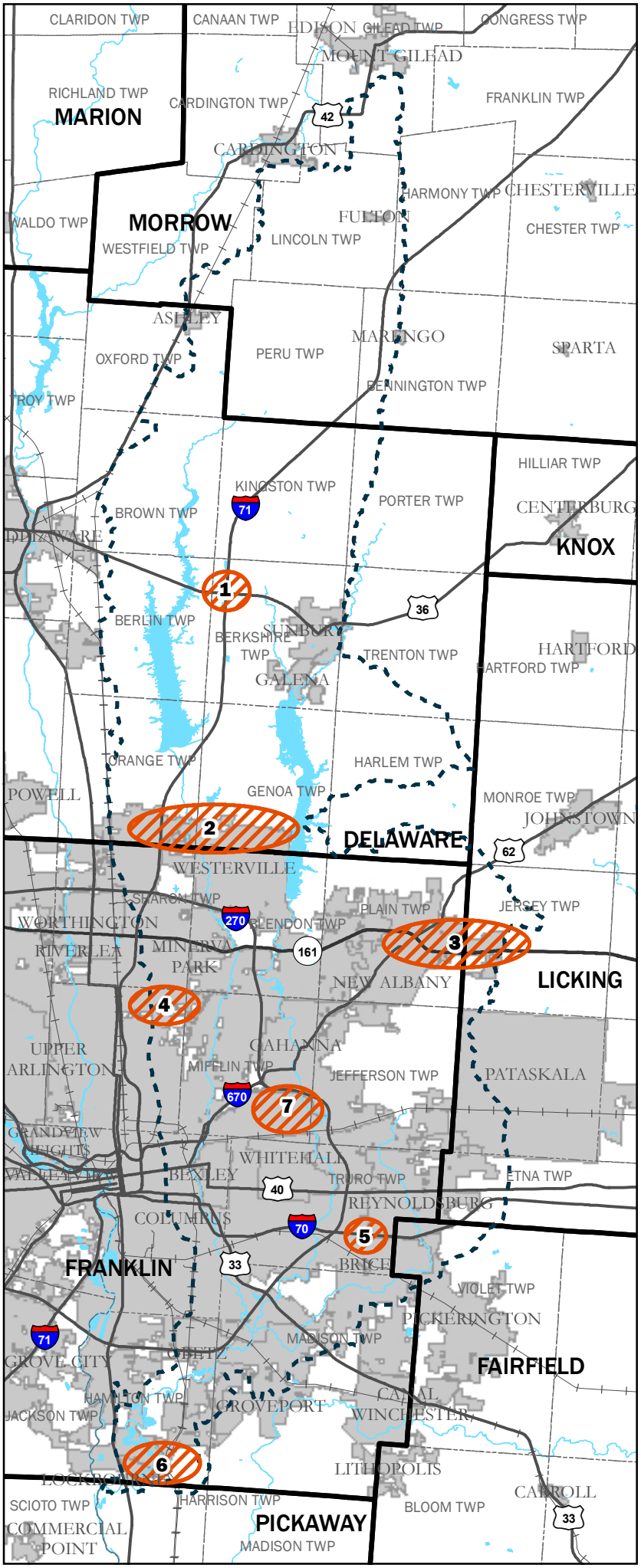
March 2012

Big Walnut
Balanced Growth Watershed

Potential Employment Growth Areas



Legend

- Big Walnut Watershed HUC-12
- Growth Area
- Township Boundary
- City/Village
- County Boundary
- Major Roads
- Water

1. 71/36 Interchange
2. Polaris & North Westerville
3. New Albany 161 Corridor
4. Northland
5. Brice Road
6. Rickenbacker
7. Port Columbus

N

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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April 2012

FUTURE CONDITIONS

Table 5. Population Projections for the Big Walnut Planning Area

	Jurisdiction	Population in Watershed 2010	2035	Change
Northern Watershed	Village of Ashley	442	635	193
	Village of Cardington	57	79	22
	Village of Fulton	186	191	5
	Village of Marengo	141	149	8
	Bennington Township	880	2,300	1,420
	Brown Township	1,067	1,930	863
	Cardington Township	47	282	235
	Gilead Township	402	462	60
	Harmony Township	230	241	11
	Kingston Township	2,166	2,443	277
	Lincoln Township	1,664	1,969	305
	Oxford Township	984	1,548	564
	Peru Township	1,470	1,467	-3
	Porter Township	301	310	9
	Westfield Township	57	51	-6
	Sub-Total	**10,094**	**14,057**	**3,963**
Central Watershed	Berkshire Township	2,635	15,924	13,289
	Berlin Township	5,491	11,669	6,178
	Blendon Township	10,069	12,263	2,194
	Village of Galena	634	1,022	388
	Genoa Township	23,187	37,550	14,363
	Harlem Township	2,286	4,779	2,493
	Monroe Township	69	194	125
	Orange Township	17,905	22,474	4,569
	Plain Township	2,754	4,298	1,544
	Sharon Township	531	616	85
	Trenton Township	382	683	301
	Village of Minerva Park	1,030	1,281	251
	City of New Albany	8,443	16,722	8,279
	Village of Sunbury	3,837	6,757	2,920
	City of Westerville	35,303	44,138	8,835
	Sub-Total	**114,556**	**180,370**	**65,814**

Population Growth

Portions of the Big Walnut Watershed are expected to experience strong population growth over the next 25 years. The population of the central portion of the watershed planning area is projected to grow by more than 50 percent, from roughly 114,000 residents to almost 180,000 by 2035.

The table on this page and the following page shows the projected population changes for all jurisdictions that had any land within the Big Walnut watershed planning area, including those communities that are not in the Big Walnut Planning Partnership. The 2010 population and 2035 projections are limited only to the areas within the Big Walnut planning area, not the entire jurisdictions. Please note that the planning area is limited to the 15 contiguous 12 digit HUCs described in the *Territory Boundary and Size* section of the plan (page 11) and depicted in Map 1.

The data is organized to show growth trends across different areas of the watershed. While population growth is expected in most Big Walnut communities, the trend will be most pronounced in the central portion of the planning area, stretching from the northern end of Franklin County up through

	Jurisdiction	Population in Watershed 2010	2035	Change
Southern Watershed	City of Bexley	13,063	13,933	870
	City of Columbus	310,177	367,840	57,663
	City of Gahanna	32,460	37,119	4,659
	City of Groveport	3,535	4,881	1,346
	Village of Lockbourne	155	157	2
	Village of Obetz	4,309	7,090	2,781
	City of Pataskala	5,279	7,149	1,870
	City of Pickerington	1,215	1,692	477
	City of Reynoldsburg	35,303	39,142	3,839
	City of Whitehall	19,245	22,835	3,590
	Clinton Township	4,523	5,201	678
	Etna Township	1,742	2,957	1,215
	Hamilton Township	2,195	2,929	734
	Harrison Township	2	2	0
	Jefferson Township	12,331	16,839	4,508
	Jersey Township	450	1,511	1,061
	Madison Township	9,926	15,298	5,372
	Mifflin Township	3,205	4,338	1,133
	Truro Township	1,573	2,461	888
	Violet Township	4,598	5,922	1,324
	Sub-Total	**465,286**	**559,296**	**94,010**
Watershed Total		589,936	753,723	163,787

central Delaware and Licking County.

MORPC uses county level population projections by the Ohio Department of Development (ODOD) through the year 2035. MORPC allocates the ODOD-projected population increases to quarter mile square grids within each county based on local land use plans and other economic and environmental factors. This allocation process results in localized population projections based on the best data available.

Sanitary Sewer Infrastructure

Below is a summary of some notable sewer infrastructure projects and developments in the watershed. See Map 7 for an illustration of current and projected sewer service areas.

MORROW COUNTY

Of the areas served by sewer, only the I-71/S.R. 61 interchange has capacity for significant increased use. The Village of Fulton has the ability to connect a few more homes and the Village of Marengo has no capacity for expansion.

DELAWARE COUNTY

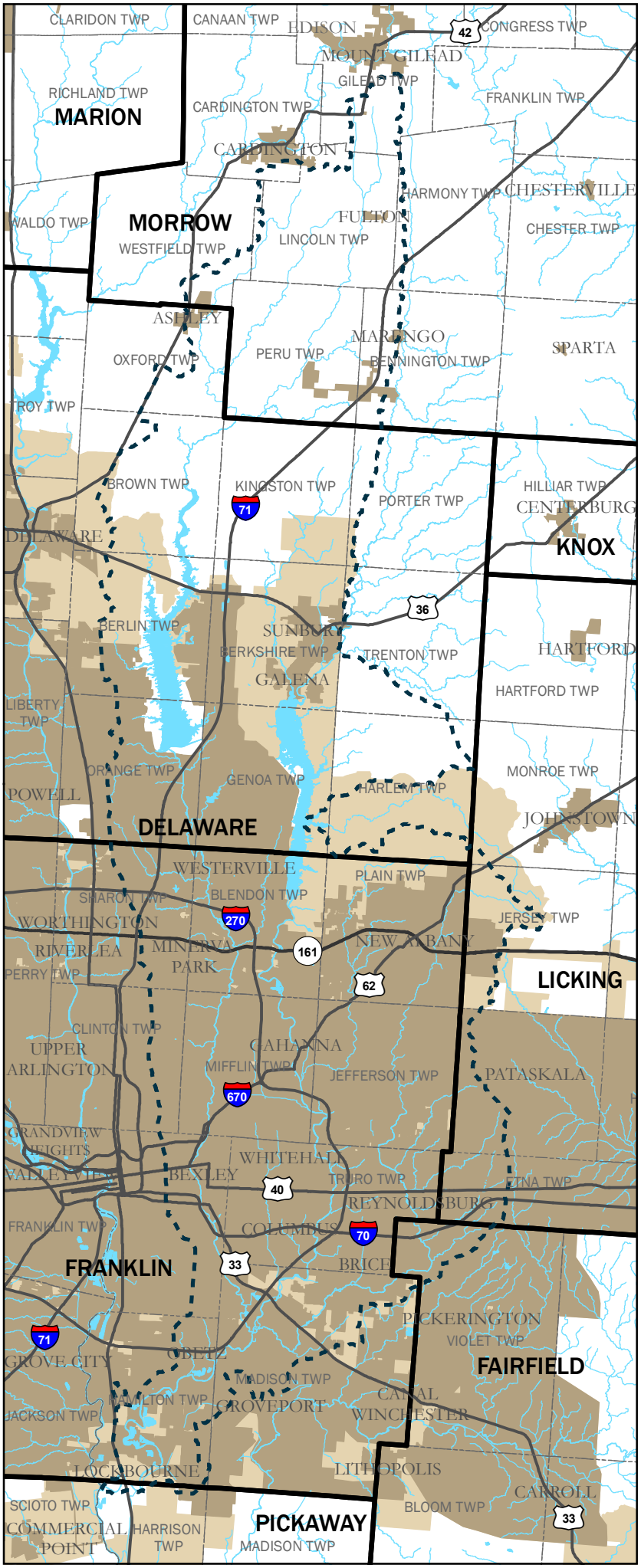
The Delaware County Sanitary Engineer continues to plan for expansion of the sanitary sewer north of Alum Creek as well as along the I-71/S.R. 36/37 interchange. Overlaps do occur between the Village of Galena and Delaware County between I-71 and Hoover Reservoir. The City of Columbus and Delaware County have signed an agreement that would eventually provide sewers to the southeastern portion of the county in Harlem Township.

FRANKLIN COUNTY

Waste water treatment for a majority of the Franklin County portion of the watershed is provided by the City of Columbus. There is some overlap of planning boundaries with the Southwest Licking Water and Sewer District in the Licking County portion of the watershed that has resulted in overlapping pipes. Discussions are being held to resolve these issues. Columbus' planning boundary also overlaps with the City of Pataskala and Fairfield County Utilities in the north west corner of Fairfield county. This has not resulted in any conflict over service areas. Ohio American Water provides waste water treatment for Blacklick Estates in Madison Township and for a portion of Blendon Township.

The City of Columbus is constructing a large sewer interceptor to provide service to the Rickenbacker Intermodal yard in southern Franklin County and northern Pickaway County. This pipe crosses the Big Walnut Watershed. The sizing of this pipe ensures the availability of sewer capacity for dense development in the area.

Big Walnut
Balanced Growth Watershed
Sewer Service Areas



Legend

- Big Walnut Watershed HUC-12
- Township Boundary
- Current Sewer Service Area
- Future Sewer Service Area
- County Boundary
- Major Roads
- Water

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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March 2012

Transportation

MORPC is the Metropolitan Planning Organization (MPO) for Franklin County, Delaware County, and portions of Fairfield and Licking Counties. This means that MORPC is responsible for carrying out a continuous, cooperative, and comprehensive (3C) transportation planning process for the Columbus urbanized area. MORPC's transportation planning area includes Franklin and Delaware Counties, Etna Township and the City of Pataskala in Licking County, and Bloom and Violet Townships in Fairfield County. As part of the 3C transportation planning process, MORPC prepares a Transportation Improvement Program (TIP) that covers a four-year planning cycle and is updated every two years.

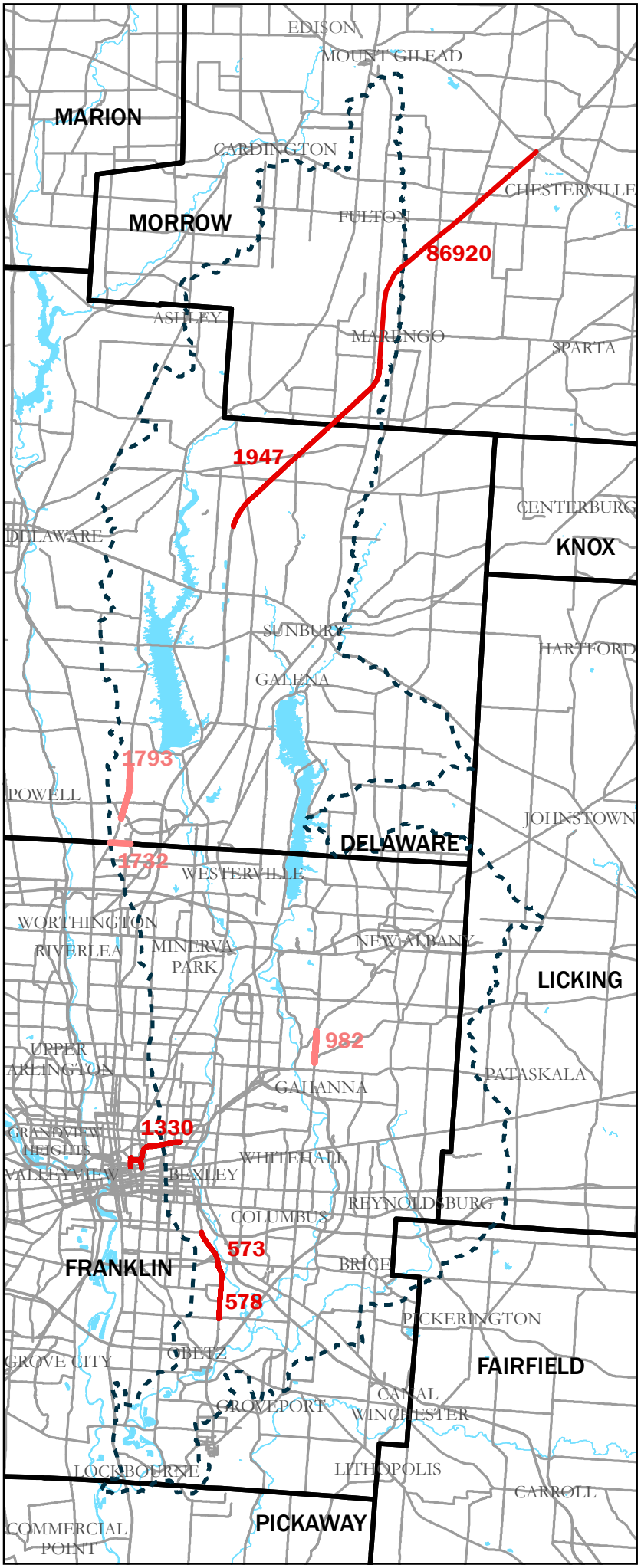
The Ohio Department of Transportation (ODOT) carries out the 3C planning process in the areas of the state that are not served by an MPO. In the Big Walnut Watershed planning area, the TIP for Morrow county is prepared by ODOT District 6 and the TIP for the portions of Licking and Fairfield Counties outside of the MORPC MPO is prepared by ODOT District 5. The most recent TIP for the MORPC MPO and ODOT Districts 5 and 6 include projects scheduled for Fiscal Years 2012-2015 (July 1, 2012 – June 30, 2015). While there are various projects that reconstruct and maintain the existing transportation system, Table 6 provides a list of major capacity adding transportation projects that are planned for the Big Walnut Watershed through June 30, 2015 and Map 8 shows the location of those planned projects within the watershed.

Table 6. List of major transportation projects planned for the Big Walnut Watershed

MORPC ID	ODOT ID	Project Description	Total Project Costs
573		Alum Creek Dr from Refugee Rd to Frebis Ave, Major Widening/Multi-Use Path from 2 to 5 lanes.	$26,861,000
578		Alum Creek Dr from Williams Rd to Refugee Rd, Major Widening/Multi-Use Path from 2 to 5 lanes.	$19,541,000
982		Hamilton Rd from Carpenter Rd to US 62, Major Widening/Multi-Use Path from 2 to 5 lanes.	$17,760,000
1330		I-70/I-71 Innerbelt (First Project), Major Widening/Interchange Modification, Reconstruction of the I-670/I-71 interchange and I-71 from over Jack Gibbs Blvd to Long St.	$2,000,000*
1732		Lazelle Rd from Flint Rd to Sancus Blvd, Major Widening from 2 to 5 lanes.	$18,606,000
1793		S Old State Rd from 800' S of Polaris Pkwy to 600' N of Orange Rd, Major Widening/Multi-Use Path from 3 to 5 lanes.	$15,833,000
1947		I-71 from Berkshire Rd to Crail Rd in Morrow Co., Major Widening from 4 to 6 lanes.	$68,496,000
	86920	I-71 from 1.22 mi N of SR-61 to 0.80 mi S of SR-95, Major Widening.	$500,000*

*Only a portion of the total project is included in the 2012-2015 TIP.

Big Walnut
Balanced Growth Watershed
Major Transportation Projects



Legend

- Major Widening (2012- 2015)
- Major Widening (Completion after 2015)
- Big Walnut Watershed HUC-12
- County Boundary
- Major Roads
- Water

N

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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March 2012

PRIORITY AREAS

About the Priority Areas

Priority Areas are areas that have been locally targeted for conservation, (re)development, or continued agricultural use. These activities are not limited to the Priority Areas or required within the designated Priority Areas. However, state incentives (see Incentives Inventory in Appendix B) will be available to encourage communities to make land use decisions that are consistent with their locally designated Priority Areas.

The BWPP designated Priority Conservation Areas (PCA), Priority Development Areas (PDA), and Priority Agricultural Areas (PAA) across the watershed. Early on in the planning process, the partnership drafted the following Priority Area definitions for the Big Walnut Watershed Balanced Growth Plan:

Priority Conservation Area: Areas designated by local communities for protection, conservation, or restoration because of their ecological, cultural, recreational, or historical value and for the significant role these areas play in water quality, stormwater management, and general quality of life.

Priority Development Area: Areas designated by local communities that are favorable for development, redevelopment, or revitalization based upon efficient use of infrastructure and having restricted negative impacts.

Priority Agricultural Area: Areas designated by local communities which, due to historical, cultural, natural or man-made features, are conducive to agricultural activities and associated practices consistent with maintaining a high quality watershed.

Using Priority Area Designations

While protection of Priority Conservation Areas is critical, portions of sites with this designation may be appropriate for development. Engaging in conservation measures is not limited to the areas that are designated Priority Conservation Areas, nor does the designation of an area as a PCA preclude land use change and/or development. In fact, communities are strongly encouraged to consider conservation measures such as the tools included in this plan wherever they could be applied to allow growth in a way that is least harmful to the health of the watershed.

While development should be targeted to PDAs, portions of individual Priority Development Areas can and should be conserved. Many of the same conservation goals applicable to the watershed as a whole are relevant to more site specific locations. It is important to note that areas having the PDA designation often include a wide range of existing conditions, including sensitive natural areas and open space.

The designation of an area as a Priority Conservation Area does not mandate that the area be conserved through any law or regulation. Likewise, there is no requirement that Priority Development Areas be developed or that Priority Agricultural Areas continue to be farmed. As was communicated throughout the planning process, no laws or ordinances are created through this planning effort. Incorporation of the Priority Areas into a community's comprehensive plan is recommended but not required. Implementation of the Balanced Growth Plan and any associated

implementation tools is left to each community's discretion.

It is important to recognize that the jurisdictional boundaries of the BWPP communities may change over time due to annexation. In some cases, the priorities of the annexing jurisdiction may not be consistent with the map designations depicted for those areas.

Criteria

The Priority Area maps are the result of both a watershed-wide technical analysis of objective criteria and a localized review process. The BWPP developed and adopted a list of criteria that were used to conduct the initial technical analysis. The criteria for identifying PCAs included features that the partnership considered important for determining the ecological, cultural, recreational, or historical value of a particular area. The PDA criteria included features that the partnership considered important for determining the development or redevelopment potential of an area. The PAA criteria list included features that the BWPP considered important for identifying areas conducive to continued agriculture and related practices.

The Partnership decided to use a simplified weighting system for the criteria analysis so that some features, like the 100-year floodplain, had more influence on the initial designation of Priority Areas than others. In one case, a feature was included that was indicative of areas that should not be prioritized. The 100-year floodplain was included as an inverse criterion for the Priority Development Area analysis. This means that points were subtracted from the Priority Development Area analysis totals for land that fell within the 100-year floodplain, making those areas less likely to score high as potential Priority Development Areas.

The initial criteria analysis was conducted using ArcGIS software. Following the initial analysis, USPP communities reviewed, adjusted, and refined the maps. MORPC assisted communities through this process. The Priority Areas designated in the maps on pages 45-49 are the result of this two-step process.

The following section describes the criteria that were selected to initially highlight Priority Areas across the watershed. Maps showing the results of the initial criteria analysis and a technical description of the BWPP adopted criteria, including all data sources and weighting, are included in Appendix A.

PCA CRITERIA

Stream Buffer

Land along streams provides critical habitat for the plant and animal life of the watershed. When maintained in a natural way, these areas help protect surface water quality by intercepting, delaying, and filtering stormwater runoff.

100-Year floodplain

There is a one percent chance of a flood occurring in any given year within the 100-year floodplain. This area is mapped by the Federal Emergency Management Administration (FEMA). Land use change within the 100-year floodplain that results in increased impervious surface coverage can result in a greater possibility of flooding and decreased water quality from stormwater runoff and erosion.

Corridor Management Zone

The Ohio EPA models the Corridor Management Zones to include the land upstream from surface drinking water intakes that should be protected in order to ensure drinking water quality. Land use changes near stream corridors feeding surface water intakes may adversely affect drinking water quality.

Wellhead Protection Areas

The Ohio EPA has delineated protection areas around public and municipal groundwater wells. These areas were modeled based on the time it would take contaminants in the groundwater to

travel to reach the wellfields. Within the 1-year wellhead protection area, potential contaminants in the groundwater could reach the wellfields within one year. It would take up to five years for potential contaminants within the 5-year area to reach the wellfields.

Natural Land Cover

The U.S. Geological Survey (USGS) maintains data which shows the location of deciduous forests, grassland/herbaceous areas, evergreen forests, shrub/scrub areas, woody wetlands, and emergent herbaceous wetlands. Natural land cover along streams or riparian areas is important because it provides valuable wildlife habitat and improves water quality by filtering out some of the contaminants in stormwater and agricultural runoff before the water reaches the streams.

Parks and Open Space

MORPC maintains a dataset of parks and other open space areas. The partnership wanted to include parks in the criteria list because these areas reflect local priorities for conservation. Conservation measures could be implemented in the future to improve water quality even in those parks which primarily serve recreational, rather than ecological, functions.

Wetlands

Wetlands provide valuable flood and stormwater storage, habitat for a number of plant and animal species, and a place to filter contaminants and sediments from stormwater or agricultural runoff. The data that was used for this criterion is the U.S. Fish & Wildlife Service National Wetlands Inventory managed by the Ohio Department of Natural Resources which maps the location of wetlands based on data analysis and/or protection agency field surveys.

Habitats

The habitats data maintained by ODNR in their Natural Heritage Database contains information about locations where state and national-listed threatened and endangered species may have habitats. These areas are important to protect because they provide high-quality, unique ecosystems and support the continuing survival of threatened and endangered species.

Hydric Soils

The soils data used in this analysis collected and maintained by the USDA Natural Resources Conservation Service (NRCS). NRCS defines hydric soil as, “a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions on the upper part.” The presence of hydric soils indicates that wetland restoration would be possible.

Soil Permeability Score

The soil permeability score was calculated as a composite of slope, soil type, depth to groundwater, and distance to the stream because these factors all contribute to runoff. Areas scoring high using this index are important to consider for conservation efforts because of their ability to improve water quality and reduce runoff.

Scenic Roads

The Big Walnut PCA analysis included land within 100 feet of the centerline of roads that are part of the Ohio Scenic Byway or America’s Byways programs. These areas were included in the analysis because of the historic, scenic, and unique qualities of some of the designated roadway corridors.

Historic Sites and Districts

The National Park Service maintains the National Register of Historic Places (NRHP), a list of historic places worthy of ongoing preservation. The Big Walnut PCA analysis included historic districts and the land within 50 feet of a structure listed on the NRHP.

PDA CRITERIA

Major Roads

Close proximity to arterial and collector roads reduces the upfront development costs associated with connecting the site to the existing transportation network. On commercial sites, proximity to arterial roads can aid businesses by providing enhanced visibility and accessibility.

Airports

Proximity to an airport can provide alternative options for freight and passenger transportation.

Commercial & Industrial Land Use

MORPC creates and maintains a standardized land use dataset based on the local community plans and zoning for its 12 county service area in central Ohio. Areas that local plans have designated for office, commercial, industrial, or warehouse use would be captured by this criterion. These areas have already been locally identified as potential development and/or redevelopment sites and the BWPP included this information in the PDA criteria to reflect local priorities.

Freeway Interchanges

Freeways can provide high capacity access to and from development sites in the region and development near an interchange has better access to this system.

High Density Residential Land Use

This criterion includes areas that local community plans have designated for high-density residential use (eight or more dwelling units per acre). These areas have already been locally identified as potential sites for high-density development and were included in the PDA analysis to reflect local priorities.

Intermodal Freight Yard

Proximity to an intermodal freight yard can improve freight transportation access making these areas potentially more desirable for certain types of development like industrial or warehousing.

Public Transit

A walkable distance to public transit increases mobility options for workers and residents. Also, public transit access may reduce the overall parking needs of new development which could lower the ratio of impervious surface coverage on the site.

Sewer Service

Areas without sanitary sewer infrastructure are difficult to develop. They require additional upfront capital expenditures to provide independent service. The soils of the Big Walnut watershed are not well suited for use as septic tank absorption fields, requiring additional controls on traditional home septic systems to ensure water quality.

Locally designated economic development areas

These areas are established to promote economic development activities in specific areas. The locally designated economic development areas included in this criterion are Cooperative Economic Development Areas (CEDAs), Community Reinvestment Areas (CRAs), Enterprise Zones (EZ), Joint Economic Development Districts (JEDDs), and/or Tax Increment Finance (TIF) areas.

Railroad

Proximity to rail lines can provide an alternative for freight transportation to and from a development site.

Urbanized Area

Developing in and near the urbanized area limits the cost of future public infrastructure extensions and public service delivery.

100-Year floodplain (Inverse)

Development resulting in an increase in impervious surfaces within the 100-year floodplain could negatively impact water quality. Buildings within the floodplain are at greater risk of damage from flooding. Additional insurance is

often required for financing, making development in these areas more costly.

PAA CRITERIA

Agricultural Easements

Agricultural easements are areas where landowners have sold or donated the development rights to their farm. By placing the land in easement, the landowner has indicated a desire to keep the land in agricultural production.

Agricultural Districts/Agricultural Security Areas

Agricultural Districts represent an individual farmer's intention to continue farming into the near term. This designation provides protection from some types of development-inducing actions. The BWPP decided to include both parcels that are enrolled in Agricultural Districts and parcels adjacent to Agricultural Districts on the PAA criteria list, giving enrolled parcels a higher weight. The rationale for including both was that farmland that is adjacent to protected farmland should also receive priority in future preservation decisions to ensure land use compatibility and preserve contiguous tracts of farmland.

Adjacent to Agricultural Easements

Farmland around protected farmland should receive priority in future preservation decisions to ensure continued land use compatibility and preserve contiguous tracts of farmland.

Prime Farmland

For the PAA criteria, the BWPP included Prime Farmland, Prime Farmland if well-drained, and Prime Farmland if well-drained and near surface drainage. The designation of prime farmland is based on soil type data that is collected and updated by the NCRS. Prime farmland was included in the PAA criteria because it is more likely to be productive farmland.

Agricultural Land Use

This criterion includes areas that local community plans have designated for agricultural use in the future. These areas have already been locally identified for continued agricultural use and were included in the PAA analysis to reflect local priorities.

Large Parcels

For this criterion, the BWPP included parcels greater than or equal to 50 acres in the PAA analysis.

Century Farms

Century farms have been maintained by the same family for at least 100 continuous years and are voluntarily registered with the Ohio Department of Agriculture.

Farmland of Local Importance

Farmland of local importance is farmland that is highly productive, but does not meet the national prime farmland criteria. The criteria for farmland of local importance are established at the local or state level and are not necessarily applicable outside of the local area.

Identifying the Priority Areas

The analysis area for the Big Walnut Balanced Growth Plan extends beyond the boundaries of the 12-digit HUCS that make up the planning area. This is because several BWPP communities elected to have their entire jurisdiction included and mapped for this plan. In the cases that a community elected to have their entire community analyzed through the Big Walnut Balanced Growth Plan mapping process, township or municipal boundaries were used; otherwise, the watershed boundary was used as the analysis area boundary.

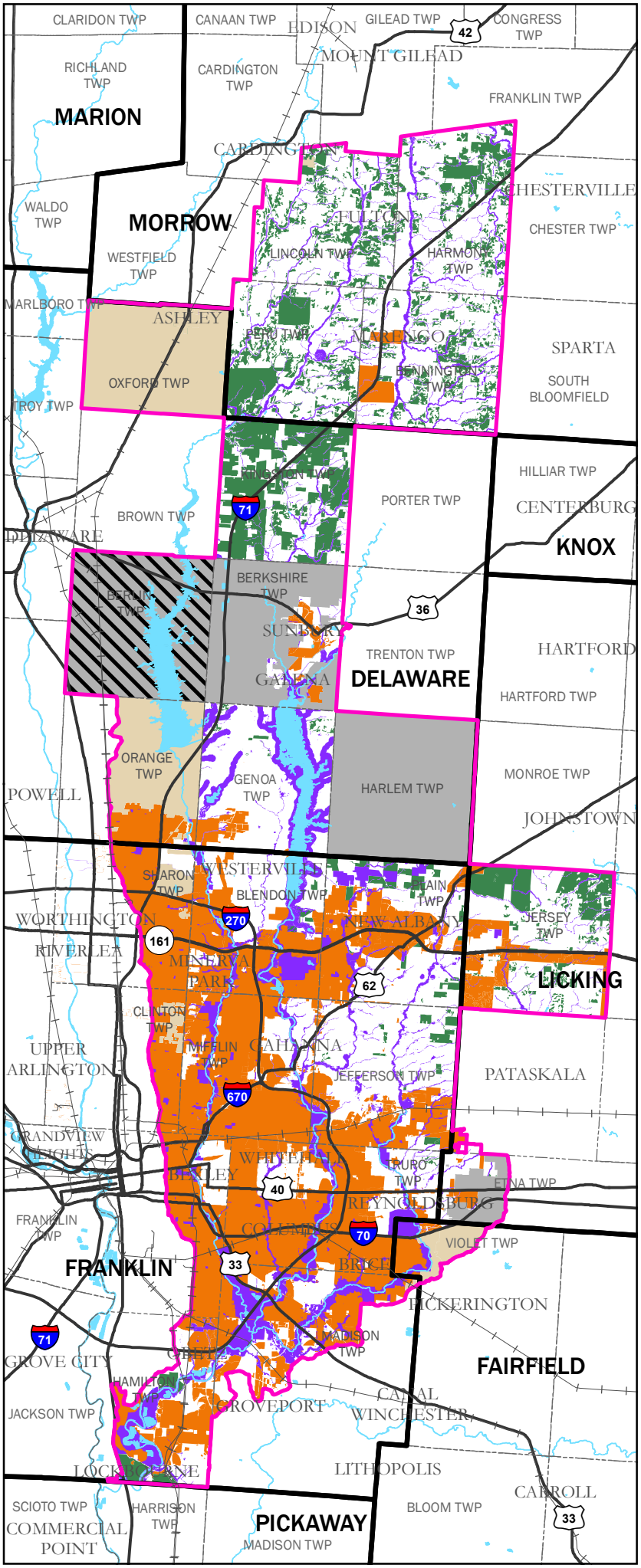
As mentioned earlier, the maps are the result of both a watershed-wide criteria analysis and a local review of the maps by each of the jurisdictions. The BWPP adopted the Priority Area criteria list and weighting in February 2011. In October 2011, MORPC distributed draft criteria analysis maps to each of the watershed communities.

MORPC met with partnership representatives from each of the participating communities to initially distribute the draft maps and explain the review process. After the initial distribution, MORPC followed up with each of the communities to determine if additional assistance was needed. MORPC staff continued to meet with individuals or groups of staff to present the draft maps and work through the local review process with the communities. MORPC also provided draft maps to stakeholders and facilitated discussions about Priority Areas between stakeholders and jurisdictions when requested.

BIG WALNUT PRIORITY AREA MAPS

Priority Areas designated across the entire analysis area are shown on page 45. The following four pages show the same Priority Areas at a larger scale. These maps show the southern, lower central, upper central, and northern sections of the Big Walnut Watershed analysis area.

Big Walnut
Balanced Growth Watershed
Priority Area Analysis



Legend

- Priority Conservation Area
- Priority Agricultural Area
- Priority Development Area
- Under Review
- Did Not Participate
- Participated in another Watershed Planning Partnership
- Big Walnut Analysis Area
- County Boundary
- Major Roads
- Railroad
- Water

N

0 4.5 9 Miles

The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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March 2012

Big Walnut
Balanced Growth Watershed
Priority Areas
South

Legend

- Priority Conservation Area
- Priority Agricultural Area
- Priority Development Area
- Big Walnut Analysis Area
- Participated in another Watershed Planning Partnership
- Did not participate
- City/ Village
- Township Boundary
- County Boundary
- Water
- Railroad
- Interstate
- US Route
- State Route
- County Road

N

0 1.5 3

Miles

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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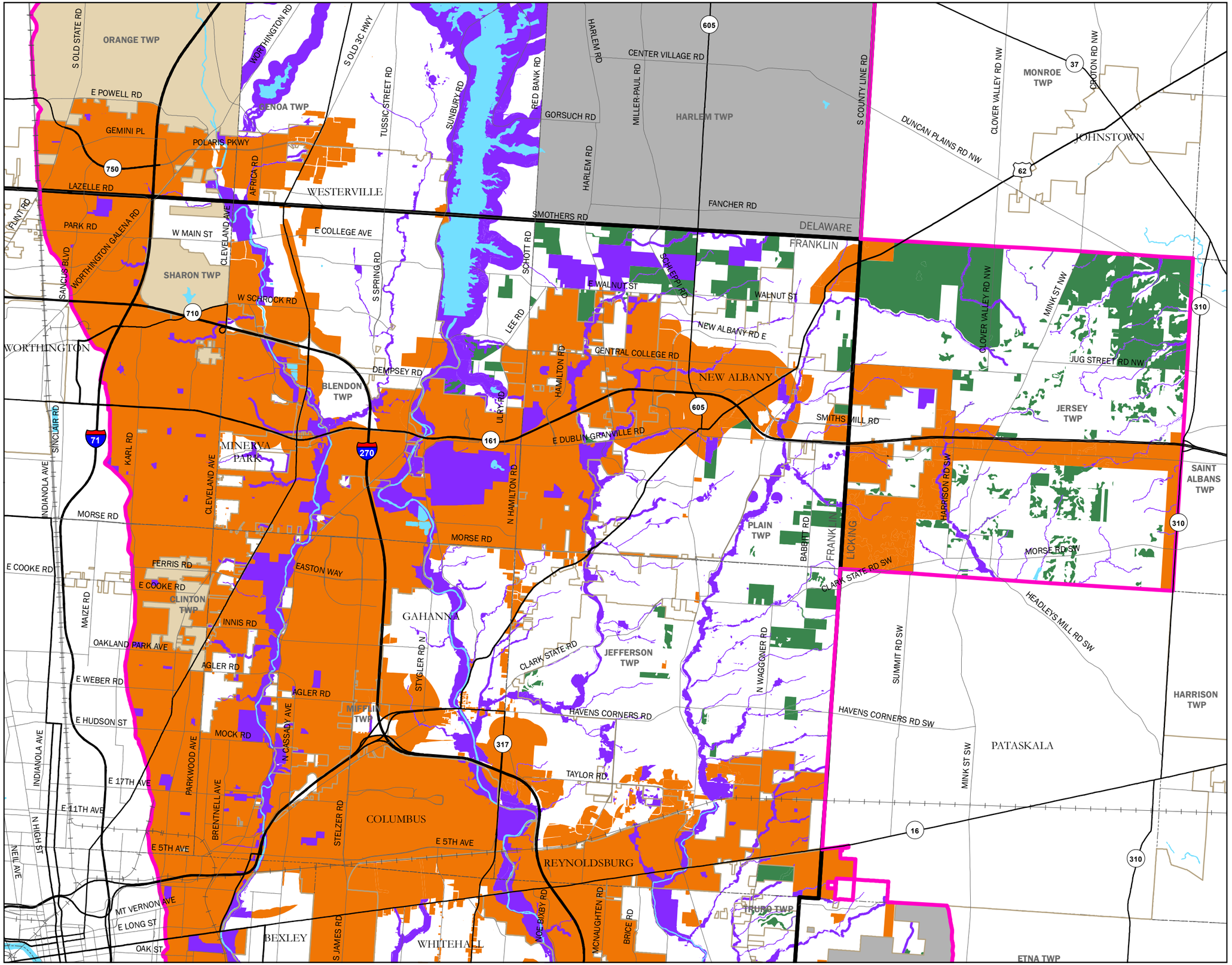
March 2012

Big Walnut
Balanced Growth Watershed

Priority Areas
Lower Central



Legend

- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area
- Big Walnut Analysis Area
- Participated in another Watershed Planning Partnership
- Did Not Participate
- City /Village
- Township Boundary
- County Boundary
- Water
- Railroad
- Interstate
- US Route
- State Route
- County Road

N

0 1.5 3

Miles

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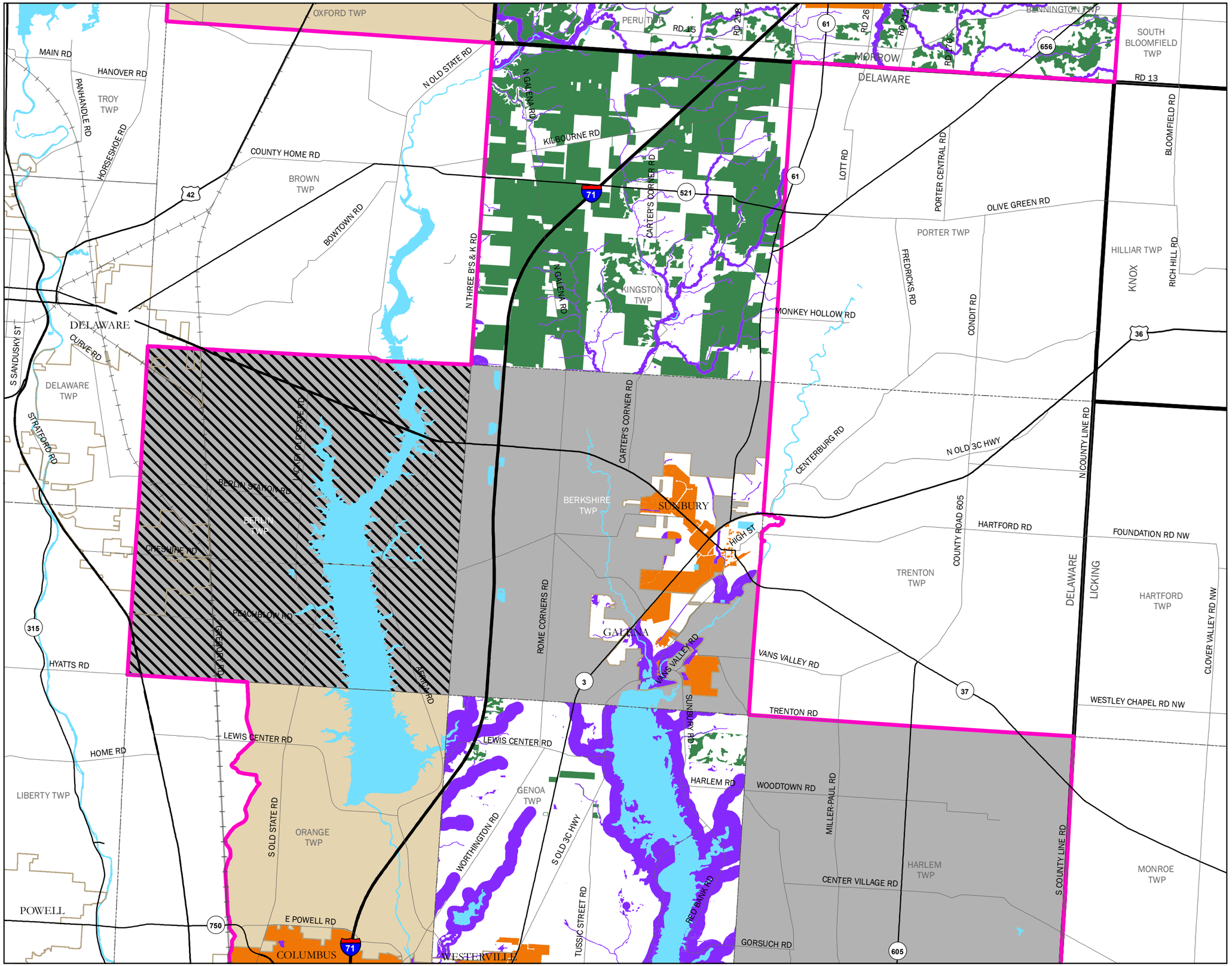
March 2012

Big Walnut
Balanced Growth Watershed

Priority Areas
Upper Central



Legend

- Priority Conservation Area
- Priority Agricultural Area
- Priority Development Area
- Big Walnut Analysis Area
- Did not participate
- Under Review
- Participated in another Watershed Planning Partnership
- City/Village
- Township Boundary
- County Boundary
- Water
- Railroad
- Interstate
- US Route
- State Route
- County Road

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Miles

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The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
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March 2012

Big Walnut
Balanced Growth Watershed

Priority Areas

North

Legend

- Priority Conservation Area
- Priority Agricultural Area
- Priority Development Area
- Big Walnut Analysis Area
- Participated in another Watershed Planning Partnership
- City/ Village
- Township Boundary
- County Boundary
- Water
- Railroad
- Interstate
- US Route
- State Route
- County Road

N

0 1.5 3

Miles

1:90,000

The information shown on this map is compiled from various sources made available to us which we believe to be reliable.
N:\ArcGIS\Center for Energy&Environs\Big Walnut\Maps for Document\BigWalnut_PriorityAreas4.mxd
March 2012

IMPLEMENTATION

Recommendations

Most land use decisions in Ohio are made at the local level. Therefore, local governments play a vital role in the protection of water quality and the efficient use of land, natural resources, and infrastructure. MORPC recommends that communities consider the following actions for local implementation of the Big Walnut Balanced Growth Plan:

1. Adopt the Big Walnut Balanced Growth Plan.
2. Establish a local comprehensive plan if one does not exist for your community.
3. Update the community's local comprehensive plan every five years.
4. Incorporate the designated Priority Areas into local community plans and zoning.
5. Integrate the recommended implementation tools (beginning on page 55) where applicable and appropriate.
6. Continue participating in the Big Walnut Planning Partnership.

Cooperation Between Jurisdictions

A key element to the success of the Big Walnut Balanced Growth Planning effort was the cooperative work of the communities and stakeholders in the BWPP. This continues to hold true for the future success of implementing the plan and enhancing the economic and environmental health of the Big Walnut Watershed. This plan recommends that interested parties maintain the BWPP and its cooperative efforts following adoption of the plan for the purposes of implementation, cross-jurisdictional coordination, and updates.

Implementation Strategies

The implementation strategies on the following page provide some additional guidance for continuing the work of the Big Walnut Planning Partnership. These strategies are assigned a general time frame, ranging from short term (approximately one to two years), mid-term (approximately two to four years) to long term (four or more years). These time frames are goals and there is no requirement to implement the strategies or to do so within a specific time frame

Figure 1. Big Walnut Watershed Balanced Growth Implementation Strategies

Implementation Strategy	Short Term	Mid Term	Long Term	Responsible Parties
Adopt the Big Walnut Balanced Growth Plan				BWPP Communities
Establish a local comprehensive plan if one does not exist for your community				BWPP Communities
Update the community's comprehensive plan every five years				BWPP Communities
Incorporate the designated Priority Areas into local plans and zoning where applicable and appropriate				BWPP Communities, MORPC
Integrate the recommended Implementation Tools into local plans and zoning where applicable and appropriate				BWPP Communities, MORPC
Track implementation projects and submit progress reports to the OWRC				MORPC
Facilitate the continuation of the BWPP including organizing and hosting annual meetings				MORPC
Meet at least annually as a partnership to discuss implementation projects and other partnership updates				BWPP Communities, Stakeholders, and MORPC
Seek state endorsement of the Big Walnut Watershed Balanced Growth Plan				BWPP Communities, Stakeholders, and MORPC
Seek grants to assist in funding Balanced Growth implementation				BWPP Communities, Stakeholders, and MORPC
Educate the public about the key planning concepts and implementation tools included in the Balanced Growth Plan				BWPP Communities, Stakeholders, and MORPC

State Endorsement

Following local adoption by BWPP communities, MORPC will seek state endorsement of the Big Walnut Balanced Growth Plan. To be eligible for state endorsement, the Big Walnut Balanced Growth Plan will need to be adopted by 75 percent of the Big Walnut Watershed planning area communities (see Appendix D for more information about partnership formation). In addition, at least 75 percent of the Big Walnut population and land area must be represented by the endorsing communities. The following table provides more detailed information about the land area and population breakdown by jurisdiction.

Table 7. Population and Land Area in Big Walnut Watershed by Jurisdiction

Jurisdiction (County)	Population in Watershed 2010	% of Watershed Planning Area Population	Land Area in Watershed (Acres)	% of Watershed Planning Area Land Area
Bennington Township (Morrow)	880	0.2	3,660	1.5
Berkshire Township (Delaware)	2,635	0.5	12,595	5.2
Berlin Township (Delaware)	5,491	1.0	12,354	5.1
City of Bexley	13,063	2.4	1,561	0.6
Blendon Township (Franklin)	10,069	1.8	4,090	1.7
Village of Brice	*114**	*0*	56	0.0
City of Columbus	310,177	56.1	62,053	25.6
Etna Township (Licking)	1,742	0.3	2,240	0.9
Village of Fulton	186	0	112	0.0
City of Gahanna	32,460	5.9	8,045	3.3
Village of Galena	634	0.1	1,086	0.4
Genoa Township (Delaware)	23,187	4.2	13,347	5.5
Village of Groveport	3,535	0.6	3,368	1.4
Hamilton Township (Franklin)	2,195	0.4	3,667	1.5
Harlem Township (Delaware)	2,286	0.4	9,619	4.0
Jefferson Township (Franklin)	12,331	2.2	9,146	3.8
Jersey Township (Licking)	450	0.1	4,010	1.7
Kingston Township (Delaware)	2,166	0.4	15,276	6.3
Lincoln Township (Morrow)	1,664	0.3	13,440	5.5
Village of Lockbourne	155	0	583	0.2
Madison Township (Franklin)	9,926	1.8	2,770	1.1
Village of Marengo	141	0	47	0.0
Mifflin Township (Franklin)	3,205	0.6	1,321	0.5
Village of Minerva Park	1,030	0.2	317	0.1
Village of New Albany	8,443	1.5	7,466	3.1
Village of Obetz	4,309	0.8	2,959	1.2
Oxford Township (Delaware)	984	0.2	4,668	1.9
Peru Township (Morrow)	1,470	0.3	15,017	6.2

Jurisdiction (County)	Population in Watershed 2010	% of Watershed Planning Area Population	Land Area in Watershed (Acres)	% of Watershed Planning Area Land Area
Plain Township (Franklin)	2,754	0.5	6,480	2.7
City of Reynoldsburg	35,303	6.4	7,138	2.9
Village of Sunbury	3,837	0.7	2,068	0.9
Truro Township (Franklin)	1,573	0.3	483	0.2
City of Westerville	35,303	6.4	8,071	3.3
City of Whitehall	19,245	3.5	3,400	1.4
Watershed Planning Area Total	**552,715**	**100**	**242,513**	**100**

Source: U.S. Census 2010 distributed within ¼ mile grid
*Due to its size, the data source for Brice is directly from the 2010 Census.

Continuing the BWPP Following Endorsement

This plan recommends that the BWPP continue to meet at least annually following endorsement. Provided that funding can be secured, MORPC will host and facilitate the annual BWPP meetings. These meetings will provide partners with the opportunity to share information about implementation projects with fellow partners. Each partner community and all stakeholders will be invited to attend the annual meeting where the partnership may share updates in a discussion format.

MORPC will record the meeting and create a meeting summary to distribute to the BWPP. MORPC will also prepare and submit progress reports regarding implementation of the Big Walnut Balanced Growth Plan to the OWRC. While the meeting format will be discussion-oriented and the partnership will be encouraged to share matters they feel are relevant to the Balanced Growth Planning effort, the following topics will be addressed at each meeting to guide the discussion in a productive manner:

- Share efforts within the past year to implement the BWPP Balanced Growth Plan.
- Share planned efforts for ongoing implementation of the plan.
- Discuss opportunities for collaboration and shared funding.
- Alert partners to major infrastructure projects, including transportation projects.
- Discuss any needed changes or adjustments to the Priority Areas maps.
- Discuss available funding opportunities with partnership.

Partnership communities are strongly encouraged to communicate with one another throughout the year as major projects that impact the watershed are slated and as opportunities for collaboration arise. The annual meeting of the partnership is intended to supplement, not replace, open lines of communication across jurisdictions.

Review of changes to local land use designations

At this time, MORPC is not aware of any proposed changes to local land use designations. If partner communities submit information about proposed local land use designation changes to MORPC, this information will be included in future drafts of the plan.

Unresolved Issues

At this time, MORPC is not aware of any unresolved issues. This section will be updated for the final draft of the plan if there are unresolved issues to report.

IMPLEMENTATION TOOLBOX

The following section provides information about selected tools that can assist Balanced Growth communities with implementing this plan. Many of these tools reference the *Best Local Land Use Practices (BLLUP)* document that was prepared by Ohio Lake Erie Commission (OLEC) to provide guidance to local communities on land use practices that minimize development impacts to water quality. OLEC also created a toolkit featuring model zoning codes and ordinances to complement the BLLUP document. Where applicable, the tools below include links to the model regulations that have been compiled by OLEC.

The Best Local Land Use Practices document strongly recommends that "the model regulations **should never be adopted without careful local review** to assure that they are adapted to fit the needs of the specific local government. They will need to be adapted for use by the specific type of local government: city, village, township, or county. **The law director/solicitor or county prosecutor should be consulted prior to adoption of any land use controls.**"[12]

In order to integrate the appropriate implementation tools, it may be necessary for the community to revise components of their local zoning code to allow for or encourage the use of specific tools. Indicator boxes are displayed near the heading of each tool to provide guidance about what type of Priority Area(s) the tool is recommended for. The tools may be applicable outside the recommended Priority Area(s) and the indicators are not intended to limit the use of the tools in any way.

[12] Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices; Web: http://balancedgrowth.ohio.gov/BestLocalLandUsePractices.aspx

Comprehensive Planning

PAA PDA PCA

A comprehensive plan is a policy document that a community develops to convey its long-term vision.[13] These plans are generally prepared with a specific timeframe in mind and are based on assumptions about how the population of the community may change over time and how those changes will impact land use patterns and infrastructure demands into the future. Strong comprehensive plans are based on a thorough and inclusive public involvement process and address land use, transportation, housing, infrastructure, recreation, and any other elements relevant to the community's long term vision.

The comprehensive planning process generally starts out with an assessment of current conditions and an evaluation of economic and demographic trends impacting the community. The first phase of comprehensive planning is often focused on gathering information, both from reliable data sources like the U.S. Census and from people living and working in the community. The next phase of planning often involves working with the public and policymakers to establish a vision for the community's future and goals related to that vision. Next, the planners will work with the community to draft policies, objectives, strategies and implementation steps that will move the community from its current state toward the vision and goals that it has established for itself in the future. The final comprehensive plan, which should also include a process for regular updates, will need to be adopted by the community's legislative body at the end of the process. There is some flexibility in the comprehensive planning process and each community may approach this process differently. However, the steps described above are generally included. Also, it is important to inform and involve the public early when developing a comprehensive plan in order to ensure that it will reflect the needs and priorities of the community.

The comprehensive plan, once adopted by a community's legislative body, provides a framework for updates of that community's zoning code. While the comprehensive plan does not carry legal authority on its own, it has the potential to shape the local zoning code which does carry legal authority. Zoning is a tool that is used to regulate land uses. Through zoning, local governments break up their jurisdictions into sections or "zones" and specify the types and intensities of land uses that can be located in each of those zones. While zoning is widely used in Ohio, it is not required.[14] However, a majority of the communities in the Big Walnut Watershed currently have local zoning codes in place and many of them also have locally adopted community plans.[15] See Table 8 for a list of Big Walnut Planning Partnership communities with Comprehensive Plans in place.

The Ohio Balanced Growth Program recommends that communities have a comprehensive plan and that they update the plan every five years. Big Walnut communities are also encouraged to consider the incorporation of Balanced Growth Plan designated Priority Areas into their local comprehensive plans. Also, BWPP communities are encouraged to consider the model regulations and land use codes that accompany

[13] Conglose, J. Comprehensive Planning Fact Sheet. Ohio State University Extension, Community Development; Web: http://ohioline.osu.edu/cd-fact/1269.html

[14] Conglose, J. Comprehensive Planning Fact Sheet

[15] City of Lee's Summit, Missouri, Department of Development; Web: http://cityofls.net/Development/Comprehensive-Plan/General-Information.aspx

the other implementation tools. These tools can be incorporated into local plans and zoning codes where appropriate to assist with implementation of the Balanced Growth Plan. A strong comprehensive plan based on a thorough public involvement process serves as a foundation for a defensible local zoning code that reflects the community's vision and priorities.

Not all the communities in the Big Walnut Watershed currently have comprehensive plans in place. The Balanced Growth Plan is not a substitute for local comprehensive planning. However, the Balanced Growth Planning process and the resulting plan can serve as a resource if communities that do not currently have a locally adopted comprehensive plan decide to create one.

BENEFITS

- Establishes a desired vision for the community's future.
- Encourages public involvement, participation, and input in local decision making.
- Provides a framework to help communities achieve long-term goals and address potential threats.
- Provides a framework for balancing private rights with public good.
- Protects and enhances health and safety of community members.
- Coordinates efficient use of existing infrastructure and prepares for future infrastructure needs.
- Supports the defensibility of zoning.[16]

RECOMMENDATIONS

1. Establish a comprehensive plan that reflects the priorities of the community.
2. Update the plan regularly, ideally every five years.
3. Incorporate the designated Priority Areas in this Balanced Growth Plan into the local comprehensive plan.
4. Reflect the designated Priority Areas in the local zoning code.
5. Examine your community's comprehensive plan and local zoning code to determine if there are barriers or disincentives in place that may prevent the use of recommended implementation tools.

[16] Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices.

Table 8. Comprehensive Plans for Big Walnut Planning Partnership Communities

Community	Plan	Year Adopted	Link/ Notes
Counties			
Delaware	No		Comprehensive plans are prepared for individual townships, villages, and cities.
Franklin	No		Comprehensive plans are prepared for individual townships, villages, and cities.
Licking	No		Comprehensive plans are prepared for individual townships, villages, and cities.
Morrow	Yes	2005	
Cities/ Villages			
Bexley	No		
Brice	No		
Columbus	Yes	Varies*	http://development.columbus.gov/uploadedFiles/Development/Planning_Division/Document_Library/Plans_and_Overlays_Imported_Content/complan.pdf
Fulton	No		
Gahanna	Yes	2002 Update	
Galena	Yes	2010	http://galenaohio.org/zoning.html#masterplan
Groveport	Yes	2004	
Lockbourne	No		
Marengo	No		
Minerva Park	No		
New Albany	Yes	2008 Update	
Obetz	Yes	1998	
Reynoldsburg	No		
Sunbury	No		
Westerville	No		
Whitehall	No		
Townships (County)			
Bennington (Morrow)	No		
Berlin (Delaware)	Yes	2010	http://www.dcrpc.org/compplan/document/BerlinTwpComPlan2011.pdf
Blendon (Franklin)	Yes	2010	http://www.franklincountyohio.gov/commissioners/edp/planning/blendon/plan/BlendonCommunityPlan-fullweb.pdf

Community	Plan	Year Adopted	Link/ Notes
Genoa (Delaware)	Yes	2009	http://www.dcrpc.org/compplan/document/GenoaTwpCompPlan2008.pdf
Hamilton (Franklin)	Yes	1998	
Harmony (Morrow)	No		
Jefferson (Franklin)	Yes	1996	
Jersey (Licking)	Yes	2010	http://www.lcounty.com/planning/PDF/FINAL%20JERSEY%20TWP.%20COMP.%20PLAN.pdf
Kingston (Delaware)	Yes	2006	http://cpmra.muohio.edu/townships/kingston/Forms/Adopted%20Comp%20Plan%2006-02-08.pdf
Lincoln (Morrow)	No		
Madison (Franklin)	Yes	2011	http://www.franklincountyohio.gov/commissioners/edp/planning/blacklick-madison/index.cfm
Mifflin (Franklin)	Yes	2009	http://www.franklincountyohio.gov/commissioners/edp/planning/clinton-mifflin/clintonmifflinplan-full.pdf
Oxford (Delaware)	Yes	2006	http://www.dcrpc.org/compplan/document/OxfordTwpComPlan2006.pdf
Peru (Morrow)	No		
Plain (Franklin)	Yes	2007	http://plaintownship.org/images/stories/Zoning/10-26-08_LandUsePlan.pdf
Truro (Franklin)	Yes	2011	http://www.franklincountyohio.gov/commissioners/edp/planning/blacklick-madison/index.cfm

*The City of Columbus prepares Area Wide plans, similar to Comprehensive Plans. The Brice Tussing Area Plan (1990), Broad Blacklick Area Plan (2011), East Columbus Neighborhood Plan (2012, pending), Far North Plan (1994), Hamilton Road Corridor Plan (2008), Livingston East Area Plan (2009), Near East Area Plan (2005), Near Southside Area Plan (2011), North Central Plan (2002), North Linden Plan (2003), Northeast Area Plan (2007), Northland Plan – Volume I (2001), Northland Plan – Volume II (2002), Port Columbus Joint Economic Development Strategy (2008), Rocky Fork-Blacklick Accord (2004), South Alum Creek Neighborhood Plan (2004), South Central Accord (2009), and the South Linden Plan (2003) cover much of the city's land within the Big Walnut watershed.

Stormwater Management Regulations

PAA PDA PCA

Stormwater management is the application of best management practices (BMPs) and design solutions to site development or redevelopment in order to manage stormwater more effectively with the goal of reducing run-off, decreasing sedimentation and pollution, and decreasing the potential for flooding.

Stormwater runoff is one of the primary sources of impairment to the Big Walnut Watershed. Stormwater runoff is a form of nonpoint source pollution, meaning that it does not come from a single source or follow a direct, identifiable route.[17] In an undisturbed ecosystem, stormwater falls onto open grasslands, forests, and other natural areas where it slowly infiltrates the soil and is filtered. In contrast, when stormwater falls on impervious surfaces, it is unable to penetrate through to the soil and instead runs off, often picking up pollutants and sediment along the way. Impervious surfaces are any surfaces that prohibit water from passing through. Examples of impervious surfaces commonly found in urbanized areas are paved roadways, parking lots, sidewalks, and rooftops. As the amount of impervious surfaces in an area increases, the volume and velocity of stormwater runoff increases with it.

Another large contributor of nonpoint source pollution from stormwater runoff is agricultural runoff. While agricultural land uses do result in lower total amounts of stormwater runoff (compared with developed, urban areas) due to the land's permeability, the runoff that does enter the stream often picks up sediment, nutrients, chemicals or bacteria that have been applied to the land. Agricultural runoff often results in increased levels of nitrogen and phosphorous in the waterways which may encourage the growth of certain types of algae that can be dangerous to humans and animals. A wide variety of practices, both structural and non-structural, are available to assist communities with managing stormwater. Several of the other tools recommended in this toolbox are also designed to achieve stormwater management. For example, Low Impact Development, Riparian and Stream Setbacks, and Conservation Development can help communities achieve lower overall rates of stormwater runoff.

The Ohio Environmental Protection Agency and the Ohio Department of Natural Resources (ODNR) have developed a plan to assist communities with managing nonpoint source pollution. The *Ohio Nonpoint Source Pollution Management Plan, 2005-2010* includes a guide to existing stormwater management practices. The guide addresses issues ranging from agricultural runoff to drinking water protection to urban stormwater runoff and can be found on the Ohio EPA's website at http://web.epa.ohio.gov/dsw/nps/NPSMP/MM/mm.html.

The *Management Plan* recommends that communities identify the major cause(s) of stream impairment and water quality threats, identify target implementation areas and potential funding sources, and review the applicability and effectiveness of various practices before selecting the stormwater management practices to implement locally.[18]

[17] D'Ambrosio, J., Lawrence, T., Brown, L. A Basic Primer on Nonpoint Source Pollution and Impervious Surface Fact Sheet. Ohio State University Extension. Web: http://ohioline.osu.edu/aex-fact/0444.html

[18] Ohio Environmental Protection Agency (EPA) and Ohio Department of Natural Resources (ODNR) (2005 – 2010). Getting the Point about Nonpoint: Ohio Nonpoint Source Pollution Management Plan; Web: http://wwwapp.epa.ohio.gov/dsw/nps/NPSMP/MM/mmdecisiontree.html

Under the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Storm Water Program, communities must ensure that their codes meet or exceed the U.S. EPA's requirements for managing stormwater runoff and pollution.[19] The NPDES program has been implemented in two phases. Phase I required operators of large and medium Municipal Separate Storm Sewer Systems (MS4) to develop a detailed Storm Water Management Program (SWMP). Large MS4s serve over 250,000 residents and medium MS4s serve between 100,000 and 250,000 individuals. Under Phase II of the NPDES program, smaller MS4s that serve less that 100,000 and are located in urbanized areas were required to develop SWMPs. The SWMP must include information about how the community will conduct public education and outreach, incorporate public involvement, detect and eliminate illicit discharges, control stormwater runoff during and after construction, and prevent pollution.[20]

These are the basic requirements for stormwater and pollution control that must be met by communities in the Big Walnut Watershed. However, jurisdictions are encouraged to consider stream and riparian setbacks and promote the use of Best Management Practices and Low Impact Development wherever it may be applicable and benefit the overall quality of the Big Walnut Watershed.

BENEFITS

- Decreases sedimentation and pollution in waterways.
- Decreases potential for flooding.
- Prevents stream bank erosion and channel incision.
- Prevents infrastructure damage.
- Protects critical habitats.

RECOMMENDATIONS

1. Preserve existing critical features like wetlands, floodplains, steep slopes, tree cover and land cover, and ravines.
2. Minimize stormwater through better site design and the implementation of stormwater best management practices.
3. Treat stormwater for quantity and quality

MODEL REGULATION & PLAN

Model Ordinance for Comprehensive Storm Water Management, Chagrin River Watershed Partners
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=HcjXwlToMSU%3d&tabid=66

[19] ODNR Division of Soil and Water Conservation (2006). Rainwater and Land Development Manual, Third Edition. Chapter 1: Selecting Stormwater Management Practices. Ohio Department of Natural Resources; Web: http://www.dnr.state.oh.us/portals/12/water/rainwater/Rainwater2009-6-23/6-23-09RLDFiles/6-24-09RLDCh1.pdf

[20] Ohio EPA. MS4 Program Overview; Web: http://www.epa.state.oh.us/dsw/storm/ms4.aspx

New Albany Village Center Storm Water Mitigation Strategy
http://www.newalbanyohio.org/wpcontent/uploads/2011/04/VillageCenterStormwaterMitigationStrategy.pdf

Table 9. Impacts from increases in impervious surface coverage (U.S. EPA, 1997)

Increased Impervious Surface Coverage	Resulting Impacts				
Leads to:	**Flooding**	**Habitat Loss**	**Erosion**	**Channel Widening**	**Stream Alteration**
Increased Amount of Flow	X	X	X	X	X
Increased Peak Flow	X	X	X	X	X
Increased Peak Duration	X	X	X	X	X
Decreased Base Flow		X			
Sediment Loading	X	X	X	X	X

Source: OSU Extension, A Basic Primer on Nonpoint Source Pollution and Impervious Surfaces

Low Impact Development

PDA PCA

Low Impact Development is a design technique for managing stormwater on site. Traditionally, stormwater management has consisted of using a means of conveyance, like storm sewers, gutters, or culverts, to quickly transfer precipitation and stormwater runoff to a central location such as a water treatment plant or a retention pond. As an alternative, communities may consider encouraging property owners to manage the stormwater runoff on site to minimize the negative impacts that the traditional system can cause while reducing the need for traditional infrastructure and the associated costs. LID seeks to maintain, to the greatest extent possible, the natural hydrology of the site and the watershed through strategic planning and micro-management of precipitation and stormwater.

LID is a decentralized practice that controls stormwater through methods dispersed throughout a site that allow water to infiltrate, evaporate, and transpire as it would naturally prior to introduction of development and increased impervious surfaces. Utilizing these methods reduces the volume of stormwater runoff and the pollutant load contained within the runoff conveyed to waterways. This contributes to a reduction of negative impacts to streamways. Water quality can be improved through LID measures that permit water to infiltrate the ground to replenish groundwater which in turn slowly feeds into wells, aquifers, and waterways.

The Best Local Land Use Practices document developed by the Ohio Lake Erie Commission summarizes three key elements of successful Low Impact Development:

- Minimize storm water runoff impacts through preservation of existing landscape features, such as streams and wetlands, and their hydrologic functions.
- Maintain predevelopment time of concentration through strategic routing of flows.
- Disperse runoff and stormwater storage measures through a site's landscape with the use of a variety of detention, retention, and runoff practices.

LID is a viable alternative to traditional stormwater management in many circumstances. Not every site is suitable for LID. Soil permeability, slope, and other site characteristics need to be considered in order to make an informed decision as to whether LID is viable for a particular site. It is critical to consider LID measures early on in the development process. With proper planning, LID can be more cost-effective and require less maintenance than traditional methods of stormwater management.

The following table shows the cost differences between conventional stormwater management and LID. A majority of the comparisons demonstrate that LID measures are more cost effective, often due to the cost savings from the reduction in costs associated with grading and preparing the site.[21]

[21] U.S. EPA (2007) *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices,* EPA publication number 841-F-07-006, December 2007.

Table 10. Cost Comparisons Between Conventional and LID Approaches

Project	Conventional Development	LID	Cost Difference	Percent Difference
2nd Avenue SEA Street	$868,803	$651,548	$217,255	25%
Auburn Hills	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall	$27,600	$5,600	$22,000	80%
Bellingham Bloedel Donovan Park	$52,800	$12,800	$40,000	76%
Gap Creek	$4,620,600	$3,942,100	$678,500	15%
Garden Valley	$324,400	$260,700	$63,700	20%
Kensington Estates	$765,700	$1,502,900	–$737,200	-96%
Laurel Springs	$1,654,021	$1,149,552	$504,469	30%
Mill Creek	$12,510	$9,099	$3,411	27%
Prairie Glen	$1,004,848	$599,536	$405,312	40%
Somerset	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus	$3,162,160	$2,700,650	$461,510	15%

Source: U.S. EPA (2007) Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, EPA publication number 841-F-07-006, December 2007.

In addition to its financial and environmental benefits, LID can also provide aesthetic and recreational value to an area. LID facilities can be linked to form urban greenways that create alluring streetscapes and increase land values.

There are also potential health benefits to incorporating many of the LID facilities into site design. The incorporation and maintenance of trees and plantlife could also lead to improved air quality, particularly in urban areas. LID measures, particularly green roofs and trees, also contribute to urban heat island reduction by increasing evapotranspiration, providing cool shade, absorbing green house gasses, and reducing impervious surface areas that interfere with the natural thermal balance of the environment. The U.S. EPA states that, "heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality."[22] Implementing many of the LID measures can result in mitigation of the extreme health-threatening temperatures experienced by communities, particularly in urbanized areas.

Communities should consider implementing one or more LID measures as a means to promote the health and well-being of its citizens while managing stormwater and precipitation in a cost-effective and environmentally friendly manner. The actual measures that can be encouraged among communities as part of low

[22] U.S. EPA (2011). Heat Island Effect. http://www.epa.gov/heatisld/

impact development are often referred to as Integrated Management Practices (IMPs). The following information is not exhaustive, but provides a range of IMPs that can be used in concert to create low impact development.

INTEGRATED MANAGEMENT PRACTICES

Riparian and Wetland Setbacks

Please refer to Page 68, Stream and Wetland Setbacks, for more details.

Biofiltration Facilities

The nature of these facilities will vary in accordance with the soil type, land use, and site characteristics. Biofiltration facilities are vegetated areas that temporarily store stormwater allowing water to slowly infiltrate into the ground and also permitting the vegetation to filter pollutants from the stormwater.

For more information: http://www.stormwaterpartners.com/facilities/bioswale.html

Vegetated Swales

Swales are naturally occurring or artificially constructed broad channels that collect stormwater runoff in an area with (preferably) native vegetation. The stormwater is transported through the swale where it can infiltrate the soil, pollutants can be filtered out, and storm water speed can be slowed (especially when paired with "check dams", rocks or other natural materials placed in the swale to intersect the flow of water).

For more information: http://www.epa.gov/owm/mtb/vegswale.pdf

Cistern and Rain Barrels

Cisterns and rain barrels are rainwater collection systems that collect precipitation for reuse. These systems may also be used for stormwater collection, but there are limitations for the use of stormwater versus rainwater that has been collected as it tends to collect a higher content of pollutants. The collected water can be used in a variety of ways. For example, water collected may be used to water gardens, to add water to a pool, to wash a car, for toilet water (with the appropriate plumbing set up), or for washing clothes.

For more information: http://www.lid-stormwater.net/raincist_home.htm

Infiltration Trenches

Infiltration Trenches are shallow excavated channels that are filled with stones created for the purpose of stormwater runoff retention and to allow for the percolation and infiltration of water into the ground.

For more information: http://www.metrocouncil.org/environment/Water/BMP/CH3_STInfilTrenches.pdf

Green Roofs

Green roofs are roofs that have been fashioned with vegetation and a layer of waterproofing for the purposes of intersecting and absorbing rainfall, reducing the amount of impervious surface, aesthetic appeal, and to reduce the urban heat island. Table 11 provides a cost comparison of green roofs versus conventional roofs. While green roofs cost more up front, they are competitive when compared over the long term due to a reduction in maintenance and replacement costs.

Table 11. Green Roof Cost Comparisons

	Conventional Roof	Green Roof
New Construction	$3-9/sq ft	$10-15/sq ft
Re-roofing	$5-50/sq ft	$15-50/sq ft

Source: Cascadia Green Building Council Green Roof Fact Sheet; Bureau of Environmental Services.

For more information: http://www.epa.gov/heatisland/mitigation/greenroofs.htm

BENEFITS

- Preserve key elements of the natural landscape.
- Effectively manage stormwater working with nature rather than against it.
- Potential cost-savings when compared with traditional systems.
- Enhanced water quality by allowing stormwater to slowly filter and infiltrate.

RECOMMENDATIONS

1. Encourage Low Impact Development measures to promote environmentally-friendly stormwater management.
2. When comparing costs between traditional and Low Impact Development, consider both upfront and ongoing maintenance costs.
3. Consider LID early on in the development process to ensure site viability and cost-effectiveness.
4. Consult your local Soil and Water Conservation District, planning staff, or other knowledgeable parties to learn more about local implementation of Low Impact Development.

Natural Areas Establishment

PCA **PAA**

Natural areas establishment and meadow protection encourage maintaining natural areas to provide stormwater control and filtering services. Many communities restrict the height of vegetation and grass through "weed laws" in an effort to curb property owner neglect. Unfortunately, these regulations subsequently prohibit property owners from leaving portions of their lawn in their natural "meadow" state. Meadow protection is coming to the forefront as alternate patterns of development, such as conservation development, are becoming more commonly explored. While areas in conservation developments are specifically designated as meadows and open space, weed laws would require the areas to be mowed.

The difference between a natural meadow and mowed lawn is not simply a matter of aesthetics, but also a matter of environmental benefit. Natural meadow areas provide water pollutant filtration, absorption and retention benefits as well as habitat for wildlife and a variety of plants. Typical grass lawns may create a thick mat that prevents adequate infiltration and it may contribute to "sheet run off" or mass transport of water over land without a defined channel, during storm events. The amount of runoff can be similar to that of many impervious paved areas. Mowed lawns are often subject to fertilizers and other treatment that pollute the water runoff while providing very little habitat for wildlife.

The BLLUP guidebook developed by OLEC addresses a number of the issues facing Natural Area Establishment and Meadow Protection. These issues and recommendations are applicable statewide. The guidebook states that weed laws can be improved to prohibit and control noxious weeds without destroying beneficial plant species.

The guide explains that there are three categories of "weed laws" that allow for Natural Area Establishment. [23]

1) Permit Laws- These regulations require that a natural area/meadow management plan be submitted for approval and that the property maintain compliance with the plan.
2) Exclusion Laws- These regulations exclude specified native grass areas from being subject to the weed law as exemptions.
3) Proactive Laws- These regulations require that a percentage or other specified amount of native grass areas be incorporated into landscaping.

[23] Ohio Lake Erie Commission. *Linking Land Use and Lake Erie: Best Local Land Use Practices.*

Permit and proactive laws tend to need a review board that can review, approve, and enforce the applicant's submitted management plan. These can be more difficult and costly to implement than the exclusion laws. Exclusion laws promote the use of a "weed expert" that can attest to the status of a grassy area as a meadow or neglected property. It is often the case that communities rely only on compliance with state laws to control noxious weeds and do not go any further. Public education on the value of established natural areas as a means to enhance water quality, rural character and habitat is a critical component of their success. Most Soil and Water Conservation Districts (SWCD) can provide communities with additional technical resources to assist in determining whether unmowed areas are, in fact, meadows.

BENEFITS

- Natural stormwater management and filtering.
- Preserve and enhance natural habitat for wildlife.
- Enhance natural beauty of a property.
- Creation of passive open space.

RECOMMENDATIONS

1. Permit natural area establishment.
2. Include provisions for the maintenance of the natural area or meadow to ensure that enforcement can be conducted uniformly.
2. Have a mechanism for determining whether an area is a natural meadow or simply a neglected area.
3. Protect communities from noxious weeds.
4. Have a procedure in place to allow for hearings and appeals following enforcement.

MODEL REGULATIONS

1. *City of White Bear Lake, Minnesota: Model Code* http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=H3C5UE6AlxI%3d&tabid=66

2. *City of Madison, Wisconsin: Model Code* http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=0E8KH0saN6s%3d&tabid=66

3. *Village of Long Grove, Illinois: Model Code* http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=HWND71Xe18U%3d&tabid=66

Ohio's Noxious and Regulated Weeds

Noxious
Musk Thistle
Oxeye Daisy
Canada Thistle
Poison Hemlock
Wild Carrot
Purple Loosestrife
Wild Parsnip
Mile-a-Minute
Russian Thistle
Cressleaf Groundsel
Shattercane
Johnsongrass
Grapevines (abandoned)

Regulated
Multiflora Rose
Purple Loosestrife

Source: Linking Land Use and Lake Erie: Best Local Land Use Practices. Ohio Lake Erie Commission

Stream and Wetland Setbacks

PCA PDA PAA

Streams and wetlands are integral to the health of our watershed, environment, and wildlife. They provide critical habitat for the plant and animal life in our region, support recreational opportunities such as fishing and bird-watching, and convey our water as part of a larger hydrologic cycle that supports life. Protecting the natural hydrology of our waterways is a critical component of environmental and community health. Therefore, it is important to minimize the impact of impervious surfaces and land use change on the health of our waterways. One way to reduce or minimize the impact is through stream and wetland setbacks.

A setback is a specified distance from a feature of the natural or built environment. Features could include roads, waterways, or any number of landmarks. For this implementation tool, the setbacks are applied to water features, specifically to streams and wetlands. Setback regulations often limit new development or redevelopment within the designated setback area.

A stream or wetland setback is the area encompassed by a distance set aside through community ordinances, regulations, or recommended development guidelines. The distance can be measured from a number of starting points including from the edge of the stream, a high watermark, or the center of the stream. For example, if a community enacted a setback of 25-feet from the edge of a stream, the setback area would be the area between the edge of the stream out to 25-feet along the length of the stream. Stream and wetland setbacks are sometimes referred to as stream buffers or riparian corridors. While this tool is specific to setbacks established through the local zoning process, other models for maintaining the natural function of stream corridors exist. For example, the City of Columbus utilizes a stormwater management plan, augmented by the development review process as new development occurs.

The purpose of stream and wetland setbacks is to provide communities with a means to protect the natural flow of waterways, protect the riparian corridor that provides critical habitat and soil stability, create an area where stormwater can slowly filter into the waterways, and provide a buffer between development and the water to promote community safety. Streams store and convey water and provide a means for rich sediment to be deposited in our floodplains. The streams and wetlands themselves provide critical habitat to fish, frogs, insects, birds, and many other creatures. The corridors along rivers and wetlands, particularly if well forested or complete with brush and other native plantlife, slowly filter stormwater runoff and also assist in regulating stream temperature by moderating the amount of sunlight that reaches the waterways (particular stream temperatures support particular forms of life). Vegetation in the riparian corridor absorbs the force and volume of floodwaters, stabilizes the stream banks from erosion, filters pollutants, and reduces floods by increasing absorption of floodwater into the soil.[24] Stream and wetland setbacks also promote groundwater recharge which is critical to maintain groundwater drinking resources and for recharging streams. There is also strong aesthetic value to maintaining a vegetated stream and wetland area.

When there is a rain event, some water may be absorbed into the ground or intercepted by vegetation and subsequently evaporated. Excess water will run off of an impervious surface like compacted soil or asphalt into storm drains and subsequently a waterway.

[24] Ward, A., D'Ambrosio, J., Witter, J. (2008). Floodplains and Streamway Setbacks. Ohio State University Extension, Agriculture and Natural Resources.

Ideally, stormwater runoff would slowly percolate through vegetation into the soil and into our waterways. When impervious surfaces such as rooftops and parking lots are placed within the floodplain or riparian area, the volume and speed of the stormwater runoff increases, causing a number of issues including flooding, soil erosion (subsequent exposure of plant roots and ensuing damage to plantlife), and deep channel cutting. Generally, research shows that when ten percent or more of land in a watershed is covered by impervious surfaces, impairment to streams occurs.[25] This is further exacerbated by impervious surfaces placed close to waterways. Furthermore, research shows that upwards of 25 percent impervious surface coverage causes severe watershed impairment.[26] It has also been demonstrated that due to impervious surfaces a typical city block generates more than five times the stormwater runoff than a wooded area of the same size. Given the research and the demonstrated impacts of stormwater runoff, it is critical that communities seek to address these issues to protect and enhance the watershed and maintain the safety of citizens from floodwaters. Figure 3 illustrates the impact of impervious surfaces on stormwater versus that of natural ground cover.

Stream protection and stormwater management are particularly relevant issues with regard to public health, safety, and welfare. Erosion of the stream banks leads to dangerous conditions for anyone nearby and for structures close to the waterway. Stream and wetland setbacks also make financial sense. While setbacks are often a reactive measure to protect our waterways and reduce flooding, they are also a proactive measure to accomplish the same means as future development occurs and to prevent stream/wetland degradation and flooding for existing development. By maintaining healthy streams and wetlands through setbacks, the need to engage in costly restoration or reconstruction is reduced. Setbacks may also allow a degraded or channelized waterway (depending on the level of degradation) to restore itself over time through natural processes as opposed to costly restoration.[27]

A common concern expressed among citizens is the impact that stream setbacks may have on private property values. Research shows that these tools *positively* impact property values. Analysis shows that home values appreciate faster near protected open space such as that created by setbacks.[28] A clean and vegetated stream near a property provides an attractive amenity to the property. Maintaining setbacks also contributes to property protection for the aforementioned reasons regarding floodwater. These setbacks can also function in tandem with the low impact development and natural area establishment tools for a comprehensive approach to stormwater management.

The BWPP is not a regulatory body and it does not and cannot create regulations. Stream and wetland setback regulations can vary widely from jurisdiction to jurisdiction, county to county, and across the range of experts' recommendations. Communities seeking to adopt stream and wetland setbacks ordinances or guidelines are encouraged to seek legal counsel, citizen input, and/or consult with the local Soil and Water Conservation District.

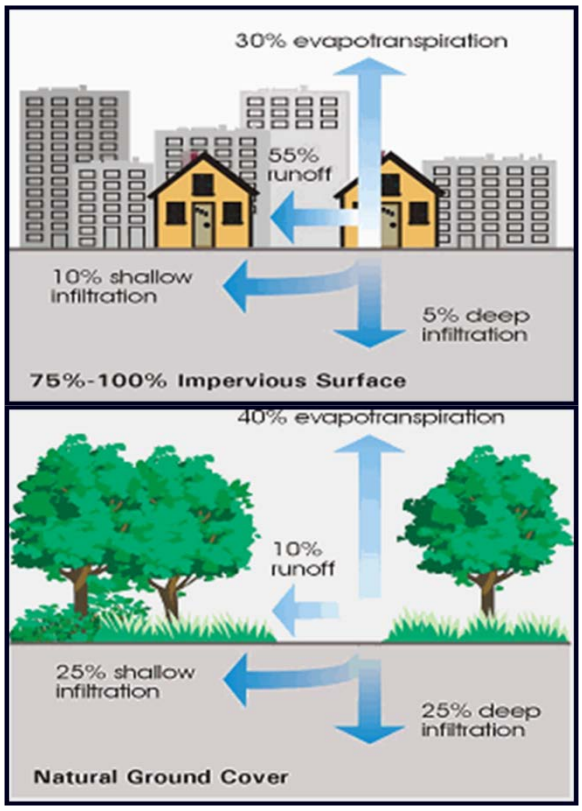
[25] U.S. EPA 2003. Protecting Water Quality from Urban Runoff.

[26] The Impacts of Impervious Surfaces on Water Resources. (2007). New Hampshire Estuaries Project (NHEP), University of New Hampshire.

[27] ODNR Division of Soil and Water conservation (2006). Rainwater and Land Development Manual, Third Edition. Chapter 2: Post Construction Stormwater Management Practices. Ohio Department of Natural Resources; Web: http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx

[28] Arendt, Randall. *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks* (Island Press 1996).

Figure 2. Relationship between impervious surface and stormwater runoff



Source: Chagrin River Watershed Partners. Low Impact Development. http://www.crwp.org/LID/low_impact_development.htm

STREAM SETBACKS

The following stream setback recommendations are from the Ohio Department of Natural Resources and the Chagrin River Watershed Partners. These recommendations both seek to achieve healthy waterways and wetlands but use different methods to calculate the recommended setbacks. Partners should remember that as part of an endorsed Balanced Growth Plan, they may be eligible for technical assistance from the Balanced Growth program in drafting regulations. In the event that a community has already adopted a setback ordinance, ODNR recommends that the larger of the two setbacks (established setback versus setback determined by recommended standards) be used.

The following are Ohio Department of Natural Resources Stream Setback Recommendations[29]:

1. The setback area width is a total width, which crosses the channel and is calculated according to the drainage area (square miles).

2. The setback area shall be a combination of two overlapping areas, one streamway-based and the other based on a minimum distance from the channel bank, equivalent to 1 channel width.

3. The Streamway size appropriate to accommodate the area within which a stream periodically shifts its course, also known as the meander belt, is:
   Streamway width = 147 (DA) $^{0.38}$
   DA = Drainage Area in square miles.

4. At no point shall the distance between the setback boundary and the stream channel be less than:
   Minimum distance from stream channel:
   14.7 (Drainage Area in square miles) $^{0.38}$
   (Approximately 1 channel width)

Another set of stream setback recommendations that BWPP communities may consider are those created by the Chagrin River Watershed Partners in northeastern Ohio. The stream setback recommendations range from 25 feet to 300 feet, varying as a function of waterway drainage area similar to the ODNR calculated method. These setbacks are to be applied to both sides of the waterway, with some flexibility allowed to account for natural resources, regional character, how buildable the affected lots remain, and so on. Coordinating

[29] *Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation. Rainwater and Land Development, Third Edition (2006). Chapter 2 Post Construction Stormwater Management Practices. Ohio Department of Natural Resources. http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx*

setbacks across jurisdictional boundaries can create a stronger positive impact on the watershed health as a whole and is necessary to create significant differences at the regional and watershed level. Coordination can also provide greater predictability from one community to the next for residents and developers.

Table 12. Chagrin River recommended setbacks

Watershed Size	Minimum Setback Distance
< 0.5 square miles	25 feet
0.5 – 20 square miles	75 feet
20 – 300 square miles	120 feet
> 300 square miles	300 feet

Source: Community Riparian and Wetland Guidance: Putting all the Pieces Together. Cuyahoga Soil and Water Conservation District. http://www.crwp.org/pdf_files/riparian_wetlands_guide_book.pdf

WETLAND SETBACKS

Wetlands provide valuable flood and stormwater storage, habitat for a number of plant and animal species, and a place to filter contaminants and sediments from water. Below are the three categories of wetlands established by the Ohio EPA, as defined in the Ohio Rapid Assessment Method User's Manual.[30]

Table 13. Ohio EPA Wetland Categorization

Wetland Category	Ohio EPA Description
1	"Wetlands with minimal wetland function and/or integrity. Wetlands which support minimal wildlife habitat, and minimal hydrological and recreational functions and as wetlands which do not provide critical habitat for threatened or endangered species or contain rare, threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated, and have some or all of the following characteristics: low species diversity, no significant habitat or wildlife use, limited potential to achieve beneficial wetland functions, and/or a predominance of non-native species."
2	"Wetlands with moderate wetland function and/or integrity which support moderate wildlife habitat, or hydrological or recreational functions, and as wetlands which are dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions."
3	"Wetlands with superior wetland function and/or integrity superior habitat, or superior hydrological or recreational functions. They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide."

Source: Mack, J. (2001). Ohio Rapid Assessment Method for Wetlands, Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.

The setbacks recommended by the Ohio EPA (Table 14) vary depending upon wetland class. Research indicates that these recommended setbacks may not adequately protect all types of wetlands, particularly vernal pools, and that a setback of up to 1,000 meters would provide more adequate protection. This plan encourages communities to establish wetland setbacks based on the Ohio EPA recommendations and/or the most recent scientific research available.

[30] Mack, J. (2001). Ohio Rapid Assessment Method for Wetlands, Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.

Table 14. Ohio EPA Recommended Wetland Setbacks

Wetland Class	Setback Distance
3	120 feet
2	75 feet
1	Protect and enhance

Source: Community Riparian and Wetland Guidance: Putting all the Pieces Together. Cuyahoga Soil and Water Conservation District. http://www.crwp.org/pdf_files/riparian_wetlands_guide_book.pdf

BENEFITS

- Preservation of stream corridors.
- Enhanced water quality.
- Reduction of stream bank erosion and flooding.
- Retention of bank stability.
- Consistency and predictability across the watershed.
- Protection of natural habitat for wildlife.

RECOMMENDATIONS

1. Protect the health and safety of residents and reduce the need for costly stormwater infrastructure, flood control, or flood damage repair by encouraging the preservation of the riparian and wetland areas that naturally address stormwater retention, infiltration, and conveyance.
2. Provide education on the benefits of stream and wetland protection to communities, property owners, and the public including the promotion of safety and increase in property values.
3. Allow a mechanism for some flexibility and creativity in site design such as grandfathering or a variance process when appropriate.
4. Communities may consider creating stream and wetland setbacks that are consistent with neighboring communities and at the watershed-scale to provide greater predictability for developers and streamlining between communities.
5. Passive recreation uses may be maintained in the setback but native vegetation and forest should be prioritized for preservation.
6. Discourage destruction or stripping of soil and vegetation within the stream and wetland setback area as a means of stream bank protection and to maintain the soil structure.
7. Encourage maintenance of natural hydrology to the greatest extent feasible to reduce disturbance of natural surface and ground water flow and reduce flooding incidence.
8. Coordinate stream and wetland protection with other tools such as low impact development and natural area establishment/meadow protection for a comprehensive approach to stormwater management.

MODEL ORDINANCE

Riparian and Wetland Setback Model Ordinance 1-27-06. Cuyahoga County Board of Health. http://www.ccbh.net/ccbh/export/sites/default/CCBH/pdf/stormwater/Riparian_Setback_Ordinance.pdf

Woodland and Tree Canopy Protection

PCA PAA PDA

Woodlands are areas with natural cover that include trees, shrubbery, and other vegetation. These areas provide numerous social, economic, and environmental benefits, like critical habitat for an array of wildlife. A tree canopy consists of the collective layers of the leaves and branches of trees. They are an important element of the urban, suburban, and rural fabric, providing lush green respite to wildlife, cool shade for the residents, improved water quality and cleaner air. They also enhance property values significantly when compared to open, non-wooded sites.

In spite of these benefits, it is a significant challenge to maintain wooded areas throughout the development process and many woodlands are lost to suburbanization. Traditional development patterns often break up blocks of woodland, leaving only scattered trees. Often, the scattered trees that remain fare poorly due to various stressors and can be expected to have a very low long-term survival rate. Even when subdivisions are well designed to reserve blocks of wooded areas, little attention is given to evaluating the trees prior to design in order to prioritize the areas of varying woodland and habitat value.

Some communities have enacted regulations which attempt to address this problem. Tree canopy protection works in tandem with other tools described in this plan, such as stream setbacks, where vegetation like trees can be preserved to stabilize stream banks and assist in the slow infiltration of stormwater. The establishment, protection, and maintenance of street trees and parking lot landscaping trees is a way that transportation and the protection of the environment can be integrated to the benefit of both. Trees enhance the aesthetic appeal of our thoroughfares and parking lots and can provide additional buffer protection between pedestrian walkways and bicycling lanes and the cars on the roadway. This can enhance safety for all modes of transportation. The shade provided by parking lot landscaping and street trees also moderates the impact of pavement that retains heat and contributes to the urban heat island effect. As discussed earlier, the urban heat island effect contributes to high temperatures and associated health threats. It should also be recognized that street and parking infrastructure beautification can work toward achieving better water quality. Appropriate stormwater measures like infiltration areas paired with street tree landscaping can also intercept street and parking lot stormwater runoff. This not only helps to reduce the impact of the impervious surface on the waterway but also provides a great aesthetic. Research has determined that the average tree canopy coverage in urban areas across cities in the U.S. is at approximately 27 percent.[31] The USDA Urban Forest Data estimates that for the State of Ohio, the percent of tree canopy cover of urban or community land is at about 21 percent.[32]

[31] Dwyer and Nowalk (2000). A national assessment of the urban forest: an overview. Society of American Foresters.

[32] USDA (2008). Urban Forest Data: Ohio http://nrs.fs.fed.us/data/urban/state/?state=OH Table 1. Statewide summary of population, area, population density, tree canopy and impervious surface land cover, and urban tree benefits in urban, community, and urban or community areas.

> "Trees make important contributions to society and are an integral part of urban infrastructure, as critical to the health and livability of communities as roads, sewers, and buildings. Community trees leverage the social, economic, and environmental value of cities, with forestry and related industries providing employment for over 1.6 million people and contributing $231.5 billion to the U.S. economy."
>
> Tom Cochran, CEO of U.S. Conference of Mayors

The percentage of tree canopy coverage varies by community and communities are encouraged to invest in a tree canopy analysis to determine their own needs. There are a number of programs available for community forest analysis such as I-Tree (http://www.itreetools.org/index.php), a program developed by the USDA Forest Service for urban forestry analysis, Urban Forest Data (http://nrs.fs.fed.us/data/urban/state/?state=OH), and various GIS programs. While performing a tree inventory or canopy analysis is encouraged, it is not a prerequisite for adopting a tree protection ordinance. No matter the character of the community, the basic process for developing a tree protection ordinance is much the same.[33] Careful consideration should be given to the community's existing tree stock, future plans and vision, and citizen wishes.

Communities are encouraged to review the document Protecting and Developing the Urban Tree Canopy (http://www.usmayors.org/trees/treefinalreport2008.pdf) developed by the U.S. Conference of Mayors to learn about the urban tree canopy benefits acknowledged by officials surveyed from 135 communities and brief summaries of their current protection efforts. The document details responses from a survey distributed to communities throughout the U.S. to gauge the tools being used for tree canopy protection, the connection between sustainability and tree preservation, trees as "green infrastructure", and the integration of tree preservation in land use plans.

Trees have a great number of benefits, two of which are air quality maintenance and sequestering of greenhouse gasses. See Table 15 for Ohio-specific data on the pollution removal benefits of trees. Storing these gasses helps moderate atmospheric concentrations and global temperatures. There are also dollar values that can be attributed to the work that the trees and the tree canopy do to store or remove greenhouse gasses and other pollutants.

There are comprehensive guidelines called *Guidelines for Developing and Evaluating Tree Ordinances* (http://www.isa-arbor.com/education/resources/educ_TreeOrdinanceGuidelines.pdf) available to assist communities seeking to develop, evaluate, and/or adopt a tree ordinance available through the USDA Forest Service through the National Urban and Community Forestry Advisory Council and the International Society of Arboriculture. These guidelines detail a number of key considerations for communities considering tree ordinance development or revision:

- Planning for an ordinance.
- Developing a community forest management strategy.
- Assess tree resources.
- Identify needs and establish goals.
- Tree inventory systems and GIS.
- Community forest education.

The preceding guidelines on developing tree ordinances highlight an important point related to the use of ordinances. It emphasizes the need for communities to develop or review their overall urban forest management strategy before considering a new or revised tree ordinance. The role of a tree ordinance is to

[33] Swiecki, T.J., and Bernhardt, E.A. (2001). Guidelines for Developing and Evaluating Tree Ordinances.

facilitate resource management, and effective ordinances are part of a larger community forest management strategy.

Communities interested in learning more about key considerations regarding the tree canopy at the watershed level can read more in the Urban Watershed Forestry Manual (http://www.forestsforwatersheds.org/storage/completePart1ForestryManual.pdf) to learn about tree planting guidelines for areas along streams, utility corridors, roadway-right-of-ways and much more. Partners are also encouraged to view a slideshow (http://www.slideshare.net/watershedprotection/formatted-uwf-slideshow-presentation?type=powerpoint) developed by the Center for Watershed Protection called Urban Watershed Forestry to learn more about the intersection of tree canopy protection and watershed health. Technical support on developing a community forest management program is also available through the Ohio DNR Urban Forestry program (http://www.ohiodnr.com/tabid/5547/Default.aspx).

Table 15. Urban tree benefits (2000)

	Urban Land and Community Land
Estimated number of trees	133,500,000
Carbon	
Carbon stored (metric tons)	25,500,000
Carbon stored ($)	$581,400,000
Carbon sequestered (metric tons/year)	840,000
Carbon sequestered ($/year)	$19,152,000
Pollution	
CO_2 removed (metric tons/year)	311
CO_2 removed ($/year)	$438,000
NO_2 removed (metric tons/year)	3,832
NO_2 removed ($/year)	$37,963,800
O_3 removed (metric tons/year)	9,157
O_3 removed ($/year)	$90,708,000
SO_2 removed (metric tons/year)	1,934
SO_2 removed ($/year)	$4,688,800
Total pollution removal (metric tons/year)	21,930
Total pollution removal ($/year)	$178,100,000

Source: Nowak, D.J. and Greenfield, E.J. (2010). Urban or community land is land that is urban, community, or both. Communities may include all, some, or no urban land within their boundaries. Urban land is based on population density and was delimited using the United States Census definitions or urbanized areas and urban clusters. Community land is based on jurisdictional or political boundaries of communities based on the United States Census definitions of incorporated or census designated places.

BENEFITS

- Moderates temperature on water and ground by providing shade.
- Reduces stormwater runoff through rainwater interception and uptake.
- Provides streambank erosion protection through healthy root systems.
- Reduces flooding by managing stormwater.
- Slows rate of stormwater runoff.
- Economic benefits to mitigation of air and water pollutants, impervious surfaces, etc.
- Improves property values by providing an attractive aesthetic.
- Filters pollution from the air and sequesters greenhouse gasses such as CO_2.
- Improves appearance of the community to visitors and pride among residents.
- Reduces noise pollution by intercepting and diffusing sound.
- Increases recreational opportunities, such as bird watching.
- Reduces heating or cooling costs due to temperature moderation.
- Reduces urban heat island effect.
- Reduces household energy costs.
- Provides urban forestry and other related functions.

RECOMMENDATIONS

1. Develop or review an overall community forest management strategy.
2. Work with residents to establish tree preservation goals.
3. Inventory trees in community using one of a suite of tools including GIS, resident survey, etc.
4. Establish a percentage threshold of tree cover acceptable to the community.
5. Prioritize areas where tree preservation and conservation are of high importance.
6. Prioritize areas for tree replacement.
7. Consider developing plans or ordinances to preserve trees and the tree canopy at the community level but consider the regional impacts of efforts. Consult with neighboring communities to promote regional consistency.
8. Utilize the comprehensive guidelines to assist policymakers in developing a tree protection ordinance.
9. Identify site-specific trees for protection during the development process.
10. Select healthy native trees for preservation and maintenance.
11. Protect undeveloped forests from encroaching development.
12. Utilize development or financial incentives to drive development away from sensitive forested areas and toward other areas deemed appropriate by the community.
13. Provide for re-vegetation and re-treeing of abandoned areas or untended open space.
14. Minimize disturbance of woodland areas and consider developing in a manner that disrupts woodland the least.
15. Prioritize protection of established mature woodlands or woodlands with recognized value (e.g., critical wildlife habitat, riparian forest buffers, PCAs).
16. When new areas are annexed to a community, recognize that some woodlands may be enrolled in a working forest easement program or the Ohio Forest Tax Law (OAC 1501:3-10-01 to 1501:3-10-07), both of which may require forest management activities. It is recommended that forest management activities can take place while protecting or enhancing other benefits from forests.

MODEL REGULATIONS

City Example

To supplement the comprehensive guidelines for developing a tree protection ordinance, consider an Ohio city example of a tree ordinance from the City of Olmstead Falls to further assist in exploring possible adoption of such an ordinance. A few key highlights from the city's ordinance include:

- Addresses protection of trees of a particular diameter or larger.
- Establishes tree protection zones during construction.
- Shows wooded areas upon application for subdivision and platting of land to ensure protection of trees to the extent practicable.
- Fosters the planting of new trees in development and protection of existing large wooded areas where possible

Link to ordinance: http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=qoUOGBTYdRo%3d&tabid=66

It should be noted that these are illustrative examples to assist communities wishing to consider the adoption of a tree preservation ordinance.

ADDITIONAL RESOURCES

http://www.isa-arbor.com/education/onlineResources/treeOrdinanceGuidelines.aspx

http://www.forestsforwatersheds.org/urban-watershed-forestry/

Conservation Development

PCA

Conservation Development is an approach to site design that allows property owners or developers to achieve the maximum allowable density for a development while also setting aside permanent open space and protecting critical natural features. Conservation development is an alternative to traditional development patterns where homes are generally more dispersed across a site on larger lots and with less consideration of preserving or protecting continuous open space and critical natural features. This approach is similar to a Planned Unit Development (PUD) or a Planned Residential District (PRD), but with more stringent requirements for open space protection.

The basic elements of conservation development are the designation of a large portion of the site to permanent open space (40 to 50 percent of total site is recommended), an allowance for smaller lots and street setbacks to achieve "density neutrality," and the preservation of important and sensitive natural features to the greatest extent possible. Due to the resulting cluster of homes on the portion of the site that is developed, this design approach is also sometimes referred to as Cluster Development.[34] The Ohio Lake Erie Commission's *Linking Land Use and Lake Erie: Best Local Land Use Practices* notes that communities may decide to allow a modest density bonus (approximately 10 percent) as an added incentive for conservation developments.[35]

[34] Blaine, T., Schear, P. Cluster Development Fact Sheet. Ohio State University Extension, Community Development; Web: http://ohioline.osu.edu/cd-fact/1270.html

[35] Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices.

This approach would be most applicable in areas that are most likely going to develop, but where the community desires that the potential impacts of land use conversion on water quality and other resources be minimized. This approach may not be ideal for a highly urbanized environment where a compact, mixed-use approach may be of greater environmental benefit. It is, however, an effective way to preserve open space and protect critical natural features when land outside our urban centers is converted from agriculture or open space to other uses. If communities establish standards for conservation development through their local zoning codes, they could encourage or incentivize connectivity between different conservation developments that would allow for more continuous protected open space and linked pedestrian paths or bikeways.

Currently, conservation developments can be difficult to implement due to zoning regulations in many communities that favor traditional development. While they may still be proposed and developed, conservation developments often must undergo a longer review process in order to be granted a variance if they are not specifically permitted under local zoning code. This delay may encourage property owners and developers who could have been interested in pursuing conservation development to forego it in favor of a conventional development which is perceived as less risky due to the simplified review requirements.

Local examples of Conservation Development exist in central Ohio. The Delaware County Regional Planning Commission has actively promoted Conservation Development and encouraged townships to adopt a model subdivision regulation. To date, four Delaware County townships have adopted forms of the model regulation.

As a complement to the Best Local Land Use Practices document, the Ohio Lake Erie Commission has posted model regulations for Conservation Development to the state's Balanced Growth website. These model regulations can provide guidance to jurisdictions that want to modify their local zoning codes to allow for more readily approved conservation development projects. The model regulations are designed to create a Conservation Development Zoning District and to treat conservation developments as a permitted use in those districts, thereby minimizing the review time necessary to approve these types of projects. This means that property owners in the Conservation Development Zoning District could choose to develop their property, by right, either as a conservation development or as a traditional development without being subjected to a lengthier review process. The goal of these model regulations is to make conservation development no more difficult to build than conventional development. The model regulation and example ordinances for conservation development can be found on the state's Balanced Growth Planning website at the following link: http://balancedgrowth.ohio.gov/BestLocalLandUsePractices/ToolkitModelOrdinances.aspx

BENEFITS

- Maintain rural aesthetics and character of community.
- Protect and preserve natural features.
- Shared open space creates potential recreation areas.
- Limits environmental impacts as a result of land use change.
- Careful planning could "link up" adjacent conservation developments to form larger green networks throughout jurisdiction.
- If properly designed, home values will be equal to or greater than those of comparable conventional developments.

RECOMMENDATIONS

1. Work with local residents to determine how conservation development fits in with the community's priorities.
2. Determine if, and how much, of a density bonus will be granted locally for conservation developments.
3. Educate the public about the potential environmental and economic benefits of conservation development.
4. Modify local zoning code to ensure that conservation development is no more difficult to build than conventional development (see model regulations).

MODEL REGULATIONS

1. *Model Regulations for Conservation Development, The Country Side Program*
   - Part I – Introduction http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=ADDchKpgzno%3d&tabid=66
   - Part II – Township Regulations http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=UFhHzkZ9NLs%3d&tabid=66
   - Part III – County Subdivision Regulations http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=3PREks5_qiM%3d&tabid=66
   - Part IV – Guidelines for Adaptation and Use by Municipalities http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=g%2f04jIT8Rag%3d&tabid=66
   - Part V – Appendices http://balancedgrowth.ohio.gov/BestLocalLandUsePractices/ToolkitModelOrdinances.aspx

2. *Rootstown Ordinance* http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=Ys9iFCKrQyg%3d&tabid=66
3. *Delaware Ordinance* http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=PDtycGNh0U0%3d&tabid=66

Figure 3. Traditional dispersed development versus conservation development

Source: Conservation Design for Subdivisions by Randall Arendt

Compact Development

PDA

Compact development, also referred to as Traditional Neighborhood Development or Smart Growth, encourages communities to make efficient use of land, infrastructure, and financial resources by concentrating development when possible and appropriate. Concentrating development reduces the amount of roads and impervious surfaces needed to serve an area and allows for more efficient use of other types of infrastructure, like water and sewer, as well. Concentrating development also reduces the amount of land needed to accommodate population and economic growth, allowing for greater conservation of open space and agricultural areas. Compact development does not seek to limit growth. Instead, compact development promotes accommodating growth through thoughtful development that:

- Encourages infill.
- Minimizes greenfield development.
- Encourages mixed-use development.
- Preserves open space and critical natural areas.
- Revitalizes older areas.
- Makes efficient use of transportation, land, and other infrastructure.

It is strongly recommended that jurisdictions wishing to promote compact development consider the needs of their community and engage citizens in the process early on. Doing so ensures a better compact design fit for the community, educates citizens on the benefits of compact development, and garners support from the beginning. The following information is intended to provide a general overview on the elements of compact development. The specific details of compact development regulations will vary widely depending on the unique goals and needs of each community.

DESIGN

According to the Local Government Commission Center for Livable Communities, an analogy can be drawn between the often cited real estate adage of "location, location, location" and the key compact development element of "design, design, design".[36] Because each community has its own unique character, those considering compact development regulations are encouraged to consider including design guidelines that outline preferences for parking and building design, landscaping, and signage. This is an excellent opportunity to engage members of the public further in deciding how they would like to see their community take form aesthetically moving forward with more compact development.

Density is a key element of compact development design and the right density may vary according to the community's existing character, future vision, and its citizens' own wishes. This means that compact development can work in a number of different settings, not only in the core of an urban area. Consider reading Dense by Design (http://www.morpc.org/pdf/morpc_density_brochure_CS3.pdf)—a compact guide to compact development—for more information regarding the impact of quality design on quality density.

Generally speaking, density is the number of units (dwelling, office, etc.) per acre of land. While that is a quantitative assessment of density, there is also an equally critical qualitative aspect to density: the design element. Some of our most desirable all-American towns and urban neighborhoods are composed of six or seven homes per acre, a density that can support public transportation.

[36] Compact Development for More Livable Communities. Local Government Commission. Center for Livable Communities. http://www.lgc.org/freepub/docs/community_design/focus/compact_development.pdf

Consider places in central Ohio where development is more compact like German Village, Victorian Village, Old Town Worthington, or Downtown Delaware. These local examples all share two key elements of compact development; they are relatively dense neighborhoods and they share quality, visually interesting design. While those are older established neighborhoods, compact development also applies to new development as well. Victorian Gate condominiums are a new development in the Short North district of Columbus designed to integrate into the surrounding environment. There are 160 units on 3.2 acres of land with businesses on the ground floor near a city park and a plethora of local businesses, restaurants, and employment centers not to mention ready access to alternative modes of transportation.

Privacy, another concern in denser areas, can also be accommodated in compact development if the design is carefully considered. Appropriate landscaping and carefully planned access points, like sidewalks, can all contribute to a sense of privacy even in an area where homes and businesses are closer to each other than might be the case in typical suburban development. When guidelines are developed for compact development, communities should ensure that privacy issues are addressed to enhance the attractiveness and success of the development efforts.

It is also worth noting that both the established and new areas feature not only density, but also a mix of uses (residences, workplaces, food/entertainment destinations) so residents can live, work, and play within a short walking, biking, or busing distance.

PARKING

One commonly cited compact development concern that may be raised is the issue of parking availability given the concentration of development. While compact development is conducive to alternative modes of transportation which can alleviate congestion and parking needs, it can also readily accommodate automobiles, particularly if the proper measures are taken. One such measure is shared parking. In fact, compact development can readily support shared parking due to the proximity of a mix of land uses with varying parking needs and peak parking times. Indeed, compact mixed-use, pedestrian-oriented commercial nodes are the ideal areas to utilize shared parking.[37] The shared parking concept can be utilized in traditional compact neighborhoods as well as new compact development to accommodate parking needs.

Communities may encourage development to utilize pervious pavers in the established parking areas. Using pervious pavers reduces the impervious surface area and increases rainwater infiltration while simultaneously reducing the amount of stormwater runoff that would otherwise occur. Impervious surface area is the largest cause of stormwater runoff due to development.[38] Landscaping can be incorporated into the design to increase precipitation infiltration and to enhance the attractiveness of the parking areas, but alternatives to typical concrete or asphalt can greatly increase infiltration. These pavers can take many forms including latticed brickwork, permeable concrete mix, or spaced stonework.

Parking areas should also be walkable. The generally preferred parking space to door distance a person is willing to walk ranges from about 400 to 800 feet with the maximum

[37] Capitol Region Council of Governments (CRCOG) (2006). Best Practices Manual. Shared Parking: Fact Sheet. http://www.crcog.org/publications/CommDevDocs/TCSP/Ch08_FactSheet_Parking.pdf

[38] ODNR Division of Soil and Water conservation (2006). Rainwater and Land Development Manual, Third Edition. Chapter 2: Post Construction Stormwater Management Practices. Ohio Department of Natural Resources; Web: http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx

approximately 1,200 feet.[39] Distance is only one component of walkability; creating visual cues such as marked walkways, decorative pavers, and landscaping integrated into the parking areas can assist in the safe flow of pedestrian traffic. This is a critical component of creating safe, usable shared parking in a thriving, pedestrian-friendly compact development.

The various facets of compact development work in tandem to create an overall quality community. This certainly continues to be true of shared parking. For example, the compact design and mix of uses creates circumstances that may only require parking once and using alternative modes of transportation to make trips to a number of stores, entertainment venues, or restaurants. Careful planning ensures that efforts to create a quality neighborhood can be coordinated as best as possible. Communities are encouraged to investigate whether the zoning code in place prohibits the use of alternative pavement in parking lots or sidewalks, the number of parking spaces required for each use, and whether shared parking is an alternative available to developers and businesses.

TRANSPORTATION

The ways in which we get around bear direct relation to the ways in which our communities develop. In other words, land use development and transportation are inextricably linked. According to Robert Cervo, the director of the University of California Transportation Center, "How these places are developed and designed – their densities, mixture of uses, site layout, parking provisions, and so on - sets the stage for virtually all commuting behavior." [40]

Compact development is conducive to a population density that can support alternative transit options. Coordinating transportation and land use decisions can produce communities that maximize the efficient use of both land and infrastructure. Returning to the critical design component of compact development, it is important to integrate transportation options into the design of the development and the layout of the land use. For example, by adhering to the principles of compact development such as a well defined street hierarchy, you are also designing a community that is conducive to convenient bus transit routing by promoting navigable roadways where transit can be targeted to major thoroughfares while maintaining a walkable distance to other areas.

Another function of compact development is that it encourages a mix of uses. Public transit, bicycling, and ride-sharing are particularly suited to this kind of development because they are characterized by a range of uses like residences, employment, shopping, dining, and entertainment establishments with a common origin and destination point in an accessible compact area. This provides citizens with access to a variety of land use destinations with the potential for a greater number of transportation options. More transportation options also provide better access to community amenities for a greater number of people who may or may not have the option of utilizing a personal automobile or who elect to forego personal automobile use.

[39] Capitol Region Council of Governments (CRCOG) (2006). Best Practices Manual. Shared Parking: Fact Sheet. http://www.crcog.org/publications/CommDevDocs/TCSP/Ch08_FactSheet_Parking.pdf

[40] Cervero, Robert, America's Suburban Centers (Unwin Hyman, Boston MA: 1989), pg. 18. Planning and Development Guidelines for Public Transit—COTA

ECONOMICS

As communities look to do more with less money, more efficient use of infrastructure and service dollars is imperative. Compact development may offer a number of economic benefits to communities. Research shows that compact development can save taxpayer money and improve the regional economic outlook as well.[41] Research from The Brookings Institution Center on Urban and Metropolitan Policy shows the following economic benefits are possible due in part to more compact development patterns and other principles of smart growth:

- Public infrastructure and service delivery costs can be reduced through careful planning and design such as Compact Development.
    - 11.8 percent ($110 Billion) from 25-year road building costs.
    - 6 percent ($12.6 Billion) from 25-year water and sewer costs.
    - 3.7 percent ($4 Billion) from annual operations and service delivery.
    - Reduced school construction costs.
- Regional economy can be boosted and overall economic conditions can be enhanced because compact development, particularly mixed use, creates a strong sense of "place" with attractive urban centers and dense labor markets. Efficient transportation systems are also possible under compact development conditions.
- Suburbs also benefit from vibrant development cores.

Infrastructure includes sewer lines, water lines, electrical lines, roadways, trails, sidewalks, and more. Community services range from police and fire service areas, schools and school bussing, public transportation lines, and access to community facilities like libraries and senior centers. Compact development seeks to make efficient use of the existing community investment in infrastructure and services, a financially prudent policy.

Consider the financial costs of sprawling development versus more compact development. A well known example of sprawl and the associated economic blight can be found in Cuyahoga County of northeastern Ohio, home to the City of Cleveland. Over the course of 50 years, the amount of developed land in the county nearly tripled, while population increased by only 0.3 percent. Consider this example in terms of the amount of new infrastructure and new community service area required to accommodate expansive development over a larger geographic area in the face of a minimal increase in population. Community tax revenue that might otherwise be used to maximize investment in existing community services and infrastructure is instead required for both existing infrastructure and communities services *in addition* to new infrastructure and extension of community services into outlying areas of the county. Because the population stagnated, this also means that the per capita cost of providing public services rose significantly.

BENEFITS

- Reduction of overall watershed-wide impervious surface coverage.
- Create compact, livable, and walkable communities.
- Save on infrastructure and community service costs.
- Create an environment conducive to a range of transportation options.
- Preservation of open space and agricultural land.

[41] Muro, M. and Puentes, R. (2004). Investing in a Better Future: A Review of the Fiscal and Competitive Advantages of Smarter Growth Development Patterns. The Brookings Institution Center on Urban and Metropolitan Policy.

RECOMMENDATIONS

1. Use the Balanced Growth Planning maps to assist in identifying development and redevelopment areas that would benefit from a compact development concept.
2. When updating comprehensive plans, consider incorporating elements of the Priority Area maps.
3. Consider the planning efforts of neighboring communities and the context of the compact development within a regional scope.
4. Look for ways to incorporate a mix of uses into districts that have traditionally been single-use, such as office districts and major retail uses.
5. Consider developing specific planning concepts for individual districts or neighborhoods that address land use; street hierarchy and parking; retail, office and residential markets; resource protection opportunities; and open space/recreation needs.
6. Develop a street design and parking strategy that incorporates a range of transportation options. Look for opportunities for shared parking. Ensure that adequate parking is provided for the typical condition rather than the peak. While making an effort to ensure that parking does not compromise pedestrian scale, short walking distances, and access to public transportation.
7. Encourage environments that are generally friendly to transit and pedestrians.
8. Appraise incorporating design guidelines to ensure visual interest and enhance architectural and building diversity. Develop design guidelines that enhance the vibrancy and quality of the development area. Consider historic preservation ordinances to preserve the historic nature of neighborhoods where appropriate.

MODEL REGULATIONS

Urban: Columbus TND ordinance
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=WS8bxFsp8mk%3d&tabid=66

Urban: Columbus Urban Commercial Overlay
http://assets.columbus.gov/development/planning/UrbanCommercialOverlay.pdf

Urban/Suburban: Franklin County Smart Growth Overlay
http://www.franklincountyohio.gov/commissioners/edp/planning/smartgrowth/SGOapprovedBCC8-9-11.pdf

Small town: Wisconsin ordinance
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=WS8bxFsp8mk%3d&tabid=66

Rural/village: Mantua Village ordinance
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=HmFG7Fqk9qQ%3d&tabid=66

Major retail: South Euclid/University Heights ordinance
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=X0Qfz9wgcyM%3d&tabid=66

Historic Preservation: Model ordinance
http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=FEj3Tca%2fjjU%3d&tabid=66

"Smart growth focuses growth in existing communities to avoid sprawl; and advocates compact, transit-oriented, walkable, bicycle-friendly land use, including neighborhood schools, complete streets, and mixed-use development with a range of housing choices. Its goals are to achieve a unique sense of community and place; expand the range of transportation, employment, and housing choices; equitably distribute the costs and benefits of development; preserve and enhance natural and cultural resources; and promote public health."

–Livability in Transportation Guidebook, U.S. Department of Transportation

Transfer of Development Rights

PDA PAA PCA

Transfer of Development Rights (TDR) is a voluntary, market based land conservation program that allows landowners in an area that is not suitable for development to sell their development rights to be applied to land in an area that is suitable for higher density development. This exchange would simultaneously promote the preservation of agricultural land and allow for more compact development in appropriate areas. There are many potential benefits associated with compact development patterns including reduced impervious surfaces, the efficient use of existing infrastructure, and the preservation of open space and farmland (see Page 81 Compact Development tool for more information).

A simple TDR program would set up a process and mechanism that allows landowners in areas that are prioritized for conservation, also referred to as "sending" areas, to sell the development rights to their property to landowners or developers in areas that are prioritized for development, also referred to as "receiving areas."[42] In some cases, a density bonus will be incorporated into TDR programs to provide additional incentives for participation. TDR does not replace zoning. In fact, to be successful, TDR relies on strong comprehensive planning and local zoning codes that designate "sending" and "receiving" areas.

The strengths of TDR programs are that they are market-based and voluntary. Land owners are free to decide whether or not they would like to sell the development rights to their property or retain them to potentially develop their land at some point in the future. The market-based approach is an attempt to make the land conservation process more equitable for landowners in areas that are not the most suitable for development. Despite these benefits, there are a number of challenges associated with implementing successful TDR programs. First, as mentioned earlier, strong comprehensive planning and/or zoning must already be in place to ensure the success of a TDR program. This is because it is necessary to have established "sending" and "receiving" areas in order to price adequately the development rights that are being transferred. Also, strong local planning and zoning are essential components because they provide an incentive for the purchase of additional development rights by capping the degree of density that is permitted in "receiving" areas without the purchase of those rights.

Another challenge to the local implementation of TDR programs is that they may encounter opposition from the public. This opposition could be related to a misunderstanding of the voluntary, market-based nature of TDR. It may, however, be necessary for communities to invest both time and resources in educating the public about TDR programs in order to achieve broad public support. Finally, implementing a TDR program can be difficult because it often requires additional administration beyond that of traditional planning and zoning.[43] Despite these challenges, however, a successful TDR program is a useful tool for encouraging the preservation of open space while also incentivizing more compact development.

The designation of Priority Conservation Areas (PCAs) and Priority Development Areas (PDAs) through this Balanced Growth Planning process

[42] Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices.

[43] Hanly-Forde, J., Homsy, G., Bieberknecht, K., Stone, R. Transfer of Development Rights Programs: Using the Market for Compensation and Preservation. Cornell Cooperative Extension; Web: http://government.cce.cornell.edu/doc/html/Transfer%20of%20Development%20Rights%20Programs.htm

could serve as a starting point for communities that are interested in locally implementing TDR programs. A close examination of the designated PCAs and PDAs could help communities determine their designations for "sending areas" and "receiving areas". Currently, development rights can be exchanged within a single jurisdiction. A change to Ohio law would be necessary in order to have a TDR program that crosses jurisdictional boundaries.

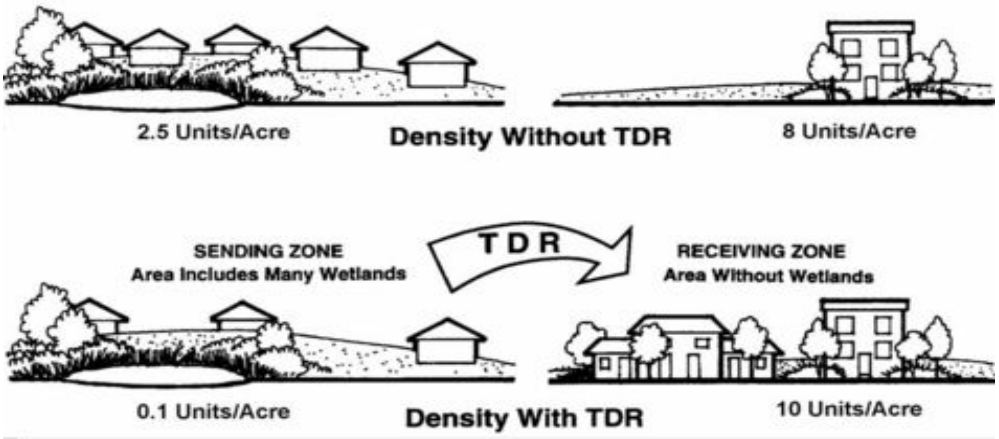
BENEFITS

- Voluntary approach to land conservation.
- Permanent conservation of critical environmental areas, areas of cultural/historic significance, and/or critical habitats.
- Preservation of agricultural land.
- Allows landowners to be compensated for the development value of their land.
- Higher density allowances in "receiving" areas allows more profitable development.

RECOMMENDATIONS

1. Use Balanced Growth Priority Areas to designate "sending" and "receiving" areas.
2. Educate the public about the potential benefits and applicability of TDR programs.
3. Promote the adoption of state legislation in support of Transfer of Development Rights.
4. Encourage strong design for compact developments that are built in "sending areas" as a result of TDR programs.

Figure 4. Illustration of Transfer of Development Rights



Source: smartgrowthvermont.org

Brownfield Redevelopment

PDA

Brownfield Redevelopment is the remediation and redevelopment of a site or group of sites that may have been contaminated by previous land uses or business activities. The U.S. EPA defines a brownfield as "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant."[44]

Prioritizing development in areas served by existing infrastructure is a goal of the Balanced Growth Planning initiative. By their nature as previously developed sites, brownfields are generally located in such areas. Many brownfields are former industrial and manufacturing sites located in or near urbanized areas. The reuse of these sites allows development to occur without the conversion of open space or agricultural lands and limits the costly expansion of sewer, water, and transportation infrastructure. Also, the redevelopment of brownfield sites provides opportunities to incorporate transportation components that can improve overall mobility in existing communities.[45]

In addition, brownfield redevelopment can help communities support job creation near their existing population base, thereby increasing local tax revenues. Based on a 2000 survey of 231 cities, the U.S. Conference of Mayors estimated that 550,000 jobs and $2.4 billion in additional annual tax revenues could be generated as the result of brownfield redevelopment in urban areas.[46]

One of the greatest obstacles to brownfield redevelopment is the perceived risk of existing or continuing contamination and questions of related liability.[47] Uncertain standards for site remediation, complicated regulations, and a lack of funding or access to funding are other issues that can prevent the revitalization and reuse of brownfield sites. Businesses and developers are hesitant to locate in or develop a site if there is a potential for them to be held liable for past activities. Therefore, reducing risk is an important component of any programs that seek to encourage or incentivize the redevelopment of brownfield sites.

> "As urban or town centers hollow out, commuting distances grow, expanding new construction takes farmland and open space, major investments in infrastructure are required to serve new areas while existing infrastructure in developed areas is underutilized and may deteriorate over time due to underfinanced and inadequate maintenance."
>
> *- Public Strategies for Cost Effective Community Brownfield Redevelopment (p.5)*

[44] U.S. EPA Brownfields and Land Revitalization; Web: http://epa.gov/brownfields/overview/glossary.htm

[45] U.S. Department of Transportation (2010). Livability in Transportation Guidebook: Planning Approaches That Promote Livability. U.S. Department of Transportation, 2010. (p. 15)

[46] McCarthy, L. (2002). The brownfield dual land-use policy challenge: reducing barriers to private redevelopment while connecting reuse to broader community goals. Land Use Policy 19, p. 287-296. Web: http://infolib.hua.edu.vn/Fulltext/ChuyenDe2009/CD292/35.pdf

[47] VanLandingham, The Stormstown Group, W., Myer, B. (2002). Public Strategies for Cost-Effective Brownfield Redevelopment. University of Louisville Center for Environmental Policy and Management; Web: http://cepm.louisville.edu/Pubs_WPapers/practiceguides/PG1.pdf

The State of Ohio has created a Brownfield Redevelopment Toolbox to guide communities through the brownfield redevelopment process. While the target audience for the Toolbox is small and rural communities, much of the information and recommendations contained within the document are also applicable to larger communities.

The Toolbox can be accessed online at the following link:

http://www.epa.state.oh.us/portals/30/SABR/docs/Ohio%20Brownfield%20Toolbox.pdf

There are a variety of programs available to assist communities with brownfield redevelopment. The following programs are all designed to facilitate the investigation, clean-up, and redevelopment of brownfield sites in Ohio:

BROWNFIELD REDEVELOPMENT PROGRAMS

Targeted Brownfield Assessments

One of the greatest challenges to brownfield redevelopment is a concern over liability if environmental contamination persists after clean-up and redevelopment. The U.S. EPA Targeted Brownfield Assessments (TBA) program was developed to help address some of the uncertainties of contamination.[48] In Ohio, Targeted Brownfield Assessments are provided at no cost to local governments through a non-competitive program funded by federal and state sources. Local governments must apply to the Ohio EPA for this program and projects are funded on a rolling basis, depending on available funds. Through the TBA program, the Ohio EPA provides Phase I Property Assessments, Phase II Property Assessments, and Asbestos Inspections. For more information, visit the Ohio EPA's website at http://www.epa.ohio.gov/derr/ACRE/sifu/fieldtechasst.aspx.

Ohio EPA Voluntary Action Program

Created in 1994, the Voluntary Action Program (VAP) was established to provide a way for companies to investigate potential contamination on a site and clean up the site in exchange for assurance from the State of Ohio that no further cleanup would be required. The VAP seeks to reduce some of the risk that was associated with brownfield redevelopment prior to its adoption by releasing the redevelopers and future owners of liability related to past contamination that has been remediated.[49]

After site cleanup, a certified professional will investigate the site to determine if the U.S. EPA standards for remediation have been met. If the site meets U.S. EPA cleanup standards, the investigator will prepare a No Further Action (NFA) letter. The Ohio EPA will then review the NFA and, after confirming that cleanup standards have been met, issue a covenant not to sue (CNS).

Clean Ohio Assistance Fund

The Clean Ohio Assistance Fund is a discretionary grant program that is designed to provide financial assistance for brownfield site assessments and remediation in designated Ohio Priority Investment Areas. Through this program, grants of up to $300,000 are awarded for environmental site assessments and grants of up to $750,000 are awarded for remediation projects. The Ohio Department of Development (ODOD) accepts, reviews, and approves applications

[48] U.S. EPA. Brownfields and Land Revitalization; Web: http://epa.gov/brownfields/grant_info/tba.htm

[49] Ohio EPA (2009). Ohio's Voluntary Action Program Fact Sheet. Ohio EPA; Web: http://www.epa.ohio.gov/portals/30/vap/docs/fact1.pdf

on an ongoing basis. As of December 2010, 176 projects had been funded (121 Phase II Assessments and 55 Cleanups) for a total of $63,561,613.[50]

Clean Ohio Revitalization Fund

The Clean Ohio Revitalization Fund is a statewide competitive program that provides financial assistance in the form of grants up to $3 million to assist communities with the purchase, cleanup, and improvement of infrastructure on designated brownfield properties. Applicants to this program must be a local government, port authority, or conservancy district. Communities that adopt a state endorsed Balanced Growth Plan will be eligible for incentives related to this program. Specifically, communities that locally adopt a Balanced Growth Plan can receive up to three points in the base calculation of the grant application if the proposed Clean Ohio Revitalization project is located in a Priority Development Area.[51]

OWDA Brownfield Loan Fund

The Ohio Water Development Authority (OWDA) Brownfield Loan Fund is a program that provides low-interest loans for the assessment and cleanup of brownfield sites. Eligible applicants for this program include both governmental agencies and private entities. The program provides loans of up to $5 million for cleanup activities or up to $500,000 for environmental assessments. The assessment and cleanup activities must meet the standards of the Ohio Voluntary Action Program (VAP) and result in economic development through the redevelopment and use of the site by a known end user.[52]

Green Columbus Fund

The Green Columbus Fund is a reimbursement grant program that uses financial incentives to encourage sustainable development and redevelopment. Private businesses and non-profits can apply for grants to either redevelop Brownfield sites or to build green in Columbus. As of February 2012, Columbus has awarded seven grants for Brownfield assessment.

BENEFITS

- Potential to lower municipal costs through efficient use of existing infrastructure.
- Reduces negative effects related to disinvestment in established communities and neighborhoods.
- Limits sprawl or development of greenfield sites.
- Creates jobs and increases tax revenues in established communities.
- Improves environmental conditions.

RECOMMENDATIONS

1. Work with landowners and developers to encourage and incentivize the redevelopment of brownfield sites.
2. Designate brownfield sites that have redevelopment potential and are located near existing infrastructure as Priority Development Areas in order to make these sites eligible for additional incentives through the state's Clean Ohio Assistance Fund

[50] State of Ohio Clean Ohio Fund; Web: http://clean.ohio.gov/BrownfieldRevitalization/

[51] Ohio Balanced Growth Program (2011). Special Incentives; Web: http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=As5V8T_ix-s%3d&tabid=56

[52] Ohio Department of Development, Urban Development Division. Brownfield Loan Program; Web: http://development.ohio.gov/Urban/BLP.htm

3. Consider area-wide impacts to prioritize potential brownfield redevelopment projects.

Exactions and Impact Fees

PAA PCA PDA

Exactions and impact fees are tools communities can use to influence local land use decisions by disincentivizing development in areas that are not served by existing infrastructure and services. Exactions allow local governments to impose conditions or financial obligations on a developer for development in areas that require an extension of infrastructure or services. To frame exactions and impact fees another way, they can be thought of as infrastructure and community service financing to account for an increased use of a public good due to expanded development. The authority to impose impact fees or exactions comes from the broad police powers granted to local governments to protect the health, safety, and welfare of its citizens and do so through protecting communities from the negative impacts of growth.[53]

Two landmark Supreme Court cases are critical to consider for communities seeking to impose exactions or impact fees on developers; namely, the Nollan v. California Coastal Commission case and the Dolan v. City of Tigard case. These cases taken together establish the necessary conditions in which exactions or impact fees are legal and appropriate. In these cases, the U.S. Supreme Court found that it was necessary to establish a nexus (a reasonable relationship) between conditions imposed on permitting development and the legitimate interests of the community and that the exaction must be roughly proportional to the impact caused by the development. [54]

There are several types of exactions that communities across the country utilize to pass part of the cost of providing public facilities and services on to the developer at the time of development rather than over time through bonds or taxes. While each exaction tool seeks to achieve similar ends, the means are slightly different. Key examples include:

- Dedication- Developer required to dedicate land or facility for public use on development site.
- Tap Fees- Developer must pay for the cost of connecting new development into existing infrastructure network.
- Fee-in-lieu- Developer pays a fee to the community to provide public facility elsewhere in lieu of providing an on-site dedication where providing such facility on site is impractical.
- Impact Fee- One-time fees are paid by the developer as a means to off-set the cost of the need for the community to provide additional public services and infrastructure necessitated by the new development.

For more specific instances of exactions in Ohio and the case law supporting the employment of such methods, please see Development Impact Fees: The Ohio Situation (http://ohioline.osu.edu/cd-fact/pdf/1558.pdf).

The appropriate method for exacting is to be determined by each community upon legal consultation and provided the necessity to

[53] Evans-Cowley, J. (2006). Development Exactions: Process and Planning Issues. Lincoln Institute of Land Policy.

[54] Freeman, B., Shigley, P., Fulton, W. (2007). Land Use: Exactions and Impact Fees. FACSNET Land Use. http://www.impactfees.com/publications%20pdf/nat9exactions.pdf

adopt such methods is based on the growth the community is experiencing or is expected to experience. Exaction and impact fees can be excellent planning tools to promote thoughtful development with efficiency and fiscal responsibility at the forefront of the community's efforts. The adoption of exactions/impact fees should be very carefully considered by communities to avoid a "taking" of the property and subsequent legal action on behalf of the land owner or developer. While the prospect of legal action exists, communities should not be deterred from exploring exaction and impact fees as viable planning tools, as the use of each has been upheld in Ohio court cases and can provide communities with a means to recover the costs of growth.

To learn more about the history of exactions and impact fees, legal considerations, examples, and other information, read Development Exactions: Process and Planning Issues (http://www.lincolninst.edu/subcenters/teaching-fiscal-dimensions-of-planning/materials/evans-cowley-planning.pdf) distributed by the Lincoln Institute of Land Policy.

BENEFITS

- Promotes thoughtful development efforts in the community.
- Provides an additional way for the community to provide and finance necessary community services and infrastructure.
- Engages the developer and the community in a discussion early on regarding the impacts of a development on the community as a whole.

RECOMMENDATIONS

1. Communities are encouraged to assess their own need to impose exactions or impact fees on development as a means to recover infrastructure and community service expenses incurred from the new development.
2. Communities are encouraged to read the documents linked in this plan for a more detailed account of the history and purpose of exactions and for case law examples of exactions and impact fees to assist in the decision to pursue such regulations.
3. Communities should consult directly with their planning staff and legal attorney or consultant to assist in drafting appropriate ordinances and regulations for exactions.

Complete Streets

PDA

Complete Streets are streets that have been designed to accommodate all users safely and comfortably. Complete streets consider the needs of motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders, regardless of age and physical ability.[55]

The concept of complete streets has been gaining acceptance and popularity among a variety of different groups including planners, public health professionals, and advocates for the aging. This is because traditional transportation planning, with its primary focus on accommodating the automobile, has often

[55] Mid-Ohio Regional Planning Commission (MORPC) (2010). Complete Streets Policy; Web: http://www.morpc.org/trans/CompleteStreets_MORPC_CS_PolicyFINAL2010-03-31.pdf

failed to consider the needs and safety of other users of the transportation system. The goal of transportation planning and engineering for many years was to move as much motorized traffic as quickly as possible.[56] According to the U.S. Department of Transportation's *Livability in Transportation Guidebook,* this focus has resulted in the development of "one of the world's largest and best highway networks. However, we have not yet put the same efforts into completing a system that works as well for walking, wheeling, or taking transit in most communities."[57]

Complete streets is not a single tool, but a collection of tools and design elements that can be applied to achieve the goal of making our streets safer and more comfortable for all users. Complete streets can be achieved through the inclusion of a variety of design elements including sidewalks, curb extensions, bike lanes or paved shoulders, designated lanes for public transit, traffic calming devices, and improved signage. A good complete streets policy will be flexible, allowing the elements incorporated to comply with the policy standards to vary from location to location. Different types of roads will call for different treatments. The National Complete Streets Coalition (http://www.completestreets.org/) is a strong advocate for complete streets policies and a great resource for communities that are interested in applying this tool locally. The following is a sampling of potential treatments that can be incorporated, depending on context, to improve the functionality of our streets for all users. For more information, visit the National Complete Streets Coalition's *Resources* page on their website at http://www.completestreets.org/complete-streets-fundamentals/resources/.

COMPLETE STREETS TREATMENTS

Sidewalks

Sidewalks improve mobility and safety for pedestrians by providing a place for them to walk that is separated from automobile traffic.[58] There are a number of design elements that can be considered to improve the functionality of sidewalks for all users. For example, wider sidewalks with planted buffer strips provide greater safety and mobility by protecting pedestrians from street traffic and allowing space for wheelchairs or multiple pedestrians to travel. MORPC's Complete Streets Policy recommends a minimum sidewalk width of five feet in order to accommodate two pedestrians walking side-by-side. The addition of street trees to the planted buffer strips can make walking a more pleasurable experience by providing shade and improving the aesthetics of the environment.

> "While nearly four-fifths of Federal transportation funding goes to highway projects, almost 85 percent of people and jobs are in metropolitan areas, which offer the potential for significant improvements in multimodal travel choices."
>
> - *FHWA, Livability in Transportation Guide (p.1)*

[56] Smith, R., Reed, S., Baker, S. (2010)."Street Design: Part 1—Complete Streets." Federal Highway Administration. *Public Roads, Vol. 74 No. 1.* Web: http://www.fhwa.dot.gov/publications/publicroads/10julaug/03.cfm

[57] U.S. Department of Transportation (2010). Livability in Transportation Guidebook: Planning Approaches That Promote Livability (p. 1).

[58] Axelson, P., Chesney, D., Galvan, D., Kirschbaum, J., Longmuir, P., Lyons, C., Wong, K. (1999). Designing Sidewalks and Trails for Access. Beneficial Designs, Inc.; Web: http://safety.fhwa.dot.gov/ped_bike/docs/ada.pdf

Bike Lanes

Bicycling is once again gaining acceptance as a viable mode of transportation. Although bicyclists are allowed to use the full lane on most roads, except for those with limited access like freeways, providing dedicated space for bicyclists can increase the safety and comfort of riders. Bicycle lanes and paved shoulders provide space for people to ride their bikes along existing roads without riding in the same lane as automobile traffic. According to the National Complete Streets Coalition, "for typical U.S. cities with populations over 250,000, each additional mile of bike lanes per square mile is associated with a roughly one percent increase in share of workers commuting by bicycle."[59] This shift in transportation mode share can help reduce congestion and emissions in our communities by reducing the number of cars on the roads.

Traffic Calming

Traffic calming devices are applied to streets to encourage drivers to slow down and be more aware of their surroundings. Traffic calming can be achieved in a variety of ways including the installation of traffic circles (or roundabouts), street trees, curb extensions, speed bumps, raised medians, and rumble strips.[60] Traffic calming devices discourage non-local traffic and slow vehicles down, resulting in a safer and more pleasant environment for pedestrians and cyclists. Traffic calming can also help improve retail environments and support local economic development.

Complete streets is a flexible tool that can be applied to improve mobility within all types of communities, from urban to suburban to rural. Some of the other tools that have been described in this toolbox will be more successful if complete streets treatments are included with implementation. For example, complete streets will provide multiple transportation options to people living in compact developments. Also, the increased density and mix of uses promoted in the compact development tool will encourage residents and visitors to walk or bike between destinations or take public transit if those options are available, accessible, and safe. The benefits of promoting complete streets in compact development include increased transportation options, public health benefits through promotion of active transportation, improved safety for pedestrians and cyclists, a reduced overall need for parking spaces, and the potential to decrease congestion by providing safe alternative forms of transportation.

In March 2010, MORPC adopted a Complete Streets policy for the Columbus Metropolitan Planning Organization (MPO) boundaries, which means that all project sponsors receiving MORPC-attributable transportation funding will need to comply with the policy when designing and building their roadway projects. The Columbus MPO includes Franklin and Delaware Counties, Etna Township and the City of Pataskala in Licking County, and Bloom and Violet Townships in Fairfield County. MORPC is currently in the process of developing a "Regional Complete Streets Toolkit" that will contain model policies, engineering, educational and enforcement strategies, and information on other resources to assist local communities in the development and implementation of their own

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[59] National Complete Streets Coalition; Web: http://www.completestreets.org/complete-streets-fundamentals/factsheets/change-travel-patterns/

[60] Project for Public Spaces. Traffic Calming 101; Web: http://www.pps.org/articles/livememtraffic/

complete streets policies.[61] When it becomes available, this Toolkit will be shared with the Balanced Growth Planning communities.

For the full adopted Complete Streets policy and an accompanying checklist, go to

http://www.morpc.org/transportation/complete_streets/completeStreets.asp.

BENEFITS

- Access for all users, regardless of age and physical ability
- Considers the safety and comfort of users
- Provides choice with regards to transportation mode
- Reduction in Vehicle Miles Traveled (VMT)
- Provides opportunities for physical activity

RECOMMENDATIONS

The following recommendations are included in MORPC's Complete Streets Policy which was approved by the MORPC Board on March 12, 2010 through the passing of Resolution T-6-10:

1. All users should be considered during the entire life cycle of a project, including planning, design, construction, operations, and maintenance.
2. Street furniture, such as bike racks or benches, should be considered as part of all projects as long as they do not impede any user.
3. When designing a facility that includes or crosses an existing or future transit route, ensure that the appropriate pedestrian and wheelchair access is provided to and from the transit stops.
4. Traffic-calming elements including, but not limited to, landscaping, street trees, and narrowing of lanes, should be considered where safe and appropriate.
5. Project sponsors should consider including street trees and landscape components, with careful analysis of tree, site, and design considerations.
6. Special consideration should be given to future planned facilities or services.
7. Each project design should be coordinated with appropriate access management strategies. Access management strategies should consider the placement of sidewalks and ramps to eliminate sight distance issues.
8. Although this policy focuses on engineering projects, the project sponsor should provide education, encouragement, and enforcement strategies during or after the project. The education component should include government officials, developers, and the public. A toolkit designed by MORPC staff will provide best practices, ideas, and resources to help with these efforts (see Implementation section).
9. While this policy focuses on transportation, local governments should review their land use and zoning policies to provide for mixed land use developments and projects that provide direct nonvehicular connections within a given development.
10. Each local community should regularly update its project design standards and procedures and train its staff to adhere to them.
11. Local governments are encouraged to adopt their own Complete Streets policies, consistent with this regional policy and federal and state design standards. State

[61] Mid-Ohio Regional Planning Commission (MORPC) (2010). Complete Streets Policy; Web: http://www.morpc.org/trans/CompleteStreets_MORPC_CS_PolicyFINAL2010-03-31.pdf

governments should work with the local Metropolitan Planning Organizations to ensure consistency in polices at the state, regional and local level.

REQUIREMENTS

The following requirements are included in MORPC's Complete Streets Policy which was approved by the MORPC Board on March 12, 2010 through the passing of Resolution T-6-10. These requirements only apply directly to communities within MORPC's MPO planning area. However, they may be helpful for communities outside of the MPO that wish to locally implement complete streets policies.

1. Each project shall use the most appropriate design standards and procedures. For projects using MORPC attributable federal funding, it will be necessary to meet or exceed standards and procedures acceptable to the Ohio and U.S. Departments of Transportation, such as the Ohio Department of Transportation's Project Development Process and Location & Design Manual.
2. Designs shall include accommodation of all users and be sensitive to the context of the project setting. It is important to note that Complete Streets may look different for every project and road type. For example, wide lanes or paved shoulders may be sufficient in a rural area, whereas sidewalks and/or bike lanes are needed in an urban setting. Also, when re-striping projects are considered, where the right-of-way will not change, options such as bike lanes, sharrows, and pedestrian crosswalks could still be implemented. More information and examples will be provided as part of the checklist and toolkit.
3. A systems approach shall be used in developing roadway projects, especially to ensure coordination with nearby jurisdictions, projects, and plans irrespective of the project sponsor.
4. If there is another project planned or in development near this project the two should be coordinated to ensure consistency in the facilities serving the corridor.
5. Logical termini should be chosen to include connections through "pinch points," such as overpasses, railroad crossings, and bridges. Logical termini should not be chosen so that the project ends before such a "pinch point" unless there is a compelling reason to do so.
6. If the project serves a destination point, such as a school, recreational facility, shopping center, hospital, or office complex, the project shall provide the opportunity for the destination to have access to the project's pedestrian and bicycle facilities.
7. Every project shall involve the local transit agency in the design process to ensure that sufficient accommodation of transit vehicles and access to transit facilities is provided. The project sponsor shall provide the local transit agency during Step 1 of the Project
8. Public transit facilities shall be designed with the goals of Complete Streets in mind, by including sidewalks, bicycle connections, or secure bicycle parking, among others.
9. Every project shall provide the opportunity for utility/telecommunications infrastructure to be appropriately accommodated to allow for existing and future growth. Efficient use of right-of-way during construction and maintenance should be considered to improve access to utility systems, including future broadband networks. This policy is not intended to create new rights for utilities outside those provided by existing law and contract.

10. Every project shall ensure that the provision of accommodations for one mode does not prevent safe use by another mode (e.g., a bus shelter should not block the clear walking zone on the sidewalk.

Economic Development Programs

PDA

There are several economic development programs and tools that could assist with implementation of the Balanced Growth Plan. Some of these programs, like Joint Economic Development Districts and Cooperative Economic Development Agreements, encourage collaboration between jurisdictions to achieve shared economic development goals. Other tools, like Tax Increment Financing, are generally implemented within a single community to target economic development investments to a specified area. All of the programs described in this section could be used to promote (re)development within designated PDAs and some of them may also be able to simultaneously promote the conservation of land in PCAs and PAAs.

The following is not a comprehensive listing of all available economic development programs and tools within the Big Walnut Watershed. For more information on potential cross-jurisdictional approaches to implementing the economic development and conservation goals of Balanced Growth Planning, see the May 2010 report by Jill K. Clark and Peggy Kirk Hall of OSU Extension titled, "*Opportunity across Political Boundaries: Balanced Growth Watershed Plans and Cross-Jurisdictional Agreements.*"

Link to report:
http://cffpi.osu.edu/docs/Report051210.pdf

ECONOMIC DEVELOPMENT PROGRAMS

Cooperative Economic Development Agreements (CEDA)

One or more townships and one or more municipalities form an agreement to support economic development in a specified area. The agreement addresses service delivery and payment for services and designates a period of time during which annexation of the specified area cannot occur.

Joint Economic Development District (JEDD)

One or more townships and one or more municipalities within the same or adjacent counties form a district to facilitate economic development within the specified area. Within a JEDD, it is possible to impose a special income tax to produce additional revenue for infrastructure improvements within the district. The special income tax rate must be no higher than the highest income tax of any of the participating local governments. In many cases, residents from affected communities must vote in support of establishing the district, making it more challenging to establish a JEDD than a CEDA.

Community Reinvestment Area (CRA)

Established to provide tax incentives for investing in real property improvements or new construction in areas where investment in housing has been discouraged. A housing survey must be completed by the city, village, or county that seeks to establish a CRA. The survey is then submitted to the Ohio Department of Development to confirm that the identified area is one in which investment has been discouraged. Once established, the CRA allows property owners in the designated area to receive real property tax exemptions on qualifying improvements and new construction.

Tax Increment Financing (TIF)

An economic development mechanism that allows communities to fund local infrastructure improvements by locking the taxable value of real property when the TIF is established. Any payments that are made on increased assessed value of the real property within the TIF is directed to a separate fund that is used to fund infrastructure improvements within the TIF.

Special Improvement Districts (SID)

A single municipality or township or contiguous municipalities or townships develop and implement plans that benefit the district. These districts are formed to support the economic development efforts of neighborhood and downtown organizations. Section 1710 of the Ohio Revised Code states that a SID can be formed if the owners of at least 60 percent of the front footage of all the property within the district sign a petition to form the SID.

BENEFITS

- Allows jurisdictions to collaborate to achieve shared economic development goals.
- Potential funding source for implementing compact, mixed-use development.
- Could support Balanced Growth efforts by directing development to locally designated PDAs.

RECOMMENDATIONS

1. Consider the utilization of economic development programs that promote shared economic development benefits.
2. Consider the utilization of economic development programs that support the direction of development incentives toward locations that can maximize the efficient use of existing infrastructure.
3. Consider potential impacts to water quality and locations of locally designated PCAs when developing economic development partnerships and programs in the future

Farmland Preservation

PAA

Farmland preservation, or the act of retaining historically farmed land in production, is a key implementation tool for Priority Agricultural Areas designated by the BWPP through the Big Walnut Watershed Balanced Growth Plan. The Ohio EPA identified the conversion of agricultural and forested land to residential, commercial, and industrial uses as one of the most serious threats to the biological integrity of the Big Walnut. [62]

In addition to reducing major water quality pollution threats, conserving soil, and replenishing groundwater supply in the watershed, retaining agricultural land provides an economic development tool for surrounding residents. Land preservation scholar Lori Lynch reports that areas with preservation policies don't suffer from a shift from high-wage to low-wage jobs and communities with less farmland loss generally have higher employment rates and higher incomes than those that lose their surrounding farmland.[63] At the same time, agricultural land often produces more to a local jurisdiction in tax revenue than it costs in the farm's use of services.

Preserving agricultural land can reduce the cost of public services in relation to residential or commercial development to local municipalities. Second, the preservation of agricultural lands near urban areas provides an opportunity for farmers to contribute to the local food supply in the form of roadside stands, community-supported agriculture (CSAs), farm markets, and other direct farm sales (the central Ohio area consumes approximately $7.5 billion per year on food). Third, preserving farmland indicates to local farmers that the surrounding community is committed to the agricultural industry, which has positive effects upon farmers' technological adoption, new skills development, debt reduction, and reinvestment in the farm for continuing, long-term production. Last, keeping land in farming helps to preserve the aesthetic of a "rural way of life," providing scenic views and wildlife habitat, which, according to Lori Lynch, are assets that people are willing to pay more for, with the highest values being in places where agricultural land is being lost most rapidly. These benefits can also attract tourists and new residents.

There are many farmland preservation methods that can support the partnership's efforts to target locally designated areas for continued, expanded and/or intensified agricultural activities due to their historical, cultural, natural or human-created traits which make them conducive to agriculture and related activities. Ideally, the following farmland preservation tools could be utilized across the watershed, particularly in Priority Agricultural Areas, to ensure the preservation of farmland and/or continued agricultural land use where communities have deemed appropriate.

[62] Ohio EPA (20102005). Total Maximum Daily Loads for the Big Walnut Creek Watershed.
[63] Lynch, Lori (2007) Chapter 2: "Economic Benefits of Farmland Preservation" In The Economic Benefits of Land Conservation (pp. 13-23). The Trust for Public Land

Table 16. Farmland Preservation Programs

Farmland Preservation Tool	Description
Current Agricultural Use Valuation (CAUV)	CAUV is a financial tool that landowners with tracts of commercial farmland can utilize to assist in the continued use of their land for agriculture. This county auditor administered program allows enrolled commercial agricultural land to be assessed for taxes based on the current agricultural land use rather than how the land could be used in the future (i.e. actual agricultural value versus true market value). To be eligible, the agricultural land must have been used for commercial agriculture for the 3 years prior to application date and must either amount to 10+ acres or produce an average gross income of $2,500 dollars per year. To find out more, contact your county auditor. A list of county auditors can be found here http://www.caao.org/DIRECTORY/
Agricultural Districts	Enrolling land in an agricultural district ensures some protection against nuisance lawsuits in an effort to provide some safe-guard against development pressure for agricultural land. Agricultural Districts are County Auditor administered. The requirements to enroll in an agricultural district are the same as those specified to enroll in CAUV. Being enrolled in an agricultural district also allows cost assessment associated with the extension of utility lines to be deferred until the land is no longer enrolled in an agricultural district or land use is changed. For the Agricultural District definition as defined in Ohio State Code, visit http://codes.ohio.gov/orc/929 For additional information about Agricultural Districts, visit http://www.agri.ohio.gov/divs/FarmLand/Farm_AGDist.aspx
Agricultural Security Areas	Enrolling land in an Agricultural Security Areas (ASA) creates an area where agriculture is both encouraged and protected. A single entity or group of entities with 500 or more acres of contiguous farmland can apply to the county and board of trustees to enroll their qualifying land into an ASA for a 10-year period. These governing bodies and the applicants both agree to promote agriculture use of the enrolled land versus other land uses with a few exceptions permitted for single family residences. For an informational brochure, visit http://www.agri.ohio.gov/farmland/docs/Farm_ASA_Brochure.pdf
Agricultural Easements- Clean Ohio Agricultural Easement Purchase Program	Agricultural easements put deed restrictions on land that landowners voluntarily agree to in an effort to guard the land from development and to ensure continued agriculture use. The landowner maintains ownership of the land. Easements are legally binding and usually permanent arrangements. The Clean Ohio Agricultural Easement Purchase Program (AEPP) is administered by the Ohio Department of Agriculture (ODA). The ODA may purchase qualifying land to place in a permanent agricultural easement

	for the amount difference between market value and the agricultural value of the land. This tool is available to farms with 40+ acres of land where farmers are engaging in best management practices. For more information, visit http://www.agri.ohio.gov/farmland/Farm_AEPP.aspx
Estate Planning	To ensure that bequeathed farmland is smoothly transferred to the heirs, solid estate planning is required. The fate of the agricultural use of the land in the future depends on a number of factors including financial security, future agricultural planning, and transfer of agricultural assets. For more information on estate planning, visit http://ohioline.osu.edu/estate/
Farm and Ranch Lands Protection Program	The Farm and Ranch Lands Protection Program (FRPP) is a Natural Resources Conservation Service (NRCS) administered program to which proprietors of a working farm may apply working in conjunction with state and local government (or a land trust). The applying entities must secure at least 50% funding of the easement value of land in a fair market. The NRCS can match up to 50% of the funding to reimburse for the purchase of the easement if the land qualifies. In exchange, agricultural conservation easement is placed on the land. For more information visit: http://www.agri.ohio.gov/farmland/docs/FRPP_Information_20100709.pdf

Sources:
Ohio Agricultural Landowners Guide to Conservation and Sustainability. American Farmland Trust. 2006.
Ohio Department of Agriculture. http://www.agri.ohio.gov/ Retrieved September 2011.

BENEFITS

- Provides land owners and communities with a tool to preserve agricultural heritage and land use.
- Agricultural character of communities can be preserved for future generations.
- May provide compensation to the land owner in exchange for an agreement to keep land in agricultural use for a period of time.

RECOMMENDATIONS

1. Consider utilizing one of the farmland preservation programs as a tool to preserve agricultural heritage where appropriate.
2. Target the use of the farmland preservation programs in areas designated as Priority Agricultural Areas identified in the Big Walnut Balanced Growth Plan maps.
3. Consult with community officials, the Ohio Department of Agriculture, and local Soil and Water Conservation Districts to determine whether one of the tools may be a viable option.

Agricultural Conservation Programs

PAA

It is critical that agriculture plays a role in the conservation effort to achieve balanced growth in the Big Walnut watershed. As opposed to farmland preservation (keeping farmland in production), agricultural conservation programs seek to reduce the negative environmental effects of production (e.g. sediment loss). This often involves setting historically farmed land aside for the purposes of improving natural wildlife habitat and creating buffers between actively productive land and adjacent water bodies. According to water quality assessments by the Ohio EPA, agriculture is a major source of nutrient and sediment deposits into the Big Walnut.[64] Fortunately a number of conservation programs exist for farmers to help them reduce the transport of nutrient and sediment loads from their farm fields into surrounding water bodies. These programs, generally funded through the U.S. Farm Bill, offer financial incentives for the conservation of historically farmed land.

For example, one federally funded, yet locally tailored conservation program, the Scioto River Conservation Reserve Enhancement Program (CREP) seeks to enroll up to 70,000 acres of "vulnerable riparian corridor and marginal farmlands into 15-year conservation set-asides."[65] The Big Walnut watershed is included in the Scioto River CREP area.

There are a variety of federal cost share and dollar incentives for land set asides, and structural and management conservation programs that farmers in the Big Walnut watershed are potentially eligible for. Table 17 features a variety of such programs.

These on-farm conservation programs are tools that the agricultural community should consider taking advantage of in an effort to enhance the physical environment and to further serve as good stewards of the land recognizing the value of the natural resources in the Walnut Watershed. The main thrust of many of these programs is a coordinated effort to preserve vulnerable and valuable natural resources, acknowledging that agricultural production and environmental health are not mutually exclusive. The two can work together if carefully balanced and both agricultural productivity and environmental sensitivity factors are carefully weighed and considered when making land use decisions. The Ohio Agricultural Landowners Guide to Conservation and Sustainability produced by the American Farmland Trust provides a detailed description of many of these programs and can be accessed at: http://www.farmlandinfo.org/documents/31106/Final_AFT_OH_Guide.pdf

[64] Ohio EPA (20102005). Total Maximum Daily Loads for the Big Walnut Creek Watershed.
[65] Ohio EPA (2010). Restoring and Protecting the Olentangy River.

Table 17. Selection of Major USDA Conservation Programs

Program	Description
Conservation Reserve Program (CRP)	The Conservation Reserve Program (CRP) provides annual rental payments and cost-share assistance to landowners in an effort to establish 10 to 15 year conservation covers on eligible farmland. CRP seeks to assist farmers in protecting environmentally sensitive land and surface water quality through the establishment of natural buffers, wetlands, and/or filter strips. Annual payments are valued based upon the agricultural rental value of the land, and provides cost-share assistance for up to 50% of the costs in establishing approved conservation practices. This program is administered by the Farm Services Agency (FSA). For more information contact your local FSA office or view the source below. Source: http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp
Conservation Reserve Enhancement Program (CREP)	The Conservation Reserve Enhancement Program (CREP) stems from the CRP program described above. It is a federal-state partnership. CREP is based upon similar goals as CRP in terms of conservation covers and 10 to 15 year contracts with landowners. CREP differs from CRP in that it focuses on conserving environmentally sensitive agricultural land near streams, and provides generally higher rates and incentive payments. Land cannot be simultaneously enrolled in CRP and CREP, therefore landowners with an existing or pending CRP contract are not eligible for the CREP until the CRP contract expires. At present there is a CREP established specifically for the Scioto River watershed, which includes the Big Walnut watershed. Source: http://www.mda.state.md.us/pdf/crepfaq1.pdf http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep
Conservation Stewardship Program (CSP)	The Conservation Stewardship Program (CSP) seeks to help landowners conserve land based upon conservation performance. It is based upon the notion of “the higher the performance, the higher the payment.” It provides two types of payments: 1) an annual payment for installing and adopting additional conservation practices, and improving, maintaining, and managing existing practices; and, 2) a supplemental payment for the adoption of resource-conserving crop rotations. This program is administered by the Natural Resource Conservation Service (NRCS). Source: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_008143.pdf

Debt for Nature (DFN)	Debt for Nature (DFN), also known as the Debt Cancellation Conservation Contract Program, serves as a debt management tool while allowing for farmers to set aside land for conservation purposes. In exchange for conservation contracts of 10, 30, or 50 years, farmers can receive cancelation of a portion of their FSA indebtedness. To qualify a landowner must have an FSA farm loan in place. Highly erodible lands or those within a 100-year floodplain, wetlands, areas with important wildlife, cultural or aquifer recharge significance, and land adjacent to existing conservation areas are eligible for enrollment. The Farm Services Agency (FSA) administers this program. Source: http://www.fsa.usda.gov/Internet/FSA_File/debtfornature07.pdf
Mississippi River Basin Healthy Watersheds Initiative (MRBI)	As a part of the greater Mississippi River Basin, farmers within the Big Walnut watershed are potentially eligible to enroll in a variety of conservation programs tied to the Mississippi River Basin Healthy Watersheds Initiative (MRBI). These programs include support for Cooperative Conservation Partnership Initiative (CCPI) projects, the Wetland Reserve Enhancement Program (WREP), and Conservation Innovation Grants (CIG). This program is administered by the Natural Resource Conservation Service (NRCS). For more information contact your local NRCS office or view the source below. Source: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcsdev11_023951.pdf
Environmental Quality Incentives Program (EQIP)	This NRCS-based program provides financial and technical support to assist farmers in planning and implementing conservation practices on their property. EQIP contacts provide financial assistance for up to 10 years. For more information contact your local NRCS office or view the source below. Source: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip

Local Soil and Water Conservation Districts possess a wealth of knowledge in regard to current conservation programs. A list of contacts for the Soil and Water Conservation Districts serving portions of the Big Walnut watershed is below.

Soil and Water Conservation District (SWCD) Contacts

Delaware Soil and Water Conservation District 557 Sunbury Rd Delaware, Ohio 43015	**Phone:** 740-368-1921 **Fax:** 740-369-8321 **Website:** http://www.delawareswcd.org/ **Email:** dswcd@delawareswcd.org
Franklin Soil and Water Conservation District 1328 Dublin Road, Suite #101 Columbus, Ohio 43215	**Phone:** 614-486-9613 **Fax:** 614-486-9614 **Website:** http://www.franklinswcd.org/ **Email:** http://www.franklinswcd.org/contact-us/
Licking Soil and Water Conservation District 771 East Main Street, Suite 100 Newark, Ohio 43055	**Phone:** 740-670-5330 **Fax:** 740-670-5338 **Website:** http://www.lickingswcd.com
Morrow Soil and Water Conservation District 871 West Marion Road, Suite 203 Mt. Gilead, Ohio 43338	**Phone:** 419-946-7923, 419-946-3755, 419-946-2780 **Fax:** 419-946-1950 **Website:** http://www.dnr.state.oh.us/morrowcounty/tabid/21124/default.aspx

BENEFITS

- Provides agricultural land owners with opportunities to be stewards of the land by minimizing impacts on the environment and water quality.
- Educates land owners on methods to be proactive with regard to the environment while recognizing the value of the agricultural way of life.
- Financial incentives and technical assistance may be available to land owners

RECOMMENDATIONS

1. Consider utilizing one or more of the Agricultural Conservation Programs as a tool to reduce the impact of agriculture on the environment and water quality
2. Target the use of these tools in areas where land is used for agriculture and sensitive or significant natural features and waterways coexist in order to mitigate the impact of agriculture on the natural feature.
3. Work with the local Soil and Water Conservation District to investigate and implement best management practices to farm in an environmentally friendly manner.

Sewer Planning and the State 208 Water Quality Management Plan

PDA

The federal Clean Water Act requires each state to develop comprehensive water quality management plans. The first step in the process is basin planning (referred to as "section 303" planning) whereby a framework is developed to study water quality in an entire watershed. Ohio EPA oversees the State Water Quality Management (WQM) Plan. The State WQM Plan is a requirement of Section 303 of the Clean Water Act (CWA) and must include nine (9) discrete elements:

1. Total maximum daily loads (TMDLs)
2. Effluent limits
3. Municipal and industrial waste treatment
4. Nonpoint source management and control
5. Management agencies
6. Implementation measures
7. Dredge and fill program
8. Basin plans
9. Ground water

Many of the elements required by Section 303 of the Clean Water Act overlap with those of Section 208 of the Clean Water Act (elements 3-9 above). The term "208 plan" is short for Areawide Waste Treatment Management Plan, a plan prepared pursuant to Section 208 of the Clean Water Act. Other titles used interchangeably with "208 plan" are "208 water quality management plan" and "areawide water quality management plan." The 208 plans are prepared by the State of Ohio or one of six areawide planning agencies. Each of these plans must involve an inclusive planning process that incorporates the views and concerns of all affected parties in the area. By law, the U.S. EPA and Ohio EPA (OEPA) cannot provide funding for, or issue certain discharge permits to, waste treatment facilities that are not built or operated by a designated management agency or not built or operated in accordance with the areawide (section 208) plan.

Since the presence of sanitary sewer infrastructure plays a prominent role as one of the criteria for identifying Priority Development Areas it makes sense to utilize sewer planning as a tool to direct development towards PDAs and away from PCAs and PAAs. Sanitary sewer infrastructure is closely associated with where,

when, and how development occurs. Its presence generally insures additional development in an area and its absence limits the intensity of development that can be built, though plans for development can and often do drive the expansion of sewer service. It is for this reason that the process of updating the State's 208 can be a powerful tool not only for directing development to PDAs but adding layers of protection for PCAs and PAAs.

Ohio EPA is responsible for developing and maintaining the 208 plan for the central Ohio region which includes the Walnut Watershed. A community working with their local waste water utility can identify the boundaries of where sewer service will be available and where it will not be extended to. Since Ohio EPA and the U.S. EPA cannot issue permits for or help fund projects that are in conflict with the 208 plan a community can use the plan to promote PDAs and protect PCAs and PAAs.

BENEFITS

- Prioritize allocation of scarce infrastructure funds to projects that support PDAs.
- Help protect PCAs and PAAs by limiting sewer availability in those areas.
- Local control of sewer planning.

RECOMMENDATIONS

1. Work with local sewer Management Agency to complete a 201 Facility Plan update following Ohio EPAs Facility Planning guidelines: http://www.epa.ohio.gov/dsw/mgmtplans/208FacilityPlanningGuidelines.aspx
2. Identify areas sewer service will be available.
3. Identify areas sewer service will not be available.
4. Submit updated plan to Ohio EPA to be included in the State's 208 plan.

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GLOSSARY OF KEY TERMS

Balanced Growth - A voluntary, incentive based strategy to protect and restore [Ohio's watersheds] to assure long-term economic competitiveness, ecological health, and quality of life.

Buffer - A zone of a specified distance around geographic features. In GIS (see below), buffers can be used in order to include the land surrounding a point (i.e. airport) or line (i.e. highway) in the analysis.

GIS (Geographic Information System) - A system that captures, stores, analyzes, manages, and presents data that are linked to location. GIS software was used to map and analyze data related to the selected criteria in order to highlight the initial Priority Areas (PAA, PCA and PDA) on the preliminary planning maps.

Priority Agricultural Area (PAA) - A locally designated area targeted for continued, expanded and/or intensified agricultural activities due to historical, cultural, natural or human-created traits which make it conducive to agriculture and related activities.

Priority Conservation Area (PCA) - An area designated by local jurisdictions for protection, conservation, or restoration because of its ecological, cultural, recreational, or historical value and for the significant role these areas play in maintaining the integrity of the watershed.

Priority Development Area (PDA) - A locally designated area defined by its potential for development or redevelopment in accordance with the area's infrastructure, development, or plan and the area's ability to accommodate development in a manner consistent with our goal.

Watershed - An area of land that drains into a common waterway. These waterways might be streams, lakes, wetlands, or the ocean.