


2012

OLENTANGY 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 Olentangy 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

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Ohio Water Resources Council

MORPC STAFF

Chester R. Jourdan, Jr.
Executive Director

Jerry Tinianow
Director of Center for Energy and the Environment

Erin Grushon
Associate Planner and Project Manager

David Rutter
Watershed Coordinator

Annie McCabe
GIS Specialist

Andy Taylor
Planning Coordinator

Brandi Whetstone
Environmental Program Manager

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Olentangy Community Representatives

David Hull, City of Columbus

David Efland, City of Delaware

Patrik Bowman, City of Grandview Heights

Jay Shoup, City of Marion

Dave Betz, City of Powell

Matthew Shad, City of Upper Arlington

Lynda Bitar, City of Worthington

Jim Nelson, Village of Ashley

Mary Jo Cusack, Village of Riverlea

James Andres, Brown Township

Dan Barker, Canaan Township

Don Lee, Cardington Township

Rex Strine, Claridon Township

John Coneglio, Clinton Township

Barbara Martin, Delaware Township

David Anderson, Liberty Township

Dick Rasmussen, Marion Township

Hal Clase, Marlboro Township

Beth Hugh, Orange Township

Jim Hatten, Oxford Township

Chet Chaney, Perry Township

John Peacock, Pleasant Township

Warren Zachman, Richland Township

Tom Kayati, Sharon Township

Doug Price, Troy Township

Chuck Groll, Waldo Township

Bruce Baker, Village of Waldo

Olentangy Stakeholders

Tim Hansley, Delaware County

Scott Sanders, Delaware County Regional Planning Commission

Jim Schimmer, Franklin County Economic Development & Planning

R. Lee Brown, Franklin County Economic Development & Planning

Dan Stewart, Marion County Regional Planning Commission

Pat Davies, Morrow County Planning & Development

Kevin Wheeler, City of Columbus

John Carter, City of Columbus

Mark Wilson, Pleasant Township

P. Kent Tudor, Del-Co Water Company

Ed Miller, Delaware County SWCD

Jennifer Fish, Franklin County SWCD

Carrie Morrow, Franklin County Metro Parks

Amy Dutt, FLOW

Natalie Pirvu, ODNR Scenic Rivers

Matt Trokan, Ohio Sierra Club

Laura Shinn, Ohio State University

Bill Mitsch, Ohio State University

Brian McCombs, Upper Olentangy Watershed Coordinator

Barb Lubberger, Ohio EPA

Dave White, Ohio EPA

Karen Rainey, League of Women Voters of Delaware County

Jo Ann Radwin-Zimmerman, League of Women Voters of Marion County

Jim Hilz, BIA of Central Ohio

Malcolm Porter, BIA of Central Ohio

Robert Yoakam, Rockford Homes

J. Anthony Eyerman, Floyd Browne Group

Jack Brickner, Planned Communities, Inc.

Andrew Overbeck, MSI Design

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GLOSSARY OF ACRONYMS

BGI – Balanced Growth Initiative

BGP – Balanced Growth Planning

BLLUP – Best Local Land Use Practices

BMP – Best Management Practices

CNS – Covenant Not to Sue

CO_2 – Carbon Dioxide

COTA – Central Ohio Transit Authority

CSCC – Columbus State Community College

CWA – Clean Water Act

DATA – Delaware Area Transit Authority

DFIRM – Digital Flood Insurance Rate Map

ECBP – Eastern Corn Belt Plains

EPA – Environmental Protection Agency

FEMA – Federal Emergency Management Agency

FHWA – Federal Highway Administration

FLOW – Friends of the Lower Olentangy River

GIS – Geographic Information System

HSTS – Home Sewage Treatment Systems

HUC – Hydrologic Unit Code

IMP – Integrated Management Plan

LID – Low Impact Development

MORPC – Mid-Ohio Regional Planning Commission

MPO – Metropolitan Planning Organization

MS4 – Municipal Separate Storm Sewers

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

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

OSU – Ohio State University

OWDA – Ohio Water Development Authority

OWPP – Olentangy Watershed Planning Partnership

OWRC – Ohio Water Resource Council

PAA – Priority Agricultural Area

PCA – Priority Conservation Area

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 Olentangy Watershed 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 3 to 5 years
- Incorporate Priority Areas into local community plans and zoning
- Integrate Implementation Tools where applicable and appropriate
- Continue participating in the Olentangy Watershed Planning Partnership

The Mid-Ohio Regional Planning Commission (MORPC), an association of local governments in central Ohio, worked with the Olentangy Watershed Planning Partnership (OWPP) to produce this Olentangy River 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 OWPP is made up of 27 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. 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. While growth and development are generally considered positive for many communities, they can become costly over the long term if not carefully planned to maximize the return on infrastructure investments and protect critical environmental areas. This plan addresses the following interrelated issues that influence the environmental and economic health of the Olentangy Watershed:

Water Quality: Despite designation of portions as a State Scenic River, the Olentangy River is

on Ohio's 2006 Section 303(d) list of impaired waters. Nonpoint source pollution from both urban stormwater and agricultural runoff is contributing to water quality impairment of the Olentangy River and its tributaries.

Growth Management: Population growth is projected in the watershed, particularly in the southern half of Delaware County. Future development in the Olentangy Watershed should be carefully 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 OWPP 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 3-step process. First, MORPC identified potential priority areas based on an analysis of objective criteria selected by the OWPP. 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 draft Priority Area maps which were distributed to each participating community for a second round of review. 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 OWPP jurisdictions.

The OWPP Balanced Growth Plan also includes a suite of implementation tools to assist communities in their efforts to address the issues the Olentangy Watershed faces. 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 OWPP and the Ohio Water Resources Council to achieve state endorsement of the Olentangy Balanced Growth Plan. State endorsement requires local adoption of the plan by at least 75 percent of the Olentangy Watershed communities. Upon endorsement, participating OWPP 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.

Stakeholders and community representatives in the Olentangy 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.

> *"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

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 organized the Olentangy Watershed Planning Partnership (OWPP) to provide guidance throughout the Balanced Growth Planning process. The OWPP, 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 (see page 12 for the full list) 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 (1) vote for matters requiring a vote during the planning process. However, the partnership worked to reach consensus the vast 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.

Early in the planning process, the OWPP developed a set of ground rules (see Appendix D for adopted ground rules) and determined the governance structure for the group. Initially, the group decided to function as a full partnership where every community representative and stakeholder would be invited to attend and participate in each meeting. Later in the process, the OWPP formed a technical advisory committee to develop draft Priority Area criteria recommendations for the full partnership to consider.

Upon finalization of this plan and the associated Priority Area maps, all partnership communities will be asked to pass a resolution to adopt the Olentangy Balanced Growth Plan. If over 75 percent of communities in the Olentangy Watershed (by number of communities, population, and land area) adopt the Olentangy Balanced Growth Plan, the OWPP can seek endorsement from the Ohio Water Resources Council. 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 C). More detailed information about the population and land area of the Olentangy Watershed by participating jurisdiction is available in the Recommendations section beginning on page 68.

PUBLIC INPUT

Throughout the planning process, the public was invited to participate in a variety of ways. The original invitation to join the OWPP 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 and posted regular updates, including the times and locations of all meetings. MORPC also sent press releases to inform the public about Balanced Growth Planning in the Olentangy Watershed and to invite broader participation.

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 OWPP Balanced Growth draft plan text. Due to the size of the watershed, MORPC hosted two public meetings (one in the southern half of the watershed and one in the northern half) at both of these points in the process. 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 April 29, 2010 meeting, the OWPP developed and voted to approve the following goal statement to guide this planning effort:

"The goal of the Olentangy Watershed Balanced Growth Plan is to protect, preserve, restore, and enhance the Olentangy River, its tributary system and areas that serve natural functions by encouraging conservation, development and agriculture in appropriate areas while recognizing the importance of the Watershed as an asset and respecting the uniqueness of our communities."

This goal statement is supplemented by the following 10 Guiding Principles developed by the state to assist Watershed Planning Partnerships in their task of creating watershed-based Balanced Growth Plans:

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

STATEMENT OF HOW THE OLENTANGY 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.

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, tree preservation, and stream setbacks (see Implementation Toolbox beginning on page 72) 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 natural hydrologic functions. Recognizing the key role the streams play in the health of the Olentangy Watershed, the partnership requested that partner communities consider adding in the floodplain and areas along streams as priorities for conservation to preserve their critical hydrologic function. Tools such as Low Impact Development (see page 80) 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.

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 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 to improve water quality and to reduce runoff. The inclusion of wellhead zones and corridor management zones in the criteria for selection of PCAs is intended to address the issue of land use change near surface water and groundwater intakes that can alter drinking water quality. The partnership recommended that floodplains and a stream buffer be potentially added as PCAs which would also preserve sensitive riparian habitat.

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 114) 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 seeks to encourage joint consideration of land use decisions and transportation decisions to ensure that each can be coordinated as best as 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 statement specifically states that the partnership communities would like to recognize the importance of the Watershed as an asset while respecting the uniqueness of the communities. The 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 OWPP decided to designate Priority Agricultural Areas due to the predominance of agriculture in the northern half 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 OWPP worked together to designate Priority Areas throughout the

watershed based on a three-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. Draft Priority Area maps were then sent back to partnership communities for a round of local review and adjustments. An explanation of the criteria, the OWPP's Priority Areas definitions, and community-scale maps showing the designated Priority Areas begins on page 34 of this plan.

Regional Planning Context

OHIO'S BALANCED GROWTH PLANNING PROGRAM

This Olentangy 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 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.

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

- 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 OLENTANGY WATERSHED

Territory Boundary and Size

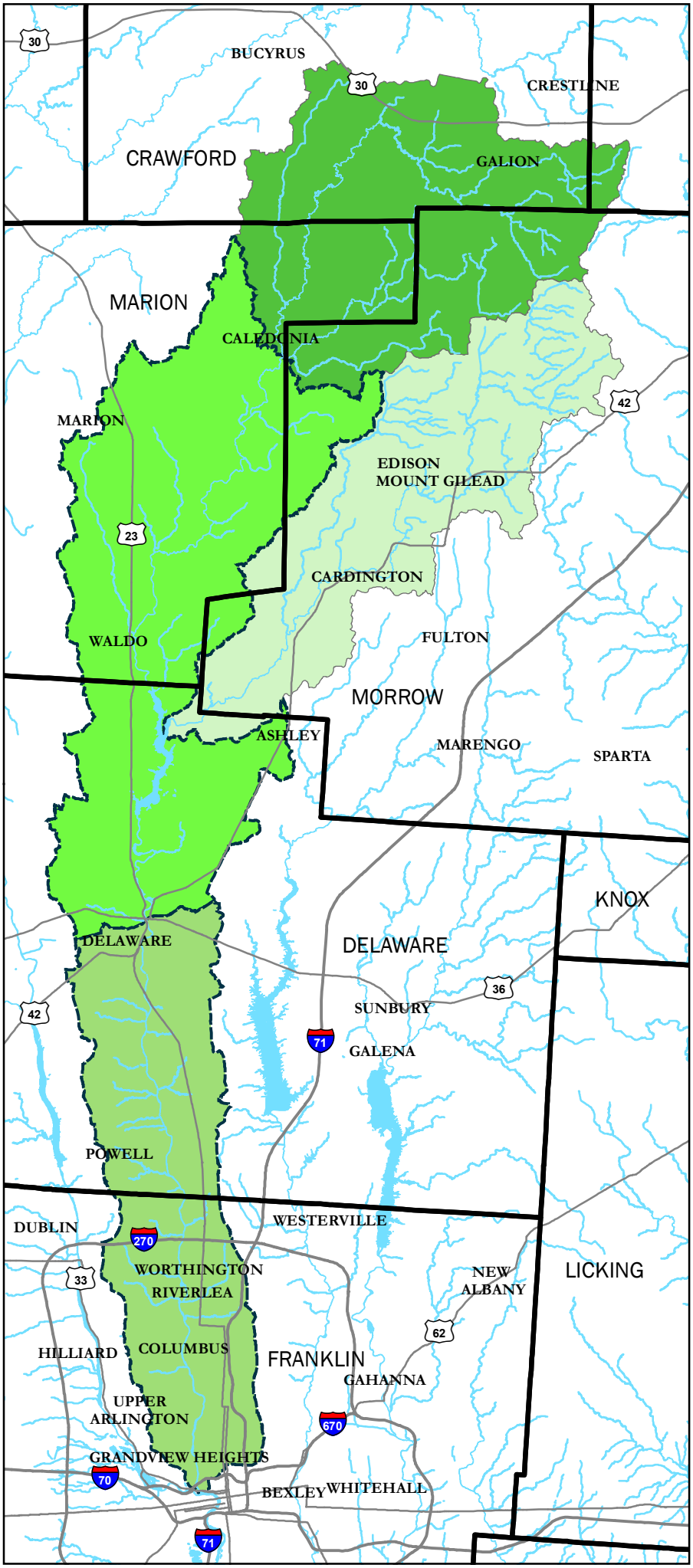
Located in central Ohio, the Olentangy River is approximately 93 miles long and drains land from Crawford, Richland, Marion, Morrow, Delaware, and Franklin Counties, before it empties into the Scioto River at the confluence in Columbus which later feeds into the Ohio River.

The planning area for the Olentangy River Balanced Growth Plan is based on the boundaries of Hydrologic Units 05060001 10 and 05060001 11 (see Map 1).

The upper (HUC 05060001 10) and lower Olentangy (HUC 05060001 11) watershed subdivisions drain approximately 294 square miles of land from Marion and Morrow counties in the north, through Delaware County, and into Franklin County. Whetstone Creek (HUC 05060001 09) is a major tributary to the Olentangy River. MORPC is also facilitating the development of a separate Balanced Growth Plan for Whetstone Creek that is expected to be complete by June 2012.

Olentangy Watershed

Subdivisions



Legend

Olentangy River Watersheds

10-Digit HUC (ODNR)

- 0506000108 (Headwaters)
- 0506000109 (Whetstone Creek)
- 0506000110 (Upper)
- 0506000111 (Lower)

OWPP

- County Boundary
- Major Roads
- Water

0 5 10 Miles

N

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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Nov 2011

The Olentangy Watershed includes representative sections of all the landscape types found in central Ohio, including rural, small town, small city, suburban, and central city urban. The watershed includes significant areas of protected lands, including the Delaware Wildlife Area and Delaware State Park, and Highbanks Metro Park. The Ohio State University's (OSU) main campus is situated along both banks of the Lower Olentangy River. OSU's Olentangy River Wetland Research Park has been designated a Ramsar wetland of international importance. There is an almost continuous greenway corridor from just south of the Franklin-Delaware County line to the confluence of the river with the Scioto River in downtown Columbus with a multiuse trail along the corridor providing public access to most of the urbanized portion of the river and connecting numerous public parks.

Political Composition

There are 27 political jurisdictions represented in the OWPP spanning across four counties. These communities range from rural agricultural townships to small villages to dense urban areas. The watershed is more densely populated in the Lower Olentangy, driven by the highly urbanized City of Columbus and its surrounding suburbs.

When forming the OWPP, MORPC invited any community that had over 25 percent of its population or over 25 percent of its total land area within the boundaries of the Olentangy River Watershed planning area to join the partnership. The 25 percent threshold was selected because numerous communities straddled 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 watershed.

All 25 communities that met the 25 percent threshold elected to join the partnership, achieving a 100 percent participation rate. In addition, Cardington Township in Morrow County and the City of Marion, while not meeting the 25 percent threshold for this planning area, elected to join the partnership. The population and land area data by jurisdiction for all 27 participating communities can be found in the appendix. Map 2 illustrates the geographic location of each of the participating jurisdictions across the Olentangy Watershed.

OLENTANGY WATERSHED JURISDICTIONS:

Village of Ashley

City of Columbus

City of Delaware

City of Grandview Heights

City of Marion

City of Powell

Village of Riverlea

City of Upper Arlington

Village of Waldo

City of Worthington

Brown Township (Delaware County)

Canaan Township

Cardington Township

Claridon Township

Clinton Township

Delaware Township

Liberty Township (Delaware County)

Marion Township

Marlboro Township

Orange Township

Oxford Township

Perry Township (Franklin County)

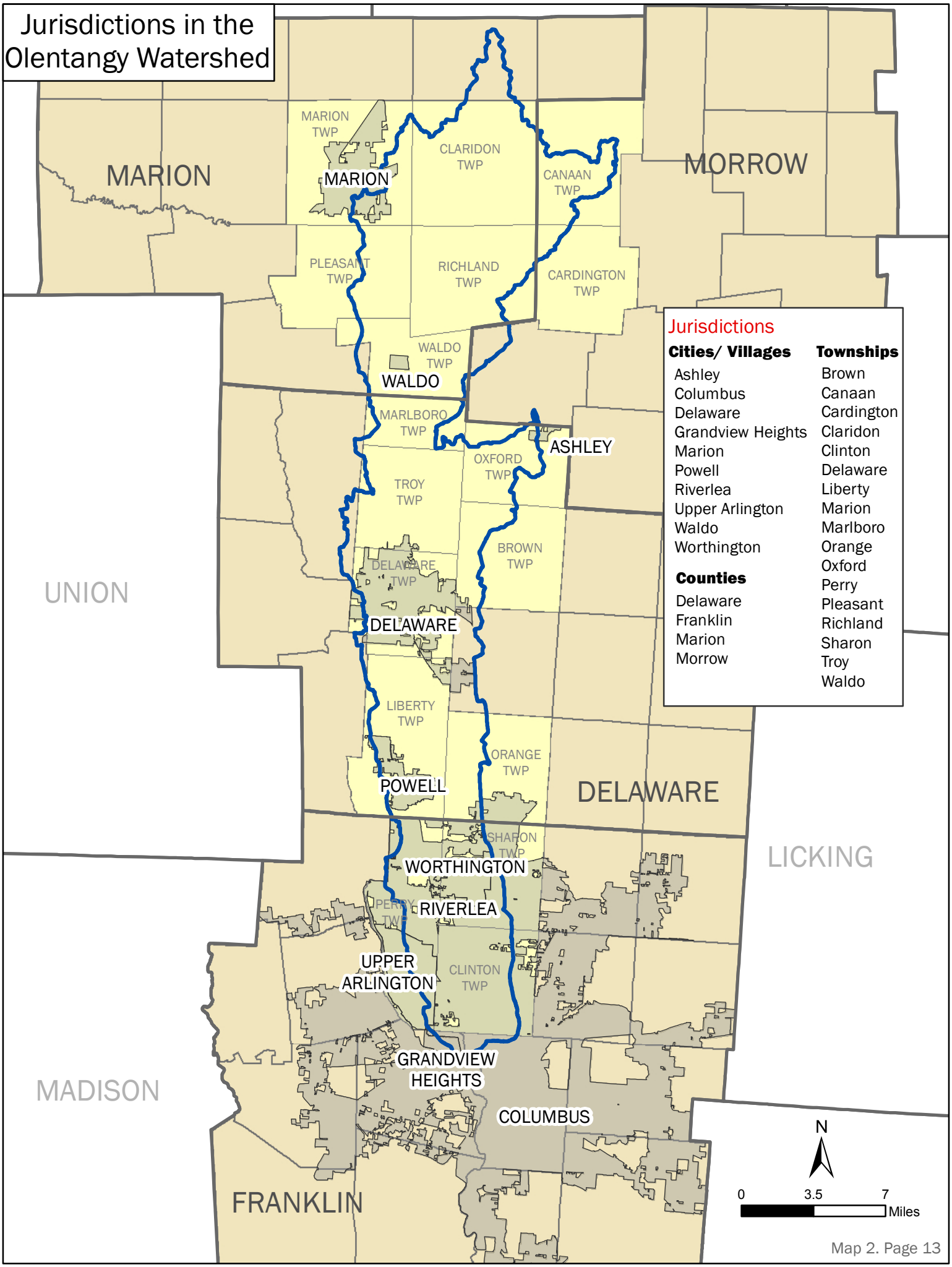
Pleasant Township (Marion County)

Richland Township (Marion County)

Sharon Township

Troy Township (Delaware County)

Waldo Township


Jurisdictions in the Olentangy Watershed
MARION
MORROW
UNION
DELAWARE
LICKING
MADISON
FRANKLIN
MARION TWP
MARION
CLARIDON TWP
CANAAN TWP
PLEASANT TWP
RICHLAND TWP
CARDINGTON TWP
WALDO TWP
WALDO
MARLBORO TWP
ASHLEY
OXFORD TWP
TROY TWP
BROWN TWP
DELAWARE TWP
DELAWARE
LIBERTY TWP
ORANGE TWP
POWELL
SHARON TWP
WORTHINGTON
PERRY TWP
RIVERLEA
UPPER ARLINGTON
CLINTON TWP
GRANDVIEW HEIGHTS
COLUMBUS
Jurisdictions
Cities/ Villages
Ashley
Columbus
Delaware
Grandview Heights
Marion
Powell
Riverlea
Upper Arlington
Waldo
Worthington
Counties
Delaware
Franklin
Marion
Morrow
Townships
Brown
Canaan
Cardington
Claridon
Clinton
Delaware
Liberty
Marion
Marlboro
Orange
Oxford
Perry
Pleasant
Richland
Sharon
Troy
Waldo
N
0
3.5
7
Miles

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 Olentangy Watershed and to review some of the key recommendations that have been prepared by both the Ohio EPA and local watershed action groups to address water quality issues.

A 22 mile portion of the Olentangy River, from the Delaware Dam downstream to the City of Worthington, is designated as a State Scenic River with an aquatic life use designation of Exceptional Warm Water Habitat (EWH). This section runs through the southern half of Delaware County, the fastest growing county in Ohio. The Olentangy River Watershed is experiencing greater development pressure and higher rates of population growth than any of Ohio's other state designated scenic rivers.[2] This implies a great need for careful growth and conservation coordination among communities in the watershed to accommodate population changes while maintaining high quality waters and the scenic nature of the river.

The Olentangy Watershed is located within the Eastern Corn Belt Plains (ECBP) ecoregion, containing primarily clay-rich soils associated with slow permeability and slow to moderate rates of infiltration. This means that agricultural production in the watershed generally requires subsurface tiling in addition to surface drainage. This soil type is not well-suited for use as septic tank absorption fields, requiring additional controls on traditional home septic systems to ensure water quality.

The streams of the Olentangy Watershed provide high-quality habitats for six state-listed endangered, threatened or special aquatic species. There are 54 species of fish, diverse communities of freshwater mussels, a variety of breeding bird populations, and various macro-invertebrates living in the Olentangy Watershed. The Olentangy Watershed also provides drinking water, recreation, and agricultural drainage for around 250,000 central Ohio residents.[3]

Despite its designation as a State Scenic River over a portion of its length, the Olentangy was included on Ohio's 2006 Section 303(d) list of impaired waters for both aquatic life use and recreational use impairments.[4] The U.S. Clean Water Act (CWA) was passed in 1972 and amended in 1977 with the goal of ensuring that the nation's streams are fishable, swimmable, and drinkable. Section 303(d) of the U.S. Clean Water Act requires states to establish Water Quality Standards (WQS) and to create prioritized lists of water bodies that do not meet those standards. The four major components of Ohio's WQS are beneficial use designations, narrative criteria, numeric criteria, and anti-degradation provisions.

The CWA also 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 U.S. EPA approved the Olentangy TMDL report in September 2007. The report is based on an extensive survey of the river that was conducted by the U.S. EPA during 2003 and 2004.

Additionally, the local citizen watershed group Friends of the Lower Olentangy Watershed

[2] *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)

[3] *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)

[4] *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)

(FLOW) completed a state endorsed watershed action plan (WAP) in 2005. The Lower Olentangy WAP, "was developed with input of citizens and stakeholders, and contains strategies and recommendations to improve or protect water quality by decreasing pollution and increasing the recreational value of the river."[5] The watershed action plan, like the TMDL report, focuses on the chemical, biological, and hydrological aspects of the river in identifying actions to restore the river to Clean Water Act standards. Unlike a balanced growth plan, it does not identify land areas in the watershed critical to maintaining the health of the river. Taken together the watershed action plan and the balanced growth plan provide a detailed map to guide efforts to protect and restore the Olentangy River.

There are several sources of impairment to the Olentangy Watershed. Sources include nonpoint (agricultural runoff and stormwater runoff), regulated point (wastewater treatment plants), household sewage treatment systems, livestock with stream access, combined and sanitary sewer overflow, channel maintenance, and stream impoundments. The related causes of impairment to the Olentangy Watershed include nutrient enrichment, sedimentation, habitat alteration, flow alteration and bacteria. The suburbanizing middle watershed exhibits signs of high levels of nutrients, pathogens and sediments as the result of altered hydrology and poor habitat caused by changing land cover and land disturbance as well as failing home sewage treatment systems. In the lower, urban portion of the watershed, combined and sanitary sewer overflows, urban runoff, and low-head dam impoundments result in high nutrient and pathogen loads, poor habitat, siltation, low dissolved oxygen concentrations and elevated stream discharges.

The Olentangy Watershed 2007 TMDL report as well as the Lower Olentangy Watershed Action Plan identifies a number of actions that can be implemented to help the waterway achieve full attainment of Water Quality Standards. The recommended actions include:

- Identify and improve failing Home Sewage Treatments Systems (HSTS).
- Ensure proper maintenance of HSTS through training and education.
- Limit stream access for livestock and seek alternative water access.
- Promote the use of vegetated buffer strips in agricultural areas of watershed.
- Minimize impervious surfaces and improve onsite stormwater retention.
- Protect floodplains throughout the Olentangy River Watershed.
- Encourage use of Low Impact Development (LID) techniques.
- Continue removal of lowhead dams along Olentangy River.
- Modify stormwater permits to reflect the load limits identified in the Olentangy TMDL.

The Implementation Toolbox in this plan (beginning on page 72) 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.

[5] *The Lower Olentangy Watershed action Plan in 2003*, Friends of the Lower Olentangy Watershed, 2005, p.1

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 Olentangy Watershed planning area are predominantly agricultural, with major development mostly limited to the City of Marion and the surrounding area. In Delaware County, land use patterns north of the Delaware Dam are also predominantly agricultural. The land south of the City of Delaware is more suburban in nature and experiences some of the greatest development pressures in the watershed and the central Ohio region. The Franklin County portion of the Olentangy River Watershed is urbanized and densely developed. This section of the watershed is mostly built out. However, there is still potential for redevelopment and infill development projects in the southern reaches of the watershed.

Within the Olentangy Watershed Balanced Growth Planning area, over half (58%) of the land is used for agriculture. Nearly one-third (31%) of the planning area is developed. This development ranges from low density rural or suburban residential areas to more compact town and village centers and even includes some dense, urban areas. The land use breakdown for the remainder of the planning area is eight percent parks and open space, three percent vacant, and three percent other. The table below and the map on the following page provide more detailed information about land use in the Olentangy Watershed planning area.

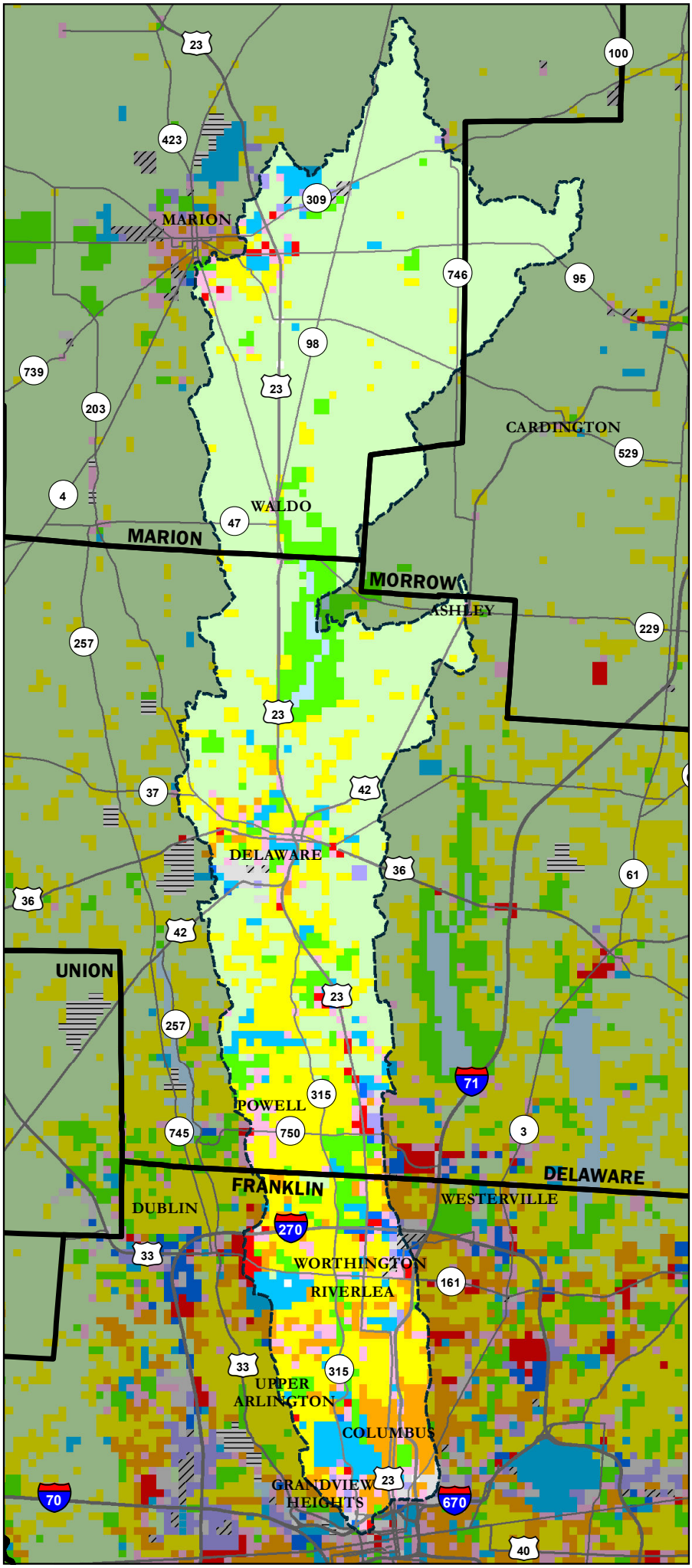
Table 2. Land Use in Olentangy Watershed Balanced Growth Planning Area

Land Use		Acres	% of Land
	Development Type		
Agriculture		106,280	58
Development	Public Use	5,680	3
	Commercial/Office	10,600	6
	Residential	44,040	24
	Industrial & Warehousing	3,880	2
	Total Developed Land	*64,200*	*35*
Open Space & Parks		13,840	8
Total		184,320	101

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

Olentangy Watershed

Existing Land Use



Legend

- Major Roads
- County Boundary
- OWPP Watershed Area
- Outside Planning Area

Exisiting Land Use

- Agriculture
- Commercial
- Mixed Use Residential/Commercial
- Office
- Light Industrial
- Industrial
- Park
- Water
- High Density Residential
- Low Density Residential
- Quarry
- Warehouse
- Public Service

0 4 8 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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November 2011

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 Olentangy Watershed. Planning for sewer service is part of the State's *208 Water Quality Management Plan.* [6] The following section describes the current sanitary sewer infrastructure in the Olentangy Watershed. See page 29 for more information about future sanitary sewer infrastructure planning and projects and page 123 for using the 208 Plan as an implementation tool.

The City of Columbus sewer system serves much of the Franklin County portion of the lower Olentangy 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.

The Delaware County area is serviced by an extensive sewer system that covers the central portion of the county south of the City of Delaware and west of Hoover Reservoir. Agreements have been forged with the City of Columbus and City of Westerville to treat effluent in several pockets in the county.

The City of Marion has expanded its sewer service area to include most areas within city limits. There are isolated neighborhoods adjacent to the sewered areas of the City of Marion not served by sewer that are potential points of expansion in the future. Outside of the city, Marion County has a sewer system with a number of outlying sewer service areas.

Transportation

Travel and goods movement in and through the planning area takes advantage of a strong surface transportation network. U.S. 23 runs over and near portions of the Olentangy River through the Franklin and Delaware County portions of the planning area. Bypasses allow U.S. 23 through traffic to move around the cities of Marion and Delaware. Major cross routes include State Routes 95 and 309 in Marion; U.S. Routes 36 and 42 and State Route 37 in Delaware; and Interstate 270 and State Route 161 in northern Columbus. Interstate 71 runs north-south through Columbus before heading northeast and out of the planning area. State Route 315 serves as an expressway through Columbus and Worthington between Interstates 70 and 270. It is one of Ohio's scenic roads between I-270 and its junction with U.S. 23 in Delaware County as it follows the banks of the Olentangy River.

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, it is the county, township, and municipal roads that complete the roadway network by providing access to almost all destinations in the planning area.

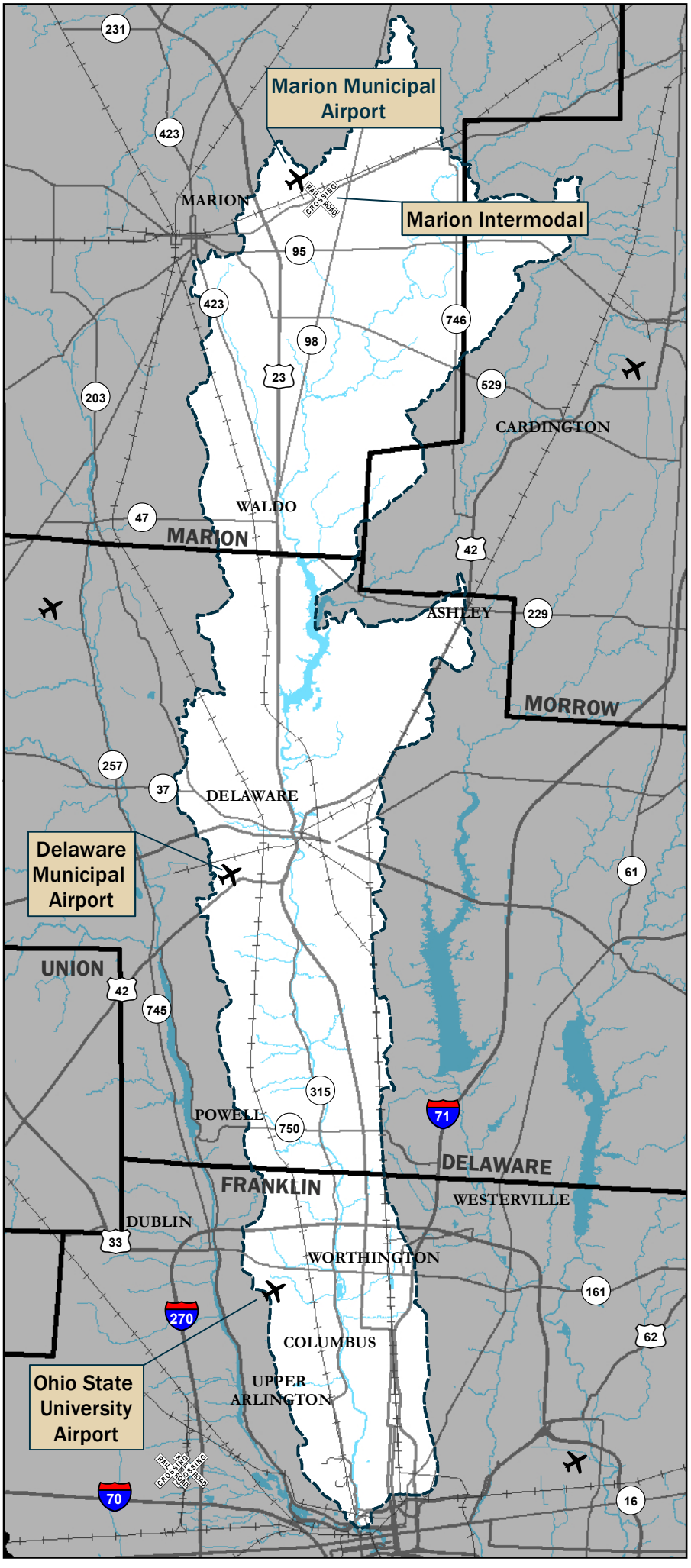
[6] Additional information about the *208 Water Quality Management Plan* including sewer service areas and local sewer prescriptions can be found at Ohio EPA's website: http://www.epa.ohio.gov/dsw/mgmtplans/208Final2006Plan.aspx

Three public transit agencies use this roadway network in the planning area. Marion Area Transit (MAT) runs a demand response system in the City of Marion. “Demand response” refers to a system that dispatches transit vehicles to a destination upon request instead of a fixed schedule. Delaware Area Transit Agency (DATA) serves all of Delaware County with its demand response system. It has two regular routes. One loop serves points in and near the City of Delaware. The other route travels down U.S. 23 where users can connect to the Central Ohio Transit Authority (COTA) system. 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 #2, runs up High Street (U.S. 23) through much of Franklin County’s portion of the planning area.

CSX and Norfork Southern (NS) are the two dominant Class I railroads east of the Mississippi. Both have tracks that connect Columbus, Delaware, and Marion. 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 of Conrail between NS and CSX has hastened the removal of these access points as system speed and efficiency are higher priorities. Depending upon the business model, larger users with more frequent shipping needs may still find direct rail access possible and practical, especially as the cost of trucking goods increases.

Intermodal facilities are designed to transfer goods between rail and truck. One of those facilities falls in the planning area. The Marion Intermodal Center is a former army depot along State Route 309. Schneider National, a trucking company, runs loaded truck trailers on rail between Marion and Kansas City as a cost saving measure for long distance trips that would otherwise go over the road across the Midwest.

Two city-owned and operated general aviation airports fall in the boundaries of the planning area. Marion Municipal Airport is run by the City of Marion. It has two runways. The longer is 5,000 feet long. It sits northeast of the center of Marion, just north of the intermodal facility. The City of Delaware has the Delaware Municipal Airport. It has just one 5,000-foot long runway. It is southwest of the center of Delaware among commercial and industrial properties. The Ohio State University owns and operates Don Scott Airport in northwest Columbus, the largest airport in the planning area. It has four runways and a helipad. The runways range from just under 3,000 feet to just over 5,000 feet in length. It serves the same functions as a general aviation airport, but carries the categorization of reliever airport as it falls within 20 miles of an airport that receives regularly scheduled commercial flights, Port Columbus International Airport.



Olentangy Watershed

Transportation Infrastructure

Legend

- Intermodal Yard
- Airport
- OWPP Watershed Area
- Outside Planning Area
- County Boundary
- Major Roads
- Railroad
- Water

0 4.5 9 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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September 2011

Natural Features and Resources

The floodplains of the Olentangy River and its tributaries provide habitat to a wide range of plant and animal species throughout the watershed. A section of the Olentangy running through Delaware County and northern Franklin County is designated a State Scenic River, the third river designated in Ohio, with an Exceptional Warm Water Habitat rating. The scenic portion runs from Delaware Dam to the Old Wilson Bridge Road in Worthington. Highbanks Metro Park, known as such due to the high cliffs that follow alongside the Olentangy River, provides the community with access to this area and views of the river from overlook decks. This section of the river runs through Delaware County, which is the fastest growing county in the state.

One of the most critical resources the Olentangy Watershed has to offer is water. The importance of waterways and greenways as a natural resource is also emphasized in the Lower Olentangy Watershed Action Plan (WAP) adopted in 2005. The Lower Olentangy WAP was prepared by Friends of the Lower Olentangy Watershed (FLOW), a non-profit watershed action group, to serve as a guiding document for protecting the lower Olentangy River and its tributaries. The central Ohio region is rich in water as a resource. As such, it is critical to recognize that this natural resource is a strong and attractive asset for our communities for the purposes of the natural functions it serves and the aesthetic enhancement it lends to our communities. This resource also is a contributing factor to healthy habitat, recreation, business, industry and agriculture in the watershed.

Along the Olentangy and its tributaries are vibrant greenways, another natural resource the Olentangy Watershed has to offer. These greenways extend like fingers through the partnership communities and provide a natural respite for residents and wildlife alike. The watershed's greenways are natural corridors that cover woodlands, open space, and the waterways themselves. The value of these critical natural resources has been recognized through programs like Central Ohio Greenways, a network of trail systems across the central Ohio region that provides access to these corridors for community enjoyment. In the Olentangy Watershed, the Olentangy Greenway Trail weaves alongside the Olentangy River connecting recreational hotspots across several OWPP communities. The Olentangy Trail also serves as a bicycle transportation corridor that is used for recreation and, increasingly, for commuting. The Olentangy Trail runs parallel to State Route 315, providing an alternate mode of transportation that helps reduce congestion on the highway.

The Olentangy Watershed is also home to the Delaware Wildlife Area spanning Delaware, Marion, and Morrow Counties. The adjacent Delaware Reservoir harnesses the natural water resource in the region and complements the surrounding 4,670 acre wildlife area and Delaware State Park. The area is also where one can find an improved wetland area with 54 ponds and 159 acres of seasonal wetlands.[7] These areas provide valuable recreational and economic opportunities, attracting boaters, fishers, campers, wildlife-lovers, hikers and more to the region. The area also is home to shooting and archery ranges where interested parties may purchase range permits. The Delaware Wildlife area supports hunting commerce and serves as a popular draw for rabbit, dove, waterfowl, pheasant, and deer hunters.[8] This area is within approximately 100 miles of a number of major population centers including Columbus and its suburbs, Dayton, Findlay, and Mansfield, providing access to a large number of people and bringing with them their business.

In addition to the parklands and wildlife areas located within the watershed, forest cover is also abundant near the waterways and within the riparian areas of the Olentangy Watershed, particularly near reservoirs. 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 National Land Cover Dataset, approximately 14 percent of the entire Olentangy Watershed is categorized as forested.[9] ODNR indicates that there are no state forests in the Olentangy Watershed where timber harvesting might occur. Regardless, woodlands are an important natural resource for a variety of other reasons. They provide habitat for wildlife and rich recreational opportunities, but they also serve the important function of cleaning our air and sequestering carbon from our atmosphere which would otherwise detrimentally impact our health and environmental well-being. Forests also permit greater water infiltration and pollution control. See the implementation tool "Woodland and Tree Canopy Protection" on page 92 of this plan for more information on the economic benefits of this vital natural resource and the assessed monetized value.

The Olentangy Watershed is fortunate to be home to some of the most fertile agriculture lands in the state and the nation, producing vital crops like corn and soybeans that feed our nation and supporting an agricultural way of life for many citizens. 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. Indeed, the northern portion of the watershed largely consists of agricultural communities dotted by villages and cities. The value of quality soils as a means to successful agriculture in the Olentangy was hardily supported by the partnership communities as indicated by their desire to prioritize agricultural land use as part of this planning effort and also reflected in local designs to designate Agricultural Districts where that land use is preferred by the communities. The majority of the Olentangy Watershed is categorized as prime farmland, if drained, or prime farmland that is naturally well-drained; the largest areas that are not prime farmland are urban areas such as the City of Columbus. Whether or not areas are considered prime farmland is directly related to the soil and the availability of drainage, both natural and artificial.

According to the Ohio Geological Survey, there are several oil fields and one notable gas field

[7] Upper Olentangy Watershed Action Plan.
[8] Ohio Department of Natural Resources (ODNR). Delaware Wildlife Area. http://www.dnr.state.oh.us/tabid/19699/Default.aspx
[9] *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)

located within the Olentangy Watershed. The largest oil field is located to the northeast of the watershed, a portion of which is located within the Morrow and Marion County communities participating in the OWPP including Canaan, Cardington, and Claridon Townships. There is also a smaller oil field located to the northeast of the City of Delaware and in Pleasant Township (Marion County). Pleasant Township is also home to a gas field. Dispersed across the watershed in every setting, ranging from urban to rural, there are activities relating to the extraction or manipulation of the natural oil and/or gas resources located within the watershed generally categorized as "wells" by the Ohio Geological Survey. The greatest concentration of these points is located in the oil and gas fields previously described, but there are others in nearly every community in the watershed. Finally, the Ohio Coal and Industrial Minerals map developed by ODNR, Division of Geological Survey, indicates that the Olentangy Watershed planning area does not have mines or quarries capable of producing natural resources common to Ohio such as coal, limestone, salt, sandstone, etc. with the exception of one limestone and dolomite quarry located just north of the City of Marion (located in the watershed planning area, however just outside the Olentangy Watershed boundary). There are, however, several limestone, dolomite, sand and gravel quarries along the fringes of the watershed.

Economy and Employment

The Olentangy watershed encompasses a vibrant portion of the central Ohio region. There are approximately 180,000 jobs currently located within the watershed. Office, service industries, medical, education and retail are the predominant employment sectors. There are several large employers in the study area, with the majority of them being universities, hospitals, or regional centers of insurance and financial offices. Map 5 shows the locations of the largest employers and Table 3 displays the percentage of employment by industry sector.

Table 3: 2010 Employment Profile of the Olentangy Watershed

Industry	% of Employment
Manufacturing	4%
Wholesale	3%
Retail	10%
Transportation	1%
Communications	2%
Finance, Insurance & Real Estate	5%
Service	29%
Education	17%
Medical	23%
Government/Non-Profit	5%

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

MORPC prepares forecasts of employment for transportation planning purposes. It uses a land use model to distribute growth based on availability of transportation facilities and utilities, environmental sensitivity of the land, economic incentives being offered, and anticipated land uses as anticipated from local land use plans. The forecasts were developed for a 25 year period, using 2010 as the base year and 2035 as the planning horizon year. Projections include an additional 53,000 jobs in the area by 2035. High growth areas include southern Delaware County, Delaware City, and the OSU area. Much of the anticipated growth is along the U.S. 23 corridor that runs through the center of Delaware County. Areas between Delaware City and Marion are anticipated to remain primarily agriculture.

The City of Marion lies just outside the northern edge of the watershed. The community is not expected to grow significantly; however, with a population of over 35,000 people, it does have

potential impact on the watershed and so is a member of the partnership. The city has an industrial focused economy with an intermodal equipped rail yard, a full service hospital and several higher level educational campuses including a branch of the Ohio State University.

While some commercial development is expected throughout the watershed area, there are key locations where specific nodes of development are occurring. Delaware City is establishing a new medical campus at its southern edge and Columbus State University, a two year institution, is establishing a campus in the same vicinity. The city is also establishing a cluster of industrial uses, consisting primarily of warehousing, on the west side of the city. Continued commercial/office development is expected along the U.S. 23 corridor between north Columbus and Delaware City through Orange and Berlin Townships. In addition, on the west side of the Olentangy River, the area north of the City of Powell, where the new Sawmill Parkway is being built as a parallel thoroughfare to U.S. 23 that will connect I-270 to U.S. 42, is attracting commercial growth to support the new residential development expected in the area.

Upper Arlington is experiencing redevelopment around the Kingsdale Shopping Center near its 5-point intersection and the Lane Avenue shopping center to the west of the OSU campus. At the Ohio State University campus, the medical center is undergoing an expansion that is expected to attract 10,000 more workers.

Other areas of note include neighborhoods on the north side of downtown. The Arena District, situated on the northern edge of downtown is attracting new and relocated offices, new residences, and new supporting commercial establishments. The High Street corridor, which has historically been the commercial spine of the region, is redeveloping with commercial infill from downtown north to Worthington.

Finally, to capitalize on the proximity to the OSU campus, there is significant redevelopment occurring at the southern edge of the watershed area on the west bank of the Olentangy. TechColumbus, a public/private collaboration between the university and local governments, is establishing a corridor of high tech companies growing out of the incubator entrepreneurial programs it supports in the area. Grandview Yard, located near the southern edge of the watershed area in Grandview Heights, is a 90 acre former industrial site being redeveloped into a mixed use center.

Map 6 is a map of anticipated high growth areas, and Table 4 is a listing of the amount of new employment growth expected in the area.

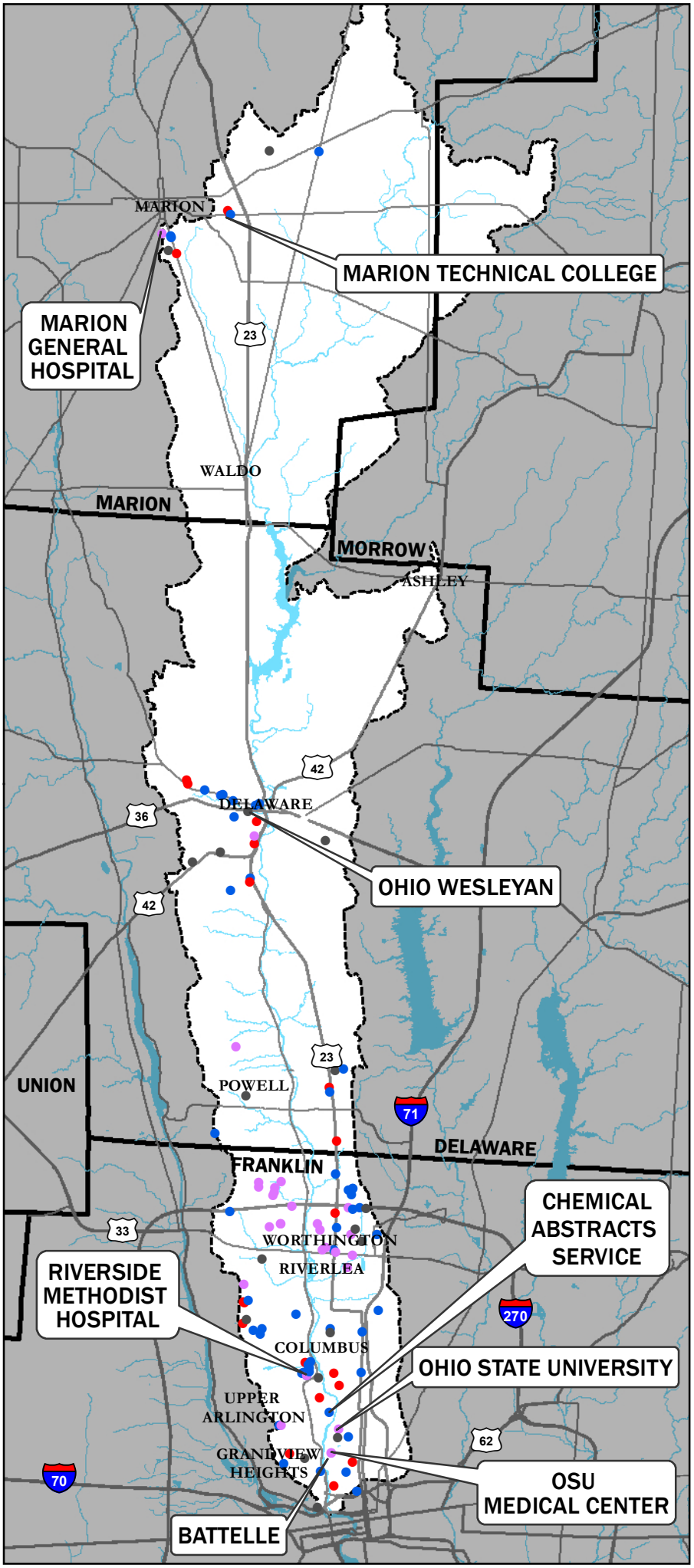
Table 4: 2009- 2035 Employment Forecasts of the Olentangy Watershed

	2010	2035	Change	Percent Change
Total Employment	178,250	231,450	53,200	30%
Office Employment	63,800	85,300	21,500	34%
Retail Employment	43,450	55,650	12,200	28%
Industrial Employment	22,900	27,350	4,450	19%
Public Employment	48,100	63,150	15,050	31%

Source: MORPC Land Use Model 2010

Olentangy Watershed

Major Employers



Legend

Major Employers

- Industrial
- Other
- Retail
- Office
- Outside Planning Area
- Water
- OWPP Watershed Area
- County Boundary
- Major Road

0 4 8 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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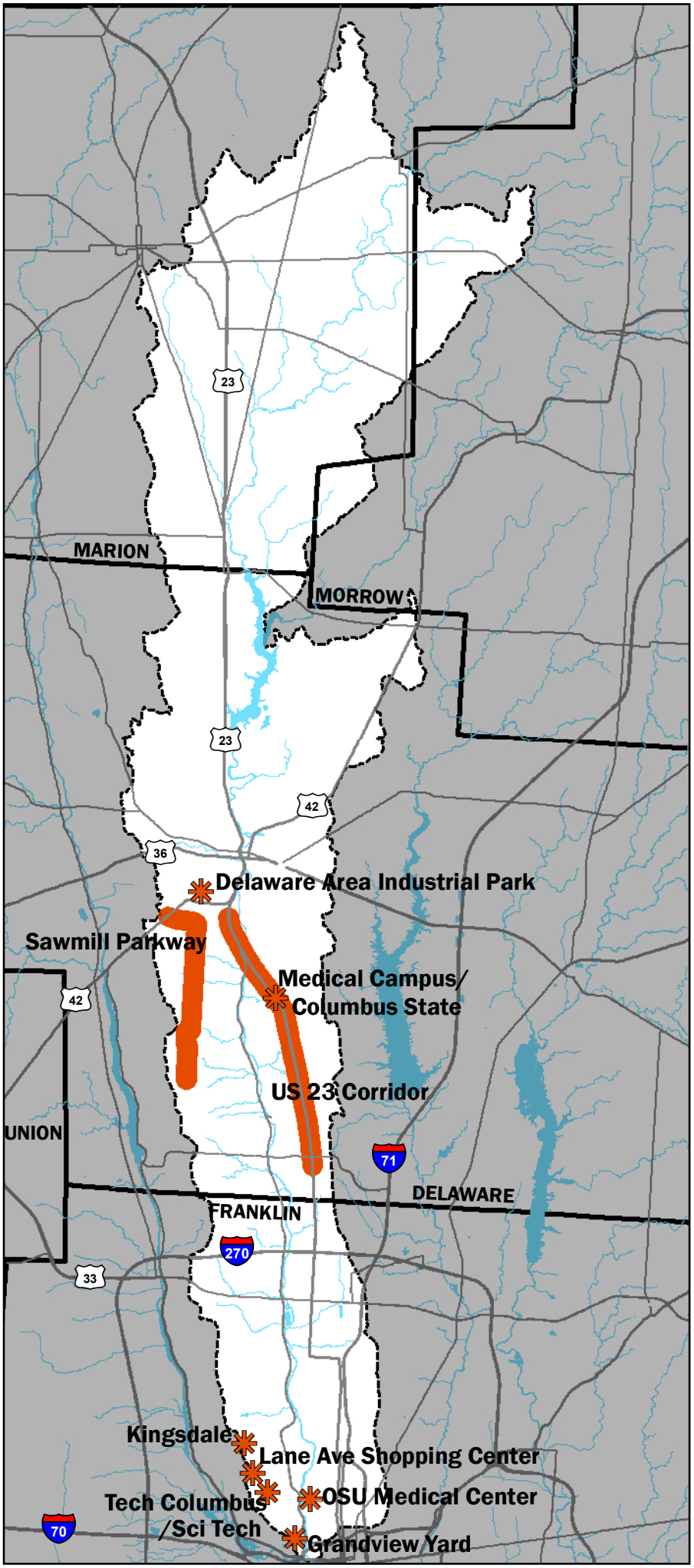
October 2011

Olentangy Watershed

Areas of Anticipated Employment Growth



Legend

- Areas of Growth
- Outside Planning Area
- Water
- OWPP Watershed Area
- County Boundary
- Major Road

0 4 8 Miles

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October 2011

FUTURE CONDITIONS

Table 5. Population projections for OWPP communities

	Jurisdiction	Population in Watershed 2010	2035	Change
Marion & Morrow Co.	Marion	4,669	5,514	845
	Waldo	291	358	67
	Claridon Township	2,017	2,279	262
	Marion Township	4,591	5,799	1,208
	Pleasant Township	1,953	2,295	342
	Richland Township	1,542	1,506	-36
	Waldo Township	783	834	51
	Canaan Township	374	323	-51
	Cardington Township	89	78	-11
	Sub-Total	**16,309**	**18,986**	**2,677**
Northern Delaware Co.	Ashley	209	308	99
	Brown Township	564	1,871	1,307
	Marlboro Township	217	355	138
	Oxford Township	565	781	216
	Troy Township	2,220	5,021	2,801
	Sub-Total	**3,775**	**8,336**	**4,561**
Southern Delaware Co.	Columbus	1,834	2,458	624
	Delaware	34,199	58,331	24,132
	Powell	10,300	14,762	4,462
	Delaware Township	2,415	7,797	5,382
	Liberty Township	9,219	30,423	21,204
	Orange Township	5,953	18,112	12,159
	Sub-Total	**63,920**	**131,883**	**67,963**
Franklin Co.	Columbus	183,024	199,334	16,310
	Grandview Heights	1,921	1,997	76
	Upper Arlington	12,482	13,726	1,244
	Worthington	13,631	15,684	2,053
	Riverlea	562	584	22
	Clinton Township	1,503	1,550	47-
	Perry Township	3,850	4,238	388
	Sharon Township	2,992	3,413	421
	Sub-Total	**219,965**	**240,526**	**20,561**
Watershed Total		**303,969**	**399,731**	**95,762**

Population Growth

Portions of the Olentangy Watershed are expected to experience strong population growth over the next 25 years. The population of southern Delaware County within the Olentangy Watershed is projected to more than double, from roughly 64,000 residents to more than 130,000 by 2035. This high growth section of the Olentangy Watershed overlaps the portion of the stream that is a state-designated scenic river with an exceptional warm water habitat designation. Careful planning and conservation coordination among communities will be necessary to accommodate population growth while also maintaining the water quality and scenic nature of the river.

The table on this page shows the projected population changes within the Olentangy watershed for all the jurisdictions in the OWPP. The data is also organized to show growth trends across different segments of the watershed. While population growth is expected in most OWPP communities, the trend will be most pronounced in Delaware 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 available data.

Sanitary Sewer Infrastructure

To protect water quality and promote the efficient use of infrastructure, future development should be prioritized in areas that will have access to sanitary sewer service 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.

FRANKLIN COUNTY

The City of Columbus's efforts to address combined sewer overflow will continue out to 2045. This effort is intended to reduce negative environmental effects of combined sewer overflow and to improve the water quality of our streams. The city will readily pursue cost-effective and efficient means to address stormwater issues when available, including green infrastructure, and the Department of Public Utilities is consistently seeking ways to improve its wet weather plan over time.

DELAWARE COUNTY[10]

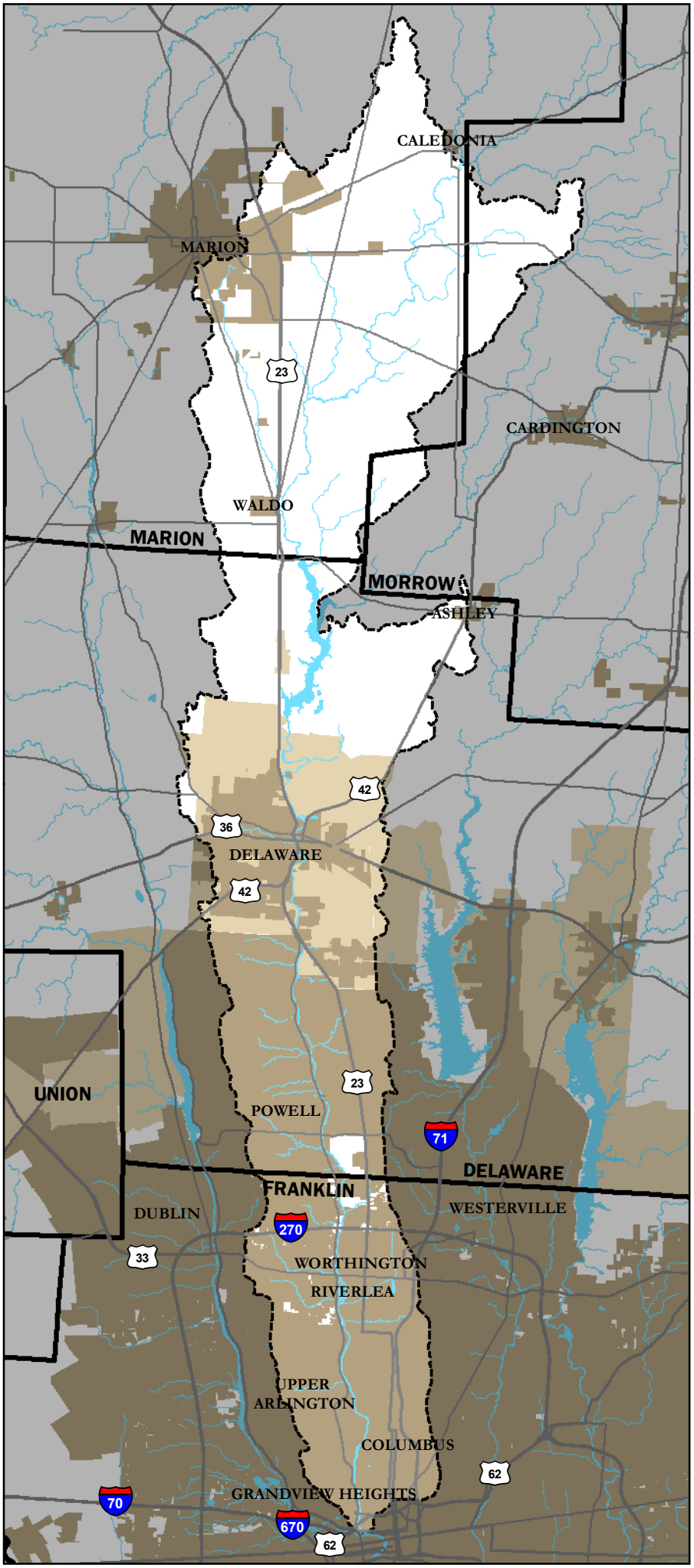
With slow growth to the north of the City of Delaware in Delaware County, some unresolved sewer service boundaries exist. The City of Delaware is planning for its sewer system boundary to coincide with that of its water service boundary and does not plan to go beyond those boundaries. The county is also host to a number of land application systems in the I-71 and State Route 36/37 area with the newest projects located at the North Star Development and near the Bent Tree Golf Course Community. The Village of Ashley in Delaware County recently completed a sewer master plan and is upgrading the storm sewers on the village's east side.

MARION COUNTY

The area along State Route 95 and east of U.S. 23 has been identified as an expected growth area that is planned to be served by sewer. The Richland Road wastewater treatment plant in Marion County has been identified for possible expansion to treat areas currently served by package plants, with notable potential impacts to nearby Graves Creek, a tributary of the Olentangy.

The Village of Waldo is developing a wastewater treatment plant that is currently in the design stage. This plant will eliminate a significant cluster of failing home sewage treatment systems (HSTS) that are an identified cause and source of impairment to the Olentangy River. This plant will discharge into the Olentangy River north of Delaware Lake.

[10] Personal communication with David Rutter, MORPC Watershed Coordinator. (2011).



Olentangy Watershed

Sewer Service Areas

Legend

- Outside Planning Area
- County Boundary
- Water
- OWPP Watershed Area
- Current Sewer Service Area
- Future Sewer Service Area
- Major Road

0 4 8 Miles

N

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\Olentangy Balanced Growth\Maps for OWPP Document\Olentangy_SSAs.mxd
November 2011

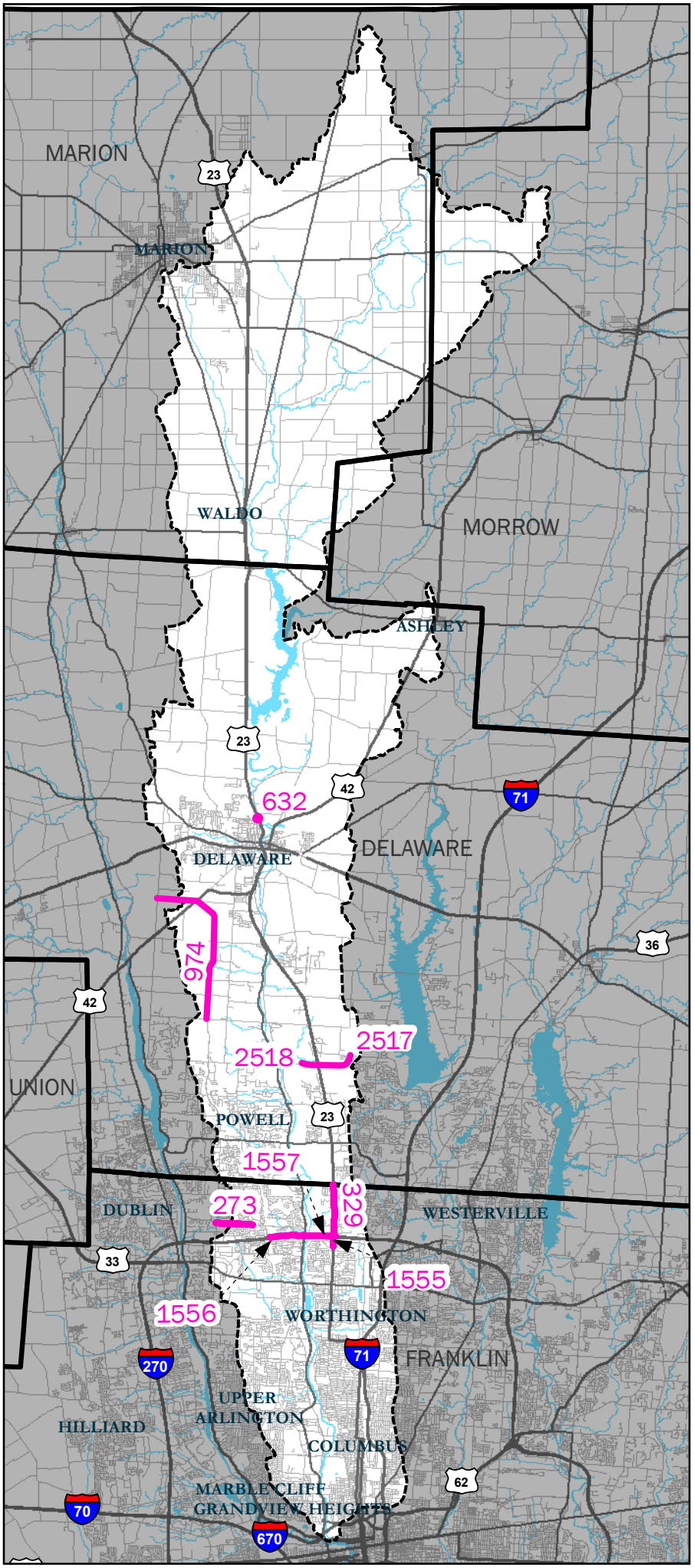
Transportation

MORPC is the Metropolitan Planning Organization (MPO) for Columbus and some of its suburbs. This means that MORPC is responsible for carrying out a continuous, cooperative, and comprehensive (3 C) 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 Olentangy Watershed planning area, the TIP for Marion and Morrow counties is prepared by ODOT District 6. The most recent TIP for both the MORPC MPO and ODOT District 6 includes projects scheduled for Fiscal Years 2012-2015 (July 1, 2012 – June 30, 2015). The following table provides a list of major transportation projects that are planned for the Olentangy Watershed through June 30, 2015.

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

MORPC ID	Project Description	Total Project Costs
273	Hard Rd Phase A from Sawmill Rd to Smoky Row Rd, Major Widening/Bicycle Lanes from 2 to 5 lanes	$14,174,000
329	US 23 (N High St) from north of Flint Rd to Lazelle Rd, Major Widening from 5 to 7 lanes	$6,065,000
632	US-23 at Pennsylvania Ave, Interchange Modification to allow full access to/from all directions.	$2,850,000
974	Sawmill Pkwy Extension from Hyatts Rd to Section Line Rd, New Roadway/Multi-Use Path, 4 lanes, plans include roundabouts at sic intersections.	$57,623,000
1555	US-23 from Wilson Bridge Rd to North Woods Blvd, Major Widening/Bridge Replacement from 4 to 6 lanes, North Central Outerbelt Study: Construction Project #4 (B & B1). Construction of two NB express lanes, replacement and widening of US-23 over IR-270 bridge, realign York Temple Rd to tie into West Campus View Blvd.	$109,405,000
1556	I-270 from 1.1 mi W of SR-315 to 0.7 mi E of US-23, Major Widening/New Bridge, North Central Outerbelt Study: Construction Project #5 (C). Reconfigure I-270 EB. Work on mainline SR-315. New structures.	$54,120,000
1557	I-270 from SR-315 to 0.7 mi E of US-23, Major Widening. North Central Outerbelt Study: Construction Project #6 (D). Reconfigure I-270 WB.	$46,640,000
2517	Home Rd extension from US-23 to Lewis Center Rd east of NS RR, New Roadway, 2 lanes, includes grade separation at NS RR. DCEO CIP # 0843 and 0846.	$13,300,000
2518	Home Rd at west of US-23, New Roadway/Realignment, 2 lanes, relocate intersection and approach from the west to the south.	$4,000,000



Olentangy Watershed

Major Transportation Projects

Legend

- Transportation Projects
- Outside Planning Area
- OWPP Watershed Area
- County Boundary
- Road
- Water

0 4 8 Miles

N

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\Olentangy Balanced Growth\Maps for OWPP Document\Major Transportation Projects.mxd
November 2011

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 C) will be available to encourage communities to make land use decisions that are consistent with their locally designated Priority Areas.

The OWPP 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 Olentangy Watershed Balanced Growth Plan:

Priority Conservation Area: 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: 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 (see page 4 for goal).

Priority Agricultural Area: 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.

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 and even single parcels 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.

Criteria

The Priority Area maps are the result of both a watershed-wide technical analysis of objective criteria and a localized iterative review process. The OWPP 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 OWPP 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. The initial criteria analysis was conducted at the parcel level. This process resulted in entire parcels initially being highlighted as potential priority areas. Through two rounds of local review, OWPP communities adjusted and refined these Priority Areas. Some communities aligned Priority Areas to features within or across multiple parcels, like streams or wetlands. MORPC assisted communities through this process.

The following section describes the criteria that were selected to initially highlight Priority Areas across the watershed. A technical description of the OWPP adopted criteria, including all data sources and weighting, is included in the Appendix.

PCA CRITERIA

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 the 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

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. This data would capture both existing parkland and also land that is planned

or zoned to be used as a park in the future. 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. These areas provide valuable ecosystems services which are costly and difficult to replicate if their natural functions are reduced or inhibited through land use change.

PDA CRITERIA

Arterial Roads

Close proximity to an arterial road 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 OWPP 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 Olentangy watershed are not well suited for use as septic tank absorption fields, requiring additional controls on traditional home septic systems to ensure water quality.

Enterprise Zone

Enterprise Zones (EZ) are locally designated areas that are considered to be appropriate for business development. Businesses that relocate to an EZ may receive tax benefits in exchange for job creation. The requirements for designation and rules governing EZs vary depending upon whether the zone is located in an area that is considered economically distressed. The OWPP included EZs on the Priority Development Area criteria list because these locations have already been locally targeted for development efforts.

Railroad

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

PAA CRITERIA

Agricultural Districts

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 OWPP 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.

Prime Farmland

For the PAA criteria, the OWPP 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 USDA. 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 OWPP included parcels greater than or equal to 50 acres in the PAA analysis. Larger tracts of farmland are eligible for more farmland preservation programs. Also, agricultural land that has been subdivided could more easily convert to low density residential land use in the future and result in potential land use compatibility issues.

Identifying the Priority Areas

While the Olentangy planning area is 294 square miles, the analysis area for this project is 370 square miles because several OWPP 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 Olentangy 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 27 jurisdictions. The OWPP adopted the Priority Area criteria list and weighting in July 2010. In January 2011, MORPC distributed draft Priority Area maps to each of the watershed communities. MORPC held meetings in the Cities of Marion, Delaware, and Columbus 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 attend township trustee meetings and village council meetings, as well as meet with individuals or groups of staff, to present the draft maps and work through the local review process with the communities.

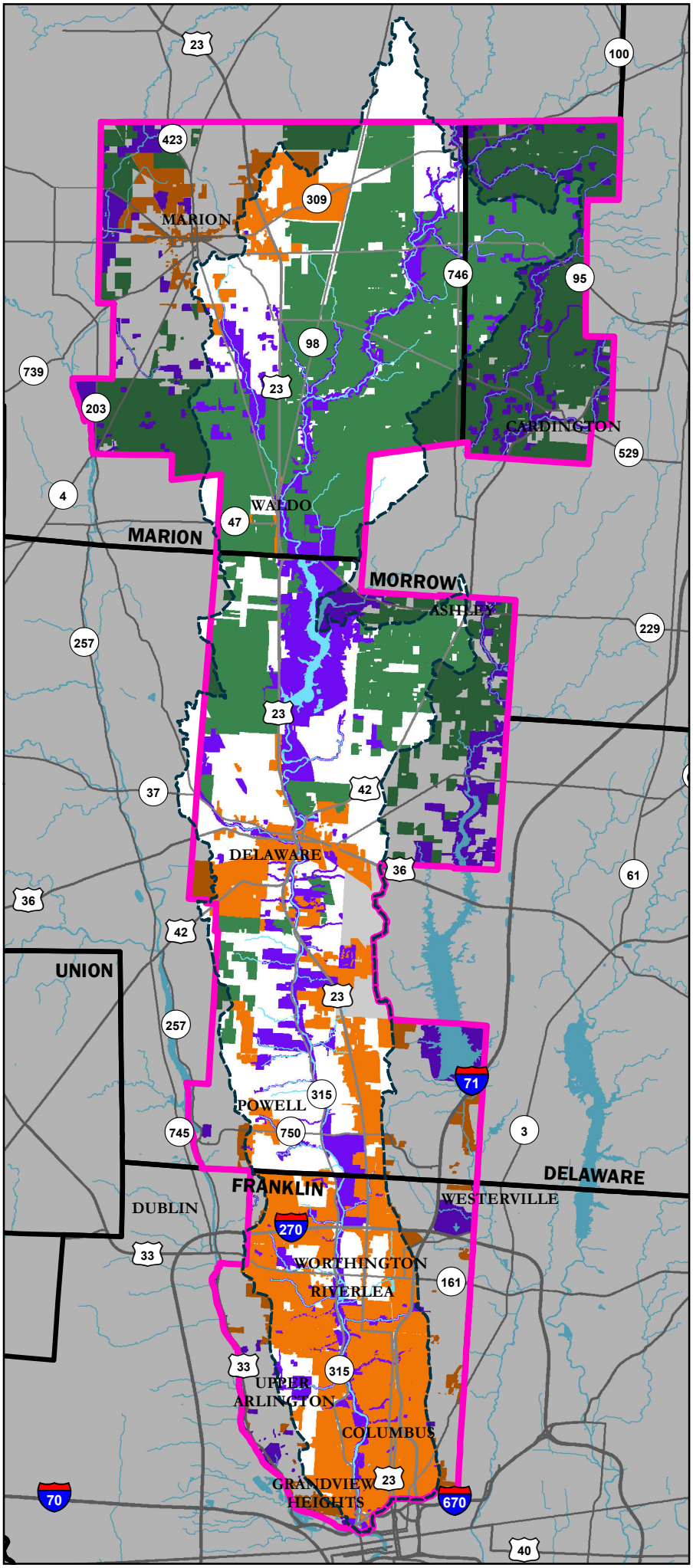
MORPC also provided draft maps to stakeholders and facilitated discussions about Priority Areas between stakeholders and jurisdictions when requested. Following a detailed review of the first round of draft maps, MORPC incorporated the suggested changes and distributed a second round of maps for review.

One of the key issues that was discussed during the initial review process was the desire, on the part of the OWPP jurisdictions, for more of the Olentangy River and its tributaries to be reflected as Priority Conservation Areas. Due to several factors related to the method of analysis initially used, the weighted criteria did not always result in land in critical areas, like floodplains, being shown as PCA initially. At a partnership meeting in April 2011, the partners present specifically requested that the second round of maps show the 100-year floodplain as a hatched layer over the designated Priority Areas so that communities could decide if they would like to add this land into their PCAs if it was not already included. MORPC continued to work with the OWPP communities, as needed, to finalize the Priority Area maps that are included in the next section.

OLENTANGY WATERSHED PRIORITY AREA MAPS

Olentangy Watershed

Priority Area Designations



Legend

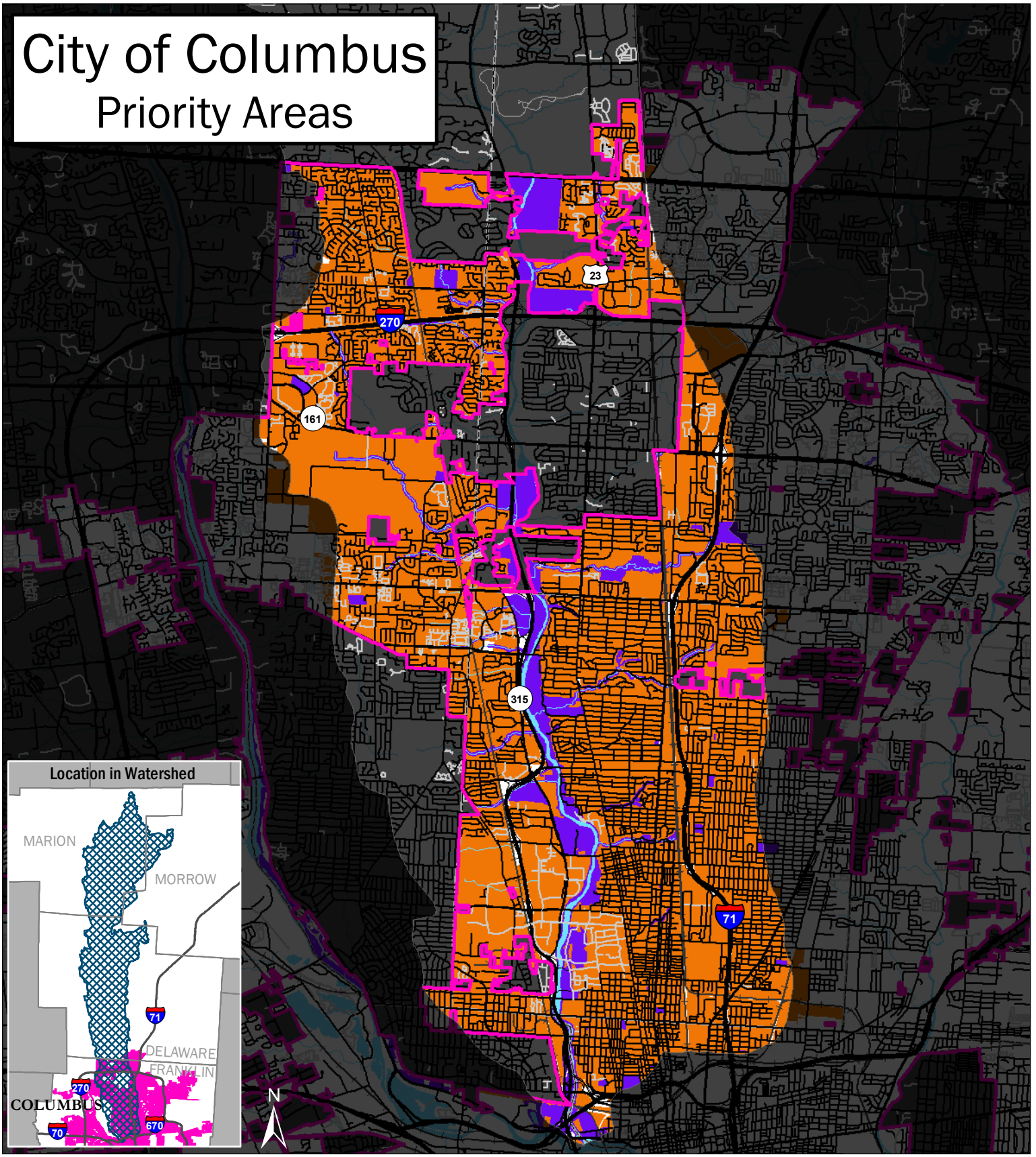
- Major Roads
- County Boundary
- Analysis Area
- OWPP Watershed Area
- Outside Planning Area
- Water
- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area

0 4 8 Miles

N

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\Olentangy Balanced Growth\Maps for OWPP Document\OWPP.mxd
January 2012

City of Columbus
Priority Areas



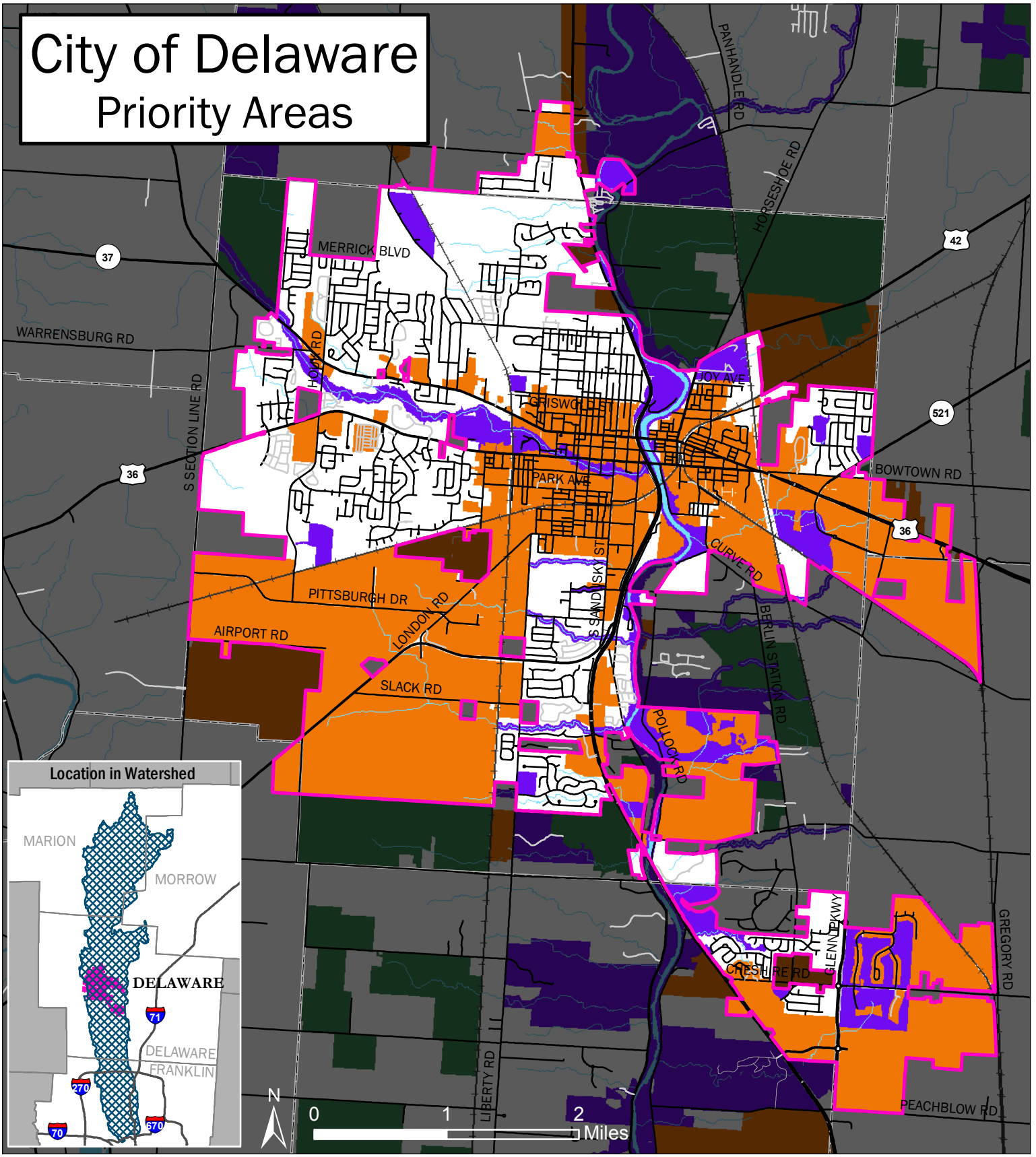
0 1.5 3 Miles

Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction or Watershed
- Township Boundary
- County Boundary
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\Columbus.mxd
September 2011

City of Delaware
Priority Areas

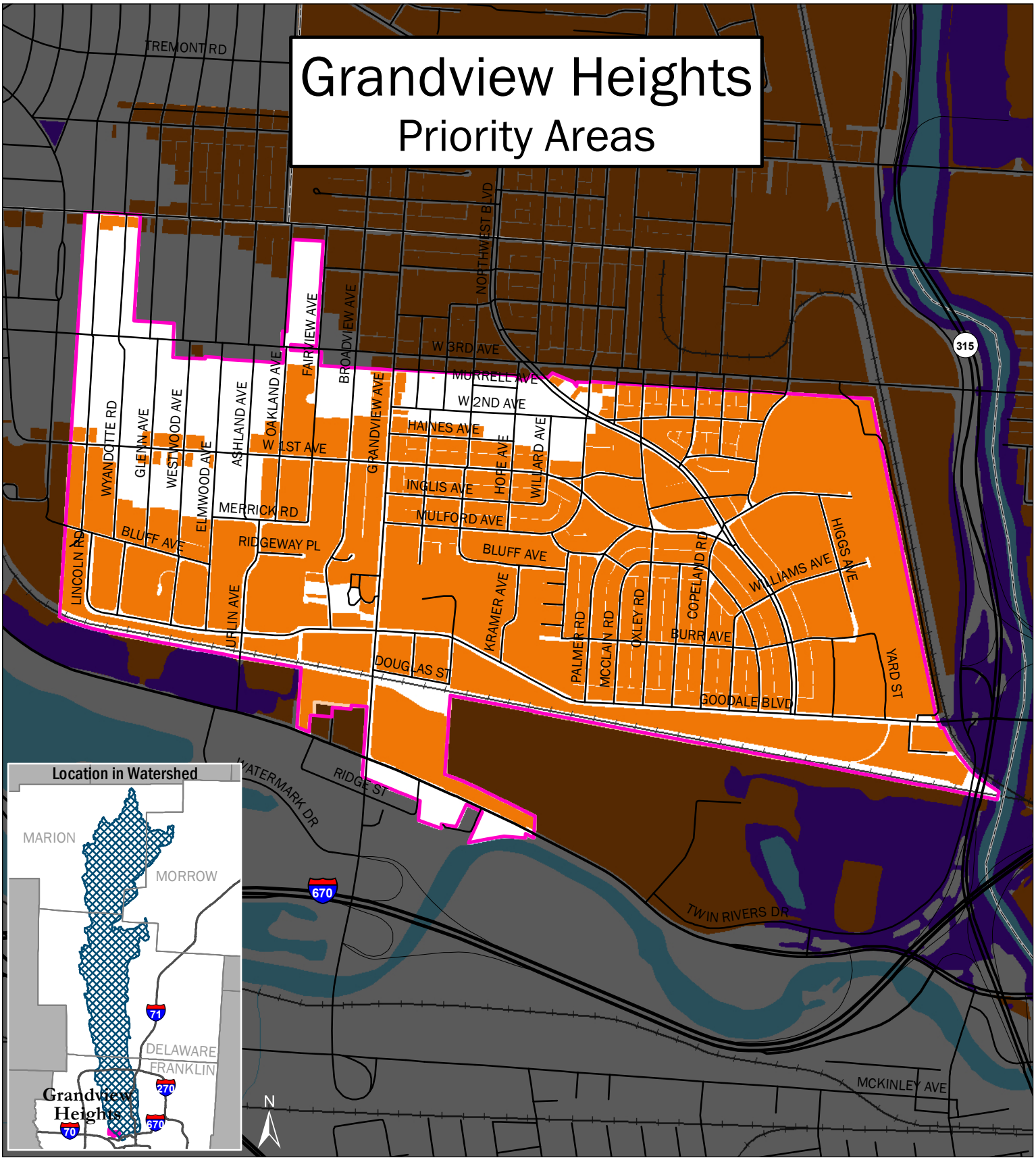


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Township Boundary
- Outside the Jurisdiction
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\CityofDelaware.mxd
November 2011

Grandview Heights
Priority Areas



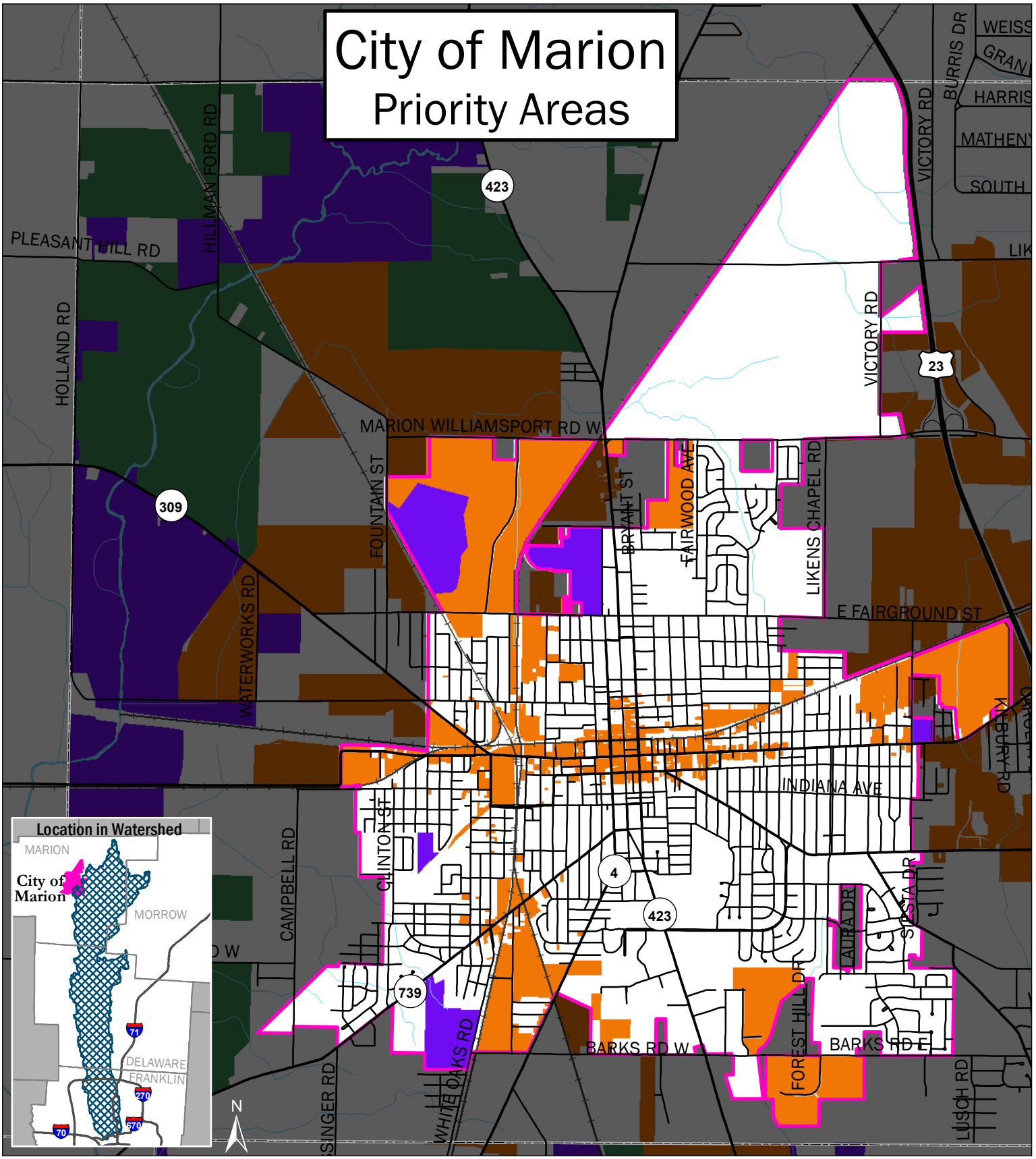
0 0.25 0.5 Miles

Legend

- Jurisdiction
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\GrandviewHeights.mxd
November 2011

City of Marion
Priority Areas

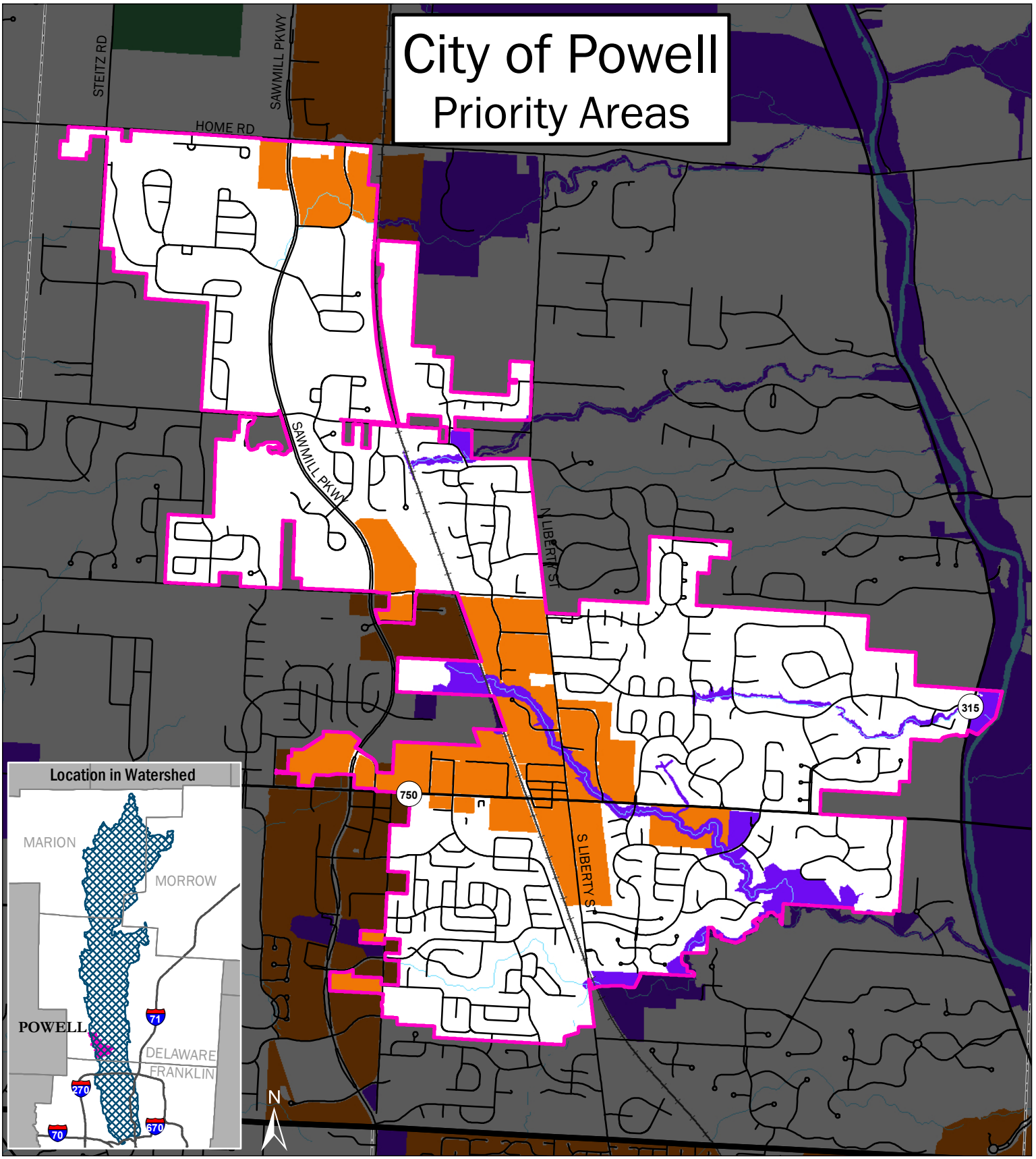


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\CityofMarion.mxd
September 2011

City of Powell
Priority Areas

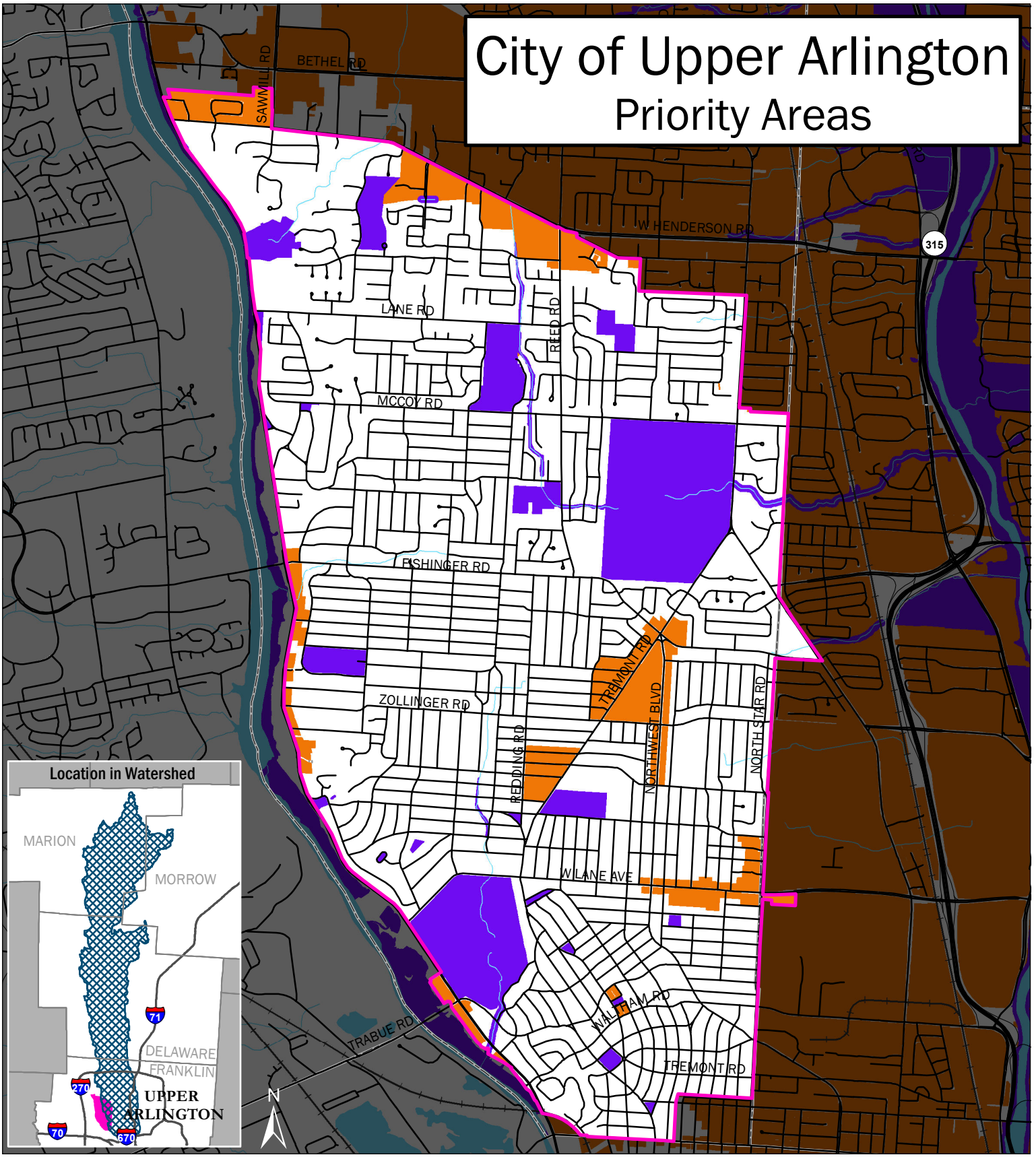


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\CityofPowell.mxd
September 2011

City of Upper Arlington
Priority Areas

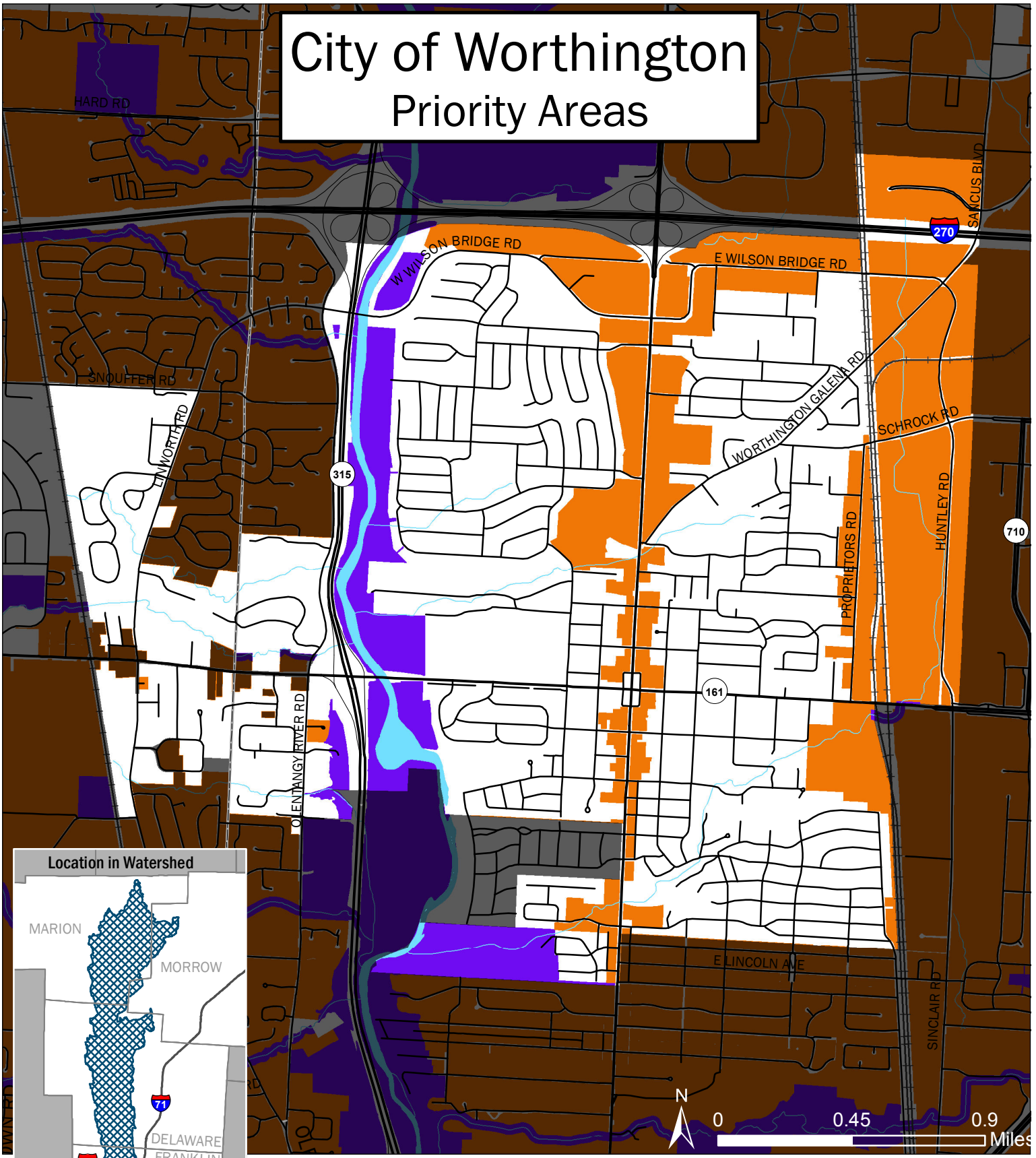


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\CityofUpperArlington.mxd
September 2011

City of Worthington
Priority Areas

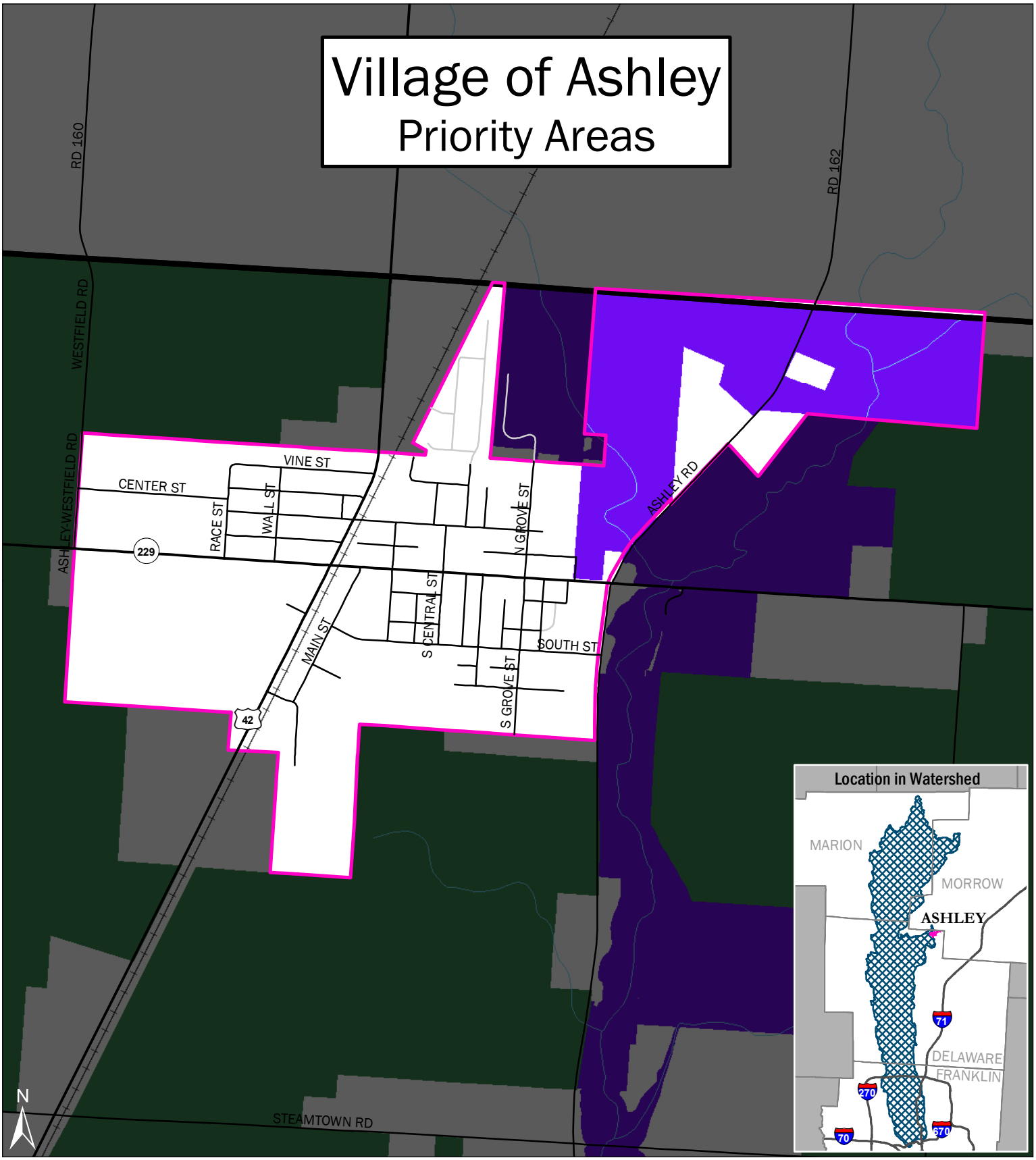


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\CityofWorthington.mxd
February 2012

Village of Ashley
Priority Areas



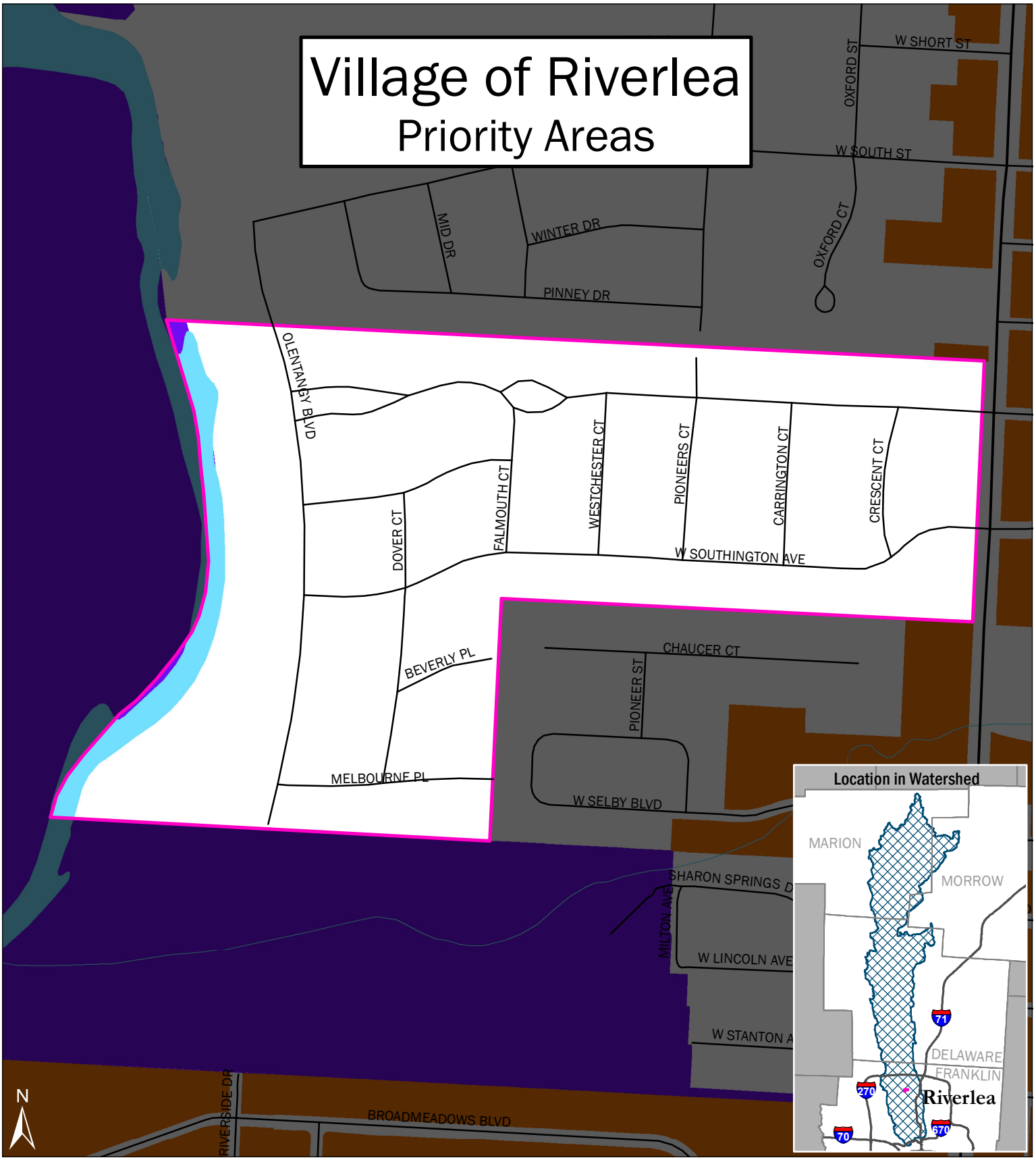
0 0.2 0.4 Miles

Legend

- Jurisdiction
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- River
- Stream
- Railroad
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\VillageofAshley.mxd
September 2011

Village of Riverlea
Priority Areas



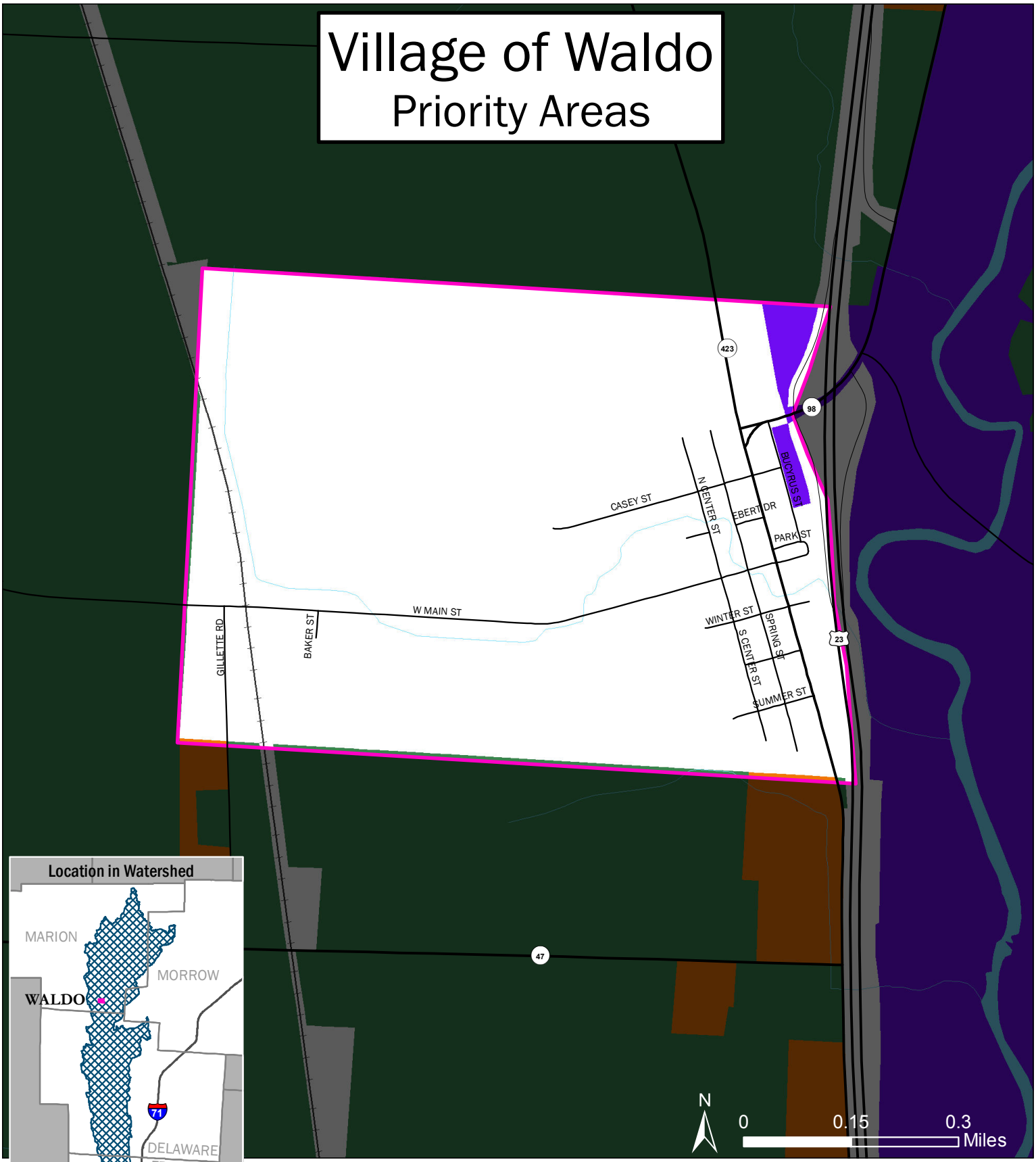
0 0.095 0.19 Miles

Legend

- Jurisdiction
- Outside the Jurisdiction
- River
- Stream
- Road

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\Olentangy Balanced Growth\Maps for OWPP Document\VillageofRiverlea.mxd
September 2011

Village of Waldo
Priority Areas



Legend

- Jurisdiction
- Priority Conservation Area
- Outside the Jurisdiction
- River
- Stream
- Railroad
- Road

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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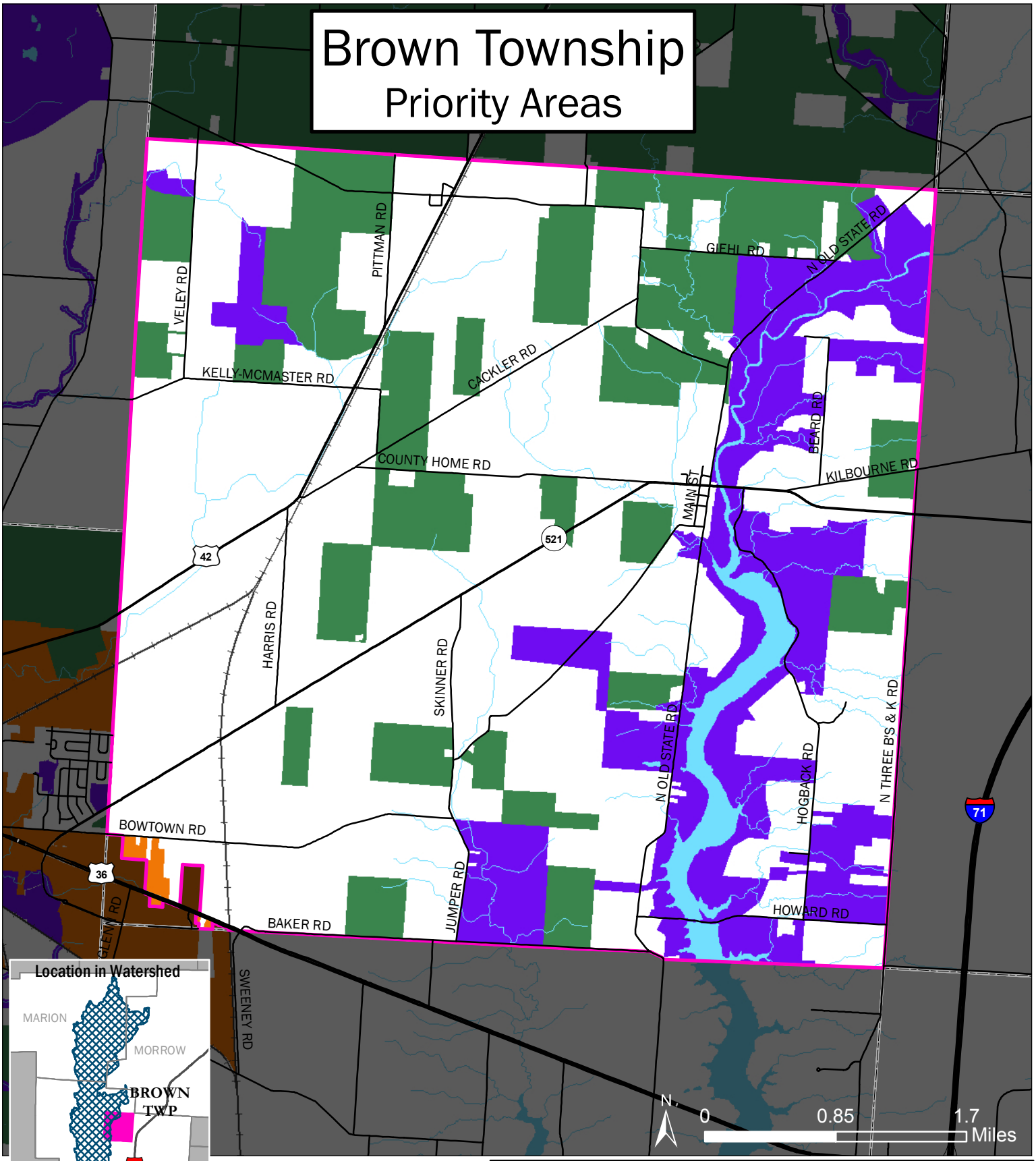
September 2011

Brown Township
Priority Areas



Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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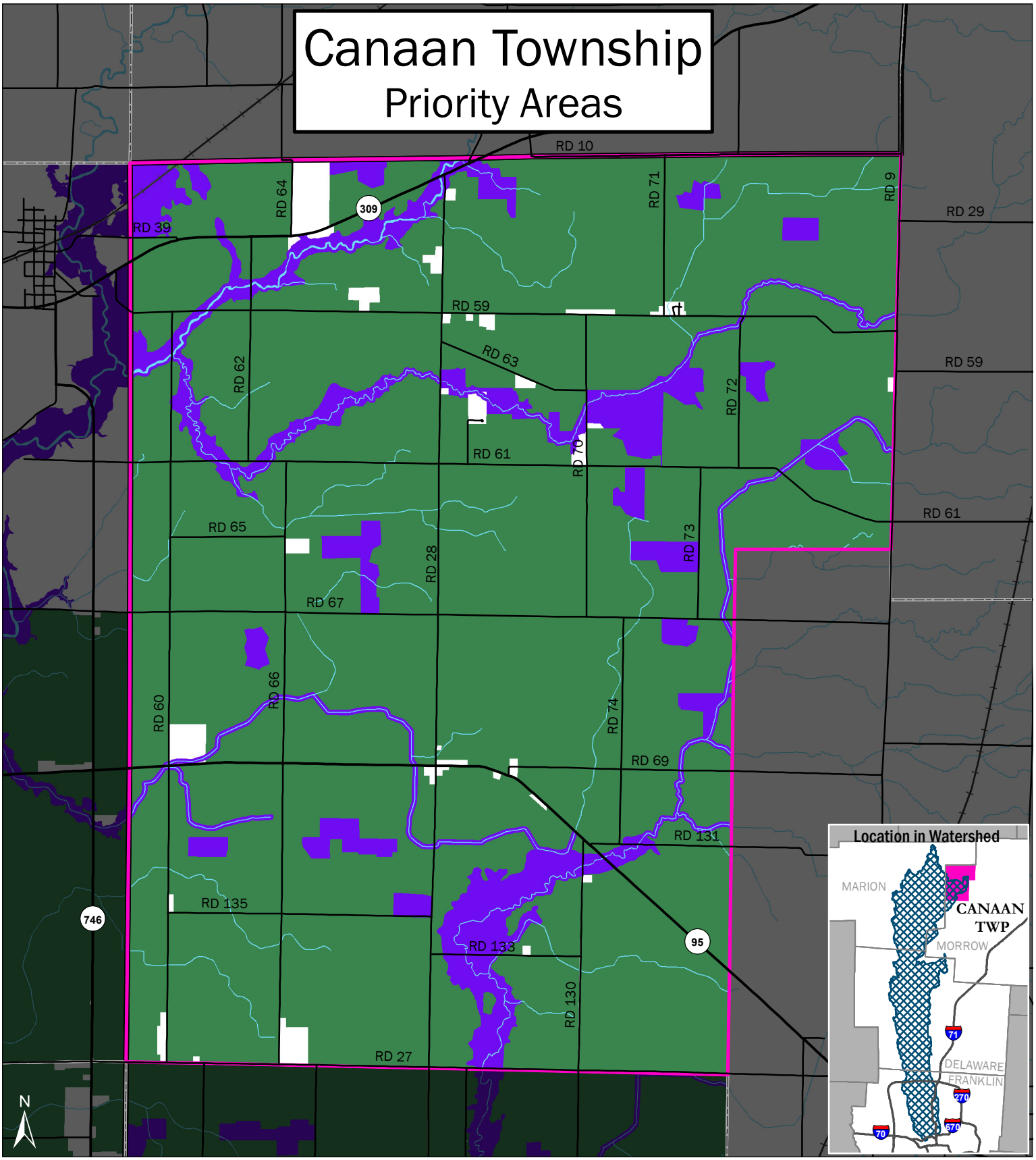
September 2011

Canaan Township
Priority Areas

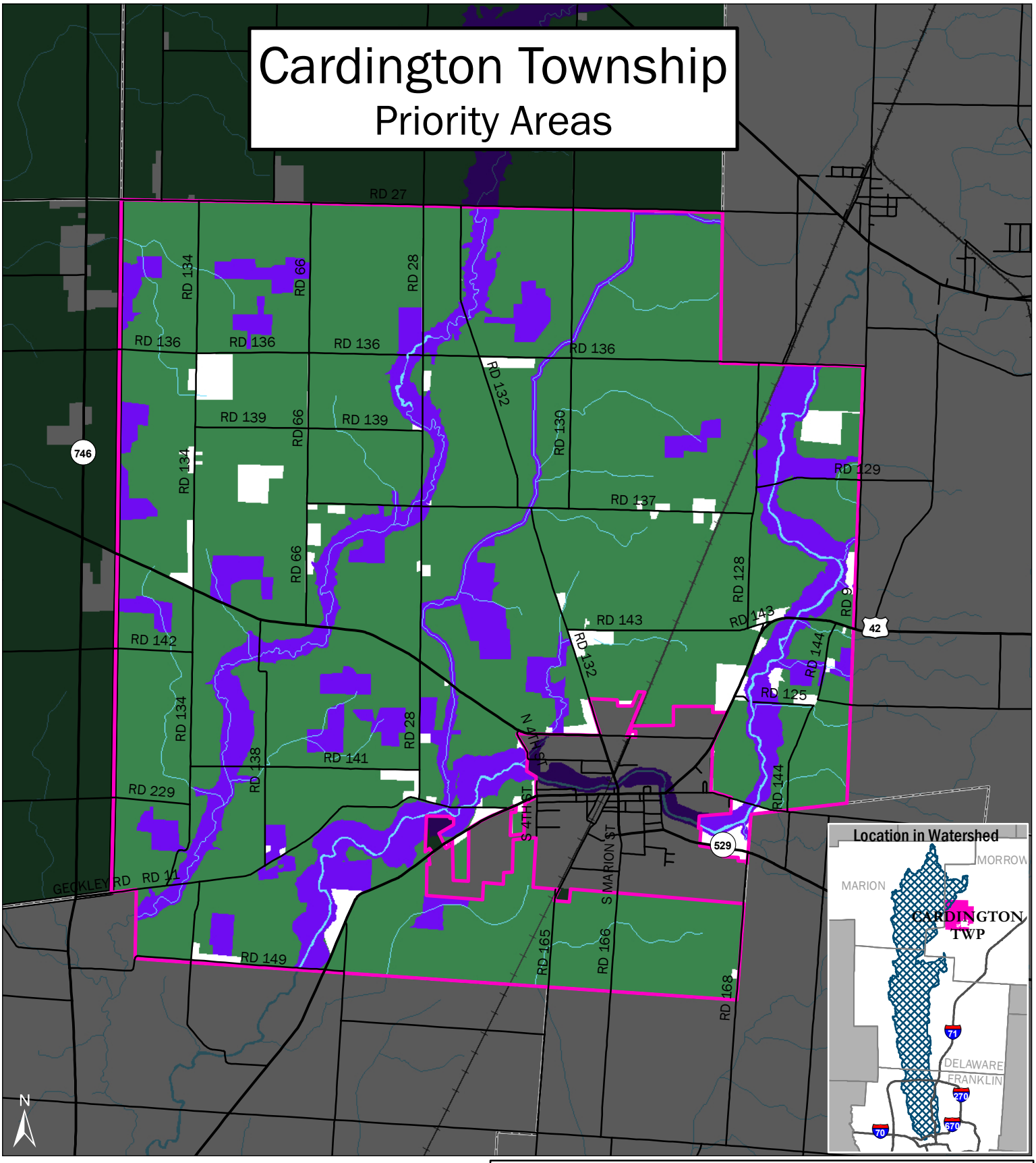


Legend

- Jursidiction
- Priority Agricultural Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\CanaanTWP.mxd
January 2012

Cardington Township
Priority Areas



Legend

- Jursidiction
- Priority Agricultural Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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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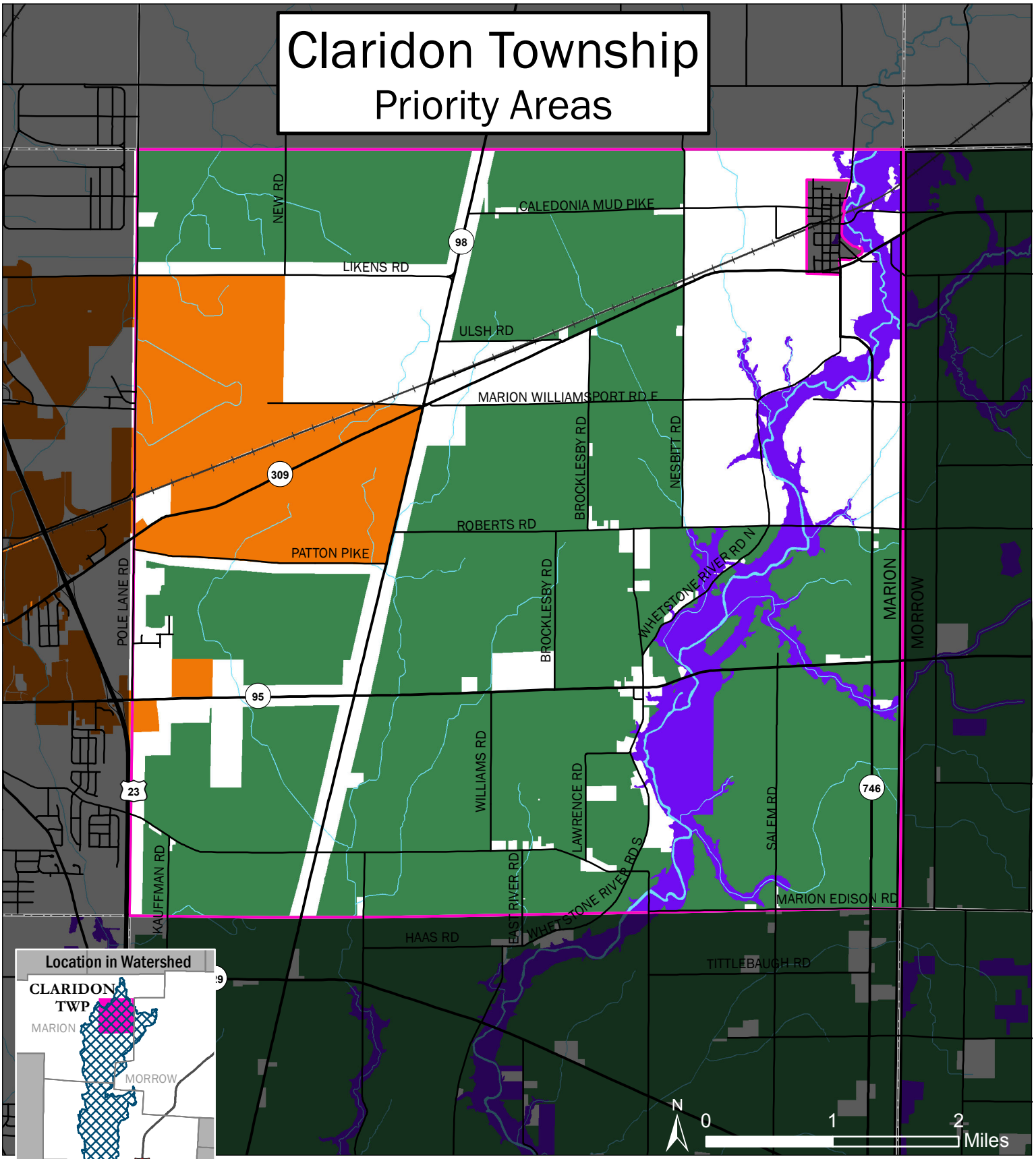
September 2011

Claridon Township
Priority Areas



Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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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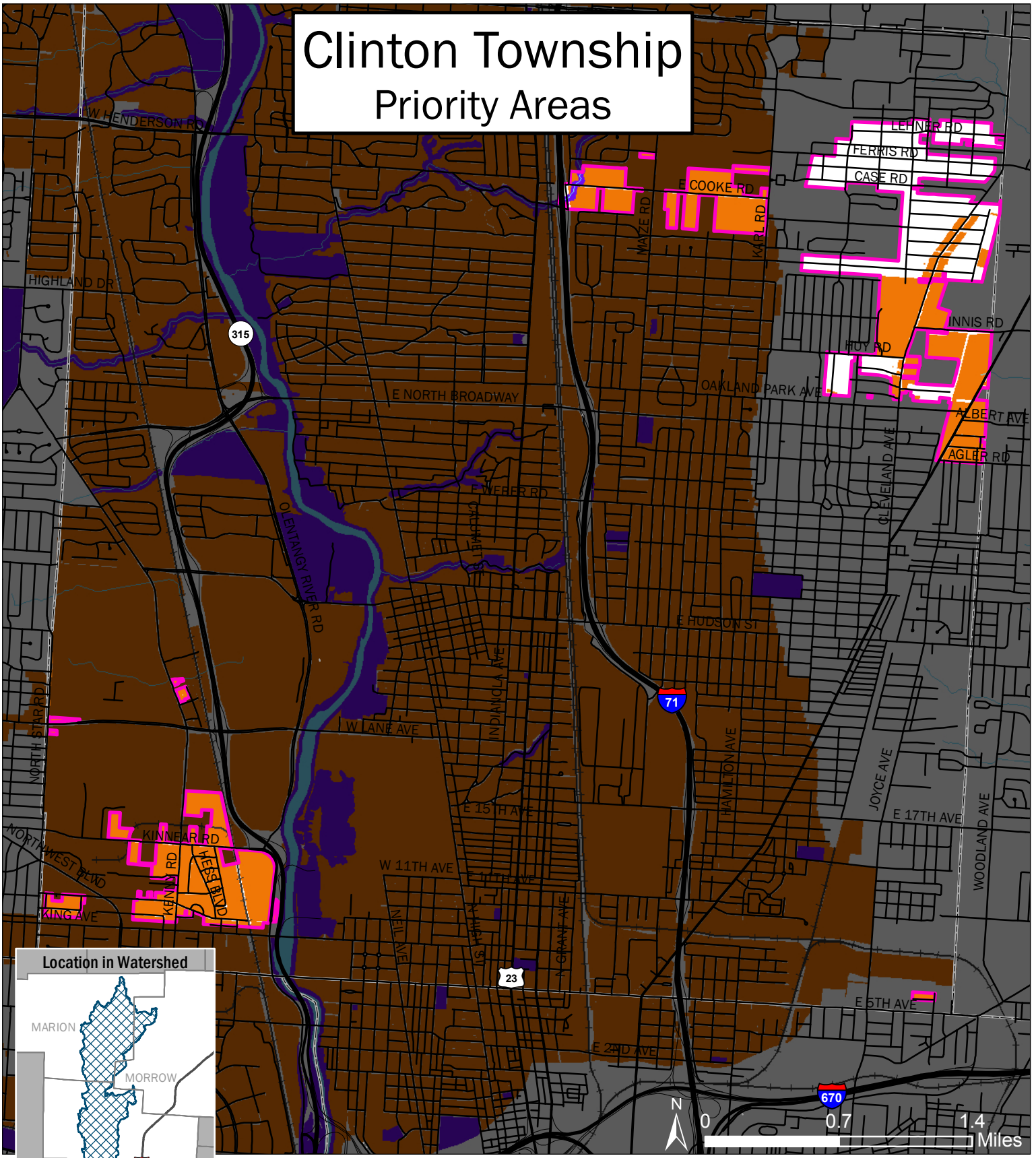
February 2012

Clinton Township
Priority Areas



Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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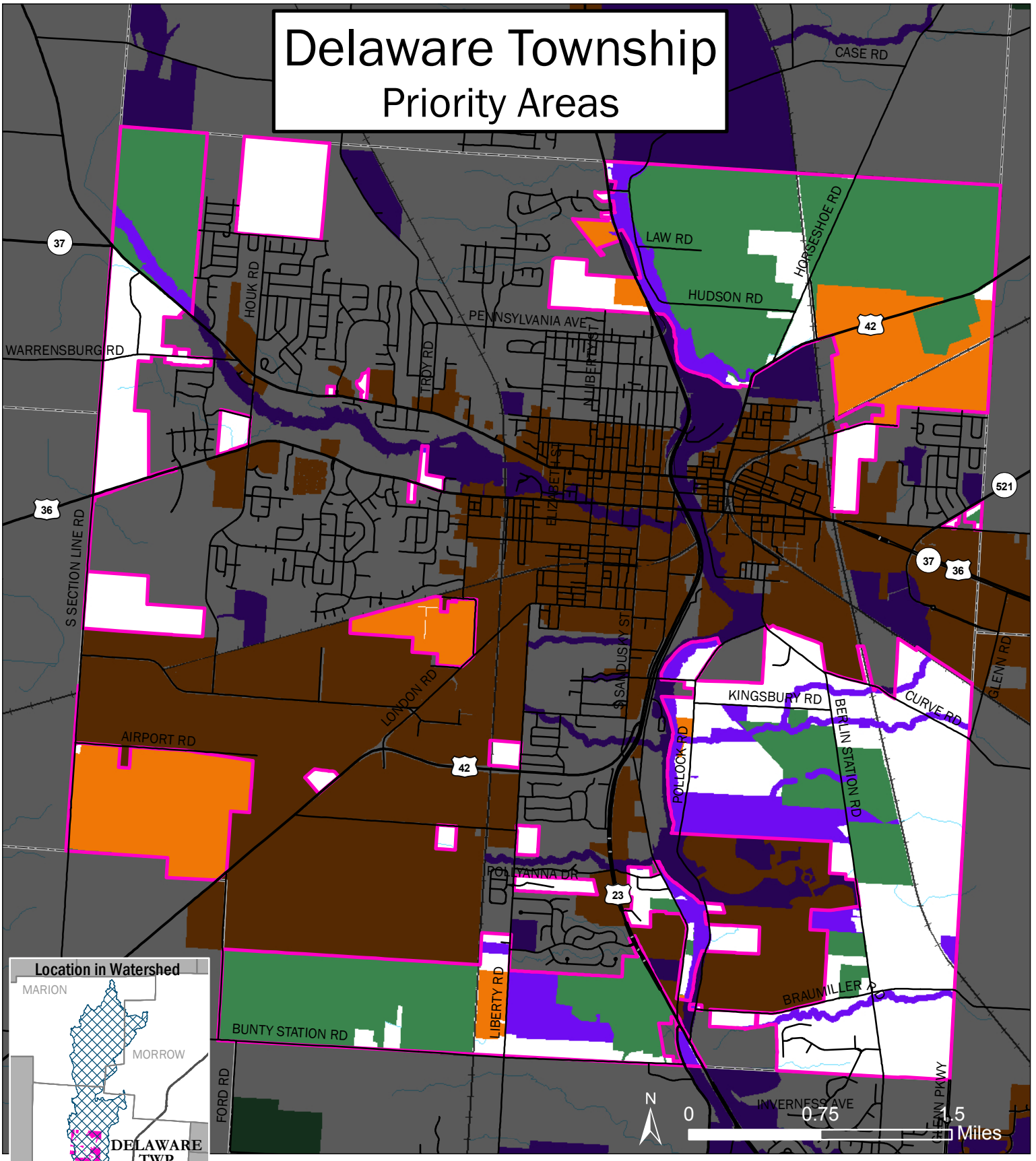
N:\ArcGIS\Center for Energy&Environs\Olentangy Balanced Growth\Maps for OWPP Document\ClaridonTWP.mxd
September 2011

Delaware Township
Priority Areas



Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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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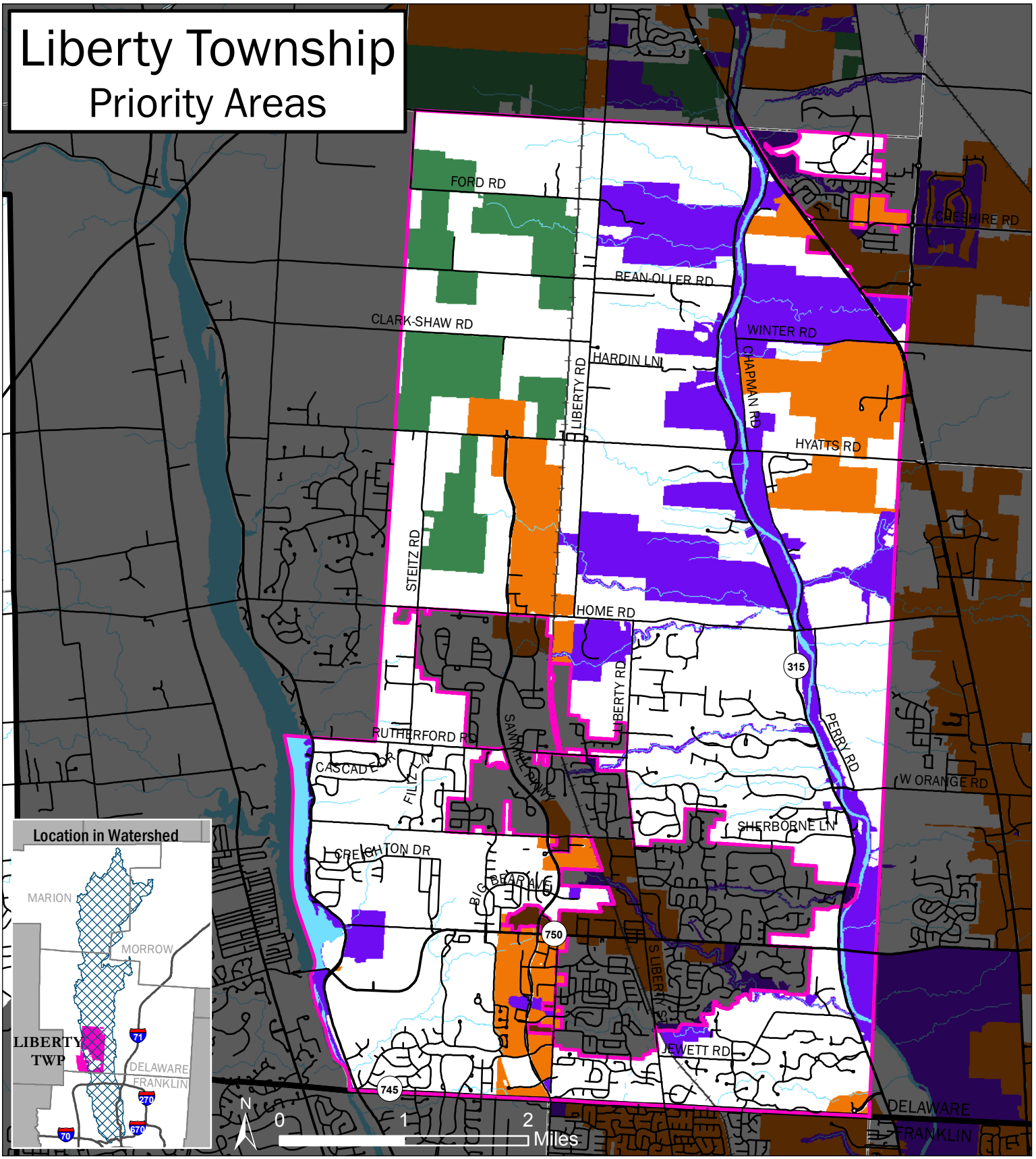
October 2011

Liberty Township
Priority Areas



Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Priority Agricultural Area
- Outside the Jurisdiction
- Township Boundary
- County Boundary
- River
- Stream
- Road
- Railroad

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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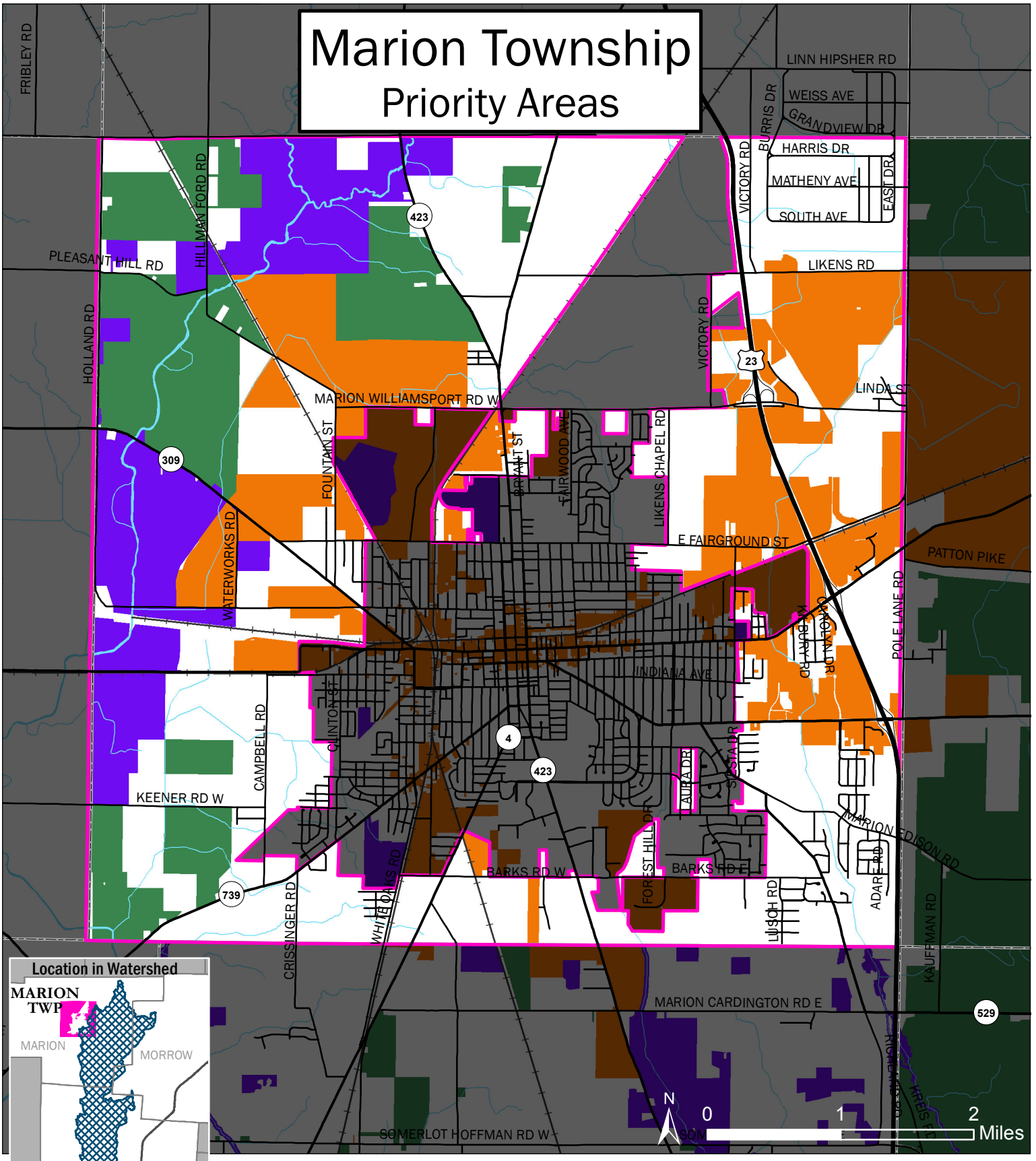
October 2011

Marion Township
Priority Areas

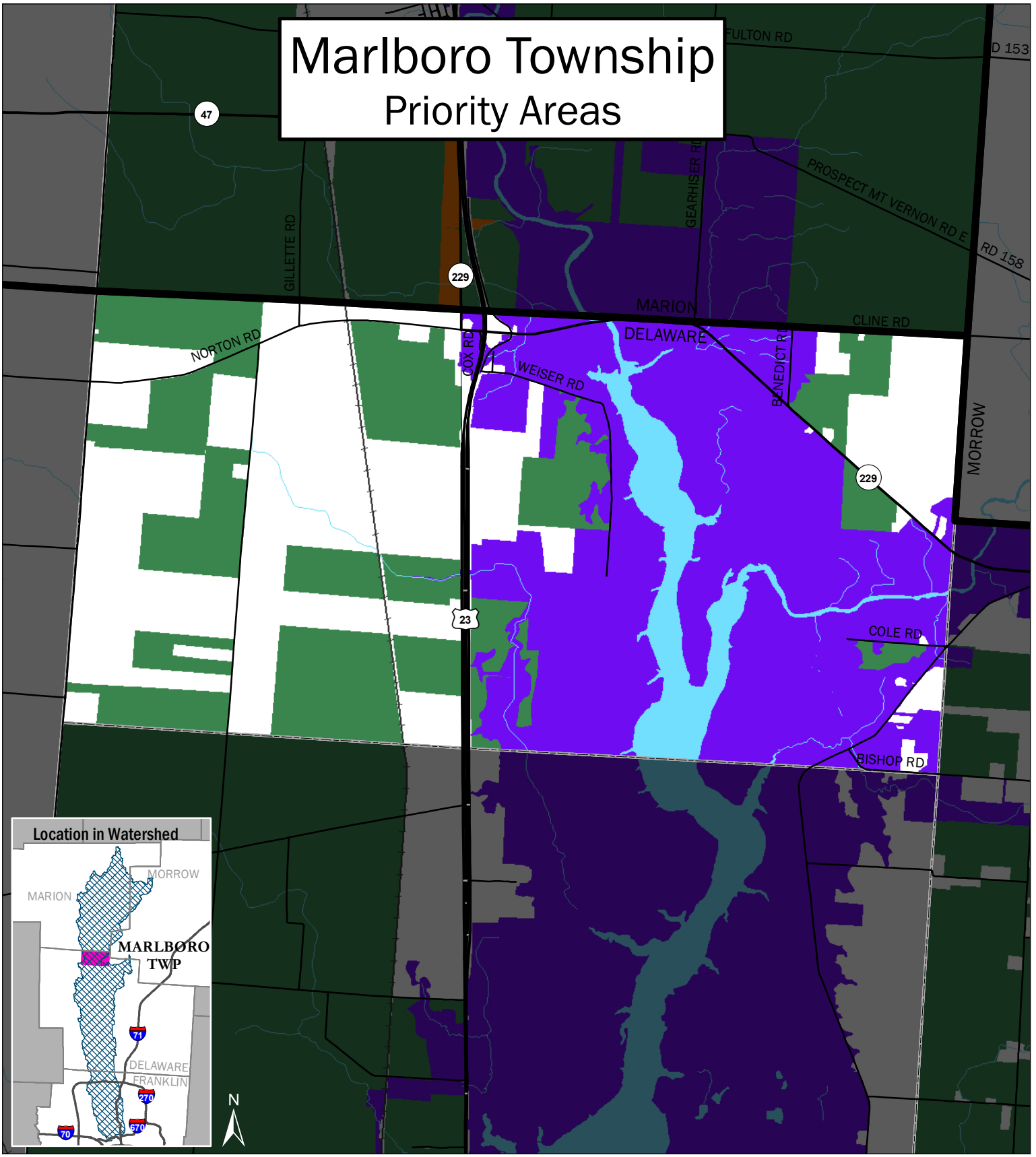


Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\MarionTWP.mxd
January 2012

Marlboro Township
Priority Areas



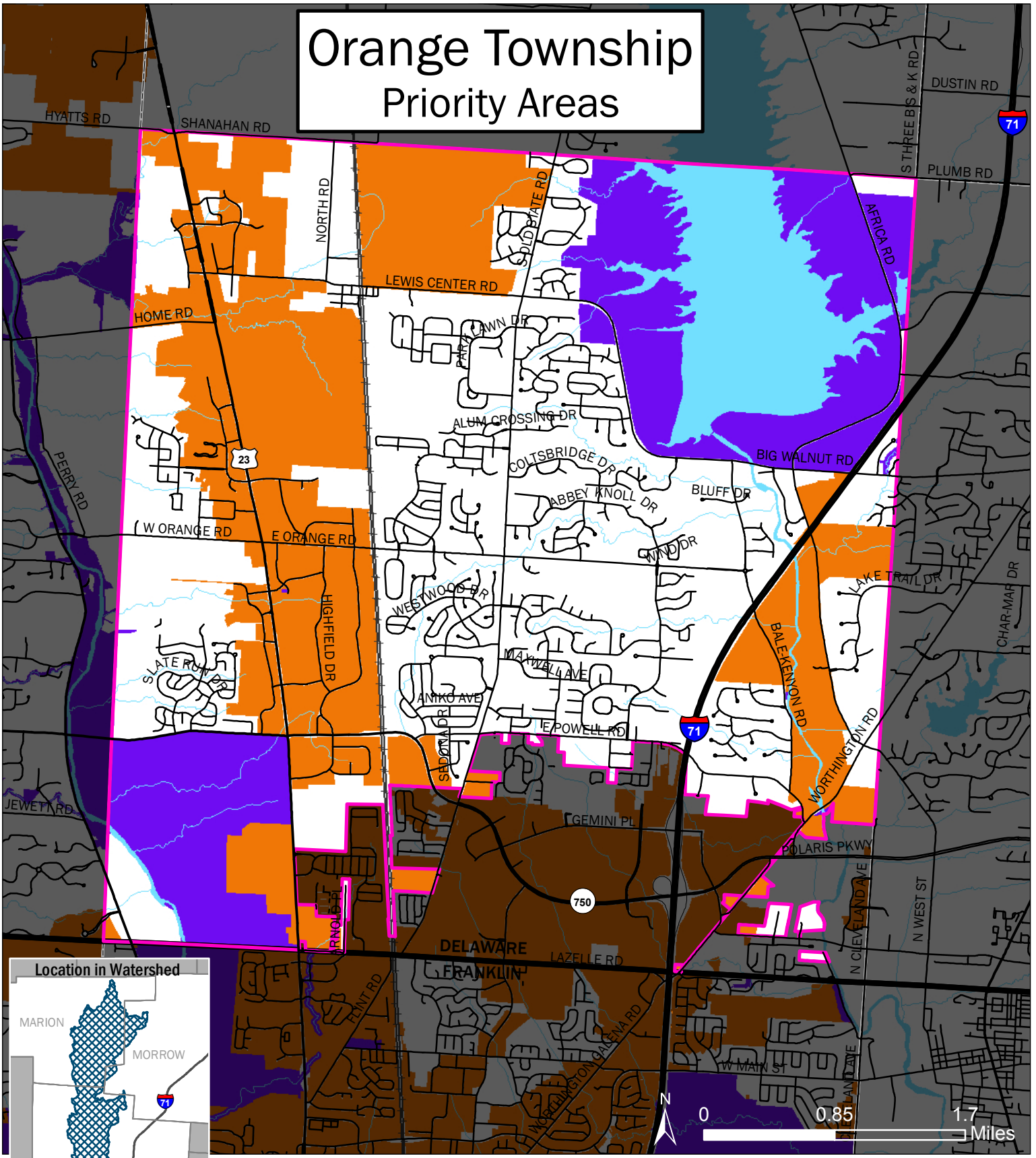
0 0.75 1.5 Miles

Legend

- Jurisdiction
- Priority Conservation Area
- Priority Agricultural Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\MarlboroTWP.mxd
October 2011

Orange Township
Priority Areas

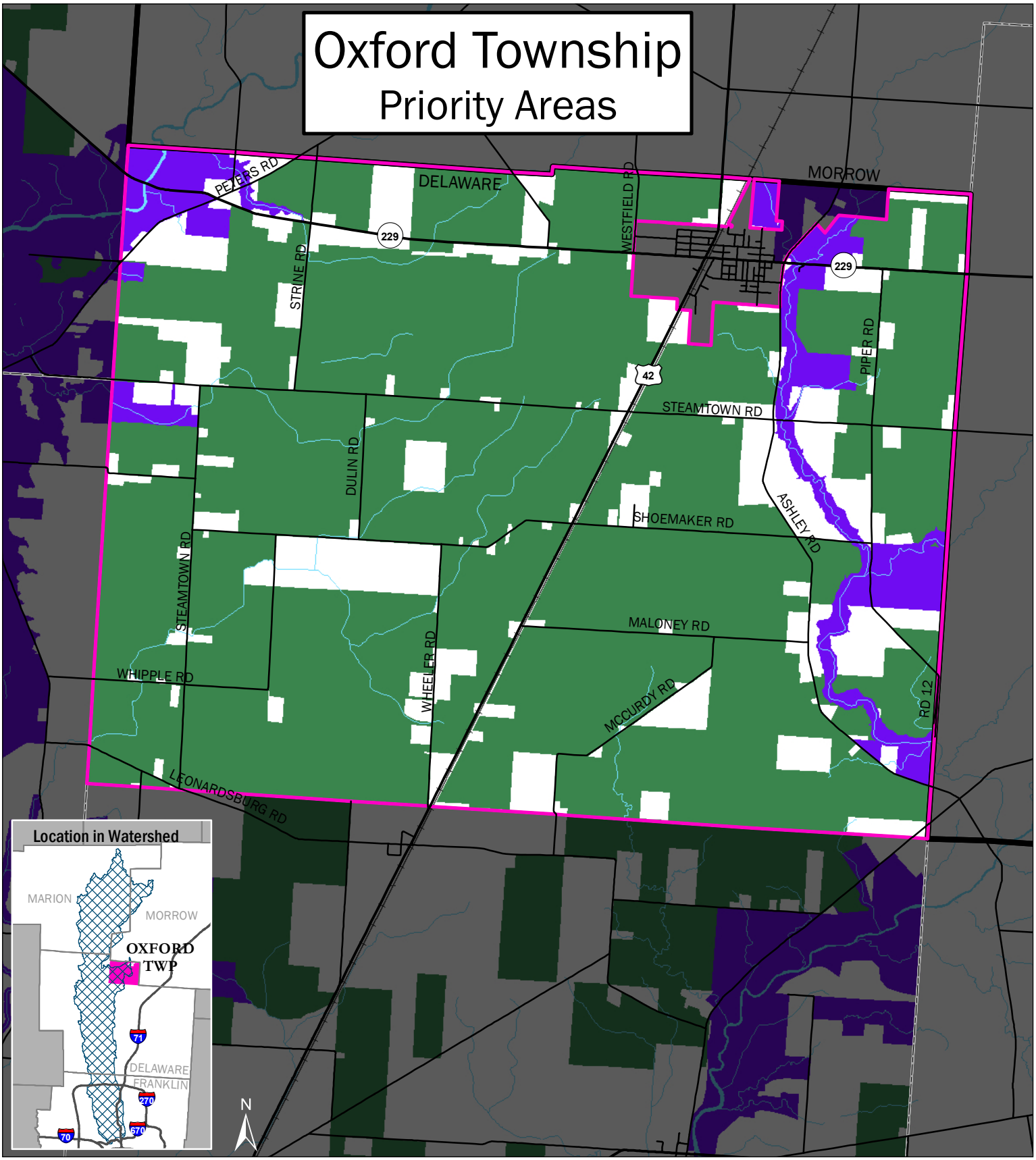


Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\OrangeTWP.mxd
October 2011

Oxford Township
Priority Areas



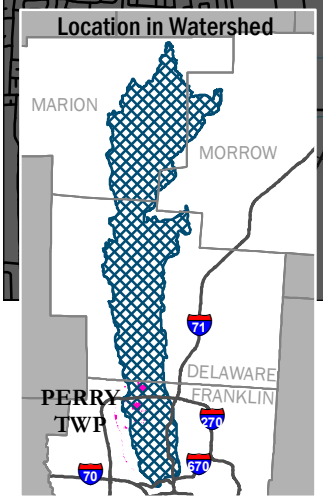
0 0.8 1.6 Miles

Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\OxfordTWP.mxd
October 2011

Perry Township
Priority Areas

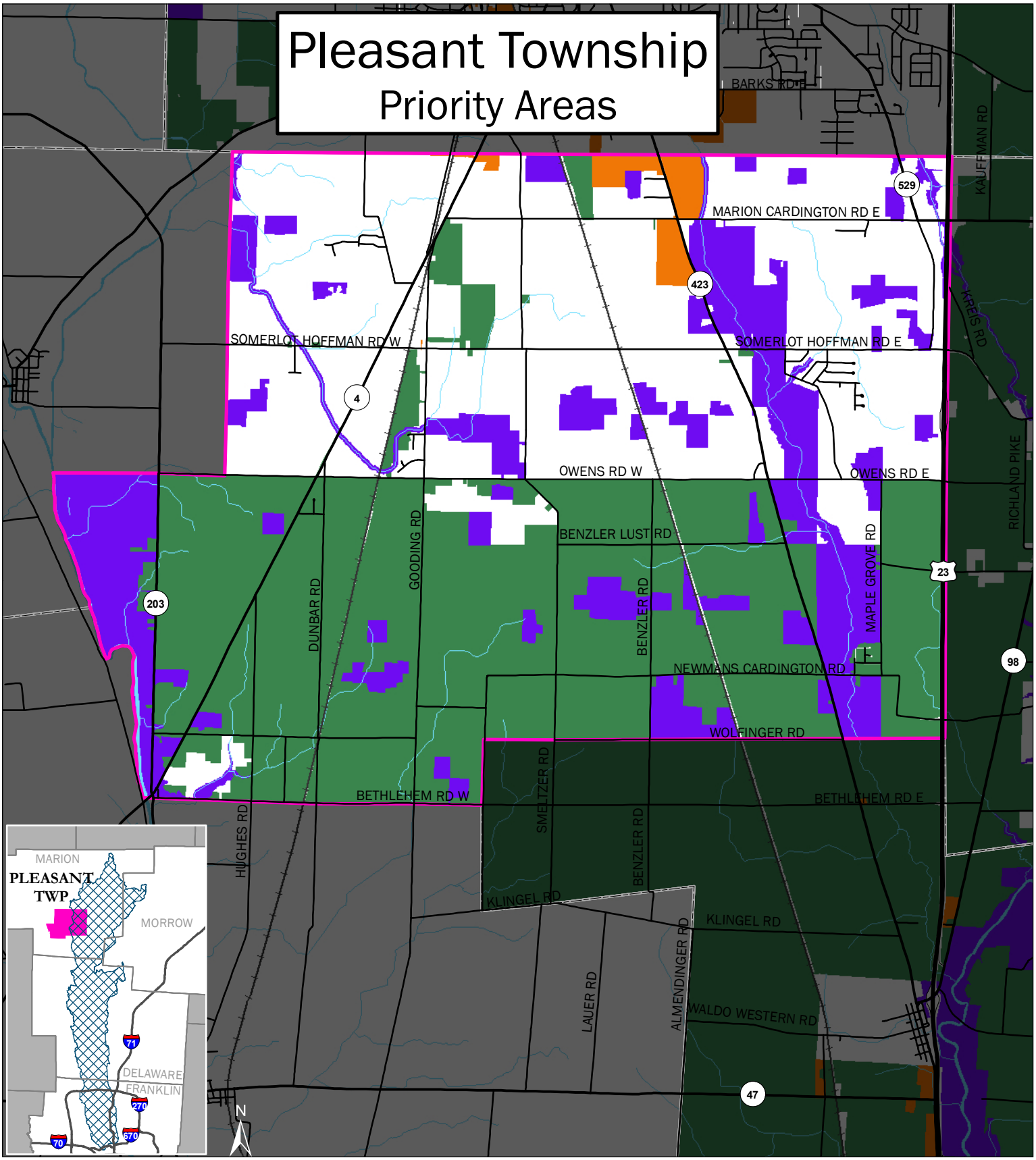


N
0 1 2 Miles

Legend

- Jurisdiction
- Priority Conservation Area
- Priority Development Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\PerryTWP.mxd
September 2011



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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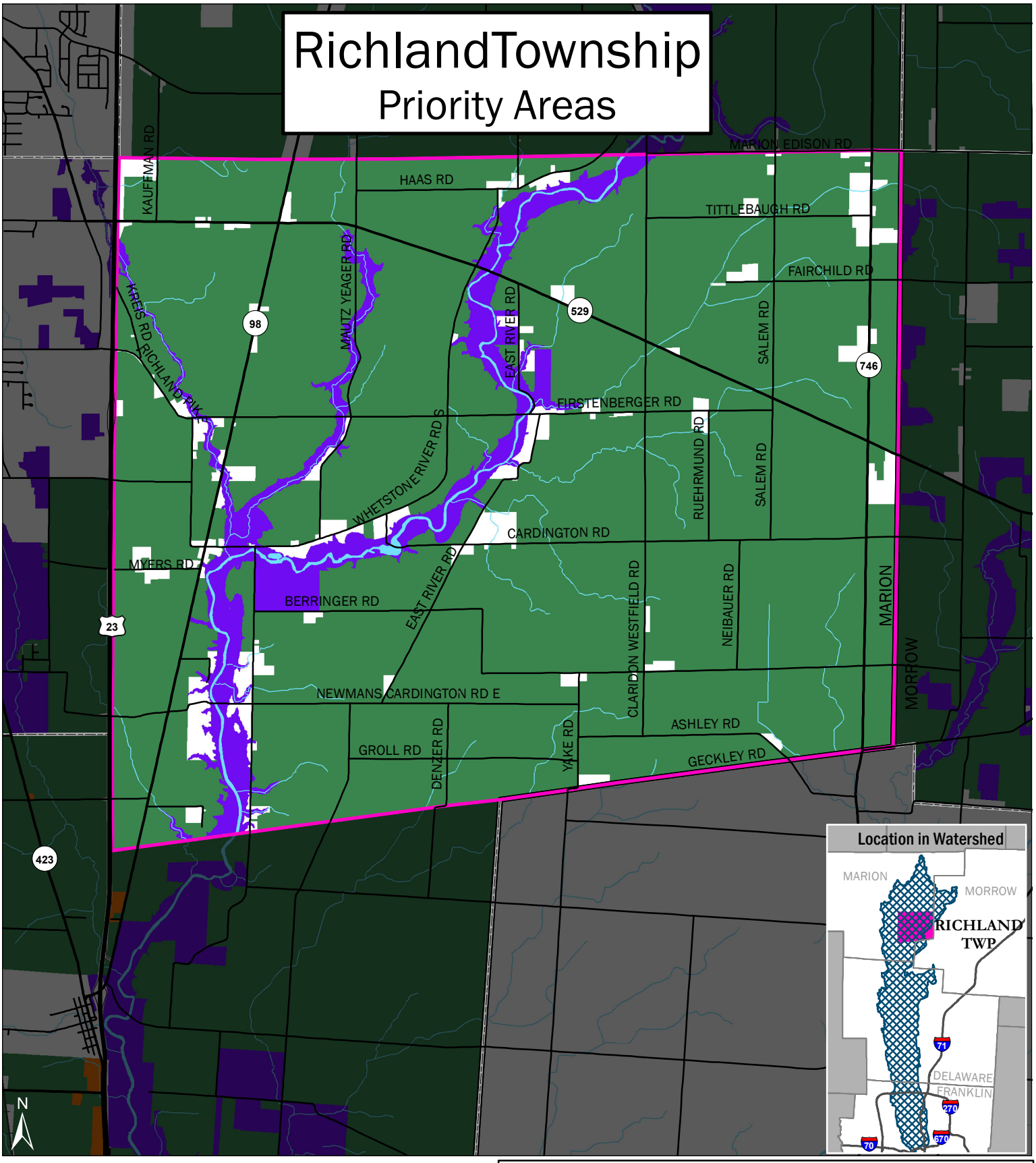
October 2011

RichlandTownship
Priority Areas

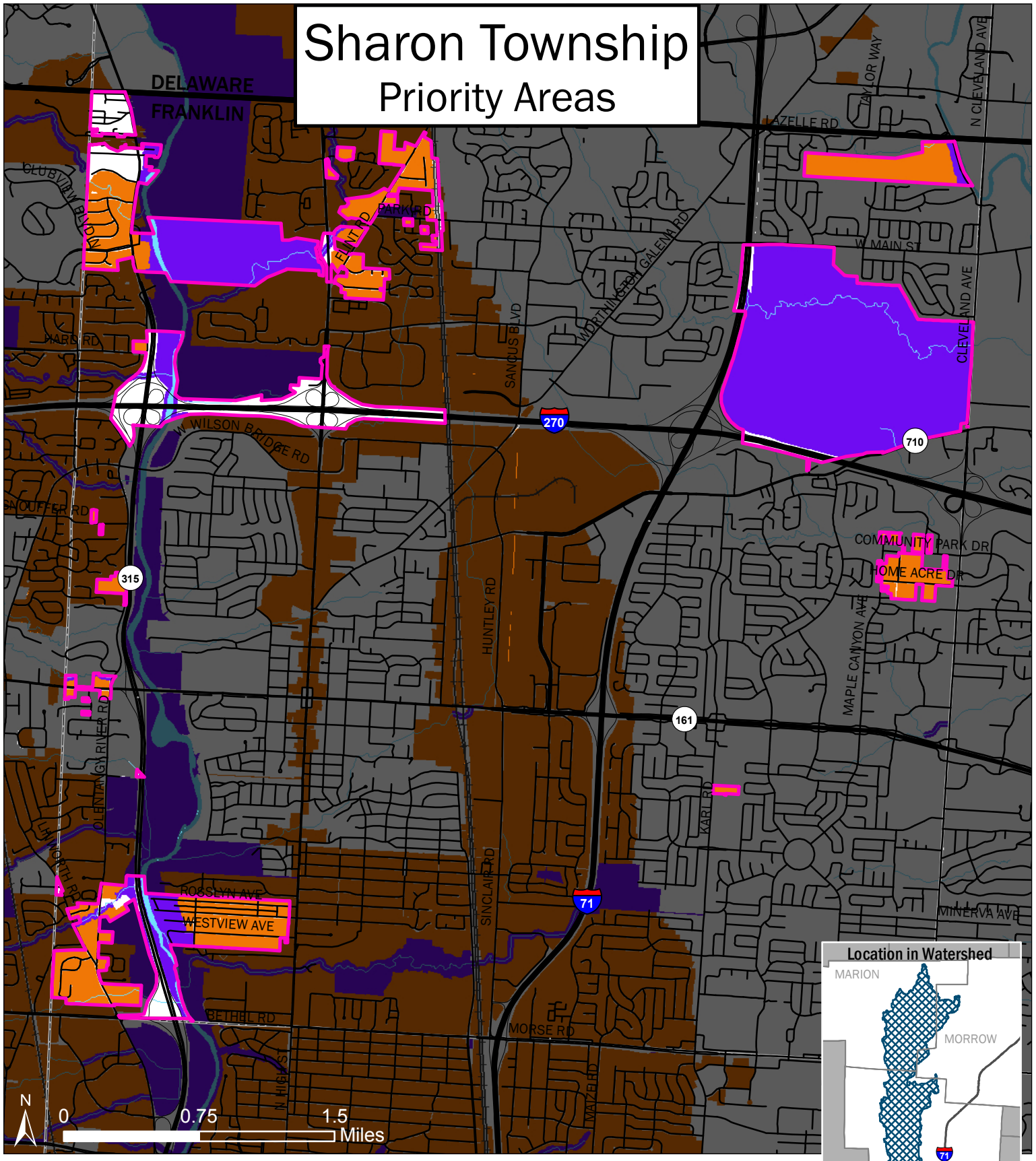


0 1 2 Miles

Legend
- Jurisdiction
- Priority Agricultural Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\RichlandTWP.mxd
January 2012

Sharon Township
Priority Areas

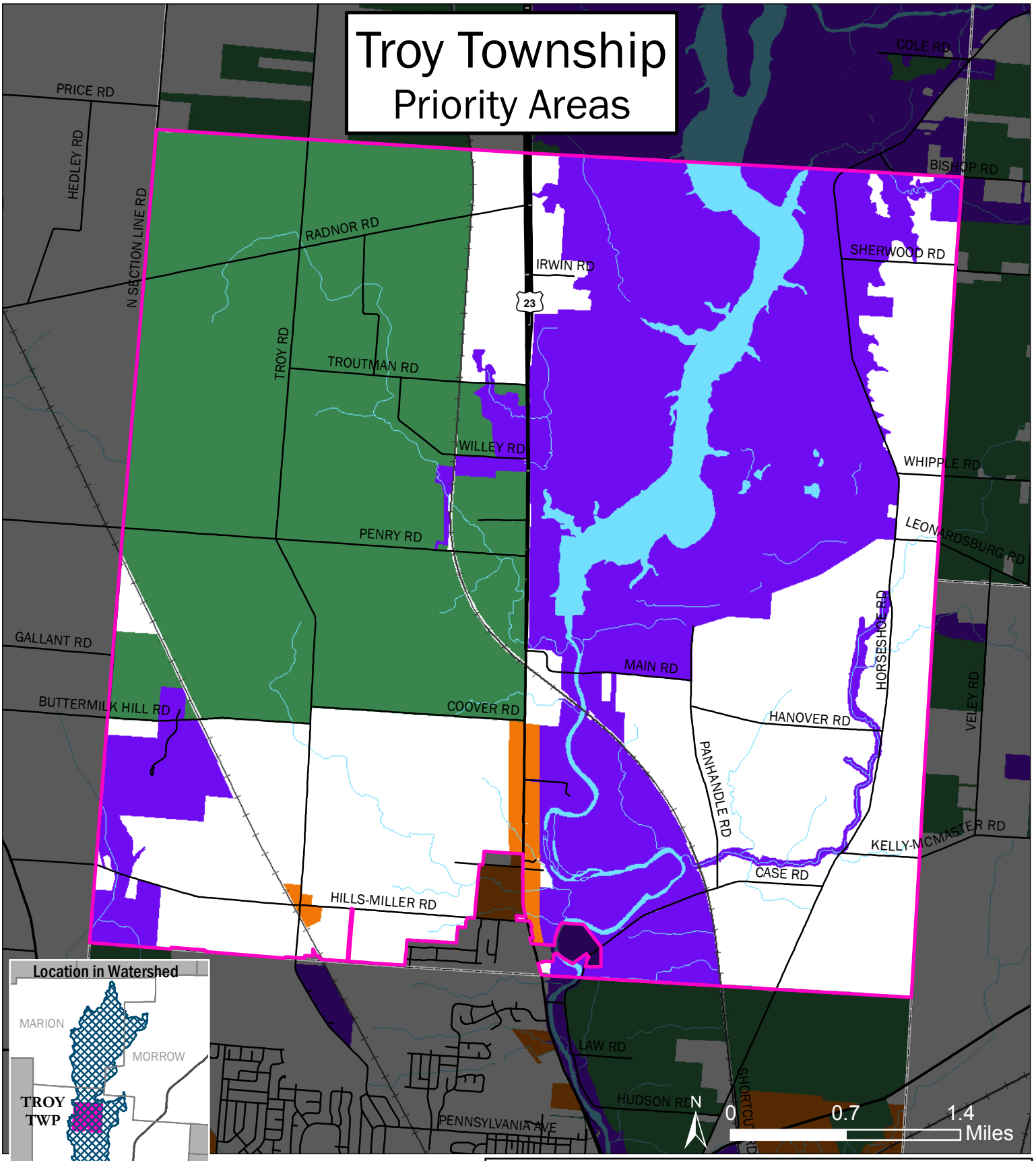


Legend

- Priority Conservation Area
- Priority Development Area
- Jurisdiction
- Outside the Jurisdiction
- Road
- Township Boundary
- County Boundary
- River
- Stream
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\SharonTWP.mxd
September 2011

Troy Township
Priority Areas

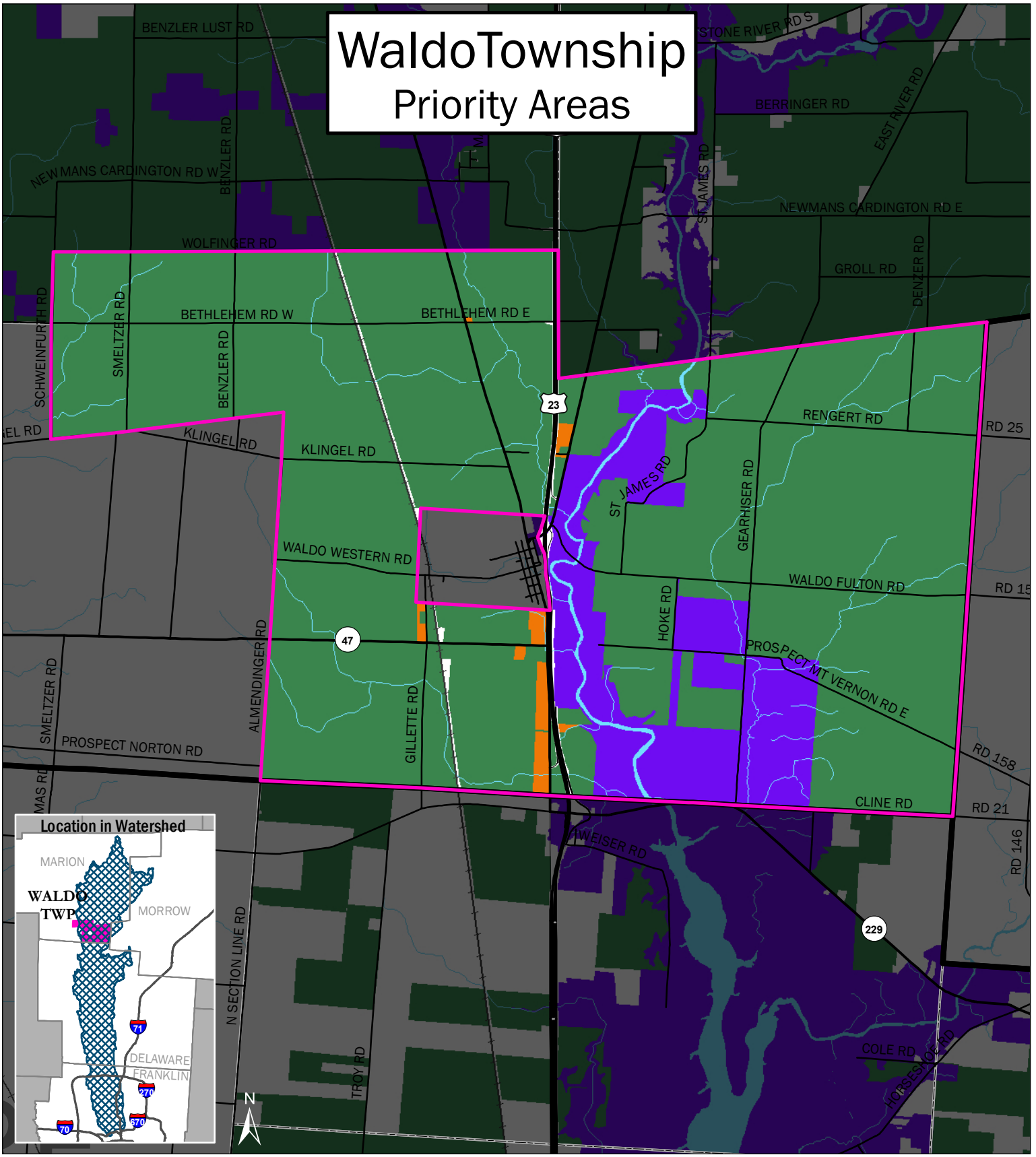


Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Development Area
- Priority Conservation Area
- Outside the Jurisdiction
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\TroyTWP.mxd
September 2011

Waldo Township
Priority Areas



0 0.8 1.6 Miles

Legend

- Jurisdiction
- Priority Agricultural Area
- Priority Development Area
- Priority Conservation Area
- Outside the Jurisdiction
- County Boundary
- Township Boundary
- River
- Stream
- Road
- Railroad

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\Olentangy Balanced Growth\Maps for OWPP Document\WaldoTWP.mxd
September 2011

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 Olentangy Balanced Growth Plan:

1. Adopt the Olentangy 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 three to five years.
4. Incorporate the designated Priority Areas into local community plans and zoning.
5. Integrate the recommended implementation tools (beginning on page 72) where applicable and appropriate.
6. Continue participating in the Olentangy Watershed Planning Partnership.

Cooperation Between Jurisdictions

A key element to the success of the Olentangy Balanced Growth Planning effort was the cooperative work of the communities and stakeholders in the OWPP. This continues to hold true for the future success of implementing the plan and enhancing the economic and environmental health of the Olentangy Watershed. This plan recommends that interested parties maintain the OWPP 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 Olentangy Watershed 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 timeframe

Figure 1. Olentangy Watershed Balanced Growth Implementation Strategies

Implementation Strategy	Short Term	Mid Term	Long Term	Responsible Parties
Adopt the Olentangy Balanced Growth Plan				OWPP Communities
Establish a local comprehensive plan if one does not exist for your community				OWPP Communities
Update the community's comprehensive plan every 3 to 5 years				OWPP Communities
Incorporate the designated Priority Areas into local plans and zoning where applicable and appropriate				OWPP Communities
Integrate the recommended Implementation Tools into local plans and zoning where applicable and appropriate				OWPP Communities
Track implementation projects and submit progress reports to the OWRC				MORPC
Facilitate the continuation of the OWPP including organizing and hosting annual meetings				MORPC
Meet at least annually as a partnership to discuss implementation projects and other partnership updates				OWPP Communities, Stakeholders, and MORPC
Seek state endorsement of the Olentangy Watershed Balanced Growth Plan				OWPP Communities, Stakeholders, and MORPC
Seek grants to assist in funding Balanced Growth implementation				OWPP Communities, Stakeholders, and MORPC
Educate the public about the key planning concepts and implementation tools included in the Balanced Growth Plan				OWPP Communities, Stakeholders, and MORPC

State Endorsement

MORPC will seek state endorsement of the Olentangy Balanced Growth Plan. To be eligible for endorsement by the Ohio Water Resources Council, the Plan will need to be adopted by 75 percent of the participating Olentangy Watershed communities (see page 9 for more information about partnership formation). In addition, at least 75 percent of the total watershed planning area population and land area must be represented by the endorsing communities. As of February 21, 2012, 25 of the 27 participating communities (93%) have passed resolutions of support for the Olentangy Balanced Growth Plan. The 25 supporting communities also represent almost 100 percent of the population and 97 percent of the land area in the watershed. Table 7 provides a detailed breakdown of population and land area by jurisdiction.

Table 7. Population and Land Area in Olentangy Watershed by Jurisdiction

Jurisdiction	Population in Watershed (2010)	% of Watershed Population	Area in Watershed (SQMI)	% of Watershed Land Area	Resolution of support for plan
Village of Ashley	398	0.1	0.2	0.1	Yes
City of Columbus	187,236	61.2	38.9	14.2	Yes
City of Delaware	34,495	11.3	18.6	6.8	Yes
City of Grandview Heights	2,545	0.8	0.5	0.2	Yes
City of Marion	4,221	1.4	2.1	0.8	Yes
City of Powell	10,560	3.5	4.6	1.7	Yes
Village of Riverlea	648	0.2	0.2	0.1	Yes
City of Upper Arlington	12,565	4.1	3.7	1.4	Yes
Village of Waldo	326	0.1	0.6	0.2	Yes
City of Worthington	13,483	4.4	5.5	2.0	Yes
Brown Township (Delaware)	397	0.1	7.7	2.8	None
Canaan Township	388	0.1	11.0	4.0	Yes
Cardington Township	41	0.0	1.3	0.5	None
Claridon Township	1,984	0.6	30.2	11.0	Yes
Clinton Township (Franklin)	3,148	1.0	1.0	0.4	Yes
Delaware Township	1,957	0.6	8.6	3.1	Yes
Liberty Township (Delaware)	9,507	3.1	22.5	8.2	Yes
Marion Township	4,874	1.6	5.2	1.9	Yes
Marlboro Township	216	0.1	9.2	3.4	Yes
Orange Township	5,390	1.8	8.3	3.0	Yes
Oxford Township	442	0.1	10.5	3.8	Yes
Perry Township (Franklin)	3,248	1.1	1.8	0.7	Yes
Pleasant Township (Marion)	1,724	0.6	10.6	3.9	Yes
Richland Township (Marion	1,519	0.5	28.2	10.3	Yes
Sharon Township	1,742	0.6	1.5	0.5	Yes
Troy Township (Delaware)	2,203	0.7	24.5	9.0	Yes
Waldo Township	708	0.2	16.7	6.1	Yes
Total:	305,965	100	273.7	100	27
Total Supporting Plan:	305,527	99.9	264.7	96.7	25

Source: US Census Bureau, 2010

Continuing the OWPP Following Endorsement

This plan recommends that the OWPP continue to meet at least annually following endorsement. Provided that funding can be secured, MORPC will host and facilitate the annual OWPP 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 OWPP and to append to the OWPP Balanced Growth Plan as an OWPP Annual Meeting Summary. MORPC will also prepare and submit progress reports regarding implementation of the Olentangy 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 community and agency efforts within the past year to implement the OWPP Balanced Growth Plan.
- Current and planned community efforts to implement 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.

Preliminary schedule of projects

A projects list is included as an appendix to the Olentangy Balanced Growth Plan (Appendix B). The projects list will be updated by MORPC following the annual OWPP meeting as new projects arise and older projects are completed. Maintaining the projects list in the appendix will allow updates to the list without compromising the resolutions of support for this plan from the Olentangy Watershed Planning Partnership communities.

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 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.**"[11]

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.

[11] 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.[12] 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 (see figure on next page). 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.[13] However, all the communities in the Olentangy Watershed currently have local zoning codes in place and many of them also have locally adopted community plans.[14] See Table 8 for a list of Olentangy Watershed 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 three to five years. OWPP communities are also encouraged to consider the incorporation of Balanced Growth Plan designated Priority Areas into their local comprehensive plans. Also, OWPP communities are encouraged to consider the model regulations and land use codes that accompany the other implementation tools. These tools can

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

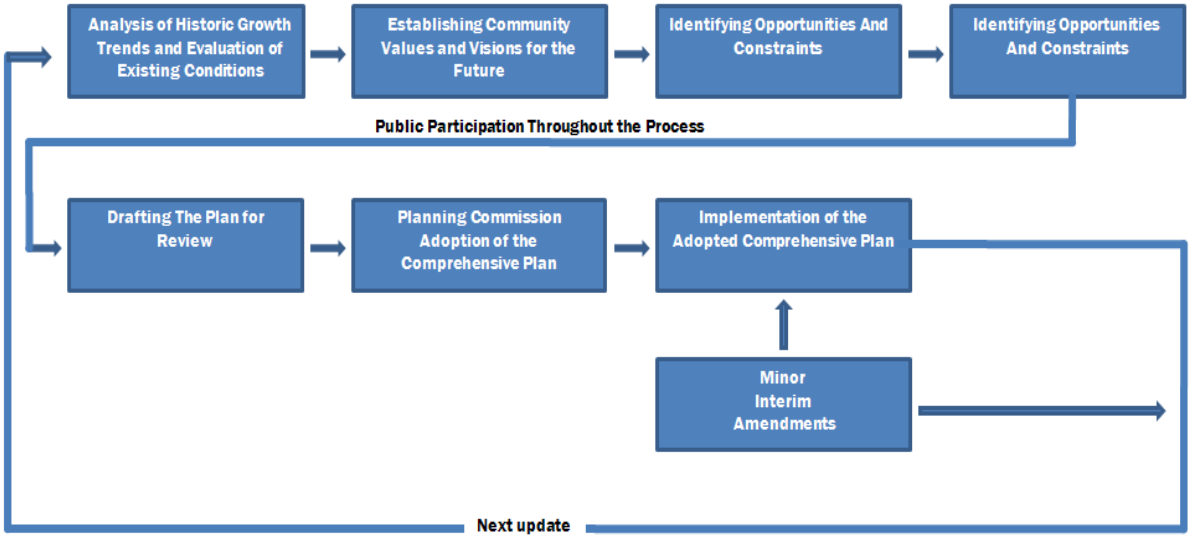
[13] Conglose, J. Comprehensive Planning Fact Sheet

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

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 Olentangy 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.

Figure 2. Comprehensive Planning Process



Source: City of Lee's Summit, Missouri. http://cityofls.net/Development/Comprehensive-Plan/General-Information.aspx

Table 8. Comprehensive Plans for Olentangy Watershed Jurisdictions

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.
Marion	Yes	2002*	
Morrow	Yes	2005	
Cities/ Villages			
Ashley	Yes	2005	http://www.dcrpc.org/compplan/document/AshleyCompPlan.pdf
Columbus	Yes	1993**	http://development.columbus.gov/uploadedFiles/Development/Planning_Division/Document_Library/Plans_and_Overlays_Imported_Content/complan.pdf
Delaware	Yes	2004	http://www.delawareohio.net/UserUploads/UserDocuments/Departments/Planning/Comp%20Plan%20Consolidated.pdf
Grandview Heights	Yes	1997	
Powell	Yes	1995, 2002 Update	
Riverlea			
Marion	No		Adopted 2002 Marion County Land Use Plan
Upper Arlington	Yes	2001	http://www.uaoh.net/egov/apps/document/center.egov?fDD=25-0&fCS=&path=browse&id=14
Waldo	No		
Worthington	Yes	2005	http://www.worthington.org/DocumentView.aspx?DID=155
Townships			
Brown (Delaware)	Yes	2001	http://www.dcrpc.org/compplan/document/BrownTwpCompPlan.pdf
Canaan	No		
Cardington	No		
Claridon	No		Adopted 2002 Marion County Land Use Plan

Clinton	Yes	2009	http://www.franklincountyohio.gov/commissioners/edp/planning/clinton-mifflin/index.cfm
Delaware	No		
Liberty (Delaware)	Yes	2006	http://www.dcrpc.org/compplan/document/LibertyTwpComPlan.pdf
Marion	No		Adopted 2002 Marion County Land Use Plan
Marlboro	No		
Orange	Yes	2010	http://www.dcrpc.org/compplan/document/2010%20Orange%20Comp%20Plan.pdf
Oxford	Yes	2006	http://www.dcrpc.org/compplan/document/OxfordTwpComPlan2006.pdf
Perry (Franklin)	No		
Pleasant (Marion)	No		Adopted 2002 Marion County Land Use Plan
Richland (Marion)	No		Adopted 2002 Marion County Land Use Plan
Sharon	No		
Troy (Delaware)	Yes	2006	http://www.dcrpc.org/compplan/document/TroyTwpComPlan.pdf
Waldo			Adopted 2002 Marion County Land Use Plan

* Marion County is currently working on an updated land use plan.

**The City of Columbus prepares Area Wide plans, similar to Comprehensive Plans, for each of its 27 Planning Areas. The Northwest Area Plan (2006) and the Clintonville Area Plan (2009) cover much of the City's land within the Olentangy Watershed.

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.[15]

RECOMMENDATIONS

1. Establish a comprehensive plan that reflects the priorities of the community.
2. Update the plan regularly, ideally every three to 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.

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

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.

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 Olentangy River Watershed.[16] 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 section 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

[16] Ohio EPA (2007). Total Maximum Daily Loads for the Olentangy River Watershed.
[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

applicability and effectiveness of various practices before selecting the stormwater management practices to implement locally.[18]

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 Sewers (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]

In addition to the NPDES program, there is a special general stormwater permit in place for much of the Olentangy Watershed. The Olentangy General Permit applies to new construction or redevelopment of land in some cases and is in effect from April 8, 2009 to April 7, 2014 (See Page 85, Stream and Wetlands Setbacks tool, for more information about the Olentangy permit).

These are the basic requirements for stormwater and pollution control that must be met by communities in the Olentangy 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 Olentangy Watershed.

BENEFITS

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

The Lower Olentangy Watershed Action Plan discusses the impacts of stormwater runoff and provides the following recommendations for the Olentangy Watershed.[21]

RECOMMENDATIONS

1. Preserve existing critical features like wetlands, floodplains, steep slopes, tree cover and land cover, and ravines.
2. Minimize stormwater.

[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

[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

[21] Friends of the Lower Olentangy Watershed (2005). The Lower Olentangy Watershed Action Plan in 2003; Web: http://www.olentangywatershed.org/files/WAP/WatershedPlan.pdf

- Encourage better site design (see Page 96 for Conservation. Development and Page 80 for Low Impact Development Tools).
- Implement stormwater Best Management Practices (BMPs).

3. Treat stormwater for quantity and quality
    - At a minimum, treat stormwater according to Ohio EPA National Pollutant Discharge Elimination System Permit (NPDES) requirements.

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

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.[22]

[22] 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." [23] 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 impact development are often referred to as

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

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 85, 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), for washing clothes, etc.

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. A cost comparison of green roofs versus conventional roofs is below. 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 the maintaining of 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 (see Page 96, 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. [24]

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

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

of native grass areas be incorporated into landscaping.

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=H3C5UE6AIxI%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.

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 corridor along the rivers and wetlands, particularly if well forested or complete with brush and other native plantlife, also assist in regulating stream temperature by moderating the amount of sunlight that reaches the waterways (particular stream temperatures support particular forms of life), and slowly filter storm water runoff. Vegetation in the riparian corridor also serves to absorb the force and volume of floodwaters, stabilize the stream banks from erosion, filter pollutants, and reduce floods by increasing absorption of floodwater into the soil.[25] 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. 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

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

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.[26] 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.[27] 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 its 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 structures close to the waterway. Stream and wetland setbacks also make prudent 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.[28]

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.[29] 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/meadow protection tools discussed elsewhere in this plan for a comprehensive approach to stormwater management.

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 during the process from beginning to end.

THE OLENTANGY PERMIT

Portions of the Olentangy River are designated Exceptional Warmwater Habitat as well as a State Scenic river. These areas are also experiencing some of the greatest population

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

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

[28] 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

[29] Stream Setback Protection Areas Factsheet Brochure. Franklin County and Franklin County Soil and Water Conservation District (SWCD).

growth in central Ohio and the state.[30] It is due to this growth that the Ohio EPA worked to create an alternative general permit for construction activity in specific parts of the Olentangy Watershed. This general permit addresses stormwater associated with construction activity in certain portions of the Olentangy River Watershed. The Permit was approved by the Ohio EPA in 2009. The 11-Digit Hydrologic Unit Codes (HUC) covered by this permit are:

- 05060001100-010
- 05060001100-020
- 05060001100-030
- 05060001110-090
- 05060001110-100
- 05060001110-110
- 05060001120-010
- 05060001120-030

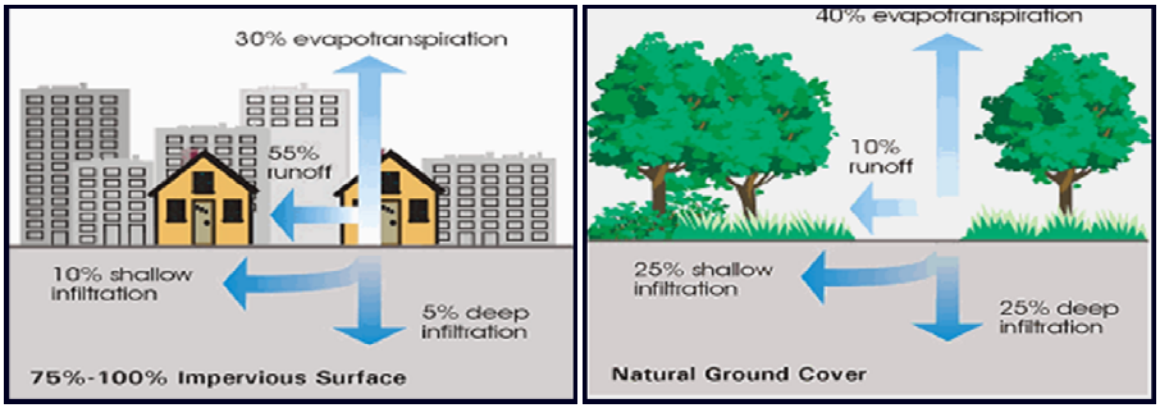
The Olentangy Construction General Permit applies when land (over a threshold acreage) will be disturbed during development or re-development of land within the permit coverage area. The permit requires the following:

1. Avoid or mitigate construction within stream setbacks.
2. Prepare and administer a SWP3 (Stormwater Pollution Prevention Plan) that shows:
    - How pollution, erosion, and sediment will be prevented during construction.
    - The post construction stormwater BMP's that will be used to manage the ¾" storm-event water quality volume (WQV) generated by added imperviousness.
    - An Operation & Maintenance (O&M) Plan describing how the Post Construction stormwater BMP's will be managed in perpetuity.
3. Acquire appropriate permits before construction. For the Olentangy Construction General Permit, as part of the NPDES system, a notice of intent form (NOI) is required at least 45 days in advance of planned construction, along with the SWP3.

The OWPP is not a regulatory body and it does not and cannot create regulations. The riparian setbacks and mitigation strategies of the Olentangy Construction General Permit were established by the Ohio EPA in 2009. Information is provided here for partnership reference. Balanced Growth Planning will not alter these regulations, but rather serves as a watershed-wide complement to them. More information about the Olentangy Permit and a map of the coverage area can be found on the Ohio EPA's website at the following link: http://www.epa.ohio.gov/dsw/permits/GP_ConstructionSiteStormWater_Olentangy.aspx

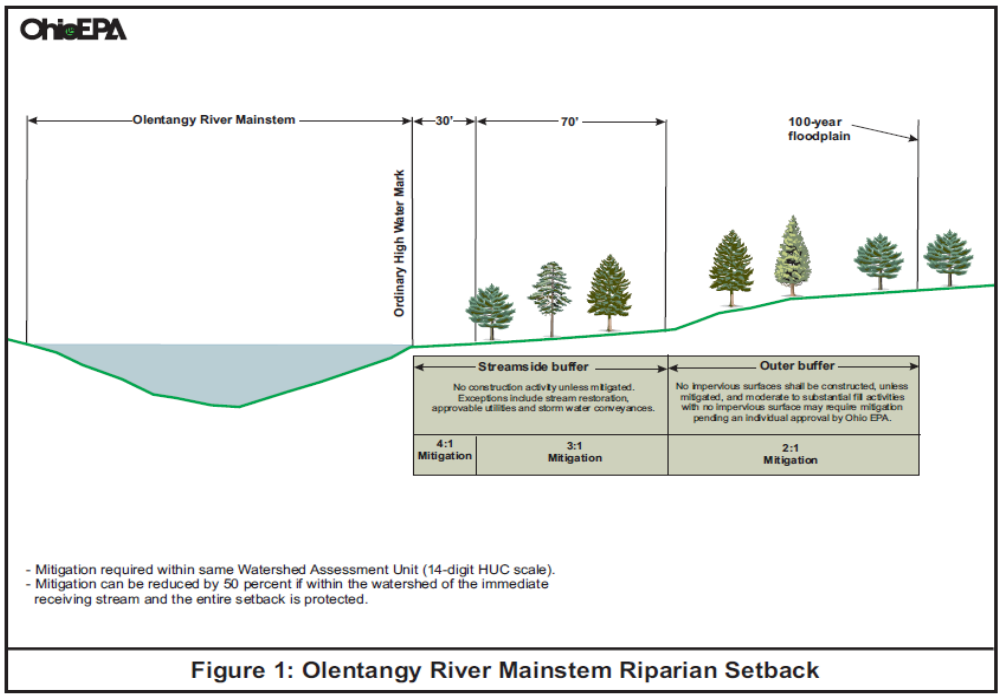
[30] Ohio EPA Olentangy Stormwater Permit; Web: http://www.epa.state.oh.us/dsw/permits/GP_ConstructionSiteStormWater_Olentangy.aspx#RelatedDocuments

Figure 3. Relationship between impervious surface and stormwater runoff



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

Figure 4. Olentangy permit setback illustration



Source: Ohio EPA. http://www.epa.state.oh.us/portals/35/permits/Olentangy_CGP_Setback_Figure_1_jan09.pdf

Olentangy River Mainstem Riparian Setback:
http://www.epa.state.oh.us/portals/35/permits/Olentangy_CGP_Setback_Figure_1_jan09.pdf

Perennial Streams Riparian Setback:
http://www.epa.state.oh.us/portals/35/permits/Olentangy_CGP_Setback_Figure_2_jan09.pdf

Intermittent Streams Riparian Setback:
http://www.epa.state.oh.us/portals/35/permits/Olentangy_CGP_Setback_Figure_3_jan09.pdf

Ephemeral Streams Riparian Setback:
http://www.epa.state.oh.us/portals/35/permits/Olentangy_CGP_Setback_Figure_4_jan09.pdf

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, with a difference being a matter of technical analysis required. 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. Should a community elect to adopt setback regulations or guidelines, the appropriate level of detail and analysis will bear heavily in the decision for which option is best for the community. 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 Resource Stream Setback Recommendations (2006)[31]:

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 the OWPP may consider are those created by the Chagrin River Watershed Partners in northeastern Ohio. These recommendations are also included in the appendices of the Lower Olentangy Watershed Action Plan. 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 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. Doing so 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

[31] *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*

WETLAND SETBACKS

As described previously, wetlands are the kidneys of our waterways. They 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.[32]

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.

[32] 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 also provide critical habitat to 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.

> "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

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.[33] The USDA Urban Forest Data estimates that for the State of Ohio, the percent of tree canopy cover of urban land is at about 21 percent.[34].

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; various GIS programs, and resources such as Urban Forest

[33] Dwyer and Nowalk (2000). A national assessment of the urban forest: an overview. Society of American Foresters.
[34] 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.

Data (http://nrs.fs.fed.us/data/urban/state/?state=OH) with reports on urban forests in Ohio to assist in the analysis. 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.[35] 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.

As detailed thus far, 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 forest management strategy.
- Assess tree resources.
- Identify needs and establish goals.
- Tree inventory systems and GIS.
- Community forest education.

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.

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

Table 15. Urban tree benefits (2000)

	Urban Land	Community Land
Estimated number of trees	96,800,000	97,600,000
Carbon		
Carbon stored (metric tons)	18,500,000	18,600,000
Carbon stored ($)	$421,800,000	$424,100,000
Carbon sequestered (metric tons/year)	609,000	614,000
Carbon sequestered ($/year)	$13,885,000	$13,999,000
Pollution		
CO_2 removed (metric tons/year)	226	228
CO_2 removed ($/year)	$317,600	$320,300
NO_2 removed (metric tons/year)	2,779	2,802
NO_2 removed ($/year)	$27,532,000	$27,761,000
O_3 removed (metric tons/year)	6,641	6,696
O_3 removed ($/year)	$65,783,000	$66,330,000
SO_2 removed (metric tons/year)	1,402	1,414
SO_2 removed ($/year)	$3,400,400	$3,428,700
Total pollution removal (metric tons/year)	15,900	16,030
Total pollution removal ($/year)	$129,100,000	$130,200,000

Source: USDA Urban Forest Data: Ohio (2008). Urban land is based on population density and was delimited using the United States Census definitions of 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. Work with residents to establish tree preservation goals.
2. Inventory trees in community using one of a suite of tools including GIS, resident survey, etc.
3. Establish a percentage threshold of tree cover acceptable to the community.
4. Prioritize areas where tree preservation and conservation are of high importance.
5. Prioritize areas for tree replacement.
6. 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.
7. Utilize the comprehensive guidelines to assist policymakers in developing a tree protection ordinance.
8. Identify site-specific trees for protection during the development process.
9. Select healthy native trees for preservation and maintenance.
10. Protect undeveloped forests from encroaching development.
11. Utilize development or financial incentives to drive development away from sensitive forested areas and toward other areas deemed appropriate by the community.
12. Provide for re-vegetation and re-treeing of abandoned areas or untended open space.
13. Minimize disturbance of woodland areas and consider developing in a manner that disrupts woodland the least.
14. Prioritize preservation of established mature woodlands

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.[36] 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.[37]

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 (see Page 99, Compact Development tool). 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

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

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

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 and near the Olentangy Watershed. The Delaware County Regional Planning Commission has actively promoted Conservation Development and encouraged townships to adopt a model subdivision regulation. To date, four townships have adopted forms of the model regulation. Also, Liberty Township, an Olentangy Watershed Planning Partnership community in Delaware County, is considering a draft code that would facilitate the implementation of conservation development.

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 5. 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".[38] 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

[38] 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

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. 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.[39] 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.[40] 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.

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[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] 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

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 approximately 1,200 feet.[41] 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." [42]

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.

[41] 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

[42] 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.[43] 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.

[43] 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/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 99 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."[44] 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.[45] 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

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

[45] 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.

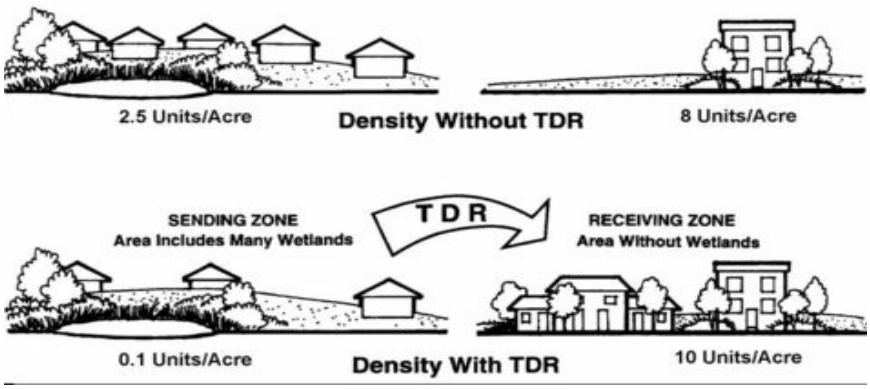
BENEFITS

- 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 6. 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."[46]

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.[47]

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.[48]

One of the greatest obstacles to brownfield redevelopment is the perceived risk of existing or continuing contamination and questions of related liability.[49] 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."*
>
> *Source: Public Strategies for Cost Effective Community Brownfield Redevelopment (p.5)*

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

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

[48] 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

[49] 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.[50] 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.[51]

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. Within the Olentangy Watershed, the City of Marion and the City of Columbus are both designated 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 on an ongoing basis. As of December 2010, 176 projects had been funded

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

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

(121 Phase II Assessments and 55 Cleanups) for a total of $63,561,613.[52]

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.[53]

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.[54]

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 July 2011 Columbus has awarded five 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
3. Consider area-wide impacts to prioritize potential brownfield redevelopment projects.

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

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

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

Exactions and Impact Fees

PAA PCA

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.[55]

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. [56]

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 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"

[55] Evans-Cowley, J. (2006). Development Exactions: Process and Planning Issues. Lincoln Institute of Land Policy.
[56] Freeman, B., Shigley, P., Fulton, W. (2007). Land Use: Exactions and Impact Fees. FACSNET Land Use. http://www.impactfees.com/publications%20pdf/nat9exactions.pdf

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.[57]

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 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.[58] 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

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

[58] 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

walking, wheeling, or taking transit in most communities."[59]

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.[60] 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 5 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.[61]

> "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."
>
> *Source: FHWA, Livability in Transportation Guide (p.1)*

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

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

[60] 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

in share of workers commuting by bicycle."[61] 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.[62] 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 complete streets policies.[63] 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.

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

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

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

- 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 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 Olentangy 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 OWPP through the Olentangy 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 Olentangy River. [64]

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.[65] 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.

[64] Ohio EPA (2007). Total Maximum Daily Loads for the Olentangy River Watershed.
[65] 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 Olentangy 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 Olentangy 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 Olentangy River.[66] 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."[67] The Olentangy River is included in the Scioto River CREP area. So far almost 20 percent of the acres currently enrolled in the CREP are located within the Olentangy watershed. Table 17 indicates that the implementation of the CREP program is having a positive effect on water quality in the Olentangy River.

Table 17. Annual nonpoint source pollutant load reductions estimates

County	Nitrogen (lbs/year)	Phosphorus (lbs/year)	Sediment (tons/year)
Marion	14,371	7,734	3,232
Morrow	5,486	2,946	1,527
Crawford	3,116	1,675	800
Delaware	2,449	1,316	647
TOTALS	25,422	13,671	6,206

Source: Ohio EPA. Restoring and Protecting the Olentangy River. 2010

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 Olentangy watershed are potentially eligible for. Table 18 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 Olentangy 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

[66] Ohio EPA (2007). Total Maximum Daily Loads for the Olentangy River Watershed.
[67] Ohio EPA (2010). Restoring and Protection the Olentangy River.

Table 18. 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 Olentangy River 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 Olentangy River 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

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 Olentangy 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 In addition, local Soil and Water Conservation Districts possess a wealth of knowledge in regard to current conservation programs. A list of contacts for the Olentangy Watershed communities is provided below:

Soil and Water Conservation District (SWCD) Contacts

Marion County Soil and Water Conservation District 1100 East Center Street Marion, Ohio 43302	**Phone:** 740-387-1314 **Fax:** 740-383-3427 **Website:** http://www.dnr.state.oh.us/MarionCounty/tabid/21116/Default.aspx
Delaware County 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 County 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/
Morrow County 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 Olentangy 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.

SOURCES

1. Ohio Revised Code. Title XV Conservation of Natural Resources. Chapter 1521: Division of Water. http://codes.ohio.gov/orc/1521.19
2. *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)
3. *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)
4. *Total Maximum Daily Loads for the Olentangy River,* Ohio EPA. 2007 (1)
5. *The Lower Olentangy Watershed Action Plan in 2003,* Friends of the Lower Olentangy Watershed, 2005 (1)
6. 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
7. Upper Olentangy Watershed Action Plan.
8. Ohio Department of Natural Resources (ODNR). Delaware Wildlife Area. http://www.dnr.state.oh.us/tabid/19699/Default.aspx
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11. Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices; Web: http://balancedgrowth.ohio.gov/BestLocalLandUsePractices.aspx
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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.