



2012

UPPER SCIOTO 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 Upper Scioto 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.

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LIST OF ACRONYMS



BGI – Balanced Growth Initiative
BGP – Balanced Growth Planning
BLLUP – Best Local Land Use Practices
BMP – Best Management Practices
CNS – Covenant Not to Sue
CO₂ – Carbon Dioxide
COTA – Central Ohio Transit Authority
CWA – Clean Water Act
DFIRM – Digital Flood Insurance Rate Map
EPA – Environmental Protection Agency
FEMA – Federal Emergency Management Agency
FHWA – Federal Highway Administration
FOSR – Friends of the Scioto River
FPA – Facility Planning Area
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 Sewer Systems
NFA – No Further Action
NHD – National Hydrography Dataset
NLCD – National Land Cover Dataset

NO₂ – Nitrogen Dioxide
NPDES – National Pollutant Discharge Elimination System
NPS – Nonpoint Source
NRCS – National Resource Conservation Service
NRHP – National Register of Historic Places
NWI – National Wetlands Inventory
O₃ – Ozone
ODNR – Ohio Department of Natural Resources
ODOD – Ohio Department of Development
ODOT – Ohio Department of Transportation
OLEC – Ohio Lake Erie Commission
ORC – Ohio Revised Code
ORDC – Ohio Rail Development Commission
OWDA – Ohio Water Development Authority
OWRC – Ohio Water Resources Council
PAA – Priority Agricultural Area
PCA – Priority Conservation Area
PCB – Polychlorinated Biphenyl
PDA – Priority Development Area
PRD – Planned Residential Development
PUD – Planned Unit Development
RR – Railroad
SO₂ – 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

USPP – Upper Scioto Planning Partnership

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

Recommendations:

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

The Mid-Ohio Regional Planning Commission (MORPC), an association of local governments in central Ohio, worked with the Upper Scioto Planning Partnership (USPP) to produce this Upper Scioto 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 USPP is made up of 29 communities and many watershed stakeholders that voluntarily agreed to direct the development of the Balanced Growth Plan while MORPC provided technical and administrative guidance.

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

Water Quality: The Upper Scioto Watershed is large and drains a very diverse landscape from the most rural farm fields to dense urban environments. As a result, water quality varies from warm water habitat in full attainment to limited resource waters in non-attainment of Clean Water Act standards. The Upper Scioto River and its major tributaries are listed on Ohio's 2010 Section 303(d) list of impaired waters. Agricultural run-off, failing home sewage treatment systems, channel modification, and urban stormwater runoff contribute to water quality impairment of the river and its tributaries.

Growth Management: The Upper Scioto Watershed is expected to experience a population growth of almost 34% by 2035. The areas with the greatest projected growth include the communities surrounding the City of Columbus to the north and the south, the City of Marysville and surrounding townships, and along the U.S. Route 33 corridor that links Columbus and Marysville. Future development in the Upper Scioto Watershed should be planned to minimize harmful impacts to the watershed, minimize the loss of important agricultural or environmentally sensitive areas, and maximize the efficient use of infrastructure.

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

Limited Fiscal Resources: There will be increasingly limited fiscal resources to support future development demands. Communities are encouraged to consider the full lifecycle costs of new development, including but not limited to

the costs to extend and maintain services into new areas of the community. Cost savings could also potentially be achieved by partnering with neighboring communities to address shared concerns or provide services.

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

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

The designation of an area as a Priority Area does not mandate that the area be conserved, developed, or used for agricultural purposes. Incorporation of the Priority Areas into a

community's comprehensive plan or local zoning is recommended but not required. When this plan is finalized, MORPC will work with the USPP and the Ohio Water Resources Council to achieve state endorsement of the Upper Scioto Balanced Growth Plan. State endorsement requires local adoption of the plan by at least 75 percent of the Upper Scioto communities. Upon endorsement, participating USPP 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

"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

watersheds and their diverse plant and animal communities.

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

Process

PARTNERSHIP FORMATION AND GOVERNANCE

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

Each participating community was asked to elect a representative to attend partnership meetings and work with fellow delegates in creating the plan. The representatives were encouraged to share the progress made at the partnership meetings with colleagues and residents of their jurisdictions. Each community

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

UPPER SCIOTO WATERSHED PLANNING PARTNERSHIP

Upper Scioto Community Representatives

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

Tracy Hatmaker, Prairie Township

David Anderson, Liberty Township (Delaware County)

Mike Watkins, Radnor Township

Janelle Thomas, Washington Township

Charles Hann, Hamilton Township

John Carter, City of Columbus

Kevin Wheeler, City of Columbus

Kathleen Crowley, Jerome Township

Wayne Warner, Norwich Township

Justin Milam, City of Upper Arlington

Patrik Bowman, City of Grandview Heights

Michael Brake, York Township

Gary Cunningham, Leesburg Township

Karen Johnson, Liberty Township (Union)

Greg DeLong, City of Marysville

Ronald Steele, Taylor Township

William Lynch, Jr., Millcreek Township

Sandra Stults, Scioto Township

Steve Langworthy, City of Dublin

Justin Goodwin, City of Dublin

Kyle Rauch, City of Grove City

Linda Rosine, City of Grove City

Carol Verity, Village of Magnetic Springs

John Kukura, Village of Marble Cliff

Larry Crile, Village of Ostrander

Yvonne Clippinger, Village of Shawnee Hills

Joseph Barnes, Sr., Village of Urbancrest

Marzia Helton, Village of Valleyview

Karen Koch, Concord Township

Paul Johnson, Franklin Township

Michael Lilly, Jackson Township

Matt Brown, Franklin County Economic Development & Planning

Upper Scioto Stakeholders

Ed Miller, Delaware SWCD

Shane Clark, P.E., Del-Co Water Co., Inc.

P. Kent Tudor, P.E., Del-Co Water Co., Inc.

Cole Miller, Ohio EPA

Bill Narducci, Union County Engineer

Tim Hansley, Delaware County Administrator

Dave Bender, Delaware County Friends of the Trail

Scott Sanders, Delaware County Regional Planning Commission

Crystal James, Delaware Area Transit Agency

John O'Meara, Metro Parks

Anthony Sasson, The Nature Conservancy

Caroline Ramsay, Honda of America

Dana McDaniel, City of Dublin Economic Development

Alex Silbajoris, Friends of the Scioto River

Thomas Wester, Ohio Department of Transportation

Jenny Snapp, LUC Regional Planning Commission

Wes Dodds, LUC Regional Planning Commission

Jennifer Fish, Franklin SWCD

Martha Gilson, Franklin SWCD

Matt Trokan, Sierra Club

Jim Hilz, Building Industry Association of Central Ohio

Kaylee Port, Union SWCD

Steve Studenmund, Metro Parks

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

Upon finalization of this plan, all partnership communities will be asked to pass a resolution to adopt the Upper Scioto Balanced Growth Plan. If over 75 percent of communities in the Upper Scioto Watershed (by number of communities, population, and land area) adopt the Upper Scioto Balanced Growth Plan, the USPP can seek endorsement from the state. If the plan receives state endorsement, all participating communities will be eligible for special state incentives that have been linked to the Balanced Growth Initiative (see Appendix B). More detailed information about the population and land area of the Upper Scioto Watershed planning area by participating jurisdiction is available on page 14.

PUBLIC INPUT

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

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

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

GOAL AND GUIDING PRINCIPLES

At their November 3, 2010 meeting, the USPP developed and voted to approve the following goal statements to guide this planning effort:

Work together as a watershed partnership to achieve common planning goals and to address shared social, economic, and environmental concerns.

- Protect, preserve, restore, and enhance the environment, the Upper Scioto river, open space, recreation areas, and areas that serve natural functions in the watershed. Improve access to these areas where appropriate.
- Preserve and enhance the unique characteristics of communities within the watershed, whether they are rural urban, agricultural, suburban, or old town centers.
- Plan for sustainable growth by maximizing efficient use of infrastructure to promote economic development and to achieve a healthy balance between land uses in the watershed and in the relationship between the natural and built environments.

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

STATEMENT OF HOW THE UPPER SCIOTO 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.

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

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, woodland and tree canopy protection, and stream and wetland setbacks (see Implementation Toolbox beginning on page 54) all seek to allow nature to filter, absorb, and sequester pollutants. The tree canopy protection tool in this plan provides a detailed background of the benefits of urban trees with regard to pollution sequestration and recommends that communities maintain a healthy tree canopy to reap, among other things, the benefits of cleaner air and water.

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

PCAs seek to conserve or preserve natural features such as the floodplain, natural land cover, and wetlands that serve hydrologic functions. Recognizing the key role the streams play in the health of the Upper Scioto Watershed, the partnership included both the land adjacent to streams and the 100-year floodplain in the criteria that was used to help identify Priority Conservation Areas. Tools such as Low Impact Development (see page 62) encourage the preservation of the natural hydrology of a site by promoting on-site stormwater management while stream setbacks and stormwater management seek to reduce the impact of impervious surface stormwater runoff on our streams and wetlands. It is important to recognize that stream restoration activities could be applicable in any of the Priority Areas, including Priority Development Areas. For example, restoration and conservation funds could be used for the restoration of impaired smaller streams, including those that have been culverted or channelized.

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

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

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

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

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

The plan encourages cross-jurisdictional cooperation and information sharing to ensure that development decisions do not shift

economic benefits or environmental burdens from one location within the region to another while encouraging cross-jurisdictional collaboration to share economic benefits (see page 96) and jointly address environmental burdens. Communities were encouraged to work with their neighboring jurisdictions during the review process to enhance cross-jurisdictional cooperation and ensure that burdens and benefits were not simply shifted elsewhere.

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

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

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

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

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

Balanced Growth Planning encourages investments in our existing communities and infrastructure networks to create thriving livable

communities. By creating thoughtful, targeted development, communities can seek to preserve the natural resources the region has to offer by minimizing the impact of development. This plan also specifically designates many natural areas that communities would like to target for conservation so that both current and future generations will be able to enjoy what the watershed and the region have to offer.

IDENTIFYING 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 USPP decided to designate Priority Agricultural Areas due to the predominance of agriculture in portions of the watershed. Generally speaking, the Priority Areas can be described as follows:

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

The identification of Priority Areas should consider the 10 Guiding Principles for Sustainable Ohio Watersheds and be consistent with Balanced Growth's purpose of protecting Ohio's watersheds while also ensuring economic competitiveness. The USPP worked together to designate Priority Areas throughout the watershed based on a two part process that started with an analysis of objective criteria developed and adopted by the partnership.

Following the initial analysis of criteria, each community was asked to review the potential priority areas and make adjustments as necessary. An explanation of the criteria, the USPP's Priority Areas definitions, and maps showing the designated Priority Areas begins on page 38 of this plan.

Regional Planning Context

OHIO'S BALANCED GROWTH PLANNING PROGRAM

This Upper Scioto 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.
- 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.

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

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 UPPER SCIOTO WATERSHED

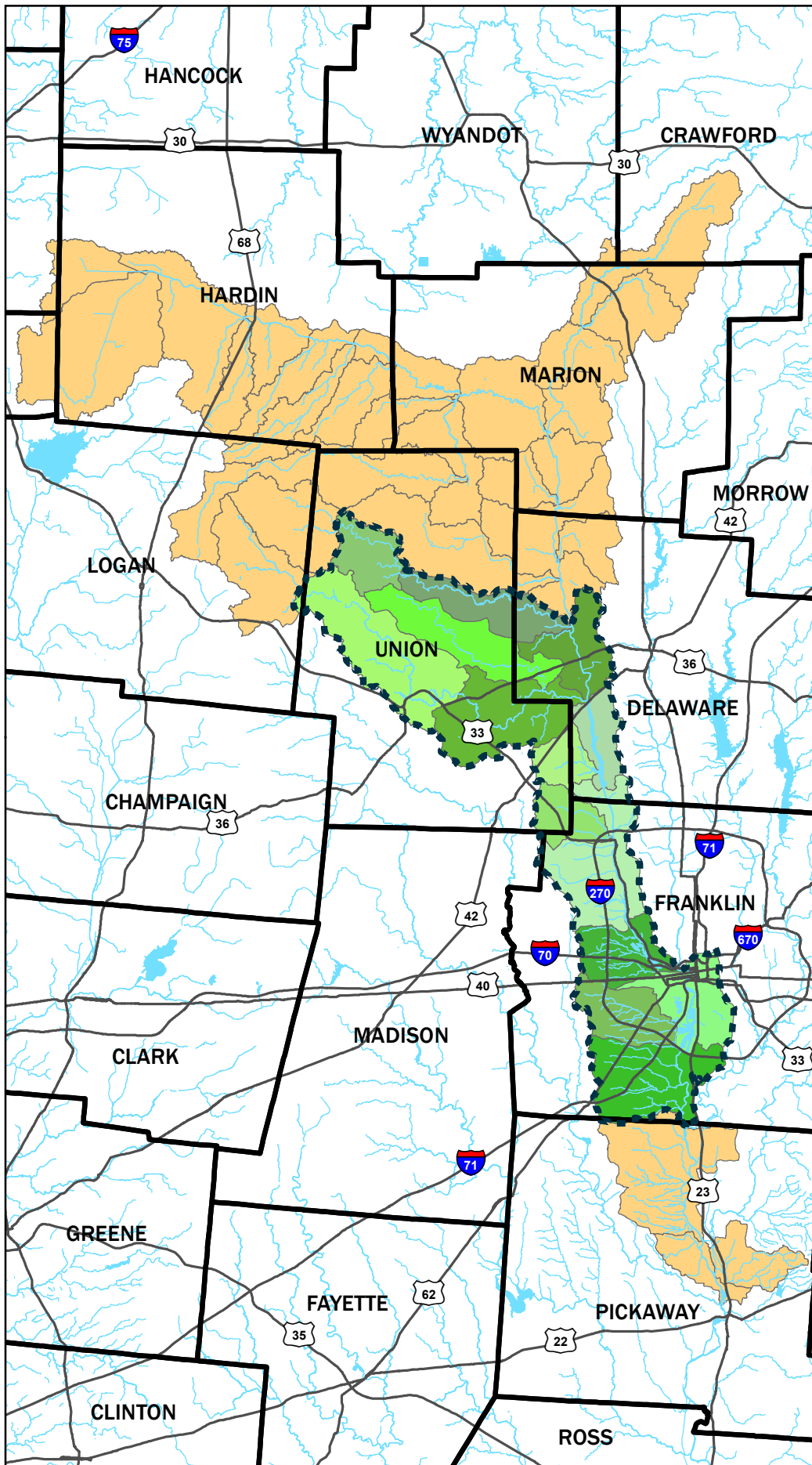


Territory Boundary and Size

The Upper Scioto Watershed is located in Central Ohio and covers portions of Crawford, Delaware, Franklin, Hardin, Logan, Madison, and Union Counties. The Scioto River originates near Roundhead in Hardin County, running south through central Ohio before emptying into the Ohio River at the confluence in Portsmouth, Ohio.

The Upper Scioto Watershed is broken into eight 10-digit Hydrologic Unit Codes (HUCs), consisting of the Little Scioto River (05060001-03), Panther Creek (05060001-04), Rush Creek (05060001-02), Fulton Creek (05060001-05), Bokes Creek (05060001-07), Mill Creek (05060001-06), Indian Run (05060001-12), and Scioto Big Run (05060001-23). Early on in the planning process, the planning area was narrowed down from these eight 10-digit HUCs to a smaller planning area consisting of 14 contiguous 12 digit HUCs within the watershed. This adjustment was made based on the interest of watershed communities to be included in the Balanced Growth planning process. The 12 digit HUCs that make up the Upper Scioto Balanced Growth planning area are depicted in Map 1.²

² The TMDL reports for Bokes Creek and Mill Creek use an older 11 and 14 digit HUC numbering system. The 11 digit HUCs correspond to the 10 digit current numbers.



Upper Scioto Balanced Growth Watershed

HUC 12 Watershed Subdivisions

Upper Scioto
Watersheds HUC-12

Not included in
Balanced Growth Plan

- 050600010602
- 050600010603
- 050600010604
- 050600010702
- 050600010703
- 050600010704
- 050600011201
- 050600011202
- 050600011203
- 050600011204
- 050600011205
- 050600012301
- 050600012302
- 050600012303

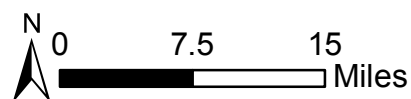
USPP

County Boundary

Water

Interstate Highway

US Route



Political Composition

There are 29 political jurisdictions represented in the USPP spanning across Union, Delaware, Franklin Counties. The communities represented in the USPP include the Cities of Columbus and Marysville, the suburban areas surrounding Columbus and spreading north into Delaware and Union Counties, growing villages, and a number of rural and agricultural communities.

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

The political composition of the USPP was also influenced by the fact that the Upper Scioto Watershed shares boundaries with three of the other watersheds in which MORPC is facilitating the development of Balanced Growth Plans. Eight jurisdictions straddle the Upper Scioto and Olentangy Watersheds. Of these eight, seven were already participating in the Olentangy Watershed Planning Partnership that was six months into the planning process at the time of the Upper Scioto Planning Partnership formation. Most of these communities had their entire jurisdictions included in the analysis area for the Olentangy Balanced Growth Plan. Liberty Township (Delaware County), Upper Arlington, and Grandview Heights participated in both partnerships but elected to use the Priority Area maps that were created during the Olentangy Balanced Growth planning process. The City of Columbus participated in the Upper Scioto, Olentangy, and Big Walnut planning processes and designated Priority Areas within each

watershed planning area for each of the three plans.

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

UPPER SCIOTO WATERSHED PLANNING
PARTNERSHIP JURISDICTIONS:

Delaware County:

Village of Ostrander

Village of Shawnee Hills

Concord Township

Liberty Township

Radnor Township

Scioto Township

Franklin County:

City of Columbus

City of Dublin

City of Grandview Heights

City of Grove City

City of Upper Arlington

Village of Marble Cliff

Village of Urbancrest

Village of Valleyview

Franklin Township

Hamilton Township

Jackson Township

Norwich Township

Prairie Township

Washington Township

Union County:

City of Marysville

Village of Magnetic Springs

Jerome Township

Leesburg Township

Liberty Township

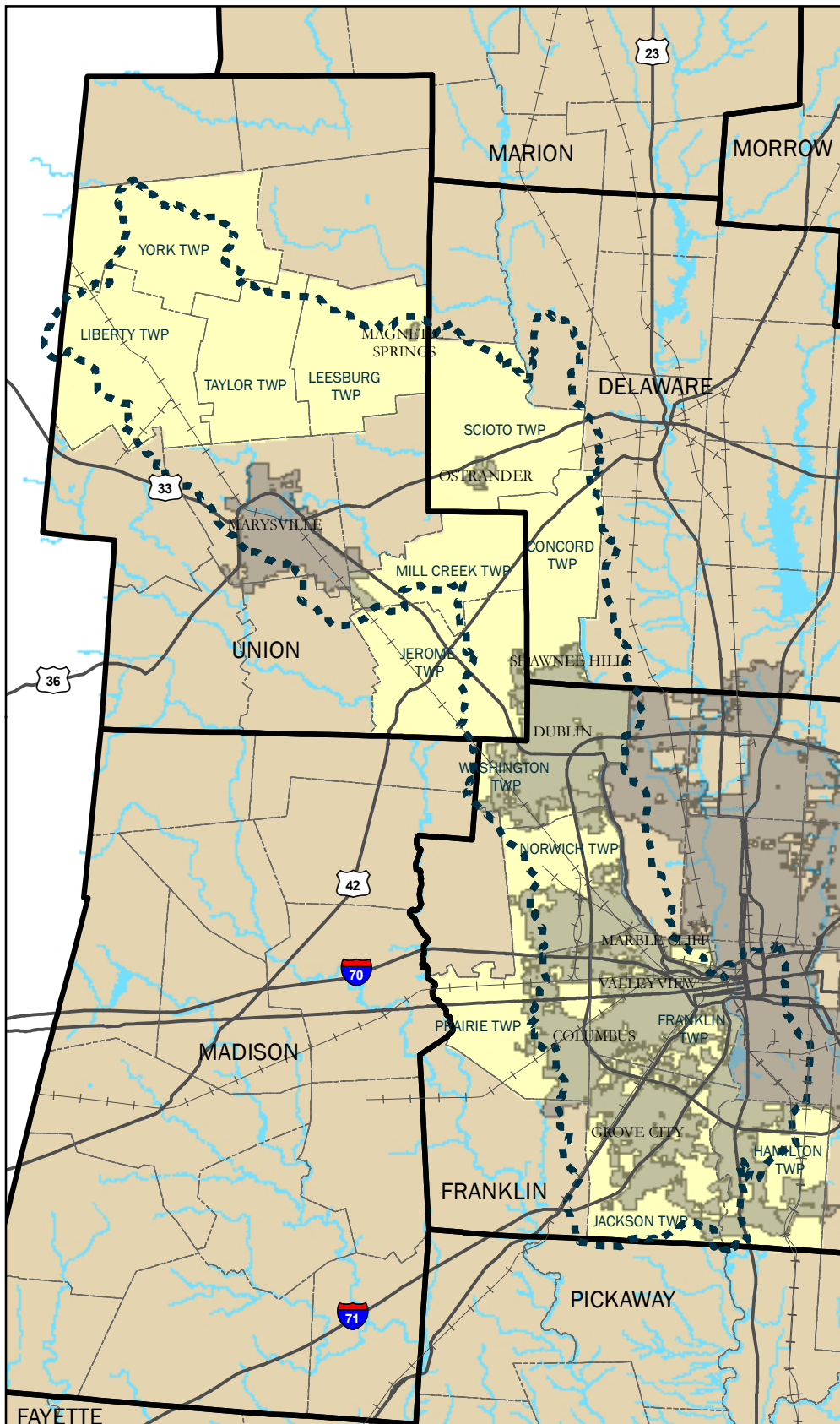
Millcreek Township

Taylor Township

York Township

Upper Scioto Balanced Growth Watershed

Jurisdictions



Legend

- Upper Scioto Watershed HUC-12
- City/Village
- Participating Township
- Township Boundary
- County Boundary
- Major Roads
- Water



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&Environ\Upper Scioto Watershed BG\Maps for Documents\US_Jurisdiction.mxd
 June 2012

EXISTING CONDITIONS



Water Quality

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

The U.S. Clean Water Act (CWA) requires the preparation of a Total Maximum Daily Loads (TMDL) report for all impaired waterways on the Section 303(d) list. The TMDL report details sources of impairment and lays out a process for achieving full attainment of Water Quality Standards (WQS), allowing removal of the water body from the 303(d) list. Only a portion of the Upper Scioto Watershed has been through the TMDL process: Bokes Creek and Mill Creek. Ohio EPA is currently developing TMDL reports for the remainder of the Upper Scioto Watershed including the areas outside of the Upper Scioto Watershed Balanced Growth study area. A draft of the TMDL for the portion included in the study area is scheduled for release sometime in 2013.

The Upper Scioto Watershed Balanced Growth area can be divided into three distinct sub watersheds suffering different major impairments from different sources: Bokes Creek, Mill Creek, and the Scioto River main stem from O'Shaughnessy Reservoir to the southern Franklin County line.

Bokes Creek flows primarily from eastern Logan County through north central Union County until it enters the Scioto River in western Delaware County. It is primarily an agricultural watershed and is severely impaired from large scale agricultural runoff. According to the TMDL report

for Bokes creek, only 9.6% of the stream is meeting attainment standards.³ Much of this impairment is the result of agricultural runoff from several large chicken farms within the watershed. Additional impairments are the result of widespread manure spreading on fields within the headwaters and tributaries. This has lead to high concentrations of nutrients, suspended solids, oxygen demanding substances, and bacteria throughout the Bokes Creek watershed.

Mill Creek drains the lands just south of the Bokes Creek Watershed. Land use includes heavy agricultural use as well as urban development with large industrial plants. Unlike Bokes Creek, the headwaters of Mill Creek do not suffer from the same level of impairment from agricultural sources. The *Total Maximum Daily Loads for Mill Creek* report identifies the Marysville waste water treatment plant as the dominant source of impairment to the creek.⁴ However, this plant has since been decommissioned and was replaced with a new state of the art treatment plant to the southeast of the city in 2009. The industrial park southeast of the city is also served by the new plant. Elimination of the old plant as well as discharges from the industrial park should result in improvement of Mill Creek below the old waste water treatment plant. Ohio EPA's next assessment will answer this question.

The Scioto River tributaries and central main stem from O'Shaughnessy Reservoir to the southern Franklin County line make up the third section of the Upper Scioto Balanced Growth study area. The majority of this section is dominated by urban and suburban land uses including portions of rapidly developing

³ Total Maximum Daily Loads for Bokes Creek. (2002). Ohio Environmental Protection Agency, Division of Surface Water. Pg 20

⁴ Total Maximum Daily Loads for Mill Creek (Scioto River Basin) Final Report. (2003). Ohio Environmental Protection Agency, Division of Surface Water.

southern Delaware County. The main stem is primarily impacted by the impoundments created by the O'Shaughnessy Reservoir and Griggs Reservoir dams. These impoundments were created to provide drinking water to the Northwestern portion of Columbus and surrounding suburbs. Additionally there are three low head dams below the Griggs Reservoir dam: the dam at the water treatment plant along Riverside Drive; the Main Street dam⁵; and the Greenlawn dam. Each of these dams creates a barrier to fish migration and creates impairments to the health of the river.

The *2010 Integrated Report Watershed Assessment Unit Summaries* created by Ohio EPA list the causes of impairment as direct habitat alterations, organic enrichment, siltation, unionized ammonia, sedimentation/siltation, high flow regime with the sources identified as channelization, suburbanization, municipal point source, non-irrigated crop production, package plants, removal of riparian vegetation, and urban runoff among others.⁶

There are two watershed action plans that have been developed for portions of the Upper Scioto watershed balanced growth study area. These include the *Bokes Creek & Mill Creek Watersheds Inventory and Watershed Action Plan* and the *Upper Scioto River Watershed Project Watershed Action Plan*. Both plans include all of the study area north of Franklin County. The Franklin County portion of the watershed has not benefitted from the development of a watershed action plan.

A diverse group of stakeholders developed each of these plans with participants representing

local watershed groups, soil and water districts, local government, state agencies, regional planning agencies, land owners, and concerned citizens. These plans identify a number of actions that can be implemented to help the waterway achieve full attainment of Water Quality Standards. The recommended actions include:

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

The Implementation Toolbox in this plan (beginning on page 54) 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 It was announced in April of 2012 that the Main Street Dam would be removed and the downtown stretch of the Scioto River would be restored to a more natural morphology.

⁶ *2010 Integrated Report Watershed Assessment Unit summaries* (WAUs) (Upper Scioto) at <http://wwwapp.epa.ohio.gov/dsw/ir2010/basin.php>

Table 1. Ohio Water Quality Standards Components

Components	Description
<i>Beneficial Use Designations</i> <ul style="list-style-type: none">• <i>Aquatic life habitats</i>• <i>Recreational Contact</i>• <i>Water Supply</i>	<ul style="list-style-type: none">• Existing or potential uses• Every water body is assigned a designation by the state• WQS for full attainment vary according to beneficial use designation
<i>Numeric Criteria</i>	<ul style="list-style-type: none">• Estimations of chemical concentrations• Degree of aquatic life toxicity
<i>Narrative Criteria</i>	<ul style="list-style-type: none">• General descriptions of water quality goals
<i>Anti-degradation Provisions</i>	<ul style="list-style-type: none">• Description of conditions under which water quality may be lowered

Land Use

This plan considers the relationship between land use and water quality, recognizing that different types of land uses have the potential to impact water quality in different ways and that measures to prevent or minimize those impacts will vary depending on the type and intensity of land use.

Agriculture is the most predominant land use in the Upper Scioto planning area, with over half of the watershed land (51.7%) used for agricultural

purposes. Agricultural land is particularly dominant in the northern portion of the watershed.

About 40 percent of the Upper Scioto Watershed planning area is developed, with 30.5 percent of the land area developed for residential use, the second most prevalent land use in the watershed. Table 2 provides more detailed information about land use in the planning area. Map 3 displays current land uses in the Upper Scioto Watershed planning area.

Table 2. Land Use in the Upper Scioto Watershed Balanced Growth Planning Area

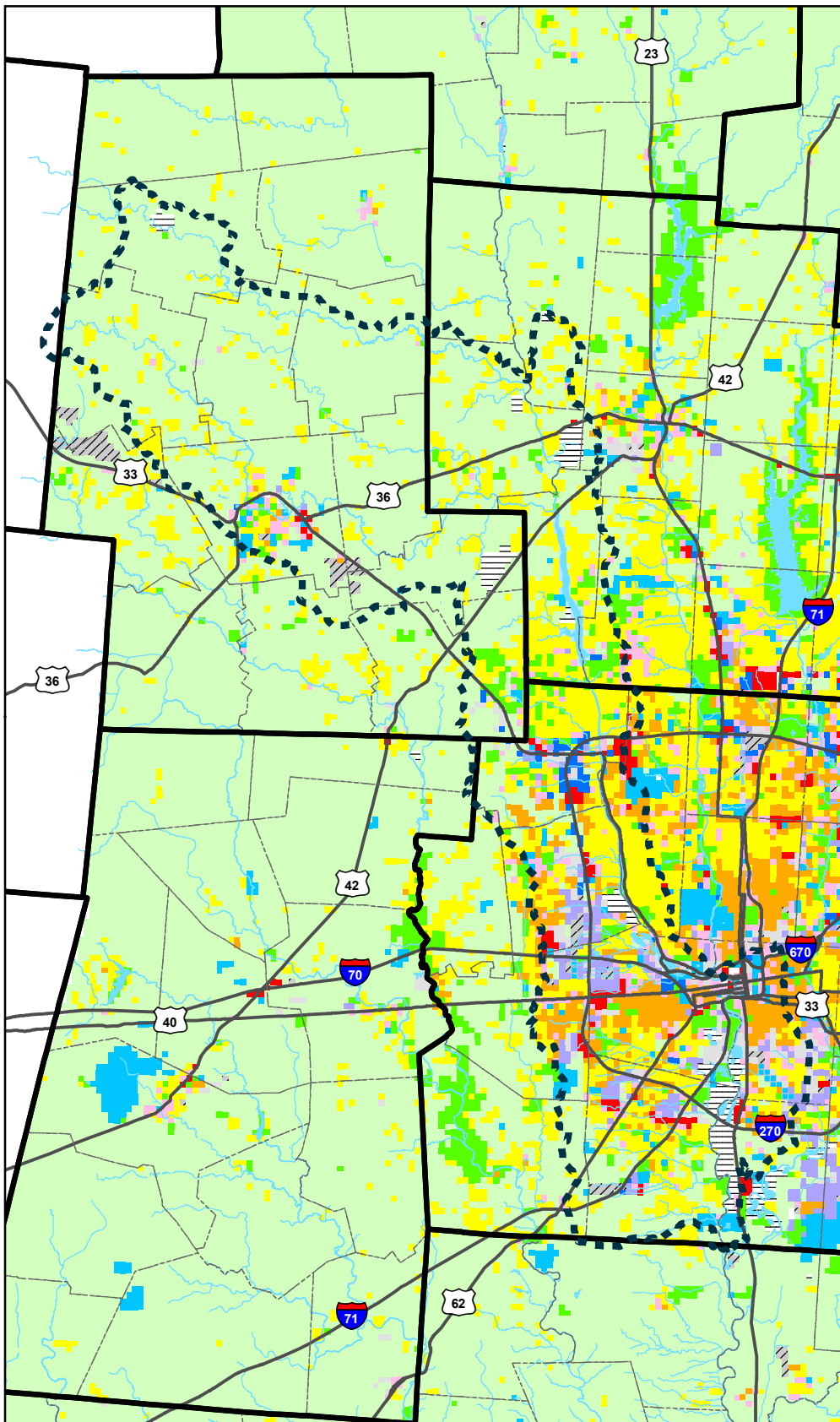
Land Use		Acres	% of Land
	<i>Development Type</i>		
Agriculture		143,160	51.7
Development	Public Use	6,640	2.4
	Commercial/Office	6,560	2.4
	Residential	84,400	30.5
	Industrial & Warehousing	14,320	5.2
	<i>Total Developed Land</i>	<i>111,920</i>	<i>40.4</i>
Quarry		7,800	2.8
Open Space & Parks		11,560	4.2
Other		2,480	0.9
Total		276,920	100

Source: MORPC Generalized Land Use Categories

Note: Uses summarized across 40 acre grid

Upper Scioto Balanced Growth Watershed

Land Use



Legend

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



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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 Watershed BG\Maps for Documents\US_LandUse.mxd
 April 2012

Natural Features and Resources

The Upper Scioto Watershed planning area is large. At over 433 square miles, it includes a diverse set of land uses and resources with agricultural dominated rural areas in the northern and southern portions, dense urban areas in Franklin County, and rapid suburbanization in western Franklin County, the Delaware/Franklin/Union County border section of the watershed along State Route 33, as well as the southern portion in the Grove City area.

One of the most critical resources of the watershed is drinking water. Several hundred thousand people in western and southwestern Franklin County rely on the City of Columbus' Dublin Road water treatment plant along the Scioto River for drinking water. The Griggs and O'Shaughnessy dams create the impoundments that supply this treatment plant. The City of Marysville also relies on Mill Creek for their drinking water. Map 4 shows drinking water protection areas for both surface water (corridor management zones) and groundwater (wellhead protection areas).

Beyond their use as a water supply, both reservoirs provide ample recreational opportunities. The City of Columbus has many parks and several boat ramps around O'Shaughnessy and Griggs that allow for boating, fishing, and picnicking.

The Upper Scioto Watershed is also home to Glacier Ridge Metro Park and the Scioto and Heritage Trails Greenways. Each of these parks protect unique and critical natural areas within the watershed and provide valuable recreational opportunities that attract boaters, fishers, wildlife-lovers, hikers and more to the region.

In addition to the parklands located within the watershed, forest cover is also abundant near the waterways and within the riparian areas of the Upper Scioto Watershed. The Ohio

Department of Natural Resources (ODNR) states that 31 percent of Ohio is forested; however, the majority of those resources are located in south and southeastern Ohio. According to the USGS Stream Stats website, 12 percent of the full Upper Scioto Watershed system is covered by forests.⁷ Woodlands are an important natural resource for a variety of reasons. They provide habitat for wildlife and rich recreational opportunities. They also serve the important function of cleaning our air and sequestering carbon, which would otherwise detrimentally impact our health and environmental well-being, from our atmosphere. Forests also permit greater water infiltration and pollution control. See the woodland and tree canopy protection tool on page 73 of this plan for more information on the economic benefits of this vital natural resource and the monetized value.

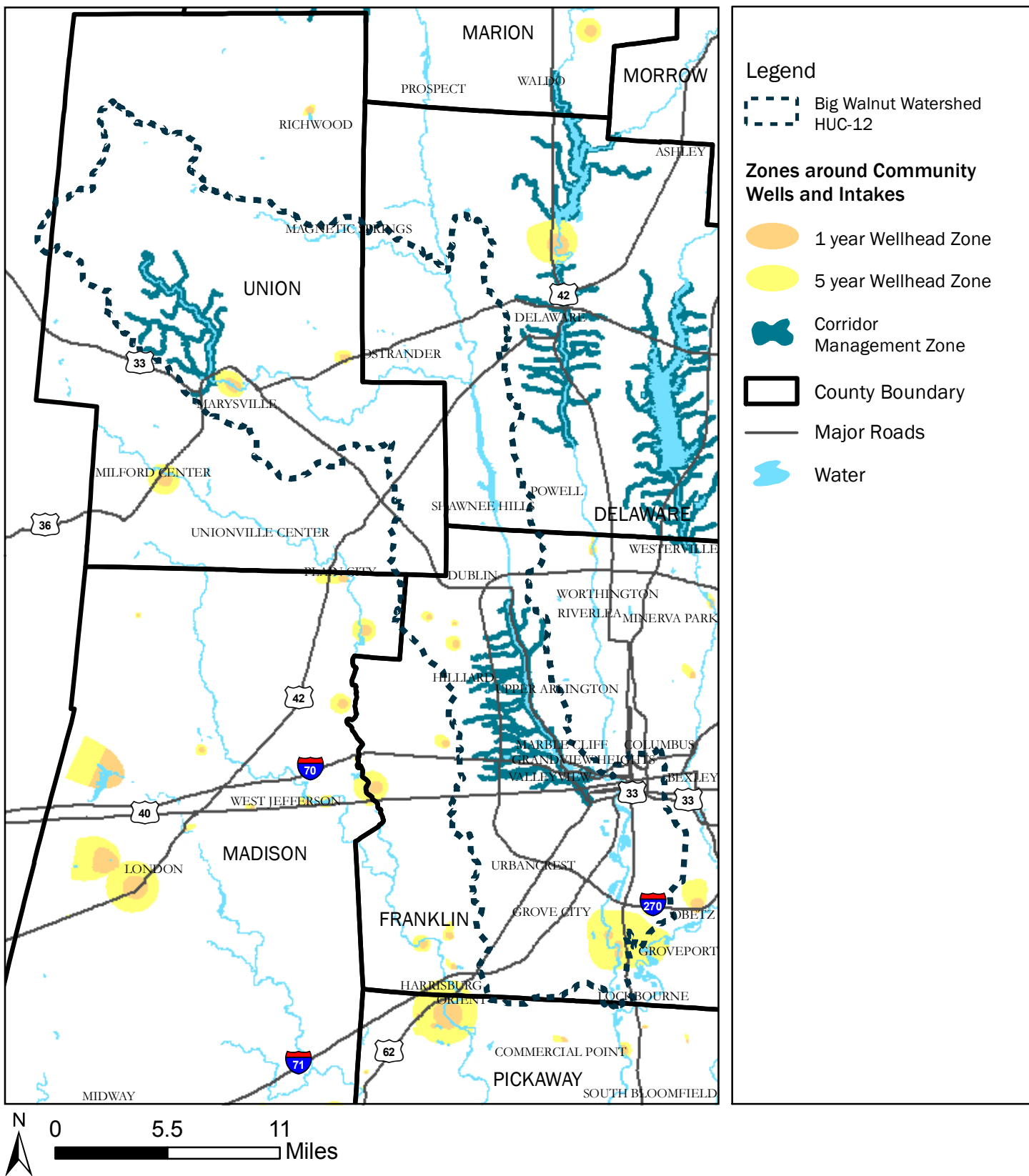
The Upper Scioto Watershed, like much of Ohio, is fortunate to be home to fertile agriculture lands, producing vital crops like corn and soybeans that feed our nation and supporting an agricultural way of life for many citizens. These fertile soils are essential to our local food economy. With an increased 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.

A number of areas in the watershed are actively quarried. It is important to recognize that there may be long-term possibilities for conservation efforts in these areas after they are no longer actively quarried.

⁷ USGS stream stats computation for the Upper Scioto Creek Watershed
http://streamstatsags.cr.usgs.gov/gisimg/Reports/BasinCharsReport1060413_201235124854.htm

Upper Scioto Balanced Growth Watershed

Drinking Water Protection Zones



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

Cultural and Historic Resources

Over 4,824 historic sites are located within the Upper Scioto watershed. They include sites on the Ohio Historical Inventory and National Register of Historic Places. The Ohio Historic Inventory program “...was developed to serve as an accurate and continuing record of the architectural and historic properties currently existing in the state. The Ohio Historic Inventory is used to record basic information on historic properties in Ohio.”⁸ “The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.”⁹

Most of the historic sites in the watershed are located in Franklin County. The highest concentrations are found within downtown Columbus and Old Dublin. Clusters of historic sites are also found in Union County, mostly in and around Marysville.

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 Upper Scioto Watershed. Planning for sewer service is part of the State's 208 *Water Quality Management Plan*.¹⁰ The following section describes the

⁸ Ohio Historic Preservation Office website <http://www.ohiohistory.org/resource/histpres/toolbox/historicinventory.html>

⁹ U.S. Department of the Interior's National Park Service website <http://www.nps.gov/nr/>

¹⁰ 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:

current sanitary sewer infrastructure in the Upper Scioto Watershed. See page 33 for more information about future sanitary sewer infrastructure planning and projects and page 105 for using the 208 Plan as an implementation tool.

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

Delaware County operates an extensive sewer system that covers most of the central portion of the county south of the City of Delaware/S.R. 36/37 and west of Hoover Reservoir to the Scioto River. Ostrander currently provides sewer service only to those areas within the village boundaries. However, the village passed legislation that allows them to provide sewer service outside of the boundaries without requiring annexation.

Marysville recently built a new plant along U.S. 33 in the southeastern corner of the county. This plant provides treatment for all of Marysville and development along the U.S. 33 corridor. Union County sold the infrastructure in this area to the City. Sewer from the Honda Plant goes to the City of Marysville.

<http://www.epa.ohio.gov/dsw/mgmtplans/208Final2006Plan.aspx>

Transportation

Travel and goods movement in and through the planning area takes advantage of a strong surface transportation network. Interstate 270 serves as a bypass around Columbus for through traffic on Interstates 70 and 71. It also helps connect communities across the planning area. Similarly, I-70 is an important east-west connection. Its path parallels U.S. Route 40, also known as the National Road, which provided an early transportation connection for the planning area. I-71 runs through the southern portion of the planning area between Downtown Columbus and its southernmost extent. Its path parallels State Route 3/U.S. Route 62, also known as 3-C Highway, which was an important connection between Cleveland, Columbus and Cincinnati. While not an interstate highway, U.S. Route 33 also plays an important role in connecting communities across the planning area.

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

Three public transit agencies use this roadway network in the planning area. Delaware Area Transit Agency (DATA) serves all of Delaware County with its demand response system and the Union County Area Transit Service (UCATS) operates a demand response system for Union County. “Demand response” refers to a system that dispatches transit vehicles to a destination upon request instead of a fixed schedule. The Central Ohio Transit Authority (COTA) has an extensive fixed route system that covers the Franklin County portion of the planning area. Express routes offer morning and evening service for working commuters. Local and

crosstown routes offer more frequent service. One of the most popular routes, COTA’s #10 follows Broad Street east-west across the southern portion of the planning area.

CSX and Norfolk Southern (NS) are the two dominant Class I railroads east of the Mississippi. Both have multiple lines that run through the planning area. Several of these lines converge at Parsons Yard and Buckeye Yard, which each serve as a major switching point for both railroads. 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 or a single point serving a collection of significant users combining for more frequent shipping needs may still find direct rail access possible and practical, especially as the cost of trucking goods increases.

The Indiana & Ohio Railway, part of the Rail America holding company, maintains a line that parallels US 62/SR 3 through the southern portion of the planning area from Columbus to the Ohio River near Cincinnati. Unlike CSX and NS lines, businesses may have increased access to this short-line for goods movement as there is less through traffic demanding speed and efficiency.

Intermodal facilities are designed to transfer goods between rail and truck. One of those facilities falls in the planning area. CSX’s Columbus Intermodal Terminal is currently being expanded. It is located at Buckeye Yard, with convenient access to both I-270 and I-70.

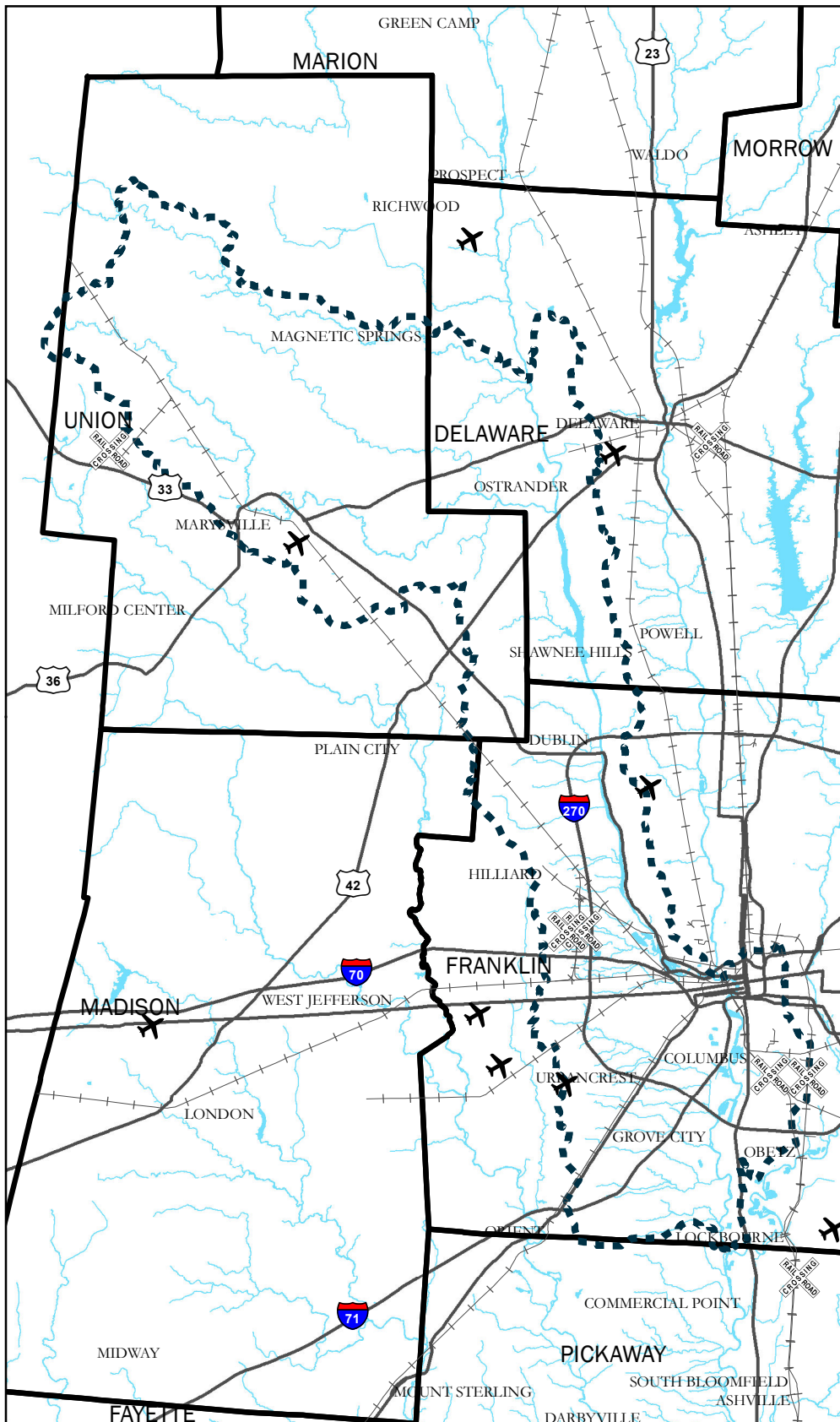
The Ohio State University owns and operates Don Scott Airport in northwest Columbus. It has four runways and a helipad. The runways range from just under 3000 feet to just over 5000 feet in length. It serves the same functions as a

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. The planning area also holds Bolton Field, another reliever airport

owned and operated by the Columbus Regional Airport Authority. Its facilities, including a 5,500-foot long runway, host many general aviation activities, but also can facilitate maintenance opportunities for area air freight services.

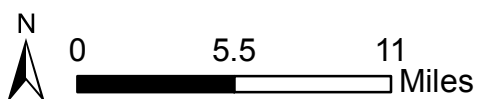
Upper Scioto Balanced Growth Watershed

Transportation



Legend

- Upper Scioto Watershed HUC-12
- Rail Yard
- Airport
- Railroad
- Major Roads
- Water
- County Boundary



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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 Watershed BG\Maps for Documents\US_Transportation.mxd
 April 2012

Economy and Employment

Approximately 457,000 people live in the Upper Scioto planning area. An additional 164,000 people are projected to live in it by 2035. The area currently hosts approximately 318,000 jobs with an additional 108,000 jobs expected by 2035.

The Upper Scioto planning area includes a wide mixture of land uses and employment centers located in communities in central and western Franklin County, including downtown Columbus, southwest Delaware County and the Marysville-Dublin corridor along route U.S. 33 in Union County.

Approximately 85,000 jobs are located in the urban center of Columbus. Many regional and national corporate offices are located in downtown Columbus including Nationwide Insurance, American Electric Power, Nysource, Grange Mutual Insurance, and State Auto Insurance. Higher education campuses located downtown include Columbus State Community College and Franklin University. In addition, Franklin County and department offices of the State of Ohio, including the Ohio Capitol and judicial offices, are all downtown.

The Ohio State University (OSU) with its enrollment of over 50,000 students and massive medical complex lies just outside of the watershed boundaries. There are several hospitals in the planning area including Nationwide Children's, Dublin Methodist, Mt. Carmel West, Doctors West, and Memorial Hospital of Union County in Marysville.

The predominance of office development in the watershed is in downtown Columbus. However, other office parks line the western arc of the I-270 outer belt through Hilliard and Dublin, and they are beginning to extend along the U.S. 33/S.R. 161 corridor between Dublin and Marysville. Within the Upper Scioto planning area, major corporate presences outside of the

downtown Columbus area include Cardinal Health, OCLC (Online Computer Library Center), the Wendy's Company headquarters and, to some degree, the PGA Memorial Golf Tournament. A regional retail node situated in the center of the watershed is anchored by the 1.0 million square foot Tuttle Mall. Other commercial corridors are laced through the area including South High Street, Stringtown Road, Georgesville Road, Rome-Hilliard Road, Lane Avenue, and Sawmill Road.

Industrial warehouse districts are located in Grove City near I-71, near Rickenbacker Port Authority in the south, and around the Buckeye Yard intermodal rail yard near the western I-70/I-270 interchange. The dominant industrial use however is the Honda manufacturing complex west of Marysville. The Marysville plant alone has over 3.6 million square feet of space and builds over 90 percent of the Honda Accord sedans sold in the United States. Scotts Miracle-Gro Company, the world's largest marketer of branded consumer lawn and garden products, is also located west of Marysville. The Columbus Post Office that serves central Ohio is located just west of downtown.

Employment growth is expected throughout the watershed, including along the western I-270 corridor. Redevelopment is occurring at Grandview Yards, an abandoned warehouse complex west of the OSU campus, along S.R. 315 west of the OSU Campus, and in the Bridge Street District in Dublin where 800 acres were recently rezoned to accommodate increased densities and mixed uses. Initiatives are also underway to redevelop residential neighborhoods located in the Franklinton area west of downtown. Residential development continues to fill-in in the areas around northwest Columbus, Hilliard, and Dublin.

The S.R. 161 corridor west of Dublin is being marketed as a high tech corridor and incentivized through streamlined administrative

tools. The U.S. 33 corridor between Marysville and Dublin is also being marketed for office and industrial development.

Map 6 shows the locations of the largest employers and Table 3 displays the percentage

of employment by industry sector. Map 7 is a map of anticipated high growth areas, and Table 4 is a listing of the amount of new employment growth expected in the area.

Table 3: 2010 Employment Forecasts of the Upper Scioto Watershed

	2010	2035	Change	Percent Change
Total Employment	318,389	426,867	108,478	34%
Office Employment	153,584	201,267	47,683	31%
Retail Employment	66,211	87,841	21,630	33%
Industrial Employment	53,621	69,344	15,723	29%
Other Employment	44,973	68,415	23,442	52%

Source: MORPC Land Use Model 2010

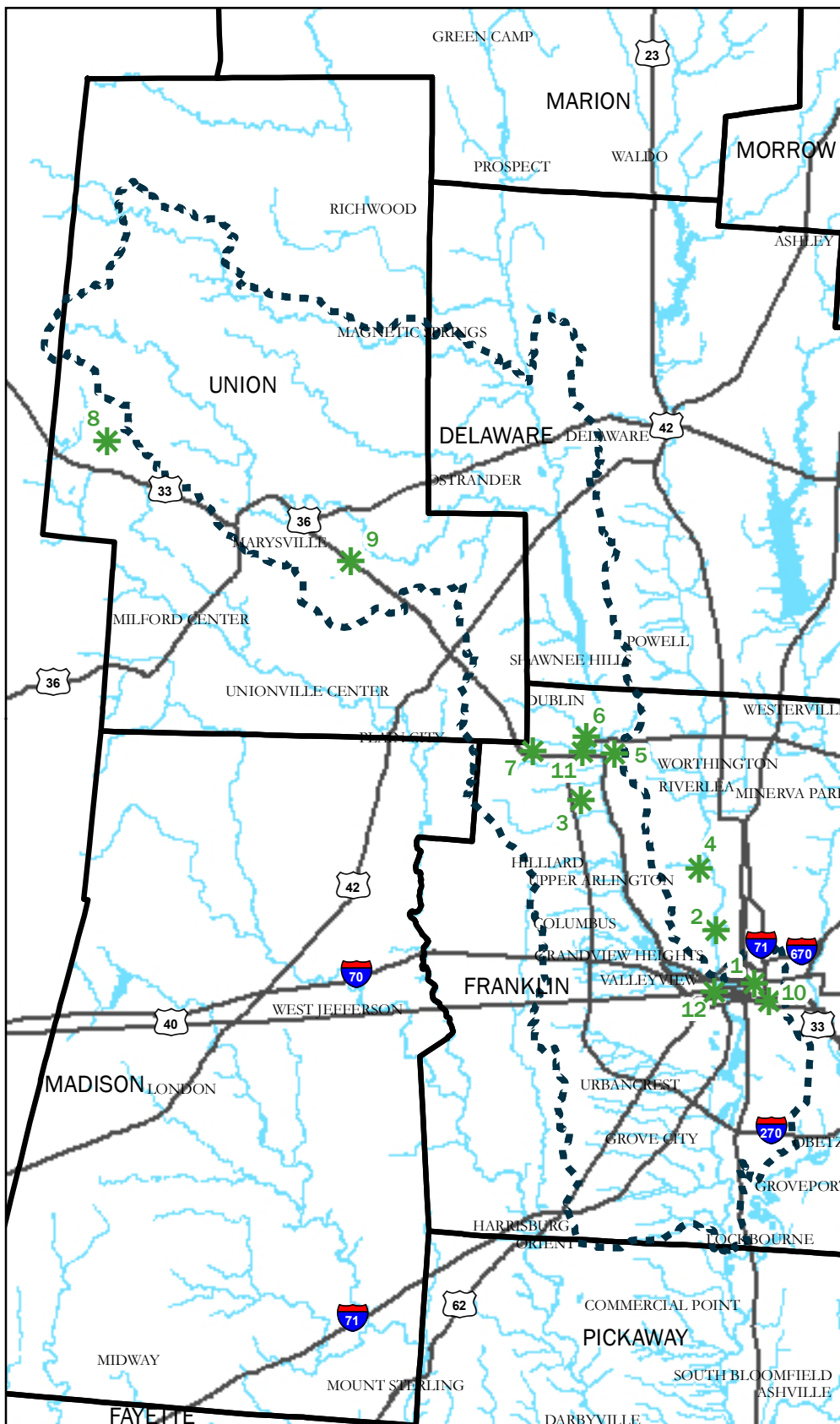
Table 4: 2010 Employment Profile of the Upper Scioto Watershed

Industry	% of Employment
Manufacturing	6%
Wholesale	5%
Retail	16%
Transportation	6%
Communications	2%
Finance, Insurance & Real Estate	14%
Service	21%
Education	7%
Medical	13%
Government/Non-Profit	11%

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

Upper Scioto Balanced Growth Watershed

Major Employers



Legend

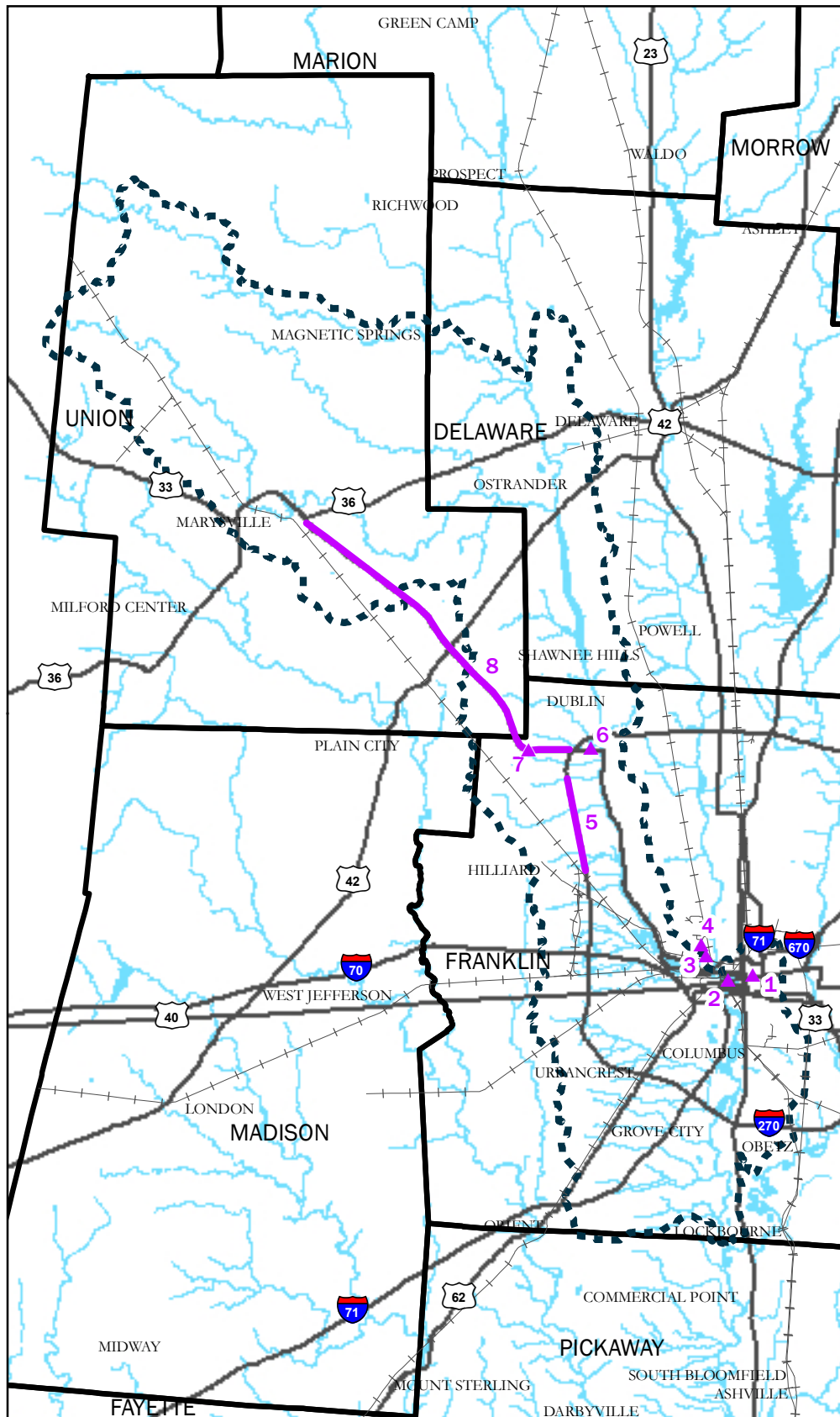
- Upper Scioto Watershed HUC-12
- County Boundary
- Major Roads
- Water
- Major Employers

1. Downtown Columbus
2. The Ohio State University
3. Tuttle Crossing Mall
4. Riverside Methodist Hospital
5. The Wendy's Company
6. Cardinal Health
7. Dublin Methodist Hospital
8. Honda of America Mfg., Inc.
9. The Scotts Co LLC
10. Nationwide Children's Hospital
11. Online Computer Library Center (OCLC)
12. Mount Carmel West Hospital



Upper Scioto Balanced Growth Watershed

Potential Growth Areas



Legend

Upper Scioto Watershed HUC-12

County Boundary

Major Roads

Water

Growth Areas

1. Downtown Columbus

2. Franklinton

3. The Grandview Yard

4. Gowdy Field

5. I-270 Corridor

6. Dublin Bridge Street District

7. Dublin West Innovation District

8. US-33 Development Corridor



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&Environ\Upper Scioto Watershed BG\Maps for Documents\US_Major_Employers.mxd
April 2012

FUTURE CONDITIONS

Table 5. Population Projections for the Upper Scioto Planning Area

		Population in Watershed		
Jurisdiction		2010	2035	Change
Union and Delaware Counties	City of Delaware	83	1,850	1,767
	City of Dublin	5,358	8,630	3,272
	City of Marysville	17,567	26,915	9,348
	Village of Ostrander	553	1,085	532
	City of Powell	813	1,172	359
	Village of Magnetic Springs	247	330	83
	Village of Shawnee Hills	766	1,902	1,136
	Allen Township	157	151	-6
	Concord Township	9,037	24,052	15,015
	Darby Township (Union County)	119	241	122
	Delaware Township	10	292	282
	Dover Township	2,146	3,760	1,614
	Jerome Township	1,579	11,951	10,372
	Leesburg Township	971	1,323	352
	Liberty Township (Delaware County)	6,019	10,669	4,650
	Liberty Township (Union County)	1,869	3,252	1,383
	Mill Creek Township	1,259	1,563	304
	Paris Township	1,774	10,324	8,550
	Radnor Township	406	683	277
	Scioto Township	2,469	5,173	2,704
	Taylor Township	1,455	1,753	298
	Thompson Township	17	57	40
	York Township	676	890	214
	Sub-Total		55,350	118,018

Population Growth

The Upper Scioto Watershed is expected to experience strong population growth over the next 25 years, with a projected growth of almost 34% from 457,372 in 2010 to 612,421 by 2035. The population of the northern portion of the watershed planning area (Union and Delaware Counties) is projected to more than double from roughly 55,000 residents to over 118,000 by 2035. This growth is projected to be strongest in the communities surrounding the City of Columbus to the north and the south and within and surrounding the growing City of Marysville. Growth is also anticipated along the U.S. Route 33 corridor that links these two cities.

The table on this page and the following page shows the projected population changes for all jurisdictions that had any land within the Upper Scioto Watershed planning area, including those communities that are not in the Upper Scioto Planning Partnership. The 2010 population and 2035 projections are limited only to the areas within the Upper Scioto planning area, not the entire jurisdictions. Please note that the planning area is limited to the 18 contiguous 12 digit HUCs described in the *Territory Boundary and Size* section of the plan (page 11) and depicted in Map 1.

		Population in Watershed		
Jurisdiction		2010	2035	Change
Franklin, Madison, and Pickaway Counties	City of Columbus	242,968	286,257	43,289
	City of Dublin	36,873	47,948	11,075
	City of Grandview Heights	5,049	5,088	39
	City of Grove City	35,082	44,970	9,888
	City of Hilliard	22,416	31,432	9,016
	Village of Marble Cliff	592	677	85
	Village of Obetz	480	3,354	2,874
	City of Upper Arlington	20,710	22,267	1,557
	Village of Urbancrest	894	1,636	742
	Village of Valleyview	439	447	8
	Brown Township	6	176	170
	Darby Township (Madison County)	26	81	55
	Franklin Township	12,140	15,884	3,744
	Hamilton Township	1,990	3,305	1,315
	Jackson Township	5,868	9,318	3,450
	Norwich Township	3,588	4,260	672
	Perry Township	743	871	128
	Pleasant Township	888	1,161	273
	Prairie Township	10,143	13,000	2,857
	Scioto Township (Pickaway County)	9	9	0
	Washington Township	1,118	2,262	1,144
	Sub-Total	402,022	494,403	92,381
Watershed Total		457,372	612,421	155,049

The data is organized to show growth trends across different areas of the watershed. While population growth is expected in most Upper Scioto communities, the trend will be most pronounced in the northern portion of the planning area.

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

Sanitary Sewer Infrastructure

Below is a summary of some notable sewer infrastructure projects and developments in the watershed. See Map 8 for an illustration of current and projected sewer service areas.

DELAWARE COUNTY

The Delaware County Sanitary Engineer has a brand new waste water treatment plant on the west side of the Scioto River in Concord Township that is currently not in service. New and existing development in the township is expected to be connected in the coming years.

Scioto Township opted out of sewer service coverage by Delaware County in an attempt to preserve the rural character of the area. A small portion of the township on the east side of the Scioto River is identified as a joint planning area between the City of Delaware and Delaware County. The Village of Ostrander is currently involved in talks with Scioto Township to be the management agency for the remainder of the township, with a Facility Planning Area boundary following the township boundary except for the small portion identified for service by the City of Delaware and Delaware County.

FRANKLIN COUNTY

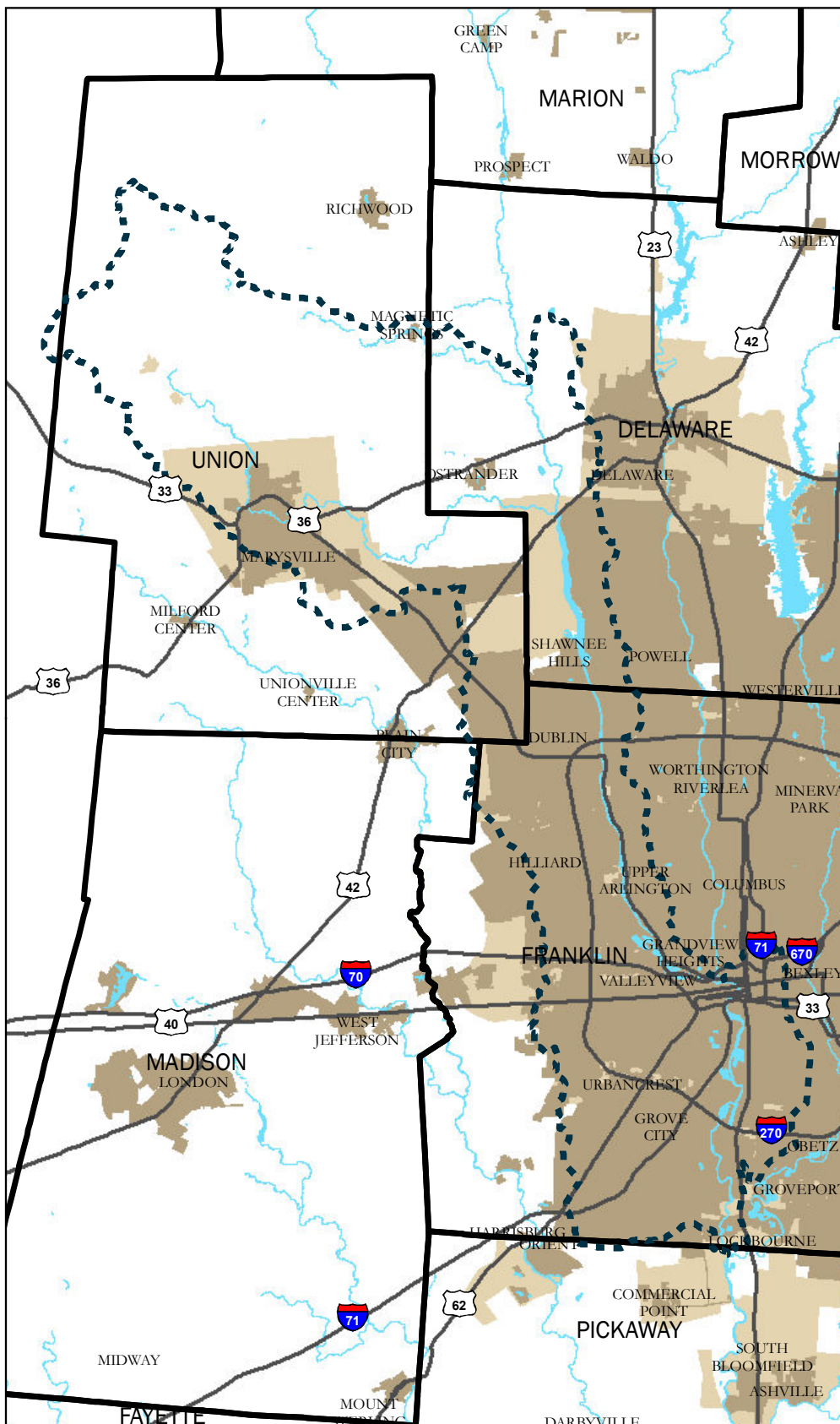
Waste water treatment for the Franklin County portion of the watershed is provided almost entirely by the City of Columbus. Ohio American Water operates a small system that serves the Lake Darby Estates neighborhood on the central west side of the county. The Franklin County Sanitary Engineer also operates four small package plants for several small communities on the west side. There is some overlap of planning boundaries with the City of Marysville in the southeastern corner of Union County.

UNION COUNTY







The Villages of Raymond and Peoria are priorities for sewer service. The county is in the process of designing a plant that will serve both. East Liberty and Broadway may also tie into this plant. The Village of Magnetic Springs is being pressured to provide sewer service also.

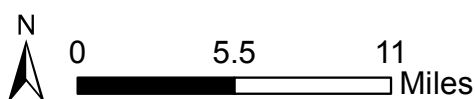
Upper Scioto Balanced Growth Watershed

Sewer Service Areas



Legend

-  Upper Scioto Watershed HUC-12
-  Current Sewer Service Area
-  Future Sewer Service Area
-  County Boundary
-  Major Roads
-  Water



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 Watershed BG\Maps for Documents
 Updated April 2013

Transportation

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

The Ohio Department of Transportation (ODOT) carries out the 3C planning process in the areas of the state that are not served by an MPO. In the Upper Scioto Watershed planning area, the TIP for Union County is prepared by ODOT District 6. The most recent TIP for the MORPC MPO and ODOT Districts 5 and 6 include projects scheduled for Fiscal Years 2012-2015 (July 1, 2012 – June 30, 2015). While there are various projects that reconstruct and maintain the existing transportation system, Table 6 provides a list of major capacity adding transportation projects that are planned for the Upper Scioto Watershed through June 30, 2015 and Map 9 shows the location of those planned projects within the watershed.

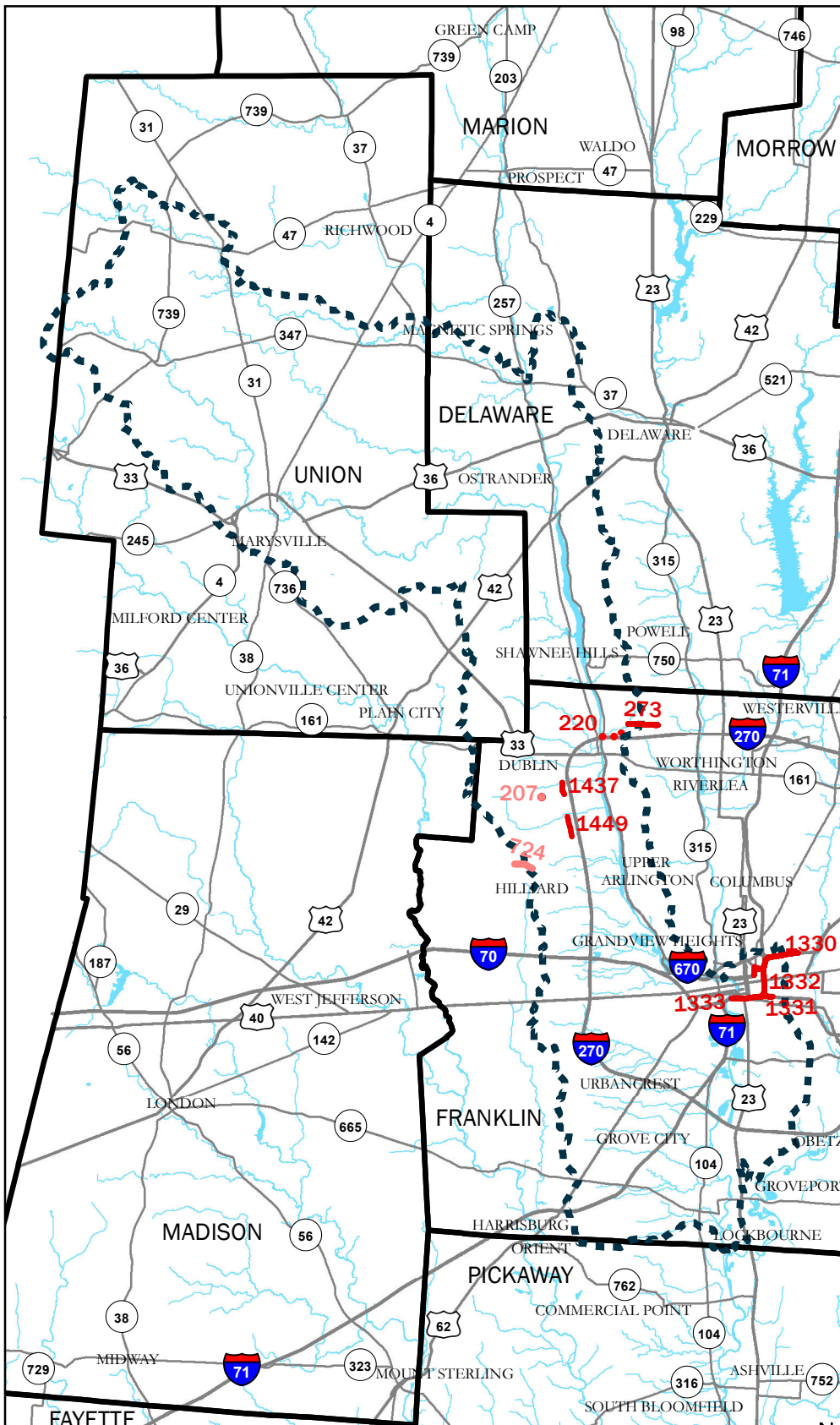
Table 6. List of major transportation projects planned for the Upper Scioto Watershed

MORPC ID	Project Description	Total Project Costs
207	Tuttle Crossing Blvd from Avery Rd to Wilcox Rd, New Roadway, 4 lanes, includes boulevard with curb and gutter, bikeway, sidewalk, street lights, roundabouts, and landscaping.	\$7,450,000
220	Emerald Pkwy from SR-257 (Riverside Dr) to N of Bright Rd (Billingsly Ditch), New Roadway, 4 lanes, Dublin Project ET0104. Boulevard with bikepath on one side and pedestrian on the other.	\$9,710,000
273	Hard Rd Phase A from Sawmill Rd to Smoky Row Rd, Major Widening/Bicycle Lanes from 2 to 5 lanes	\$14,174,000
724	Scioto Darby Rd from Cosgray Rd to Bradford Dr, Major Widening from 2 to 5 lanes	\$6,900,000
1330	I-70/I-71 Innerbelt (First Project), Major Widening/ Interchange Modification, Reconstruction of the I-670/I-71 interchange and I-71 from over Jack Gibbs Blvd to Long St. Includes one cap on Spring St and two caps on Long St.	\$2,000,000*
1331	I-70/I-71 Innerbelt (Second Project), Major Widening/Interchange Modification, I-70 from Grant Ave to 18 th St, I-71 from I-70 to Main St: Add 1 lane and rebuild with new ramps to Parsons Ave, Fulton St, and Mound St. Convert Mound and Fulton to one-way.	\$244,125,000*
1332	I-70/I-71 Innerbelt (Third Project), Major Widening/Interchange Modification, and reconstruction of I-71 from I-70 (East Split) to I-670 and associated ramps. It also contracts the NB and SB urban streets, as well as the Town, Oak, Broad, and Long St bridges.	\$113,900,000
1333	I-70/I-71 Innerbelt (Fourth Project), Major Widening/Reconstruction, South Trench – Downtown 70/71 overlap; Work on Mound St from 2 nd St to Fourth St; Work on Fulton St from Front St to Fourth St.	\$200,700,000
1437	Emerald Pkwy from Rings Rd to Tuttle Crossing Blvd, Major Widening/Multi-Use Path from 3 to 5 lanes, includes roundabouts at the Lakehurst Ct and Glendon Ct intersections. Joint project with the City of Dublin.	\$6,654,000
1449	Britton Pkwy (Sect.2/Ph.2 and Sect.3/Ph.2) from Davidson Rd to Hayden Rd, Major Widening from 3 to 5 lanes.	\$10,100,000

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

Upper Scioto Balanced Growth Watershed

Transportation



Legend

- Upper Scioto Watershed
- HUC-12
- Major Widening
- New Roadway
- Major Widening After 2015
- Interstate
- US Route
- State Route
- County Boundary
- Water



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April 2012

PRIORITY AREAS



About the Priority Areas

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

The USPP 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 Upper Scioto Watershed Balanced Growth Plan:

Priority Conservation Area: An area where local communities are encouraged to promote the conservation of land for its unique natural, cultural, recreational or historical value.

Priority Development Area: An area targeted for future development or redevelopment where the local communities will promote use of the land, community services, and existing or planned infrastructure with maximum efficiency while minimizing the impact on the watershed.

Priority Agricultural Area: An area that local communities target 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 minimizing the impact on the watershed.

Using Priority Area Designations

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

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

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

It is important to recognize that the jurisdictional boundaries of the USPP communities may change over time due to annexation. In some cases, the priorities of the annexing jurisdiction

may not be consistent with the map designations depicted for those areas.

Criteria

The Priority Area maps are the result of both a watershed-wide technical analysis of objective criteria and a localized review process. The USPP 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 USPP considered important for identifying areas conducive to continued agriculture and related practices.

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

The initial criteria analysis was conducted using ArcGIS software. Following the initial analysis, USPP communities reviewed, adjusted, and refined the maps. MORPC assisted communities through this process. The Priority Areas designated in the maps on pages 45-48 are the result of this two-step process.

The following section describes the criteria that were selected to initially highlight Priority Areas

across the watershed. Maps showing the results of the initial criteria analysis and a technical description of the USPP adopted criteria, including all data sources and weighting, are included in Appendix A.

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 surface drinking water intakes that should be protected in order to ensure drinking water quality. Land use changes near stream corridors feeding surface water intakes may adversely affect drinking water quality.

Wellhead Protection Areas

The Ohio EPA has delineated protection areas around public and municipal groundwater wells. These areas were modeled based on the time it would take contaminants in the groundwater to travel to reach the wellfields. Within the 1-year wellhead protection area, potential contaminants in the groundwater could reach the wellfields within one year. It would take up to five years for potential contaminants within the 5-year area to reach the wellfields.

Natural Land Cover

The U.S. Geological Survey (USGS) maintains data which shows the location of deciduous forests, grassland/herbaceous areas, evergreen forests, shrub/scrub areas, woody wetlands, and emergent herbaceous wetlands. Natural land cover along streams or riparian areas is important because it provides valuable wildlife

habitat and improves water quality by filtering out some of the contaminants in stormwater and agricultural runoff before the water reaches the streams.

Parks and Open Space

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

Wetlands

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

Habitats

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

Hydric Soils

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

Soil Permeability Score

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

Scenic Roads

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

Historic Sites and Districts

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

Covered Bridges

The Upper Scioto PCA analysis included land within 100 feet of a covered bridge. The partnership included these areas because covered bridges are important local cultural, historic, and aesthetic assets.

PDA CRITERIA

Major Roads

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

Regional 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 USPP 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 Upper Scioto Watershed are not well suited for use as septic tank absorption fields, requiring additional controls on traditional home septic systems to ensure water quality.

Improvement to Land Value Ratio in Urbanized Area or Urbanized Cluster

A low improvement-to-land value ratio may indicate that the parcel is vacant or underutilized.

Community Reinvestment Areas (CRA)

Community Reinvestment Areas (CRA) are established to provide tax incentives for investing in real property improvements or new construction in areas where investment in housing has been discouraged.

Enterprise Zones (EZ)

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 USPP included EZs on the Priority Development Area criteria list because these locations have already been locally targeted for development efforts.

Tax Increment Financing (TIF)

TIFs are an economic development mechanism that allow communities to fund local infrastructure improvements within a designated area by locking the taxable value of real property when the TIF is established. These areas were included on the Upper Scioto Priority Development Area criteria list because they have been locally targeted for development or redevelopment efforts.

Railroad

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

Urbanized Area/Urbanized Cluster

An urbanized area and/or urbanized cluster typically indicates the presence of infrastructure and public services. Developing in and near the urbanized area limits the cost of future public infrastructure extensions and public service delivery.

PAA CRITERIA

Agricultural Easements and Century Farms

Agricultural easements are areas where landowners have sold or donated the development rights to their farm. By placing the land in easement, the landowner has indicated a desire to keep the land in agricultural production. Century farms have been maintained by the same family for at least 100 continuous years and are voluntarily registered with the Ohio Department of Agriculture.

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 USPP decided to include both parcels that are enrolled in Agricultural Districts and parcels adjacent to Agricultural Districts on the PAA criteria list, giving enrolled parcels a higher weight. The rationale for including both was that farmland that is adjacent to protected farmland should also receive priority in future preservation decisions to ensure land use compatibility and preserve contiguous tracts of farmland.

Adjacent to Agricultural Easements and Century Farms

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

Prime Farmland

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

Agricultural Land Use

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

Large Parcels

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

Certified Agricultural Use Value (CAUV)

Enrolling land in the CAUV program may indicate that the land is being employed for agricultural purposes currently and may continue to be into the near term.

Identifying the Priority Areas

The analysis area for the Upper Scioto Balanced Growth Plan extends beyond the boundaries of the 12-digit HUCS that make up the planning area. This is because several USPP 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 Upper Scioto Balanced Growth Plan mapping process, township or municipal boundaries were used; otherwise, the watershed boundary was used as the analysis area boundary.

As mentioned earlier, the maps are the result of both a watershed-wide criteria analysis and a local review of the maps by each of the

jurisdictions. The USPP adopted the Priority Area criteria list and weighting in February 2011. In November 2011, MORPC began distributing draft criteria analysis maps to each of the watershed communities.

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

UPPER SCIOTO PRIORITY AREA MAPS

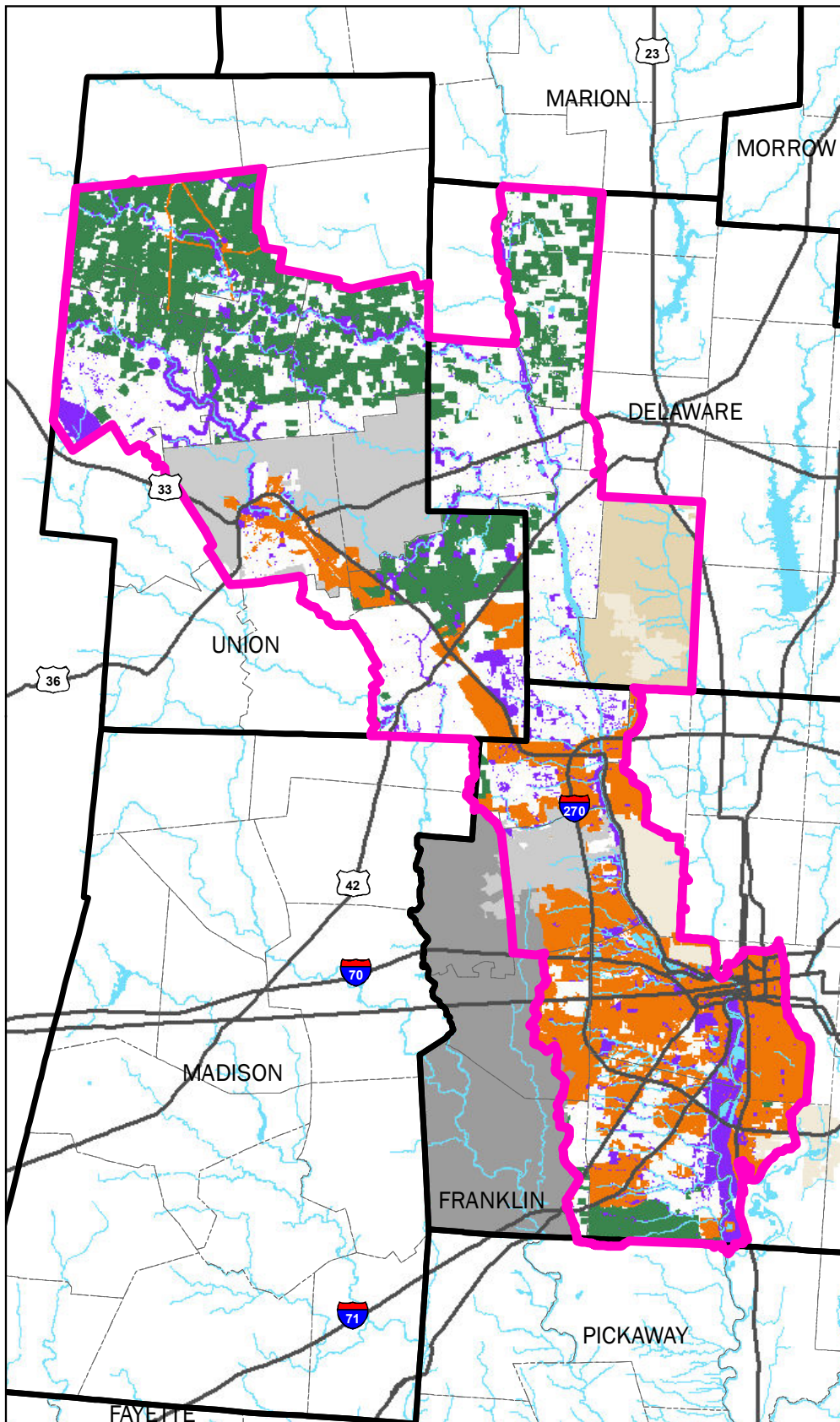


Priority Areas designated across the entire analysis area are shown on page 45. The following three pages show the same Priority Areas at a larger scale.

Map 10. Upper Scioto Priority Areas.....	45
Map 11. Union County Priority Areas.....	46
Map 12. Delaware County Priority Areas.....	47
Map 13. Franklin County Priority Areas	48

Upper Scioto Balanced Growth Watershed

Priority Analysis Areas



Legend

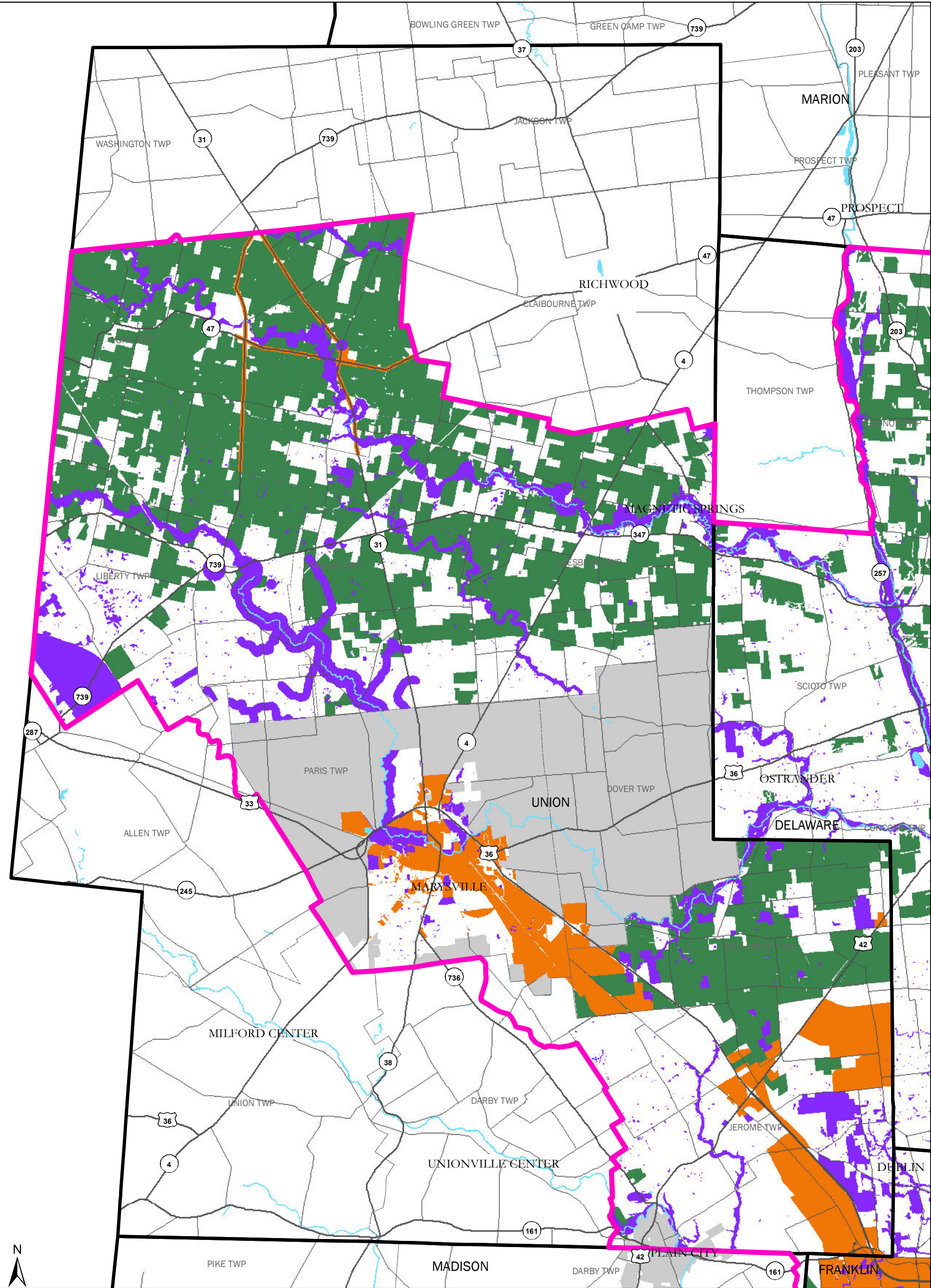
- Upper Scioto Analysis Area
- Priority Agricultural Area
- Priority Conservation Area
- Priority Development Area
- City/ Village Participating in other Balanced Growth Plan
- Township Participating in other Balanced Growth Partnership
- Not Participating in Balanced Growth Partnership
- Darby Accord Area
- Railroad
- Major Roads
- Water
- Township Boundary
- County Boundary



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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 Updated January 2013

Upper Scioto Balanced Growth Watershed

Union County



Balanced Growth Watershed

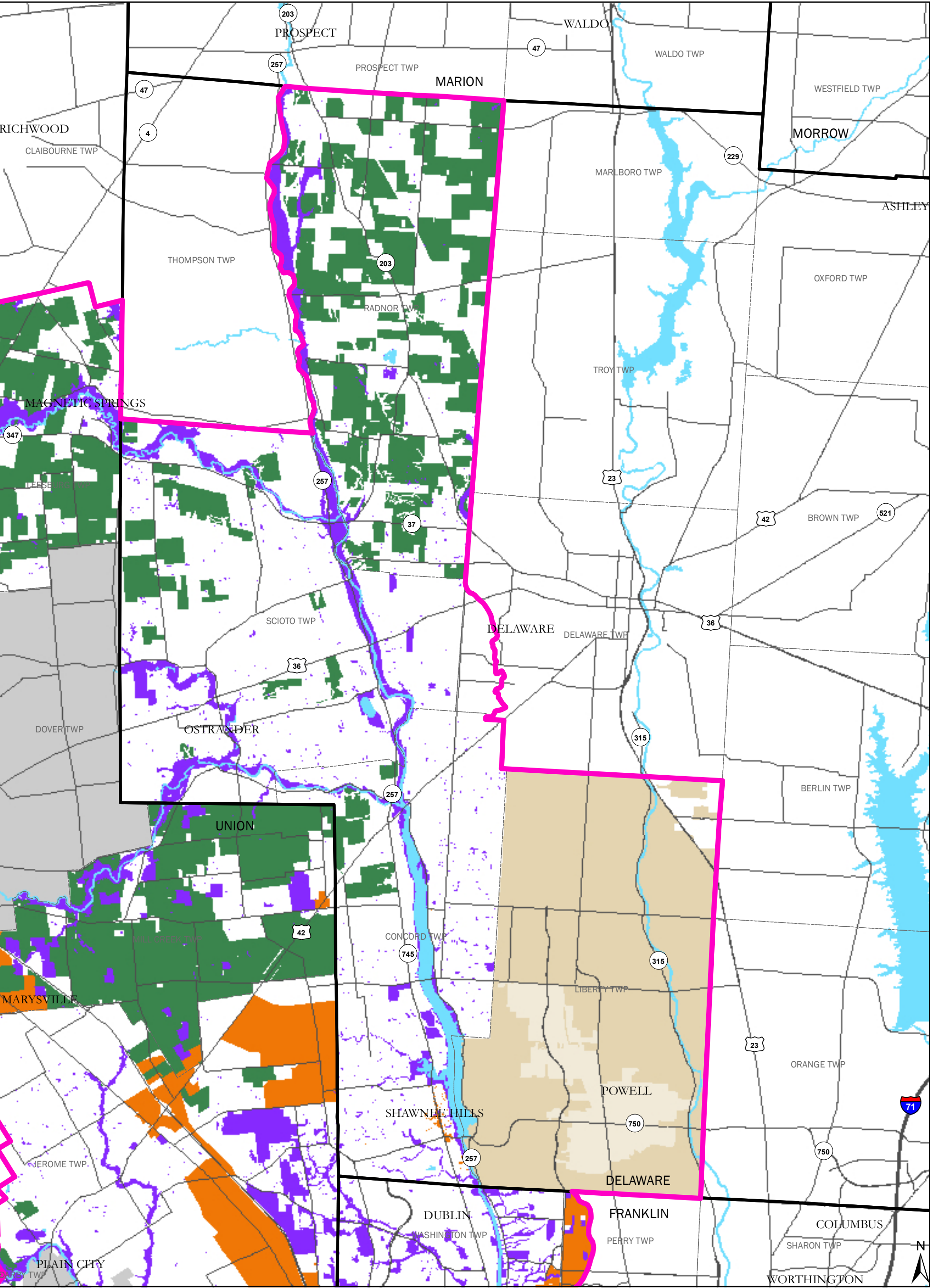
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|----------------------------|------------------------------------------------------------|-------------------|
| Upper Scioto Analysis Area | City/ Village Participating in Balanced Growth Partnership | Township Boundary |
| Priority Agricultural Area | Township Participating in Balanced Growth Partnership | County Boundary |
| Priority Conservation Area | Not Participating in Balanced Growth Partnership | Major Roads |
| Priority Development Area | | Water |

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









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Updated January 2013

Upper Scioto Balanced Growth Watershed

Delaware County



Balanced Growth Watershed

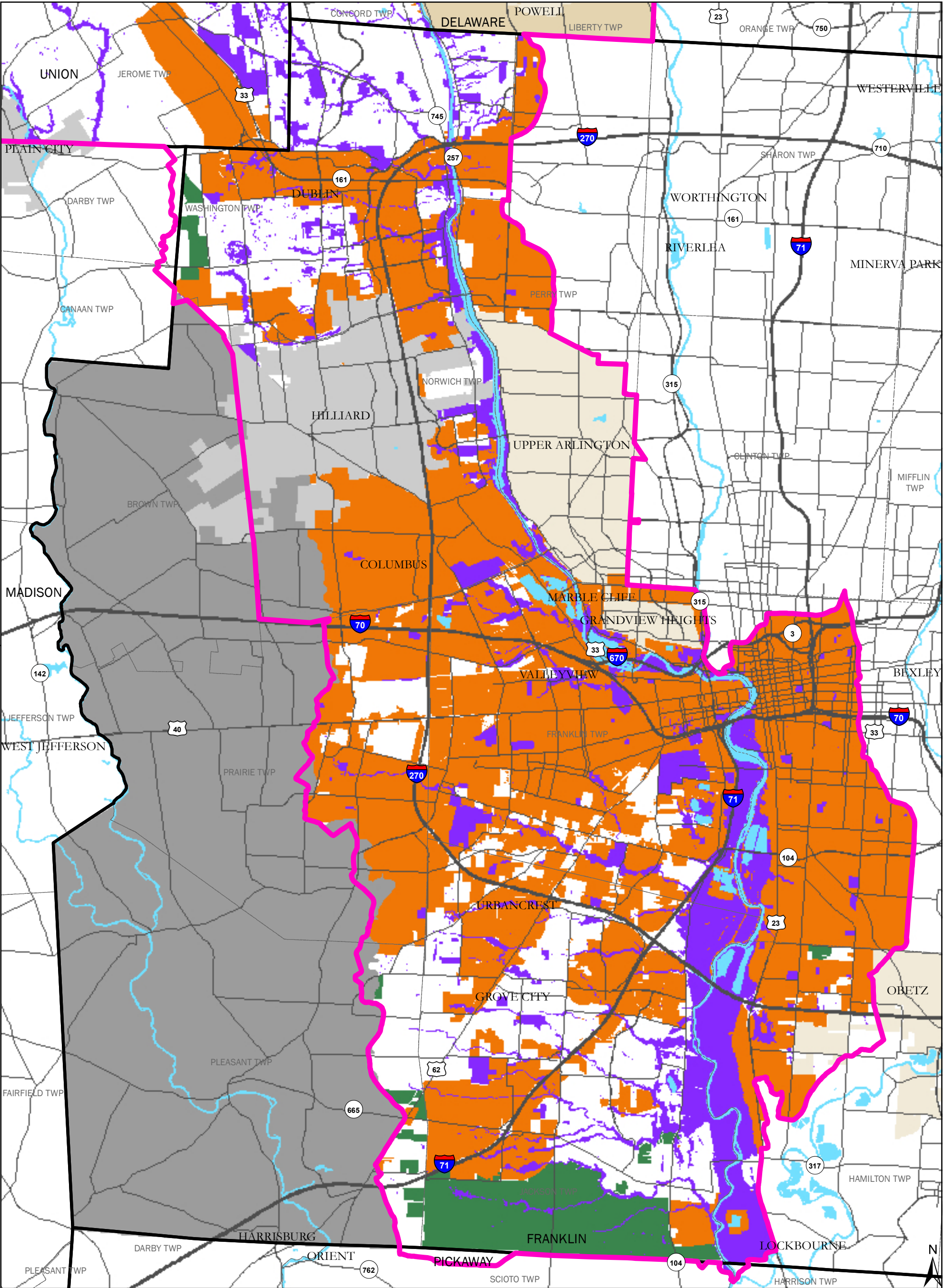
- | | | |
|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|  Upper Scioto Analysis Area |  City/ Village Participating in Balanced Growth Partnership |  Township Boundary |
|  Priority Agricultural Area |  Township Participating in Balanced Growth Partnership |  County Boundary |
|  Priority Conservation Area |  Not Participating in Balanced Growth Partnership |  Major Roads |
|  Priority Development Area | |  Water |

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June 2012

Upper Scioto Balanced Growth Watershed

Franklin County



Balanced Growth Watershed

- Upper Scioto Analysis Area
- Priority Agricultural Area
- Priority Conservation Area
- Priority Developement Area

- City/ Village Participating in Balanced Growth Partnership
- Township Participating in Balanced Growth Partnership
- Not Participating in Balanced Growth Partnership
- Darby Accord Area

- Township Boundary
- County Boundary
- Major Roads
- Water

0 1 2 Miles
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June 2012

IMPLEMENTATION



Recommendations

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

1. Adopt the Upper Scioto Balanced Growth Plan.
2. Establish a local comprehensive plan if one does not exist for your community.
3. Update the community's local comprehensive plan every five years.
4. Incorporate the designated Priority Areas into local community plans and zoning.
5. Integrate the recommended implementation tools (beginning on page 54) where applicable and appropriate.
6. Continue participating in the Upper Scioto Planning Partnership.

Cooperation Between Jurisdictions

A key element to the success of the Upper Scioto Balanced Growth Planning effort was the cooperative work of the communities and stakeholders in the USPP. This continues to hold true for the future success of implementing the plan and enhancing the economic and environmental health of the Upper Scioto Watershed. This plan recommends that interested parties maintain the USPP 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 Upper Scioto Planning Partnership. These strategies are assigned a general time frame, ranging from short term (approximately one to two years), mid-term (approximately two to four years) to long term (four or more years). These time frames are goals and there is no requirement to implement the strategies or to do so within a specific time frame

Figure 1. Upper Scioto Watershed Balanced Growth Implementation Strategies

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

State Endorsement

Following local adoption by USPP communities, MORPC will seek state endorsement of the Upper Scioto Balanced Growth Plan. To be eligible for state endorsement, the Upper Scioto Balanced Growth Plan will need to be adopted by 75 percent of the Upper Scioto Watershed

planning area communities (see Appendix D for more information about partnership formation). In addition, at least 75 percent of the Upper Scioto population and land area must be represented by the endorsing communities. The table on the following page provides more detailed information about the land area and population breakdown by jurisdiction.

Table 7. Population and Land Area in Upper Scioto Watershed by Jurisdiction

Jurisdiction (County)	Population in Watershed 2010	% of Watershed Planning Area Population	Land Area in Watershed (Acres)	% of Watershed Planning Area Land Area
City of Columbus	242,968	53.5%	49,250	18.3%
City of Dublin	42,231	9.3%	15,712	5.8%
City of Grandview Heights	5,049	1.1%	545	0.2%
City of Grove City	35,082	7.7%	10,371	3.9%
City of Hilliard	22,416	4.9%	6,142	2.3%
Village of Magnetic Springs	247	0.1%	142	0.1%
Village of Marble Cliff	592	0.1%	179	0.1%
City of Marysville	17,567	3.9%	8,970	3.3%
Village of Ostrander	553	0.1%	538	0.2%
Village of Shawnee Hills	766	0.2%	283	0.1%
City of Upper Arlington	20,710	4.6%	3,907	1.5%
Village of Urbancrest	894	0.2%	366	0.1%
Village of Valleyview	439	0.1%	100	0.0%
Concord Township	9,037	2.0%	13,973	5.2%
Dover Township	2,146	0.5%	14,203	5.3%
Franklin Township	12,140	2.7%	4,463	1.7%
Hamilton Township	1,990	0.4%	1,576	0.6%
Jackson Township	5,868	1.3%	11,434	4.2%
Jerome Township	1,579	0.3%	8,938	3.3%
Leesburg Township	971	0.2%	14,680	5.5%
Liberty Township (Delaware)	6,019	1.3%	3,942	1.5%
Liberty Township (Union)	1,869	0.4%	18,254	6.8%
Millcreek Township	1,259	0.3%	11,823	4.4%
Norwich Township	3,588	0.8%	1,257	0.5%
Paris Township	1,774	0.4%	11,537	4.3%
Prairie Township	10,143	2.2%	1,733	0.6%
Radnor Township	406	0.1%	4,323	1.6%
Scioto Township (Delaware)	2,478	0.5%	21,214	7.9%
Taylor Township	1,455	0.3%	16,003	5.9%
Washington Township	1,118	0.2%	1,812	0.7%
York Township	676	0.1%	11,517	4.3%
Watershed Planning Area Total	454,030	100	269,187	100

Source: U.S. Census 2010 distributed within ¼ mile grid

*Due to its size, the data source for Brice is directly from the 2010 Census.

Continuing the USPP Following Endorsement

This plan recommends that the USPP continue to meet at least annually following endorsement. Provided that funding can be secured, MORPC will host and facilitate the annual USPP 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 USPP. MORPC will also prepare and submit progress reports regarding implementation of the Upper Scioto Balanced Growth Plan to the OWRC. While the meeting format will be discussion-oriented and the partnership will be encouraged to share matters they feel are relevant to the Balanced Growth Planning effort, the following topics will be addressed at each meeting to guide the discussion in a productive manner:

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

Partnership communities are strongly encouraged to communicate with one another throughout the year as major projects that impact the watershed are slated and as

opportunities for collaboration arise. The annual meeting of the partnership is intended to supplement, not replace, open lines of communication across jurisdictions.

Review of changes to local land use designations

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

IMPLEMENTATION TOOLBOX



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

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

Stormwater Management

Low Impact Development

Natural Areas Establishment

Stream and Wetland Setbacks

Woodland/Tree Canopy Protection

Conservation Development

Compact Development

Transfer of Development Rights

Brownfield Redevelopment

Exactions and Impact Fees

Complete Streets

Economic Development Programs

Farmland Preservation

Agricultural Conservation Programs

208 Planning

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. 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, a majority of the communities in the Upper Scioto 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 Upper Scioto Planning Partnership communities with Comprehensive Plans in place.

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

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>

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

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

BENEFITS

- Establishes a desired vision for the community's future.
- Encourages public involvement, participation, and input in local decision making.
- Provides a framework to help communities achieve long-term goals and address potential threats.
- Provides a framework for balancing private rights with public good.
- Protects and enhances health and safety of community members.
- Coordinates efficient use of existing infrastructure and prepares for future infrastructure needs.
- Supports the defensibility of zoning.¹⁵

RECOMMENDATIONS

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

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

Table 8. Comprehensive Plans for Upper Scioto Planning Partnership Communities

Community	Plan	Year Adopted	Link/ Notes
Counties			
Delaware	No		Comprehensive plans are prepared for individual townships, villages, and cities.
Franklin	No		Comprehensive plans are prepared for individual townships, villages, and cities.
Union	Yes	Updated 1999	http://www.lucplanning.com/CompPlan/Union%20County%201999%20Comprehensive%20Plan.pdf
Cities/ Villages			
Columbus	Yes	Varies*	http://development.columbus.gov/uploadedFiles/Development/Planning_Division/Document_Library/Plans_and_Overlays_Imported_Content/complan.pdf
Dublin	Yes	2007	http://www.dublin.oh.us/planning/community/index.php
Grandview Heights	Yes	1997	
Grove City	No		
Upper Arlington	Yes	2001	http://www.uaoh.net/egov/apps/document/center.egov?fDD=25-0&fCS=&path=browse&id=14
Magnetic Springs	No		
Marble Cliff	No		
City of Marysville	Yes	2010	http://www.marysvilleohio.org/DocumentView.aspx?DID=173
Ostrander	No		
Shawnee Hills	Yes	2002	http://www.dcrpc.org/compplan/document/ShawneehillCompPlan.pdf
Urbancrest	No		
Valleyview	No		
Townships			
Concord Township (Delaware County)	Yes	2004	http://www.dcrpc.org/compplan/document/ConcordTwpCompPlan2004.pdf
Franklin Township (Franklin County)	Yes	Varies**	** http://www.franklincountyohio.gov/commissioners/edp/planning/southwest/SouthwestAreaPlan.pdf (2009) http://www.franklincountyohio.gov/commissioners/edp/planning/westland/WestlandInterimFrameworkweb.pdf (2010) http://www.franklincountyohio.gov/commissioners/edp/planning/scioto-franklin/SciotoFranklinPlanweb.pdf (2011)

Community	Plan	Year Adopted	Link/ Notes
Hamilton Township (Franklin County)	Yes	Varies***	*** http://development.columbus.gov/planning/content.aspx?id=24150 (1997, amended 2004) The Obetz and Hamilton Township Community Plan also covers part of Hamilton Township (1998)
Jackson Township (Franklin County)	Yes	2010	http://www.franklincountyohio.gov/commissioners/edp/planning/jackson/pdf/jacksonplan.pdf
Jerome Township (Union County)	Yes	2008	http://www.lucplanning.com/CompPlan/Jerome%20Township%20Comp%20Plan%20-%20Draft%28August%202008%29.pdf
Leesburg Township (Union County)	No		
Liberty Township (Delaware County)	Yes	2006	http://www.dcrpc.org/compplan/document/LibertyTwpCompPlan.pdf
Liberty Township (Union County)	Yes		
Millcreek Township (Union County)	Yes	Updated 2010	http://millcreektwpohio.us/DandGPlan.pdf
Norwich Township (Franklin County)	Yes	2001	
Paris Township (Union County)	No		
Prairie Township (Franklin County)	Yes	Updated 2006	
Radnor Township (Union County)	No		
Scioto Township (Delaware County)	Yes	2006	http://www.dcrpc.org/compplan/document/SciotoTwpCompPlan.pdf
Taylor Township (Union County)	Yes	2008	http://www.lucplanning.com/CompPlan/Taylor%20Township%20Plan%20Draft%20Final.pdf
Washington Township (Franklin County)	Yes	2005	http://www.franklincountyohio.gov/commissioners/edp/planning/washington/Washington_Township_Comprehensive_Plan.pdf
York Township (Union County)	No		

*The City of Columbus prepares Area Wide plans, similar to Comprehensive Plans. The Brewery District Plan (1993), Franklinton Plan (2003), 5th by Northwest Plan (2009), Greater Hilltop Plan & Update (2010), Interim Hayden Run Corridor Plan (2004), McKinley Avenue Corridor Plan (2001), Near Southside Plan (19997), Near Southside Plan Update (2011), Northwest Plan (2007), Scioto Southland Plan (2007), South Alum Creek Plan (2004), South Central Accord (2009), South Side Plan (2002), South Side Plan: Merion-Southwood (2008), Southwest Area Plan (2009), Tri-South Plan (2003), Trabue Roberts Area Plan (2011), and Westland Plan (1994) cover much of the city's land within the Upper Scioto watershed.

Stormwater Management Regulations

PAA

PDA

PCA

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

Stormwater runoff is one of the primary sources of impairment to the Upper Scioto Watershed. Stormwater runoff is a form of nonpoint source pollution, meaning that it does not come from a single source or follow a direct, identifiable route.¹⁶ In an undisturbed ecosystem, stormwater falls onto open grasslands, forests, and other natural areas where it slowly infiltrates the soil and is filtered. In contrast, when stormwater falls on impervious surfaces, it is unable to penetrate through to the soil and instead runs off, often picking up pollutants and sediment along the way. Impervious surfaces are any surfaces that prohibit water from passing through. Examples of impervious surfaces commonly found in urbanized areas are paved roadways, parking lots, sidewalks, and rooftops. As the amount of impervious surfaces in an area increases, the volume and velocity of stormwater runoff increases with it.

Another large contributor of nonpoint source pollution from stormwater runoff is agricultural runoff. While agricultural land uses do result in lower total amounts of stormwater runoff (compared with developed, urban areas) due to the land's permeability, the runoff that does enter the stream often picks up sediment,

nutrients, chemicals or bacteria that have been applied to the land. Agricultural runoff often results in increased levels of nitrogen and phosphorous in the waterways which may encourage the growth of certain types of algae that can be dangerous to humans and animals. A wide variety of practices, both structural and non-structural, are available to assist communities with managing stormwater. Several of the other tools recommended in this toolbox are also designed to achieve stormwater management. For example, Low Impact Development, Riparian and Stream Setbacks, and Conservation Development can help communities achieve lower overall rates of stormwater runoff.

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

The *Management Plan* recommends that communities identify the major cause(s) of stream impairment and water quality threats, identify target implementation areas and potential funding sources, and review the applicability and effectiveness of various practices before selecting the stormwater management practices to implement locally.¹⁷

¹⁶ 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>

¹⁷ Ohio Environmental Protection Agency (EPA) and Ohio Department of Natural Resources (ODNR) (2005 – 2010). Getting the Point about Nonpoint: Ohio Nonpoint Source Pollution Management Plan; Web: <http://wwwapp.epa.ohio.gov/dsw/nps/NPSMP/MM/mmdecisiontree.html>

Under the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) Storm Water Program, communities must ensure that their codes meet or exceed the U.S. EPA's requirements for managing stormwater runoff and pollution.¹⁸ The NPDES program has been implemented in two phases. Phase I required operators of large and medium Municipal Separate Storm Sewer Systems (MS4) to develop a detailed Storm Water Management Program (SWMP). Large MS4s serve over 250,000 residents and medium MS4s serve between 100,000 and 250,000 individuals. Under Phase II of the NPDES program, smaller MS4s that serve less than 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.¹⁹

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

¹⁸ 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>

¹⁹ Ohio EPA. MS4 Program Overview; Web: <http://www.epa.state.oh.us/dsw/storm/ms4.aspx>

BENEFITS

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

RECOMMENDATIONS

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

MODEL REGULATION & PLAN

Model Ordinance for Comprehensive Storm Water Management, Chagrin River Watershed Partners
<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=HcjXwiToMSU%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.²⁰

²⁰ 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.”²¹ 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

²¹ U.S. EPA (2011). Heat Island Effect. <http://www.epa.gov/heatisld/>

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

INTEGRATED MANAGEMENT PRACTICES

Riparian and Wetland Setbacks

Please refer to Page 67, Stream and Wetland Setbacks, for more details.

Biofiltration Facilities

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

For more information:

<http://www.stormwaterpartners.com/facilities/bioswale.html>

Vegetated Swales

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

For more information:

<http://www.epa.gov/owm/mtb/vegswale.pdf>

Cistern and Rain Barrels

Cisterns and rain barrels are rainwater collection systems that collect precipitation for reuse. These systems may also be used for stormwater collection, but there are limitations for the use of stormwater versus rainwater that has been collected as it tends to collect a higher

content of pollutants. The collected water can be used in a variety of ways. For example, water collected may be used to water gardens, to add water to a pool, to wash a car, for toilet water (with the appropriate plumbing set up), or for washing clothes.

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

Infiltration Trenches

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

For more information:

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

Green Roofs

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

Table 11. Green Roof Cost Comparisons

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

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

For more information:

<http://www.epa.gov/heatisland/mitigation/greenroofs.htm>

BENEFITS

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

RECOMMENDATIONS

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

Natural Areas Establishment

PCA

PAA

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

developments are specifically designated as meadows and open space, weed laws would require the areas to be mowed.

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

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

The guide explains that there are three categories of “weed laws” that allow for Natural Area Establishment.²²

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

²² Ohio Lake Erie Commission. *Linking Land Use and Lake Erie: Best Local Land Use Practices*.

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

BENEFITS

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

RECOMMENDATIONS

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

MODEL REGULATIONS

1. *City of White Bear Lake, Minnesota: Model Code*
<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=H3C5UE6AlxI%3d&tabid=66>
2. *City of Madison, Wisconsin: Model Code*
<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=0E8KH0saN6s%3d&tabid=66>
3. *Village of Long Grove, Illinois: Model Code*
<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=HWND71Xe18U%3d&tabid=66>

Ohio's Noxious and Regulated Weeds

Noxious

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

Regulated

Multiflora Rose
Purple Loosestrife

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

Stream and Wetland Setbacks

PCA

PDA

PAA

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

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

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

corridors exist. For example, the City of Columbus utilizes a stormwater management plan, augmented by the development review process as new development occurs.

The purpose of stream and wetland setbacks is to provide communities with a means to protect the natural flow of waterways, protect the riparian corridor that provides critical habitat and soil stability, create an area where stormwater can slowly filter into the waterways, and provide a buffer between development and the water to promote community safety. Streams store and convey water and provide a means for rich sediment to be deposited in our floodplains. The streams and wetlands themselves provide critical habitat to fish, frogs, insects, birds, and many other creatures. The corridors along rivers and wetlands, particularly if well forested or complete with brush and other native plantlife, slowly filter stormwater runoff and also assist in regulating stream temperature by moderating the amount of sunlight that reaches the waterways (particular stream temperatures support particular forms of life). Vegetation in the riparian corridor absorbs the force and volume of floodwaters, stabilizes the stream banks from erosion, filters pollutants, and reduces floods by increasing absorption of floodwater into the soil.²³ 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.

²³ Ward, A., D'Ambrosio, J., Witter, J. (2008). Floodplains and Streamway Setbacks. Ohio State University Extension, Agriculture and Natural Resources.

Ideally, stormwater runoff would slowly percolate through vegetation into the soil and into our waterways. When impervious surfaces such as rooftops and parking lots are placed within the floodplain or riparian area, the volume and speed of the stormwater runoff increases, causing a number of issues including flooding, soil erosion (subsequent exposure of plant roots and ensuing damage to plantlife), and deep channel cutting. Generally, research shows that when ten percent or more of land in a watershed is covered by impervious surfaces, impairment to streams occurs.²⁴ 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.²⁵ It has also been demonstrated that due to impervious surfaces a typical city block generates more than five times the stormwater runoff than a wooded area of the same size. Given the research and the demonstrated impacts of stormwater runoff, it is critical that communities seek to address these issues to protect and enhance the watershed and maintain the safety of citizens from floodwaters. Figure 2 illustrates the impact of impervious surfaces on stormwater versus that of natural ground cover.

Stream protection and stormwater management are particularly relevant issues with regard to public health, safety, and welfare. Erosion of the stream banks leads to dangerous conditions for anyone nearby and for structures close to the waterway. Stream and wetland setbacks also make financial sense. While setbacks are often a reactive measure to protect our waterways and reduce flooding, they are also a proactive measure to accomplish the same means as future development occurs and to prevent stream/wetland degradation and flooding for

existing development. By maintaining healthy streams and wetlands through setbacks, the need to engage in costly restoration or reconstruction is reduced. Setbacks may also allow a degraded or channelized waterway (depending on the level of degradation) to restore itself over time through natural processes as opposed to costly restoration.²⁶

A common concern expressed among citizens is the impact that stream setbacks may have on private property values. Studies have consistently shown that home values appreciate faster near protected open space such as that created by setbacks.²⁷ A clean and vegetated stream near a property provides an attractive amenity to the property. Maintaining setbacks also contributes to property protection for the aforementioned reasons regarding floodwater. These setbacks can also function in tandem with the low impact development and natural area establishment tools for a comprehensive approach to stormwater management.

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

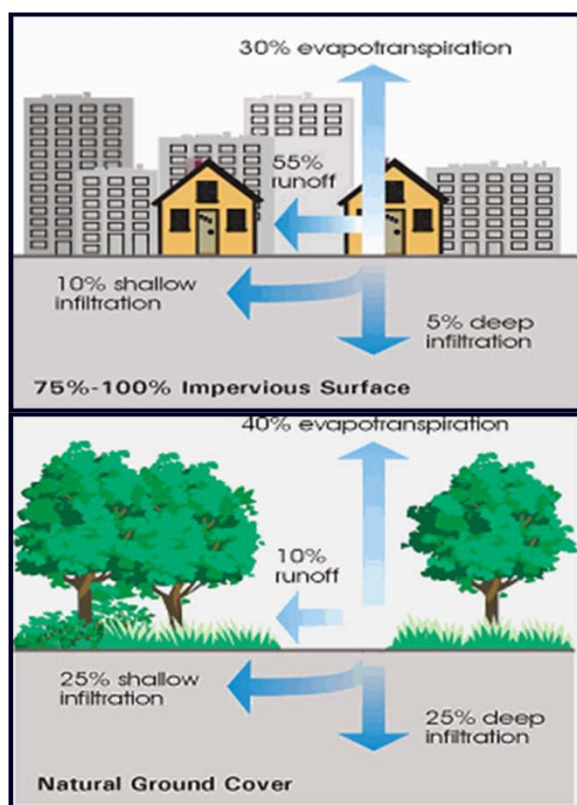
²⁴ U.S. EPA 2003. Protecting Water Quality from Urban Runoff.

²⁵ The Impacts of Impervious Surfaces on Water Resources. (2007). New Hampshire Estuaries Project (NHEP), University of New Hampshire.

²⁶ 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>

²⁷ Arendt, Randall. *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks* (Island Press 1996).

Figure 2. Relationship between impervious surface and stormwater runoff



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

STREAM SETBACKS

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

The following are Ohio Department of Natural Resources Stream Setback Recommendations²⁸:

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:

$$\text{Streamway width} = 147 (\text{DA})^{0.38}$$

$$\text{DA} = \text{Drainage Area in square miles.}$$
4. At no point shall the distance between the setback boundary and the stream channel be less than:

$$\text{Minimum distance from stream channel: } 14.7 (\text{Drainage Area in square miles})^{0.38}$$
(Approximately 1 channel width)

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

²⁸ Ohio Department of Natural Resources (ODNR) Division of Soil and Water Conservation. *Rainwater and Land Development, Third Edition (2006). Chapter 2 Post Construction Stormwater Management Practices.* Ohio Department of Natural Resources.
<http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx>

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

Table 12. Chagrin River recommended setbacks

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

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

WETLAND SETBACKS

Wetlands provide valuable flood and stormwater storage, habitat for a number of plant and animal species, and a place to filter contaminants and sediments from water. Below are the three categories of wetlands established by the Ohio EPA, as defined in the Ohio Rapid Assessment Method User's Manual.²⁹

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.

²⁹ 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.crwpp.org/pdf_files/riparian_wetlands_guide_book.pdf

BENEFITS

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

RECOMMENDATIONS

1. Protect the health and safety of residents and reduce the need for costly stormwater infrastructure, flood control, or flood damage repair by encouraging the preservation of the riparian and wetland areas that naturally address stormwater retention, infiltration, and conveyance.
2. Provide education on the benefits of stream and wetland protection to communities, property owners, and the public including the promotion of safety and increase in property values.

3. Allow a mechanism for some flexibility and creativity in site design such as grandfathering or a variance process when appropriate.
4. Communities may consider creating stream and wetland setbacks that are consistent with neighboring communities and at the watershed-scale to provide greater predictability for developers and streamlining between communities.
5. Passive recreation uses may be maintained in the setback but native vegetation and forest should be prioritized for preservation.
6. Discourage destruction or stripping of soil and vegetation within the stream and wetland setback area as a means of stream bank protection and to maintain the soil structure.
7. Encourage maintenance of natural hydrology to the greatest extent feasible to reduce disturbance of natural surface and ground water flow and reduce flooding incidence.
8. Coordinate stream and wetland protection with other tools such as low impact development and natural area establishment/meadow protection for a comprehensive approach to stormwater management.

MODEL ORDINANCE

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

Woodland and Tree Canopy Protection

PCA

PAA

PDA

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

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

Some communities have enacted regulations which attempt to address this problem. Tree canopy protection works in tandem with other tools described in this plan, such as stream setbacks, where vegetation like trees can be preserved to stabilize stream banks and assist in the slow infiltration of stormwater. The establishment, protection, and maintenance of street trees and parking lot landscaping trees is

a way that transportation and the protection of the environment can be integrated to the benefit of both. Trees enhance the aesthetic appeal of our thoroughfares and parking lots and can provide additional buffer protection between pedestrian walkways and bicycling lanes and the cars on the roadway. This can enhance safety for all modes of transportation. The shade provided by parking lot landscaping and street trees also moderates the impact of pavement that retains heat and contributes to the urban heat island effect. As discussed earlier, the urban heat island effect contributes to high temperatures and associated health threats. It should also be recognized that street and parking infrastructure beautification can work toward achieving better water quality. Appropriate stormwater measures like infiltration areas paired with street tree landscaping can also intercept street and parking lot stormwater runoff. This not only helps to reduce the impact of the impervious surface on the waterway but also provides a great aesthetic. Research has determined that the average tree canopy coverage in urban areas across cities in the U.S. is at approximately 27 percent.³⁰ The USDA Urban Forest Data estimates that for the State of Ohio, the percent of tree canopy cover of urban or community land is at about 21 percent.³¹

³⁰ Dwyer and Nowalk (2000). A national assessment of the urban forest: an overview. Society of American Foresters.

³¹ USDA (2008). Urban Forest Data: Ohio <http://nrs.fs.fed.us/data/urban/state/?state=OH> Table 1. Statewide summary of population, area, population density, tree canopy and impervious surface land cover, and urban tree benefits in urban, community, and urban or community areas.

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

- Tom Cochran, CEO of U.S. Conference of Mayors

The percentage of tree canopy coverage varies by community and communities are encouraged to invest in a tree canopy analysis to determine their own needs. There are a number of programs available for community forest analysis such as [I-Tree](http://www.itreetools.org/index.php) (<http://www.itreetools.org/index.php>), a program developed by the USDA Forest Service for urban forestry analysis, Urban Forest Data (<http://nrs.fs.fed.us/data/urban/state/?state=OH>), and various GIS programs. While performing a tree inventory or canopy analysis is encouraged, it is not a prerequisite for adopting a tree protection ordinance. No matter the character of the community, the basic process for developing a tree protection ordinance is much the same.³² 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) (<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

³² Swiecki, T.J., and Bernhardt, E.A. (2001). Guidelines for Developing and Evaluating Tree Ordinances.

details responses from a survey distributed to communities throughout the U.S. to gauge the tools being used for tree canopy protection, the connection between sustainability and tree preservation, trees as "green infrastructure", and the integration of tree preservation in land use plans.

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

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

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

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

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

Communities interested in learning more about key considerations regarding the tree canopy at the watershed level can read more in the [Urban Watershed Forestry Manual](http://www.forestsforwatersheds.org/storage/completePart1ForestryManual.pdf) (<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)

(<http://www.slideshare.net/watershedprotection/formatted-uwf-slideshow-presentation?type=powerpoint>) developed by the Center for Watershed Protection called Urban Watershed Forestry to learn more about the intersection of tree canopy protection and watershed health. Technical support on developing a community forest management program is also available through the Ohio DNR Urban Forestry program (<http://www.ohiodnr.com/tabid/5547/Default.aspx>).

Table 15. Urban tree benefits (2000)

Urban Land and Community Land	
Estimated number of trees	133,500,000
Carbon	
Carbon stored (metric tons)	25,500,000
Carbon stored (\$)	\$581,400,000
Carbon sequestered (metric tons/year)	840,000
Carbon sequestered (\$/year)	\$19,152,000
Pollution	
CO ₂ removed (metric tons/year)	311
CO ₂ removed (\$/year)	\$438,000
NO ₂ removed (metric tons/year)	3,832
NO ₂ removed (\$/year)	\$37,963,800
O ₃ removed (metric tons/year)	9,157
O ₃ removed (\$/year)	\$90,708,000
SO ₂ removed (metric tons/year)	1,934
SO ₂ removed (\$/year)	\$4,688,800
Total pollution removal (metric tons/year)	21,930
Total pollution removal (\$/year)	\$178,100,000

Source: Nowak, D.J. and Greenfield, E.J. (2010). Urban or community land is land that is urban, community, or both. Communities may include all, some, or no urban land within their boundaries. Urban land is based on population density and was delimited using the United States Census definitions 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 CO₂.
- Improves appearance of the community to visitors and pride among residents.
- Reduces noise pollution by intercepting and diffusing sound.
- Increases recreational opportunities, such as bird watching.
- Reduces heating or cooling costs due to temperature moderation.
- Reduces urban heat island effect.
- Reduces household energy costs.
- Provides urban forestry and other related functions.

RECOMMENDATIONS

1. Develop or review an overall community forest management strategy.
2. Work with residents to establish tree preservation goals.
3. Inventory trees in community using one of a suite of tools including GIS, resident survey, etc.
4. Establish a percentage threshold of tree cover acceptable to the community.
5. Prioritize areas where tree preservation and conservation are of high importance.
6. Prioritize areas for tree replacement.
7. Consider developing plans or ordinances to preserve trees and the tree canopy at the

community level but consider the regional impacts of efforts. Consult with neighboring communities to promote regional consistency.

8. Utilize the comprehensive guidelines to assist policymakers in developing a tree protection ordinance.
9. Identify site-specific trees for protection during the development process.
10. Select healthy native trees for preservation and maintenance.
11. Protect undeveloped forests from encroaching development.
12. Utilize development or financial incentives to drive development away from sensitive forested areas and toward other areas deemed appropriate by the community.
13. Provide for re-vegetation and re-treeing of abandoned areas or untended open space.
14. Minimize disturbance of woodland areas and consider developing in a manner that disrupts woodland the least.
15. Prioritize protection of established mature woodlands or woodlands with recognized value (e.g., critical wildlife habitat, riparian forest buffers, PCAs).
16. When new areas are annexed to a community, recognize that some woodlands may be enrolled in a working forest easement program or the Ohio Forest Tax Law (OAC 1501:3-10-01 to 1501:3-10-07), both of which may require forest management activities. It is recommended that forest management activities can take place while protecting or enhancing other benefits from forests.

MODEL REGULATIONS

City Example

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

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

Link to ordinance:

<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=qoUOGBTYdRo%3d&tabid=66>

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

ADDITIONAL RESOURCES

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

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

Conservation Development

PCA

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

The basic elements of conservation development are the designation of a large portion of the site to permanent open space (40 to 50 percent of total site is recommended), an allowance for smaller lots and street setbacks to achieve “density neutrality,” and the preservation of important and sensitive natural features to the greatest extent possible. Due to the resulting cluster of homes on the portion of the site that is developed, this design approach is also sometimes referred to as Cluster Development.³³ 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.³⁴

³³ Blaine, T., Schear, P. Cluster Development Fact Sheet. Ohio State University Extension, Community Development; Web: <http://ohioline.osu.edu/cd-fact/1270.html>

³⁴ Ohio Lake Erie Commission. *Linking Land Use and Lake Erie: Best Local Land Use Practices*.

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

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

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

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=PDtycGNhOU0%3d&tabid=66>

Figure 3. Traditional dispersed development versus conservation development



Traditional Dispersed Development



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”.³⁵ Because each community has its own unique character, those considering compact development regulations are encouraged to consider including design guidelines that outline preferences for parking and building design, landscaping, and signage. This is an excellent opportunity to engage members of the public further in deciding how they would like to see their community take form aesthetically moving forward with more compact development.

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

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

³⁵ Compact Development for More Livable Communities. Local Government Commission. Center for Livable Communities. http://www.lgc.org/freepub/docs/community_design/focus/compact_development.pdf

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

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

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

PARKING

One commonly cited compact development concern that may be raised is the issue of parking availability given the concentration of development. While compact development is conducive to alternative modes of

transportation which can alleviate congestion and parking needs, it can also readily accommodate automobiles, particularly if the proper measures are taken. One such measure is shared parking. In fact, compact development can readily support shared parking due to the proximity of a mix of land uses with varying parking needs and peak parking times. Indeed, compact mixed-use, pedestrian-oriented commercial nodes are the ideal areas to utilize shared parking.³⁶ 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.³⁷ Landscaping can be incorporated into the design to increase precipitation infiltration and to enhance the attractiveness of the parking areas, but alternatives to typical concrete or asphalt can greatly increase infiltration. These pavers can take many forms including latticed brickwork, permeable concrete mix, or spaced stonework.

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

³⁶ Capitol Region Council of Governments (CRCOG) (2006). Best Practices Manual. Shared Parking: Fact Sheet. http://www.crcog.org/publications/CommDevDocs/TCS/Ch08_FactSheet_Parking.pdf

³⁷ ODNR Division of Soil and Water conservation (2006). Rainwater and Land Development Manual, Third Edition. Chapter 2: Post Construction Stormwater Management Practices. Ohio Department of Natural Resources; Web: <http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx>

approximately 1,200 feet.³⁸ 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 Cervero, 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.”³⁹

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.

³⁸ Capitol Region Council of Governments (CRCOG) (2006). Best Practices Manual. Shared Parking: Fact Sheet.
http://www.crcog.org/publications/CommDevDocs/TCS/Ch08_FactSheet_Parking.pdf

³⁹ 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.⁴⁰ 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.

⁴⁰ Muro, M. and Puentes, R. (2004). Investing in a Better Future: A Review of the Fiscal and Competitive Advantages of Smarter Growth Development Patterns. The Brookings Institution Center on Urban and Metropolitan Policy.

RECOMMENDATIONS

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

MODEL REGULATIONS

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

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

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

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

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

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

Historic Preservation: Model ordinance
<http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=FEj3Tca%2fjiU%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 80 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.”⁴¹ 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.⁴² 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)

⁴¹ Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices.

⁴² 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>

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

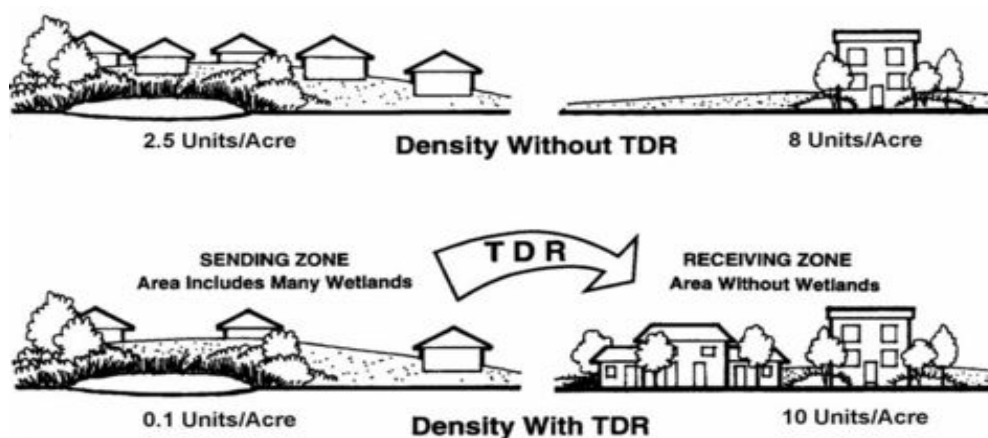
BENEFITS

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

RECOMMENDATIONS

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

Figure 4. Illustration of Transfer of Development Rights



Source: smartgrowthvermont.org

Brownfield Redevelopment

PDA

Brownfield Redevelopment is the remediation and redevelopment of a site or group of sites that may have been contaminated by previous land uses or business activities. The U.S. EPA defines a brownfield as “real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.”⁴³

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.⁴⁴

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.⁴⁵

One of the greatest obstacles to brownfield redevelopment is the perceived risk of existing or continuing contamination and questions of related liability.⁴⁶ 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)

⁴³ U.S. EPA Brownfields and Land Revitalization; Web:

<http://epa.gov/brownfields/overview/glossary.htm>

⁴⁴ U.S. Department of Transportation (2010).

Livability in Transportation Guidebook: Planning Approaches That Promote Livability. U.S.

Department of Transportation, 2010. (p. 15)

⁴⁵ 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>

⁴⁶ 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.⁴⁷ 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

⁴⁷ U.S. EPA. Brownfields and Land Revitalization; Web: http://epa.gov/brownfields/grant_info/tba.htm

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.⁴⁸

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

Clean Ohio Assistance Fund

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

⁴⁸ Ohio EPA (2009). Ohio's Voluntary Action Program Fact Sheet. Ohio EPA; Web: <http://www.epa.ohio.gov/portals/30/vap/docs/fact1.pdf>

on an ongoing basis. As of December 2010, 176 projects had been funded (121 Phase II Assessments and 55 Cleanups) for a total of \$63,561,613.⁴⁹

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.⁵⁰

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.⁵¹

Green Columbus Fund

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

BENEFITS

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

RECOMMENDATIONS

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

⁴⁹ State of Ohio Clean Ohio Fund; Web:

<http://clean.ohio.gov/BrownfieldRevitalization/>

⁵⁰ Ohio Balanced Growth Program (2011). Special Incentives; Web:

http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=As5V8T_ix-s%3d&tabid=56

⁵¹ Ohio Department of Development, Urban Development Division. Brownfield Loan Program; Web: <http://development.ohio.gov/Urban/BLP.htm>

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

Exactions and Impact Fees



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.⁵²

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.⁵³

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, provided the necessity to adopt

⁵² Evans-Cowley, J. (2006). Development Exactions: Process and Planning Issues. Lincoln Institute of Land Policy.

⁵³ Freeman, B., Shigley, P., Fulton, W. (2007). Land Use: Exactions and Impact Fees. FACSNET Land Use. <http://www.impactfees.com/publications%20pdf/nat9exactions.pdf>

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

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

BENEFITS

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

RECOMMENDATIONS

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

Complete Streets

PDA

Complete Streets are streets that have been designed to accommodate all users safely and comfortably. Complete streets consider the needs of motorists, cyclists, pedestrians, transit and school bus riders, delivery and service personnel, freight haulers, and emergency responders, regardless of age and physical ability.⁵⁴

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

⁵⁴ Mid-Ohio Regional Planning Commission (MORPC) (2010). Complete Streets Policy; Web: http://www.morpc.org/trans/CompleteStreets_MO_RPC_CS_PolicyFINAL2010-03-31.pdf

failed to consider the needs and safety of other users of the transportation system. The goal of transportation planning and engineering for many years was to move as much motorized traffic as quickly as possible.⁵⁵ According to the U.S. Department of Transportation's *Livability in Transportation Guidebook*, this focus has resulted in the development of "one of the world's largest and best highway networks. However, we have not yet put the same efforts into completing a system that works as well for walking, wheeling, or taking transit in most communities."⁵⁶

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

⁵⁵ 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>

⁵⁶ U.S. Department of Transportation (2010). *Livability in Transportation Guidebook: Planning Approaches That Promote Livability* (p. 1).

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.⁵⁷ There are a number of design elements that can be considered to improve the functionality of sidewalks for all users. For example, wider sidewalks with planted buffer strips provide greater safety and mobility by protecting pedestrians from street traffic and allowing space for wheelchairs or multiple pedestrians to travel. MORPC's Complete Streets Policy recommends a minimum sidewalk width of five feet in order to accommodate two pedestrians walking side-by-side. The addition of street trees to the planted buffer strips can make walking a more pleasurable experience by providing shade and improving the aesthetics of the environment.

"While nearly four-fifths of Federal transportation funding goes to highway projects, almost 85 percent of people and jobs are in metropolitan areas, which offer the potential for significant improvements in multimodal travel choices."

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

⁵⁷ Axelson, P., Chesney, D., Galvan, D., Kirschbaum, J., Longmuir, P., Lyons, C., Wong, K. (1999). *Designing Sidewalks and Trails for Access*. Beneficial Designs, Inc.; Web: http://safety.fhwa.dot.gov/ped_bike/docs/ada.pdf

Bike Lanes

Bicycling is once again gaining acceptance as a viable mode of transportation. Although bicyclists are allowed to use the full lane on most roads, except for those with limited access like freeways, providing dedicated space for bicyclists can increase the safety and comfort of riders. Bicycle lanes and paved shoulders provide space for people to ride their bikes along existing roads without riding

in the same lane as automobile traffic. According to the National Complete Streets Coalition, “for typical U.S. cities with populations over 250,000, each additional mile of bike lanes per square mile is associated with a roughly one percent increase in share of workers commuting by bicycle.”⁵⁸ 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.⁵⁹ 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.

⁵⁸ National Complete Streets Coalition; Web: <http://www.completestreets.org/complete-streets-fundamentals/factsheets/change-travel-patterns/>

⁵⁹ Project for Public Spaces. Traffic Calming 101; Web: <http://www.pps.org/articles/livememtraff/>

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.⁶⁰ When it becomes available, this Toolkit will be shared with the Balanced Growth Planning communities.

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

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

BENEFITS

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

RECOMMENDATIONS

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

1. All users should be considered during the entire life cycle of a project, including planning, design, construction, operations, and maintenance.
2. Street furniture, such as bike racks or benches, should be considered as part of all projects as long as they do not impede any user.
3. When designing a facility that includes or crosses an existing or future transit route, ensure that the appropriate pedestrian

and wheelchair access is provided to and from the transit stops.

4. Traffic-calming elements including, but not limited to, landscaping, street trees, and narrowing of lanes, should be considered where safe and appropriate.
5. Project sponsors should consider including street trees and landscape components, with careful analysis of tree, site, and design considerations.
6. Special consideration should be given to future planned facilities or services.
7. Each project design should be coordinated with appropriate access management strategies. Access management strategies should consider the placement of sidewalks and ramps to eliminate sight distance issues.
8. Although this policy focuses on engineering projects, the project sponsor should provide education, encouragement, and enforcement strategies during or after the project. The education component should include government officials, developers, and the public. A toolkit designed by MORPC staff will provide best practices, ideas, and resources to help with these efforts (see Implementation section).
9. While this policy focuses on transportation, local governments should review their land use and zoning policies to provide for mixed land use developments and projects that provide direct nonvehicular connections within a given development.
10. Each local community should regularly update its project design standards and procedures and train its staff to adhere to them.
11. Local governments are encouraged to adopt their own Complete Streets policies, consistent with this regional policy and federal and state design standards. State governments should work with the local

⁶⁰ Mid-Ohio Regional Planning Commission (MORPC) (2010). Complete Streets Policy; Web: http://www.morpc.org/trans/CompleteStreets_MO_RPC_CS_PolicyFINAL2010-03-31.pdf

Metropolitan Planning Organizations to ensure consistency in policies 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 Upper Scioto 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.

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

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

Farmland Preservation

PAA

Farmland preservation, or the act of retaining historically farmed land and important farmland in production, is a key implementation tool for Priority Agricultural Areas designated by the USPP through the Upper Scioto 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 Upper Scioto.⁶¹

In addition to reducing some of the 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.⁶² At the same time, agricultural land often produces more tax revenues for local jurisdictions than it costs to provide services to the farm.

Preserving agricultural land can reduce the cost of public services in relation to residential or commercial development to local jurisdictions. Second, the preservation of agricultural lands 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 of 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, 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.



⁶¹ Ohio EPA (20102005). Total Maximum Daily Loads for the Upper Scioto Creek Watershed.

⁶² 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

Program	Description
Current Agricultural Use Valuation (CAUV)	<p>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/</p>
Agricultural Districts	<p>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.</p> <p>For the Agricultural District definition as defined in Ohio State Code, visit http://codes.ohio.gov/orc/929</p> <p>For additional information about Agricultural Districts, visit http://www.agri.ohio.gov/divs/FarmLand/Farm_AGDist.aspx</p>
Agricultural Security Areas	<p>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 commission and board of township 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.</p> <p>For an informational brochure, visit http://www.agri.ohio.gov/farmland/docs/Farm_ASA_Brochure.pdf</p>
Agricultural Easements-Clean Ohio Agricultural Easement Purchase Program	<p>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.</p> <p>For more information, visit http://www.agri.ohio.gov/farmland/Farm_AEPP.aspx</p>

Estate Planning	<p>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.</p> <p>For more information on estate planning, visit http://ohioline.osu.edu/estate/</p>
Farm and Ranch Lands Protection Program	<p>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.</p> <p>For more information, visit: http://www.agri.ohio.gov/farmland/docs/FRPP_Information_20100709.pdf</p>
Agricultural Easement Donation Programs	<p>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. This Ohio Agricultural Easement Donation Program is administered by the Ohio Department of Agriculture (ODA) and allows landowners to donate the development rights to their land.</p> <p>For more information, visit: http://www.agri.ohio.gov/farmland/docs/Farm_AEDP_DonationBrochure.pdf</p>

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 Upper Scioto 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 Upper Scioto 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 Upper Scioto.⁶³ 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.”⁶⁴ The Upper Scioto watershed is included in the Scioto River CREP area.

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

These on-farm conservation programs are tools that the agricultural community should consider taking advantage of in an effort to enhance the physical environment and to further serve as good stewards of the land recognizing the value of the natural resources in the Upper Scioto 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

⁶³ Ohio EPA (20102005). Total Maximum Daily Loads for the Upper Scioto Creek Watershed.

⁶⁴ Ohio EPA (2010). Restoring and Protecting the Olentangy River.

Table 17. Selection of Major USDA Conservation Programs

Program	Description
Conservation Reserve Program (CRP)	<p>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.</p> <p>Source: http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cpr </p>
Conservation Reserve Enhancement Program (CREP)	<p>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 Upper Scioto Watershed.</p> <p>Source: http://www.mda.state.md.us/pdf/crepfaq1.pdf http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=cep </p>
Conservation Stewardship Program (CSP)	<p>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).</p> <p>Source: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_008143.pdf </p>

Debt for Nature (DFN)	<p>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.</p> <p>Source: http://www.fsa.usda.gov/Internet/FSA_File/debtfornature07.pdf</p>
Mississippi River Basin Healthy Watersheds Initiative (MRBI)	<p>As a part of the greater Mississippi River Basin, farmers within the Upper Scioto 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.</p> <p>Source: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcsdev11_023951.pdf</p>
Environmental Quality Incentives Program (EQIP)	<p>This NRCS-based program provides financial and technical support to assist farmers in planning and implementing conservation practices on their property. EQIP contracts provide financial assistance for up to 10 years. For more information contact your local NRCS office or view the source below.</p> <p>Source: http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip</p>

Local Soil and Water Conservation Districts possess a wealth of knowledge in regard to current conservation programs. A list of

contacts for the Soil and Water Conservation Districts serving portions of the Upper Scioto Watershed is below.

Soil and Water Conservation District (SWCD) Contacts

Delaware Soil and Water Conservation District 557 Sunbury Rd Delaware, Ohio 43015	Phone: 740-368-1921 Fax: 740-369-8321 Website: http://www.delawareswcd.org/ Email: dswcd@delawareswcd.org
Franklin Soil and Water Conservation District 1328 Dublin Road, Suite #101 Columbus, Ohio 43215	Phone: 614-486-9613 Fax: 614-486-9614 Website: http://www.franklinswcd.org/ Email: http://www.franklinswcd.org/contact-us/
Union Soil and Water Conservation District 18000 State Route 4, Suite B Marysville, Ohio 43040	Phone: 937-642-5871 Fax: 937-642-2825 Website: www.co.union.oh.us/SWCD

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 Upper Scioto 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. The TMDL report for Bokes Creek and Mill Creek uses an older 11 and 14 digit HUC numbering system. The 11 digit HUCs correspond to the 10 digit current numbers.
3. Total Maximum Daily Loads for Bokes Creek. (2002). Ohio Environmental Protection Agency, Division of Surface Water.
4. Total Maximum Daily Loads for Mill Creek (Scioto River Basin) Final Report. (2003). Ohio Environmental Protection Agency, Division of Surface Water.
5. It was announced in April of 2012 that the Main Street Dam would be removed and the downtown stretch of the Scioto River would be restored to a more natural morphology.
6. *2010 Integrated Report Watershed Assessment Unit* summaries (WAUs) (Upper Scioto) at <http://wwwapp.epa.ohio.gov/dsw/ir2010/basin.php>
7. USGS stream stats computation for the Upper Scioto Creek Watershed http://streamstatsags.cr.usgs.gov/gisimg/Reports/BasinCharsReport1060413_201235124854.htm
8. Ohio Historic Preservation Office website <http://www.ohiohistory.org/resource/histpres/toolbox/historicinventory.html>
9. U.S. Department of the Interior's National Park Service website <http://www.nps.gov/nr/>
10. 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> <http://www.nps.gov/nr/>
11. Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices; Web: <http://balancedgrowth.ohio.gov/BestLocalLandUsePractices.aspx>
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/ComprehensivePlan/General-Information.aspx>
15. Ohio Lake Erie Commission. Linking Land Use and Lake Erie: Best Local Land Use Practices.
16. 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>
17. 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>
18. 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>

19. Ohio EPA. MS4 Program Overview; Web: <http://www.epa.state.oh.us/dsw/storm/ms4.aspx>

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

21. U.S. EPA (2011). Heat Island Effect. <http://www.epa.gov/heatisld/>

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

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

24. U.S. EPA 2003. Protecting Water Quality from Urban Runoff.

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

26. ODNR Division of Soil and Water conservation (2006). Rainwater and Land Development Manual, Third Edition. Chapter

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

28. 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>

29. 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.

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

31. 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.

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

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

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

35. 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

36. 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

37. 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>

38. 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

39. Cervero, Robert, America's Suburban Centers (Unwin Hyman, Boston MA: 1989), pg.

40. 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.

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

42. 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>

43. U.S. EPA Brownfields and Land Revitalization; Web:
<http://epa.gov/brownfields/overview/glossary.htm>

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

45. 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>

46. 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

47. U.S. EPA. Brownfields and Land Revitalization; Web:

http://epa.gov/brownfields/grant_info/tba.htm

48. Ohio EPA (2009). Ohio's Voluntary Action Program Fact Sheet. Ohio EPA; Web:

<http://www.epa.ohio.gov/portals/30/vap/docs/fact1.pdf>

49. State of Ohio Clean Ohio Fund; Web:

<http://clean.ohio.gov/BrownfieldRevitalization/>

50. Ohio Balanced Growth Program (2011). Special Incentives; Web:

http://balancedgrowth.ohio.gov/LinkClick.aspx?fileticket=As5V8T_ix-s%3d&tabid=56

51. Ohio Department of Development, Urban Development Division. Brownfield Loan Program; Web:

<http://development.ohio.gov/Urban/BLP.htm>

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

53. Freeman, B., Shigley, P., Fulton, W. (2007). Land Use: Exactions and Impact Fees. FACSNET Land Use.

<http://www.impactfees.com/publications%20pdf/nat9exactions.pdf>

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

1 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>

55. 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>

56. U.S. Department of Transportation (2010). *Livability in Transportation Guidebook: Planning Approaches That Promote Livability* (p. 1).

57. 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

58. National Complete Streets Coalition; Web:
<http://www.completestreets.org/complete-streets-fundamentals/factsheets/change-travel-patterns/>

59. Project for Public Spaces. *Traffic Calming 101*; Web:
<http://www.pps.org/articles/livememtraffic/>

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

61. Ohio EPA (2010). *Total Maximum Daily Loads for the Walnut Creek Watershed*.

62. 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

63. Ohio EPA (2010). *Total Maximum Daily Loads for the Walnut Creek Watershed*.

64. Ohio EPA (2010). *Restoring and Protecting the Olentangy River*.

ADDITIONAL REFERENCES AND RESOURCES



Capitol Region Council of Governments (CRCOG) Best Practices Manual. (2006). Shared Parking: Fact Sheet.

http://www.crcog.org/publications/CommDevDocs/TCSP/Ch08_FactSheet_Parking.pdf

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

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

Green Roofs Fact Sheet. U.S. Green Building Council, Cascadia Chapter.
http://www.seattle.gov/Seattle/dpd/cms/groups/pan/@pan/@sustainablebldg/documents/web_informational/dpdp017822.pdf

Land Use Considerations. Planning and Development Guidelines For Public Transit. (1999).—The Central Ohio Transit Authority. .
http://www.morpc.org/trans/COTA_1999_Guidelines.pdf

Livability in Transportation Guidebook: Planning Approaches that Promote Livability. U.S. Department of Transportation, Federal highway Administration, Federal Transit Administration.

Low Impact Best Management Practice (BMP) Information Sheet. Charles River Watershed Association (CRWA). (2008).
http://www.crwa.org/projects/bmpfactsheets/crwa_green_roof.pdf

Low Impact Development Center. (2011).
<http://www.lowimpactdevelopment.org/about.htm>

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.

Nowalk, D. (2006). Air pollution removal by urban trees and shrubs in the United States. USDA Forest Service, Northeastern Research Station, Syracuse, N Y 13210.

Nowalk, D. and Greenfield, E. (2009). Urban and Community Forests of the North Central East Region. USDA, Forest Service.

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>

Shared Parking. (2011). Victoria Transport Policy Institute.
<http://www.vtpi.org/tdm/tdm89.htm>

The United States Conference of Mayors (2008). Protecting and Developing the Urban Tree Canopy: A 135-City Survey.
www.usmayors.org/trees/treefinalreport2008.pdf

Tree and Woodland Protection Flyer. The Macomb County Department of Planning & Economic Development. Macomb County, Michigan

ULI—the Urban Land Institute. (2007). ULI Community Catalyst Report Number 6: Compact Development: Changing the Rules to Make It Happen. Washington, D.C., ULI—the Urban Land

Urban Tree Canopy. (2008). Watershed Forestry Resource Guide. Center for Watershed Protection and the US Forest Service.
<http://www.forestsforwatersheds.org/urban-tree-canopy/>

Urban Uses of LID. (2007). Urban Design Tools. Low Impact Development Center, Inc.
http://www.lid-stormwater.net/general_urban.htm

U.S. EPA (2011) Heat Island Effect.
<http://www.epa.gov/heatisld/>

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.

Ward, A., D'Ambrosio, J., Witter, J. (2008). Floodplains and streamway setbacks. Ohio State University Extension, Agriculture and Natural Resources.

WILLIAMS, B. (2011). DENSE BY DESIGN: A COMPACT GUIDE TO COMPACT DEVELOPMENT. [HTTP://MORPC.ORG/PDF/MORPC_DENSITY_BROCHURE_CS3.PDF](http://MORPC.ORG/PDF/MORPC_DENSITY_BROCHURE_CS3.PDF)

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.