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**THE STATE ROLE IN
GUIDING LAND USE
CHANGE IN THE OHIO
LAKE ERIE BASIN**

**Key Policies, Programs,
and Incentives for the
Ohio Balanced Growth
Program**

Final Report

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Executive Summary: The Ohio Balanced Growth Program

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Lake Erie is the single most important ecological resource in the state of Ohio. It is vital to the health and well-being of its people in the Great Lakes basin and across the state because of the life-giving water it provides and the economic benefits it generates. Today, urbanized land development patterns threaten Lake Erie and its tributaries because urbanized land development fundamentally changes the way water moves. When land is developed, the hard surfaces of buildings, parking lots, drainage systems, and roads stop rain water from being absorbed into the ground. As less rain water filters into the ground, one result is often a decrease in the water table. Pollutants such as oil, gasoline and yard chemicals accumulate quickly into engineered storm water systems. Waters enter streams more quickly and causes increased erosion. The end result of this new hydrologic regime is more frequent flash flooding and more pollution in surface water. As more and more land in an area is developed, rivers are degraded and ultimately, the waters of Lake Erie become more polluted, less hospitable to aquatic life, and more expensive to purify for industrial use and drinking water. This is the process that is occurring in the Lake Erie basin in the second half of the 20th century.

The *Lake Erie Protection and Restoration Plan*, completed by the Ohio Lake Erie Commission (OLEC) in 2000, identified dozens of actions to protect and restore Lake Erie. One recommendation was for an Ohio Balanced Growth Initiative that would address land urbanization and land conservation in the Lake Erie basin. As part of this program, a Balanced Growth Task Force appointed by the Ohio Lake Erie Commission developed a set of recommendations to balance ecological protection with economic growth in the basin. The Taskforce worked for two years to develop recommendations in the areas of state policies and programs that directly shape land use and urbanization patterns; state policies, laws and programs that shape the actions of local governments (township, municipality, county) and regional collaboration; and local land use regulation and land management practices.

OLEC officially accepted the recommendations of the Balanced Growth Task Force in April 2004. OLEC staff, supported in part by the activities and results described in this policy paper, then developed the *Lake Erie Balanced Growth Strategy* which was adopted by the com-

mission in June 2006. That document arrays the state strategies that are available to support implementation of the watershed balanced growth plans being developed in the basin through three pilot processes in 2006-2008. These strategies include an inventory of appropriate state programs through which incentives will be provided, the creation of a special state work group to provide additional technical assistance to communities in the pilot processes, and improvements to state programs in wetlands permitting, program consistency, and other state regulations.

Successful implementation of the Balanced Growth Program (BGP) will occur in three areas of policy and administration: direct actions of the state agencies as they carry out their mandated programs; agency support through incentives and funding of the pilot Watershed Balanced Growth Plans currently under development; and education and technical assistance regarding best land management practices.

The core framework of the Watershed Balanced Growth Plans is collaborative planning at the watershed level to identify Priority Development and Priority Conservation Areas that will guide state investments, regulation, funding, and other activities. These priority areas will not preclude local governments or the private sector from development. They will, however, target state development investments into existing settlement areas, and target state conservation investments into head water and other areas of ecological and significance. This planning framework was recommended by the Balanced Growth Taskforce and adopted by the Commission as the most scientifically-grounded and practically feasible way to protect Lake Erie and its tributary rivers and streams.

Study Purpose and Design

The purpose of the study described in this paper was to identify which land planning and management policies and mechanisms have been used to effectively shape land development processes to achieve a more sustainable or balanced outcome, and what policy and program changes and incentives would likely prove most effective in changing land development and conservation patterns “on the ground” in Ohio. The results of each part of the study were shared with OLEC staff to inform policies, programs, and incentives identified for the Commission and its agencies to support the Ohio Balanced Growth Program in the Ohio Lake Erie basin.

The study was undertaken in four parts: a review of the best academic and “think tank” research studies; interviews with policy experts at the state and national levels; focus groups of

participants from the private real estate development sector; and assembly and analysis of a database of policies, programs, and funding streams of the OLEC agencies and other state entities that affect land development and conservation patterns through their actions. One of the most challenging aspects of the study was to organized large amounts of data into a framework that illustrates the connections between government policies, actions in the private sector and patterns of land development and conservation. This framework is described in Section 4 in the full policy paper.

Most simply, state policies and programs can be designed to affect: 1) the location or pattern of urbanized land development; 2) the density or use intensity of settlements and their surrounding lands; 3) the overall function of ecological systems located in open space; and 4) the rate at which land is developed. These outcomes can be shaped by direct investments by the state (building roads, locating facilities, purchasing land, etc.), policies that influence local governments (grant and loan programs, requirements for planning, etc), and policies that influence the decisions of the private sector, including families and real estate developers (taxes, permits, and regulations). Figure 2 in Section 4 presents a model of these policy areas and who or what each influences.

Results

This section presents highlights of the results that are presented in the full report for the data collection and analysis completed for the project.

Literature Review and Focus Group Comments

The literature on growth management and smart growth is vast. However, a smaller portion of this literature focuses on the affect of specific programs or policies, and the overall effectiveness of programs at the local, metropolitan, or state level. Through the literature review, we identified a set of policy categories and areas of influence, and identified several clusters of the literature concerning these.

The literature review suggests that there is no one single policy or action that will dramatically change land development and conservation patterns. Rather, the state needs to assemble a constellation of inter-working policies and programs that will incrementally, over time, shift investment for development into existing settlements and their adjacent areas and “push”

development away from critical ecological areas that support a healthy Lake Erie. Because the Ohio Lake Erie basin is not growing in population overall, the state does not need to encourage “growth management” per se to manage an increasing population, but rather can direct existing and new development investments. According to the literature and focus groups, several key policy areas have the most significant affect on land development and conservation patterns.

- Transportation Infrastructure Policies

The academic and professional engineering literature are quite clear that there is a close causal relationship between the location, type, and capacity of transportation infrastructure and landscape change. Provision of infrastructure is both a stimulus to development itself and directs the location of development and its density as a function of the transportation mode and capacity. The presence of transportation infrastructure (highways, other roads and mass transit) is often a prerequisite for any urbanized development. Landscape change occurs as transportation infrastructure enables access to a specific territory by workers and suppliers. In effect access exchanges faster travel time for distance costs. Anticipated access tends to raise expectation of increased land costs, making real estate development attractive in a given market areas. Transportation projects at the fringe of urban areas reduce the “accessibility premium” of the center of a metropolitan area, reducing property values there.

Different transportation modes (in particular automobile-oriented vs. mass transit) act alike to increase land demand and thus property values. Because transit tends to be in areas of higher density to begin with, however, it promotes higher density of use around a station. Increased expansion of infrastructure in undeveloped areas will tend to promote lower-density land use patterns (in the absence of appropriate zoning requirements) because the land is relatively less expensive.

Expansion of infrastructure capacity, particularly roads, highways, and highway interchanges, provides an economic advantage to business already in a given location, and can create an economic disadvantage to other businesses and communities in a region. Guidelines for transportation engineers to evaluate the economic impacts of a given transportation project caution against using a study area that is too small because this will misconstrue the transfer of businesses from outside the project area as economic “growth.” The literature suggests that transportation agencies should assess the land use implications of its major projects and assess the benefits and costs of transportation projects on a regional basis rather than on a project basis, a practice which is in fact now required by federal TEA 21 legislation. Agencies are also advised to coordinate across metropolitan areas to minimize transfer of benefits from the core to outlying communities typically caused by highway construction.

- Water and Sewer Infrastructure Policies

Urban service areas for water and sewer infrastructure have been used for several decades to guide investment and location. This mechanism has been a key part of growth management programs, and is highly effective in shaping the timing of land urbanization. It has not been used for the most part to limit land use change. However, the power of water and sewer as a prerequisite to large scale development is well understood and illustrated through these experiences.

Another way that provision of water and sewer infrastructure shapes land use at the fringe is that it allows “leap-frogged” development. Where the infrastructure is extended along a rural road, new subdivisions, significantly separated from existing settlements can be developed. The market responds to the presence of these infrastructures, much as it does to roads. At times, seeking compliance with federal Clean Water Act standards, communities upgraded waste water treatment plants, which provided increased capacity and allowed for more development in rural areas.

Provision of water and sewer infrastructure was the single most mentioned variable shaping investment by the focus groups, and was particularly significant for participants in the commercial real estate development focus group. In slow growth areas, the literature suggests that state assistance to water and sewer upgrades in existing small communities is critical for the quality of life for residents and for their ability to attract businesses. Failure to target these existing communities, while funding infrastructure in rural areas, places these communities as a disadvantage, thus skewing the local real estate and business market and encourage extremely low density or leap frog development.

- Economic Development Policies

Economic development programs and their policies are carried out by state and local governments to alter private market decisions and direct local population and economic growth. Economic development is not merely growth per se, but seeks rather to stimulate changes in the business enterprise and workforce makeup of an area that will better promote a desirable quality of life for residents. The most common goals of economic development policies are to increase employment in an economic sector or increase per capita income. All changes should be sustainable over the long term. Public investment through economic development programs serves to stimulate private investment by providing needed infrastructure, training, financing, or other incentives.

Two aspects of economic development have implications for land development. The location of investments through economic development programs will shift other public and in turn, private investment into a given location. Every new or expanding business needs appropriate facilities and results in new jobs for members of the community. The benefits that accrue from the public and private investment are the objective of these programs, but state government decisions about where to invest will pull new business development in a specific community and not into another. The geography of these investments, if biased toward rural communities unintentionally, can promote new unintended land urbanization. Several studies described in the policy paper indicate economic development programs are often undertaken without assessment of impacts to land urbanization. Older suburbs in metropolitan areas tend to receive less assistance, and subsi-

dies to industrial parks and distribution centers, which are seen as positive investments, tend to shift economic development away from urban areas to more rural areas.

Successful economic development is increasing regional, and the overall economic efficiencies of specific land development patterns have also been studied. While lower land costs in rural areas are a benefit to private companies building new facilities, one study undertaken from a regional perspective regarding over 180 metropolitan areas in the United States indicate that all else being equal, metropolitan regions that had growth management programs to control unplanned land urbanization were more successful economically. A second study found that more compact and higher density land development patterns reduced the cost of public infrastructure and improved the region's economic performance, largely due to agglomeration efficiencies, knowledge spillovers, and better access to labor. Other studies confirm that managing land urbanization is an essential element of a long term economic development strategy, and therefore, state economic development programs should not encourage low density land conversion into the countryside, but should seek more efficient land development patterns around existing settlements.

- Land Conservation and Open Space

The literature reveals a growing recognition of the interdependence between policies that promote revitalization and growth in existing settlements and protection of open space. Despite a long tradition in the United States of open space, farmland, and natural resources protection, many of the policies and mechanisms were not explicitly linked to concerns with urban form (density, spread and location) per se. This has begun to change as many states development "smart growth" programs that consciously address settlements and open space concurrently. A prominent approach is to seek to generate additional development in existing settlements, while "pushing" development away from critical natural resource areas, historic landscapes, or productive farmland. This approach will tend to create a nodal regional landscape, with a network of settlements of various sizes separated by non-urbanized lands. This pattern is deemed to be more efficient as well for transportation and infrastructure provision.

The literature reports varying degrees of success in achieving this pattern, or in preserving non-urbanized land itself. Success is dependant upon the mechanism used, but also upon its appropriateness for the land development pressures in a given area. Policies and mechanisms to protect open space (including farmland) range from fee simple ownership, regulation, easements and tax policies. A few states in the United States explicitly encourage local jurisdictions and regional agencies to use greenways to achieve their growth management or require the presence of greenways as "urban separators." The most common public mechanisms in use in the Great Lakes basin are tax incentives (found to be the least effective), agricultural zoning, and right to farm laws. All the Great Lakes states have land trusts that purchase and protect significant open space as well. While only a few states in the basin allow them, transfer of development rights have been used successfully in other parts of the United States to protect open space and induce development in existing settlements.

Regardless of mechanism used, land permanently protected through fee simple acquisition or conservation easement or designated through regional plans as critical resource areas or open space is effectively removed from the possible land development market. A key consideration for ecological function is to ensure that the pattern of protected open space is not fragmented, and that it mirrors the pattern of the resources to be protected on the regional landscape.

- Tax Policies and Fiscal Conditions

Tax policies can intentionally or unintentionally shape land development and conservation practices. Tax policies exert influence on urban redevelopment, farmland and open space lands, and overall urban form. Tax incentives have been used in many states to induce real estate development in slow market urban areas. Several studies suggest that property tax relief generally puts off rather than prevents land conversion from rural to urban, largely because the incentives distort land value and do little to reduce expectations of profit for the land owner. Tax incentives in rural areas have proven effective in promoting farm viability; however, other studies have found that tax incentives are the least effective for preserving farmland. For commercial and business development, however, tax incentives that support expansion can be key. The geographic location of the investment is critical, however.

Local fiscal conditions influence tax policies and property tax rates, which in turn influence the decision making of families, businesses, and land developers. The most direct association occurs with the need for local revenue in the face of rising public expenditures, including rising costs for schools. This need tends to skew localities toward land development, and toward high-end residential housing and retail development.

At times the distribution of tax revenues unintentionally shapes land development patterns. One study in Ohio determined that the system of categorizing state routes results in an anti-urban bias in funding from the state and federal gas tax revenue disbursement because these routes are maintained by the state in unincorporated areas of the state, but must be maintained by incorporated municipalities and villages when state routes pass through these settlements. Further, state gas tax revenues cannot be used to maintain the state routes by local jurisdictions, which must instead raise alternative monies. Thus the rules of the state program as defined have an unintended geographical effect of raising local taxes in the urban core, disadvantaging those communities in their efforts to attract businesses and residents.

In the focus groups conducted for the project, participants discussed fiscal and tax policies at length. Participants felt that Ohio's tax code needed serious revision, particularly as it was affecting bonds for development and for school financing. However, the residential development group noted that revisions to the tax code were far less important in shaping development at the edge of metropolitan regions than the problem of school financing. They noted that home buyers want to know about the quality of schools, and because state spending is less than needed, school quality is shaped by local revenue streams. Thus state spending requires increases in local taxes, which stimulates high-end residential development. As a result, the real estate market is tilted toward large homes at the fringe.

- Land planning consistency and collaboration across localities and regions

Thirty-five states in the United States have some form of land use and planning policies that seek to influence the timing and location of land urbanization. The programs vary widely in the methods used, and include legislative, regulatory, and incentive mechanisms. Many states have planning offices or agencies that either conduct planning to address land use at the state level, provide guidance to local communities for their own planning activities, or both. A critical difference among the states is whether they require local or regional comprehensive plans, and if so, how these plans relate to other local plans and state plans. Fragmentation of jurisdictions, which typically characterizes urbanized areas in the United States, tends to aggravate land urbanization at the fringe. For planning to be successful in managing and mitigating the negative effects of land urbanization, studies suggest that collaboration and consistency among local governments and the state planning agency are critically important. That is, to the extent that land use change is coordinated among localities, either by the state or a regional planning agency, negative outcomes from land development can be avoided and increased opportunities through jointly-designed projects can be accrued.

Results in the focus groups indicate that land use regulations and practices were critically important. The residential developers noted their difficulties in compliance with the many varieties of zoning requirements across a region. They suggested that a key aspect of the planning function at the state level would be to encourage regionally compatible land planning and zoning requirements. Developers were also interested in mechanisms at the local level that would enable higher densities in development areas as a trade off for expanded conservation practices.

- Environmental regulations

The literature suggests that many states originally established policies to manage land development and conservation as part of their environmental regulatory practices. Today many states recognize that better economic performance and protected environmental health and natural resources are not necessarily opposing objectives, but rather can be mutually supportive.

In each state environmental, health, and natural resource agencies issue permits or licenses to regulate pollution emissions to protect the public health and to manage wildlife habitat and resources. In most cases, major land or facility development proposals must acquire one or more of these permits to proceed. Some states, in order to promote cleaner development and investment, have sought to coordinate their permitting processes across different programs within one agency (air, water, etc.) or across multiple agencies. These types of programs have proven successful in streamlining the development approval process and have increased the level of knowledge shared among the agencies about conditions in a given area.

Permitting and its influence on the development process was one of the most important topics of discussion at the focus groups conducted for the project. Developers noted that the most important concern they have is predictability in the development review process, including the permit review process at the state level. They also noted that they would be willing to either pay higher

administrative costs or accept more restrictive project guidelines if the predictability of the permit review process, no matter what the outcome, was ensured.

Agency Program Data Base

The review of literature, interviews and focus groups were followed by assembly of a database of state agency policies, programs and funding levels. The database was checked by members of the OLEC Interagency Taskforce for accuracy, which also provided additional data where possible. (Despite reasonable and efforts, two limits to data remained: the data for funding levels for these agencies was only available on a state-wide basis, and therefore does not reflect public monies spent in the Lake Erie basin alone; some gaps still remain in the funding data).

The review included the six OLEC agencies (the Environmental Protection Agency and the Departments of Development, Transportation, Health, Agriculture, and Natural Resources), the Ohio Water Development Authority, the Ohio Public Works Commission, the Department of Education, the Soil and Water Conservation Commission, the Water and Sewer Commission, and the Ohio Water Resources Council. These twelve state-level agencies, commissions and councils exert influence on land development and conservation decisions.

The review of the data was intended to answer the following questions: What programs exist among the agencies that shape land development and conservation decision making, either directly or indirectly and how? What are the levels of funding for these agencies and their programs? Which programs can be used as incentives to support development and implementation of Watershed Balanced Growth Plans? Which programs constitute direct actions by the state agencies that will influence the successful implementation of the Balanced Growth Program? Which of these direct actions and incentives are critical components? Are there any programs that have an unintentional bias facilitating or stimulating land development in ex-urban areas or impeding urban development and revitalization? This last question is based on the two guiding principles adopted by the Balanced Growth Taskforce as goals for the plan, which were principles taken from the Lake Erie Restoration and Protection Plan of 2000.

Our review identified the following characteristics, each described briefly.

- Disproportionate spending levels across agencies

While it is true that delivery of programs and product units varies across different sectors (e.g. it likely costs more to pave 1 mile of highway than put 1 acre of rural wetland in conservation), the differences in the budget levels of the agencies reviewed, and across programs with different geographic impacts, is stunning. Table E.1 below provides annual budget for the 2006

fiscal year for the primary agencies and programs shaping land development and conservation patterns as assembled through our work with the state agencies and our independent review of state budgets: transportation infrastructure, water and sewer infrastructures, economic development, and land and resources conservation.

For example, within ODOT , the differences in the money allocated for highways vs. transit is far more than what could be a function of the relative costs of a mile of highway vs. a mile of transit, for example. The budget figures reflect policy priorities that favor highway construction to increase connectivity for automobile-based travel rather than increasing connectivity via public transit or other commercial modes such as rail. The preference directly translates into creation of different land development patterns, increases dependence on the automobile, reduces safety on the road system as the number of cars increases, increases the economic inefficiencies of the built form in Northeast Ohio, and virtually rules out development and maintenance of an efficient, cost-effective public transit network, which would rely on higher density and closer proximity connections to function properly.

The difference among the sectors is also stunning. The annual state budget to build, expand and enhance the road infrastructure, to provide water and sewer upgrades, and to stimulate economic development on an annual basis is about \$ 6,855,425,580. Each of these programs has a direct or indirect affect that increases the land area available for urbanization. This is more than 22 times greater than the \$305,443,729 annual budget spent and transferred to conserve land, protect farmland, and manage wildlife and habitat areas. These programs, directly or indirectly, tend to remove land available for urbanization. These figures are for the entire state, but we have no logical upon which to assert that the relative proportions would be fundamentally different in the Lake Erie basin. Despite some data gaps, the order of magnitude of these differences illustrates well the relative strength of the state's influence on land patterns.

Table E.1 Annual Budgets, State Agencies and Programs Affecting Land Development & Conservation		
Agency	Annual Budget	Comment
<i>Transportation Infrastructure</i>	6,254,056,654	
ODOT	6,254,056,654	For all agency programs
Highway construction	2,215,976,205	Direct state and transfer to local governments
Public transit	91,695,000	Assistance to local and regional agencies
Economic development	1,000,000,000	Jobs and Progress; TRAC
Railroads (passenger, freight and lines)	5,229,000	
<i>Water and Sewer Infrastructure</i>	432,827,926	From programs funded in 2006 and 2004
ODOD	10,500,000	water/sanitary; small cities Community Develop. Block Grant
OWDA		
Drinking water/waste water		
Rural only (2004)	78,132,842	Village capital, rural, community assistance (<5,000 pop)
Rural and urban (2006)	300,000,000	Water pollution control fund
Economic development (2004)	36,478,307	New facilities, dams, and industrial bonds
OEPA		
drinking water	3,716,777	revolving loan fund
Permit program	4,000,000	
<i>Economic Development</i>		
ODOD*	168,541,000	(Excluding water/sanitary sewer program)
<i>Land and Natural Resources Conservation</i>		
ODNR	305,443,729	
Agency division and lands management	290,031,500	
Conservation/restoration transfers	3195000	
Coastal management grants	250,000	
Streams/nonpoint pollution transfers	2,138,625,000	
Trails/recreation transfer	11,967,229	

*funding does not include minority-business program and several other programs for which data was not available for 2006 budget; does not include OWDA programs for industrial bonds and new facilities (included in water and sewer section)

- Redundant programs/opportunities for collaboration toward Balanced Growth objectives

Several agencies have funding streams targeting the infrastructure and incentives to support economic development, either through infrastructure, business technical assistance, bonds, or lower interest rates on loans. Some of these programs were designed specifically for infrastructure in rural or small cities, or for community development in small communities. One program targets urban areas, and several programs have been created to assist minority businesses (which are more likely to exist in an urban area given Ohio's demographic patterns). The redundancy begs the question as to whether these programs are coordinated across the agencies that offer them, either in terms of targeting specific locations strategically, or to ensure that the funding provided by agencies is not being used to increase competition between two communities in the same market area. Such expenditure, if it serves to transfer jobs from one Ohio county to another, is not true economic development. If the transfer is from an urbanized area, or existing settlement, to a rural area, the stimulation of land urbanization is likely. Any of these outcomes do not fit within the objectives of the Lake Erie Restoration and Protection Plan or the Balanced Growth Program, which seeks to prefer existing cities and settlements as investment areas. In the long run, this strategy will, according to the literature, likely prove to increase the economic efficiency of the region.

- Decision making criteria.

The importance of normalizing decision making criteria across state agencies to avoid opposing impacts was highlighted in our research as well. Enhanced inter-agency collaboration to avoid opposing impacts will be critical to institutionalize. The creation of the Interagency taskforce which identified the incentives for the Balanced Growth Program is a critical first step in this process. In addition, the agencies should review their own projected budgets and projects undertaken in terms of the expected land urbanization outcomes. All OLEC agencies and their state-entity partners (such as the ODWA or OPWC) should adopt use of impact assessments for all major projects with extra-local impact or cross-jurisdictional economic and environmental impact, including residential, commercial and industrial development funding, incentives and permits.

- Geographic bias.

Our framework for reviewing the agency program database included whether programs and actions have an explicit, implicit or unintended geographical bias. As can be seen in the full report, programs exist that have an explicit geographic bias to direct funds to small communities, rural areas gas tax, highway spending,

Strengths, Challenges and Recommendations for the Balanced Growth Program

Watershed Balanced Growth Planning Framework Gets It Right

The use of the PDA/PCA scheme explicitly recognizes the relationship between directing development and conservation/preservation of critical resources and is in the best tradition of regional landscape planning. Second, the likely strong role of ODNR in the BGP pilot programs as support staff or *ex officio* participants should infuse information on critical headwater areas and wetlands into the process. Third, development of plans for watersheds will strengthen the connection of development location to natural resource decisions. To the extent that local participants are encouraged to consider natural resources in their designation of PCAs, and specifically to the extent they internalize this framework inside their jurisdictions, urban form can be modified by open space planning. Ideally each jurisdiction in a BGI watershed planning process would conduct/have a community open space/critical areas element in a plan or a map. These areas in each community can be connected to other communities across the watershed, creating a network of open space/critical areas (which would in effect “push” development into other less critical areas). The Watershed Planning Framework also encourages a nodal regional settlement pattern, which in the long run is more efficient in terms of infrastructure provision and supports more effective economic development through proximity and critical mass of activities.

Fourth, there will be review of BGI watershed plans by the Lake Erie Commission. One of the criteria for “accepting” the plan has to be the extent to which the plan identifies the watershed open space network. Fifth, the scheme is politically feasible in that it does not require, but encourages, local jurisdictions to participate. And sixth, focus on location of development is likely appropriate given that urbanization at the fringe is not a function of a burgeoning population but rather a result of market forces and state policies that have a direct influence by providing the infrastructure necessary to create a real estate market.

The challenges to successful implementation of the Balanced Growth Program, meaning that the policies and incentives put in place will result in a changed pattern of land development and conservation, lie in marshalling adequate resources and combinations of policy and program changes to create a constellation of mechanisms rather than one or two discreet actions. This conclusion was derived from the literature review, and was found among the focus

group participants who were asked what the state could do to influence development decisions. As one participant noted, “demand [for a type of building product], water and sewers, and easy zoning codes to work with determine where we build. An interchange also helps. Different tax rates and available or unavailable utilities in different areas could affect where we developed. Schools can also affect location of development.”

Through the analysis undertaken, we suggest that a key challenge will be examination and changes to direct state actions that influence land development **in addition** to agency support of the Watershed Balanced Growth Plans. Without significant changes to activities by and among the agencies and their normal way of doing business, activities associated with the watershed scale may be insufficient, particularly if on going state agency activities act in opposition to strategies at the watershed scale. These changes will likely take several years, even decades to accomplish, but formal, routine attention by each agency to the land development/conservation implications of their programs and policy decisions will be needed to ensure long-term landscape change in the Lake Erie basin.

OLEC Agency Administration

Building on the inter-agency task force that has come together to identify incentives to support the pilot watershed plans, the state has proposed to create a State Assistance Work Group which will assist local communities in their efforts to plan for and implement Balanced Growth-related policies and practices through the Balanced Growth Watershed Plans. This group can have an immediate affect on the processes that approve land development and conservation in the basin.

A second type of interagency-coordination is also needed to improve the knowledge set used by the OLEC agencies and their partners in terms of the agencies’ own programs and investment (their direct actions) in the basin. The key to successful implementation of the Balanced Growth Program is to design a package of complementary policy instruments that reinforce each other. In addition to supporting the Watershed Plans developed through the pilot projects, the OLEC agencies, along with other agencies such as the Ohio Water Development Authority, should institutionalize the interagency working group that has assisted in the Balanced Growth Project as a basin-wide planning function. This working group should complete the original recommendations of the Balanced Growth Taskforce, which was to develop a col-

laborative basin wide approach to economic development, transportation and land conservation investments. To that end, this work group would:

- Review all policies, programs and funding allocations for land change effects. This working group, mindful that local governments hold land use authority, should none-the-less take changes in land urbanization patterns into account in its decision making. These agencies should include a “sprawl” impact calculation/narrative on their major projects. While rural areas legitimately need and should obtain economic development and infrastructure improvements, the OLEC agencies should do everything to ensure that their decisions do not exacerbate unplanned urbanization. One technique for such a review would be:
 - adopt process of impact assessments for major projects as to the affect on land use; this is to get agencies to review the impacts of their activities, either independently or combined

State Facilities

- OLEC agencies should adopt a policy to locate government facilities in existing settlements and within designated PDAs in the basin. Facilities under this policy would include location of state service yards, offices, and location of new schools. New state facilities should be used as an important economic development tool to catalyze and influence private sector to invest in existing settlements and PDAs.

Transportation Infrastructure

- Shift funding for infrastructure to maintenance and replacement rather than expansion or additional interchanges;
- The responsible agencies should adopt use of impact assessments for all major projects with extra-local impact or cross-jurisdictional economic and environmental impact, including residential, commercial and industrial development;
- Analysis for the economic benefits and costs from transportation projects should be at the regional scale to ensure that projects are not merely shifting economic activities from one local (city, village, or township) to another. If a project is considered necessary for safety reasons, any benefits and costs from anticipated shifts in economic activity should be shared by the jurisdictions;
- TRAC
 - Require analysis of regional impacts of development projects that apply for highway monies.

- TRAC projects brought forward by three or more jurisdictions, based on coordinated planning of needs for land use change (housing, economic development, safety, etc) for their jurisdictions and that demonstrate a regional benefit (not just transferring businesses) based on projections, and in PDAs, receive higher ranking in ODOT and possibly MPO ranking scoring system.
- State routes. The state should assume maintenance of all sections of state routes, whether these are in incorporated or unincorporated jurisdictions, to “level the playing field” between urban and township areas.
- Gas tax funds. State policies should officially allow gas tax funds to be used for public transit projects.
- Alternative commercial systems. The state should invest to enhance the freight rail system to reduce truck traffic on state highways and encourage nodal development patterns by focusing rail transfer facilities in existing settlements and PDAs.

Water and Sewer Infrastructure

- An effective strategy to manage the timing of growth in many states has been to require adequate public facilities ordinances or establishment of urban service areas. In effect, PDAs are voluntary urban service areas for water and sewer. If PDAs are based on sound projections for settlement population needs, infrastructure projects in PDAs should be given significant priority over other projects.
- State Health Department and Ohio EPA cooperate to prohibit development of subdivisions with septic systems. This would help prevent “leap frog” development and place developments adjacent to existing settlements. This will reduce infrastructure costs over time and support a nodal landscape pattern that will help conserve key resource areas needed to protect water quality in the Lake Erie basin.
- Applications by local governments for funding for water and sewer infrastructure should include or receive additional priority if an infrastructure needs assessment and plan is included and if the local community ties land use and zoning regulations to the availability of water and sewer lines.

Economic Development

- The ODOD should adopt a policy that no economic development money will be granted or loaned that will simply shift jobs from one county to another or from core urban area to rural areas unless it can be demonstrated that inadequate room for expansion does not exist in the current jurisdiction.

- Multiple-jurisdictional economic development projects with shared benefits should receive priority in funding.
- Brownfield redevelopment programs should be coordinated with the Job Ready Sites Program to prioritize investment in PDAs. The ODOD should change the acre minimum for the Job Ready Sites Program to accommodate appropriate site sizes in urban areas.
- ODOD and OEPA should institute a “one-stop” environmental permitting and economic development funding application process as incentive for businesses to locate in PDAs.
- Two studies by scholars at the Brookings Institution found that communities engaged in managing their growth spatially realized marginal improvements in economic performance relative to other communities, *ceteris paribus* (Nelson and Peterman 2000), saved money on infrastructure and brought economic benefit to both suburbs and cities (Muro and Puentes 2004). To that end OLEC should publish and disseminate information on the rationale for participation in the Balanced Growth Program and restraint regarding land urbanization for its positive association with economic performance.

Environmental Regulations

- The agencies with regulatory permitting authority should strive to decrease inconsistencies and reduce unpredictability of permit review processes related to land development and redevelopment processes. A cross-agency, cross jurisdictional coordination of permit review can be used as an incentive to induce development in PDAs or shift development near PCAs into more ecologically-appropriate configurations at the site level. There was significant support for such technical assistance among the development professionals in the project focus groups, indicating this incentive could be highly effective. Developers even suggested a higher ecological standard on project designs would be possible if the permit process were more predictable.

Land Conservation

- Enable transfer of development rights within a single jurisdiction and between local jurisdictions to direct development toward PDAs and away from PCAs or strongly support economic development or land conservation projects undertaken collaboratively by jurisdictions.
- Strategic collaboration and support of urban containment/green infrastructure protection by working with local governments, Metroparks, land trusts and conservancies. Identify key lands critical to riparian systems and provide incentives in funding when included in PCAs through Balanced Growth Watershed Plans.

- Enable and set up administrative mechanisms for use of a land conservation equity insurance program.

Tax Policies

- Gas tax distribution should be changed to a per capita basis rather than a per-county allocation to reflect a realistic level of wear and tear on roads.
- Enable cities to tax land that has remained undeveloped in urban cores for a significant time period at higher rate than developed land to encourage development (conceptually the opposite of strategies to have lower tax rates in rural areas to allow farmers not to develop). The land owner would get a tax break if the land is designated (owner authorizes) for use in a city redevelopment plan.
- Alternatively, tax policies could enable a developer who is in process of land assembly, who has clear intent to develop and is working with a city, to put off taxes on property until the development project has been completed.
- Increase tax incentives for land owners who sign easement agreements for conservation in PCAs.

Land Use Planning and Site Design

- Enable township planning and zoning to include a standard of public welfare. Townships do not have the authority to regulate land use broadly, yet much of the growth at the urban fringe is occurring in townships.
- Provide incentives to townships or require townships to coordinate with villages around which they are growing in terms of land use and tax benefits. Tie all funding programs to locations in PDAs. This approach is likely to be supported in Northeast Ohio, where the Voices and Choices process identified “shared land use planning” as an important step for regional economic development.
- Enable cross-jurisdictional transfer of development rights, joint economic development districts, and joint conservation districts to encourage sharing of tax revenues from development/conservation activities.
- Priority in funding should be given to jurisdictions that complete impact assessments of land development and demonstrate a plan to share benefits and mitigate adverse impacts to other jurisdictions.
- Provide planning and technical assistance grants for local jurisdictions to complete comprehensive plans that designate housing and infrastructure needs for 20 years, include natural resource protection elements, and to change zoning to concur with PDAs and PCAs identified through the Balanced Growth Watershed Plans.

- Provide incentives to cross-jurisdictional coordination of land use and zoning decision making concerning PDAs. Many states require local plans, require regional collaboration, or at minimum regional impact studies for large projects. Ohio currently requires a zoning map for townships and does not require that incorporated municipalities complete comprehensive or master plans. Many states require environmental impact assessment for projects over a set level of significance. Ohio does not. Yet, according to the literature reviewed for this project, coordination and horizontal concurrency have provided effective mechanisms to mitigate negative externalities of larger development projects. The state, through the Balanced Growth Program, can encourage municipalities and townships to coordinate their growth in an orderly fashion with benefits shared across jurisdictional boundaries.
- Enable agricultural and conservation zoning in all jurisdictions and provide technical and legal assistance to communities that chose such zoning so their ordinances can withstand legal action.
- Provide incentives to multiple-jurisdiction natural resource/open space protection planning (e.g., extra points on scoring rubrics for funding; special call for proposals, etc.)
- Review decision making assumptions and rubrics for awards and permits to identify bias toward rural, undeveloped areas outside existing small settlements.
- Housing. Standard regional land use planning practice includes a calculus of the expected population growth and how this translates into housing needs. As part of the pilot programs, the state may want to retrieve data of baseline housing needs assessment in the watersheds. The literature suggests that if there is sufficient demand and incentives for increased density are in place, the market will shift to multiple family or smaller houses. If these two conditions are not in place, higher densities are not likely to result. That is a planning/design issue, and the state can have an influence there, particularly on counties and through subdivision control. Enabled transfer of development rights would greatly augment the power of incentives for increasing the intensity of development of housing in existing settlements and PDAs.

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1.0 Introduction: Protecting Lake Erie and Its Tributaries

Lake Erie, one of the Great Lakes, is the single most important ecological resource in the state of Ohio. It is vital to the health and well-being of its people, both in the Great Lakes basin and across the state because of the life-giving water it provides and the economic benefits it generates. The Lake Erie Protection and Restoration Plan of 2000 authorized the Ohio Balanced Growth Initiative, which included creation of a Balanced Growth Task Force to develop a set of recommendations to the Commission and Governor to protect Lake Erie while balancing economic growth in the basin to improve quality of life for residents. The Protection and Restoration Plan was developed by the Ohio Lake Erie Commission, a six-agency cabinet level cluster in the state's executive office (the Environmental Protection Agency and the Departments of Development, Transportation, Health, Agriculture and Natural Resources). The Commission also supported the work of the Balanced Growth Task Force. The Ohio Lake Erie Commission officially accepted the recommendations of the Balanced Growth Task Force in April 2004.

The work of the Task Force was structured to reflect the authorization of the Protection and Restoration Plan, and focused on three key areas of policy: 1. state policies and programs that directly shape land use and urbanization patterns; 2. state policies, laws and programs that shape the actions of local governments (township, municipality, county) and their regional collaboration; and 3. local land use regulation and land management practices. A work group was formed for each of these policy areas, with subsequent recommendations made to the Ohio Lake Erie Commission.

The current project summarized here focused on policy areas 1 and 2. The project has been designed and carried out in partnership with the Ohio Lake Erie Commission. In particular, the workgroup in policy area #1, state policies and programs, recommend a review of state programs and their effect on land use change. Workgroup #2 recommended a framework for watershed-based planning that would be fueled by a set of state program incentives. The current project sought to assist the state's efforts to identify key Ohio policies and programs that would support the Balanced Growth Initiative, now the Balanced Growth Program.

2.0 The Costs of Haphazard Land Conversion and Urbanization

Why the focus on urbanized land development patterns to protect Lake Erie and its tributaries? Urbanized land development (characterized by buildings, water and waste water systems, storm water drainage systems, roads, and parking lots) fundamentally changes the hydrologic cycle. That is, when land is developed, the presence of these characteristics changes the way rain water runs across the land and into streams, rivers and Lake Erie. By and large the addition of all the hard surfaces, known as impervious cover because it does not let rain water filter through, has the following affects: less rain water filters into the ground, often resulting in a decrease in the water table; the increased overland flow picks up pollutants such as oil, gasoline and yard chemicals and washes these into streams; rain water accumulates quickly into engineered storm water systems, thereby entering streams more quickly and causing increased erosion; this new hydrologic regime results in more frequent flash flooding. As more and more land in an area is developed, and the land becomes more impervious to infiltration of rain water, down stream flooding becomes more and more frequent. This is the process that has occurred in the Lake Erie basin quite significantly in the second half of the 20th century.

The resulting changes in Lake Erie itself are of concern to scientists, resource managers, elected officials, and Ohio's citizens. Pollutants washing into the lake from the land cause increased bacteria levels at beaches, choke near-shore fish habitat and recreational areas with eroded sediments, decrease oxygen levels in the lake leading to die-off of fish, and cost lake-side communities millions of dollars each year to dredge out eroded sediments from harbors and river bottoms. The loss of important fish habitat, decreasing oxygen levels in the lake, and degradation of recreational areas and beaches costs the residents of Ohio millions of dollars each year in maintenance and threatens recreational and commercial fishing industry on the lake and local economic development tied to waterfront revitalization all along the lake. Ultimately, for communities that take their drinking water from the lake, deteriorating water quality means added expense to purify water to meet federal drinking water standards.

Ohio's experience with land conversion from rural, agricultural or natural resources to an urbanized form is not unique in the United States. Land conversion has affected millions of acres, and the process is accelerating. Under current rates of land conversion, over the next 20 years 18.8 million acres of rural, agricultural, natural resource, and environmentally sensitive

land in the United States will be converted to build over 26 million new housing units and over 26 billion square feet of new nonresidential building space. This translates into conversion of 0.6 acres for each expected residential unit, and 0.2 acres per 1,000 square feet of nonresidential space (Burchell et al 2000). As Burchell, et al note, “this projected level of land conversion need not take place” (p. 9).

Conversion of land to residential and nonresidential uses, what can be considered “urbanized” settlement patterns, is in part a function of the requirements of families to improve their quality of life and of businesses to provide more efficient facilities and add jobs to the current US employment market. The amount of acreage consumed in this process, however, is not merely a function of overall market demand. It is also a function of cultural norms about housing size and lawns, the relative cost of land itself, and of public policy and regulation. In the interest of citizens, governments regulate the use of land, provide financial subsidies that assist homeowners and business owners in their land development process, and directly provide a range of capital infrastructure and other public services that allow the land development market to function.

In the past 50 years, the urbanized land used by American homes and businesses has, on a per capita and per business ratio, increased quite dramatically. While new facilities have been built on previous un-urbanized land in some regions as population increased (birth rate and immigration), other regions with a stable population or even population loss have also seen new facilities built at the metropolitan fringe. In some instances in these latter areas, the land occupied by relatively the same or less people and business has increased by 1/3 or more. This is particularly the case in the Great Lakes basin states (Beach 1995; Pendall 2003). Rather than support value added business in these regions, subsidies for land conversion have often supported relocation of businesses and residents from urban centers and older suburbs to new suburbs, rural villages, and the wider ex-urban area. Low-density urbanized land also costs local, state, and federal governments increasing money to provide capital infrastructure for new communities.

Academic researchers have attempted to characterize this low-density pattern of development systematically, using various quantified characterizations. Overall “sprawl” is defined as the process in which the spread of development across the landscape far outpaces population growth, suggesting four dimensions: population widely dispersed in low density development;

the location of homes, shops and workplaces separated by zoning regulation; network of roads marked by huge blocks and poor access; and lack of well-defined, thriving activity centers. Other characteristics associated with sprawl are a manifestation of these conditions.

The results described in this policy paper are based on evidence that this pattern of land development is profoundly unsustainable. By that we mean the costs of unmanaged growth in terms of environmental degradation and fiscal solvency in both the private and public sectors are too large to be borne effectively by this and following generations. For example, Burchell et al (2000) estimate that during the period from 2000 to 2025 under existing land conversion trends, developers and local governments in the United States will expend more than \$190 billion to provide necessary sewer and infrastructure (p. 10). For the same period, they estimate that communities and states will spend more than \$927 billion to provide necessary road infrastructure to add 2 million lane-miles of local roads (p. 11). During the same period, localities will spend \$143.2 billion *annually* to provide public services as residents and businesses expand across metropolitan areas into the countryside (p. 13). For the private development sector, continued land development patterns will require expenditure of more than \$4 trillion to develop residential and non-residential structures to accommodate new or relocating households and employment centers (p. 13). Burchell and Listokin (2001) estimate that application of current growth management practices to create a more traditional, compact development pattern and to stimulate infill development in existing communities would save nearly \$250 billion dollars over the same 25 year period (p. 6).

A set of social costs may also occur if land conversion patterns continue. Families can expect ever-increasing travel miles and costs (unless public transit systems can be made solvent in low-density areas), a loss of distinctiveness in settlements across the landscape, and perpetuation of the concentration of poverty in the urban core, in part because of exclusionary housing markets in outer suburban areas (Burchell et al, pp. 13-17).

The response to these patterns of land development in many states has been to institute a system of growth management. Such systems do not prohibit or preclude new development. Rather, they guide the land development and redevelopment process and location toward patterns that can be serviced more efficiently, and protect agriculture, natural resource and environmentally sensitive areas. This is the emphasis of the Ohio Balanced Growth Program as well—to encourage local communities and private developers to build in patterns that can be

serviced sustainably in to the future, and protect the vital areas around streams, wetlands and rivers that are critical to the ecosystem health of Lake Erie.

What would the regional land use pattern look like if the sustainable development of existing settlements was supported and critical ecological resources were protected as the Balanced Growth Program recommends? One possible outcome might be as presented in Figure 1. The PDA circles represent the urbanized areas designated by local officials and

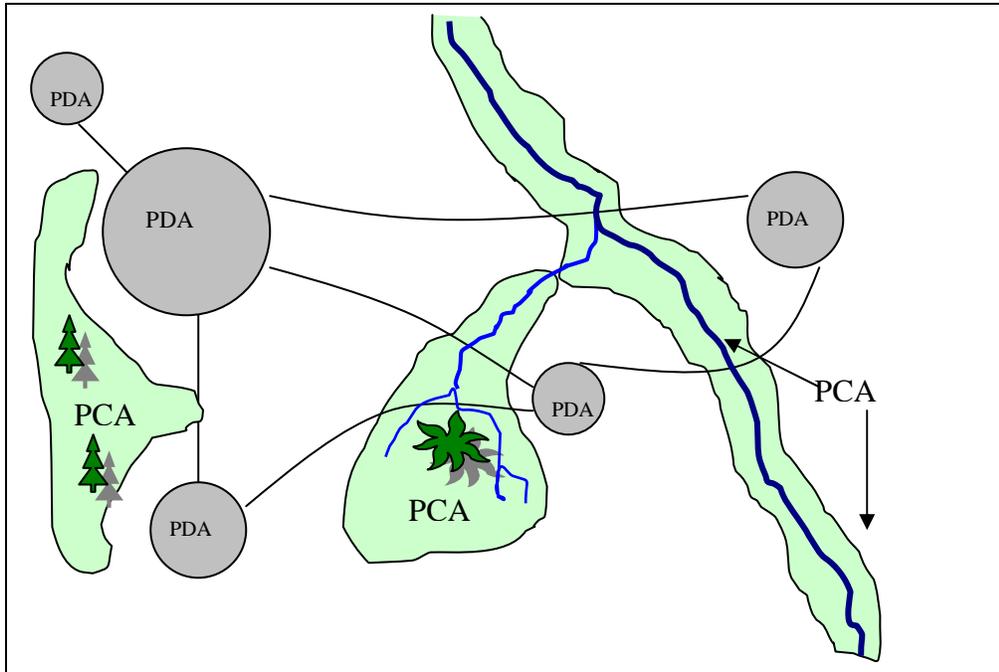


Figure 1. Nodal Settlement and Resource Protection Pattern

Source: Author

stakeholders working through the Balanced Growth Watershed Planning Processes. The PDAs would accommodate the expected land use needs given the expected population in the community over a set time period. The PCAs constitute lands that have likewise been designated as ecological areas critical for protection of Lake Erie and its tributary rivers and streams. Please keep in mind that the figure is abstracted, meaning that it is not likely that every parcel of land in either PDAs or PCAs would ultimately conform to the designation. And while no land owner or jurisdiction will be mandated to change land use as part of the Balanced Growth Program Watershed Plans, over time if local governments and private citizens acknowledge the benefits to this scheme, and are supported by state incentives and decision making, more and more parcels within each type of area would conform.

3.0 Study Purpose and Context

The purpose of the study described in this paper was not to investigate all of the causes of sprawl, or the range of growth management programs per se, although some of this information was included in our review as background information. Rather, its purpose was to ascertain which growth management techniques have been assessed in terms of their overall effectiveness in guiding land urbanization processes and what have been their outcomes. That is, which types of mechanisms and policies have been used to shape land development processes effectively to achieve a more sustainable or balanced outcome? The ultimate use of the study is to inform policies, programs, and incentives that can be used to support the Ohio Balanced Growth Program in the Ohio Lake Erie basin.

4.0 Theoretical Framework: Land Urbanization

4.1 Variables Influencing Land Development Decisions

We have defined “development” for this project as a change in the land use and land cover in a given location to that characterized as “urban,” including presence of buildings, roads, waste disposal facilities, parking lots, landscaping with non-indigenous plants, and other non-agricultural artifacts. Variables are conditions, trends, actions, objectives, etc. that influence whether, where, and what type of development occurs. Some of the variables are exogenous (considered immune to influence for the purposes of this project) (these are presented as ovals in the model). Other variables are endogenous (considered amenable through actions or individuals, organizations and public entities) (these are presented as squares in the model). Variables may influence decisions positively or negatively, or in support or against a particular type of land development in a particular location. The model does not at this time suggest these attributes. It does suggest, however, through the use of arrows, the direction of influence that one variable has upon another.

The first step in building the model was to array the variables that can influence land development. This array was developed using the literature that was reviewed for the project. Table 1 presents these variables. These variables were then used to construct a conceptual model representing the combination of variables that shape land development practices. Figure 2. below presents this model.

Table 1. Variables Influencing Land Development Decision-making

Overall demographic trends

Private sector (individual and family) housing preferences/demand

Mortgage interest rates

Transportation costs

Developer sector product supply/profit motive

Nonprofit and private land conservation

Commercial Finance (interest rates, loan availability)

Local community needs identified through planning

- housing
- commercial/industrial
- institutional (schools, parks, other public facilities)

Local community land use regulation

- Land use areas for planning purposes
- Zoning and building standards

Local economic development incentives (loans and tax policies)

State land conservation (fee simple acquisition, easements)

Infrastructure provision through direct state spending or loans to local governments

- Roads and bridges
- Water systems
- Sewer systems

State financial policies

- Tax policies related to property, income and gasoline
- Economic development loans/assistance
- Tax credits

State and local ecological/environmental regulation

- Wetland permits
- Discharge permits

Infrastructure standards and regulations

Topographical and aesthetic conditions of land itself

Farmland/agriculture profitability & farmer retirements

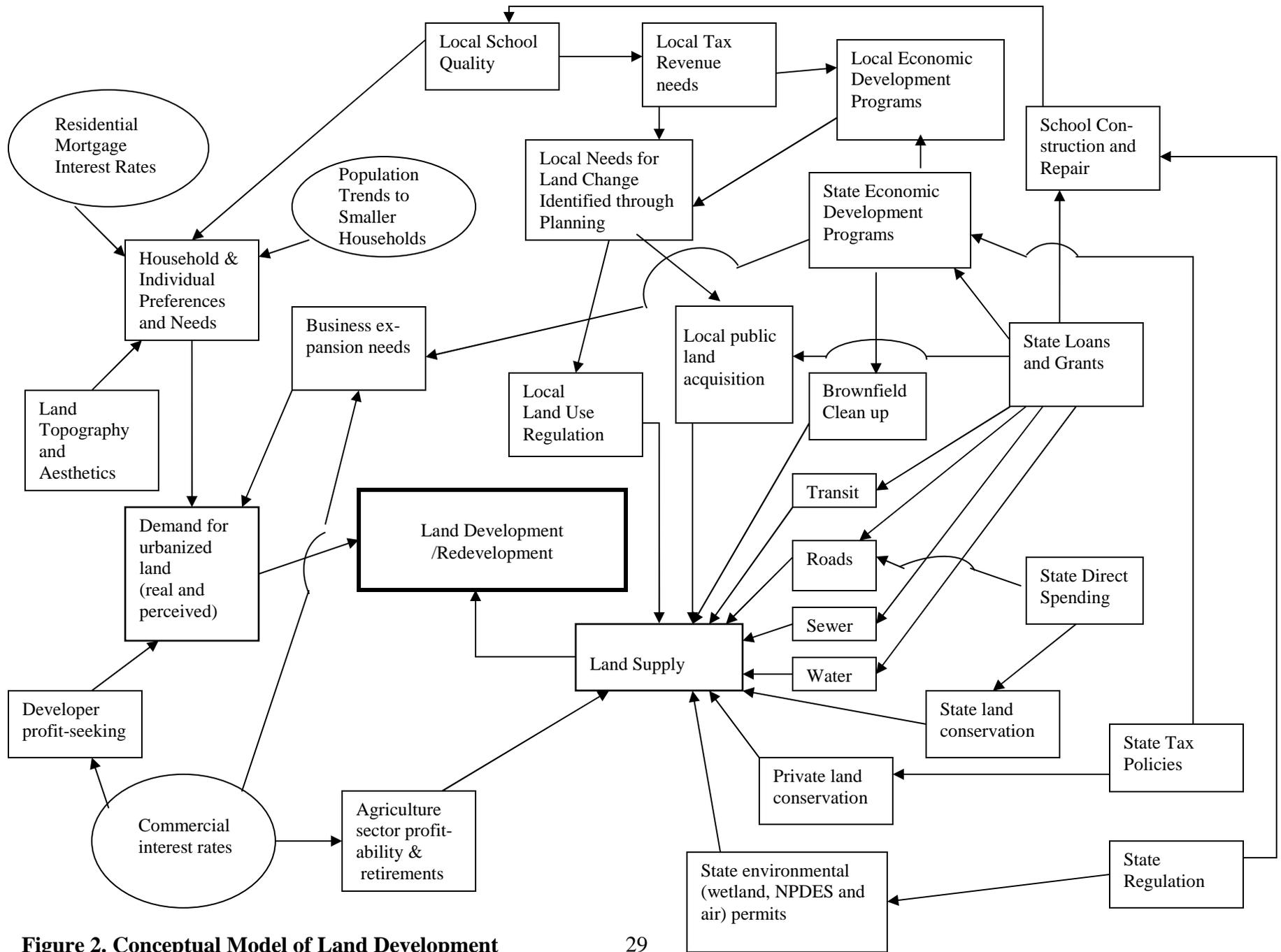


Figure 2. Conceptual Model of Land Development

4.2 Conceptual Model of Land Development

At the center (both conceptually and diagrammatically) is “land development/redevelopment.” The variables presented in the model act individually and in concert to shape two key forces that affect this outcome: the demand for urbanized land and the supply of urbanized land itself. Urbanized land can be found or created in either existing settlement areas (through infill development), adjacent to existing settlements, or in rural settings.

Demand for urbanized land, in this case either real or perceived is an outcome of household preferences and needs, the facility expansion needs of commercial enterprise, and real estate developer profit-seeking. All types of demand are influenced by the cost of money. Household preferences and needs are influenced by the size of the household unit (e.g., smaller size households require more housing units), preferred size of dwelling units, preferences regarding land aesthetics, the quality of services (including schools), the cost of mortgage finance, and the cost of transportation, among other things. Business facility expansion needs may demand larger tracts of land, either in existing settlements or in rural areas, and is stimulated by market demand and economic development incentives and influenced by the cost of borrowing. Profit-seeking by real estate development companies motivates these types of businesses to develop new properties or redevelop existing properties for changed uses, thereby increasing the demand for land that is amenable to these activities.

The supply of land that can be used to respond to an urbanized land pattern is shaped by many variables as well. Profitability and farmer retirements influence individual and family decisions regarding continued agricultural use of land. Rural resource lands are taken out of the potential supply by direct acquisition by the state, local governments or private entities and by environmental regulations. Local land use regulation, based on tax revenue, schools and other needs, either favors or constrains development/redevelopment of land. The presence of land contamination from past uses also shapes the supply of urbanized land in the city core and smaller communities. Local decisions are influenced by state law, standards, regulations and economic development incentives. Lastly, provision of infrastructure (roads, water and sewer), often thought of as a service amenity, directly influences the supply of land by creating a “market” for development itself. Thus the private sector real estate and economic development market does not operate unfettered, but is shaped by (subsidized or discouraged) a range of policy levers (Mondale and Fulton 2003). We should note that it is quite

possible that in a given state policies that influence different variables may exert contravening or aggrandizing influences. That is, one state agency, for example, may be seeking to restrict the supply of developable land, while another is seeking to increase the urbanized land available as part of its mission and responsibilities. In the absence of collaboration and alignment, the overall influence in this case will likely depend upon which agency marshals greater resources or authority in fulfilling its mission.

Each of these variables exists in a chain, which is represented by variables “further away” from the center. For example, private land conservation actions may be influenced by state-level tax policies, while direct state spending influences public land conservation actions. In a more complex chain, maintaining good quality schools strengthens the local need for tax revenue, which in turn leads to economic development and encouragement of housing starts, which in turn leads to land use regulation that tends to increase the supply of developable land.

The reader is invited to trace through the model. It should be pointed out that this model does not specify whether the land supply for urbanized land development is in existing settlements, at their edge, or in rural areas. The geographic location of the land development/redevelopment is a product of the location of investment actions, regulations, and incentives. These decisions are intentional in many cases. However, some actions by individuals or governments are on the surface “geographically neutral,” meaning that there is no explicit intention to direct development to a specific place through these variables. However, at times the outcomes of these policies and actions, or the programs through which they are implemented, may in fact be geographically-biased toward conversion of rural land to urbanized patterns, and these aspects of government policy, particularly those of OLEC agencies and other agencies, need analysis as well.

5.0 Study Design

5.1 Research Objectives

Our purpose was to augment the resources devoted to the state’s review of policies and programs by gathering information from academic, government agency, and private “think-tank” research on the effectiveness of growth management programs across the United States. We sought to identify likely types of policies and programs that have worked

in other settings, and bring that knowledge to the ongoing efforts in the Ohio Lake Erie basin. More specifically, our methods were designed to answer the following questions: of the variables presented in Figure 2, which have been amenable to policy influence? Which policy mechanisms and tools of growth management programs have been used to shape land conversion patterns most effectively? How do these mechanisms compare to the policies, programs and incentives suggested for the Ohio Balanced Growth Program? What mechanisms are of high priority and can be expected to be effective in the Ohio case given the current legal, political, administrative and cultural context?

5.2 Methodology and Limits of Study

The project uses multiple methods to create a set of recommendations for the Balanced Growth Program. These methods include: 1) a review of academic and “think tank” research on the causes and remedies for low density urbanization; 2) field-testing of possible policy strategies; 3) interviews with state and other policy actors on specific types of programs and policies; and 4) a review of current state of Ohio policies and agency programs. Table 2 summarizes these data and sources.

The project team documented the factors that affect land use patterns, the types of policies and programs that have been implemented to shape these factors, the effectiveness of these policies and programs through a review of academic and “think tank” research articles and reports. Through this method we sought to identify policies and programs that have worked in other locations.

We conducted two focus groups of participants from the commercial and residential development sector, asking them to react to a set of questions concerning their decision making practices and how these were or might be influenced by state level policies, programs and incentives.

The team interviewed 20 policy experts on the current status of tax policies in Ohio and how these affect land use patterns. We also interviewed several staff members of metropolitan planning organizations and county planning commissions for their perspective on economic development and infrastructure aspects of land use change.

We then arrayed the existing policies of the Ohio Lake Erie Commission agencies and others whose mission and programs are related to and might affect land use patterns.

These policies and programs were incorporated into an on-line database organized by 10 major policy areas (housing, transportation, health, environmental regulations, etc.). The database includes information on the policy, its legal source, what agency is responsible for implementation of the policy, relevant administrative programs, and the annual budget for those programs. “State policies and programs” consist of two categories or types of entities: those leading to direct action by a state agency (building a road, issuing a permit, etc.) and those affecting the actions of regional or local agencies, governments or local private development sector (planning enabling, tax policies, infrastructure funding, etc.). These two categories **roughly** translate into direct state actions that can be taken to accommodate the Balanced Growth Watershed Plans, and policies and programs that are being discussed as incentives in terms of the watershed balanced growth planning processes.

The project used a broad cross-comparison between academic literature and government policies and programs to summarize the current state of knowledge regarding effective policies and programs in various states and to identify the likely comparable policies and programs that are either in use in Ohio or that could be used in the Balanced Growth Program. These are described in more detail below.

Table 2. Summary of Study Information Needs and Data Collection Methods

Information Need	Data Collection Methods			
	Literature Review	Interviews	Focus Groups	Policy Database
Types of growth management policies and mechanisms	X	X		
Effectiveness of growth management policies in other states and regions	X	X		
Current policies and programs of OLEC agencies and others that influence land development process	X	X	X	X
Likely influence of changes to state role regarding land development/conservation	X	X	X	

The limitations of the study stem from both conceptual and resource constraints. Regarding the literature available on the effectiveness of a range of growth management programs, a condition discovered by Nelson and Moore (1996) a decade ago has not been altered dramatically. As these authors assessed the results of growth management programs in six

states, they noted that the scholarly literature at the time lacked assessments of effectiveness of growth management policies, citing four challenges to research:

- The inability to measure the counterfactual. To evaluate effectiveness, one must know something of what would have happened in the absence of growth management;
- Timing. Growth management plans affect land use decision making over long periods of time, perhaps generations;
- Scale. Methodologically, at what scale is it appropriate to measure change? State, county, local, region?
- Measurement. Many growth management programs do not include effectiveness measures or targets built into local plans or systematic review processes, thus making even an evaluation of the extent to which programs achieved their internal objectives difficult.

Given the resource constraints of the study, we did not conduct a spatial analysis of the distribution of state investment, monetary support, or existing incentives. Data for such an analysis is costly to acquire or create. The team spent considerable time reviewing state document budgets available through state government web pages (including the agency programmatic budgets) in assembling the state database. Ultimately, we were dependent upon state agencies for some of the budget data used in the study and to verify the most current levels of funding in programs that the research team identified through our search. Budget numbers are 2006 where available, otherwise we used the most recent available. Most of these alternatives were for 2005. The state agencies that assisted in data provision did not have a breakdown of money spent just in the Ohio Lake Erie basin. Therefore the budgetary amounts described in the paper are for state as a whole, not just in the Lake Erie basin. We have no way of estimating the relative proportion of money that was directed toward communities or investments the Lake Erie basin vs. the rest of Ohio short of tracing the location of disbursement. The exception to this is for programs that only exist in the basin, such as the Ohio Coastal Management Program or other programs designated as Lake Erie focused.

A second limitation of the budget data is that these are presented by programs, not by “unit” of product delivered; i.e., we cannot at this time compare budgets on basis of miles of highway vs. acres of wetland protected even if this proved to be a meaningful comparison. We are working with the state agencies to identify a “unit cost” of the services and products they provide for future analysis. However, the amounts we do have indicate the relative proportion of state spending directed to different types of services.

The next step in research that is desirable, if data can be made available, is to track the specific distribution of program money geographically in terms of the local community and whether it is an existing urbanized area or in rural or exurban areas.¹ Where is the project money spent? Where are grants given? Is there any bias in distribution (either intentional or unintentional) in programs or the distribution of state money? Answering these questions empirically is desirable. For now, we can tease out which programs have explicit urban or rural designation, and using the outcomes of our review of literature and the focus groups and interviews we conducted, formulate reasonable suggestions as to the likely effect of policies and programs and how these can be changed to support the Balanced Growth Program.

6.0 Results and Implications for the Balanced Growth Program

6.1 Academic, Government, and “Think Tank” Literature Review

Our specific objectives in conducting the literature review were to:

- Array the literature related to state policies and programs affecting urbanization and land use changes;
- Discover important themes concerning design and implementation of state policies and programs;
- Assemble current knowledge on effectiveness of types of policies;
- Generalize across policy types to ascertain likely high significance policies in Ohio and high impact changes to policy that could be adopted through the Balanced Growth Program; and
- Develop a framework against which current Ohio policies and programs might be compared and evaluated.

We began with some knowledge of the urban and regional planning literature that has been developed in the last several years regarding “smart growth.” The search for information expanded to include academic/peer reviewed studies, leading “think tank” research (the Urban Land Institute, the Lincoln Institute for Land, and the Brookings Institution) and research conducted by state and national government agencies. Our focus was on materials that could shed light on the implementation consequences and effectiveness of programs. The review also gathered information to develop a picture of how leading scholars conceptualized urban land use change dynamics and the forces affecting urban form.

¹ One study included in our literature review begins to reveal the spatial distribution of state spending. Hill et al 2003 determined that the disbursement of federal and state gas tax monies in Ohio on a county basis reveals an anti-urban bias in the flow of state monies.

Several broad categories of literature were identified by the review:

1. Growth management, including a more recent iteration in “smart growth” planning;
2. Open space/environmental resource conservation, a different literature with its historic source in natural resource management and environmental quality policies and practices;
3. Transportation and economic development and their relationship;
4. Tax policies at state and local levels and their relationship to land development patterns;
5. Case studies of cities/regions/state programs; and
6. Literature describing development of measurements regarding the characteristics and degree of sprawl

The review used a step-wise method, beginning with searches using a set of key words using several academic search engines available through the state’s Ohio Link system. An initial set of articles and books were reviewed. Their reference lists were then scanned for additional literature on relevant topics. After an initial review of literature on sprawl to ascertain the relevant variable or factors that the literature identified a *causing* or *contributing to* sprawl, the review then focused on policies, planning and management techniques or tools that had been used to address sprawl, and further, on materials that analyzed or evaluated their effectiveness. Not surprisingly, much of the literature describes or analyzes the experiences of leading growth management states, and describes the use of techniques well-known among land use planners.

While there are hundreds of articles and books about sprawl, there are relative few that present scholarly analyses of the effectiveness of policies or programs. The most-often featured location and growth management technique was Oregon and the use of an urban growth boundary, either in the greater Portland area, or comparisons across that state. However, as was noted in several articles, relatively few studies have been done on the effectiveness of growth management planning in its various forms (with Oregon possibly the exception). These articles call for a more concerted effort among planning scholars to document programs, particularly those at the sub-state level.

Table 3 summarizes the categories of policies by the sector of their impact our outcomes documented in the literature review and provides author/date citations. The table should be read as to understand the impact of various policies (the horizontal axis) upon the types of impact areas (the vertical axis), and not vice versa. (The author/date citations shown in the

table are listed in Appendix 1. Bibliography.) (Specific results of this literature review are discussed on a policy-area basis later in this paper).

The policy types that were identified in the literature include: economic development programs; school funding & construction; infrastructure installation and funding; tax policies; environmental regulation; public lands and critical areas; governance (enabling legislation, annexation, regional government); comprehensive planning, consistency requirements, and zoning; easements, trusts and TDR/PDR regulations; growth phasing programs; adequate public facilities requirements/concurrency; urban service boundary/designated growth areas; urban growth boundary/limit line; and measurement methodology or indicators.

The impact sector identified include: housing supply or value; land value; economy; schools; greenspace/recreational open space; habitat/sensitive lands/natural resources; farm land; air and water quality; water and sewer infrastructure; transportation infrastructure; urban form (define an urban edge, limit continuous development, limit discontinuous development, make development more compact); land use/supply; and inter-government coordination. The ovals on Table 3 indicate a substantial cluster area of the literature.

Table 3. Typology of Literature Review Results

Policy Areas	Economic development programs	School funding & Construction	Infrastructure development	Tax & fiscal policies	Environmental regulation	Public lands, critical areas	Governance enabling, annexation, regional govt.	Comprehensive planning, consistency requirement, zoning	Easements, trusts and TDR/PDR regulations	Growth phasing programs	Adequate public facilities requirements or concurrency	Urban service boundary designated growth areas	Urban growth boundary	Measurement Methodology or Indicators
HOUSING SUPPLY OR VALUE			Downs 1999	Thomas 2006			Gibson & Abbott 2002	Dawkins & Nelson 2003; Gibson & Abbott 2002; Nelson 2004	Whittaker 1999	Nelson and Peterman 2000; Nelson 2004	Nelson and Peterman 2000	Dawkins & Nelson 2003; Nelson and Peterman 2000; Dotson 2004	Dawkins & Nelson 2003; Nelson and Peterman 2000	1000 Friends of Oregon. n.d
LAND VALUE			Eretting & Nelson 2001; Forcumbrock and Weisbrod 2001; Nelson et al 1995; Ohara 1997; Burchell et al 2000			Correll et al 1978; Beaton & Pollock 1992		Carruthers 2002; Feiock 1994	Fulton et al 2004	Brueckner 1990	Brueckner 1990; Feiock 1994	Brueckner 1990	Pendall et al 2002; Brueckner 1990; Nelson, 1994	Kline 2000
ECONOMY			Helling 1997	Hill et al 2003; Puentes & Prince 2003	Feiock 1994;			Feiock 1994		Nelson and Peterman 2000;	Feiock 1994; Nelson and Peterman 2000;	Nelson and Peterman 2000;	Nelson and Peterman 2000	MLUI, 2005.
GREEN SPACE/OPEN SPACE								Bengston et al 2004	American Farmland Trust 2004; Daniels 1991; Hollis & Fulton 2002			Bengston et al 2004	Nelson, 1994	Kline 2000; 1000 Friends of Oregon. n.d.
HABITAT, NATURAL RESOURCES				Williams, et al 2004				Kline & Alig 1998; Bengston et al 2004; Ryder 1995	Whittaker 1999; Hollis & Fulton 2002					Hasse & Lathrop 2003
FARM LAND				Nelson 1992; Beesley, 1999; Adelaja & Schilling 1999		Adelaja & Schilling 1999		Kline & Alig 1998; Nelson 1992; Hsieh, W., E. Irwin, & L. Libby. 2001	Maynard et al 1998; Drabec & Smith 2002; Daniels 1991; Nelson 1992; Adelaja & Schilling 1999; Ryan & Walker 2004; Whittaker 1999; Beesley 1999				Moore & Nelson, 1994; Nelson, 1994	Kline 2000; Hasse & Lathrop 2003
AIR AND WATER				Hill et al 2003										Hasse & Lathrop 2003

QUALITY														
WATER AND SEWER INFRASTRUCTURE			Florida Dept. 1991; Burchell & Listokin 2002; Kelly 1993.				Carruthers & Ulfarsson 2002	Carruthers 2002			Weitz 1997	Florida Dept. 1991; Carruthers 2002	Nelson, 1994	
TRANSPORTATION INFRASTRUCTURE			Florida Dept. 1991; Forkenbrock and Weisbrod 2001; O'Hara 1997	Hill et al 2003; Puentes & Prince 2003			Carruthers & Ulfarsson 2002			Downs 2004	Carruthers 2002; Downs 2004	Florida Dept. 1991; Downs 2004	Downs 2004	1000 Friends of Oregon. n.d.
URBAN FORM	Bellafiore et al 2003; Behr, et al 2003;	MLUI 2004; Schneider et al 2005	Barnet & Haughwout 2000; Mondale & Fulton 2003; Bretting & Nelson 2001; Plant 2001; Blair 2001; Schneider et al 2005; O'Hara 1997; Burchell et al 2000; Burchell & Listokin 2001	Pendall 2003; Schneider et al 2005; Thomas 2006; Hill et al 2003; Puentes & Prince 2003		Hollis & Fulton 2002; Mondale & Fulton 2003; Schneider & Schneider 1997; Ryder 1995	Carruthers 2003; Pendall 2003; Bier 2001; Gibson & Abbott 2002; Carruthers & Ulfarsson 2002; Calt-horpe & Fulton 2001; Burchell et al 2000;	Gibson & Abbott 2002; Haeuber 2000; Nelson & Moore 1996; Hsieh, W., E. Irwin, & L. Libby, 2001; Moore & Nelson, 1994; Carruthers 2002; Blair 2001	Fulton et al 2004; Hollis & Fulton 2002	Pendall 2003; Kelly 1993; Nelson and Hawkins 2004	Pendall 2003; Kelly 1993; Carruthers 2002; Nelson and Dawkins 2004	Kelly 1993; Carruthers 2002; Nelson and Dawkins 2004	Daniels, 2004; Pendall et al 2002; Kelly 1993; Weitz & Morre 1998; Nelson, 1994; Moore & Nelson, 1994; Nelson and Dawkins 2004	Kline 2000; Ewing et al 2004; Hasse & Lathrop 2003; 1000 Friends of Maryland. 2001; 1000 Friends of Oregon. n.d.
LAND USE/SUPPLY	Bellafiore et al 2003; Behr, et al 2003		Forkenbrock and Weisbrod 2001	Thomas 2006			Carruthers 2003; Downs 1999	Nelson & Moore 1996; Florida Dept. 1991; Hsieh, W., E. Irwin, & L. Libby. 2001; National Association of Realtors. 2005; Nelson 2004	Fulton et al 2004		Downs 1999	Downs 1999	Pendall et al 2002; Moore & Nelson, 1994	Knaap & Moore 2000; Rossiter 1996; Williamson 2001; Knaap 2004
INTER-GOVERNMENT COORDINATION			Burchell et al 2000	Puentes & Prince 2003			Richardson et al 2003, Carruthers 2003; Burchell et al 2000	Ben-Zadok & Gale. 2001; Florida Dept. 1991.; Carruthers 2002; Nelson 2004; Blair 2001	Fulton et al 2004; Burchell et al 2000	Burchell et al 2000	Burchell et al 2000; Weitz 1997	Burchell et al 2000	Burchell et al 2000	

Summary of Literature Review

Growth management policies that have been adopted in over 30 states in the United States and dozens of localities and regions seek to affect the location, timing and/or rate of “growth,” which consists of land use change from a rural or natural resource base to a more urbanized state. This urbanization is characterized by residential, commercial or industrial land uses dominating over agricultural or resource extraction uses or other open land.

Studies in the literature are attempting to answer the following questions:

- Do /how well do these policies work?
- Are they more or less effective in certain types of settings?
- Is there an ideal scale at which to apply them or from which they are generated (meaning at the local, county, multi-county, region, state, or national level)?
- What are the consequences of these policies across multiple sectors (land prices, housing, ecological, working landscapes) and how are these interrelated? What are the unintended consequences?

Most of the research concerning growth management concerns the impacts of growth management policies in two areas: land prices (for real estate development or business location) and housing (supply or affordability). Other research on the relationship between the transportation networks and from economics examines changes in land prices and accessibility as it lowers cost (for firms and for commuters). There is considerable work on urban form (population distribution, buildings, infrastructure and open space across the landscape as well). A few articles raise the issue of relationship between growth management and open space. Most of the literature is concerned with growth at the fringe, and most studies are set in areas where population increase is one of the existing conditions.

The first wave of growth management policies occurred during the 1970s as part of the so-called “quiet revolution” in land use planning, whereby several states adopted policies and planning requirements for local governments to address areas of rapid population growth and urbanization. Most early growth management efforts, such as Florida’s state growth management law, were not focused on shaping urbanization patterns per se but rather on predicting future urban expansion that was needed to meet expected population growth and ensuring that public infrastructure was adequate to accommodate the urban growth that was predicted.

A few overall observations should be kept in mind when comparing the results of the literature review to the current situation in Ohio. Not surprisingly, much of the literature uses the experiences of leading growth management states, and describes the use of techniques well known among land use planners. The most-often featured location and growth management technique was Oregon and the use of an urban growth boundary, either in the greater Portland area, or comparisons across the state. In all but a few cases, the literature describes policy development, implementation and assessment in locations experiencing population increases, either on a local or regional scale. Many of the articles feature experiences in Oregon and Florida, the two states with the oldest, and perhaps best known, efforts to manage growth and land use change. Two studies, however, focused on urban sprawl in states with low growth regions (upstate New York and Pennsylvania outside the greater Philadelphia area). This aspect of the literature is significant for a study of Ohio's policies, given the stable or declining level of population in the Lake Erie basin coupled with decreasing density of urbanized settlement patterns.

Because of the focus on implementation effectiveness, the literature describes experiences in states that have adopted a variety of land use planning and policies. Overall, most of the literature describes practice in states with relatively high degree of land use capacity and regulatory requirements. For example, adoption of growth management strategies in most states is on the basis of existing requirements for local land use planning, introducing additional attention to growth issues, requiring consistency with state level plans, etc. Ohio has far fewer planning requirements to begin with, and consideration of the state's role must be in light of these differences.

Many studies focus on one sector and the effects generated by one or more policies or programs. There is also a significant literature on urban form (density, geography, morphology), but again, this literature tends to be focused on states, regions or localities with urban growth boundaries and some aspect of urban service provision, which are the dominant policy approaches explicitly targeting urban form.

Based on the review of literature, it is not likely that there is a "smoking gun" state policy that can be changed to affect land use, but rather a constellation or package of policies and incentives that will be effective for implementing the goals of the Balanced Growth Program.

The results can best be summarized through a series of questions that were derived from the literature review. These questions address how the literature presents urban/rural land use change and the factors that affect land use; the characteristics of settlement patterns that can be influenced by policy; the types of policies that can be used; and the intended outcome of state policies, that is, what entity the state-level policy is intended to influence. These are discussed briefly, with any relevant implications for the Balanced Growth Program as it has been structured presented.

How is the urban/rural relationship envisioned (what shapes land change) and how is it to be managed?

Two broad approaches to policy were identified through the literature review: shaping urban form or accommodating urban growth.

Shaping Urban Form. One substantial portion of the literature conceptualizes growth management as an effort to shape urban form, that is, the location and physical characteristics of settlements on the land. This focus tends to be characterized in the literature as “urban containment.” Two different conceptions of urban and metropolitan area are found, however. The first evolves from Von Thunen’s theory of geographic location and urban growth from a mono-centric city, with urbanization spreading over the countryside in a series of concentric rings or growth stages. Current literature may not specify this historic root, but the language is consistent with this conceptualization. Policies are developed to “contain” growth, to increase density in the core while limiting land conversion outside some observable or created limit.

Another framework also informs the literature on directing spatial development, but this assumes a more polycentric metropolitan region, with urbanization occurring around a set or series of centers. Policies in this model are designed to maintain some physical or jurisdictional land use differences between nodes of settlements. One variation of this approach is evident in a small area of the literature that focuses on green space as a buffer or border to urbanization.

For both these conceptual models, policies would seek to directly and intentionally contain urbanized land uses in and around these settlement nodes through land use regula-

tion. A less regulatory approach would seek to directly and intentionally stimulate real estate markets in and around these nodes, while discouraging development investment outside these areas. A secondary strategy to maintain interstices between settlement nodes is to directly and intentionally protect preservation/conservation of land for rural or resource uses through increased conservation-oriented investment.

A conceptual model similar to these (in that it seeks to direct the location of development) is a gravity model, which is based on a notion of “push” and “pull” rather than explicitly bounding of urban land uses. In this model, actions are taken to push development away from areas where it is not desired, or to pull development into desired locations. For example, preservation of rural open spaces or working landscapes is a “push” factor, in that it limits development in one area and therefore “pushes” development to other areas. In contrast, infrastructure development is considered a “pull,” attracting development to a place as it provides access to a service and/or lowers cost. This model, although highly abstracted, in some way mimics the existing processes that shape development location, but makes these push and pull factors obvious and subject to manipulation by policy.

A good portion of this literature focuses on the states with growth management plans that include implementation of planning requirements or have extensive planning enabling legislation. Here there is concern with the scale at which growth management occurs (local, regional, statewide), and the planning frameworks and tools that are mandated as part of growth management plans. Specifically, the literature considers the following: enabling legislation used by states, annexation policies, creation of regional governments, requirements for local comprehensive planning, consistency requirements, and use of zoning to shape form and density. (In Ohio, these would be considered “indirect” policies, where in many states, the state itself has an active role in use of these tools.)

Accommodating Growth. The second major area of the literature focuses on growth management policies that are designed less to shape the settlement pattern at the regional or local scale, than to accommodate and “keep up” with the service and infrastructure demands of growth that is driven by population increase (either at the metropolitan or local level). Growth management from this model is a question of timing, staging, phasing and in some

part directing land development to meet the demands of new population that in a way is fiscally responsible and feasible.

Three types of growth management programs in this model are described in the literature (Kelly 1993):

- adequate public facilities standards (APFO), which prohibit development except where adequate (defined) public facilities are available;
- phased growth programs, which regulate location and timing based on community plans (urban service areas or limits are a typical tool used for this phasing); and
- rate of growth programs, which establish specified rates of growth; these are typically expressed as % increase in housing stock; typically used at the local jurisdictional level, with some use regionally.

What do policies seek to influence?

State policies and programs can be designed to affect: 1) the location or pattern (spreading or nodal) of urbanized land development; 2) the density or use intensity of settlements and their surrounding lands; 3) the overall function of ecological systems located in open space; and 4) the rate at which land is developed.

Urban Pattern. Much of the literature describes the purpose of growth management policies as addressing one or more of four aspects of land use urbanization, including development that is strip, leap frog, or scattered. Strip urbanization consists of lines of independent stores stretching along an arterial. Planners consider this type of land development pattern disorderly and inefficient in terms of the costs of service provision and travel time for commercial activities. To the extent residential areas follow such development, travel time for commuting increases as well. A second type of urbanization is leap-frogging, meaning single function land use (typically residential subdivisions) within a local context. This is development that for one reason or another (infrastructure provision, cheap land, etc.) “jumps” over undeveloped land or around barriers created by policies. Scattered development equates with dispersed, “shotgun” pattern with individual buildings, a wide distribution of functions and activities in many locations. It appears random across rural landscape with no focal points or activity centers (Weitz and Moore 1998).

A significant portion of this literature examines the parameters of setting appropriate size and location of any boundaries and the implications on density and other sectors. Tighter containment strategies tend to encourage greater increase in density in areas designated for

growth, as long as local policy permits it and strategies cannot be changed easily or frequently. This has generally been true in Oregon, where the period in between changes to the Urban Growth Boundary is relatively long (20 year). The designation of urban service area has not been as effective in Minneapolis, however, in part because the metropolitan government has changed the service area frequently (five years or less), creating anticipation of market changes.

Implications for BGP. These two different views have different implications for policy. Is the policy objective to contain urbanized land uses within a boundary or to direct growth (implying a monocentric core that spreads?) or to influence growth in such a way as to maintain open space (natural resources and/or working landscapes) and create more satellite communities across the landscape? The appropriate policy actions may be different. The latter approach has two relevant topics. First, it was the model proposed by Ebenezer Howard, adopted into town planning in England, and advocated by regional planners in the United States from the 1930s onward, who proposed a larger central city with a set of satellite towns around it, separated by open space and connected by transportation networks. Howard and his disciples have advocated nodal development along a unifying, regional skeleton (which in theory could be realized through infrastructure design). Ian McHarg, in *Design With Nature* (1969), and others proposed that the skeleton of the region was the blue/green infrastructure, and that the “meat” of the region was laid over this to fit in the function of these systems in terms of deciding where to put settlements. That decision would be based on a suitability analysis of the region to determine what locations were most suitable for each type of land use (residential, commercial, conservation, etc). These satellite cities tend to be what is developed anyway when a greenbelt strategy is used. Howard and the others envisioned these satellites as functionally integrated towns, where most urbanized areas created by leapfrogging are bedroom communities (although this is changing somewhat as they get larger and farther out).

This regional network approach underlies, in part, the Maryland’s Smart Growth strategies Maryland and the Ohio Balanced Growth Program’s designation of urban growth and conservation areas (the latter to maintain some open space). Much of the focus of the Balanced Growth Program is on shaping the location of land urbanization. This focus is ar-

articulated in the first two policies of the Lake Erie Restoration and Protection Plan (invest in the existing urban core areas and minimize development in greenfields). It is also the primary component of the Balanced Growth Watershed Plan framework developed by the Commission's Balanced Growth Task Force, which calls for identification of priority development and priority conservation areas in a tributary watershed.

Density. Growth management policies also have attempted to influence density, which is typically measured in population or buildings per land area. These policies tend to have been put in place at the local level, by local jurisdictions, seeking to either limit or enhance density in appropriate locations.

This is a well-developed segment of the literature, primarily focusing on case studies of high-growth metropolitan areas. The studies are highly quantitative, measuring the affect of constrained development on land value or markets (see Brueckner 1990, Pendall et al 2002) or housing value or supply (see Dawkins & Nelson 2003 or Dotson 2004 for example). Other investigators document the affect of planning requirements and governance structures on housing and land values (See Gibson and Abbott 2002 for example).

One study focused more on implementation of growth management programs, suggesting that a key issue is to ensure that housing densities allowed for in plans were built to that level. The study in Oregon found that typically housing was built to 50-80% of allowable density (likely due to protest from residents around project). (This may be an issue for PDAs, if the point is to encourage higher densities. Project team conversations with National Smart Growth Center researchers suggested the same phenomenon. The biggest issue for Maryland now is the resistance by residents in priority funding areas for development who want no more development transferred from conservation areas.)

Natural Resources and Open Space. Protection of ecosystem function is a smaller part of the literature, but has direct connections to growth management. There are two types of open space described in the literature: ecologically significant areas, and working or recreational landscapes. Together these comprise the rural landscape. The literature focusing on ecologically significant areas comes from the natural resources conservation and management fields. Its emphasis has been how to improve the resource by land conservation (habitat, riparian

corridors, etc.) and has not explicitly focused on either the impact upon or an explicit concern with influencing urban form per se. It is concerned with protection of natural resources and the adverse effect urbanization often has on them.

A second part of this literature focuses on preservation of farmland as a working landscape. This literature strongly suggests that “growth management” per se will not adequately protect farmland without specific attention to preservation of the entire working landscape (attention to the scale of farms, fragmentation, and the supporting businesses). This was seen in the Portland, Oregon area, where farmland conversion still continues. Compare this with some counties in Pennsylvania and Montgomery County, Maryland, which have had some success in preserving farmland by explicit policies. Direct state policies described in the literature are tax policies and urban growth boundaries. More literature focuses on policies and planning mechanisms enabled by the states, such as use of transfer of development rights (TDRs) and purchase of development rights (PDRs), requirements for local and regional planning, and review of local and regional plans by state governments.

There was explicit policy/planning attention to use of greenbelts or other open space to shape urban form at the turn of the century through 1930s (based on earlier work of Ebenezer Howard and his disciples, who included Lewis Mumford). Cleveland Metroparks is a good example of this strategy. Today the natural resource-based literature is “reaching out” conceptually to regional planning and attempting to think through urban form and conservation. A few articles document the effectiveness of growth management policies such as Urban Growth Boundaries in preserving ecologically significant or working landscapes, which are apparently not working very well overall without specific attention to open space preservation in tandem. The literature suggests that there needs to be explicit attention to landscape preservation to preserve it, not just a notion of a boundary for urban containment.

Because the Balanced Growth Program is not restricting development per se, the issue becomes one of designating the appropriate areas in which to encourage development and those in which to “push” away or discourage development. As discussed below, the most significant “pull” factors are infrastructure (roads, water and sewer); the most significant “push” factors are policies which acquire land or regulate its use outright.

Implications for BGP. Based on the literature review several aspects of the BGP are encour-

aging. First, the use of the PDA/PCA scheme explicitly recognizes the relationship between directing development and conservation/preservation of critical resources. Second, the likely strong role of ODNR in the BGP pilot programs as support staff or *ex officio* participants should infuse information on critical headwater areas and wetlands into the process. Third, development of plans for watersheds will strengthen the connection of development location to natural resource decisions. To the extent that local participants are encouraged to consider natural resources in their designation of PCAs and PDAs, and specifically to the extent they internalize this framework inside their jurisdictions, urban form can be modified by open space planning. Ideally each jurisdiction in a BGP watershed planning process would conduct/have a community open space/critical areas element in a plan or a map. These areas in each community can be connected to other communities across the watershed, creating a network of open space/critical areas (which would in effect “push” development into other less critical areas). Fourth, there will be review of BGI watershed plans by the Lake Erie Commission. One of the criteria for “accepting” the plan has to be the extent to which the plan identifies the watershed open space network.

Fiscal solvency/concurrency and capital improvements. Achieving a planned rate of growth or accommodating growth with fiscal solvency was part of the earliest state-level policies put in place. These policies, whether at the state, regional, or local level, seek to ensure that public services and infrastructure capacity will not be outpaced by private-sector development. The primary mechanisms used in this framework are requirements that infrastructure is in place or developed at the same time as development, whereby a moratorium is put in place until public services can be planned and installed or where the private sector provides adequate infrastructure to meet increased population needs (concurrency). These requirements often mean that development proposals must include assessments on economic, infrastructure or services that will be generated by the new development. Much of this literature focuses on the outcomes of capital improvements and infrastructure development, primarily in terms of provision of services and the impact of various policies on the built form. Some of this literature examines the role of capital improvements in “pulling” development, with the general consensus being that infrastructure provision, particularly sewer and roads, is a powerful factor pulling development into a given territory. There is also a related literature that addresses

the relationship of infrastructure to economic development and land use. Infrastructure makes the quality of life higher, and because to the extent the area is more accessible, property values will rise as demand for the property increases (see Helling 1997 for example).

Implications for BGP. This cluster of the literature leaves little doubt of the significance of the role of infrastructure provision in economic development. It is a key direct state action in terms of state-built and maintained roads, and is also an indirect influence through loans and grants to local communities.

Through What Types of Policies Can Land Change Be Guided?

The dominant response in the literature to answer this question is through planning and regulation. This is a well-developed body of literature, likely because it examines the experiences of states that have instituted changes to their state and local planning requirements through legislation beginning in the 1970s. This literature focuses on the states with growth management plans which include implementation of planning requirements or planning enabling.

Key questions these studies attempt to answer include at what scale is growth management effective (local, regional, statewide), and what planning frameworks and tools have been used as part of growth management plans? Specifically, the literature considers the following types of planning-related policies and mechanisms: enabling legislation used by states, annexation policies, creation of regional governments, requirements for local comprehensive planning, consistency requirements, and use of zoning to shape form and density. (These are discussed in greater detail in the analysis section of this report).

Again, the inability of the counter-factual limits these studies, but longitudinal case studies and cross-state comparisons suggest that those states that have instituted the most integrated planning framework have been somewhat more effective in managing the location and density of growth.

The second area of study in this literature are those related to more market-oriented methods such as the use of easements, purchase and transfer of development rights, or tax policies. A large literature related to land conservation dominates the discussion of these mechanisms (see above).

Finally, a third relatively smaller body of literature cuts across several aspects of land development. One focus is the explicit use of tax incentives to encourage preservation of habitat, farmland and open space, preventing their conversion to an urbanized landscape. A second focus is on how tax policies not explicitly directed at land patterns that none the less shape these patterns. Here the literature notes how state and local policies affect infrastructure provision and how local fiscal needs drive land development toward high-end residential or retail.

Implications for BGP. In Ohio, these would be considered “indirect” policies, where in many states, the state itself has an active role in use of these tools. The Watershed Planning Framework adopts an explicit regional scale (that of a watershed) and requires participants to develop land use designations of Priority Development and Priority Conservation areas collaboratively. There are no requirements for such collaboration currently in the state’s legislation. There is also no requirement that incorporated local jurisdictions (cities and villages) complete comprehensive plans. All that is required is for communities to have a zoning map. Thus, there is no legal requirement for horizontal or vertical consistency. The process to develop a Watershed Balanced Growth Plan, however, is intended to encourage vertical consistency (with the Lake Erie Protection and Restoration Plan) and horizontal consistency (as participating jurisdictions recognize the benefits that might accrue from collaborative land use planning). The question, of course, is how likely this will occur without mandate or requirement, solely on the basis of incentives and collaborative learning through the planning process.

6.2. Focus Groups

The purpose for the focus groups was to obtain input from the development community on what variables most significantly shape their development project decisions, and therefore, which of these are most amenable to state-level policies, programs and incentives that are being considered by the Ohio Lake Erie Commission in support of implementation of the Ohio Balanced Growth Program. A key objective was to gain information on the relative importance of these variables, the relative priorities that developers have when making decisions, and the actions by the OLEC agencies that would, in the developer’s mind, have the greatest level of influence on land development patterns in the Lake Erie basin. A second ob-

jective was to gain information on the interactions that the development community has had with the agencies of the Lake Erie Commission and to take suggestions on measures that would improve those interactions in the eyes of development professionals.

Definition of Focus Group

The focus group is most often considered a technique from the business or political world, and has been used most frequently as part of marketing strategies or political campaign (Bellinger, Bernhardt & Goldstucker 1976; Higgenbotham & Cox 1979). Use as a research technique has been expanded into the social sciences, medical professions, and environmental studies fields, although sometimes it is called a group interview technique or a participatory research methodology (Dreaschlin 1999; Desvousges & Smith 1988; Kaplowitz & Hoehn 2001). The focus group has been used in a policy setting to facilitate communication between policy organizations and publics (Grunig 1992), and has been used to enable participant stakeholders to become part of the policy-making process, uncover potential problems of implementation, and allow policy analysts to predict stakeholder response to policy alternatives (Kahan 2001).

The focus group offers a setting in which clients, users, or stakeholders get a chance to express what they perceive about a specific situation (Kreuger 1994; Kreuger & Casey 2000; Kellogg, et al 2005). The make-up of focus group participants depends in large part upon the purpose of the exercise and the information needed. Ideally the members of a focus group are characterized by relative homogeneity (i.e. they share common traits of interest to the researcher) but with enough variation, either within the group or across several groups, to allow for identification of consensus and contrasting opinions (Krueger & Casey 2000). The target size for a focus group is typically quite small (ideally no more than 8-12 participants). The key is to ensure a sufficient number of participants together to generate discussion, while precluding a group that is too large, which can result in a loss of valuable comments (Kreuger 1994).

Focus Group Protocol and Conduct

Participants in the focus groups were invited through several email correspondences carried out by EcoCity Cleveland, with assistance from two private-sector organizations serving

the development community. Both focus groups were held in northeast Ohio. Potential participants who responded affirmatively were sent a brief summary of the OLEC Balanced Growth Program, a set of directions to the session, and a two-page questionnaire. They were asked to return the questionnaire to EcoCity ahead of time, or to bring it with them to the session. Additional copies of the questionnaire were available at the sessions, and we received a completed questionnaire from all the participants. The questionnaire confirmed the participants' contact information, asked them about the size and geography of their practice, and their experience. One section of the questionnaire provided a set of factors or conditions that "shape development" practice. Respondents were asked to rank the top five factors that influenced their decisions (see Figure 3 below). This list of factors was also used during the focus group session to guide discussion.

The focus groups were carried out in conference-style setting, with participants seated around either a conference table or tables arranged in an open U shape. Introductions were made around the conference table. The facilitator stood at the front, taking notes on a flip chart. At each session, a team staff member typed in "real-time" to capture participant responses. The discussion was guided using a protocol that had been developed for the project. The participants were asked several questions to stimulate an interactive conversation. Participants were asked to respond to the following questions (with considerable discussion and interaction occurring for each question):

- As you plan your next round of development projects, what key factors you take into consideration in determining what to develop and where to develop? To what things do you pay the most attention?
- What are the priorities? What has the most influence?
- What difference would the following state actions make in the development decisions you make? (financial incentives, tax structure, changes in regulatory rules, etc.).
- Are there any other types of actions the state agencies could have to influence your development decisions?

Focus Groups Results

Results are presented for the groups separately, with comparison made to draw out dominant themes shared, and any significant differences observed between the two groups. (A full summary of the focus group discussion can be found in Appendix 3.)

Commercial/Industrial Developer Focus Group

Key factors influencing development

(Presented in the order in which they were prioritized by the participants).

- *Marketability and demand.* The participants agreed that the most important factor influencing their decisions is marketability or the demand for specific products (warehouse, factory, etc.). One developer noted that in places where there is high demand, such as Florida or the west, it's "all very easy—no need to know about schools, open space, environmental issues. Demand is No. 1 in importance." Another noted that redevelopment happens in areas where they know the project would be marketable, with or without incentives, knowledge of zoning, etc. He suggested that their knowledge of the market could trump any incentives that might be offered [by the state]. The participants noted that commercial and industrial development is more about the development product available —i.e., product specific, finding the product, what type of structure—that the client needs. They also noted that having a sufficient critical mass of population is important to ensure viability of commercial projects, particularly for lending decisions.
- *Infrastructure: sewer, water, roads.* There was some disagreement as to whether this factor should be ranked number 2 or 3, but all agreed that "where the sewer ends [in more rural areas]...determines where development goes. It stops where the sewer stops." They also suggested that sewer is more important for commercial and industrial development than for residential, where proponents can receive septic permits.
- *Minimize risk, increase predictability.* The group stressed that overall, developers tend to build products and locations that will minimize their risk during the process, thus assuring a higher probability of success. A key factor is predictability in the process. In part this predictability is improved through planning and zoning conditions, which participants noted shape the relative ease of finishing projects. These conditions have the effect of pushing them away from some areas and into others. As one noted, "Speed and ease of doing the deal is critical." Another noted: "When deals are hard (as they are in urban areas), developers go outside of the city." "Easy" deals are those where they can save time or money or both.
 - Zoning, characterized as either number two or number three in importance by individual participants. They view zoning as an "entitlement," that is, it tells the developer what he or she can do by right on the property. Therefore, the development process is easier. Developers are attracted to sites for which they will not need to seek a zoning change.
 - Predictability is highly desirable, where as risk is to be avoided in their minds. Comments included "Risk—how much are you willing to take to accomplish something?" and "when urban development takes more time, you want higher return to balance out the risk. The hoops are there in urban development projects: you can't assemble land before approval of the project from the city, so how much am I able to front-end when the city can shoot down the deal? I can't get approval until there is a full picture

and plan. So, if I don't have control [of the land], then I lose interest in taking those risks.”

Overall, the participants recognized that it is a combination of factors that shape where and what they develop. As one participant noted, “demand [for a type of building product], water and sewers, and easy zoning codes to work with determine where we build. An interchange also helps. Different tax rates and available or unavailable utilities in different areas could affect where we developed. Schools can also affect location of development.”

State role

The commercial/industrial development professionals who participated in the study provided concrete ideas about the how practices of the state agencies might change and how the state could influence the private development sector and local governments directly.

- *Direct state action/policies.*
 - Rural bias. The participants focused at some length about the ways that state actions across different agencies and programs tends to (intentionally or unintentionally) support development in more rural areas and not stimulate development in urban areas. One participant cited the differences in budgets between agencies that tended to favor fringe or suburban areas:

“OEPA’s budget is a pittance for, say, brownfields versus what ODOT has for, say, building new interchanges, which, in turn, lead to development in rural areas. Take the Mentor and Route 615 interchange as a case in point. Considering that an interchange might cost \$30 million, think what developers could do with that amount of tax-payer investment in Cleveland.”
 - Utilities and transportation infrastructure investments. The group agreed that if the state doesn't extend roads or renovate sewers it is a disincentive to development. They were skeptical, however, if this mechanism would actually be used in the Balanced Growth Program.
 - Tax code. Participants felt that Ohio's tax code needed serious revision, particularly as it was affecting bonds for development and for school financing. One participant noted that “the state tax system doesn't work. For example, school financing has been through the Supreme Court four times and we still have no solution...[to] ... the huge problem of school financing.” On the same issue, another participant suggested that “other states have done some policy changes...In Maryland, the funding for new school construction used to be allocated at 75% and 25% for renovation of schools. They then flipped this allocation over to encourage reuse of land and buildings—made it 25% for new, 75% for renovation.” Another suggested that [if the state

doesn't want development in a certain area] the state could withhold public dollars for schools where no development is to take place. "The state has to follow through politically." *How can it do this?* "If development is driven by taxes they generate, then the state has to step in and make sure there isn't as much benefit by withholding what would normally be state-supported."

- State policy intention. Finally, the group noted that if the state wants to influence land development spatially, it needs to make that known. One participant commented: "the state should stand behind and publicize the idea, that is, why it's so important that we recycle land, use existing infrastructure, etc. Politicians could perhaps help with such a leadership of vision."
- *State actions toward private sector and development process*
 - Financing and incentives. Participants stressed that for a developer, the key question is how to get additional money to finance the project and make it viable. Overall their reaction to "incentives" was lukewarm. One participant noted that incentives can be a problem. 'If enterprise zones [as an example of incentives] were eliminated, that would be great. It would allow developers to be less hassled. The existing incentive programs are bottle necks for developers. And, the current low interest rates really encourage us to bypass state incentives such as enterprise zones, which are fraught with time-consuming hoops.'
 - Risk and predictability. This was viewed as a key aspect of the state role. Participants noted key issues with brownfield redevelopment: "How do you get an environmental impact study done prior to the property going on the market? An owner doesn't have enough incentive to sink more money into a property he wants to sell. If EPA were willing to make a small \$10 to \$15 thousand loan to do predevelopment work that gets paid off out of the sale proceeds, that would expedite the developers' ability to do the project—it takes care of an "unknown." So, the state could help by lending money in advance of sale for these clean-up projects."

Another expressed this in terms of the state assuming greater risk to stimulate development: "The state has to be prepared to take some risk—maybe we'll never see 20% of the money because some of the projects are too dirty, the [environmental] studies will find—and, therefore, the land won't sell. So, the state needs to do that—take risks in redevelopment in targeted areas. Therefore, this is a good incentive for a priority development area. The taxes from the new, urban projects will more than pay back the state for the 20% loss. And, the state should make owners use approved consultants—that will help with consistency of study results."

- Permit process. The commercial/industrial developers in the focus group agreed that a key improvement to their development practice would be efforts by the state to streamline or rationalize the permit process. The issue here was the length of time for the permitting process, and the unpredictability of that process. They suggested that the state create an on-line permitting process that would cut the timelines for ap-

proval. The group was very enthusiastic about a suggestion that a powerful incentive would occur if the state could identifying land that is permit- ready and therefore developer-ready.

- Coordinate with other agencies. The Lake Erie Commission agencies could intercede or assist with other agencies that become involved in the development process. This might speed the permitting process up, therefore allowing developers to complete projects in a timelier manner and with greater regularity.
- *State influence on local governments*
 - Predictability of local processes. The participants noted that if the state could find a way to make local development more predictable across the region the development community could be influenced. Several participants suggested that there needs to be “metropolitan cooperation” and that a “regionalism approach would be great.” They suggested that the state could be of great benefit if it could encourage local governments to act together through the Balanced Growth Program.
 - Coordinated infrastructure. The participants suggested using infrastructure to guide where development would occur and to gain participation among local governments. One commented: “The state does have a lot of power. For example, ODOT could say, ‘do it this way, or else we won’t send you road monies.’ But these changes take political will. Withholding state funds to get compliance would be huge politically.”
 - Local planning and permitting. Their concern was the many steps and types of regulations that are required that vary across jurisdictions. They suggested that if the state could work with local governments and coordinate the local and state permitting processes to lay out the entire process of requirements, through one office, or even one staff person, there would be greater predictability as to the time schedule. The entities could collaborate to avoid telling the developer different information, which is a problem. They also suggested that the state could work with local governments to “designate pre-permitted parcels, where the environmental problems had been identified in advance...knowing that in advance so the city could tell the developer what it takes in money and other effort to clean it up would be a helpful streamlining.”
 - Tax laws. Participants suggested that if “a city could defer taxes on land during 5-year holding pattern while other parcels are being assembled to complete the land assembly for a development project, noting that the deferred taxing would be an incentive to development and redevelopment.” Participants noted that this type of tax policy exists with current agricultural use value and in urbanized areas could eliminate costs to the development corporation for carrying a long-term development acquisition. Another noted that “currently, when a developer begins assembling land, taxes are paid on empty lots, say 500 parcels. Just the cost and effort of filing of 500 pieces of individual paperwork, on top of the actual taxes, is a huge burden on a developer. Streamline it—defer the taxes.” Another suggested that “in addition, maybe [cities

could] have different tax rates [beyond the assessment] for development or leaving land vacant.”

Residential Developer Focus Group

Key factors influencing development

Eliciting responses around a conference table, participants were asked to submit the factor that to each was the highest priority, and if their first choice was taken, move to their second rank, etc. This process was used to simulate further discussion on each of the topics. The following factors were given, in this order:

1. Appropriate existing zoning (no change required)
2. Water and sewer. (“We’re a high density developer; we develop townhouses – we need water and sewer”). (*Facilitator clarification– so unless those are present you won’t look at a site?* “Very rarely”
3. Proximity to residential housing (“we are not a pioneer; we build where others have been successful”)
4. Proximity to interstate highways; (*Facilitator clarification: is there a distance where falls off?*) “It’s the drive time versus the actual distance.”
5. Status of environment. Regarding contaminants in soils and water, participants suggested this knowledge would deter them away from a site.
6. Wetlands and steep slopes. “We generally try to stay away from wetlands and try to keep our density counts up; every acre loss of wetlands is a loss in our bottom line.When you have to mitigate that’s a big problem.”
7. Inexpensive land – “If can’t build to market there’s no point in being there.”
8. Good schools. “Being primarily residential, we note the disparity in schools, and our customers more and more want to know about the quality of the schools”
9. Absence of impact fees is a plus

A lively discussion followed, during which the following themes predominated in terms of the factors that most strongly influenced their development practice.

- ***Infrastructure.*** Participants noted: “Sewer and water is the biggest issue, bigger than roads. It’s absolutely critical in the development site. From standpoint of sewer districts, a number of issues are important. In some cases you have municipalities that take control, in some cases you have a county pass it off to municipality which will design the most inexpensive system, but then uses our projects to develop the municipality’s infrastructure.” Another participant pointed out the inconsistency between counties regarding sewer and treatment capacity requirements moves development into districts where the capacity for treatment is adequate. *The Facilitator asked for a clarification: How does that affect where you develop?* “In Lake County, if you fix the old systems, you could double the amount of development. Or if you redo streets in the city of Cleveland, you

could redo the sanitary [sewers] so that instead of hunt and peck you could redevelop larger areas. It would make it easier to do infill and build where there is already OTHER infrastructure too if the sewer capacity was higher so that it didn't preclude development."

- *School Funding.* Participants identified this as a significant factor shaping their practice. They noted that more and more often potential purchasers are asking questions about the quality of the schools in the area. The participants agreed that they cannot afford to build houses in districts with a poor reputation. They traced the problem to the uneven funding of schools and the desire of localities to build new homes to fund the schools. The overriding comments concerning state school funding was that the inequality between school districts was distorting the residential housing market. Participants suggested that there was a need to "share the wealth," [across districts] so that funding was not based "only on new houses....base schools on existing housing too." One commented, "Schools absolutely affects us. The market is good if the schools are good. There will be a flood of development. Then the school in that municipality gets over-crowded because there's desirability [by developers to build there]– we all follow the market. Someone goes out there and finds out where all the permits pulled, and the rest of us follow. Once the school is overcrowded, they raise property taxes to compensate, then the community is less desirable to develop because the taxes price some homeowners out of that market."
- *Environmental regulation.* By far the most time was spent by participants discussing the affect of environmental regulations on their practice. Because all but one developed predominantly in urbanizing, rural areas, they were particularly concerned with regulations regarding the streams and wetlands and other natural features associated with them in North East Ohio. Their comments suggest that the regulatory uncertainties and market realities have reshaped their thinking and practice concerning surface water to a great extent:
 - "Wetlands – it's more and more important to not look at wetlands as something we have to mitigate. Just look at them the same as steep slopes [i.e., just avoid them totally in the design of the development]. That way they don't have to get a permit and go through mitigation process."
 - "Is it the presence of wetlands or not being able to work it through the 404 process, which is a nightmare. As soon as you go for 401 or 404 permit it's a pain; ODNR is a pain because you might have an animal issue as well [i.e., a species that is protected]."
 - "Our approach is to delineate wetlands and avoid them."
 - "Stream impact is our biggest issue."
 - The participants noted that a lot of desirable [for development] land is near wetlands, but it often takes a year or more to get through the approval process. It often takes more than 6 months alone to get a state approval for the delineation. One participant was very assertive, making the point that "the problem isn't regulation

itself; [it's that] there is no end in sight once you start.” *Facilitator asked for clarification.* He reiterated that most developers understand and accept that the public wants to protect wetlands and riparian areas. The issue for him and for developers he knows is not the regulation per se, just how the process is administered so slowly and without predictability.

- Another issue raised was what is perceived to be inconsistent and changing regulations, which increase the unpredictability of completing their projects in a timely manner. Often this inconsistency was a result of different requirements communicated by state and federal agency staff. Another noted that “in ten years the regulations have changed 5 times and it seems like they change every year and a half and people are expected to know about them.” One participant summed up the situation: “Environmental regulation is the critical path” for our projects.

State role

- *Infrastructure.* The facilitator asked: *What's more critical, transportation links or sewer and water?* Most agreed that sewers and water had a greater affect on their practice, and therefore a change in the state's funding and permitting would have a direct influence on development patterns. The participants suggested that rather than loan money for new sewer systems, the state should help municipalities fix their existing sewer systems to meet the capacity so they also take into account rain water if needed.
- *Stormwater regulations.* The participants noted two problems: conflicts between what the state wants and what localities want; and inconsistencies between localities that raise development design costs. They also noted that the discharge requirements are different across the region, so the design and regulations vary too much from jurisdiction to jurisdiction. The state could help if it would make them consistent.
- *Permit Applications.* Regarding the permit application process, participants were most concerned about inefficiencies with the wetlands and other permit processes. One commented: “I would be willing to pay more money – double the fee -- to get the state to process the wetland permit in a timely manner, the time they say it will take.” They also proposed an alternative to the current mitigation system, suggesting that when a developer wanted to affect a wetland, he or she could “pay a fee to bank regionally, to build up wetlands in the region –we would just as soon pay up front and have the state use the money to create something more meaningful for the region; saving a quarter acre here and there doesn't really do much for the wetlands.” The participants noted that the state budget is a problem for ensuring an efficient interaction of state agencies with the development community.
- *Change planning law.* The group was assertive in suggesting that the state needed to overhaul its planning and zoning enabling legislation, noting that the accumulation of conflicting and overlapping regulations posed significant challenges to development:

“Most of what we deal with is the many layers of regulations from local jurisdictions to the state to the federal government.” “What need to be reviewed are the state regulations. We have a hundred years of mish mash of enabling legislation. It [reform] needs to come from Columbus because it has evolved into quite a tangled web. We need an overhaul of the legislation that enables township and municipal planning and zoning; it has worked in other states.”

- *Term limits.* The group also noted the difficulty in moving legislation forward to reform land use and environmental regulation. One participant’s comments stimulated agreement around the room: “How can we get anything done at the state level when everyone is term limited out – it’s a mess. We need to end term limits. They [the legislators] don’t know what they are doing down there, and by the time they learn something, they have to leave.”
- *Incentives to influence private investment.* The facilitator asked “what about state incentives such as different tax rates, lower interest rates, etc.?” The participants were overall not receptive to the use of incentives at the state level per se. They noted that offering incentives normally indicates to most developers a risky market:
 - “In terms of local incentives, if a community needs to give incentives to a developer, they are really hurting; maybe in Cleveland it’s understandable, but otherwise, that’s a sign of a big problem.”
 - “If you get to the point where need to give incentives to developers you’ve hit rock bottom – you’re really in trouble in a community.”
 - Others noted that tax incentives are a relatively minor attraction to developers that work primarily in urbanizing areas: “In most communities where I work you couldn’t get incentives anyway. We are building housing, and the communities want to know how many kids will this bring to our schools? They are not going to talk about tax incentives that would mean less property tax for the schools.”
 - “Availability of incentives [the state might offer directly] is my last concern.”
- *Actions to Influence Local Governments.* However, the residential developers were more enthusiastic regarding the role that state could have in influencing local governments.
 - State regulation and surface water. One participant suggested that a solution to the inconsistencies among local jurisdictions regarding surface water was for the state to establish riparian setbacks and setbacks for wetlands. “The state should take that power away from municipalities and just have one standard across everything so we know what to expect.”

- Innovative planning enabled. Reform was needed to allow developers to use more innovative site planning, such as conservation development, where housing is clustered on the development site at more village-like densities, leaving a large portion of the site undeveloped or developed with trails. They proposed that this style of development would benefit all concerns:
 - “Conservation Development can be a win-win situation. It concentrates housing, and lowers our costs for infrastructure to build it. It also lowers maintenance costs in the long run.”
 - Density bonus. As part of a way to encourage conservation development or clustering, one participant suggested that the incentives that are most needed and what developers want is a density bonus for providing open space or recreational amenities. “If we preserve a percentage of open space, can we get a density bonus?”
 - Setbacks. The issue for the developers was that despite growing acceptance or market demand for this model of development among some buyers and communities, it was difficult to carry out because regulations in many communities preclude its use. They noted the requirements for large setbacks in particular: “In my experience, conservation development is tough. When communities want 25 foot wide side setbacks – you are encouraging us to build bigger lots. We’ll preserve the set backs, but having these onerous setback requirements is stopping us from doing clustering developments.” “We just need the ability to do smaller lots so we can afford to do clustering.”
 - Because the communities don’t have zoning to allow for the smaller lot size used in clustering to leave open space, one developer noted the additional cost that is accrued to achieve higher densities: “We recently had to donate 15 acres in a [local community] ...to the park system in order to get the density we needed. The cost was \$15,000 an acre-- that was a hard hit.” *Facilitator: so if the community zoning doesn’t allow for clustering?* “We’ll go back to large lot [building].”

What can the state’s role become regarding this?

- “The only thing state can do is regionalize this area and do away with municipalities. ...State involvement should be in regional land use planning, to require it or give incentives for it.
- “We need someone at the state level to say put an industrial park ‘here,’ something else ‘there.’
- “[The state could say to municipalities] if you combine together, we’ll give you more incentives, and if citizens know their tax burden will go down and services will stay the same, then residents will go for it.”

- One developer summed up their frustrations: “We just need fairness and predictability; I figure out the best way to make money and will do whatever it takes to make it work for that community as long as I can make my money.”

The facilitator asked the participants to envision the Watershed Balanced Growth plans, which might designate priority conservation areas in communities where many of them practice. How could you tell the townships, where there is plenty of open land – to support these conservation areas and not develop? How would you compensate them?

The participants suggested a need for regional tax sharing, and suggested that many other regions are already successfully improving their regional competitiveness.

“We need to create a big pot of money that could be shared regionally. ...They seem to be doing better in sharing resources, for example, in Minneapolis or Indianapolis....We don’t have to reinvent the wheel.”

Comparison and Conclusions of Focus Groups

Overall, several key themes emerge from the sessions. Both groups suggested that provision of water and sewer infrastructure, followed by roads, were the most important factors shaping the location and type of development they provide. As such, these factors are the most amenable to influence from the state, whether it is in terms of direct state building or funding.

For the residential group, compliance with regulations regarding surface water (streams and wetlands) was the second most critical factor, and therefore suggests an opportunity for influence. It should be noted that this group agreed that they understood the community’s will in protecting wetlands and streams, and their problem was not with the regulations per se, but with the unpredictability and long time frame typically needed to secure permits. These conditions presented significant challenges to successful practice, given that extended permit review periods and conflicting information across regulatory agencies jeopardized their ability to finance projects reasonably and bring a project to completion to meet market demand.

Both groups noted the role that the state agencies could play to increase predictability and professional efficiency for regulatory implementation. Some state of Ohio agencies received high praise in their management of permitting, but the participants from the residential

development community were overall negative in their appraisal of the management of the wetland permit system. In part, their frustration resulted from conflicting information and time schedules presented by the need to involve several state and federal agencies. Their experiences strongly suggest a key opportunity for implementing the Balanced Growth Program in streamlining the regulatory process for the development sector. It should be noted that some participants suggested their willingness to pay higher fees if it would ensure more timely service from the agencies. One developer suggested (in a conversation after the session ended) that the Balanced Growth Program administrators could learn from how development is done in Florida, where, at the beginning of all large projects, one staff person from the county (where development is controlled) assembles a team of all relevant local and state agencies. This team meets with the developer and communicates precisely what is required under their mandates. Discussion clarifies for the developer what is needed, and any inconsistencies among agencies are usually resolved then. This model would seem to have great relevance as an incentive for implementation of a Balanced Growth Plan.

Results from both sessions indicate that the private sector would prefer a greater role by the state in securing regional uniformity in key regulations. This appeared in terms of storm water regulations, building codes, and zoning for conservation development and setbacks. A lower variability across a region would hypothetically lower costs for developers in terms of the time devoted to learning and complying with different sets of regulations. This also seems to provide an opportunity for implementation through the BG plans, which will be developed and implemented at a regional, watershed scale.

Lastly, while it has little to do with Lake Erie water quality, it was of note how animated the discussion was in both sessions regarding school funding inequities and how these distort the commercial and residential housing markets and change development patterns. The need for communities to attract new housing, given their inability to capture increasing value when existing homes appreciate, stimulates new construction. Other factors present obstacles to infill development, which strengthens perceptions in the development community that building at the urban fringe is easier. The participants recognized, however, that there were significant issues with equity regarding school funding, and suggested that the state needed to address the overall funding formula would decrease school quality as a market factor.

Focus Group Questionnaire

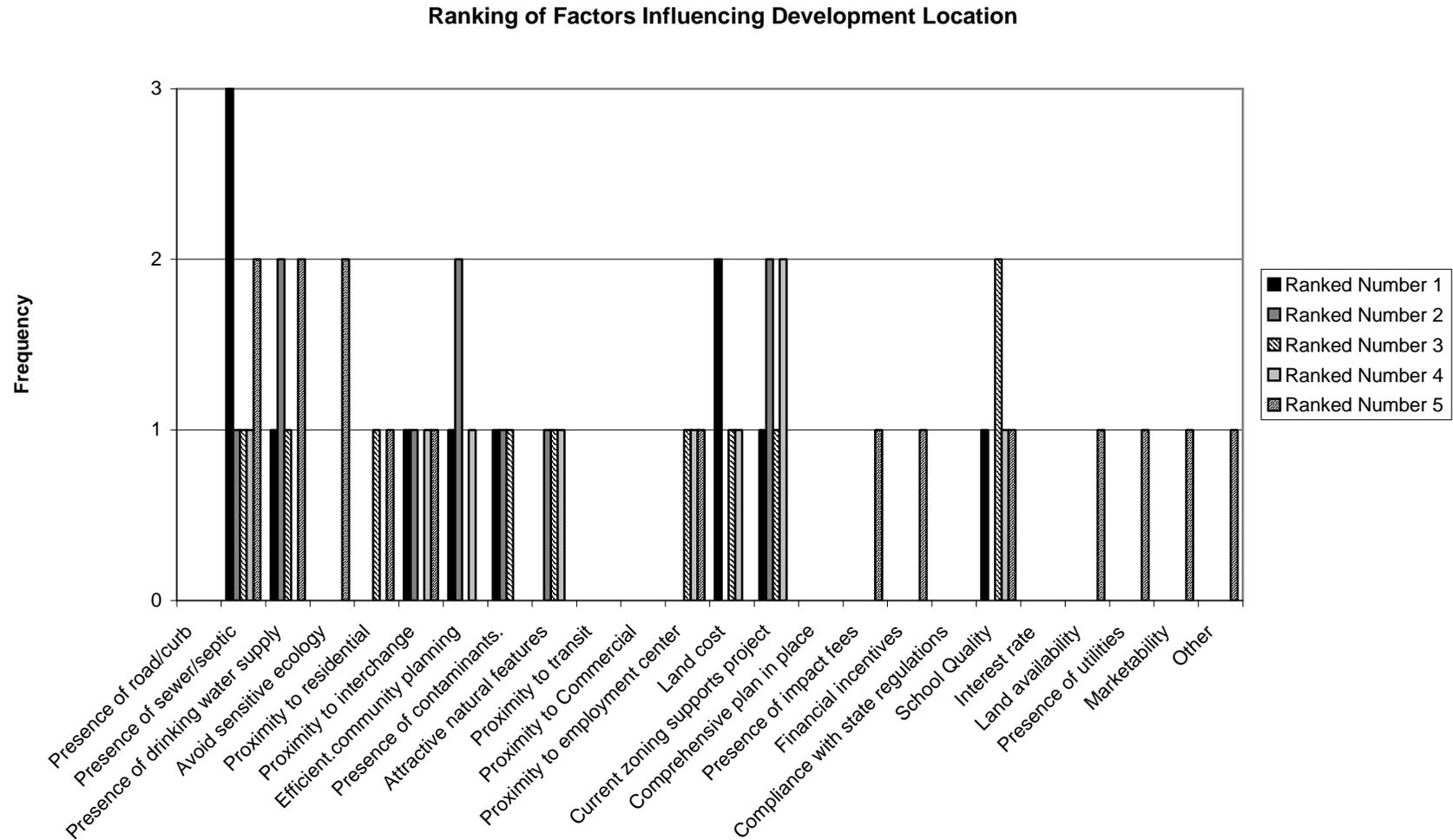
Participants were given a two page questionnaire at the beginning of each session, and asked to fill it out and leave it with the facilitators. All participants returned the questionnaire. An additional two developers who could not attend the focus group session submitted the questionnaire during the week following the session. The full results are in Appendix 3.

Respondents were asked to rank factors influencing their practice from a list of factors, ranking the most important 5, the next, 4, etc. (These factors were also used during the discussion sessions to explore them in more depth.) Figure 3. summarizes the results of this question.

6.3. Interviews with State, Regional and National Leaders

Two members of the team conducted interviews with state experts on tax policies and their impact on land use. The interviewees represented academic economists and other scholars, practicing attorneys, financial experts, local elected officials, engineers, and commercial and residential developers. These experts were asked what affect they thought current state tax policies have on the pattern of land development in the state. Twenty interviews were conducted. In addition, newspaper articles on state tax policies were reviewed. Another team member conducted interviews with regional and county planning staff regarding regional collaboration practices. Several national experts on smart growth and growth management at the American Planning Association and the National Center of Smart Growth at the University of Maryland-College Park were also consulted.

Figure 3. Focus Group Participant Ranking of Development Influences



6.4 Database of Current State Policies, Programs and Budgets in OLEC and Other Relevant State Entities

A comprehensive review of the programs of the agencies in the Ohio Lake Erie Commission and other agencies affecting land development and conservation patterns was carried out. We sought to identify the following characteristics of each agency: its mission, mandates and responsibilities; the specific divisions within the agency; the policies, programs and rules that might affect regional land use, development patterns or the function of streams; and the funding levels for these programs. Data were gathered on administrative programs and incentives and were entered into a searchable database by members of the project team. The data base information includes fields of category (the agency division or program), policy and description, the authorization or source of the policy, which agency is responsible for carrying out the policy, and fields for notes and assessments of the land use impact.

The entries in the database are an amalgamation of data gleaned by reviewing several state documents (budgets, agency program reports, etc.) and a list of programs compiled by the Ohio Lake Erie Commission Internal Agency Taskforce that is developing incentive programs for the Balanced Growth Program. The database was also examined relative to the literature review that had been conducted. The database was then compared to a listing of possible incentives compiled by the OLEC Interagency Taskforce working with OLEC's Executive Director. This comparison revealed the disparities between the two databases. These differences are due to two factors. In just a few instances, the team had failed to include an incentive that was identified by the Interagency Taskforce. The new data was added accordingly. In other instances, the data base also includes programs and funding that was not included by the OLEC Task Force as an incentive. These tend to be the programs and actions that constitute "direct actions" by the agency itself, that is, direct investment in infrastructure or other types of goods that were not considered appropriate as incentives per se. It is important to include the programs that are not necessarily incentive-based, however, for analysis and consideration. While incentives provided by the state can provide a wide array of implementation support for the BGP, there still remain other activities carried out by the agencies that shape land development patterns. The key state policies and programs identified through this process are included in the tables and described in the programmatic substantive sections below.

7.0 Policy Analysis Framework

7.1 Policies, Programs and Tools

This section focuses on the link between policies and programs that can be used to influence land development patterns in the Ohio Lake Erie basin. Public policy instructions may be defined as “the set of techniques by which governmental authorities wield their power in attempting to ensure support and effect or prevent social change” (Bengston et al 2004). The authors classify public policy regarding urbanization of land into four categories: public ownership and management, regulation, incentives and educational campaigns (p. 274).

Public ownership and management entails direct ownership or management of land and other public goods; regulation entails exerting an authoritative relationship between the state and individuals or groups to elicit specific desired behaviors; incentives involve either handing out or taking away monetary or non-monetary material resources in order to change behavior; and educational campaigns attempt to influence people through transfer of knowledge, reasoned argument and moral suasion (Bengston et al 2004, p. 274).

The particular configuration of the policies and incentives that have been proposed to implement the goals of the Balanced Growth Program area a direct result of the underlying structure and scope of policy problem itself and policy subsystem that shapes sprawl in Ohio. This policy subsystem consists of the various interactions among the actors that address issues relating to a particular issue (Blair 2001), in our case land development patterns. Because land urbanization has local, regional, state, and federal government influences, the policy subsystem includes actors from these realms. It also, of course, includes actors from the private and non-profit sectors. Each actor, depending on its place in the policy subsystem, advocates for or against continuation of the policy mechanisms that currently shape land development. In this policy issue, the policy subsystem is characterized by “diverse and strong opinions on policy goals and program proposals..., varying degrees of technical capacity among government units, and the overriding presence and influence of fierce market forces....Little agreement exists among subsystem actors over basic policy goals or programs....[resulting in a] complex policy subsystem” (Blair 2001, p. 105). Blair suggests that the policy instruments that are likely to evolve, and be acceptable to actors in the policy sub-

system, are function of the complexity of the issue and the level of capacity and involvement at the state government level. He presents a matrix that indicates the likely types of policy instruments that will be adopted in one of four situations (See Table 4 below). To the extent that state involvement increases, one would expect policies to move from voluntary instruments toward a mix of instruments as well. This involvement will eventually build capacity, and perhaps generate support for more direct state intervention.

The Ohio Balanced Growth Program has developed in a situation of low state capacity for intentionally influencing land development patterns. There is no planning agency at the state level, there is no state-wide or basin-wide plan for land development, there is relatively little coordination among state agencies, there is no state legislation requiring environmental impact assessment, there is no requirement that incorporated local jurisdictions develop comprehensive plans, there is no requirement for consistency. It is not surprising, therefore, that the predominant policy tools proposed for the BGP consist of what Blair (2001) characterizes as a “mixed” instrument setting: information and exhortation, subsidies, auction of property rights (p. 107). The BGP consists of an incentive package gleaned from existing state administrative and funding programs to influence both local jurisdictions and private development market, an educational outreach program to encourage voluntary participation, but also includes efforts to increase the level of collaboration among the OLEC agencies to streamline land development decisions to achieve the goal of the program (encourage development in locally-designated priority development areas and encourage conservation in priority conservation areas).

Table 4. Likely Policy Instruments In Four Policy Contexts

	Policy Subsystem Complexity	
	High	Low
State Capacity		
High	Market instruments	Regulatory, public enterprise, or direct-provision instruments
Low	Voluntary, community or family-based instruments	Mixed instruments

SOURCE: Blair 2001, p. 108.

The process to develop the Balanced Growth Program itself has begun to build the interaction among the six agencies of the Ohio Lake Erie Commission, which may lead to enhanced capacity at the state level as well, at least in coordinating with local jurisdictions.

Table 5 presents the categories of state policy action that are possible and their relevance. Table 6 arrays the three types of policy effects in terms of how policies might shape land use patterns. Figure 4 illustrates how these three dimensions of policy (category, spheres and effect) relate to each other. For example, Hill et al (2003) assert how the system of categorizing state routes results in an anti-urban bias in funding from the state and federal gas tax revenue disbursement. In unincorporated areas of the state, state routes that go through settlements are maintained by the state. However, in incorporated jurisdictions, maintenance of state routes within the jurisdiction's borders becomes the responsibility of the local jurisdiction, even though the route serves travelers using the state system as well as local drivers. Despite this difference, state gas tax revenues cannot be used to maintain the state routes by local jurisdictions, which must instead raise alternative monies. Thus the rules of the state program as defined have an unintended geographical effect of raising local taxes in the urban core, disadvantaging those communities in their efforts to attract businesses and residents.

The desired outcome of the analysis is to be able to answer the question: What actions, policies, programs and incentives are likely to most effectively shape land development patterns in NE Ohio? Which of these actions, policies, programs and incentives are critical for success of the Balanced Growth Program? That is, which, if excluded from use, might override others and tend to work against implementation of the BGP whereby we would see no change in land development patterns as a result?

Table 5. Categories of State Policy Actions and Spheres of Influence

Categories of State Actions	Spheres of Influence			
	Direct state action or administration and management of state agencies	State policies and programs shaping regional or inter-local decision making and action	State policies and programs shaping local land use/land management practices	State policies and programs shaping private business decision making re: location and land use
State review/impact assessment of major development projects	X	X		X
State tax policies	X	X	X	X
State land ownership	X			
State facilities (siting and construction)	X			
State-“owned” infrastructure (roads, bridges)	X	X		X
State permitting of non-state projects		X	X	X
State enabling law for planning and zoning		X	X	X
State requirements for local plans		X	X	
State funding to regional and local jurisdictions for infrastructure (roads, sewer, water, parks, schools, etc.)		X	X	X
State funding to regional and local jurisdictions other than infrastructure		X	X	X

Table 6. Types of Policy Effects Concerning Land Development Pattern

<i>Type</i>	<i>How Policies Shape Land Use</i>
Type 1	Policies that intentionally catalyze development (or divert development) or put elements or prerequisites into place toward or away from specific areas
Type 2	Policies and programs that require a distribution of benefits equitably across geographies, which may result in expansion of urbanized area
Type 3	Policies and their implementation that have a differential affect geographically, although there is no identifiable geographic/location intention inherent in the policies or program

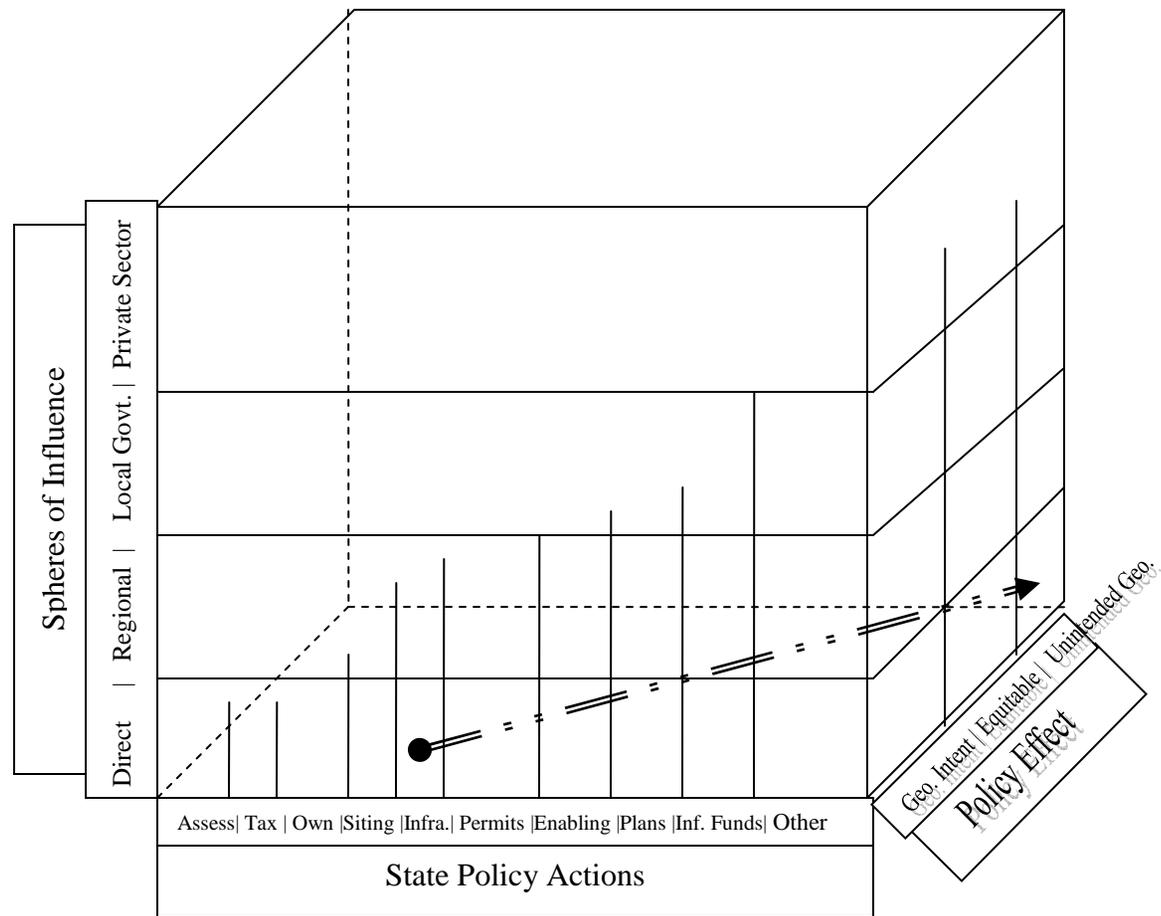


Figure 4. Three Dimensions of Policy Actions, Influences and Effects

8.0 Key Policies and Incentives Discussion by Policy Area

The results of the literature review, interviews, focus groups and examination of the state programs data base were reviewed using the policy framework presented in Section 7. Below are six key areas of policy and program change relevant to the Balanced Growth Program. Each section presents a more focused literature review, and the implications for the Balanced Growth Program. It then presents in table form the relevant budgets, an array of policies, programs and incentives, a discussion and the recommended changes based on the literature reviews and other data.

8.1 Transportation Infrastructure: Highways, Roads, Public Transit, Railway and Aviation

Figure 5 presents a conceptual model of land development with the variables relevant to transportation infrastructure highlighted.

8.1.1 Literature

It can be asserted that land use responds to the road network (current and expected). It has also been asserted that current highway improvements are a response to transportation problems that are a result of development and settlement patterns. Put differently, does transportation produce sprawl by providing the means for development to expand out from high-density centers to undeveloped land, with real costs of transportation services not charged in any manner to users? Or does sprawl precede transportation investments, spurred by other factors, but quickly produce demand or additional capacity in existing transportation systems (Plant 2001)? There is likely no clear “first cause” to answer resolve the assertions easily. Both are “true” depending on what one’s purpose is (to plan communities or to plan roads). However, it is the divergence in perspective and associated task, and the lack of coordination that at this time prevails, that fuels land development patterns and transportation network patterns that are ultimately unsustainable.

Our focus here is the former: how provision and modification of transportation infrastructure affect land development patterns and land use change. When compared to the mid-twentieth century, it is likely true that the “leading role” that highways have had to change land use in a given area has diminished as interstates have been completed and urban road networks

now serve all parts of metropolitan areas (Oregon DOT no date). However, to the extent that a new road, upgrade to a limited access highway, or substantially enhanced capacity through widening occurs in an area that only has rural roads, the affect can be significant.

Scholars and state departments of transportation often provide a set of definitions to tease out the different effects from transportation projects. However, two kinds of impacts or affect are possible: direct (those changes that are a direct result, in a short time frame, or the transportation project; and indirect (those that are longer run and cause more wide spread changes to development patterns and comprehensive plans that are induced by the transportation project). It is noted that direct costs of highway improvements understate perhaps significantly the full cost to society (Oregon DOT, n.d). Examples of indirect impacts include unmitigated environmental damage; increase air pollution if the project enables more driving; divided neighborhoods if the project cuts through or removes housing; and economic benefits from development or changes to zoning at the local level to accommodate the project. Federal impact assessment further characterizes some of these indirect impacts as “growth inducing effects” that need to be evaluated in impact assessments.

We can identify a set of direct and secondary effects focused on changes in access, capacity, commute time, and land values that are affected by changes in transportation infrastructure. Forkenbrock and Weisbrod (2001), in a report for the Transportation Research Board of the National Research Council, provide a guidebook for assessing economic effects of transportation projects. They suggest that transportation projects are generally selected according to how significantly they would improve performance measures such as travel time or safety. They also suggest, however, to an audience of transportation engineers and planners, that the social and economic effects of transportation policies should be fully considered as well as “these effects can be substantial” (p. 1). The authors suggest that the need for each transportation project should be assessed in part on the basis of whether the project would advance community development and land use goals as stated in the community’s adopted comprehensive plan, and should consider both short-run and longer-term effects on the community’s development patterns (p. 3).

Of importance is the discussion on changes in property value as a result of changes in accessibility brought by new projects. Provision of new roads, or expansion of existing roads, creates enhanced accessibility to an area. This makes the place more desirable (particularly to

the extent it is near or adjacent to an existing commute shed). This raises demand for land in the area, which in turn either immediately raises property value, or at least raises expectations that property values will soon increase for land owners. More expensive land will tend to be used intensively with increased access. The same positive effect on property values has been found in relation to public transit stations or stops as well. However, this infrastructure functions in areas of higher density, and tends to promote higher densities or more intensive uses around the stations. However, increased accessibility in undeveloped areas will tend to promote lower-density land use patterns due to the availability of relatively inexpensive land (p. 6). This process is more typically a function of road infrastructure.

The changes to land value are particularly relevant for commercial land uses, which tend to need direct access to highways or major arterial roads. Current land owners, anticipating increasing values, begin selling land in the area. As long as appropriate zoning is in place, and other economic factors are supportive, development will flow into the area. If transportation projects affect the desirability of a place to live, the property value will increase, and the intensity of use of the land will increase. Projects affect property value by affecting accessibility, safety, visual amenity, community cohesion, and business productivity (p. 159). Property values are the “capitalized valuation” of other local factors.

Forckenbrock and Weisbrod (2001) also discuss how transportation projects affect economic development, as the “end result of other direct effects that a transportation project has on travelers and non-travelers (p. 108).” These effects include improvements in business travel costs (for shipping or clients) and reliability; expanded the breadth of markets for suppliers, customers, and workers; reduce household travel costs; increased access to jobs outside the area; and improved the visual appearance of the area. All these changes can potentially increase property values in an area providing economic benefit.

The authors caution that transportation decision makers should always be aware of the size of the study area about which they are measuring potential changes stimulated by a given transportation project, in that *if the geographic scope of the analysis is too small, the assumed economic growth generated by a project might in fact merely be a case of relocation of businesses from outside the project study area (emphasis added)*. They warn that such relocation may not be consistent with the community’s comprehensive plan (p. 109). For example, differ-

ent effects by location may occur: “The property value effects of an individual transportation project are often positive in some areas and negative in other areas” (p. 161).

The authors note that transportation planners also need to consider the differential effects on populations within a given project areas. For example, the project may have different effects on land: property values effects can differ for commercial and residential land; e.g. widening an arterial may increase the value of parcels zoned for commercial uses due to increased customer access and pass-by traffic; however, it may reduce value zone residential use due to effects on noise and view (p. 162). Their study suggests the need for regional impact assessment for every major road project.

Helling (1997) also examined the relationship between transportation infrastructure and economic development, defined as increased employment and income. Her article summarizes the evidence of when and why transportation affects the long-term ability of areas to attract, create, and retain employment and income. Transportation can affect six overall aspects of an area that contribute to economic development: productivity, efficiency, innovation, quality of life, improved perceptions of the area, and spatial patterns of land use (p. 85). Evidence from the literature reviewed by Helling indicates the following: 1) the level of transportation services (proximity and access) affects location choice by businesses; 2) building interstate highways tends to weaken economic performance in adjacent counties that do not have access to the highway; 3) transportation allows larger markets and makes large-scale production and its attendant economies possible; and 4) there is a diminishing return to transportation enhancement, with marginal additions bringing increasingly smaller benefits. Helling also notes that the benefits of transportation projects for economic development are often overstated in less-than rigorous benefit-cost studies.

Mondale and Fulton (2003), in a paper on metropolitan growth in Minneapolis-St. Paul, note that infrastructure investment policy is one of three major sets of government policies shaping metropolitan growth (the other two being land use policy and open space protection policies). In particular, the location and capacity of transportation system, water system and wastewater system direct or encourage growth to move into particular areas. Infrastructure investment is a pull factor, pulling growth outward into the region (p. 4). A primary outcome of road enhancements is increased access and what it means for residential land development: travel time decreases with enhanced accessibility, opening up a given area to residential habita-

tion and increasing the attractiveness of the area for development. The importance of drive time vs. drive miles was confirmed in the residential focus group process carried out for our current study.

How should road and transit infrastructure decision be made? The Florida Department of Community Affairs (1991) noted the importance of accommodating infrastructure development, including roads, to local land use plans. Plans should designate land that will be available for development based on a careful analysis of expected community needs based on predicted population growth. Development rights should be distributed based on this analysis, and the timing of development should be coordinated with provision of public facilities (p. 36-37). This study suggests the need to meet transportation needs identified in local plans where that community has carefully considered their expected future needs based on population growth, rather than using roads to stimulate economic growth per se.

Knaap and Moore (2000) confirm this approach. Land use needs are based on expected increases in housing units and nonresidential square footage to support continued economic prosperity. Infrastructure then is planned and developed to support those uses. As the Knaap and Moore state, “The central problem when implementing growth management practices for infrastructure is to accommodate market forces while preventing the spoil of sprawl” (p. 1). The key questions then become how much land and infrastructure is currently available for urban development, when must the supply of land and infrastructure be augmented, and how much land and infrastructure must be provided to accommodate future urban development (p. 3). Building excess capacity, or over-investment, in infrastructure distorts the land use market away from responding to need to one of stimulating un-needed development into areas (Nelson et al 1995).

Answering these questions, of course, assumes a planning function in the region that can determine how much “new” land, that is land with infrastructure to support an urbanized built form, is “needed.” This perspective starts with the public good and community well-being as its foundation. It also requires a more regional perspective that encompasses the likely impact area of each major highway or road project.

Coyne (2003) suggests that each development project permitted by local government should undergo a fiscal impact analysis that considers the true long term cost of service provi-

sion, and that projects funded or permitted by state agencies should be evaluated on the basis of their likely impact to land use densities and sprawl.

What potential does sharing info between transportation and planning agencies do to mitigate sprawl? Plant (2001) describes how, through executive order, PENNDOT shifted its project approval process to include local land use decisions, and to assess the land use change implications of its own projects. This resulted in a heightened level of coordination with local governments through MPOs and other mechanisms, and more coordination with other state agencies as well who were involved in local land use regulation and funding.

Boarnet and Haughwout (2000), after a review of highway policies and research on highways, conclude that changes in metropolitan location patterns are induced by highways, and these changes are not, on net, costless. They recommend development of highway investments plans that account for the effects on location that highways induce, in that economic benefits to one area may come at the expense of even larger costs elsewhere. They further suggest an increased role for representative regional decision making bodies with the authority to balance competing transportation demands. They envision an transition of metropolitan planning organizations (MPOs) from advisory and research bodies to full highway financing, planning and programming authorities, all to be encouraged by federal policy (p. 1).

Boarnet and Haughwout (2000) also note that most models predict a link between improvements in transportation access and increases in land prices and development densities nearby. Evidence suggests, however, that the first large highway project brings large improvement in access, therefore inducing a large change in land prices near the project. As additional highways and roads are built, as overall connectivity increases, the changes in accessibility are relatively smaller, and the land prices near each project increase less (p. 6), and the affect of the project is felt on a finer geographic scale, closer to the project (p. 7). Other studies cited by the authors suggest that highway-building affects locations across a metropolitan region differently. New highways at the urban fringe tend to decrease the accessibility premium of the central metro, and thereby tend to reduce property values. State highway investments tend to foster decentralization of employment growth from dense to less dense counties (p. 8). Highway projects affect the geographic location of economic activity by advantaging some places while causing firms and person to shift their location away from other places. One study cited suggests that the fringes of urban areas benefit at the expense of the center; another suggests that

urbanized counties benefit more from highway projects than non-urbanized counties (p. 8). In sum, the evidence suggests that highways influence land prices, population and employment changes near the project, and that the land use effects are likely at the expense of losses elsewhere. They caution, however that this conclusion is not to state that highways cause urban decentralization (alone) although they are likely one of many factors in the process (p. 9).

Regarding economic impacts of highways, Boarnet and Haughwout (2000) note that to the extent that commerce benefits from agglomeration, and highways decrease overall density of the urban form, highways can actually decrease overall economic growth (p. 12). A second social cost of decentralization that might be induced by highways is the shift in jobs to suburban or exurban areas to take advantage of greater accessibility. If jobs relocate, the social costs to area unemployment may result.

Efficiency and subsidy issues result from the differential geographic distribution effects. Modern highway projects bring localized benefits to a particular part of the region. Much evidence suggests that local highway projects shift activity from another part of the region. This localized benefit, however, is financed by state and federal money, so in effect each locality “buys” local gains with money that comes from other jurisdictions in the metropolitan area. This situation suggests that transportation projects should be assessed as to their regional benefit/cost ratios, not just on a project-by-project basis (Boarnet and Haughwout 2000, p. 14). One approach to projects is to finance them based on the geographic area of benefit, requiring a correspondence between types and levels of funding with the dispersal of economic benefits. This practice would reduce regional cross subsidies (p. 14). Said another way, benefits that are purely local should be purchased with local funds; funds transferred from state or federal levels should provide a regional benefit, and should not be given if they generate intra-regional negative externalities. Such a shift would require a stronger role by MPOs to ensure that the appropriate analysis of projects occurs and intra-regional negative externalities are discussed. This is the policy framework that was initiated through both ISTEA and TEA 21, which requires metropolitan areas with greater than 50,000 to plan projects on a regional basis (Boarnet and Haughwout, 2000, p. 17). The current separation of planning and highway financing increases inefficiencies in the system. It is likely that realistic consideration of the true benefits and costs of local projects on the region will result in “fewer highway projects, a relative shift in trans-

portation resources from outlying areas toward central cities, and a continued examination of how investments in suburban highways affect central cities” (p. 24).

Studies from Colorado (Coyne 2003), Maine (O’Hara 1997,) and Maryland (Redman/Johnston Associates 1998) suggests the following changes to transportation infrastructure to effectively shaping land development patterns:

1. Use of fiscal impact analysis of development projects, or a cost of development analysis by local governments to assess whether the expected benefits of a given development project or expansion of road capacity in a given area are greater than the costs over a long-term period. For every community project, ask “can the community afford to maintain the infrastructure in the long term? Does the project benefit the community as a whole?”
2. The full cost of growth borne by developers changes the market for development and allows for more measured land use change. This implies developers pay full costs for infrastructure within and connecting new development. At minimum, this policy approach requires enabling of impact fees so that communities can provide services to development they have deemed desirable. (If combined with changes that end state subsidies to fringe projects with only local benefit, the true cost of development will be reflected in the real estate market, as development fees for a single family house have been demonstrated between \$10,000 and \$50,000 per house in some areas of the United States. This true-cost approach to home prices would make housing in existing suburbs and urban centers more competitive in terms of price. Such policies can also induce developers to build more dense projects, conserving land from conversion to urbanized uses.
3. Screen infrastructure subsidies given at the state level to assess their sprawl-inducing effects and to direct federal pass through money toward smart growth economic development; this assessment should include overall location of land development, and the densities at which land is built out, as higher density development requires less sunk costs into infrastructure
4. Assess the regional impacts of all local transportation projects, particularly highways and new capacity for roads that run outward from the core or that connect existing outlying settlements with urbanized centers. In most cases, the economic impact of increased capacity will benefit communities further out once the increased accessibility has been provided by a new or capacity-increased road. State transportation agencies that have undertaken these assessments then change their funding priorities to deter such transfer of benefits within areas in the metropolitan region

Much of the growth management or smart growth literature, including that generated from the more academic research institutions, describes the results of research in regions experience increasing population and job creation. Many of these studies are of metropolitan regions in the sunbelt, on either coast. In these regions, some of the new land development meets the need for additional housing units, commercial and industrial properties, and urban services.

(Although numerous studies have documented that much of the population and business shift to the sunbelt and west coast was a direct result of federal investment in the defense industry and public works projects to supply water. See Perry and Watkins (1977), for example). In the Midwest and the Great Lakes basin states, lower density land uses spreading outward from the urban core is not a result of increasing population per se. Pendall's (2003) study of upstate New York is particularly relevant for Northeast Ohio. Pendall documented how much of the upstate region had experienced a shift of population and businesses not only out of the larger urban centers, but from villages and small cities into exurban townships as well. What explains this shift in the face of an overall loss of population? Pendall cites three macro market trends that have pushed this shift: decreasing land prices at the urban fringe, an increase in the number of households fueled by more single residents, and the inadequacy of many commercial and industrial properties in the urban centers for the new 21st century business uses. He also cites six policy areas that have contributed to increased sprawl: fiscal disparities between cities and towns; fragmented local governance; infrastructure subsidies that favor outlying locations and encourage construction of surplus housing and business space; disincentives against reinvestment in cities; exclusionary zoning in many towns; and limitations on the ability of incorporated jurisdictions to annex. His study results suggest that highway construction subsidized by federal money accommodated suburban expansion.

Carruthers and Ulfarsson (2002) examine the relationship of political fragmentation to metropolitan growth patterns, including density, urbanized land area, property value and public expenditures on infrastructure. Their analysis sought to verify the efficacy of jurisdictional cooperation and regulatory consistency on reducing urban sprawl. While there was not a statistically significant relationship between political fragmentation and infrastructure in their study, they did find that fragmentation in jurisdictions was associated with decreasing density, which then necessitates increased expenditures on infrastructure of roads and sewers (Carruthers and Ulfarsson 2002, p. 332). The researchers hypothesized a time-dependent relationship between spending on roads and spending on sewers and the amount of urbanized land in a region, and found a positive correlation. This result confirmed to the authors that per capita spending on roads and sewers influences the spatial extent of development in later time periods (p. 333). They found a slightly higher correlation for sewers, which was not surprising, for, as the au-

thors note, “sewers are built specifically to support development while roads and highways are built and maintained for the purpose of transportation in general” (p. 333).

Carruthers and Ulfarsson also suggest that reduction in political fragmentation, or increased planning and decision making collaboration and regulatory consistency, will reduce land urbanization, suggesting a stronger role for state planning or regional land use planning. Regional planning organizations are particularly critical to decision about highway and road building, and to the extent these organizations foster inter-local cooperation and a regional perspective they can reduce the urbanization of land caused by highways and roads (p. 335)

8.1.2 Policy Approaches, Programs and Incentives for the Balanced Growth Program

Table 7 presents the data for the annual ODOT budget constructed on the basis of our review of the state budget and confirmation from ODOT agency staff facilitated by the Ohio Lake Erie Commission. In 2006, the expected ODOT budget was just over \$6.25 billion. In a given year, the proportion of the budget for highway construction, maintenance, enhancements far exceeds other individual categories of spending, including for public transit, railroads, airports and ports.

Table 8 presents the key policy changes and incentives that will help ensure success of the Balanced Growth Program. The items included in the table are not ALL mechanisms that might be included, but are rather those that the review of literature, other state programs, and the focus group results suggest are critical, either because of the more significant dollar expenditures for the programs, the impact of action in the context of the land development model, or the inducement of a chain of effects in the model from a given action through policy.

Table 7. ODOT Annual Budget (Dollars Allocated)

ODOT	2006
<i>Planning/research</i>	
state planning and research	59,900,000
planning and surveillance	25,500,000
planning review and appraisal	16,080,000
urban transportation planning	10,320,000
research and development	7,100,000
Access Ohio program (annual \$)	2,000,000,000
metropolitan planning	2,500,000
Total planning and research	2,062,400,000
<i>Highway construction</i>	
State direct	
major new construction	756,109,205
bridges and culverts	240,238,000
access roads to state facilities	7,333,000
enhancement (rural and by ODOT)	11,000,000
pavement preservation	518,410,000
safety	69,571,000
Railroad crossing safety	15,735,000
federal discretionary	97,834,000
Local assistance	
local government projects	324,446,000
enhancement projects	8,300,000
local major bridge program	25,000,000
metro park program	2,000,000
municipal bridge program	8,000,000
Urban paving program	
state infrastructure bank	132,000,000
Total highway construction	2,215,976,205
<i>Highway repair and safety</i>	
State direct	
roadway maintenance (all)	386,527,582
rest area maintenance	13,878,000
garage operations	40,302,000
snow and ice control	35,105,000
traffic systems maintenance	74,931,000
guard rail maintenance	83,821,000
roadside maintenance	27,940,000
pavement maintenance	88,198,582
bridge maintenance	22,352,000
Local assistance	
county local bridge funds	32,000,000
county surface transportation program	20,000,000
Total repair and safety	825,055,164

Table 7, continued

<i>Public transit (all)</i>	
State (no direct spending indicated)	
Local assistance	
capital assistance	19,651,000
operating assistance	21,588,000
elderly disabled fare assistance	6,082,000
coordination assistance	1,427,000
technical assistance	1,335,000
transit planning	2,312,000
transit infrastructure bank	5,000,000
Ohio public transportation grant program	9,800,000
rural transit program (and small urban)	14,200,000
small city program	8,000,000
specialized transit fund	2,300,000
Total public transit	91,695,000
<i>Enhancements/rest areas</i>	
State	
rest area upgrades/construction	12,035,000
tourist information centers	7,658,700
	19,693,700
<i>Railroads and airports</i>	
rail freight economic development	4,019,000
state-owned rail lines	953,000
passenger rail	257,000
highway crossing safety	13,865,500
railroad crossing safety initiative	2,771,000
airport grants program	17,371,085
	39,236,585
<i>Economic development</i>	
jobs and progress program (annual \$)	500,000,000
transportation review advisory council	500,000,000
	1,000,000,000
Stream wetland mitigation permits program	
Total ODOT	6,254,056,654

Table 8 Key ODOT Policy and Incentive Summary

Direct State Action	Policy Description	Affect on land development pattern	Literature	Focus group	Policy and Incentive Change Needed
Major new construction	Highway capacity increases and interchanges; \$750M state-wide/yr	The strongest single inducement to land conversion if done in areas with relatively low overall connectivity	Forkenbrock and Weisbrod (2001); Helling 1997; Mondale and Fulton (2003); Coyne (2003); Plant (2001); Boarnet and Haughwout (2000)	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development but ranked lower than other infrastructure	Agency should assess each major project for its inducement to conversion of land to low density patterns; projects should not be approved for economic development purposes unless located in priority development areas; projects should not be undertaken if favor less-developed areas in expected benefits or induce transfer of economic benefits
State Planning and Research Program	Provides technical assistance and planning support for statewide and local projects		Knaap and Moore 2000; Caruthers and Ulfarsson 2002; Boarnet and Haughwout 2000	Suggested the state coordinate on a regional basis to guide development	ODOT planning function should take land use change implications at the metropolitan level when planning projects and commit to not funding sprawl-inducing projects
Gas Tax Dispersion Policy	Provides funding for state projects and to local governments	Officially restricted to projects for highways; equal distribution to counties of portion of funds, not on per capita basis; state routes in incorporated areas not eligible for funding dollars	Hill et al 2003; Puentes and Prince 2003	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development but ranked roads lower than water and sewer	Allocate "county" destined portion of funding on a per capita, not equal basis to change anti-urban bias; change law to allow transit and other programs eligibility for gas tax revenues; change policy so that portions of state highways in incorporated areas are maintained by the state, not by local jurisdictions (which must use locally-generated dollars while maintenance of highways in rural settlements is responsibility of the state)
Incentives	Incentive description	Affect on land development pattern	Literature	Focus group	Change Needed
P DAs					
Regional					
TRAC Process	TRAC; New capacity projects; Accessibility for economic development included as award criteria; \$500M/yr	Placing or increasing capacity with new or expanded highway changes land value and induces private sector development; most dramatic change in areas with few or no highways and interchanges at the fringe	Forkenbrock and Weisbrod (2001); Helling 1997; Mondale and Fulton (2003); Coyne (2003); Plant (2001); Boarnet and Haughwout (2000)	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development but ranked lower than other infrastructure; commercial investment dependent upon type of road	Match the benefiting geographic areas with highway funding responsibility by eliminating extra-local funding of projects for economic development at local level unless in priority development area and B/C analysis is region-wide; state TRAC project criteria should be synchronous with MPO criteria unless safety-based
State Infrastructure Bank	\$132M/yr; provides loans to regional/local political entity; provides loans and bonding	Purpose is to increase number of transportation projects; if used for capacity increases in fringe areas, will induce land conversion	Forkenbrock and Weisbrod (2001); Helling 1997; Mondale and Fulton (2003); Coyne (2003); Plant (2001); Boarnet and Haughwout (2000)	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development but ranked lower than other infrastructure	Prioritize for PDAs, public transit; projects with regional benefit based on B/C analysis; screen for sprawl-inducing projects; offer reduced interest rates if inter-local collaboration and PDA focus
Public Transit Infrastructure Bank	\$5M/yr; Purpose is to fund public transportation projects	can encourage more intensive/compact use of land			Increase funding overall; ensure priority to PDA-focused development
PCAs					
Major new construction	Highway capacity increases and interchanges; \$750M state-wide/yr	The strongest single inducement to land conversion if done in areas with relatively low overall connectivity	Forkenbrock and Weisbrod (2001); Helling 1997; Mondale and Fulton (2003); Coyne (2003); Plant (2001); Boarnet and Haughwout (2000)	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development;	ODOT commits to avoid new construction projects that would induce land conversion within a reasonable proximity of PCAs and severely scrutinizes end projects inside PCAs for inducement of land use change

8.1.3 Key Policy Elements

1. Proportion of ODOT budget devoted to highway capacity increases vs. other programs

ODOT's budget surpassed \$6,000,000,000 in 2006. Of this, slightly over \$2,200,000,000 was appropriated for highway construction, either by the state directly or through loans and grants given to local jurisdictions. This money was for major new construction (\$756,000,000), installing and bridges and culverts, providing access roads to state facilities, enhancement (rural and by ODOT), pavement preservation, safety, railroad crossing safety, and providing assistance to local governments for roads, bridges, and other highway enhancements. An additional \$825,055,164 was allocated for highway maintenance and repair by ODOT itself and for local jurisdictions. ODOT's budget for public transit for the same year was slightly over \$90 million.

The differences in the money allocated for highways vs. transit is far more than what could be a function of the relative costs of a mile of highway vs. a mile of transit, for example. The budget figures reflect profound policy priorities that favor highway construction (a new construction or enhancements) to increase connectivity for automobile-based travel rather than increasing connectivity via public transit. The preference directly translates into creation of different land development patterns. Preference for highways and automobile-based transportation supports conversion of rural land to a lower density urbanized pattern. It increases the dependence on the automobile, as land use designations and location of businesses and residential areas follow each change in road alignment, capacity and interchanges. The low density development facilitated by spending on new highways, interchanges and road capacity enhancements increases the economic inefficiencies of the built form in Northeast Ohio (see section below on economic development as well), and stimulates conversion of farmland to subdivisions in the western Lake Erie basin, undermining the economic well-being of the region. The low density land development patterns virtually rule out development and maintenance of an efficient, cost-effective public transit network, which would rely on higher density and closer proximity connections to function properly.

2. Equity in distribution of highway and other transportation funds

Two aspects of equity are relevant: geographic and per capita spending to provide an efficient transportation system across the Lake Erie basin. The state allocation for 2006 for public transit was just over \$91,000,000. Given that mass transit itself is predominantly an urban-based service, its relatively low level of funding suggests a less-than equitable distribution of funding on a per capita basis. The lack of an efficient transit network in the Lake Erie basin region discriminates against lower income residents who rely on mass transit for work trips, particularly those who seek to travel to the jobs provided by businesses that are moving outward to take advantage of state subsidies in roads and other infrastructure at the fringe of metropolitan regions.

The literature would suggest that one mechanism by which to increase economic efficiency among transportation projects is to adopt a more regional approach to project assessment that is based on land use plans developed by communities in conjunction with regional planning agencies. Ohio's weak land use planning culture poses a significant challenge to this approach. First, the state does not require incorporated jurisdictions to adopt a comprehensive plan (in which a community identifies the expected future needs of different types of land uses that would need to be served by different types of roads and highways). Second, the state itself does not provide guidance to local communities in terms of priority land uses, economic efficiencies, or the issues that should be addressed through community planning. For example, in some states, state-level planning agencies require that communities develop comprehensive plans and stipulate what type of community aspects need to be included in the plans (housing, natural resources, transportation, etc.). In this context, the disconnect between efficient use of land use and efficient infrastructure is virtually complete.

Both ISTEA and TEA 21, the most recent federal transportation legislation, require metropolitan areas with greater than 50,000 people to plan transportation investments on a regional basis. The intention of the legislation appears to be to give metropolitan planning organizations (MPOs) more equal footing with state DOTs in prioritizing transportation projects. MPOs are "**instructed** to use a list of criteria to evaluate projects, including the negative externalities of local projects, such as air pollution, energy consumption and the relationship between transportation and land use" (Boarnet and Haughwout, 2000, p. 17). How has this been implemented in Ohio?

Of interest in our compilation of these data was the location of \$1,000,000,000 in the “economic development” program, which includes \$500,000,000 for the “jobs and progress” program and the same amount for the TRAC program. The categorization of these programs indicated to us that ODOT is fully aware of the purpose of these programs: stimulate or facilitate economic development through highway and other projects.

The Transportation Review Advisory Council (TRAC) is the body that oversees selection of “major new capacity” projects. The council was established by the Ohio Revised Code in 1997 and is a “permanent body of predominantly non-ODOT personnel which develops and modifies a project selection process and approves major new projects for funding” (ODOT 2003). The TRAC process was developed in response to federal transportation legislation, with the goal of addressing economic efficiencies through regional collaboration.

MPOs in Ohio’s Lake Erie basin are part of the decision making under the requirements of the TRAC process. The TRAC process is the primary venue for proponents of major transportation projects to gain support from MPO decision makers (which consist of mayors and other elected officials from across the metropolitan region). Each year local jurisdictions and the MPO itself propose transportation projects. The MPO planning staff analyzes the projects using a set of criteria established by federal legislation and reflecting the MPO’s regional transportation plan. These criteria include transportation efficiency and safety, economic efficiency, regional impact equity, and the likely effect on land use for a given project.

The staff then makes its recommendations to the MPO’s transportation advisory committee, which in effect constitutes the local/regional TRAC committee. That committee makes recommendations to ODOT, which has the ultimate decision making authority on funding projects. The tension of this process with the ODOT decision making process is considerable as well. This is in part due to the use of a different set of criteria in its evaluation of locally-proposed projects. For example, in the greater Cleveland areas, NOACA (Northeast Ohio Area-wide Coordinating Agency) uses 9 criteria for scoring proposed projects. Table 9 lists these criteria. The criteria tend to disfavor locally-proposed projects that are made *solely* on the basis of spurring local economic development.

Table 9 NOACA TRAC Project Selection Criteria

Scoring Category	Maximum Points	Percent of total
1. transportation system use and accessibility	20	10%
2. transportation system congestion	40	20%
3. transportation safety	20	10%
4. urban core reinvestment	30	15%
5. economic development/redevelopment	40	20%
6. planning	15	7.5%
7. multimodal and intermodal considerations	10	5%
8. funding participation	15	7.5%
9. cost effectiveness	10	5%
Total points possible	200	

In contrast, ODOT has 16 policies that shape its decision making. Table 10 lists these with a brief description and the maximum points that might be awarded in the scoring process. The table makes the emphasis on highways and roads clear, as transit and other types of projects are generally only considered if they support intermodal connections or improve efficiency by removing vehicles from congested roads. Because the TRAC process is itself focused on capacity (meaning new roads or widening roads to accommodate increased levels of traffic), projects in the existing urban cores tend to rank lower, in that they are not seeking to add new roads or lanes, unless there are significant safety problems that would be alleviated. Note that the safety criteria may garner up to 15 points, where the efficiency criteria (volume and moving traffic quickly) may garner up to 55 points in the ODOT scoring system.

The outcome of these differences is that ODOT’s criteria disfavor transit projects in general and encourage additional expansion of the highway system in rural areas. A key part of this expansion is found in Category 5, Transportation Efficiency, which includes “completing of the macro-corridor program.” This is part of the Access Ohio program, which is designed to encourage highway construction to ensure that “94 percent of Ohio’s population will be within a 15-minute commuting distance of an efficient corridor which can attract economic development” (Ohio DOT 2003; p. 13). The macro corridor sub-criteria is justified on the basis that “a completed macro corridor network serves the entire state by facilitating the movement of raw materials, finished goods and people to every region of Ohio. It is likely that a key objective of this criteria and program is to bring economic development to south eastern Ohio,

Table 10 ODOT TRAC Policies, Descriptions and Selection Criteria Points

TRAC Policy	Description	Maximum Points for Selection Criteria
1. Open, Fair, Criteria-driven Process	Criteria that contribute most to state, regional and local transportation and economic development goals	
2. Long-range, Statewide Planning with Local Approval	Selection criteria reflect goals of ACCESS OHIO, the state’s long range planning document, and priority project lists of MPOs;	
3. Preservation First	Preservation, maintenance and management shall have greatest weight in allocating funds among ODOT’s programs	
4. Transportation and Development Factors	Transportation efficiency and effectiveness factors represent 70 percent of total potential score; economic development factors represent 30 percent of total potential score	
5. Transportation Efficiency	Efficiency includes average daily traffic, volume-to-capacity-ratio, roadway classification, and macro corridor completion	55
6. Safety	Accident rate at project site is used in selection to ensure health and safety of citizens and improve business climate	15
7. Non-ODOT participation	Amount of private funding, local assistance, or funds contributed through project-specific federal processes	15
8. Interchange participation	TRAC will build no new interchanges on existing routes without a minimum of 50 percent contribution of the cost of the interchange from either private, local or other non-ODOT funds	
9. Intermodal connectivity	Projects that improve connections to water ports, airports, rail facilities or transit facilities will receive additional points	5
10. Economic development criteria	Job creation, job retention, level of investment, cost effectiveness and economic distress; points only assigned if Ohio DOD and ODOT are assured that economic development is not merely speculative	30
11. Retail and tourism	TRAC does not award points for projects that attract new retail development; tourism-related projects are pro-rated based on length of the tourist season	
12. Fixed transit line evaluation	Parallel criteria exist to rank linear expansion transit projects and compare them to highway projects	
13. Non-traditional projects	Non-highway projects that alleviate congestion, increase capacity or facilitate freight movement on the state’s major corridors; examples may include high-occupancy lanes, shared ride facilities, freight rail infrastructure, model hubs	
14. Bypass projects	Different criteria are used than for regular projects, but include average daily traffic, percentage of vehicles to be diverted, volume-to-capacity ratio	
15. Urban revitalization	Additional points for projects that support re-investment in an urban core by attracting economic development into the city or helping retain existing jobs	10
16. Intelligent transportation systems	ITS systems in the state and federal transportation network only; must be sponsored by an ODOT district deputy director	

a legitimate end. However, the criterion does not include any intra-metropolitan regional considerations, and therefore is likely to stimulate further out-migration of jobs and people on a metropolitan scale, all else being equal.

The loss of budget in the agency in the last several years has intensified this dichotomy, as the agency has focused on highway lanes and interchanges in response to the trucking industry's needs to carry goods through Ohio on the interstate system. In effect, ODOT has tended to override the recommendations of the MPOs, in effect ignoring the sprawl-inducing economic development highway projects.

Key to supporting the Balanced Growth Program in the pilot watersheds and across the basin is a modification of the TRAC process. ODOT's criteria for highway project evaluation should include a "sprawl inducing" factor as a negative category, or at minimum consider within-region spatial externalities for discussion in its own decision making. Table 10 arrays the key (based on the literature, interviews, budget allocations and focus groups) policies and incentives that should be targeted to implement the Balanced Growth Program.

8.2 Sewer and Water Infrastructure

8.2.1 Literature

Provision of sanitary sewer and drinking water systems is a substantial influence on the location of urbanized land form. While extremely low density residential development can be accommodated with private septic systems and wells, these are generally financed privately, and are of limited influence by the state agencies that fund sewer and water systems.

Provision of sewer and water systems gave rise to the earliest efforts to plan cities, dating from Roman times. Deteriorating public health conditions in late Victorian cities in England and the United States required installation of large public sewer and water systems (Kruekeberg 1983) in the late 19th and early 20th centuries. Kelly (1993) notes that some of the earliest actions considered part of the growth management field were when communities had to plan out provision of sewage treatment capacity for the 1972 Clean Water Act to ensure meeting the discharge standards set by the law.

Figure 6 presents the variables in our conceptual model of land development related to sewer and water system provision. While planning and building of sewer and water systems

tends to bring order to city development, extension of water and sewer lines are perhaps the primary reason for leapfrogged development. Because of its powerful pull to development, stopping such practices will have a significant impact on land development pace and patterns. Extension of sewer lines down a country road allows larger residential developments that would exceed septic regulations or if soils are not compatible to proceed away from existing settlements (Libby and Nalukenge 2001).

Mondale and Fulton (2003) suggest that while transportation systems have received more attention as a factor “pulling” development into the urban fringe, provision of sewer and water systems and treatment facilities has also had a significant influence. They note that the shape and capacity of the water and wastewater system direct or encourage growth to move into particular areas, as public policy and investment shape private land markets (p. 3). For example, the implementation of the Federal Clean Water Act’s funding shaped growth patterns. The policy goal was to improve water quality, and a major program was to provide funding to communities to upgrade waste water treatment plants. While the policy was “place-blind” however, and the upgrades sometimes connected remote or undeveloped areas on the metropolitan fringe to regional wastewater treatment systems (p. 5). Pendall’s (2003) study of upstate New York provides an illustration of the influence of federal subsidies for wastewater systems. Federal tax and state subsidies paid over 80% of the cost to extend sewer lines throughout Monroe County, which is the county surrounding Rochester, NY, and to upgrade the system’s sewage treatment plant. In terms of drinking water, the Monroe County Water Authority—with growing economies of scale as the system size increases—has provided a reliable water source for many suburban municipalities in metro Rochester (Pendall 2003, p. 8), allowing them to continue to add houses and businesses. Thus Lake Ontario water has been used to subsidize suburban expansion.

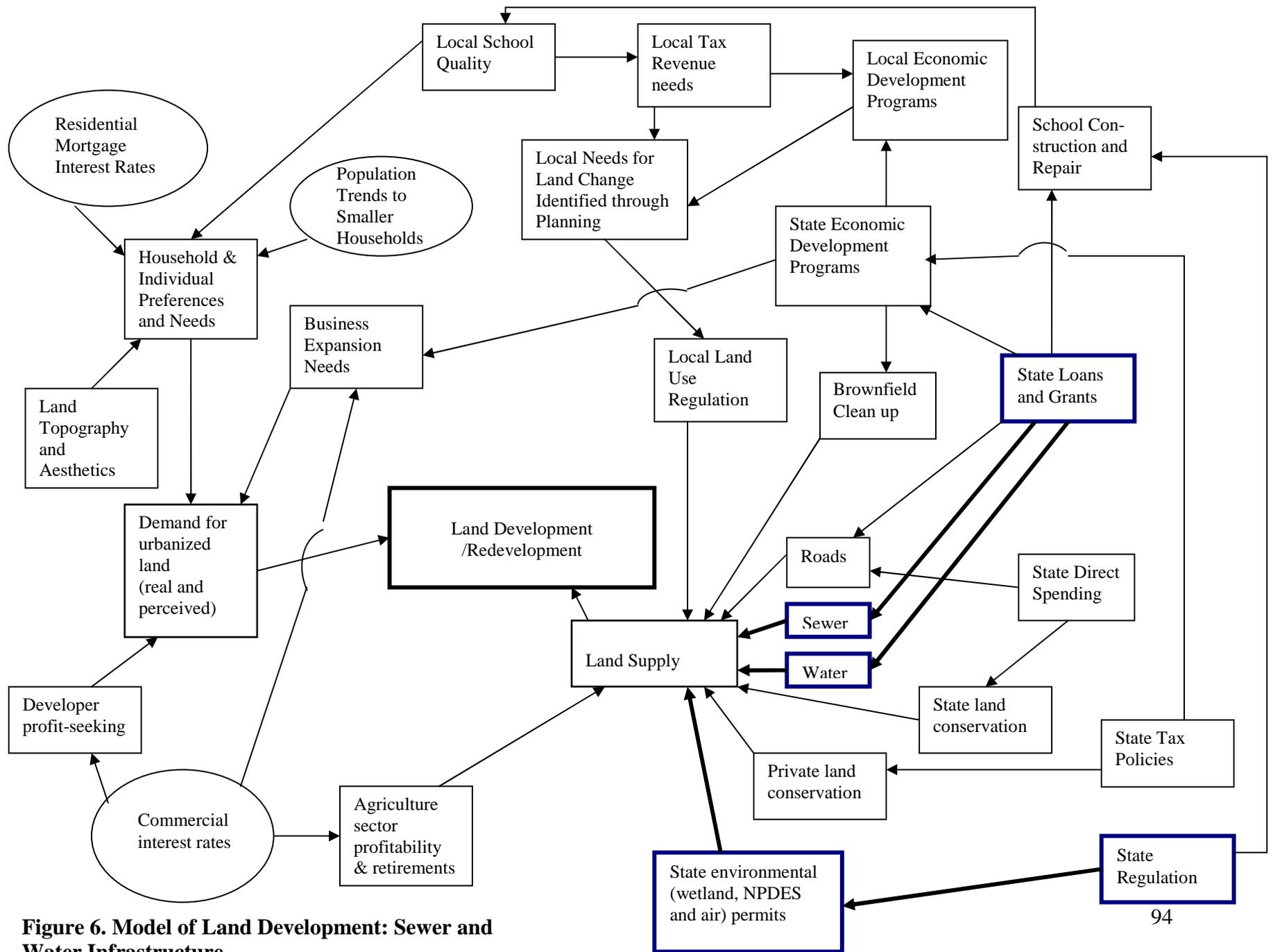


Figure 6. Model of Land Development: Sewer and Water Infrastructure

Pendall, et al (2002) describe how historically the first recognition of sprawl was as leap frog low density development. The predominant response was designating urban service areas to pull development to infrastructure and away from other areas. The urban service area sets the geographical limits to urban growth that requires sewer and water. It is more flexible than a set boundary; more concerned with geographical sequencing of growth, not constraint per se. The most often used growth management technique for water and waste water systems has been to designate an urban service boundary or urban service area, outside of which service providers will not allow attachments to the system. This mechanism has largely been used to ensure an orderly timing of development, rather than to direct development spatially per se. However, there is no inherent reason that development could not be directed into areas and away from others through service area designation that was used in a more explicit way.

Many metropolitan regions used federal funding programs and other money to expand capacity. Eventually, as the regions recognized the fiscal challenges with low density growth, they instituted urban service areas to plan more orderly urban growth, although often this growth has not been compact (Mondale and Fulton 2003, p. 5). An enhanced approach to urban service areas has been to move administrative control over water and wastewater systems from single-purpose service agencies to regional councils of government, as was done in the Twin Cities. Thus a planning agency was given direct control over infrastructure options (p. 11).

Closely tied to urban service areas is Weitz's (1997) investigation of the role of concurrency in promoting or controlling sprawl. Concurrency requirements at the local or state level stipulate that development can only proceed when either local capital planning implementation or developer installation of services occur prior to, or in conjunction with, land conversion. This is to ensure that the level of services continues at an adequate level for all service users in the community. Weitz notes that concurrency has been an effective mechanism for minimizing the excess fiscal burden on jurisdictions in areas of high growth. He notes, however, that unless concurrency requirements exist across the metropolitan region, they are likely to contribute to sprawl, as development investments seek communities without concurrency requirements, most often those just beginning to experience the effects of land urbanization.

Burchell and Listokin (2001) note the importance of overall regional characteristics in terms of how techniques should be applied, including differences in high growth vs. no or low population growth areas. Because provision of water and sewer is such a key component of

large scale and continued development in an area, the authors note that it is critical in slow-growth areas for states to assist local governments in traditional, existing communities to improve public services as part of efforts to provide a high quality of life for residents and to attract businesses.

For example, Mondale and Fulton (2003) describe how management of growth in the Twin Cities region has been through creation of a metropolitan urban service area (MUSA), which is the geographical areas within which the Metropolitan Council (a regional planning agency covering seven counties) will permit connections to the regional wastewater treatment system (p. 5). As part of regional visioning exercise Smart Growth Twin Cities, the planning agency generated different scenarios and tested them in terms of costs for infrastructure provision. The agency found expected savings of 15% (\$3 billion dollars) from a more compact development scenario, largely from saving costs of roads, water systems and sewer systems (p. 17).

A review of implementation and effectiveness of Vermont's Growth Management Act (Act 200) in 2003 found that regarding water and sewer funding, there was insufficient consideration of growth impacts by state and federal agencies and virtually no consideration of regional plans in funding, even through the growth management act requires such a review. However, the review noted that Vermont's sewer funding rule seems to be working. As part of the growth management act, state funds can only be used for sewers expansion to serve designated growth areas (although exceptions can be made for immediate health problems and industrial parks with acceptable controls on sewer hook ups).

The results of the focus groups substantiate the results of the literature review. Most participants in both the commercial and residential development focus groups, *when asked which were more critical, transportation links or sewer and water*, agreed that sewers and water had a greater affect on their practice, and therefore a change in the state's funding and permitting would have a direct influence on development patterns. As such, these factors are the most amenable to influence from the state, whether it is in terms of direct state building or funding. The participants further suggested that rather than loan money for *new* sewer systems, the state should help municipalities fix their existing sewer systems to meet the capacity so they also take into account rain water (storm sewers) if needed. The developers participating also noted how inconsistencies in sewer regulations and inadequate sewers or treatment capac-

ity in older communities shape their choice for development location. They favored state loans to upgrade existing sewer systems rather than add new capacity at the fringe. These upgrades, they suggested, would allow developers to increase infill development in the larger urban areas of the basin.

8.2.2 Implications for the Balanced Growth Program

The result of this research has two implications for the Balanced Growth Program, particularly for the watershed balanced growth plans. First, in order to adequately plan for infrastructure, local communities need to analyze the need for future types of land uses (commercial, industrial, residential) in order to provide adequate infrastructure. It also suggests that infrastructure planning and installation should be accomplished on a regional level to avoid developers hop-scotching to nearby communities that do not have such plans and requirements. Regional infrastructure planning, and state loans for enhanced water and sewer capacity, should not be used to subsidize movement of population or businesses from the core to the periphery in a metropolitan region. In metropolitan regions with stagnant population growth, some localities (at the fringe) will likely need to plan for additional infrastructure capacity if populations are moving into their area from other parts of the region. However, it does not seem either efficient or equitable to expect subsidies from areas losing population to support this accommodation in terms of state-level loans.

8.2.3. Key Policy Elements

Table 11 presents the budgets for agencies with programs related to water and sewer infrastructure funding. Table 12 summarizes the policies, programs and incentives that are key to successful implementation of the Balanced Growth Program.

The Ohio Water Development Authority, the Ohio Environmental Protection Agency and the Ohio Department of Development each has a key role in shaping the capacity and location of water and sewer service systems through finance of capital improvements for pollution control and economic development objectives and through their permitting processes. Their budgets for the programs listed below together are approximately \$580,000,000 in a given fiscal year, not a small amount. This could be of significant impact if reconfigured to support the Balanced Growth Program.

Table 11. Budget for Agencies Influencing Water and Sewer Infrastructure

Agency and Programs	2006	2004	2003	2002
ODOD				
<i>Water/sanitary; small cities CDBG</i>	10,500,000			
Total	10,500,000			
OWDA				
<i>research/grants</i>		6,313,753		
<i>coastal erosion</i>				
soil erosion prevention		11,337,522		
<i>solid waste facility construction</i>		18,085,478		
<i>drinking water/wastewater</i>				
rural		19,267,178		
village capital (500+pop, low income)		3,405,361		
community assistance (less 5k pop)		55,460,303		
master program/fresh water group				117,824,346
water pollution control loan fund	300,000,000			
water supply revolving loan (part of drinking water asst. fund)			65,649,626	
<i>economic development</i>		36,478,307		
Brownfields				
dam safety private owners				
dam safety public owners				
industrial revenue bonds				
Local government (for water and sewer for new facilities)				
Total		150,347,902	65,649,626	117,824,346
OEPA				
<i>Drinking water supply revolving loan fund</i>	3,716,777			
<i>Permits to install waste water treatment</i>	4,000,000			
Total OEPA	7,716,777			
Misc. agencies				
Water and Sewer Commission		523,775		
Water Resources Council		282,524		
Totals*	307,716,777	151,154,201		

*The budget numbers for these agencies varied quite significant from year to year. (We suspect there is missing data despite efforts to retrieve this data from public documents and through the OLEC interagency task force.

The key issues for these state agencies are to screen projects for their potential sprawl-inducing effect. Most of the programs listed in Table 12 are designed to reduce waste water pollution by upgrading technology or increasing capacity of existing facilities. Several specifically target small cities, villages and rural areas. Similarly, programs to improve drinking water are designed to ensure compliance with federal Safe Drinking Water Act standards. However, for both types of programs, the key question to be asked is whether the financing of a particular project brings the community into compliance and will ensure compliance for a reasonable time frame forward, or will the project accommodate increased population or business location that may move from a more urbanized area at a cost that is in effect subsidized by all citizens of the Lake Erie basin and the state of Ohio?

Of additional interest is the relative proportion of programs devoted to upgrade of existing systems vs. expansion or new installation. One program, the Local Economic Development Loan program through the OWDA, provides loans to local governments for improvements to water and waste water systems needed for economic development. The program is specifically designed to support new business location in Ohio and its contact person acknowledged in our project interviews that this typically opens new land to development. This program is used in cases to attract large manufacturing or distribution facilities to the state when it is in direct competition with other states for hundreds of jobs. While economics might override the sprawl-inducing concerns in these high profile cases, the agencies need to screen other projects that do not come from outside the state for stimulating land use change, as one potential outcome of shifting businesses from urban to exurban areas might be a lower total number of jobs and loss of income.

One program of particular concern is the Ohio Water and Sewer Commission Rotary Loan program at ODOD. This program provides grants for upgrade and extension of water and sewer lines through farmland that would otherwise be paid for by agricultural property assessment. If we assume that the program was created to relieve the pressure to convert farmland pieces to get water and sewer down a rural road, the outcome may be unexpected. Based on the literature reviewed, this program would likely contribute to leapfrog development around existing farms. Unless there is a guarantee through the program that the farms past which the sewer and water lines run will remain agricultural production in perpetuity, the program should be considered for termination.

Also of potential is the sewer provision and its relationship to OEPA permitting process, particularly in terms of industrial and commercial facilities, which cannot as a rule be serviced by septic as can some residential. OEPA and ODWA together can assess whether a project will likely induce unbalanced land conversion. The key is instituting a more collaborative process to screen projects.

8.3 Economic Development

8.3.1 Literature Review

Economic development programs constitute attempts by “state and local governments to use public policy both to alter private market decisions and to direct local population and economic growth” (Feiock 1994, p. 208). Economic development is not merely growth in precise definition. It signifies an increase in economic activity that brings about structural change (Malizia 1990). That is, growth itself is not the end sought, but change to a locality’s economy in the kind of business enterprises and workforce that will achieve goals such as equity in income distribution, self determination, or stability. The most common goals of economic development policies are to increase employment in a specific desirable sector, increase per capita output or income within some boundary, and to ensure these changes are longer term (Helling 1997) so they contribute to the overall sustainability of the area. Economic development occurs as a result of increased productivity, either form more resources be used or existing resources used more productively. Public investment has a large positive effect on productivity, complementing the investments of private capital. In general public investments are either oriented toward consumption (e.g. parks) or production (streets and highways or brownfield clean up, for example) (Helling 1997).

Two aspects of land development relate to economic development programs: the impact economic development programs have on changing the location of urbanization; and the overall economic efficiencies of specific land development patterns. In this section we are not focused on real estate development per se as an economic factor, nor are we focused on economic development policies related to retail business. Instead we focus on policies, programs and incentives related to business creation and retention, job creation and retention, and workforce development.

Table 12 KEY ODWA, OEPA and ODOD Programs, Policies and Incentives Regarding Sewer and Drinking Water Infrastructure

Direct State Action	Policy Description	Affect on land development pattern	Literature	Focus group	Change Needed
Permits to install waste water treatment	OEPA; construction permit for wastewater; permits cannot conflict with CWA Sec. 208 plan	Permit for new or expanded facility may result in leapfrog development		Ranked 2 or 3; “where the sewer ends determines where development goes”	Screen applications for sprawl-inducing vs. public health justification; work with ODOD to identify permitable sites in PDAs for businesses
PDA's	Incentive description	Affect on land development pattern	Literature	Focus group	Comment
Local/Regional					
Water and sanitary sewer program	ODOD. Small Cities program Provide grants to small, needy rural communities to comply with USEPA mandates	Excess capacity can pull residential development into area	Carruthers 2002; Weitz 1997; Kelly 1993; Pendall 2003;	Expansion of rural capacity was key for inducing rural development	Only a problem if \$ used to expand capacity to accommodate leapfrog development
Water pollution control loan fund	OEPA; funds improvements to wastewater treatment facilities	Excess capacity can pull residential development into area	Carruthers 2002; Weitz 1997; Kelly 1993; Pendall 2003;	Expansion of rural capacity was key for inducing rural development	Only a problem if \$ used to expand capacity to accommodate leapfrog development
Water supply revolving loan account	OEPA; loans to public water systems to eliminate public health threats	Excess capacity can pull residential development into area	Carruthers 2002; Weitz 1997; Kelly 1993; Pendall 2003;	Expansion of rural capacity was key for inducing rural development	Only a problem if \$ used to expand capacity to accommodate leapfrog development
Village capital improvement fund	OEPA& OWDA; Ohio villages, including those that are part of or planning to be part of a regional water or sewer district and meet population and median household income criteria are eligible.	Excess capacity can pull residential development into area	Carruthers 2002; Weitz 1997; Kelly 1993; Pendall 2003;	Expansion of rural capacity was key for inducing rural development	Only a problem if \$ used to expand capacity to accommodate leapfrog development
Downtown Revitalization	ODOD, Community Development	Support infill development through enhanced capacity		Confirmed need to upgrade services in existing urban areas to encourage development	Priority to PDAs
Ohio Water and Sewer Commission Rotary Loan program	ODOD; grants for upgrade and extension of water and sewer lines through farmland otherwise paid for by agricultural property assessment	Created to relieve pressure to convert farmland pieces to get water and sewer;		Expansion of rural capacity was key for inducing rural development	Likely would contribute to leapfrog development around existing farms
Master program/fresh water group	OWDA; agency states loans typically to areas that have been developed	Excess capacity can pull residential development into area			Only a problem if \$ used to expand capacity to accommodate leapfrog development
Community assistance loan program	OWDA; for communities with less than 5k population	Excess capacity can pull residential development into area			Only a problem if \$ used to expand capacity to accommodate leapfrog development; restrict to existing, traditional settlements and adjacent lands identified to accommodate growth, not for new subdivisions away from existing settlements
Local Economic Development Loan program	OWDA; provides loans to local governments for improvements to water and waste water systems needed for economic development	Program to support new business location in Ohio; opens new land to development; ODWA secures private industrial revenue bonds		Ranked 2 or 3; “where the sewer ends determines where development goes”	Screen applications for sprawl-inducing vs. public health justification; coordinate with ODOD to identify permitable sites in PDAs for businesses as priority

Table 12, continued					
PCAs	Incentive description	Affect on land development pattern	Literature	Focus group	Comment
Local					
Source water assessment and protection program	OEPA; grants to localities to identify and delineate drinking water protection areas	Should preclude potential contamination in area		Residential developers state they try to stay clear of environmentally sensitive areas due to the added expense and regulatory hoops	Use PCAs to further protect; \$ for planning help to protect PCAs; restrict all development?

As Bretting and Nelson (2001) note, the key problem driving most growth management programs is to continue to have economic development while fostering reasonable quality of life and maintaining or preserving environmental quality. In many of the state growth management programs reviewed in the literature, environmental quality regulations are the constraint shaping the level and kind of economic development. That is, jurisdictions are required to comply with federal or state law regarding air, water and other environmental resources, and growth management programs were put in place to ensure compliance in the face of rapid population growth into a metropolitan region and ensuing rapid land conversion.

Bellafiore, et al (2003), in a study that was part of a Brookings Institution study on economic competitiveness for Pennsylvania, examined the extent to which economic development subsidies in Pennsylvania contribute to sprawling land use patterns and job redistribution. Their analysis included the spatial distribution of grants and loans given under three Department of Community and Economic Development business assistance programs from 1998 to 2003—Opportunity Grant Program, the Infrastructure Development Program, and the Pennsylvania Industrial Development Authority. The Brookings study designated two types of geographical areas for measuring location of subsidies: “older Pennsylvania” and “outer townships,” which correspond to cities and suburbs (older PA) and the urban fringe or more rural areas, respectively. The study was conducted for areas in the nine major metropolitan areas of Pennsylvania. The results of the study are instructive:

- Pennsylvania does not use economic development dollars to counteract outward movement of jobs and the tendency is to reinforce sprawl. Per capita economic development dollars are about same across the state (\$58). However, jobs are predominantly needed in cities and older suburbs, which have higher populations. Therefore, in order to use economic development dollars most efficiently, “creating jobs closer to the communities and people most in need of them,” the researchers suggest a higher per capita spending level in Pennsylvania’s existing, older, more highly populated areas. Overall the study found that the state was not using economic development subsidies on a consistent basis to promote job creation in struggling older towns and cities.
- Older inner ring suburbs receive very little economic development assistance to help ward off job and population loss.
- Subsidies to industrial parks (135 projects totaling \$101million during the study years, and about half of all money given during that time period) have the greatest bias toward new suburbs. On a per capita basis these projects receive 2.2 times as much subsidy as projects in “older Pennsylvania.” These new industrial parks can trigger or accelerate relocations from older communities of professional services as well as manufacturing.
- Economic development subsidies appear to play significant part in emergence of huge

distribution centers that dot farmland across the state. These facilities, in the “transportation and wholesale trade” sector, received nearly \$90 million in the years in the study. Fully \$44,600,000 was infused in outer townships for these facilities.

The study further notes that the three state programs examined did not appear to use any spatial criteria in determining project awards. That is, no screening for the land use effects was apparent.

A second study on Pennsylvania, one of the background papers generated as part of the Brookings Institution project, also examined the spatial allocation of Pennsylvania’s major economic development programs (Behr et al 2003). The authors examined the spatial allocation of seven major grant and loan programs of PA DCED for 1998-2003. The study used sub-county geographical units (2500+) and analyzed spatial distribution of grants and loan subsidies for business development, job creation and retention. The authors found no discernable pattern for the subsidies, except to note that for the programs combined, 42% of all the money went to the second class townships, which correspond to rural PA; these townships have 42% of the population. This was deemed to likely be a random occurrence, as DCED has no policy to distribute monies on a per capita basis.

The importance of including spatial distribution of projects and land use concerns in economic development planning is illustrated well by a study by Nelson and Peterman published in 2000. The authors note that the first wave of growth management programs were largely put into place in response to growing concerns about negative environmental impacts from land urbanization. They note the “misconceived” notion that economic development and environmental quality are necessarily tradeoffs, arguing instead that protection of environmental resources that accrue from more compact land development patterns also have economic development benefits. Responding to questions as to how growth management land policies affect economic performance of regions, the researchers evaluated the economic performance of 182 MSAs over period of 1972 to 1992 with respect to presence or absence of growth management efforts. They found a positive correlation between the presence of growth management programs and economic performance, *ceteris paribus* (Nelson and Peterman 2000, p. 283). In fact, the presence of growth management program in a region accounted for 10% or more of improvement in the MSA’s aggregated personal income.

In a review for the Brookings Institution, Muro and Puentes (2004) reviewed many studies on the relationship between smart growth land patterns and overall economic and fiscal

performance. They found that the studies were in consensus that more compact and higher density land development patterns had the following benefits: reduced the public cost of providing new infrastructure and delivering new services; improved a region's economic performance, and brought economic gains to suburbs as well as cities (p. 5). Fiscal benefits were a result of economies of scale or density efficiencies, and economies of geographic scope. Economic development benefits were also evident. Smart growth policies resulted in higher property values in older communities, and benefits in labor markets, efficiencies, and quality of place which support better economic performance (p. 8). More compact areas, typical of cities and older suburbs, still do a better job in "spurring growth because they facilitate companies' access to suppliers, contractors, and the regional labor pool, and because they catalyze the sort of "agglomeration" efficiencies or "knowledge spillovers" that result from the sharing of information, ideas, technology, and opportunities" (p. 8). Smart growth, to the extent it fosters the economic well-being of cities, promotes the economic well being of suburbs as well. As the authors note, cities and suburbs today are adjacent sub-units of encompassing regional economies, competing as "city-states" in a global economy. Disinvestment from the urban core has now begun to adversely affect many older suburbs, and such patterns will eventually weaken the whole region. Re-investment in the urban core is therefore a key economic development strategy to keep suburbs economically prosperous (p. 10).

Carruthers and Ulfarsson (2002) studied the role of political fragmentation on land conversion in fourteen states and concluded that competition for economic development across a fragmented political territory was a key driver to urbanization of land at the metropolitan edge. Growth patterns are affected by rivalry among jurisdictions as they compete with one another to attract economic development and maintain high residential property values in an effort to increase their tax bases. The study hypothesized that unilateral efforts by individual local jurisdictions to exclude unwanted growth also contributed to land conversion at the fringe by shifting growth elsewhere. Boulder, Colorado is a good example of such efforts, where imposition of a greenbelt around the city merely pushed development into surrounding rural lands (Pendall, et al 2002, p. 19). Carruthers and Ulfarsson (2002) then examined statewide policies affecting land use, including economic development programs (p. 328). Their findings lend support to state and regional planning efforts aimed at increasing cooperation among local governments to reduce the shift of negative impacts of growth. The authors warn that further research is needed in order to evaluate whether or not these efforts toward regional collabora-

tion will produce their intended effects (reducing sprawl), in that many of these efforts are relatively recent.

The results of these studies suggest that growth management (protecting environmental quality and fostering more efficient land use patterns) becomes an essential element of a long term economic development strategy. Therefore, state economic development programs should not encourage low density land use conversion into the countryside, but rather should seek more efficient land development patterns around existing settlements. Further, economic development programs applied across a fragmented political landscape will only exacerbate the competition among local governments, further fueling haphazard development and economic and fiscal inefficiencies.

8.3.2 Implications for the Balanced Growth Program

Which of Ohio's economic development programs mirror those examined in these studies? Which programs are likely to most significantly influence the location of development? According to our model four types of state programs related to economic development can directly influence the pattern of land development: loans and grants to jurisdictions for economic development; loans and grants for brownfield redevelopment; loans and grants and tax policies to promote business expansion in the state; and environmental permitting for new and expanded facilities (See Figure 7 below). Table 13 summarizes the annual budget for ODOD and other economic development programs from other agencies. Table 14 summarizes the programs that are key and the changes needed to support the goals of the Balanced Growth Program in the Ohio Lake Erie basin.

The studies in Pennsylvania are particularly relevant for the Balanced Growth Program given the similar legal and political cultures. The programs listed in Table 13 provide either financial assistance in terms of grants or loans or tax incentives/breaks for business and job creation/retention. ODOD also provides loan assistance to local communities and businesses for infrastructure and other improvements to the built form that support attraction, retention or expansion of jobs. The programs, if appropriately targeted, could have a significant affect on directing the location of economic activity in the Lake Erie basin into PDAs and to support agricultural landscapes as well.

While funding levels for no one program come close to the state's budget for highway construction, together ODOD can shape economic development at the local and regional level

through combinations of these programs. When combined with water and sewer infrastructure funding provided by the Ohio Water Development Authority, and the permit processes of the Ohio Environmental Protection Agency, the state has the resources and tools to direct business location to support PDAs. A key support to the Balanced Growth Program pilot projects, and for influencing land development practices across the basin, is to develop a more coordinated, if not integrated, permit process. Agencies that issue permits for a given project should collaborate in the review of the project. Such an integrated review has been instituted with success in New Jersey, and a more integrated approach underlies some state efforts in the Great Lakes basin as well (Rabe 1995; Rabe and Zimmerman 1995). Integrated permit review has been an effort to integrate across pollution types and receiving media on a facility wide basis. This would be an important first step for the Balanced Growth Program as an incentive for the appropriate location of a new facility. However, this collaborative review should also include staff of agencies providing funding or tax incentives to the project. This review should include an assessment of the affect of the project on land use change and urbanization patterns. Such a review will at minimum make transparent how agency decisions affect urbanization and decrease agencies acting at cross-purposes.

Overall the framework of the Lake Erie Restoration and Protection Plan and the Balanced Growth Plan is to strengthen existing communities of all sizes and deter leapfrogging or discontinuous land urbanization in the watersheds. The programs that assist small communities in maintaining or restoring their downtowns and the businesses that exist there are critical for encouraging a nodal land settlement pattern in the watersheds. These nodes would consist of designated PDAs, and PCAs could form the core of a network of ecologically critical areas as well.

USEPA (2004) considers redevelopment of brownfields and greyfields one of the top 15 priority policies for protecting watershed resources in the United States. This is because many brownfields and greyfields are located in existing settlements (where there has been industry or other businesses that resulted in land pollution) and clean up of all such sights,

Table 13. ODOD (2006) Annual Budget for Economic Development Programs*

Agency and Programs	2006
ODOD	
<i>economic development to local government</i>	
program to local govt. (loans)	6,700,000
roadwork assistance (tied to econ. dev.)	11,600,000
technology development	64,413,000
Clean Ohio Assistance Fund	10,000,000
Clean Ohio Revitalization Fund	
<i>community development</i>	
community development program	23,200,000
water/sanitary; small cities CDBG	10,500,000
community housing improvement program	28,000,000
downtown revitalization small cities	2,500,000
planning	100,000
rehabilitation	2,400,000
<i>programs targeting business</i>	
Business development	
technology development	
innovation loan fund program	
direct loan program	
international trade division	
export finance initiative	
microenterprise business development	700,000
business bonding (minority)	
minority contractors business assistance	
Ohio capital access (minority)	
procurement technical assistance (minority)	
minority business direct loan	
Enterprise bond fund loans	
investment training program	
OHIO sites --property acquisition	21,428,000
pioneer rural loan program (investment areas only)	
research and development investment loan fund	
Energy	
loan fund-business	
grants distribution	
Total ODOD	179,041,000
OWDA	
<i>economic development (2005)</i>	
brownfields	
dam safety	
industrial revenue bonds	36,478,307
local government (water and sewer for new facilities)	

* Figures were taken from ODOD and other agency web pages and provided by agency staff through the OLEC Interagency Taskforce. Missing data was not available through either source during the study period.

whether they are urban or rural, would decrease the likelihood of pollution entering surface and ground water.

Several programs target larger businesses, providing loans or tax credits or reimbursements for expansion or relocation into the state. In support of the BGP, ODOD should ensure that these programs are not used to support “expansion” of business facilities by relocating into other jurisdictions. This policy is critical for successful implementation of the Balanced Growth Program. A recent example illustrates the practice. The Beck Center, long an important cultural resource for Lakewood and Cleveland’s west side neighborhoods, needs new facilities for its performing and visual arts programs. The board of directors has reviewed the current financial situation of the organization and estimates a need for \$20 million dollars. Approximately 40% of the Beck Center’s patrons reside in Lakewood, with the remainder either from Cleveland or many of the western suburbs farther out. Learning of the organization’s financial need and need for land for the new center (although the center could rebuild on site), the owner of Crocker Park, a new mixed-use “life style center” in a newer suburb, offered a development package that includes a new building. According to the article in the Cleveland Plain Dealer, the package includes tax incentives from the City of Westlake and *perhaps additional assistance from the state* (emphasis added). Here is a prime example of how economic development incentives are used merely to transfer an institution from one community to another. While the actions of private and non-profit organizations should not be controlled, in this instance it would not be appropriate to use state tax dollars or bonding authority to facilitate movement of yet another business out of an older suburb to a newer one. Such subsidies are inequitable.

The overall task at hand is to use economic development incentives to improve the quality of life for residents in the area while protecting the region’s natural resources (Lake Erie and its tributary rivers and streams). As was acknowledged through the process to develop the Balanced Growth Program, economic development and ecological protection are not mutually exclusive efforts. Rather, sound economic development policies, including where that development is placed in relationship to natural resources, are the foundation of a sustainable regional economy.

Growth that, at the margin, increases environmental and social costs more than it increases production benefits is not sustainable and will not in the long run foster a competitive region or state. No economic development program or tool should ignore the environmental and social costs that it might induce by stimulating low-density land use development. Two

types of economic development strategies could be used to shift development patterns in the basin. First, recent interest in alternative energy and the manufacturing sector in Northeast Ohio could provide a sound economic development strategy for the already urbanized areas in the basin. The traditional manufacturing centers provide a foundation in labor and businesses to develop an industrial cluster in production of products for alternative energy systems such as wind or environmental clean up technologies. These products would benefit not only Ohio and the United States, but could be sent to growing markets in India and China that are at a critical stage: these locations need affordable pollution control and energy technologies to improve air and water quality and replace coal.

A second area of economic development investment that should be enhanced is rail freight. Many of the state's highway projects are pursued to address the needs of the trucking industry and to ensure that increasing truck traffic does not adversely affect the safety of the state's highway system. A reinvigorated use of rail would decrease the need for highway expansion (thus decreasing the stimulus to urbanization of rural land) and would move development to a more nodal pattern. Rail terminus points improved in PDAs would support redevelopment of existing settlements.

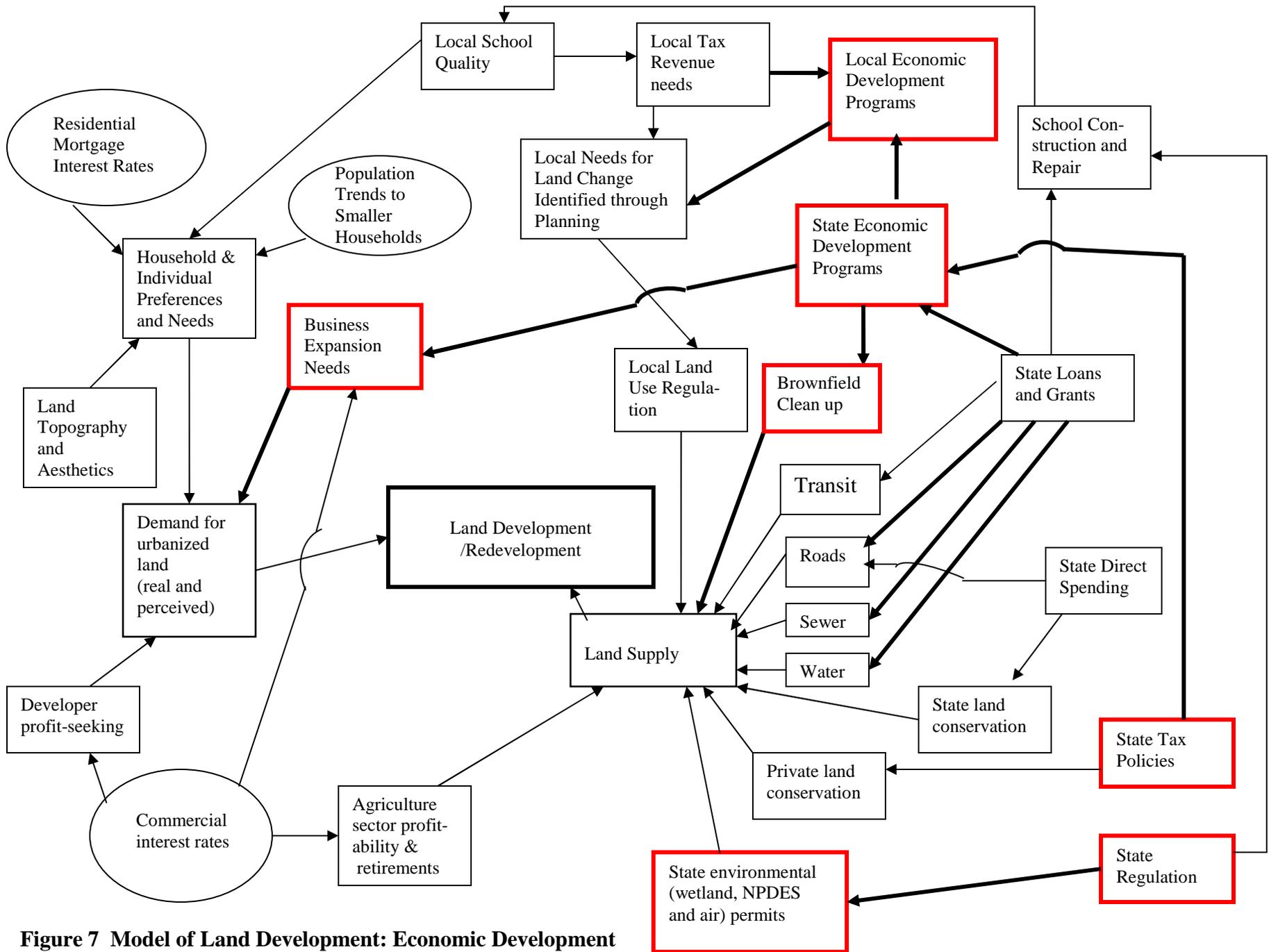


Figure 7 Model of Land Development: Economic Development

Table 14. Key ODOT and Other Agency Programs, Policies and Incentives for Economic Development

Direct State Action	Policy or Incentive Description	Affect on land development pattern	Literature	Focus group	Change Needed
OEPA	Permits for new and expanded facility				
PDA's					
Regional/local					
Roadwork development program	roadwork assistance for economic development purposes; financial reimbursements for local road improvements tied to a pending private investment that will create jobs within three years of completion	Location sensitive; can induce unbalanced development	Forkenbrock and Weisbrod (2001); Hellig 1997; Mondale and Fulton (2003); Coyne (2003); Plant (2001); Boarnet and Haughwout (2000)	Both groups confirmed the relationship between roads, access to land, increasing land values or potential for development but ranked lower than other infrastructure	Projects should be assessed for extent of regional benefit, not transfer of jobs; weight in favor of PDA location
Clean Ohio Assistance Fund	Provides financial assistance to local governments for Phase I and Phase II Assessments, Brownfield Cleanup, and Public Health Projects	Clean up of contaminated land allows for productive re-intensification of land use in existing settlements	USEPA (2004)	Comment on how little is spent by state compared to highway construction in rural areas; suggested state clean up key sites to permit-ready level	Increase funding levels overall; collaborate with OHIO Sites program and ODWA to make key sites in PDAs clean and ready with infrastructure and permits
Clean Ohio Revitalization Fund	Provides grant funding for brownfield clean up activities	Clean up of contaminated land allows for productive re-intensification of land use in existing settlements	USEPA (2004)	Comment on how little is spent by state compared to highway construction in rural areas; suggested state clean up key sites to permit-ready level	collaborate with OHIO Sites program and ODWA to make key sites in PDAs clean and ready with infrastructure and permits
Brownfield Clean Up Revolving Loan Fund	Provides loan funding for brownfield clean up activities	Clean up of contaminated land allows for productive re-intensification of land use in existing settlements	USEPA(2004)	Comment on how little is spent by state compared to highway construction in rural areas; suggested state clean up key sites to permit-ready level	collaborate with OHIO Sites program and ODWA to make key sites in PDAs clean and ready with infrastructure and permits
Water/sanitary loans (Small Cities)	Water and Sanitary Sewer program funds projects that provide water and/or sanitary sewer service for residential users	Improved capacity in existing settlements can strengthen their ability to retain/attract residents and businesses	Carruthers 2002; Weitz 1997; Kelly 1993; Pendall 2003; Muro and Puentes (2004); Nelson and Peterman 2000	Confirmed importance of adequate water/sewer for infill development and role in inducing development in rural areas	Weight for PDAs; preclude extension of lines to support leapfrog development outside PDAs
Downtown revitalization (Small Cities)	Assists local government revitalize central business districts to eliminate slums and blight, create/retain permanent private-sector job opportunities; principally for persons from low- and moderate-income households; uniform façade and sign improvements, parking improvements, streetscaping, infrastructure/rehabilitation activities (inc. streets, water and sewer lines.)	Funded at \$2.5 million for entire state; key to keeping/making downtowns healthy to encourage nodal settlement pattern in watersheds; will pay for planning and implementation		Confirmed importance of adequate water/sewer for infill development and role in inducing development in rural areas	Increase funding; weight for communities participating in BGP planning or in PDAs
Urban and Rural Initiative Grant program	help distressed areas of rural Ohio to create well-planned industrial parks.	Location sensitive; if in rural areas, could induce unbalanced land patterns			Priority/weight toward PDAs and in existing small settlements in rural areas

Table 14, Continued					
Rural Industrial Park Loan programs	help distressed areas of rural Ohio to create well-planned industrial parks.	Location sensitive; could induce leapfrogged land development			Priority/weight toward PDAs or at edge of existing settlements
Urban Redevelopment Loans					
Private					
166 Direct Loan program	Provides long-term, fixed-rate, low-interest loans to businesses willing to commit to create new jobs or preserve existing employment opportunities in manufacturing, research and development and distribution; Retail projects ineligible	Location sensitive	Bellafiore, et al (2003); Helling 1997; Behr et al 2003		Target PDAs;
Business development	To businesses and communities for infrastructure improvements related to economic development				Weight for PDAs; avoid use for transferring business in basin
Enterprise Bond Fund Loan program	Provides long-term, project financing for qualifying businesses that create or retain jobs in manufacturing, research and development and distribution. Retail projects are ineligible.	Location sensitive;			Weight for PDAs; collaborate with OHIO sites program to encourage business in existing urban settlements
Job ready sites program	Grants to businesses for up to 75% of project costs to buy land, clean up pollution, roads and sewers; minimum site size to be in database is 200 acres for manufacturing, 1000 acres for mega manufacturing plants	Although state recently loosened up requirements for sites, the limits may still be biased against cities according to economic development staff from Cleveland and Cuyahoga county; response from state was that cities can apply for other economic development money.			Remove acre minima or tailor minima to accommodate needs of urban sites; consult with city and urban county economic development departments to set appropriate property minima
Job creation tax credit	Refundable state franchise or income tax credits that minimize expenditures to encourage business expansions and/or relocations in Ohio. Business must create at least 25 new full-time positions at a facility in Ohio and pay a minimum of 150 percent of the federal minimum wage (in certain circumstances, as few as 10 new full-time positions may be eligible).				Do not allow use for expansion that transfers facilities from one area to another in the basin, particularly from urban or existing settlement to rural or exurban area.
Enterprise zone	tier, 1real and personal property				Weight for PDAs
	tier 2 franchise, day care & training				Weight for PDAs
	tier 3 state income tax, MSA				Weight for PDAs
Community investment area program	Local real property tax incentives for residents and businesses that invest in designated areas in Ohio; available for residential, commercial, and/or industrial projects involving remodeling or new construction.				Weight for PDAs; weight for remodeling vs. new construction unless in PDA ; do not allow for support of transfer of businesses from one part of basin to another;
PCA	Incentive description	Affect on land development pattern	Literature	Focus group	Comment
Family farm loans	Capital improvements on farms; lower interest rates; very small \$	May preclude/put off sale for other use			Increase funding levels and coordinate with economic development programs

8. 4 Land Conservation/Open Space

8.4.1 Literature Review

The relationship between human settlements and preservation or conservation of rural resources and lands is one that has been recognized for centuries. Ancient cities had designated areas inside and outside their defensive walls for food production. Many cities, whether in Europe, Asia or the Middle East, had designated lands that supplied resources such as stone and wood or protected the city's water supply. This early protection stemmed from possession of all land by the sovereign (in this case the king or queen and the nobility). Over time, as the sovereign became embodied in a democratic governance system, lands and resources held for the people was embodied in the concept of the public trust (Caldwell and Schrader-Frchette 1993). This public trust to protect resources lay at the foundation of the efforts during the Progressive Era to protect land and resources through a national system of parks and reserves.

City planners and geographers during the Progressive Era also recognized the benefits of open space for the physical and mental health of urban residents. They proposed and built large urban parks and networks of parks in America's cities (Olmsted 1870). The town planning tradition in England adopted green belts around satellite cities of London to ensure a distinct boundary between town and farm, and close proximity of residents to the countryside (Howard 1898). Howard's town planning tradition also included the presence of a green space at the center of the city or village, an opportunity to maintain contact with nature for the resident population.

The model was advocated by regional planners in United States from 1930s onward as well, who proposed a larger central city with a set of satellite towns around it, each with a central green space, and separated by open space and connected by transportation network. Howard and his disciples, including Benton Mackaye, Lewis Mumford and other members of the Regional Planning Association of America in the 1930s advocated nodal development along a unifying, regional skeleton (which in theory could be realized through infrastructure design in conjunction with land use planning). Ian McHarg, in *Design With Nature* (1969) proposed that the skeleton of the region was the blue/green infrastructure, the surface water and natural resource areas that provided the life of the region, and that the settlements in the region should be placed within this infrastructure to maintain the function of these systems. Many aspects of this

blue/green infrastructure have been protected through federal laws and programs (e.g., the Endangered Species Act or the Clean Water Act) beginning in the 1970s. These federal laws, however, are resource-specific and do not address the relationship between natural resources and environmental quality and local land use decision making authority.

We can conceptualize land conservation from two vantage points: the land itself and the value it holds, and the land as part of a regional system. Land may be worthy of conservation for its current or future economic value, for its inherent aesthetic value, or for its inherent ecological value. Alternatively land conservation might be used as a strategy to direct or “push” development out of a given area as part of an urban containment strategy, and therefore shape the location of urban settlement development. Many states have programs to conserve these different types of open space, but typically programs in a state are not coordinated unless part of a comprehensive growth management program. It is also typical to find greenspace designated to serve more than one purpose (separating landscape types, providing recreational opportunities, and protecting a natural resource).

The first growth management programs in the late 20th century required identification of critical natural resource areas such as wetlands, forest lands, coastal areas and farmland, acknowledging the interdependence of population growth, natural resource conservation, and critical area protection (Ryder 1995). Hollis and Fulton (2002) note, however, that state growth management programs have not consciously focused on relationship of open space and urban form per se. Most programs have taken an opportunistic approach to conserving land or followed a pattern of open space protection that revolved around each state’s interest in natural resources. As growth management has matured into smart growth programs, a more explicit attention to the relationship between urbanization, natural resource and open space protection and urban form (location and density) is emerging (Hollis and Fulton 2002, p. 5). At the national and state levels, farmland protection is now considered a critical tool in smart growth for cities; several states have completed greenway plans; and the Green Infrastructure Workgroup of the Conservation Fund advocates a system of interconnected greenspace, or “green infrastructure” for conservation (Hollis and Fulton 2002, p. 6).

8.4.1.1 Land Conservation: Working Landscapes

Many states have adopted policies and programs to protect working landscapes. The issue at hand concerning farmland and urbanization in North America is the relative proximity of much high quality agricultural land (ranked “prime” by the USDA, for example) and the expanding urbanized edge of the metropolitan region (Beesley 1999; Hollis and Fulton 2002). In addition, several federal law and policies exist to protect agricultural production and improve the ecological sustainability of farms as they relate to other ecological resources, including the Coastal Zone Management Act (1972), the Food Security Act (1985), and the Farms for the Future Act of 1990. The majority of strategies to preserve farmland, however, are administered by state governments and through private conservation in the United States (Beesley 1999).

Several different policy tools can be used to accomplish land conservation, including: direct acquisition of property; acquisition of easements or development rights that preclude development in perpetuity; regulatory mechanisms such as zoning, subdivision design, urban growth boundaries or other planning-related mechanisms; and tax policies (Hollis and Fulton 2002; Nelson 1992). Table 15 summarizes these mechanisms and policies. While some of these mechanisms are primarily the purview of local government (zoning for instance), the state itself can enable or provide incentives or financial support for use of these mechanisms. These mechanisms are discussed below in terms of their role and effectiveness toward farmland protection, protection of critical ecological resource areas and urban containment, all of which attempt to preclude conversion of land to an urbanized pattern.

Table 15 Public Policies and Mechanisms for Protecting Open Space

<i>Fee simple ownership/acquisition</i>	
<i>Regulation</i>	
<ul style="list-style-type: none"> ▪ cluster zoning ▪ very large lot zoning ▪ exclusive agricultural or forest zoning 	<ul style="list-style-type: none"> ▪ subdivision design ▪ mitigation ordinances and banking ▪ agricultural districts
<i>Other law</i>	
<ul style="list-style-type: none"> ▪ right to farm laws ▪ transfer of development rights 	<ul style="list-style-type: none"> ▪ purchase of development rights ▪ conservation easements
<i>Incentives/tax policy</i>	
<ul style="list-style-type: none"> ▪ use-value tax assessment ▪ circuit breaker tax relief credits ▪ capital gains tax on land sales 	

For example, in a study of farmland preservation techniques conducted in 1999, Beesley arrayed the types of farmland protection mechanisms available in each state. For the Great Lakes states, Ohio had five mechanisms in place (tax incentives, differential assessment, agricultural districts, right-to-farm legislation, and land trusts). The other Great Lakes states (New York, Pennsylvania, Illinois, Michigan, Wisconsin and Minnesota), which have similar urbanization patterns, all have more mechanisms available (See Table 16).

How effective are these types of mechanisms, laws and policies? Scholars have received differing results from studies of these mechanisms, likely due to differences in the legal and regulator context in which they are applied and the market conditions in a given area of state. Brabec and Smith (2002) studied the affect of three types of land protection strategies on fragmentation of agricultural land. They analyzed the use of purchase of development rights (PDRs), transfer of development rights (TDR) and subdivision clustering for their affect on total land preserved, parcel size and contiguity, and active farming status in the areas to which the mechanisms had been applied. The study found that TDRs were the best mechanism in terms of total percentage of land parcels protected (likely because of their relative lesser expense when compared to PDRs) and for protecting parcels of larger sizes. These two mechanisms also resulted in higher levels of parcel adjacency or contiguity among protected parcels. The study also suggests that the larger the size of the parcel that is protected, and the higher the degree of overall contiguity among protected parcels in an area, the more likely the parcels will remain in active farming. The three mechanisms performed about equally well in terms of active farming status on protected lands. The overall conclusion is that isolation of protected agricultural parcels reduces the likelihood the resource will remain in agricultural use. The authors suggest that a combination of farmland protection mechanisms will likely have the best results over time (p. 266).

In contrast, Nelson (1992) evaluated the effectiveness of common farmland preservation techniques, measuring their success in influencing the land market in terms of increasing productive value of the land, reduction or elimination of consumption value, eliminate speculation of value, and eliminate the impermanence syndrome—which occurs if the first three conditions are met (p. 3). The study analyzes mechanisms of property tax relief, right to farm laws, acquisition of development rights, and agricultural zoning as the most dominant types of

Table 16. Agricultural Preservation Mechanisms in the Great Lakes States

Mechanism	State							
	OH	NY	PA	ID	IL	MI	WI	MN
Incentives								
Tax incentives	X	X	X	X	X	X	X	X
Differential assessment	X	X	X	X	X	X	X	X
Circuit breaker taxation						X	X	
Estate and inheritance taxes		X	X	X	X	X		
Benefit assessment exemptions			X					
Land Use								
Ag district	X	X	X	X	X	X		X
Ag zoning		X	X	X	X	X	X	X
Right to farm	X	X	X	X	X	X	X	X
Purchase of development rights	X	X	X					X
Transfer of development rights			X					
Review of eminent domain actions			X					
Land banking			X					
Comprehensive planning				X				
Land trusts	X	X	X	X	X	X	X	X
Foreign ownership restriction			X	X	X		X	X
Growth management		X						

Source: Beesley, 1999

mechanisms in state farmland preservation or growth management programs. Nelson concludes that these farmland preservation techniques used by states are at best overall ineffective and at worse may even have inverse effects (p. 4). Intended to give farmers lower taxes that reflect non-urbanized land uses, property tax relief programs typically assess a penalty to farmers who sell land while in the program. However, Nelson argues that because these programs almost never require full payback of taxes that would have been collected, farmers use these programs to hold onto land at lower than market rates (reflecting the lower taxes) until ready to sell.

The overall affect of the programs are to extend the impermanence syndrome, and therefore have a tendency to induce sprawl (p. 4). Citing several studies, Nelson concludes that right-to-farm laws, which prohibit nuisance lawsuits by encroaching subdivision residents, do little to support farm profitability, which is the key determinant of endurance. Likewise, PDR and TDR programs do little to affect urbanization that is contiguous to already urbanized land, because farmers that participate tend to be those at the far edge of the metropolitan area, while farmers closer to urbanized development anticipate windfall profits and do not participate. Further, PDR and TDR programs typically are not applied in a strategic fashion to maintain a critical mass of farm parcels in an area needed to support profitability and the secondary businesses that support farming. PDR programs usually are only used for small size parcels and for smaller areas of land altogether because of the relatively high cost. They may be more effective as open space conservation measures, but do not do well for agricultural land preservation. Finally, agricultural zoning typically allows some residential development, and depending on the lot size requirements, can actually contribute to establishment of hobby farms and other low density land conversion that might be allowed under less strict zoning regulations (p. 5).

Nelson concludes that these measures are not enough to preserve farmland, and that some sort of growth boundary or area needs to be designated to end the impermanence and speculative nature of land markets that fuel sprawl (p. 6). Citing efforts in Oregon, Nelson notes the importance of designating some rural land for rural residential to accommodate those who wish to live in a more rural environment, coupled with zoning and other efforts to preserve true productive farmland from development (p. 6). The key to success was establishment of a minimum of 20 acre agricultural preserve districts devoted exclusively to farming, which tended to stifle speculation on farmland for future conversion.

Beesley's (1999) review of farmland preservation programs concurs with Nelson's

conclusions about tax policies, finding evidence these are the least effective. However, Beesley did find evidence that the following other strategies could be effective (in order): purchase of development rights; transfer of development rights; exclusive agricultural zoning; land trusts; land banking; use value assessment; urban growth boundaries; growth management; and municipal planning.

Beesley's ranking confirms an early study by Daniels (1991), who confirmed the effective use of PDRs as growth management tool in preserving agricultural land. In a study of six different state PDR programs, he found that PDRs hold some promise of influencing location, rate, and timing of development in areas where property tax breaks are not sufficient to withstand development pressures. He notes that the most effective strategy appears not to be purchasing in areas with the most development pressure, or in areas with little pressure (the "most acres for the money" approach). Rather, a middle course to purchase land in areas with moderate development pressure, where the purchases are still cost effective to assemble adjacent or proximate farm land, helping to maintain a "critical mass" of farms. When used in conjunction with comprehensive plans and restrictive agricultural zoning, PDRs could help create a critical mass in an area to ensure viability of a farm community.

Maynard et al (1998) assessed the results of Pennsylvania's agricultural easement program, which allows farmers to sell development rights. By the time of the study, the state had spent more than \$50,000,000 to prevent development on thousands of acres. To ascertain whether the high cost was justified, nearly 200 farmers participating in the program were surveyed as to their motivations and the outcomes in terms of farm production/sustainability. The study found a demand for the program among farmers sensitive to development pressure. Participants were older on average than non-participating farmers and debt reduction was the largest use of easement sale proceeds, followed by savings and farm capital purchases. The program seemed to preserve existing farming operations, as only 15 % used easement payment to expand operations. However, the authors note that preservation of individual family farms through the program does not guarantee that a critical mass of farmland in any one area will survive. Conservation easements (or PDRs) do not ensure continued farming of rural land, but do contribute to the overall financial sustainability of the farmer, therefore increasing the odds that farming will continue.

The different conclusions from these studies are likely a result in part of the high variety in state programs, and the land market conditions in different regions of the country. The

choice for policies and mechanisms should reflect the desired outcome. If the desired outcome is to preserve individual parcels or individual farms, purchase, outright purchase and transfer of development rights, and other easements and tax incentives may have a positive effect. If however, the desired outcome is to preserve an agricultural landscape, which is a function of the preservation of a system of farms linked to support businesses, it is likely that additional measures, such as zoning, business assistance, right to farm laws, and perhaps use of a containment mechanism are needed.

8.4.1.2 Natural Areas for Ecological and Recreational Purposes

In terms of conservation of ecologically significant areas, the literature comes primarily from the natural resources conservation/management fields. Its emphasis has been on how to improve resources such as habitat or riparian corridors and has not explicitly focused on either the impact upon or an explicit concern with influencing urban form per se until recently.

One key challenge to the use of land conservation techniques is how to address the systemic nature and scale of many natural resources and green infrastructure. For example, preservation of an individual land tract along a stream benefits the stream at that point, but doesn't address upstream conditions or the cumulative effects of land management practices up or down stream. Likewise, preservation of one habitat area of specie does not necessarily address the overall condition of the landscape in which that specie lives or even moves. Thus a key aspect of land conservation is to address fragmentation in terms of the size of the tracts of land protected, their location relative to other pieces, and the overall pattern in which they are situated in a given region. Adoption of a watershed or habitat network approach begins to reconcile this tension.

Another key challenge to understanding open space protection is the decentralized nature of decision making and funding. As Hollis and Fulton (2002) note, "most strategic open space acquisitions are made by a patchwork of state governments, local and regional agencies, and non-profit land trusts....[that use] state, regional, and local public funds..." (p. 20).

Thus a variety of public and private mechanisms, combined with a variety of funding sources, have been used to conserve open space or green space. These include fee-simple acquisition, environmental regulation, zoning, purchase of easements, purchase or transfer of development rights, and tax policies or incentives. Many of these mechanisms are also used for

agricultural land conservation when that land serves the purpose of habitat or other ecological protection.

Public Entities and Mechanisms

Beyond its role as a land owner, which in some states is significant, the federal government directly spends and provides grants and loans to states, local communities and private land owners for protection of natural resource lands. These funds are used by state and local governments to purchase land or conservation easements or for conservation by private land owners to assist them in erosion and restoration activities (Hollis and Fulton 2002).

The US Environmental Protection agency offers preservation of open space, including critical environmental areas, as one of the most critical policies in its Smart Growth Principles (USEPA 2004). The agency recognizes the need to preserve open space as a key part of watershed protection programs. Large open areas serve to “ reduce and slow runoff, absorb sediments, serve as flood control, and help maintain aquatic communities” (USEPA 2004, p. 19). Open space to protect streams often entails the creation of buffers or setbacks along streams (riparian corridors). These linear areas prevent or minimize introduction of pollutants from adjacent lands.

Protection of ecologically significant land or water areas can be achieved most directly by purchase of land by a public entity. Many states and local communities have developed parks and park systems to provide both habitat for non-human species and recreational areas for humans. Direct purchase of land, or purchase of development rights or easements, removes the land from the local or regional land market. Since the early 1990s there has been dramatic upturn in state open space programs and in support of open space protection by the electorate. During this time period, thirty two of fifty states either created new programs or enhanced their existing programs. These are largely the states experiencing more rapid urbanization patterns (Hollis and Fulton, 2002, p. 22).

Local governments can protect open space through planning, zoning and subdivision design. In states which require local comprehensive planning, inclusion of natural resource and open space elements is the most direct way to ensure that communities take these resources into consideration when planning future land uses (University of Wisconsin & Wisconsin Department of Natural Resources 2002). One approach to land conservation at the local level that builds on comprehensive planning is combining community-wide effort to identify key open

space areas (public and private) and coordinate creation of open space at the site planning or subdivision level. Many communities today allow for “conservation development,” whereby at least 40% of the land in a subdivision remains undeveloped to protect a variety of resources amenities. With forethought, a community can coordinate the location of this site-level open space across the community to link up open space in subdivisions, and perhaps with public open space, to form vital links in a community’s open space network. Through a community open space inventory the community identifies potential conservation areas prior to designating development layouts that will use a conservation development format. As each site plan is reviewed, the development is laid out to allow for connections with open space areas in other developments. Ultimately these areas can be connected to public parks and greenways within the community, and can contribute to a regional open space network (Arendt 2004). These areas will remain open in perpetuity through easements that become part of the subdivision approval process. This approach helps ensure that development, where it occurs, occurs at a more protective pattern that is not indiscriminately fragmented and does not needlessly consume resource lands.

Arendt’s conservation subdivisions, and the move to integrate them at the community scale, are a key part of Pennsylvania’s Growing Greener program, which has helped to protect resource lands in the eastern part of the state. Such an approach can help minimize fragmentation and help retain vegetative materials along riparian areas, critical for maintaining healthy function of tributary streams and other water bodies.

Finally, local communities regulate land use through zoning, which can be used to establish conservation areas, riparian buffers or setbacks, and to avoid development in floodplains. The key to success at the local level is to develop and integrated approach to open space protection through community planning, capital programs, incentives and agreements with local land owners, and zoning ordinances. Such as system offers some protection to local communities from legal challenges to their efforts to protect public health and safety and the overall welfare of the community.

Private Entities and Mechanisms

Individual land owners and nonprofit land trusts are the two types of private entities that can conserve land and its natural resources. Individual land owners may receive tax incentives through their preservation efforts. These incentives can be used to protect important natu-

ral resources such as forests or fields, other habitat areas, wetlands, or to create buffers in riparian corridors to protect streams.

The impact and effectiveness of private participation in land conservation programs is equivocal, however. For example, a study of Tennessee's Forest Greenbelt Program, in which private landowners can receive use-value taxation on property as long as the property stays in forest, found that the program failed to protect forest largely because land owners either didn't know about the program, their participation failed to change their plans for land conversion in the future, or the tax benefits were not sufficient enough to influence their decisions (Williams, et al 2004).

One type of entity that can play a significant role in land conservation is the nonprofit land trust or conservancy organization. These types of organizations are incorporated as nonprofit organizations and have the legal right to hold land either through purchase or by holding an easement on a property the organization does not own. The first land trusts in the United States began in the late nineteenth century in the Northeast US in response to urbanization. However, by the 1950s rapid urbanization across the country resulted in an equally rapid expansion of these organizations. By the end of the 20th century, there are more than 1,200 land trusts operating in the United States. These land trusts are engaged in land conservation for wildlife habitat protection, wetland preservation, greenway establishment, forest protection, recreation lands, watershed protection, and farmland protection (Whittaker 1999). Most land trusts are small organizations and operate on a local or perhaps regional scale, although the Nature Conservancy is a well-known exception.

The relative effectiveness of land trusts and conservancies has not been systematically assessed, however thousands of acres across the United States have been conserved. A key question concerning the role land trusts relates to which land or for what purpose in terms of a qualitative assessment of their effectiveness. Whittaker (1999) reports that there seems to be a correlation between the size and capacity of the organization and its approach to property selection and acquisition: the larger the organization the more likely they use a strategic approach that identifies key properties for conservation based on a set of criteria. In contrast, smaller organizations tend to operate opportunistically (p. 269). However, regardless of the approach, land removed from the local land market through the efforts of land trusts will not likely be developed.

8.4.1.3 Urban Containment

The notion of “urban containment” implies a more coherent and perhaps strategic understanding of open space and working landscapes. Rather than focus on individual parcels or tracts of parcels with significance for working landscapes or habitat to be “saved” from development, an urban containment approach would operate at the landscape or watershed level and identify areas that should be designated as barriers or separators to urbanization.

One of the most comprehensive assessments of the effectiveness of policies for managing growth and protecting open space was conducted by Bengston, Fletcher and Nelson in 2004. They describe the main policy instruments proposed and used for managing urban growth and protecting open space at various government levels. Their study itself is evidence of the growing recognition among scholars and policy analysts that “growth management and open space protection are two sides of the same coin” (Bengston et al 2004, p. 273). They conclude that the most effective way to protect open space is by effectively containing and managing urban growth. The study did not, however, make any conclusions as to how effective open space policy might be in constraining land conversion itself. The authors note, however, that many of the same policies useful to growth management are also employed for open space protection, including fee simple or easement acquisition of land, zoning regulation including clustering homes, and tax credits, differential assessments, and transferring development rights (p. 275).

Urban containment through greenbelts or other open space has been less studied, and there have been no research to date that explicitly addresses the question of how open space protection programs affect metropolitan form (Hollis and Fulton 2002). The explicit policy/planning attention to use of greenbelts to shape urban form at the turn of the century (Cleveland Metroparks is a good example of this strategy) was lost as an integral part of regional planning in most of the United States during the second half of the 20th century. Today the natural resource-based literature is “reaching out” conceptually to regional planning and attempting to think through urban form and conservation.

For example, Ryder’s (1995) examination of four state growth management programs (Florida, Georgia, Washington and Oregon) for the degree to which each incorporates greenway planning. The objective of the research was to ascertain whether the state’s growth management program had incorporated greenways and was supporting greenway development, or

if not, greenway preservation were still primarily traditional grass roots efforts. The study then compares greenway project implemented in a county with growth management requirements and county without requirements in Washington State. The state program explicitly encourages local jurisdictions and regional agencies to use greenways to achieve the goals of the growth management act. The legislation also requires designation of urban growth areas, separated by “urban separators,” essentially open space corridors or greenways (Ryder 1995, p. 424). The state’s growth management emphasizes establishment and protection of integrated ecosystem corridors. The author notes that a reciprocal relationship between greenways and growth management has occurred in the state, where grass roots greenway advocates have found support in the state’s growth management planning requirements (p. 429). The study suggests that growth management programs that include conservation of ecological resources can provide added support to locally-based conservation efforts initiated by citizens, primarily because it brings a systemic perspective to understanding the process of landscape change and ecological resources.

A study of the application of the Oregon’s requirements for urban growth boundaries in most larger settlements found that while the state’s land use planning under its growth management programs did concentrate development within the urban growth boundaries, it could not be confirmed that the same planning efforts would reduce the likelihood of development on rural resource lands, forest lands and farm use zones. The affect of the urban growth boundary on lands outside the boundary is difficult to measure, in that lands outside the boundary would be less likely developed simply by virtue of their further distance from the center (using a land-rent model of land value to determine likelihood of development) (Kline and Alig 1999).

The literature suggests that there needs to be explicit attention to landscape preservation to preserve it, not just a notion of a boundary. One illustration of additional concerns is that of land fragmentation. As a rule, fragmentation of landscape into a mosaic of different types of uses impedes ecological function overall. Most animals find a fragmented landscape more difficult to navigate, and fragmentation can easily result in the loss of sufficient quantity and adequate quality of habitat. Fragmentation of landscape type in a watershed often implies increased sediment erosion, and more difficulty in preserving the vegetative riparian corridor critical for stream health.

Ryan and Walker (2004), examining the relationship between private farmland and public greenways, suggest a mix of regulatory and financial incentive mechanisms in a given

area will likely have the most success in making connections and reducing fragmentation. This success is measured on the basis of the amount and quality of land preserved, and also on the basis of the strategic alliances formed between private landowners, farmers and recreational advocates that collaborative, complementary efforts can provide (p. 197).

8.4.2 Implications for the Ohio Balanced Growth Program

The rationale for examining the role of land conservation or preservation in the Balanced Growth Program is that land that is conserved in some way is effectively taken out of the potential land for development and therefore can be used to protect areas of critical resource value to Lake Erie. Policies and programs that support conservation can also be thought of a “pushing” development away from a given area. Any conservation or protection mechanisms for the Balanced Growth program should also prevent or reduce fragmentation of landscape characteristics which will in turn support more healthy ecological systems.

Figure 8 below presents the land development model with variables related to land conservation and open space highlighted. Table 17 presents the annual budget for programs related to agricultural and open space protection and conservation. Table 18 presents the OLEC agency programs of key importance for implementing in the Balanced Growth Program.

The Ohio Department of Agriculture, one of the OLEC member agencies, works with local governments, land trusts, and private land owners to encourage preservation of farmland. The agency oversees five programs which either restrict development through easements or support farms as businesses. Under the agriculture easement programs, farmers can donate development rights to their land to the state of Ohio or to local governments. Donated land is enrolled in the Current Agricultural Use Value program (CAUV), making it eligible for reduced land taxes as a benefit to the farmer. The agency also administers an agricultural easement purchase program, which is funded through the Clean Ohio Fund. Easement purchases must be nominated by local governments or land trusts on behalf of the farmer. Once the easement has been purchased, the property is also enrolled in the CAUV. From 2002-2004, the agency used \$12.5 million in Clean Ohio Funds and \$3.3 million in federal grants to purchase easements on 37 farms and options on 12, totaling nearly 9,000 acres. However, there was no money allocated for the agricultural donation program in 2004 or 2005.

Table 17. ODNR Budget* for Land and Natural Resource Conservation and Protection (2006)

ODNR	2006
<i>Agency divisions/direct action</i>	
parks and recreation	74,096,000
Natural areas and preserves/scenic river/NERR	44,544,600
forestry: restoration/management	26,929,300
soil and water conservation	32,387,600
Coastal management	11,168,300
water: resources & management (dam & flood plain)	16,647,700
Wildlife	84,258,000
Total	290,031,500
<i>Conservation/restoration/resource management</i>	
forestry watershed program	
grassland restoration program	75,000
forestry stewardship program	2,420,000
urban forestry program	500,000
wetland restoration program	200,000
<i>Agricultural</i>	
NW Ohio windbreak program	
agricultural easement donation program	
<i>Coastal management</i>	
coastal erosion area permit	
coastal management assistance grant	250,000
erosion control loan program (coastal)	
shore structure permit	
state and federal consistency	
Lake Erie submerged land lease program	
<i>Streams/erosion/NPS pollution</i>	
agricultural pollution abatement cost share	
nonpoint source pollution education program	10,000
Lake Erie conservation reserve enhancement	1,145,625
streams and storm water program	140,000
watershed action grants/coordinator grant program	843,000
<i>Trails/recreation</i>	
land and water conservation fund	450,000
nature works program	1,878,604
Clean Ohio trail program	6,500,000
recreational trails grant program	1,000,000
Total grants and loans	15,412,229
Total direct agency plus grants and loans	305,443,729

*Figures based on search of agency web page, state budget, and provided by OLEC Inter-agency taskforce.

Table 18. Key ODNR, ODA and OEPA Land and Ecological Conservation Policies, Programs and Incentives

Direct State Action	Policy Description	Affect on land development pattern	Literature	Focus group	Change Needed
State and federal consistency	Ensure state and federal activities area consistent with policies of Ohio Coastal Management Program	Can protect high value coastal areas from development and other damage			Need to make sure that Ohio Coastal management program is fully funded and staffed to secure NOAA funds and participate effectively in BGP
Stream wetland mitigation program	Avoid, minimize and mitigate impacts to streams and wetlands from state transportation systems	Emphasis on avoidance vs. mitigation would likely change presence or location of road infrastructure	Hollis & Fulton 2002; USEPA 2004	Residential development group was willing to set aside more wetlands in exchange for streamlined permit process	State should put priority on avoidance rather than mitigation; projects that are “mitigated” should require investment in same watershed
TMDL program	Water quality compliance plan where technical controls are not sufficient	Depends in great part on addressing NPS pollution at the site level; BGP best practices	USEPA 2004		Give priority to TMDL program in BG watersheds
Floodplain management program	Technical assistance on floodplain management to local governments	Development in floodplains continues to disrupt stream areas and cause additional erosive pollution and property loss	USEPA 2004		More rigorous/restrictive application of floodplain program to support local riparian protection efforts
PCAs	Incentive description	Affect on land development pattern	Literature	Focus group	Comment
State					
Clean Ohio Conservation Fund	\$37 million per year for land purchases	Funds state purchase of riparian corridors and open space which will preclude land conversion	Daniels 1991; Whittaker 1999; Ryder 1995; Hollis & Fulton 2002	Not a point of interest to focus group participants	Strategic purchases should be coordinated with local governments, regional park districts, land trusts; support multi-county efforts for green networks
Local					
Agricultural easement purchase program	grants to local governments and land trusts to make purchases	Prevents conversion of agricultural land to urbanized form	Nelson 1992; Beesley 1999; Daniels 1991; Maynard 1998; Brabec and Smith 2002; Hollis & Fulton 2002	Not a point of interest to focus group participants	Literature cites as an effective mechanism for farmland protection if funded sufficiently
Land and water conservation fund	Federal grants to local governments for recreational open space; 50% federal reimbursement	Sequesters land from development; can be used to protect resources	Bengston et al 2004	Not a point of interest to focus group participants	Public acquisition of land to prevent conversion is most effective in perpetuity; funds limit quantity of land that can be acquired or put in easement
Natureworks	State bond \$ for acquisition, development, and rehabilita-	Recreational areas remove land from developable stock; may	Bengston et al 2004; Hollis &	Not a point of interest to focus group participants	Well-defined regional trail network can be used to constrain settlement expansion; this network can be coordinated

	tion of recreational areas	stimulate development in area if zoning not appropriate, e.g. if zoning allows for residential development in contiguous areas	Fulton 2002		through funding to BGP watersheds; state coordinates with Metroparks and nonprofit land trusts to create
Clean Ohio Trails Fund	Part of state-wide bond issue of \$200 million	Emphasis on land acquisition to protect natural resources	Bengston et al 2004; Hollis & Fulton 2002; Ryder 1995	Not a point of interest to focus group participants	Well-defined regional trail network can be used to constrain settlement expansion; this network can be coordinated through funding to BGP watersheds; state coordinates with Metroparks and nonprofit land trusts to create
Recreational trails grant program	Financial assistance to local governments to acquire trails	Removes land from developable stock; might be used to connect regional trail network	Bengston et al 2004; Hollis and Fulton 2002;	Not a point of interest to focus group participants	Well-defined regional trail network can be used to constrain settlement expansion; this network can be coordinated through funding to BGP watersheds; state coordinates with Metroparks and nonprofit land trusts to create
Agricultural security areas		local government commits to no extension of water, sewer, roads	Beesley 1999; Hollis and Fulton 2002	Not a point of interest to focus group participants	State could provide additional tax incentive on top of local property tax exemption
Private					
Agricultural security areas	Agreement between local government and local farmers; tax exemption	landowners agree with local govt. not to undertake non-agricultural use	Beesley 1999; Hollis and Fulton 2002	Not a point of interest to focus group participants	State could provide additional tax incentive on top of local property tax exemption
Easement donations	Donation by private land owner of easement to state or land trust	Precludes change in land use	Whittaker 1999; Ryan and Walker 2004; Beesley 1999; Hollis and Fulton 2002	Not a point of interest to focus group participants	Coordinate strategically with regional conservation and park organizations
Conservation subdivisions	zoning and subdivision regulations for clustered development to avoid on-site resources	Can be linked to regional open space network	Arendt 2004; Whittaker 1999;	Focus group participants urge wider use and support;	OLEC should work with local incorporated jurisdictions and with counties (which control township subdivision regulations) to institutionalize across the Lake Erie basin; education and outreach; coordinate within local jurisdiction with comprehensive planning ;
PDA's	Incentive description	Affect on land development pattern	Literature	Focus group	Comment
Private					
Section 401 isolated wetlands permits	Program regulates dredging and filling activities in waters of the state	Allows development in or near high ecological value areas		Participants acknowledged the local and state interest in protecting water quality and wetlands; were willing to accept more stringent standards for streamlined permit process	State technical assistance should focus on design of projects to avoid disruption of wetlands; state develops "one-stop" permit process in coordination across agencies and with local jurisdiction if development threatens wetland

Two ODA programs focus on strengthening existing farms in the state. The Ohio Farm Loan program supports projects that generate agriculture-related economic development in rural communities. The Family Farm Loan program is designed to enhance the economic viability of the state's agricultural areas. Under the program, the state will guarantee up to 40% of a bank loan to the farmer, ranging from \$25,000 to \$200,000. In 2006, the budget for these two programs was slightly over \$175,000.

A fifth program, the Ethanol Incentive Program, allows for a tax credit for individual farmers wishing to invest in an ethanol plant. The tax credit can be 50%, up to \$5000.

While these programs are important to individual farm families and businesses, it is striking how little budget the programs receive on an annual basis, particularly compared to ODOT. It is doubtful that a budget less than \$500,000 will achieve desired results when land conversion stimulated and facilitated by highway expansion is funded at levels nearing \$2 billion on an annual basis.

An innovative farmland preservation mechanism that should be considered by the state is equity insurance. As describes by Adelaja and Schilling in 1999, under an equity insurance program the state, county or local government establishes an insurance policy that guarantees a farmer the future value of the current difference between the market value of his/her farmland and the development-restricted value in exchange for development easements. The easement value is paid to the farmer if the land is sold to another farmer, to the farmer when s/he retires, or to the farmer's heirs. The government entity pays the premiums on the insurance policy, and gives the farmer 10% of the value of the easement value and interest on the premium payments. Since much farm acreage is lost to development conversion upon retirement or inter-generational transfer, equity insurance can help farm families maintain the land as farm (Adelaja and Schilling 1999, p. 127). The authors suggest that such an insurance program can dramatically increase the resources available for purchase of easements, confirming the results of other studies that have shown easement purchases as an effective mechanism for land protection, but one that chronically suffers from insufficient levels of funds.

The Ohio Department of Natural Resources (ODNR) strives for conservation and wise use of Ohio's natural resources through management, planning, delivery of services, and collecting and disseminating information about environmental protection, economic development, and natural resource management decisions. ODNR employs approximately 3,400 permanent and seasonal staff; has a total annual operating budget of approximately \$326,000,000.

ODNR's 13 statutory divisions cover 3 areas of responsibility: recreational management, resource protection, and resource management. The agency has operations and facilities in each of the 88 counties where ODNR owns or manages more than 482,000 acres of land comprised of 74 state parks, 20 state forests, 123 nature preserves, and 100 state wildlife areas. ODNR has jurisdiction over more than 100,000 acres of inland waters, as well as Ohio's portions of Lake Erie and the Ohio River. ODNR also manages the state's water resources, coordinates activities of county soil and water conservation districts, and supports local recycling and litter prevention programs.

The agency's services and activities include: resource management by sustained productivity of Ohio's renewable natural resources, promoting the wise use of non-renewable natural resources, and protecting Ohio's threatened and endangered natural resources; economic development through job creation/expansion/retention, stimulating local economies, developing industry and tourism opportunities, and supporting the present and future economic health of the state; health and safety through fair and consistent law enforcement, participating in regulatory matters and identifying and responding to environmental hazards; and recreation through leisure services and recreation opportunities for the public.

Administration of ODNR's programs provides an opportunity to shape landscape patterns in the Ohio Lake Erie basin. Together the major divisions of the agency (parks and recreation, natural areas and preserves, forestry, soil and water conservation, coastal management, water resources management, and wildlife) could have a direct influence on the location and quality of land development. It is critical that the divisions of ODNR work together at the regional and watershed scale to collaborate on developing a set of strategic projects to guide direct ODNR action, and collaborate on funding sources to provide incentives to support the Balanced Growth Watershed Plans. For example, parks and recreation division includes land acquisition function; the soil and water conservation division provides technical assistance regarding soil erosion and conservation, primarily through the soil and water conservation districts; the coastal management office coordinates across several state and federal agencies to ensure compliance with the state's coastal management program; the water division controls dam programs and administers the state's floodplain management program; the wildlife division includes efforts to protect the state's fisheries. These aspects of the program, if coordinated through the Balanced Growth Program, could marshal resources to protect prime areas

for inclusion in the PCAs. This coordination should be accomplished through the OLEC inter-agency task force, and through the district-level offices of the programs.

The Floodplain Management Program could be a key locus for change at the state level. The program provides advice and technical information to reduce the impact of flooding. Emphasis is placed on floodplain management and coordination of the National Flood Insurance Program. The staff recommends management strategies to reduce flood damage and promote the natural benefit of floodplains. It also serves as the state repository for flood data, coordinates efforts of federal, state, and local agencies involved in flood loss reduction programs, and assists communities in gaining and maintaining eligibility for participation in the National Flood Insurance Program. A more rigorous application of the program, with an enhanced emphasis on the natural benefits of floodplains, would support local efforts to protect riparian corridors and head water areas.

ODNR and other agencies collaborating on the BGP should develop a Lake Erie basin wide greenspace/openspace plan. Building on existing efforts of land trusts and conservation organizations, county and regional park systems, the state should help “connect the dots” in terms of acquisition of rights-of-way and other corridors between parks. Many of these connections will be made along riparian corridors, which will support stream health and reduce fragmentation as well. The state can also assist technically by support inventory and analysis of open space in terms of strategic needs for watershed protection, thus supporting land conservation more effectively rather than on an ad hoc, opportunistic basis. This should occur in the Pilot Watershed planning processes, but needs to be encouraged throughout the Ohio Lake Erie basin.

While development of a basin-wide open space network will not literally contain urbanization, the land protected will preclude development, thus altering the expected pattern of development. PDAs are one component of this effort, but the state’s direct acquisition of land or easements must be increased as well to support this connection. State input to designation of PCAs as high priority protection areas will be critical to making the connections between resources at a regional, basin-wide scale.

One untended consequence of added recreational facilities such as parks and trails might be to stimulate land development. The scenario would arise if investments in recreational facilities make an area attractive in terms of lifestyle, and the development sector perceives value in those amenities. Projects that improve the recreational amenities in an area are,

in effect, economic development activities. The BGP should be sure to include trails that improve amenities in urban or already urbanized areas. Adoption of best management practices suggested by the Balanced Growth Program by local jurisdictions through which these trails pass is critical to head off further degradation of riparian and other habitat areas and water quality that might occur as a result of the secondary economic effects of trails. In terms of incentives, added weight to awards of funds through the various trails programs could accrue from a project's presence in a BG watershed process and adoption of best land management practices along the trail.

The Balanced Growth Program can be used to encourage local communities to plan for natural resources protection and improvement in their comprehensive, master or strategic plans. As part of the process to identify PCAs, each community should bring forth its critical natural and cultural resources that it seeks to protect. These assets should be identified through a community natural/cultural resource inventory based on science and community preferences. This inventory can be used to identify how natural and cultural resources protection relates to other communities goals and priorities. For example, natural areas can increase property value in the community, can help support local economic activity, and can protect groundwater and surface water needed for consumption and production (University of Wisconsin & Wisconsin Department of Natural Resources 2002).

8.5 Tax Policies and Fiscal Conditions

8.5.1 Literature Review

Tax policies at the state and local level can unintentionally or intentionally stimulate land development or land conservation practices. The literature on tax policies arrays in four major subject areas: stimulation of urban redevelopment; protection of farmland; protection of habitat and natural resource lands; and influences on urban form.

Bengston et al (2004) suggest use of a split-rate property tax to stimulate urban infill development. A higher tax rate is applied to land values and a lower rate for improvement values such as buildings. This reduces tax burdens on land-intensive uses and increases tax burden on land-extensive uses, e.g., parking lots. Such a tax policy provides an incentive of lower taxes for capital investment in building improvements, and takes away the speculative value of holding undeveloped property with the urban growth area, thus promoting infill and redevelopment. Experience in Pennsylvania verifies this result (Bengston et al 2004, p. 277).

In programs designed to protect farm and natural resource lands, the working hypothesis is that tax subsidization will provide sufficient incentives to prevent conversion of land. That is, the land owner will perceive that the benefits gained from the tax incentive are greater than the expected benefit from selling the land for urbanized development (Williams et al 2004). Regarding protection of farmland, several studies examined the effect of tax policies on land development patterns and effectiveness of tax policies for growth management. Nelson's 1992 study of farmland protection in Oregon found that property tax relief had a tendency to induce urban sprawl in the long run (supporting Williams et al's conclusion that tax policies only delay land conversion) in the absence of other land controls. Nelson found that tax programs create or raise speculative value by distorting land value. They tend to extend the "impermanence syndrome" farther into the landscape by subsidizing the holding costs of inefficient speculation or turning farmers into speculators (p. 4). Nelson found that although states assess a penalty if a farmer in the program converts the land, no state requires full payback of the tax savings.

Adelaja & Shilling 1999 note that tax reductions and incentives, which all states have in one form or another, do not permanently protect farmland, but rather promote farm viability, which is subject to other influences as well.

Beesley's (1999) review of farm preservation programs, which surveyed agricultural policy experts in the United States and Canada, concluded that tax incentives, while the most frequent mechanism instituted for farmland preservation, are the *least* effective farmland preservation tool.

Regarding protection of forested lands, Williams et al (2004) investigated the use of use-value taxation of property in the Tennessee forest greenbelt program and evaluated the effectiveness in protecting forested land. The study considered the programs to be effective only if the results primarily targeted those parcels facing conversion pressure; that is, if the majority of land owners enrolled in the tax program is not facing development pressure, the program is not working as intended. In a previous study of Tennessee's forest greenbelt program, researchers found that many properties enrolled in the program lie outside of areas in development pressure. The tax program was not preventing development per se, and in effect shifted the tax burden to non-enrolled properties. The Williams study confirmed previous studies that suggested that use-value taxation delays conversion, but does not prevent it.

Bengston et al and other authors note that tax incentive, purchase of development rights, or conservation easements, in the absence of zoning and other techniques, might actually stimulate development, as the patchwork of protected lands become a magnet for development on adjacent or nearby unprotected land (Bengston et al 2004; American Farmland Trust 1997; Bowers 2001).

Hill et al (2003) and Puentes and Prince (2003) document how current distribution policies for the federal gas tax tends to be biased against urban areas (see Section 7.1 Transportation Infrastructure).

School funding and local property taxes can be a key element in the decision making process by families, businesses and developers. Regarding the relationship of fiscal and tax aspects of local government and urban form, two studies hold important implications for the Balanced Growth Program and for Ohio. In a study of 289 medium-sized cities in the United States published in 2006, Thomas examined the fiscal forces shaping local development patterns to assess the conventional wisdom that local governments seek retail and high-end residential development to increase tax revenues. A very significant factor fueling high-end residential land development was the need for revenue in the face of rising public expenditures. The connection to development to meet rising public expenditures was more pronounced in metropolitan areas in states with limits to state funding (Thomas 2006). This is a critical finding for Ohio, where the state's proportion of school funding is relatively lower than in many states, resulting in a heavier burden on local governments to fund school operating budgets. As a community begins to grow, rising expenditures for schools necessitate the need for more development that will increase property tax revenues, expanding the need for development and skewing it to high-end residential and retail.

Pendall's (2003) study of upstate New York study identified fiscal disparities between cities and towns as perhaps the most significant contributor to low density development into the countryside. The property tax rates among cities, villages and towns ranges from an average of \$17.47 per \$1,000 in assessed value in townships to \$20.79 in villages, to \$22.15 in cities. This disadvantages cities the most, as buyers get less house for their money—where taxes eat up more of their housing budget—than in towns outside villages. In addition, township houses typically are newer, have larger lots, and have better access to open space and better schools (Pendall 2003, p. 8). Pendall's study also describes how the New York State Empire

Zone program provides tax subsidies for many developments in rural and suburban locations, “often encouraging jobs simply to move from one Upstate location to another” (p 9).

8.5.2 Ohio’s Tax Policies and Fiscal Conditions

There are more than 3,600 taxing jurisdictions in Ohio. These different authorities have produced very many different taxes – sales, income, and property-- on individuals and on business-- corporate franchise, personal property, and investment credits. All taxes may influence where a business or a resident locates. The key themes that were gleaned from the interviews of policy experts and practitioners are instructive as to the current status of tax policies in the state and their influence on development location and type:

- The different local tax rates and tax breaks give jurisdictions the tools to compete for businesses to locate within their borders. Therefore, politicians determine development, not the free market.
- Business is more sensitive to the weight that state and local tax policies bear on where they decide to locate. Residents tend to select amenities – schooling, shopping, safety, recreation, and highway access – first, before considering retail sales, income, and property taxes. The exception is when communities, such as Cleveland, offer residential property tax abatement. This does seem to be influencing certain households to move into new housing in the City of Cleveland.
- The state gas tax is reallocated equally to all counties, not to jurisdiction from which it was collected. Therefore, traffic problem areas do not receive transportation dollars in proportion to their needs. Thus, the worsening traffic patterns in urban areas contribute to relocation in suburban areas.
- Regional tax sharing, as in Minneapolis-St. Paul and Sacramento, reduces competition and improves conditions to control development.
- Counties want sales tax income, so they offer incentives to locate within their boundaries; municipalities levy income taxes, townships do not. People move from the former to the latter to save that cost. This contributes to sprawl.
- The state legislature in 2003 failed to pass Governor Taft’s tax reform proposals, substituting instead a one-cent sales tax, which expired in June 2005. That action perpetuates the state’s non-competitive tax system and encourages the loss of business, jobs, and income. It also leaves the location of development largely uncontrolled.
- Representative Sally Conway Kilbane has proposed eliminating the corporate franchise and the personal property taxes for a “business activity” tax, which would be lower and broader, but revenue neutral. This would unburden business and create a fairer and simpler tax system.
- Highway construction and business and residential locations both seem inextricably linked.

Many tax policies exist in Ohio that support land conversion. However, tax programs also exist to promote conservation of resources. The Balanced Growth program can use these

tax mechanisms as incentives. Table 19 summarizes the current tax incentives available in Ohio, organized by their relevance to PDAs and PCAs in the Balanced Growth Program watershed plans. The number of tax policies at the state level for economic development purposes is greater than for those that support land and resource conservation. It will be critical to implementation of the Balanced Growth Program that these tax incentives are used strategically to support development in PDAs and conservation in PCAs.

Pendall’s study of upstate New York is highly relevant for the Ohio Balanced Growth Program because that part of New York has stable population with lower density land conversion expanding into the countryside.

Table 19. Tax Incentives Available in Ohio Related to PDAs and PCAs

PDAs
ODOD
office of tax incentives
community investment area program
conversion facilities energy
enterprise zone
tier, 1 real and personal property
tier 2 franchise, day care & training
tier 3 state income tax, MSA
manufacturing machinery
warehouse machinery sales tax exemption
foreign trade zones program
job creation tax credit
Research and development sales tax exemption
technology investment credit
warehouse inventory tax exemption
worker guarantee program
job retention tax credit
PCAs
ODNR
forest tax law 50% reduction
wildlife conservation area tax credit
ODA
agricultural security areas
ethanol incentive program

8.6 State Planning Function, Context and Jurisdictions

8.6.1. Literature Review

States have the authority to assert control over land use. Some do, and some leave land use decisions nearly exclusively to local government jurisdictions. All states, through their own governance actions, influence land use, however. In over 35 states, the “quiet revolution” in state action regarding land use that began during the 1970s resulted in adoption of some form of land use and planning policies, including growth management policies to influence the timing and location of land urbanization (Abbott et al 2002). These programs vary widely, but most include legislative, regulatory, and incentive mechanisms. A key aspect of state programs related to land use is whether the state itself has a planning agency that works with other state agencies to prioritize and guide development decisions that result in land urbanization. The relative strength of the planning culture in a state, and how that culture is embodied in state law, directly shapes land use planning at the local level. If a state does not have a planning agency, and if the state does not require planning by local jurisdictions, we can anticipate that the planning culture in the state is relatively weak. We would not expect, therefore, to see strong legislative or regulatory mechanisms that might be used to address land urbanization.

Bengston et al (2004) reviewed the literature on public policies for managing land urbanization and open space and derived several lessons, two of which relate to the role of the state vis. a vis. a planning function. First, they report that “one of the clear lessons from the growth management literature is that the use of multiple, reinforcing policy instruments is far more effective than relying on a single technique” (p. 281). For example, Porter, a leading authority on growth management, notes “the hallmark of *effective* growth management...is that these individual techniques are interlinked and coordinated in a synergistic manner rather than applied incrementally and individually (1997, p. 13, emphasis in original). Without such coordination, individual techniques applied may produce perverse results.

Carruthers (2002) evaluated the affect of different types of state growth management programs on five key outcome measures of sprawl: density, spatial extent of urbanized land area, property value, public expenditures on infrastructure, and population change. State programs were examined for the components of consistency requirements, urban containment policies, and enforcement mechanisms. He found that state programs with strong consistency requirements (particularly those requiring vertical, horizontal and internal) and enforcement

mechanisms (requiring local land use plans with specified elements) hold promise for reducing sprawl (p. 1978). The purpose of consistency is to coordinate planning activities of local governments with state policy priorities (vertical), with other localities (horizontal) and to ensure that local land development decisions reflect the jurisdictions comprehensive plan (internal). Programs that did not require consistency or that have weak enforcement mechanisms not only are not effective in shaping land development patterns, but may actually contribute to sprawl. The study also suggested that requirements for concurrency (adequate infrastructure in place prior or concurrent with development) did not exert a strong influence in managing growth in an area.

Carruthers and Ulfarsson (2002) studied the effect of fragmented jurisdictions in the absence of coordinated land planning in metropolitan regions and evaluated the efficacy of promoting jurisdictional cooperation and regulatory consistency across metropolitan areas. Their study examined cooperation and consistency in states with growth management programs. Overall, the authors found that the role of local governments acting separately contributes to low density land development at the urban fringe. While ultimately residential local is a private household choice, local governments, each with land use authority, tend to enact zoning that each considers appropriate to attract residents they consider beneficial to the community. Land use regulation and services set the baseline of affordability in each community; thereafter residents vote with their feet, or their purse strings, to meet their residence requirements (Carruthers and Ulfarsson 2002, p. 316). Developers will seek the lowest land costs, least restrictive zoning and design requirements, and land that has infrastructure. In regions with high growth rates, communities enact more restrictive land use regulations and impose higher taxes as entry “fees” to residents. In regions with little or stagnant population growth, communities compete for residents to fund their community’s need for tax revenues, often providing tax incentives and infrastructure funding for development. Thus local governments help shape private decisions, so development is drawn further and further outward. The study suggests that increasing the consistency of local government responses is desirable, as it mitigates the competition and creates a more “even regulatory landscape by ameliorating the place to place differences that arise through fragmentation” (p. 335).

Mondale and Fulton (2003) describe how the Twin Cities Metropolitan Council shifted its overall regional framework in the course of implementing Blueprint 2030, a regional plan. The Council had used an approach based on concentric rings whereby the Metropolitan-Urban

Service Area line defined the circles. The Council eventually shifted to a landscape framework based on “nodes and corridors,” calling for higher densities and a mix of different types of centers, including downtowns and community centers. The plan even allows for rural growth centers if the communities agree to development guidelines and affordable housing in the latest regional visioning effort Smart Growth Twin Cities (p. 15). The new plan distinguishes six different types of communities in the metro area, and sets specific targets for new growth and re-investment in each area. The focus now is on pattern of development, its location and density, rather than merely the rate of urbanization itself (p. 16).

8.6.2 Implications for Balanced Growth Program

Planning and zoning is enabled in Ohio in sections of the Ohio Revised Code and the Ohio Administrative Code. The state’s laws were written over 50 years ago. The Balanced Growth Taskforce, which worked for two years, focused on changes to OLEC agency administrative programs and practice and for the most part avoided recommending new legislation. The sole exception to this was a recommendation by the Taskforce for new law that would enable transfer of development rights across local jurisdictions. This enabling legislation would provide an important tool for implementing the watershed balanced growth plans currently under development.

The underlying framework for the pilot projects is for jurisdictions in the watershed to collaboratively identify priority development and priority conservation areas. To protect tributary streams, many of these priority conservation areas will likely be designated in headwater or riparian areas that are currently rural, but which in the future may experience development pressure. This potential change in land markets, and the future tax revenue that can be gleaned, is not lost upon local governments. Therefore, it seems likely that in order to forgo expected future revenues, local jurisdictions will need an incentive or arrangement that can replace, at least in part, these revenues. In many states transfer of development rights allow land owners to increase density in one parcel in exchange for forgoing developing in another. If used across jurisdictional boundaries, the land owner or land owners might accrue the profits they desire, but this would required a legal arrangement between the jurisdictions as well. Cross-jurisdictional transfer of development rights, if enabled by the legislature, could provide such a mechanism. Thus in the pilot watershed areas, a jurisdiction with headwater areas designated as PCAs would be more likely to resist development pressure if it could offer TDR options to

land owners. The receiving jurisdiction would get the development, and the two jurisdictions would share in the benefits. If the development rights were applied in a receiving jurisdiction in a designated PDA, so much the better.

Beyond the adopted recommendation of the Balanced Growth Taskforce, other planning and zoning mechanisms should be encouraged through incentives. Numerous watershed plans have been developed in the Lake Erie basin, and it is likely that the Balanced Growth Program will increase thinking on a watershed basis. The literature suggests that enhanced knowledge sharing and collaboration across jurisdictions improves overall planning efforts in a region by avoiding negative externalities from one jurisdiction to another and optimizing benefits through joint planning and implementation efforts. Some states require either vertical or horizontal coordination, or both. Vertical coordination operates between policies at different governmental levels, and horizontal coordination among neighboring communities, regions or states. Some form of regional coordination is a key ingredient to more effective planning and more efficient markets. The need is to transcend local boundaries in the course of land use development and conservation decision making. To the extent that the agencies and programs of OLEC can form a bridge between local and state activities, and encourage inter-local collaboration, the Balanced Growth Program will be supported more effectively.

Many of the incentives identified in OLEC's Lake Erie Balanced Growth Strategy should be used to encourage such inter-local collaboration. This might most simply entail notification of surrounding jurisdictions of proposals for large retail or residential projects. Ideally, jurisdictions would work together to identify PDAs that are contiguous and institute joint economic development agreements to share in benefits, particularly because the negative externalities in terms of traffic increases and air pollution of a project are also likely shared. As stated in section 8.3, under no circumstances should OLEC agencies be supporting development projects that will result in a shift of business activity, jobs and other benefits from one jurisdiction to another in a watershed or in an economic region.

The need for consistency in land use was verified by the focus groups as well. Developers suggested a key part of their investment is learning the many varied requirements for each community. They suggested that a key role for the state would be to promote regional uniformity in key regulations such as zoning, building codes and storm water. Supporting collaborative planning at the state level might provide an opportunity for communities to modify their

zoning together to encourage investment in jointly-designated PDAs and PCAs, and share the benefits, also making it easier for developers to invest in both communities.

9.0 Summary of Recommendations

Note: The conclusions offered in this report are the responsibility of the author alone and do not necessarily reflect the policies or opinions of the Ohio Lake Erie Commission, EcoCity Cleveland, or the Joyce Foundation. The recommendations below include changes to state agency programs. Several recommendations are legislative, and while the author recognizes change to law cannot be accomplished by OLEC or other agencies, the changes recommended are an integral part, if not necessary part, of change that will further support the Balanced Growth Program.

9.1 Administration of OLEC Agencies

Building on the inter-agency task force that has come together to identify incentives to support the pilot watershed plans, the state has proposed to create a State Assistance Work Group which will assist local communities in their efforts to plan for and implement Balanced Growth-related policies and practices through the Balanced Growth Watershed Plans. This group can have an immediate affect on the processes that approve land development and conservation in the basin.

A second type of interagency-coordination is also needed to improve the knowledge set used by the OLEC agencies and their partners in terms of the agencies' own programs and investment (their direct actions) in the basin. The key to successful implementation of the Balanced Growth Program is to design a package of complementary policy instruments that reinforce each other. In addition to supporting the Watershed Plans developed through the pilot projects, the OLEC agencies, along with other agencies such as the Ohio Water Development Authority, should institutionalize the interagency working group that has assisted in the Balanced Growth Project as a basin-wide planning function. This working group should complete the original recommendations of the Balanced Growth Taskforce, which was to develop a collaborative basin wide approach to economic development, transportation and land conservation investments. To that end, this work group would:

- Review all policies, programs and funding allocations for land change effects. This working group, mindful that local governments hold land use authority, should none-the-less take changes in land urbanization patterns that into account in its decision making. These agencies should include a “sprawl” impact calculation/narrative on their ma-

major projects. While rural areas legitimately need and should obtain economic development and infrastructure improvements, the OLEC agencies should do everything to ensure that their decisions do not exacerbate unplanned urbanization. One technique for such a review would be:

- adopt process of impact assessments for major projects that require more than one state agency's approval (e.g. water development authority projects that require EPA permits for installation of new infrastructure) as to the affect on land use. This is to get agencies to review the impacts of their combined activities

9.1 Transportation Infrastructure

- Shift funding for infrastructure to maintenance and replacement rather than expansion or additional interchanges;
- Agencies adopt use of impact assessments for all major projects with extra-local impact or cross-jurisdictional economic and environmental impact, including residential, commercial and industrial development
- TRAC
 - Require analysis of regional impacts of development projects that apply for highway funding
 - TRAC projects brought forward by three or more jurisdictions, based on coordinated planning of needs for land use change (housing, economic development, safety, etc) for their jurisdictions and that demonstrate a regional benefit (not just transferring businesses) based on projections, and in PDAs, receive higher ranking in ODOT and MPO ranking scoring system
- State routes. The state should assume maintenance of all state routes, whether in incorporated or unincorporated jurisdictions, to level the playing field between urban and township areas
- Gas tax funds. Change law to officially allow gas tax funds to be used for public transit projects
- Alternative commercial systems. The state should invest to enhance the freight rail system to reduce truck traffic on state highways and encourage nodal development patterns by focusing rail transfer facilities in existing settlements and PDAs

9.2 Water and Sewer Infrastructure

- An effective strategy to manage the timing of growth in many states has been to require adequate public facilities ordinances or establishment of urban service areas. In effect, PDAs are urban service areas for water and sewer. If PDAs are based on sound projec-

tions for settlement population needs, infrastructure projects in PDAs should be given significant priority over other projects

- State Health Department should prohibit or discourage development of subdivisions with septic systems. This would help prevent “leap frog” development and place developments adjacent to existing settlements. This will reduce infrastructure costs over time and support a nodal landscape pattern that will help conserve key resource areas needed to protect water quality in the Lake Erie basin.
- Applications by local governments for funding for water and sewer infrastructure should include or receive additional priority if an infrastructure needs assessment and plan is included and if the local community ties land use and zoning regulations to the availability of water and sewer lines

9.3 Economic Development

- The ODOD should adopt a policy that no economic development money will be granted or loaned that will simply shift jobs from one county to another within Ohio, or from core urban area to rural areas. If analysis suggests that such a move will have regional benefits, state funding should depend upon the locality losing the business receiving compensation (for example, through shared tax benefits).
- Multiple-jurisdictional economic development projects with shared benefits receive priority in funding
- Brownfield redevelopment programs should be coordinated with the Job Ready Sites Program to prioritize investment in PDAs. The ODOD should change the acre minimum for the Job Ready Sites Program to accommodate relevant site sizes in urban areas.
- Coordination of “one-stop” environmental permitting and economic development funding application process as an incentive for businesses to locate in PDAs
- Two studies by scholars at the Brookings Institution found that communities engaged in managing their growth spatially realized marginal improvements in economic performance relative to other communities, *ceteris paribus* (Nelson and Peterman 2000), saved money on infrastructure, and brought economic benefit to both suburbs and cities (Muro and Puentes 2004). To that end OLEC should publish and disseminate information on the rationale for participation in the Balanced Growth Program and restraint regarding land urbanization for its positive association with economic performance.

9.4 Land Conservation

- Enable transfer of development rights within a single jurisdiction and between local jurisdictions to direct development toward PDAs and away from PCAs

- Strategic collaboration and support of urban containment/green infrastructure protection by working with local governments, Metroparks, land trusts and conservancies. Identify key lands critical to riparian systems and provide incentives in funding when included in PCAs through Balanced Growth Watershed Plans.
- Enable and set up administrative mechanisms for use of land conservation equity insurance program (see page 132 in this report).

9.5 Tax Policies

- Gas tax distribution should be changed to a per capita basis to reflect a realistic level of wear and tear on roads.
- Enable cities to tax land that has remained undeveloped in urban cores for a significant time period at higher rate than developed land to encourage development (conceptually the opposite of strategies to have lower tax rates in rural areas to allow farmers not to develop). The land owner would get a tax break if the land is developed, or if the land is designated (owner authorizes) for use in a city redevelopment plan.
- Alternatively, tax policies could enable a developer who is in process of land assembly, who has clear intent to develop and is working with a local jurisdiction, to put off taxes on property until development project has been realized.
- Increase tax incentives for land owners who sign easement agreements for conservation in PCAs

9.6 State Facilities

- OLEC agencies should adopt a policy to locate government facilities within existing settlements or within designated PDAs in the basin. Facilities under this policy would include location of state service yards, offices, and new schools. New state facilities should be used as an important economic development tool to catalyze and influence private sector to invest in existing settlements and PDAs.

9.7 Land Use Planning and Site Design

- Enable (through legislation) township planning and zoning to include a standard of public welfare. Townships do not have the authority to regulate land use broadly, yet much of the growth at the urban fringe is occurring in townships.
- Provide incentives through funding awards to townships or require townships to coordinate with villages around which they are growing in terms of land use and tax benefits. Tie all funding programs to locations in PDAs. This approach is likely to be sup-

ported in Northeast Ohio, where the Voices and Choices process identified “shared land use planning” as an important step for regional economic development.

- Enable (through legislation) cross-jurisdictional transfer of development rights, joint economic development districts, and joint conservation districts to encourage sharing of tax revenues from development/conservation activities.
- Priority in funding should be given to jurisdictions that complete impact assessments of land development and demonstrate a plan to share benefits and mitigate adverse impacts to other jurisdictions.
- Provide planning and technical assistance grants for local jurisdictions to complete comprehensive plans that designate housing and infrastructure needs for 20 years, include natural resource protection elements, and to change zoning to concur with PDAs and PCAs identified through the Balanced Growth Watershed Plans.
- Provide incentives to cross-jurisdictional coordination of land use and zoning decision making concerning PDAs. Many states require local plans, require regional collaboration, or at minimum regional impact studies for large projects. Ohio currently requires a zoning map for townships and does not require that incorporated municipalities complete comprehensive or master plans. Many states require environmental impact assessment for projects over a set level of significance. Ohio does not. Yet, according to the literature reviewed for this project, coordination and horizontal concurrency have provided effective mechanisms to mitigate negative externalities of larger development projects. The state, through the Balanced Growth Program, can encourage municipalities and townships to coordinate their growth in an orderly fashion with benefits shared across jurisdictional boundaries.
- Enable (through legislation) agricultural and conservation zoning in all jurisdictions.
- Provide incentives to multiple-jurisdiction natural resource/open space protection planning (e.g., extra points on scoring rubrics for funding; special call for proposals, etc.)
- Review decision making assumptions and rubrics for awards and permits to identify bias toward rural, undeveloped areas outside existing small settlements
- Housing. Standard regional land use planning practice includes a calculus of the expected population growth and how this translates into housing needs. As part of the pilot programs, the state may want to retrieve data of baseline housing needs assessment in the watersheds. The literature suggests that if there is sufficient demand and incentives for increased density are in place, the market will shift to multiple family or smaller houses. If these two conditions are not in place, higher densities are not likely to result. That is a planning/design issue, and the state can have an influence there, particularly on counties and through subdivision control. Enabled transfer of development rights would greatly augment the power of incentives for increasing the intensity of development of housing in existing settlements and PDAs

9.8 State-level Planning Function

- The State of Ohio should create a state planning agency at the cabinet level that will have the following functions: 1) identify key investments, development and conservation areas and work with state agencies to coordinate programs and policies; 2) provide technical assistance in local and regional planning to jurisdictions; and 3) develop and provide data to local and regional jurisdictions, organizations and the public to support sound land planning practices.

Future Research Needs

- Identify the geographic location of state-funded and state-permitted projects receiving economic development and transportation, water and sewer infrastructure funding to assess its urban or rural location and affect on land urbanization patterns
- Monitor changes in land use over next decade and longer in the pilot watershed planning areas to assess possible effectiveness of the Watershed Balanced Growth Plans according to the indicators developed through the Ohio Land Use Roundtable process

Implications for Land Urbanization Patterns in the Great Lakes Basin

The states and provinces in the basin, in part due to a shared natural resource base, share a history of exploration, economic development, and more recently, economic decline and loss of population resulting from the structural shift to a “post”-industrial economy in North America (Dennis, 2003; Goetzman & Williams, 1992; High, 2003). The cities experiencing this decline include Chicago, Detroit, Cleveland, Buffalo, and Milwaukee in the United States, and Hamilton, Windsor, and Toronto in Canada. The cities that had grown large and prosperous from steel, shipping, automobile, paints and other chemical production industries lost investment and jobs starting in the 1960s. Middle income and affluent populations began moving away from urban core areas, facilitated in part by the federal interstate highway system which made commute by automobile a viable option.

The states in the Great Lakes basin also have in common their efforts to identify policies and programs that will revitalize the core of metropolitan regions while reducing the spread of urbanized areas across the countryside. This territorial de-concentration of population, exhibiting some of the characteristics used to characterized metropolitan growth as “sprawl” (including low density, auto-dependent, separated land uses), occurred without population growth. By the mid-1990s, public decision makers in the basin recognized the need for

changes to state-level policies and to local planning practice to address this shift, looking to the new “smart growth” agenda for guidance. “Smart growth” policies and programs have been adopted in states outside the Great Lakes basin in the last few years, building on a decades-long practice of “growth management.” Most of these programs have developed in response to increasing population and resulting traffic congestion, rising infrastructure costs, and rapid land development in metropolitan regions experiences population growth pressures (Haeuber 1999). Some have evolved out of farmland, “rural character” or open space preservation movements (Brookings Institution 2003; Benedict 2000; Bengston, et al 2004).

However, the Great Lakes states need an alternative. Not “growth” management per se, for overall the region is not growing, but rather management of the location and type of land development and redevelopment on a metropolitan scale. In the Great Lakes states, smart growth is not a response to burgeoning population, the need for more services, or to relieve traffic congestion. Rather, recent policies and programs are focused on restoring population to the core settlements, rebuilding and revitalizing existing settlements, protecting farm land or rural culture, and protecting rural environmental resources as urbanization occurs (Brabec & Smith 2002; Pendall 2003; Brookings Institution 2003; Maynard et al 1998; Schneider, et al 2005). Core settlements seek to retain and regain population; communities at the fringe seek to manage increased costs for services and the loss of small town or rural character. All communities engage in a competition for new jobs and revenues.

The states in the Great Lakes basin also share a common legal and cultural history that in large part structures how they states respond to changes in economic markets and changing land development patterns. With some variation, these states for the most part assign land use authority at the local level. Many of the states have townships, which cover territory outside incorporated villages and municipalities. Land use authority in the Great Lakes states is extremely fragmented. In addition, the planning culture in these states is weaker than in other states in the United States that have instituted growth management or smart growth programs. By this, we mean that the states do not assume land use authority, do not designate the contents, and often do not require local communities to complete comprehensive plans (with a few exceptions), and do not require consistency in planning between jurisdictions.

This set of conditions suggests that the balanced growth effort in Ohio has relevance for the other states in two ways: the particular setting in a non-growth context, and the reliance on incentives rather than a comprehensive legislative package. In Ohio and the other Great Lakes

states, land urbanization is not a result of increases in population as in other states. Urbanization occurs “at the margin” both literally at the urban edge, and economically. Land development is not accommodating increases in population that stress infrastructure and housing supplies. Rather, it is a function of housing preferences and availability of land ready for development. Programs for smart growth in the Great Lakes basin are not seeking to impede growth but instead tend to focus on the location of growth itself. The key challenge for these states is to identify what location will, in the long run, be most efficient in stimulating and sustaining the economic development needed to improve the well-being of citizens. It seems likely, therefore, that small changes such as those being proposed through the Balanced Growth Program may result in changes on the land to a greater degree than we would expect in a setting of significant population growth. This assumption, however, still rests on creation of a more regional perspective among decision makers, which hopefully will be supported by the Watershed Balanced Growth Plans.

The framing of smart growth on a watershed basis in Ohio may provide an example for the other states in the basin as well. The Ohio effort originated from the Ohio Lake Erie Commission, and the purpose of the Balanced Growth Program is to protect and restore Lake Erie and its tributary streams. The other programs in the basin do not have a watershed-based approach, relying on more traditional land use planning approaches. However, the advantage of the watershed-based approach has already become apparent because it builds on the efforts of existing watershed organizations and because of their efforts and efforts of the OLEC agencies in the past, watersheds have become recognized as a legitimate use of state authority. In states with more traditional legal and political cultures such as found across the Great Lakes basin, a framework that stimulates greater cooperation across jurisdictions regarding land use would provide added support for smart growth programs. In many respects the other Great Lakes states are well-ahead of Ohio’s efforts, including in aspects such as greater levels of planning required by local jurisdictions and the level of organization of technical support for planning efforts. However, the use of the watershed-based framework for managing land urbanization patterns seems an innovative and yet realistic approach that the other states should consider.