Land Use Tools and Techniques

March 2003

A Handbook for Local Communities

SEMCOG . . . Local Governments Advancing Southeast Michigan

Southeast Michigan Council of Governments

Land Use Tools and Techniques:

A Handbook for Local Communities

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Abstract

Land Use Tools and Techniques provides current techniques for addressing local land use decisions with the goal of positively impacting local communities and the Southeast Michigan region, and ultimately, in a healthy quality of life of all residents. The handbook is divided into four main sections – Land Development, Community Design, Environmental Protection, and Transportation. Each section is further divided into several specific chapters. Each chapter contains "Keeping it Connected," noting how issues are interrelated; Planning and Regulatory Considerations; Tools for Implementation, Case Example(s), and Additional Resources. The handbook also includes basic terminology on planning and development, a glossary, bibliography, index, and other available SEMCOG services to assist local member communities. *Land Use Tools and Techniques* is an updated version of the handbook published by SEMCOG in 1994.

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Special Thanks

A special thank you to those who provided pictures and graphics. Appropriate credit has been given under each picture or graphic. All others are from SEMCOG.

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List of Case Examples

Below is a list of case examples found in this handbook. SEMCOG will continue to gather case examples for use by other Southeast Michigan communities. If your community has additional case examples, please submit them to SEMCOG's Information Services via e-mail at infoservices@semcog.org, or fax (313) 961-4869.

Introduction

Southeast Michigan is a region of diverse communities. The region includes older urban areas, new residential subdivisions and commercial developments, small villages, farms, quarries, inland lakes, urban open space, and pristine natural areas. Diversity in communities is accompanied by diversity in visions and goals for each community. A main goal for all, however, is a healthy quality of life for all residents. Core quality of life elements include a strong economy, an efficient transportation system, quality education and housing, a clean environment, and recreational opportunities.

Numerous innovative projects are underway that move communities and the region toward a healthier quality of life. A few examples include:

- Redevelopment projects such Warren's Detroit Arsenal Tank Plant, Monroe's Mason Run, and Detroit's Re$tore Detroit.
- Historic preservation projects such as the gathering of historic buildings into a village structure found in Troy, Livonia, and Clinton Township; and historic districts such as downtown Ypsilanti.
- New urbanism projects found in Dearborn and the Cherry Hill Village mixed-use development in Canton Township.
- Multi-modal corridor studies such as the Eight Mile Corridor Study which partnered Macomb, Oakland, and Wayne Counties with the Greater Detroit Economic Development Group in commissioning a comprehensive corridor study and developing a plan for revitalizing Eight Mile Road.
- Downtown revitalization projects such as Oakland County's Main Street Program that includes the communities of Ferndale, Holly, Pontiac, Farmington, Walled Lake, and Rochester.
- Multi-community planning initiatives throughout Washtenaw County.
- Open space developments in Hamburg and Washington Townships.
- Increased greenways initiatives throughout Southeast Michigan such as the Downriver Linked Greenways Project, the Oakland County Linked Trail System, and the Macomb Orchard Trail.
- Public/private partnerships such as the Rouge River Gateway Partnership between Wayne County; the cities of Detroit, Melvindale, Allen Park, and Dearborn; Ford Motor Company, University of Michigan Dearborn, Henry Ford Museum, and numerous other cultural and education resources which highlights economic revitalization and environmental protection by enhancing the Rouge River.
- Innovative storm water management and habitat programs such as those involving the Rouge River National Wet Weather Demonstration Project, including Inkster Golf Course constructed wetlands project, Green Oak Township's natural rivers overlay district, and the redesign of the Ford Rouge Plant.

These wide-ranging projects are excellent examples of just a few of this region's evolving, successful efforts to make land use decisions that positively impact local communities and the region.

The primary purpose of *Land Use Tools and Techniques: A Handbook for Local Governments* (an updated version of *Land Use Tools and Techniques,* published by SEMCOG in 1994) is to provide SEMCOG member communities with information and best practices to assist them in moving forward the vision for their community.

Pontiac's downtown revitalization efforts.

Historic district in Ypsilanti.

Themes of Land Use Tools and Techniques

There are three overarching themes we encourage users of *Land Use Tools and Techniques* to consider.

The first theme is recognizing the connectivity or interrelationships between different land use decisions and differing visions. What, for example, is the relationship between traffic safety and water quality? Each section of this handbook contains examples of some of the interrelationships between issues that should be considered as part of the local government land use decision-making process. A separate chapter called "Keeping it Connected," discusses this theme in more detail (see page 3).

The second theme is assuring that the master plan and all local ordinances are integrated and consistent. The master plan should reflect the community's vision of itself. Ordinances are a means to achieve that vision. To achieve the community's vision, ordinances must be consistent with each other and with the master plan, and reflect the deliberate, often difficult choices a community makes in preparing for the future. Thus, whenever an ordinance or the master plan is changed, the other should be evaluated as well. This is the kind of dynamic decision-making needed in a dynamic environment.

The third theme is sustainability. SEMCOG proposes that the many practices described in this handbook represent incremental progress in achieving a more sustainable future for our communities and for our region. As our knowledge increases and improves, so will this handbook.

Cherry Hill Village in Canton Township.

How Land Use Tools and Techniques is Organized

This handbook is divided into four sections: land development, community design, environmental protection, and enhancing transportation. Each section contains several topic-specific chapters, each including the following information:

- **Keeping it connected** – Examples of some of the interrelationships that exist between issues that, at the surface, may not seem connected.
- **Planning and regulatory considerations** – Legal background on a specific topic.
- **Tools for implementation** – Specific tools local communities can use in implementing a specific practice.
- **Case example** – At least one case example of a community in Southeast Michigan implementing a specific tool.
- **Additional resources** – Periodicals, books, and Web sites that provide additional assistance on a specific topic.

In addition, final sections of the handbook contain basic terminology on planning and development, a glossary, bibliography, other available SEMCOG services to assist local member communities, and an index.

Mason Run development in Monroe.

Photo courtesy of Crosswinds Communities.

Keeping it Connected

There is a growing recognition that decisions to implement land use policies in one particular area are likely to impact other land use policy decisions. For example, traffic calming techniques could also incorporate storm water management tools. To this end, we propose "keeping it connected," that is, remembering the potential interrelationships of programs during the planning process and then making land use decisions based on the compatibility or incompatibility of these programs. Each section of *Land Use Tools and Techniques* contains a "Keeping it Connected" box with examples of these interrelationships. Figures 1-3 illustrate some of these possible connections in one "snapshot."

To assist local communities wishing to assess these interrelationships during the planning process, here is a sample process to use in determining the relationships between land use decisions and desired outcomes. Benefits of applying such a deliberative process to local decision making are:

- Determining what outcomes are desirable.
- A better understanding of the importance the community attaches to the outcomes (some are likely to be more important than others).
- A new understanding of the level of compatibility (or incompatibility) of desired outcomes.
- Efficiency as a result of identifying land use practices that contribute to achieving several desired outcomes.
- Efficiency as a result of eliminating certain practices that may be impeding desired outcomes.
- Improved likelihood that desired outcomes will be achieved as planned.

Using a Connectivity Matrix

This process can begin by using a Connectivity Matrix; Table 1 is an illustrative template. The columns across the top should be filled in with the community's desired outcomes, for example, improved traffic safety, habitat protection, reduced storm water runoff, and improved walkability.

The rows down the side of the template should be filled in with the land use tools/techniques a community might consider to achieve the desired outcomes, for example, requiring buffer, creating a historic preservation district, building roundabouts, and encouraging open space developments.

In each cell, a qualitative rating is assigned which reflects the community's assessment of using a particular tool to gain a particular outcome. For example, implementing traffic calming with roundabouts (tool/technique) would impact traffic safety, community character, and water quality protection (desired outcomes). Here, all the relationships would be positive since roundabouts contribute to achieving the desired outcomes noted above.

When complete, the matrix provides the community with a big-picture view of the effectiveness of tools/techniques, either being employed or considered. A draft of the matrix could also be used as a tool to foster discussion and input from planning commissions, council meetings, public hearings, and other forums.

Recognizing the values of home rule and community diversity, different land use choices in different communities are not just likely, but desirable. What is important is that each community "keep it connected" by assessing the relationships between possible tools/techniques and desired outcomes.

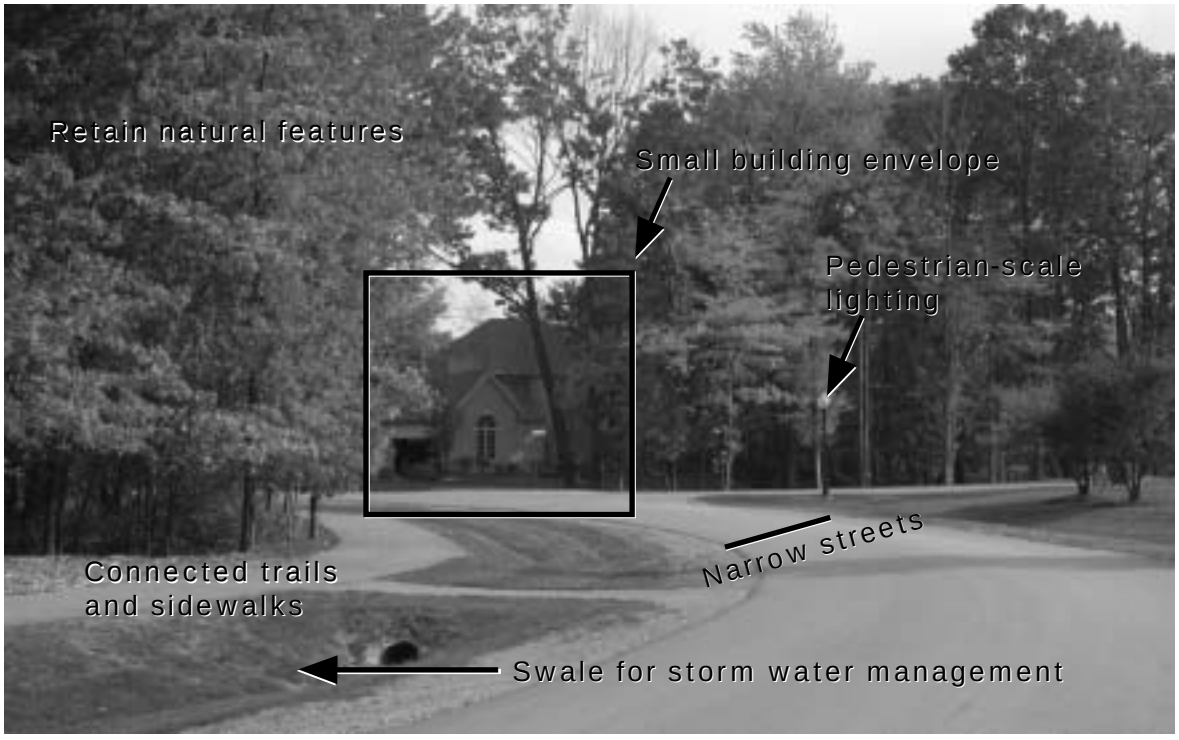
Figure 1
Multiple Benefits of Land Use Decisions, Ferndale

This snapshot of Ferndale illustrates the multiple benefits of various desired outcomes, such as promoting transit, encouraging a walkable/bikeable community, and providing traffic safety.

Figure 2
Multiple Benefits of Land Use Decisions, City of Northville

This snapshot of Northville illustrates the multiple benefits of various desired outcomes, such as pedestrian friendly, traffic safety, economically viable, and preserving community character.

Figure 3
Multiple Benefits of Land Use Decisions, Washington Township



This snapshot of Washington Township illustrates the multiple benefits of various desired outcomes, such as preserving natural features, reducing impervious surfaces, promoting nonmotorized transportation, and preserving community character.

Table 1
Connectivity Matrix

Most land use decisions have long-ranging effects on other local community interests. The matrix below illustrates this linkage. Although desired outcomes may differ based on community goals, the end result of connecting land use decisions with multiple outcomes remains. Below is a sample which illustrates these connections. Following this matrix is a blank matrix your community can use to show the linkages between your community's unique goals and current and/or potential land use tools.

Land Use Tool	**Desired Outcome**								
	Traffic Safety	Habitat Protection	Water Quality Protection	Congestion Management	Efficient Infrastructure Use	Walkable/ Bikeable	Economically Viable	Preserving Open Space	Preserving Community Character
Cluster/Open Space Development	L	H	M	L	M	L	H	H	H
Trails	H	L	L	M	M	H	H	M	H
Reducing Impervious Surfaces	M	M	H	N	H	M	M	L	M
Sign Ordinance	M	N	L	L	N	M	M	N	H
Sewer Infrastructure Planning	N	L	H	N	H	L	H	L	M
Downtown Development Authority	L	N	M	L	H	H	H	L	H
Buffering/Screening	H	H	M	N	N	H	L	L	M
Historic Preservation District	N	L	N	N	N	L	M	L	H

H = High connection between tool and desired outcome.

M = Medium connection between tool and desired outcome.

L = Low connection between tool and desired outcome.

N = No connection between tool and desired outcome.

Table 1
Connectivity Matrix

Land Use Tool	**Desired Outcome**								
1.									
2.									
3.									

H = High connection between tool and desired outcome.

M = Medium connection between tool and desired outcome.

L = Low connection between tool and desired outcome.

N = No connection between tool and desired outcome.

Land Development

Protecting Agricultural Lands

Preserving Public Open Space

Managing Residential Development

Enhancing Older Residential Areas

Managing Commercial and Industrial Development

Enhancing Older Commercial and Industrial Areas

Protecting Agricultural Lands

Many parts of Southeast Michigan's rural areas contribute to both the state's and the region's agricultural economies. However, farming in the region has been diminishing over the years. A significant reason for this decline is the direct and indirect effects of urban development. A dilemma for many communities in the region that still have extensive farming operations is how best to sustain a continued strong agricultural production system while at the same time addressing the demand for development.

For a community seeking to protect agricultural lands, the focus must be twofold: limiting development in predominantly agricultural areas and providing for development away from prime agricultural lands. The degree of success in protecting agricultural land is largely dependent on creating the appropriate planning options that will result in a balanced development pattern.

Keeping It Connected

Many communities feel that all development will result in a net increase in revenues generated for the community. However, recent studies indicate that farmland preservation can provide economic benefits to communities because farms and open land contribute more in tax revenues than they receive in public services (e.g., schools, fire and police protection, infrastructure and road maintenance).

A study of two Michigan communities by the American Farmland Trust found that for every $1 in tax revenue generated by farms and open land in Marshall Township, only 27 cents was required for associated services. For every $1 in tax revenue generated by residential development in that township, $1.47 was required in public services.

Source: American Farmland Trust.

Specific benefits of implementing the suggested tools and techniques include:

- Maintains the most productive agricultural land for food production today and for future generations.
- Reduces development pressures on protected farmlands.
- Discourages fragmentation of farmland for other land uses.
- Provides an area for storm water infiltration and groundwater recharge.
- Generates more in tax revenue than they receive in public services.
- Protects rural character.

Agricultural land in Livingston County.

This section describes some tools and techniques that provide choices for communities who wish to preserve agriculture, including mapping of prime agricultural soils, use of various zoning techniques, and participation in the state's farmland preservation programs.

Planning and Regulatory Considerations

The State of Michigan's Farmland and Open Space Preservation Act (Part 361 of the Natural Resources and Environmental Protection Act (NREPA), but commonly known as P.A. 116) enables a landowner to enter into a development rights agreement with the state. The agreement is designed to ensure that the land remains in an agricultural use for a minimum of 10 years and ensures that the land is not developed in a nonagricultural use. In return for maintaining their land in an agricultural use, the landowner may be entitled to certain income tax benefits, and the land is not subject to special assessments for sanitary sewer, water, or non-farm drain projects.

Part 361 of NREPA also includes a provision for a state purchase of development rights (PDR) program. The PDR program is a voluntary program between the state and landowner and puts a permanent restriction on the land. This program ensures the land will remain in agriculture in exchange for a cash payment to the landowner.

The Michigan Agricultural Preservation Fund and Agricultural Preservation Fund Board was established in 2000 under Part 362 of the Natural Resources and Environmental Protection Act, Act 451 of 1994 as amended. This act provides for the establishment of the agricultural preservation fund, the creation of the board,

the development of an application procedure, and the adoption of various standards and guidelines for the awarding of grants by the Board.

The City and Village Zoning Act and the Township Rural Zoning Act give the statutory authority for local communities to implement various zoning techniques for farmland preservation, such as sliding scale, quarter/quarter zoning, and exclusive agricultural.

Tools for Protecting Agricultural Land

There are several tools communities can draw from to protect agricultural land. This section focuses on the following techniques:

- Incorporating farmland preservation into the master plan.
- Mapping prime agricultural lands.
- Implementing alternative agricultural zoning techniques.
- Participating in a Development Rights Agreement.

Incorporating farmland preservation into the master plan

If farmland protection is a high priority, it must be included as a part of the community's master plan. Public involvement is a vital component to successful protection programs. Farmers, residents, and realtors all need to be included in the master plan process.

The master plan should include:

- A map of all prime and unique farmland in need of protection and lands currently protected under a Farmland Preservation Program. Information is available from the Natural Resources Conservation Service, Michigan Department of Agriculture, or SEMCOG.
- Community goals for protecting farmland and prioritizing existing farmland for future protection efforts.
- A community's participation or support of state or local farmland preservation programs.

Mapping prime agricultural lands

Agricultural protection efforts are typically targeted toward prime and unique agricultural lands. Prime farmland, because of level topography and soil characteristics (fertility, moisture levels, depth, and texture), is the land most suitable for row crops. Unique farmlands are lands other than prime lands that have a special combination of characteristics (e.g., soil qualities, location, topography, and growing season) that make them ideally suited for specialty crops like vineyards, orchards, and vegetables. The Natural Resources Conservation Service identifies prime and unique agricultural lands by county.

Source: "Farmland Zoning." *Community Planning Handbook*. p. 24.

Prime soils are also usually erosion resistant, allowing intensive cultivation with minimal adverse environmental impacts, such as soil erosion and other agricultural runoff. The conversion of prime farmland to other land uses, such as commercial, industrial, or residential increases pressure to farm less productive, ecologically fragile lands, which when cultivated tend to degrade more rapidly, erode easily, and contribute excessively to water quality problems.

Source: *Planning & Zoning for Farmland Protection.* p. 3.

Unfortunately, many of the same characteristics that make land ideal for farming also make it prime for urban development (good drainage, relatively flat topography). Often the motivation for protecting prime agricultural areas that are in the path of urban growth is preserving rural character as much as protecting the resource. Therefore, agricultural protection done in combination with other innovative growth management techniques to guide urban growth to other areas has a higher chance of success.

Implementing alternative agricultural zoning techniques

Various zoning techniques should be considered to protect farmland. These techniques include:

- sliding scale zoning,
- quarter/quarter zoning,
- exclusive agricultural zoning, and
- agricultural buffer zoning.

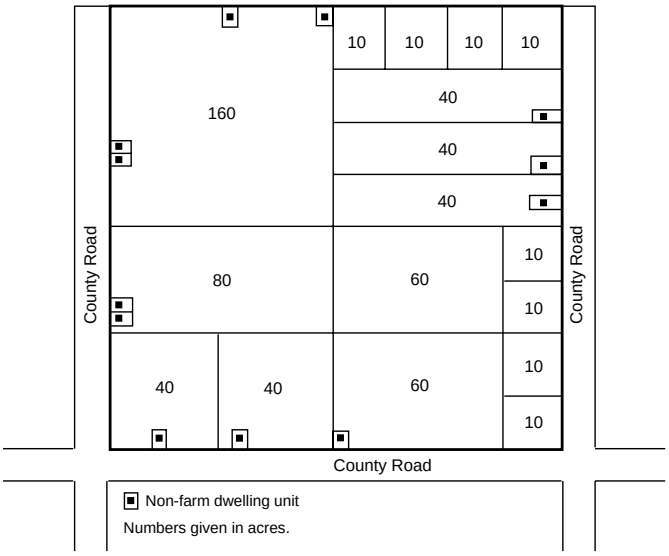
Sliding scale zoning limits the number of lot splits allowed in agricultural areas for other than agricultural uses. The number of divisions (or lot splits of land) allowed depends on the size of the parent parcel. The larger the original parcel, the higher the number of splits allowed, up to a cap (established by the community).

Quarter/quarter zoning allows one residential nonagricultural lot per 40 acres of farmland. (The area of one-fourth of a quarter section of one square mile survey section of land is 40 acres.) Once the lot has been created, the landowner is entitled to no further non-farm development. Parcel splits are recorded and monitored by the local unit of government. If the farmer owns multiple quarter/quarter sections, then all of the permitted lots can be concentrated on one section. The quarter/quarter system works best in areas where the average parcel sizes are 40 acres or more. To further protect present and future property owners, requirements can also be placed on new lot splits that prevent creating inefficient or undesirable parcels. Figure 4 illustrates quarter/quarter zoning.

Exclusive agricultural zoning prohibits all nonfarm dwellings. Agriculturally related activities such as grain elevators, farm equipment repair facilities, etc., need a special permit. If extensive areas are prime agricultural land, the best way to protect them is by prohibiting nonfarm uses, including residences. Communities usually permit residences for family or workers employed on a farm.

Agricultural buffer zoning is a transition zoning technique that can be used to help protect the long-term integrity of prime or unique agricultural lands. A residential/agricultural zone is created in appropriate areas of the community between more intensive development and large tracts of agricultural land. This transitional area, or buffer zone, allows for rural residential lifestyle opportunities and isolates agricultural operations from higher-intensity uses. The buffer district should be placed in areas not considered prime or unique for agriculture. The captured funds can be used within the specified district for various allowable uses, as outlined in the pertinent legislation.

Figure 4
Quarter/Quarter Agricultural Zoning



Note: Allows one non-farm dwelling unit per 40 acres (quarter section), which may not occupy more than 1-2 acres in order to protect farmland. Pre-existing larger land divisions, like the 10-acre provisions shown above, may not be divided further. Farmsteads may occupy the 10- to 160-acre parcels.

Source: Planning and Zoning Center, Inc.

Participating in a Development Rights Agreement

The state has numerous programs in place to preserve farmland by temporary and permanent restriction on development of farmland in return for various benefits such as tax benefits, exemptions from special assessments, and cash.

Table 2
Current Michigan P.A. 116 Agreements
(as of November 2002)

	Agreements	Acres
Livingston	256	21,580
Macomb	44	4,462
Monroe	1,068	69,745
Oakland	43	3,596
St. Clair	245	22,397
Washtenaw	565	52,029
Wayne	20	1,149
Total for Southeast Michigan	**2,241**	**174,958**

Source: Michigan Department of Agriculture.

Farmland Development Rights Agreement (commonly known as the PA 116 program). This is a voluntary partnership between the state and the landowner putting a temporary restriction (minimum of 10 years) on development of the land. In return for preserving their land for agriculture, the landowner receives certain tax benefits and exemptions from special assessments. Table 2 lists the current number of these agreements in Southeast Michigan.

State Purchase of Development Rights (PDR) Program. This is a voluntary partnership between the landowner and the state putting a permanent restriction on development of the land. In return for preserving their land for agriculture, the landowner receives a cash payment. Table 3 lists the acres preserved from 1994-2001 in Southeast Michigan.

Agriculture Preservation Fund. This fund provides grants to local units of governments for the implementation of local purchase of development rights program. These local governments must have adopted a development rights ordinance providing for a PDR program in accordance with the applicable zoning act and adopted, within the last 10 years, a comprehensive land use plan that includes a plan for agricultural preservation.

Table 3
Michigan's Purchase
of Development Rights Program
Acres Conserved by County, 1994-2001

	Acres
Livingston	223
Macomb	78
Monroe	0
Oakland	0
St. Clair	0
Washtenaw	976
Wayne	51
Total Acres in Southeast Michigan	**1,328**

Source: Michigan Department of Agriculture.

CASE EXAMPLE

Comprehensive Master Plan, Urban-Rural Boundary

Community: Fort Gratiot Township

Contact: Jerry Dawson, (810) 385-4489

In 1999, Fort Gratiot Township updated their master plan to include an urban-rural boundary. This boundary divided the township into planned urban and rural areas. The location of this boundary was based on the existing land uses, natural resources, and public services of the township.

The planned rural area contains most of the existing agricultural uses in the township, and the bulk of prime agricultural land will not be served by public water and sewer by the year 2020. The planned land use map arranged the planning classifications, in part, according to the urban-rural boundary.

Multi-Jurisdictional Agribusiness Preservation Program

Community: Macomb County

Contact: John Crumm, (586) 469-5285

The State of Michigan assisted Macomb County and six of its northern townships to create the first multi-jurisdictional agribusiness preservation program. The participating townships include Armada, Bruce, Lenox, Ray, Richmond, and Washington. The program helps the townships meet two primary objectives: 1) to be able to participate in Michigan's Purchase of Development Rights (PDR) program, and 2) to develop and implement tools beneficial to the long-term protection and enhancement of the rural character of the communities.

For farmland preservation to be successful, the practice had to be incorporated into the larger comprehensive plan that addressed how to support farming over the long term. Because state legislation requires that communities have an updated master plan and zoning ordinance reflecting areas targeted for preservation to participate in the PDR program, Macomb County and these communities are working collaboratively to develop a coordinated strategy for future development.

Additional Resources

American Farmland Trust. www.farmland.org.

American Farmland Trust. *Saving American Farmland: What Works*. American Farmland Trust. 1997.

Michigan Department of Agriculture. Farmland and Open Space Preservation Program. www.michigan.gov/mda/0,1607,7-125-1567_1599_2558---,00.html.

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Planning & Zoning Center, Inc. “Farmland/Forestland Protection.” *Grand Traverse Bay Region Sample Regulations*. September 1992.

Rural Partners of Michigan. www.ruralmichigan.org.

Thiel, Craig. *Preserving Michigan Farmland Through Purchase of Development Rights*. Michigan Senate Fiscal Agency. Lansing, Michigan. August 2002.

Wyckoff, Mark A. and Warbach, John D. *Development Guidelines to Protect Community Character*. Training Workshop. 1993.

Preserving Public Open Space

Open space that extends across community boundaries provides opportunities for parks and recreation use by people and for conserving natural features such as habitat for plants and animals. In addition to the environmental and recreational aspects of open space, these areas also provide transportation opportunities through linear trails and bike paths, allow for the preservation of historical areas, and preserve the character of the community.

Often, communities become concerned after discovering that the development pattern established from existing planning and regulatory measures has resulted in little or no valuable open space. In an attempt to remediate this problem, communities find themselves left with a poor selection of land suitable for parks and recreation areas, natural resource protection, or private on-site open space. Very often acquisition costs are so high that acquiring useful parcels is not affordable.

Recognizing this issue, local land use management practices and policies are needed to respond to both the demands for development and protection of open space areas that have natural resource, recreation, and aesthetic value. The tools and techniques that follow provide some direction and options for creating and/or protecting unique and special open space areas. Among these are parkland acquisition, greenways planning, and conservation easements. (Other techniques for maintaining open space can be found in the chapter on Managing Residential Development).

Keeping It Connected

Acquiring and maintaining public open spaces offers benefits beyond recreational opportunities. Parks and recreation increase economic development by attracting tourists, businesses, retirees, and enhancing real estate values. In addition, using open space for parks and recreation can alleviate social problems such as youth crime, relieving stress, and adding to a healthy lifestyle. Finally, parks and recreation can also encompass environmental stewardship by protecting historic sites and the natural environment.

Source: Crompton, Parks and Economic Development, 2001.

Active recreation in Macomb Township.

Planning and Regulatory Considerations

Federal, state, regional, and local entities have taken an active role in preserving of public open space. Both federal and state governments not only acquire land for public open space, but have passed legislation to support acquisition and development of public open space at the local level.

To be eligible to apply for these grants, a local unit of government must have a current community recreation plan on file with the Michigan Department of Natural Resources (MDNR) that complies with current MDNR requirements. These requirements include the prioritization of needs and inclusion of a capital program for land acquisition, facility development, and maintenance schedule. In addition, the plan must be updated every five years.

The federal and state government also compensate landowners for preserving their land as open space through conservation easements. These easements restrict the use on the land in exchange for certain tax benefits and exemptions from various special assessments.

Another mechanism to establish an open space easement is under the “open space” provisions of the Farmland and Open Space Preservation Act, (Part 361 of the Natural Resources and Environmental Protection Act (NREPA), but commonly known as P.A. 116). Property owners may dedicate a portion of their development rights to either the state or local communities. The act enables the property owner to enter into a development rights easement in exchange for property tax relief over a 10-year period.

Tools for Acquiring and Maintaining Public Open Space

Although state and federal government have taken an active role in open space preservation, local communities provide the genesis for most open space preservation efforts. The tools and techniques that can be used to create and protect public open space include:

- Developing a parks and recreation plan.
- Acquiring parkland.
- Financing parkland acquisition.
- Utilizing open space and conservation easements.
- Developing a greenway plan.

Developing a parks and recreation plan

A community parks and recreation plan is a prerequisite for communities interested in receiving federal or state grants. However, as noted above, this is not the only benefit of planning for your community's parks and recreation. In preparing the plan, communities are encouraged to consider local benefits and the overall needs of the community, as opposed to simply focusing on state mandates.

Consider incorporating both active and passive recreational opportunities, such as Waldenburg Park in Macomb Township, when developing parks. This allows various recreational opportunities along with providing essential habitat.

Specifically, the plan can encompass such items as environmental protection and alternative transportation mechanisms. For communities interested in going beyond state requirements, suggested goals to include in a parks and recreation plan follow.

- Appropriately utilize (while preserving and restoring) areas of natural, historical, or architectural significance.
- Enhance and protect the natural resources in the community. Park development and acquisition affecting these natural resources should restore and preserve the resource, improve water quality, preserve wildlife habitat, manage storm water, and enhance recreation opportunities.
- Incorporate alternative transportation opportunities for residents through greenways and trail systems.

Acquiring parkland

One mechanism local communities can employ to provide public open space is directly purchasing land for parks and recreation. Priority areas for parkland acquisition should be clearly stated in the community's parks and recreation plan. In addition, the parks and recreation plan should contain criteria to evaluate a parcel being considered for acquisition.

Following is a listing of possible evaluation criteria. These criteria may be summarized and quantified on an evaluation sheet, however, they are not meant to exclude other salient considerations, such as urgency driven by a parcel's uniqueness, limited time availability, or an emerging recreation activity. The criteria are meant to aid in making a subjective decision to acquire the land using objective information.

Natural resource frontage. If a natural feature (such as a river system) is integral to the community's quality of life, acquisitions along the feature which protect or enable better public identity and use of this asset should be highly rated.

Community-wide system balance/geographic distribution. The location and type of acquisition being evaluated should be considered in relation to what other facilities are nearby. System balance refers to open space, natural areas, and recreation opportunities convenient to all.

Natural resource protection. This evaluation should consider how a proposed acquisition may protect an existing open space from urban degradation, protect a historic or cultural site, or incorporate unique and valuable natural features into the park system.

Environmental enhancement. Some parcels available for open space may have been subject to possible environmental contamination based on prior use. The community can significantly improve the quality of life for its residents by expediting mitigation and making that land available for public use. Parcels with low risk and a strong possibility of successful mitigation would rate high in this category.

Open space and green space imagery/aesthetics. An acquisition which contributes to the visual enjoyment of the community and parks would rate high for this criterion.

Enhance access and linkage. This includes connectivity and linkage of traffic corridors for both pedestrians and wildlife.

Appropriate to adjacent land use. When a site enhances, protects, provides connectivity, or adds missing recreation opportunities to an adjacent park property, it would rate higher in this category.

Protection of watersheds and water quality. Areas that protect or restore the watershed by incorporating fragile or important watershed features into the park system would rate higher in this category.

Suitability for intended use. Sites that help meet a specific need identified to enhance recreation opportunities or provide better balance of park or recreation facilities would rate high on this criterion.

Recreation value. A proposed acquisition would rate high if it provided an opportunity to meet a specific need that was missing in a particular location, and had buildable land for fields or structures.

Method of acquisition/direct costs. Provides the opportunity to rate a site's value relative to how it will be acquired. Grants or gifts would rate higher than purchases. Dedications, easements, and leases may also be preferable.

Multiple-use benefit. Sites which provide opportunities for many recreation activities, active and passive, should be rated high on this criterion.

Community benefit. It is important that the benefit for the entire parks system is considered when evaluating a parcel of land for acquisition. A parcel of land that would benefit the entire community would rate highest in this category.

Provides for future needs/anticipates growth. If the community is growing, future needs for residents must be anticipated and accommodated. A site that addresses future growth and recognizes other agency plans and impacts would rate highest in this category.

Overall cost/benefit to parks system. Each proposed acquisition should be rated according to how well it meets park system objectives of balance and accessibility. Sites benefiting larger constituencies, satisfying recreation needs not otherwise met, or resolving gaps in connectivity would rate higher.

Long-term development and maintenance costs. Excessive development and maintenance costs that a potential acquisition site requires would be a factor in the perceived value of the acquisition. Sites requiring minimal anticipated development and/or maintenance costs would rate higher in this category.

Urgency for acquisition. Certain parcels of land may require a faster decision-making process because there is a high potential for development that would lead to a loss of desirable land.

Consistency with parks and recreation plan. Any proposed acquisition should contribute to fulfillment of the parks and recreation plan based on projected needs. A site which is specifically identified in the plan for acquisition would receive the highest rating in this category.

Source: Ann Arbor Parks, Recreation, and Open Space Plan, 2000-2005.

Financing parkland acquisition

Another issue facing many communities is having the financial resources necessary to acquire land, develop parks, maintain parks and recreation facilities, and carry out recreation programs. Financial assistance is available through state and federal sources to assist communities with acquisition of lands for park and recreational purposes or merely to retain open space and public viewing of a particularly scenic resource. In addition, communities in Southeast Michigan have passed millages specifically dedicated to acquiring land for recreation purposes, and for maintaining and operating parks

Table 4
Recreation Grant Programs
Local Government Funding Limits

Grant Program	Land Acquisition Grants		Facility Development Grants	
	Minimum	Maximum	Minimum	Maximum
Michigan Natural Resources Trust Fund	None	None	$15,000	$500,000
Land and Water Conservation Fund	$30,000	$500,000	$30,000	$500,000

Source: Recreation Grants Selection Process, MDNR, 2003.

and recreation programs. There are two primary grant programs available to local governments on an annual funding cycle —the Michigan Natural Resources Trust Fund and the Land and Water Conservation Fund. The Michigan Natural Resources Trust Fund is a state program that provides a source of funds for public acquisition of land for recreational purposes or for the protection of land deemed to have environmental importance or scenic beauty. These funds are also available for outdoor facility development. The Land and Water Conservation Fund is a federal program that distributes funds to states on an annual basis for community recreation projects and trailway improvement projects.

Table 4 summarizes local government funding limits for both recreation land acquisition and facility development under the two recreation grant programs.

There are several other state programs that offer targeted recreation grant assistance to local communities:

- Boating Waterways Fund, MDNR, (517) 373-9900.
- Coastal Zone Management Program, Michigan Department of Environmental Quality Land and Water Management Division, (517) 335-3456.
- Inland Fisheries Cooperative Grants, MDNR Fisheries Division, (517) 373-6762.
- Nongame Wildlife Fund, MDNR, (517) 241-4632.
- Recreation Improvement Fund, MDNR, (517) 373-1263.
- Southeast Michigan GreenWays Initiative, (313) 961-6675.

Utilizing open space and conservation easements

Another mechanism for preserving public open space is the use of conservation easements. An easement is a restriction on private property which is legally binding on present and future landowners. Initiation of easements by the landowner is voluntary. However, after signing, the easement is an enforceable document binding both parties. When an owner places a conservation easement on land, certain rights are transferred to another person or organization. When the easement document is properly signed and recorded in the county land records, owners cannot exercise the rights which have been given up.

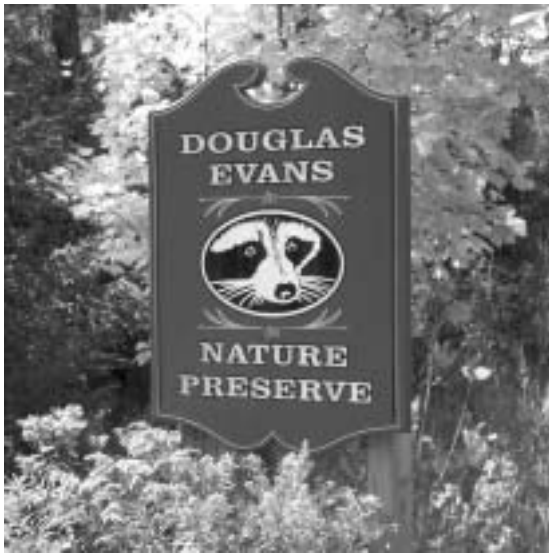
Open space easements allow for certain limited uses and activities such as farming, grazing, or recreational uses. The focus of an open space easement is to maintain open space for human use. For example, conservation easements can be used to provide a guarantee that the open space within a cluster development plan will not be the future site of more structures.

A conservation easement may provide for the land to be left completely in its natural state or provide for limited access. The conservation easement is an effective tool to protect land which is environmentally sensitive or unique.

These easements are often transferred to a land conservancy (or land trust). Land conservancies provide first-hand involvement in land transaction or management. Often, land conservancies help to negotiate conservation agreements and work in cooperation with government agencies to determine open space needs and priorities. Some land conservancies manage land owned by others or advise landowners how to protect and preserve the natural character of their land. Land conservancies also purchase or accept donations of land or conservation easements. Table 5 lists the land conservancies in Southeast Michigan. Local officials can take several steps to encourage use of conservation easements:

1. Identify priority resource areas where conservation easements would be the appropriate tool for protecting water quality, wildlife habitat, and environmentally sensitive lands.
2. Contact landowners in the selected areas to inform them of the option of easements and related financial incentives.
3. Encourage the formation of (or partner with existing) a local conservancy organization to promote the easement concept and receive conservation easements if there is a high degree of citizen interest in preserving open space.

Local governments cannot determine where easements will be executed. They can, however, encourage the use of conservation easements as a means of saving taxpayers land acquisition costs associated with purchase of open land.



Douglas Evans Nature Preserve in Beverly Hills.

Table 5
Land Conservancies/Land Trusts in Southeast Michigan

Blue Water Land Conservancy, Port Huron
Grosse Ile Nature and Land Conservancy, Grosse Ile
Holly Land Trust, Holly
Independence Land Conservancy, Clarkston
Livingston Land Conservancy, Brighton
Macomb Land Conservancy, Romeo
Michigan Nature Association, Avoca
Monroe County Land Conservancy, Dundee
The Nature Conservancy, Michigan Chapter, East Lansing
North Oakland Headwaters Land Conservancy, Clarkston
Oakland Land Conservancy, Rochester
Raisin Valley Land Trust, Manchester
Southeast Michigan Land Conservancy, Ann Arbor
Superior Land Conservancy, Ypsilanti
Washtenaw Land Trust, Ann Arbor
West Bloomfield Land Conservancy, West Bloomfield

Developing a greenways plan

Greenways are open space corridors that can be managed for conservation, recreation, and/or alternative transportation. Greenways often follow natural or existing land or water features such as rivers, utility corridors, and abandoned rail lines. Although each greenway is unique, most connect recreational, natural, cultural, and/or historical areas. A greenway plan can provide natural features preservation, facilities for alternate modes of transportation, and recreation opportunities. As in most planning documents, a greenway plan requires goals and objectives. These principles guide development of the plan and assist in decision-making. Often times, communities solicit public input in developing a greenway plan, which helps to identify corridors, destinations, and points of interest along the way.

Sample goals and objective

Goal: Develop a greenway system that helps protect cultural and sensitive environmental areas.

Objective: Acquire property or conservation easements (or the like) along environmentally-sensitive corridors such as rivers, streams, wetlands, woodlands, and wildlife habitat corridors to protect and integrate these areas as part of the greenway system.

Goal: Develop the greenway system through cooperation and coordination with private land owners, land conservancies, developers, recreation and environmental groups, and other public agencies.

Objective: Build on existing relationships between the community and public and private groups to plan, finance, and implement the greenway system.

Other important goals would discuss the approach to funding and maintaining the greenway trail.

A greenway plan can be created by combining layers of information about the community, its natural resources, and cultural assets.

Step 1: Determine greenway elements.
Determine the important destinations within the community that should be connected by a nonmotorized path system. These elements could include existing parks, schools, and historic and cultural points of interest.

Step 2: Determine natural features.
Identify natural features that should be preserved, particularly natural river and stream corridors.

Step 3: Determine human-made features.
Identify human-made corridors such as roads, abandoned railroad rights-of-way, tree rows, natural beauty roads, and utility line corridors. Other amenities to identify are existing and planned trail systems offered through other state, county, or local agencies.

Step 4: Create and map the greenway.
When all this information is combined on a map, the potential routes and destinations present themselves by the pattern of overlapping data. The actual trail and points of interest can be considered and finalized, culminating in a greenway plan map.

A greenway plan can be a stand-alone document, or can be a chapter in the community's Recreation Master Plan. If it is a stand-alone document, descriptions of the community's relevant features, such as streams and rivers, other natural resources and cultural destination points, need to be included as background information for the greenway plan itself.

Intergovernmental cooperation is key

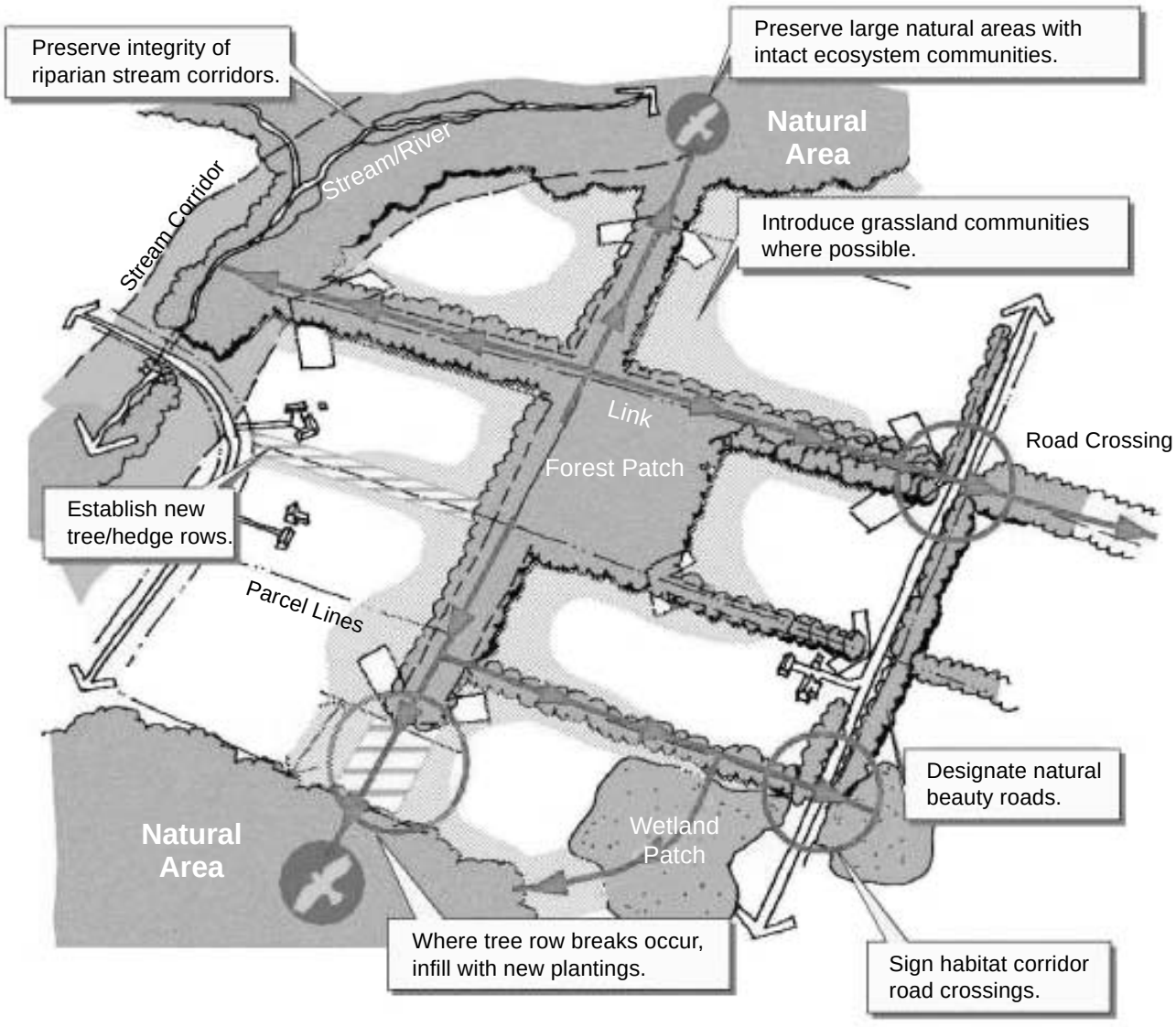
When establishing a local greenway program, it is essential for the community to interact with programs existing at the county, regional, and state/national level. Your community may be incorporated into a larger scale greenways plan. Therefore, partnering with other organizations could result in a coordinated, shared vision by all entities. This will significantly increase the value of the greenway for alternative transportation and recreation purposes. Following is information on some of these programs.

State and national level. The "Rails-to-Trails Conservancy" is a national program which promotes the conversion of abandoned rail corridors to trails which can be used for nonmotorized transportation such as walking and bicycling. This popular program allows for the establishment of a trail without the need to move homes or condemn property because the new trail can use existing bridge structures and crossings.

Regional level. The Greenways Initiative is a program of the Community Foundation for Southeast Michigan, and is designed to improve and enhance Southeast Michigan by engaging people, organizations, and resources in construction and implementing greenways projects in the seven counties of Southeast Michigan. The initiative is dedicated to developing this region's vision and capacity to continue greenways work for years to come.

County level. One example of a county program is the Oakland County Trails Initiative, which has provided a greenway vision for the county. As of printing this report, over $9 million has been awarded to Oakland County trail interests for trail acquisition, planning, and development. Of the approximately 152 miles of the primary trial system envisioned, 27 percent (41 miles) has been completed, 19 percent (29 miles) are in the detail planning/design/development phase, and 54 percent (82 miles are being considered as an option locally).

Figure 5
Potential Natural Landscape Corridor Connections



There are many opportunities for establishing a network of natural landscape corridors. This includes linking hedge/tree rows, stream corridors, and patches of wetlands and woodlands.

Source: Oakland County Planning and Economic Development Services.

Case Example

Comprehensive Parks, Recreation, and Open Space Plan

Community: City of Ann Arbor

Contact: Amy Kuras, (734) 994-1827

In 2000, the City of Ann Arbor adopted a comprehensive parks, recreation, and open space plan. This plan promotes environmental stewardship by recognizing the importance of the Huron River to the city. Following is one goal and the corresponding objectives found in their plan:

Goal: Enhance the Huron River and its tributaries as Ann Arbor's most significant natural resource and a source of its domestic water supply. Park development and acquisition affecting the Huron River watershed should restore and preserve the Huron River and its tributaries, improve water quality, preserve wildlife habitat, manage storm water, and enhance recreation opportunities.

Objectives: Plan and utilize storm water management as a resource for recreational or educational use, rather than a waste product to be removed quickly.

- Work to restore eroded stream banks through revegetation and erosion control to enhance water quality.
- Enforce buffer zones of no mowing adjacent to streams and the river.
- Coordinate water quality monitoring activities with other organizations such as the Huron River Watershed Council.

Huron Valley Trail

Community: Lyon Township, Milford Township, and South Lyon.

Contact: Patricia Carcone, (248) 437-2240

Three local governments in Southwest Oakland County cooperated on the development of a 12.25 mile greenways corridor. The scenic corridor links Kensington Metro Park to Lyon Township to the north and the City of South Lyon to the south. This corridor is also part of a county-wide greenways plan which may eventually stretch eastward across the county and connect with the Clinton River Trail.

Other partners in this project included: Michigan Department of Natural Resources Parks Division, Huron-Clinton Metropolitan Authority, Michigan Department of Transportation, Rail-to-Trails Conservancy, Oakland County Parks, and Oakland County Planning and Economic Development Services.

Bicycling along the Huron Valley Trail.

Photo courtesy of Oakland County Planning and Economic Development Services.

Additional Resources

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Flink, Charles A. & Searns, Robert M. *Greenways: A Guide to Planning, Design, and Development*. Washington, D.C.: Island Press, 1993.

Fogg, George E. *Park Planning Guidelines*. 3rd ed. National Recreation & Park Association. 1995.

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Roakes, Susan L.; Zwolinski, Marie; University of Memphis. *The Land Trust as a Conservation Tool*. Council of Planning Librarians. 1995.

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Warbach, John D. "Developing Community Recreation Plans." *Planning and Zoning News*. July 1990.

Managing Residential Development

In many Southeast Michigan communities, residential development encompasses the largest portion of land use. New development is both necessary and desirable to maintain and improve the quality of life of the people who currently live in the community as well as for those who will live there in the future. Citizens of each community recognize what is unique, beautiful, and desirable about their natural and cultural environment. New development that is compatible with the natural and cultural heritage of a community is an important consideration to those who live there.

The planning process should capture the community's vision of how it wants to shape and integrate residential neighborhoods into the future development scheme, and the desired type, design, quantity, and location for residential development. The master plan and zoning ordinance continue to be the primary land use management tools for shaping development. This chapter presents specific tools that could be included in the master plan and zoning ordinance to manage residential development.

Keeping It Connected

You can make your community conducive to walking and biking between different land activities. Encourage continuous sidewalks and provide for pedestrian and bicycle access throughout your community and in open spaces. Consider the type of streetscape design that will improve your community's visual quality.

Planning and Regulatory Considerations

Local government authority for planning comes from the following laws: Municipal Planning Act (PA 285 of 1931, as amended), Township Planning Act (PA 168 of 1959, as amended), and County Planning Act (PA 282 of 1945, as amended).

Michigan's Land Division Act (PA 591 of 1996 and PA 87 of 1997) governs the process by which lots are created out of larger parcels. In guiding the division of land into multiple lots or a plat, land division regulations address many factors including grading, erosion control, utility easements, street alignments, circulation, lot size, and emergency access.

Local government power to zone comes from the following laws: City and Village Zoning Act (PA 207 of 1921, as amended), Township Zoning Act (PA 184 of 1983, as amended), and County Zoning Enabling Act (PA 183 of 1943, as amended).

Non-exempt local communities are now required to provide developers with the option to conduct open space preservation zoning, otherwise known as cluster zoning, as provided for under the following laws: City and Village Zoning Act (PA 207, as amended by PA 179 of 2001), Township Zoning Act (PA 184 of 1983, as amended by PA 177 of 2001), and County Zoning Act (PA 183 of 1943, as amended by PA 178 of 2001).

Condominium Act (PA 59 of 1978, as amended) authorizes condominiums and site condominiums. Mobile Home Commission Act (PA 96 of 1987) provides the framework for standards related to the development and layout of manufactured housing parks.

Tools for Managing Residential Development

Several tools for managing residential development are available to communities:

- Use the master plan to define future land development,
- Manage land use through zoning ordinances, and
- Develop a capital improvement plan (CIP).

Each of these methods are highlighted below. However, many sections of this handbook provide detailed information that may be helpful when planning for residential development.

Residential development within walking distance of a commercial district in Novi.

Use the master plan to define future land development

As a community's blueprint for the future, the master plan should be the first tool consulted in managing residential development. (For more information on the master plan, see the Planning and Development Basic Terminology section.) The master plan should contain goals, objectives, and policies on how the community will manage the expected residential growth. Here is a specific goal your community may include in your plan:

- Goal — A variety of housing types, located within a desirable residential setting, ensures a maximum choice of dwelling units and a diverse population within the community.

To accomplish this goal, consider the following objectives and policies:

- Objective — Protect and enhance natural features, including wetlands, groundwater recharge areas, woodlands, streams, hedgerows, slopes, and agricultural lands from adverse development.
- Policy — Consider land capacity when determining the appropriate density of development. Place dwelling units on portions of the site most suited to development in order to preserve natural features. Institute and implement measures that protect the environment during and after development.
- Objective — Recognize that strong, cohesive neighborhoods contribute to a positive community identity.
- Policy — Ensure that new residential development shall be compatible in density and character with existing residences and neighborhoods in the immediate area. Organize and encourage residential development around natural features or recreational amenities and site and architectural design that will create neighborhoods of lasting value and stability.
- Objective — Consider land uses best suited to the land and existing conditions, at a rate of growth that can be financially absorbed by the local government.

Source: Northfield Township Growth Management Plan, 1998.

Manage land use through zoning ordinances

Zoning ordinances regulate the present allowable uses for land and protect public health, safety, and general welfare of a community. These regulations (e.g., lot sizes, and widths, setbacks, residential dwelling unit sizes, lot coverage, height, signs, and parking) can play an important part in managing residential growth.

Community values and character developed in the master plan will determine neighborhood layouts. Considerations should include housing density, urban or rural concerns, and desires for a walkable community. Resulting neighborhood layout could include conventional, open space/cluster subdivisions, planned unit development, and traditional neighborhood designs. Road designs should complement the neighborhood structure, adhering to grid standards, curvilinear, and cul-de-sac. Descriptions of neighborhood layouts follow.

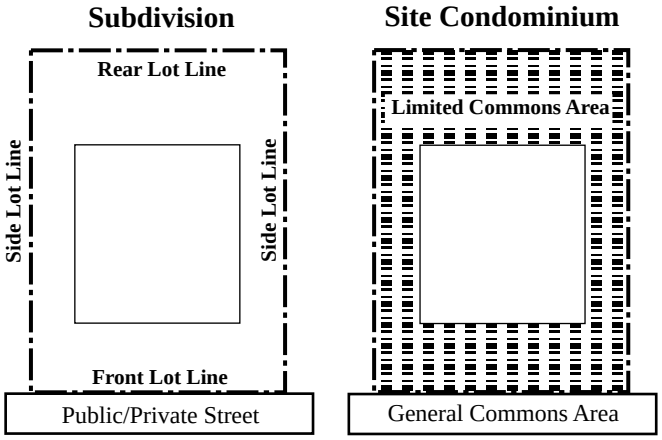
Explore opportunities for conventional subdivisions and site condos

Many communities utilize a conventional subdivision style when developing residential areas. These subdivisions are identified by single-family, detached houses on like-sized lots within a curvilinear or cul-de-sac road system. Virtually all the land in the subdivision is used for infrastructure or is parceled out to individual lot owners. The balance of the subdivision is generally attributed to regulated wetlands or land with steep slopes.

Condominiums are regulated by the Condominium Act and local regulations. Traditional condominium developments (those individually owned in either attached or detached units) can be regulated using standard zoning provisions. However, site condominiums (developments that include both the dwelling unit and an area of land immediately surrounding each dwelling or building unit) require specific provisions in applying local zoning and subdivision-like regulations. Following are specific design standards local communities should consider when developing subdivisions or condominiums:

- Limit clearing and grading of forests and native vegetation at the site to the amount needed to build lots, allow access, and provide fire protection. Communi-

Figure 6
A Comparison of a Conventional Lot to a Site Condominium
(153 lots/units both)



Source: Michigan Society of Planning. *Basic Training: Planning Comissioners and Zoning Boards of Appeals*. 2000.

ties have several tools that might be adapted to limit clearing, including erosion and sediment control ordinances, grading ordinances, tree protection ordinances, and open space development.

- Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, sidewalk, and vegetated open channels.
- Where density, topography, soils, and slope permit, vegetated open channels should be used in the street right-of-way to convey and treat storm water runoff.
- Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Consider requiring the use of native plants in landscaping requirements.
- When solid walls are used to buffer traffic noise (as is sometimes necessary in residential projects along major streets), avoid visual monotony by providing a change of plan at intervals no greater than 50 feet. This can be accomplished by providing planting "pockets," varying the setbacks, or providing pilasters for visual relief.
- Fences and walls over three feet high which face public streets should provide a fully landscaped buffer of at least four feet deep on the street-facing side of the wall.
- Review the other techniques discussed in this book, specifically Walkable and Bikeable Communities, Traffic Safety Techniques, Buffering/Screening/Landscaping, Historic Preservation, Private Roads, Storm Water Management, Soil Erosion and Sedimentation Control, Floodplain and Stream Corridor Protection, Wetlands, and Woodlands.

Varying the type of buffer, such as this subdivision in Troy, avoids visual monotony.

Utilize open space/cluster subdivisions

Open space subdivisions or cluster subdivisions are increasingly popular options for communities seeking protection of community character. In essence, co-grant incentives for preserving open space or environmentally sensitive features by focusing development in the areas most appropriate for development. Smaller building lots are permitted, with the lots grouped closer together. The balance of land on the site is preserved in perpetuity as open space. When developing the open space subdivision section of your ordinance consider:

Open space subdivision in Washington Township.

- Allowing flexible site design criteria, such as setback and road widths.
- Requiring open space to be consolidated into larger units, such as having a minimum size or width.
- Requiring that a portion of the open space be used for recreational purposes and a portion managed in a natural condition. (The natural areas often treat polluted storm water and provide areas for passive recreation).
- Coordinating recreational opportunities with the community's Parks and Recreation Plan.
- Protecting the open space through a conservation easement. (See chapter on Public Open Space for more information).
- Delineating open space with permanent markers (especially those areas left natural) to educate property owners about the importance of open space and reduce the possibility of inadvertent clearing.
- Linking open space with adjacent open spaces in the community (and surrounding communities).
- Preparing a natural features, open space, or greenways map that can guide the placement of open space provided through open space subdivisions.

Preserve open space with planned unit development (PUDs)

PUDs provide communities with flexibility through innovative designs. Authorized under Michigan planning enabling legislation, PUDs can apply to residential, commercial, and industrial uses. PUDs vary from clustering of residential buildings to complex mixed-use developments. The PUD process ties a site

plan to zoning approval. To use the PUD technique, there must be some community benefit, typically:

- preserving some significant natural asset,
- providing recreation facilities and open spaces, or
- providing a complementary and integrated mixture of uses, and housing densities and types.

The specific recommendations noted in the open space/ cluster subdivisions section should also be considered in the PUD process.

Consider traditional neighborhood design

Traditional neighborhood design (TND), sometimes called neotraditional or new urbanism, is another technique to consider in developing areas. TNDs are more recent developments that capture many aspects of traditional neighborhoods. Typically, they are characterized by a discernable town center with commons and civic buildings, a variety of housing types, connected streets, and shopping along the edge. Also, lots are aligned to a grid street system pattern and continuous sidewalks provide convenient pedestrian movement. Specific recommendations when using TND include:

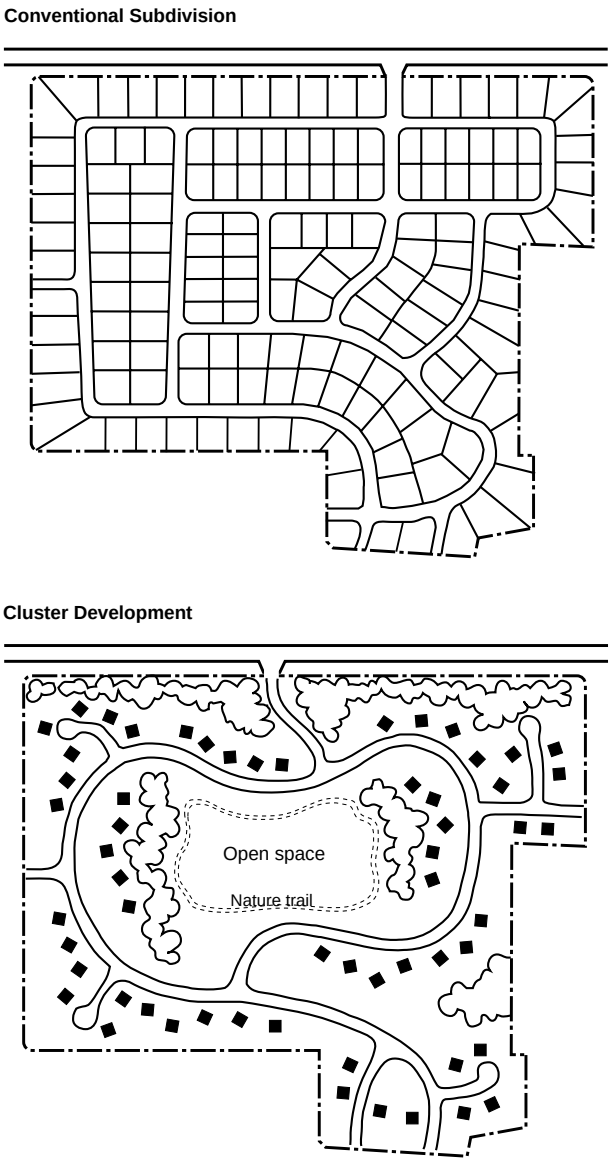
- Focus the center of the neighborhood around a public space and/or buildings.
- Keep the size of the neighborhood to a quarter mile from center to edge. This provides easy walking distance (approximately five minutes) to many of the residents' daily needs.
- Balance neighborhood activities to include shopping, working, schools, worship, recreation, and dwellings.
- Interconnect streets that equitably provide pedestrian comfort and automobile movement.

Establish a site plan review

A site plan is the collection of documents and drawings that present the information depicting what an applicant wishes to do with a particular parcel of land. The plan notes the site's natural characteristics and features, as well as existing and proposed man-made structures. Communities establish a site plan review process in order to provide consistent and uniform procedures and standards for proposed development plans, ensuring full compliance with federal, state, and local laws, regulations, and standards. The zoning ordinance specifies the procedures for submitting, reviewing, and approving the site plan.

Projects should demonstrate sensitivity to both natural setting and neighborhood context. To accomplish this, a basic site analysis should be incorporated into the site plan review process.

Figure 7
Comparing Conventional Subdivision to Cluster Development



Source: David Listokin and Carol Walker, *The Subdivision and Site Plan Handbook.*

Typical information should include:

- Basic site data: boundaries and dimensions; location and ultimate width of roads, sidewalks, and right-of-ways; location of setbacks and easements; existing structures and other built improvements.
- Existing natural features: location, size, and species of trees and other significant vegetation; topography, with steep slopes highlighted; patterns of surface drainage; location of floodplain or riparian areas; soil capability; groundwater recharge location; and other features that are either amenities or potential hazards in development.

- Neighboring environment: vies to or from the site; land use of neighboring properties; form and character of neighboring buildings; important site details on neighboring properties which can be seen from the street (such as stone walls, fences, and organized plant ings).

Understand manufactured housing regulations

Communities can approach the zoning of manufactured housing parks under various means. Many communities do so under manufactured housing park zoning districts. Other communities permit manufactured housing parks in certain zoning districts under specified conditions. Communities must allow individual manufactured homes on lots within all zoning districts that permit single-family units, though communities may adopt reasonable standards to ensure compatibility with the surrounding neighborhood.

Unlike most land uses, manufactured housing communities in Michigan are regulated by the state. The Mobile Home Commission (MHC), as directed in the Mobile Home Commission Act, has developed construction standards that are contained in the Mobile Home Commission Code. Table 7 provides examples of the standards contained in the code. Local governments can propose stricter standards than in the code and submit them to the MHC for review and approval. Table 6 contains examples of strict standards (including the justification for these stricter standards) that were approved by the MHC. (Approval is not required for standards related to manufactured homes not within manufactured housing communities.)

Develop a capital improvement plan

Capital improvement plans (CIP) are short-term plans (typically five or six years) that identify where major, non-recurring facilities will be provided. The CIP details each capital project, estimated project cost, description, and funding source. Capital items could include such things as transportation facilities, buildings, water facilities, sewage systems, and parks. The overall goal of the CIP is to order and time the community's fiscal expenditures while coordinating public investment with adopted plans and policies to properly manage the city's long-term investments. Working together with zoning and subdivision regulations, CIPs provide local governments with an integral instrument for implementing comprehensive, strategic, and development plans. Specifically, your community may want to include the following in your CIP:

- Installation, maintenance, and replacement of storm water and sanitary sewer utilities.
- Use, maintenance, and replacement of storm water best management practices.
- Constructing and renovating sidewalks, curbs, gutters, and streets.
- Purchasing right-of-way and constructing bicycle facility.

Table 6
Approved Stricter Standards by the Mobile Home Commission (MHC) and Justification for One Municipality

Summary of Stricter Standard	Justification for Stricter Standard
16-foot wide driving surface for one-way streets with no parking (MHC code requires 13 feet for one-way, no parking).	Insufficient minimum width for safe travel, particularly for large emergency vehicles such as fire trucks, which measure 8 to 8.5 feet.
Roof overhangs set back four feet or more from the edge of the internal road (MHC code provides for two feet minimum).	Under the MHC standard, it is forseeable that vehicles could have protrusions on them that could extend more than two feet past the roadway edge (particularly with emergency vehicles). The stricter the standard provides a means to prevent collisions between vehicles and homes, preventing property damage and injuries.
Two access points shall be provided to a public thoroughfare to allow a secondary access for emergency vehicles. A boulevard entrance extending to the first intersection of a community road shall be interpreted as satisfying this requirement (MHC code has no direct counterpart).	Ensures that emergency vehicles can enter the site, even if one of the access routes is blocked.

Source: Order of the Manufactured Housing Commission, State of Michigan, to Approve Proposed Local Ordinance Pursuant to the Mobile Home Commission Act, October 30, 2002.

Table 7
Selected Community Standards Contained in the Mobile Home Commission Code

Construction Element	Selected Portions of Standards (Rule Number)
Internal Roads	• surfaced width of one-way, no-parking road shall be 13 feet, 21 feet if two-way (125.1920). • all turning lanes shall be minimum 10 feet wide and 60 feet deep (125.1920).
Parking Facilities	• two parking spaces per site (125.1925). • spaces may be provided side-by-side or in tandem (125.1925). • tandem spaces shall be at least 10 feet in width and have a combined minimum length of 40 feet (125.1925). • minimum one parking space per three sites or visitor parking (125.1926).
Sidewalks	• if constructed, sidewalks shall be minimum three feet wide (125.1928).
Lighting	• access points to public thoroughfares shall be lighted (125.1929). • minimum .15 footcandles illumination at all street intersections and pedestrian cross walks (125.1929). • minimum .05 footcandles illumination along roads, parking bays, and sidewalks.
Setbacks	• mobile homes shall be set back a minimum 10 feet from mobile home park property line (125.1944). • mobile homes and other structures shall be set back a minimum 50 feet from a public right-of-way (125.1944). • for a home not sited parallel to an internal road, mobile homes shall be set back a minimum of 20 feet from an adjacent mobile home used for living purposes (125.1941). • for a home sited parallel to an internal road, mobile homes shall be set back a minimum of 15 feet from any part of an attached structure of an adjacent mobile home used for living purposes, if the adjacent home is sited next to the home on the same internal road or an intersecting internal road (125.1941). • mobile homes shall be set back a minimum of 50 feet from community buildings, maintenance, and storage facilities (125.1941). • attached or detached structures or accessories that are not used for living space shall be set back a minimum 10 feet from adjacent mobile home or its adjacent attached or detached structures (125.1941).
Open Space	• mobile home park of 50 or more units must have a minimum two percent of park's gross acreage devoted to open space, but not less than 25,000 square feet (125.1946).
Screening	• park developer may completely or partially screen the park by installing fencing or natural growth along the entire property boundary (125.1945).

Source: Manufactured Housing Commission General Rules, Michigan Department of Commerce & Industry Services, 1998.

Case Example

Cherry Hill Village

Community: Canton Township

Contact: Jeff Goulet, (734) 394-5170

Cherry Hill Village in Canton Township is being touted as Michigan's first Traditional Neighborhood Development (TND). In 2000 the Michigan Society of Planning awarded Canton officials and the subdivision's contractor, Biltmore Properties, Corp., the Outstanding Planning Project Award. This is a public-private 338-acre venture that when completed will be home to over 1,200 households as well as various retailers, restaurants, and a Performing Arts Center.

A system of pedestrian-friendly streets and nearly 22 miles of sidewalks, pathways and bicycle trails will connect the entire community. One trademark of traditional neighborhood communities is their variety of home styles that create a diverse and interesting streetscape, conveying a sense of space much larger than any one individual house. At the center of the community is the Village Square, with planned shops, grocery, and restaurants clustered around the public park, creating an inviting setting for neighborhood events and gatherings.

The development of the village's concept plan was a broad-based collaboration which included public input. The plan built upon the area's historic character and was consistent with the Township Master Plan for the area. A design review committee with a village architect developed a Pattern Book that will guide and control the design of all buildings, site, and landscape improvements, including architectural character, key design elements, and materials. The community will implement these standards by using planned development district regulations, subject to Cherry Hill overlay district regulations, which will be based upon the concept plan's Pattern Book and design guidelines.

Cherry Hill Village in Canton Township.

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Enhancing Older Residential Areas

Neighborhood revitalization deals with the rehabilitation and redevelopment of older residential sections of urban areas. Older residential areas may have a number of issues to address, including: aging housing stock, deteriorating infrastructure, and abandonment of commercial and industrial buildings. Effectively revitalizing a neighborhood requires a comprehensive approach, focusing on all land uses in the neighborhood by requiring the evaluation of existing housing stock, shopping areas, employment centers, community and recreation facilities, and traffic flow patterns.

In addition to the available tools for managing residential development, there are numerous tools which aim to the successful revitalization of residential neighborhoods. This section focuses on the tools that provide incentives to make improvements in these areas. The concept of infill development is explored as a mechanism to blend new development in with older, stable developments. Additionally, tools created through legislation include neighborhood enterprise zones, blighted area rehabilitation, municipal blighting program, obsolete property rehabilitation districts, and special assessment districts.

Keeping It Connected

Your community may have historic structures that give it a tangible link to the past and a sense of identity. You can protect these valuable resources by using various provisions under federal, state, and local laws. Start by identifying the significance of these buildings and evaluating whether they need to be protected. Consider the type of streetscape design that should be prevalent in historical districts.

Planning and Regulatory Considerations

Neighborhood Enterprise Zone Act (PA 147 of 1992, as amended by PA 217 of 2001) provides for the creation of neighborhood enterprise zones.

Blighted Area Rehabilitation Act (PA 344 of 1945, as amended by PA 320 of 1986) authorizes counties, cities, villages and townships to adopt plans to prevent blight and to adopt plans for the rehabilitation of blighted areas. Communities can carry out such plans by the acquisition of real property, the improvement of such real property and the disposal of real property in such areas.

Harbortown development in Detroit.

Municipal Blighting Act (PA 27 of 2002) provides communities with a tool to eliminate "spot blighting" by designating a structure or lot as a blighting property and acquiring title in it.

Obsolete Property Rehabilitation Act (PA 146 of 2000) permits qualified local governmental units to establish obsolete property rehabilitation districts, and allow the owner of obsolete property to apply for tax abatements for commercial facilities undergoing rehabilitation in these eligible districts.

Historic Preservation Tax Credit (PA 534 of 1999, PA 535 of 1999; as amended by PA 213 and 214 of 1999) aims at residential and commercial historic preservation efforts in Michigan.

Tools for Enhancing Older Residential Areas

There are several tools communities can draw from to enhance their older residential areas. This section focuses on the following techniques:

- Designing successful infill development,
- Providing neighborhood enterprise zone incentives for housing development,
- Removing blight and obsolete properties, and
- Creating a special assessment district to finance capital improvement projects.

Each of these methods are highlighted below. However, many sections of this book provide detailed information that may be helpful in enhancing older residential areas.

Designing successful infill development

Infill sites include both single vacant neighborhood lots in older neighborhoods and remaining acreage parcels that may be of odd configuration in already built-up suburban areas. The scale of the project relates to the surrounding development, and the project includes new construction, not simply a renovation or adaptive reuse. Infill sites range from abandoned inner city lots to high-value land in a built-up suburb or small town as well as odd-shaped outlying parcels that are unbuildable due to setback requirements of current zoning or presence of protected natural features.

The infill technique will vary according to the parcel location. For instance, the most prevalent type of infill parcels within the older urban areas is the single lot, while clustering may often be an appropriate infill tool in fringe areas due to the types of remaining vacant parcels. An attempt should be made to match the character of the existing homes in the neighborhood. The attractiveness of the infill development option varies according to the marketability of the community or the particular area within the community. Due to the land values and market demands, infill development will occur without any promotional efforts in some communities, whereas in other communities, infill development requires extensive marketing efforts and some incentives.

Benefits of infill development:

- Assists in bringing new taxes to the community.
- Takes advantage of existing infrastructure thereby offering a less expensive approach for communities than having to build new infrastructure elsewhere in the community.
- Contributes to the community's tax base with only marginal increases in the services required.

Table 8
Types of Redevelopment and Infill Projects

- Historic preservation
- Waterfront development
- Brownfields
- Residential infill
- Adaptive reuse
- Downtown business district
- Multi-family
- Suburban commercial
- Mixed use development
- Roadway expansion

Source: Center for Watershed Protection, "Smart Site Practices for Redevelopment and Infill Projects."

- Protects environmentally sensitive land in outlying areas by promoting development of vacant land within already developed areas.
- Provides housing in close proximity to employment centers, thus reducing the impact on transportation systems.

When conducting infill development, communities should consider the following:

- Inventorying and mapping all vacant lots and classifying these lands according to appropriate land use and any development constraints.
- Establishing flexibility in zoning standards — such as building setbacks and side yard requirements — to encourage infill cluster development.
- Relating the size and character of a project to the type and scale of surrounding land use.

Providing neighborhood enterprise zone incentives for housing development

Neighborhood enterprise zones (NEZs) are geographic areas designated for the purpose of fostering improvements in housing stock and helping to stabilize neighborhoods in cities and townships that meet certain criteria. Michigan's NEZ program reduces property taxes on new and rehabilitated housing for qualifying local governmental units.

Benefits of Michigan's NEZs:

- Addresses a specific and significant problem preventing development in urban communities — high property tax levies.
- Potential exists to assist in neighborhood development by increasing housing affordability for moderate income families.
- Existing local revenue is not eliminated.
- Encourages new owner-initiated residential development and overall neighborhood development and improvement.
- May eventually attract commercial and industrial development by promoting residential neighborhood stability.

Considerations for participants joining the NEZ program:

- Homeowners and developers within the zone apply for a state-issued NEZ certificate that enables new or rehabilitated homes to be exempt from property tax.
- A neighborhood enterprise zone tax is levied on the home owner, which is significantly less than the normal property tax. The NEZ tax is calculated by multiplying a formula defined in the legislation based on the facility's taxable value, not including the land. NEZ certificates remain in effect until 12 years from their effective date.

- To be eligible for the NEZ program, the local government must be listed as a "core community," as defined under the Obsolete Property Act. (See Table 9 for a list of eligible core communities in Southeast Michigan.)

Restrictions for allowable use of the NEZ program incentives:

- Total acreage of all neighborhood enterprise zones in a community cannot exceed 15 percent of the local unit's total acreage.
- Facility must have as its primary purpose residential housing; the facility must be in compliance with local codes, and
- Requirements for minimum levels of investment and maximum values of existing structures for rehab properties.

Recent neighborhood enterprise zone act amendments define the qualified communities for this program as the core communities as defined in PA 146 of 2000 (refer to Table 9 for a list of these core communities).

Table 9
Core Communities: Qualified Local Governmental Units in Southeast Michigan under the Obsolete Property Rehabilitation Act (Public Act 146 of 2000)

Ann Arbor	Hazel Park	Redford Twp.
Dearborn	Highland Park	River Rouge
Dearborn Heights	Inkster	Royal Oak Twp.
Detroit	Lincoln Park	Southfield
Eastpointe	Livonia	Taylor
Ecorse	Melvindale	Trenton
Ferndale	Monroe	Warren
Gibraltar	Oak Park	Wayne
Hamtramck	Pontiac	Wyandotte
Harper Woods	Port Huron	Ypsilanti

Source: Citizens Research Council of Michigan. Survey of Economic Development Programs in Michigan (Report Number 334). Livonia, MI: Citizens Research Council of Michigan, 2001.

Removing blight and obsolete properties

There are various laws that provide communities with the ability to remove blight:

- Rehabilitate blighted areas.
- Eliminate "spot" blight.
- Establish an obsolete property and rehabilitation district.

The first of these tools has been available for many years, while the latter two are newer tools to assist communities with facilitating rehabilitation and construction.

Rehabilitate blighted areas

Counties, cities, villages, and townships within Michigan can take significant steps towards reducing blight in their municipalities by utilizing the Blighted Area Rehabilitation Act. The act is important to the revitalization of older urban areas because it helps to:

- preserve property values, and
- maintain and increase the tax base and protect the health, safety and general welfare of the municipality.

The act, passed four years before the Federal Urban Renewal Act, was the first state authorization for the revitalization of communities and remains the most versatile. It permits all levels of government to carry out projects ranging from minimum neighborhood conservation to total clearance and redevelopment. It can and has involved all land uses — residential, commercial, industrial, institutional, and open space.

Its powers allow the taking of private property and reuse of that property for not only public use, but new and perhaps different uses. This issue has been adjudicated successfully all the way to the United States Supreme Court. The court found that the removal of blight provided the necessary public purpose and any new use was permissible so long as it followed the community master plan.

Through a combined effort between a citizens district council and the local legislative body, the Blighted Area Rehabilitation Act allows communities to:

- Improve or acquire and develop properties within a designated blighted area district.
- Lease, sell, renovate, improve or exchange real property.
- Implement methods of raising funds to effectively operate a blighted area rehabilitation district.

Rather than relying on private entities to perform the above tasks, the act allows municipalities interested in preserving their community to function in those capacities. Since the federal government withdrew matching grants in favor of bloc grants, this act has not been used as extensively. However, its versatility is still not matched and it remains a valuable tool for community revitalization.

To qualify as a blighted area district, an area must meet the following criteria:

- District must demonstrate physical, economic and social deterioration, marked by functional or economic obsolescence of buildings, physical deterioration of

structures and buildings, and improper and inefficient division or arrangement of lots, ownerships, streets, and other open spaces.
- District must also have characteristics which endanger the health, safety, or general welfare of the municipality.

Initially, implementation of the act requires that a citizens district council (CDC) be established. The CDC should be composed of 12 to 24 members, the majority of whom are residents of the affected area. The CDC provides a voice for the local neighborhood on redevelopment projects, plans for housing development and related activities. Local officials responsible for preparation and development of the plan must report directly to the CDC on all matters concerning the plan prior to it going to a local commission, public agency or legislative body.

In addition, the legislative body that prepares the blighted area development plan must have the following:
- A master plan that designates areas in need of rehabilitation or in need of measures to prevent blight.
- A plan showing the general features of the district within which the development area lies and the features of areas adjacent to the development district.
- The legislative body works together with the CDC to define problems, suggest solutions, and implement plans.

Eliminating "spot" blight

Cities in Michigan have thousands of vacant lots and vacant and abandoned buildings that are subject to trespassing and criminal activity, creating an unsafe situation for the public. This blight also contributes to making neighborhoods as unlivable, unsafe, and unsightly. Furthermore, the blighting reduces the value of nearby property and leads to a reduction in the community's tax base. An obstacle that cities have met in removing blight is that they sometimes need to have title to the blighting properties.

The benefit of the Municipal Blighting Program (MBP) to communities is that it helps to eliminate "spot blighting." Under the MBP, municipalities now can designate a structure or lot as a blighting property and acquire title to it by purchase, gift, exchange, or condemnation.

Blighting property is defined as property that is likely to have a negative financial impact on surrounding property values or on the increase in value of surrounding property. Other components of blighting property include:
- was declared a public nuisance;
- was an unattractive nuisance;
- was a fire hazard or otherwise dangerous;
- had the utilities disconnected;
- had a damaged building or structure on it that did not meet building codes;
- had a building or structure that was likely to fall, become detached, or collapse and injure persons or damage property;
- had a building or structure that had become the place for the accumulation of trash or debris,
- was a haven for rodents,
- was unsanitary or unfit, or
- was determined to injure the health, safety, or general welfare or people in the dwelling.

Planning considerations under provisions of the law:
- Require the municipality to hold a hearing on the designation of "blighting property" within a particular time frame, giving notice to those occupying the property and others with a legal interest in the property. There are provisions for those with a legal interest in the property to contest the designation.
- Require the municipality to transfer blighted property for development or to develop it.
- Allow the municipality to accept a deed instead of foreclosure for delinquent property taxes on the blighting property.

Establishing an obsolete property and rehabilitation district

This tool gives qualified local governmental units as defined in PA 146 of 2000 (refer to Table 9 for a list of these core communities), with the ability to establish obsolete property and rehabilitation districts. Owners of commercial facilities in these districts, including residential property, that are undergoing rehabilitation are eligible for tax abatements.

The benefit to the community is the opportunity to facilitate rehabilitation of obsolete property. Within these districts, qualified obsolete property rehabilitation

Infill development in Detroit.

projects are eligible to receive a one to twelve year tax exemption certificate. These certificates would freeze the property at its pre-habilitated value, which in effect allows the rehabilitation of the property to be tax free.

Planning considerations when establishing an obsolete property and rehabilitation district:

- By resolution of its legislative body, a local unit, can establish one or more districts containing obsolete property in an area characterized by obsolete commercial or commercial housing property.
- The community would have to give notices and hold a series of hearings as provided for under the Act to afford property owners and other stakeholders with the opportunity to comment.
- Once a request for property tax exemption was approved, the exemption certificate would be issued to the applicant containing, among other things, the period of time authorized by the legislative body in which the rehabilitation must be completed. If the certificate was for less than 12 years, it would have to contain the factors, criteria, and objectives for extending the period of time, if any.
- An exemption certificate could not be approved unless, among other things, the rehabilitation of the facility began after the establishment of an obsolete property rehabilitation district; the completion of the rehabilitation was likely to increase commercial activity, create employment, retain employment, prevent a loss of employment, revitalize urban areas, or increase the number of residents in the community in which the facility was situated; the applicant stated in writing that the rehabilitation would not be undertaken without the exemption certificate; and the applicant was not delinquent in the payment of any taxes related to the facility.
- Local units would be required to report annually to the State Tax Commission on the status of each exemption, including the current value of exempted property, the number of jobs retained or created, and new residents.

Creating a special assessment district to finance capital improvement projects

Special assessment is a financing mechanism used to secure funds for capital improvements in residential, commercial and industrial areas. Special assessment districts (SADs) are unique because they are based upon the premise that where there are a few properties which are specially benefitting from an improvement, such properties should contribute toward the cost of that improvement. When a capital improvement is needed, a special assessment district is established with boundaries encompassing all benefitting property owners. Each property owner is then assessed for his/her fair share of the improvement cost. SADs are widely used in Michigan to finance drains, sidewalks, curbs and gutters, road improvements, sanitary and storm sewer improvements, and the like.

Benefits of special assessment districts:

- SADs offer local units of government flexibility in raising revenue. If only a portion of the property owners in the community desire certain capital improvements, SADs enable the community to only charge those properties which will specifically benefit from the improvement.
- SADs, unlike general property taxes, can be levied against all real property in a district.
- Special assessment statutes do not designate limits on the rate or duration of the levy. Some statutes allow the community to adjust the levy on an annual basis to meet operational costs and capital expenditures without public approval. However, a public hearing is required.

Limitations of special assessments:

- SADs increase administrative costs.
- SADs can be politically controversial and easily misused.
- Because special assessments are not taxes, property owners are not allowed to deduct them on their federal income taxes.

Special assessment districts may be initiated by the local governing body or by a citizen petition. A property owner who wishes to initiate a SAD does so by petition, which must affirmatively reflect the desires of not less than 50 percent of the real property owners in the district based upon the number of parcels within the district or the total front footage of the parcels, depending on the nature of the project.

Information required to initiate a SAD petition includes:

- A description of the proposed district.
- A description of the proposed project.
- Signatures of the real property owners.
- The respective lot numbers.
- An affirmation that the signers are property owners in the district to be assessed, provided by the city clerk or his/her designate.

The information is then sent to the community's legislative body addressed to the clerk.

Case Example

Neighborhood Enterprise Zone

Community: Wyandotte

Contact: Joseph M. Voszatka, (734) 324-4541

The City of Wyandotte started the NEZ program in 1992 by establishing three zones. The zones were created in neighborhoods consisting of inexpensive homes built in the early 1900s to house workers for the industries in the area. A maximum of 11 percent of the City's area may be included within an NEZ, or a total of 371 acres. Approximately 219 acres are still available for inclusion within the NEZ program. The NEZ program has been very successful in assisting the City with its neighborhood revitalization goals. This incentive, combined with aggressive code enforcement, acquisition of substandard housing, and other investments in parks and streets, had a dramatic "ripple effect."

A total of 81 new homes have been constructed in the three areas with NEZ certificates (with more than 150 homes being demolished). Properties immediately outside of the zones have also been revitalized. New commercial developments have been constructed and adjoining neighborhoods improved. Two residential projects currently under construction include the Wyandotte Lofts Condominium Project and the Biddle & Orchard Condominium Project.

On a city-wide basis, the NEZ program and other revitalization programs have had a dramatic effect. From 1981 to 1987, approximately 250 permits were issued annually for dwelling alterations, averaging $800,000 invested per year. In 1993, more than 1,100 permits were issued for $4.2 million in improvements. From 1999 to 2001, an average of 1,346 permits were issued annually, averaging $17.5 million in improvements per year.

Neighborhood in Wyandotte

The Inn on Ferry Street

Community: Detroit

Contact: Susan T. Mosey, (313) 577-5088

The Inn on Ferry Street was an adaptive reuse project that entailed the renovation of four Victorian homes and two carriage houses into a 42-room boutique inn with modern-day amenities and conference facilities.

The historic inn serves visitors to Detroit's Cultural Center, Wayne State University, and Detroit Medical Center. The planning process spanned nearly a decade, and had project costs of $8.5 million, with 23 sources of financing being assembled to move the project forward. Funding sources included private and public loans, grants, and historic tax credits. This project demonstrates how preservation can be used as a tool for community renewal and economic revitalization.

Woodward Corridor Development Fund

Community: Detroit

Contact: Glenn Lapin, (313) 259-5400

The Woodward Corridor Development Fund was established to encourage the development of new and renovated quality housing in Detroit's Woodward Corridor area. The target area's boundaries is Grand Boulevard to the north, Chrysler Freeway to the east, Lodge Freeway to the west, and the Detroit River to the south. The types of housing development to be supported by the fund include rental and owner units. The fund's application guidelines indicate that while multiple family development is preferred, single family projects may also be considered if the cost per unit is competitive with multiple family developments. The fund is

The historic Inn on Ferry Street in Detroit

Photo courtesy of KGT Photographics.

intended to encourage for-profit developers and for-profit/non-profit partnerships to make equity investments in housing development projects in the target area. Since its inception in 1994, the fund has made loans of over $1.6 million for 21 projects, generating nearly $69 million in investment. Projects have included the Garfield Building, Cass Lofts project, and Stuber-Stone Building.

Additional Resources

Citizens Research Council of Michigan. *Survey of Economic Development Programs in Michigan* (Report Number 334). Livonia, MI: Citizens Research Council of Michigan, 2001.

Michigan Economic Development Corporation. *Economic Development in Michigan: A Guide for Michigan Communities*. Lansing, MI: Michigan Economic Development Corporation, 2002.

Northeast Midwest Institute. *Strategies for Successful Infill Development*. 2001.

Managing Commercial and Industrial Development

The development and growth of a community's commercial and industrial economy is influenced by several factors. Among these factors are:

- regional location,
- characteristics of the community population,
- existing commercial and industrial development pattern,
- availability of adequate sites, and
- the existing transportation system.

While private firms have various criteria when making their own facility location decisions, communities, too, must consider a number of things, including:

- the type of development that it wants to attract in light of community goals,
- how much land should be planned to accommodate future population,
- where such development should be located, and
- the development's physical qualities.

Upon determining the character of the desired development, the community must develop a means for carrying them forth. This chapter presents the tools that communities can use in managing commercial and industrial development.

Keeping it Connected

Consider using buffering, screening, and landscaping techniques to lessen the degree of conflict between adjacent land uses. Encourage landscaping along nonresidential buildings to soften the visual impact. In mixed-use developments, shared parking should be encouraged as an effective method for increasing the efficiency of land use and controlling access to major roads.

Planning and Regulatory Considerations

Local government authority for planning comes from the following laws: Municipal Planning Act (PA 285 of 1931, as amended), Township Planning Act (PA 168 of 1959, as amended), and County Planning Act (PA 282 of 1945, as amended).

Local government power to zone comes from the following laws: City and Village Zoning Act (PA 207 of 1921, as amended), Township Zoning Act (PA 184 of 1983, as amended), and County Zoning Enabling Act (PA 183 of 1943, as amended). Condominium Act (PA 59 of 1978, as amended) authorizes condominiums and site condominiums.

Tools for Managing Commercial and Industrial Development

Several tools for managing residential development are available to communities:

- Use the master plan to define future land development.
- Manage land use through zoning ordinances.
- Pattern community appearance with design guidelines and standards.
- Manage various planning tools and programs.

Each of these methods are highlighted below. However, many sections of this book provide detailed information that may be helpful when planning for commercial development.

Use the master plan to define future land development

As discussed in the Managing Residential Development section, the master plan should be the first tool consulted since it provides the blueprint — the vision for the future. (For more information on the master plan, see the Planning and Development Basic Terminology section.) The master plan should contain goals, objectives, and policies on how the community will manage its expected commercial and industrial growth. Here's one goal that you might consider including in your plan:

- Goal: Provide for a balance and variety of land uses including commercial, office, industrial, open space, and recreation uses in areas which will not adversely impact the living environment of existing and future

Commercial development in Wixom.

residential areas and which will provide for the needs of the residents of the community.

To accomplish this goal, consider incorporating a series of strategies, such as those provided below:

- Consider transitional land uses (multiple family, cluster housing, office, open space) between commercial and industrial land uses and existing or future single family residential uses. (Note: some communities may determine that mixing some of these land-uses is best for them — such as the mix of commercial retail and residential land uses found in neo-urbanism developments.)
- Recognize that unchecked "strip commercial" development that occurs in an unplanned fashion may lead to numerous curb cuts along thoroughfares resulting in traffic conflicts, unsightly conditions, and potential impairment of land values.
- Require the use of sound site planning principles, landscape development techniques, and coordinated sign systems for all new, expanded, or modified commercial, office, and industrial developments.
- Deny "spot zoning" of commercial, office, and industrial uses.

Source: Plymouth Township Master Plan, 1994.

Consider land capacity when determining the appropriate density of development. When assessing your community's needs by industrial sector (including retail and industrial) try using comparisons and benchmarks. Do not overplan or overzone for commercial development. Institute and implement measures that protect the environment during and after development.

Manage land use through zoning ordinances

Zoning ordinances regulate the present allowable uses for land and protect public health, safety, and general welfare of a community. These regulations (e.g., lot sizes, and widths, setbacks, lot coverage, height, signs, and parking) can play an important part in managing commercial and industrial development. Some communities may wish to separate commercial activities from residential, while others may embrace a mix of residential and lighter commercial development, whether it be in a neo-traditional, neighborhood preservation, or downtown development setting.

In its zoning ordinance a community will specify the permitted uses and level of intensity for various land uses, including those that are commercial and industrial. Table 10 provides examples of various categories of zoning districts that you might want to consider for your community, along with a brief summary description of the intent for these zones.

Commercial development in Novi.

Manage strip development areas

Strip development areas are linear patterns of development, primarily commercial, found along major highways and roads. When developing a vision for these areas, consider conducting a corridor analysis to address the needs of businesses and adjacent residential neighorhoods. Such an analysis should include a look at the function the corridor serves, the relationship between the current land uses, the needs of the area residents for services, and the needs of the motoring public.

Here are some considerations for making land use decisions that will benefit all stakeholders:

- Cluster businesses into shopping districts near major intersections with adequate parking.
- Develop more intensive uses — mix of commercial, retail, office and higher density residential — to increase the potential for transit service.
- Revise local zoning ordinances to allow a mix of uses in older, multiple-story commercial buildings.
- Initiate appropriate zoning to encourage adaptive reuse of existing buildings where appropriate.
- Provide more off-street parking (e.g., parking between buildings or creating larger lot depths (300 feet) behind buildings).
- Provide for rear access drives linked to parking areas to get turning movements off the main thoroughfare and provide a safe place to travel.
- Selectively close adjoining residential streets to reduce traffic in residential neighborhoods and provide areas for off-street parking for businesses.

Table 10
Commercial and industrial zoning districts

Zoned district	Intent of zone
O - Office District	Primarily for office buildings. Classification applied as a transitional use buffer between residential uses and uses which would be incompatible indirect contact with residential districts.
RE - Research District	Designed for research facilities to serve the needs of commerce, industry, business, and education. The prime characteristics of this district are the low intensity of land coverage by utilizing campus-like developments and preserving significant natural features, and the absence of nuisance factors such as excess noise, heat or glare, air pollution, or wastewater production.
ORL - Office/ Research/ Limited Industrial District	Designed to provide for a mixture of research, office, and light industrial uses whose external effects are restricted to the site and do not adversely impact surrounding districts. The preservation of significant natural features and the encouragement of low-density, campus-like developments are objectives for the establishment of such zones.
C1 - Local Business District	Business district designed solely to serve the needs of the surrounding residential neighborhood, providing goods that are day-to-day needs and are classed by merchants as convenience goods and services. The normal spacing between these shopping districts is approximately one mile, and the total land area averages two acres. Businesses which might tend to be a nuisance to the immediately surrounding residential development are excluded.
C2A - Central Business District	Designed to serve the central retail marketing function of the entire city trade area which extends at least halfway to surrounding cities of comparable size. A prime characteristic is a core of intense pedestrian activity, with most persons entering into the district coming by automobile and typically parking once to carry out several errands. Office building activities are compatible with the purpose of the district. Residential development above the street level is also an important component of the district's pedestrian orientation.
C2A/R - Commercial Residential District	Encourages the orderly clustering and placement of high-density residential and complementary commercial development within the Central Business District.
M1 - Limited Industrial District	Included lands are those suited for use primarily by industries characterized by low land coverage, the absence of objectionable external effects and the possibility of large setbacks, attractive building architecture and large, landscaped park-like areas.
M2 - Heavy Industrial District	Provide land for more intense types of industrial and manufacturing uses which are usually located deep within the industrial areas of the city and downwind from residential and business areas. Regulations to minimize their incompatibility with other districts are the minimum required for mutual protection of the industrial areas and to that end, the district should not be adjacent to any residential or business district if such abutment can possibly be avoided.
PUD - Planned Unit Development District	Provides flexibility in land development. Encourages innovation in land use and variety in design, layout, and types of structures constructed. Achieve economy and efficiency in the use of land, natural resources, energy, and the provision of public services and utilities.

Source: City of Ann Arbor Zoning Ordinance, 1996.

Fountain Walk development in Novi encourages pedestrian activity by providing an attractive streetscape coupled with speciality and anchor stores.

- Implement inexpensive but visible physical changes that will improve the appearance of the area — scheduled clean-up, lighting, landscaping, facade and site improvements.
- Encourage pedestrian activity by providing street furniture, lighting, walkways.
- Address how to preserve the traffic-carrying capacity of the roadway while permitting safe pedestrian and vehicular access to abutting properties.
- Establish uniform signage for both businesses and neighborhood identity through an overlay sign ordinance.
- Step up code enforcement — use neighborhood group volunteers to serve as eyes and ears for code violations.
- Require site plan approval for new uses in existing buildings and for the construction of new buildings.
- Provide an announcement of site plan approval so that residents are aware of the proposed project for site plan approval.

While some existing strip development areas are wholly within a community, many of them, particularly on major arterials in the region, traverse several communities. Therefore, intergovernmental cooperation and coordination can be of critical importance in taking action to revitalize older strip development areas.

Pattern community appearance with design guidelines and standards

Your community can develop design guidelines and standards to influence its visual character. Design standards are mandatory — defined by the ordinance as the minimum requirements for development. Many communities have set standards by regulating signs, landscaping, and buffering between land uses. Design guidelines, which can be used in tandem with design standards, are advisory (i.e., not law), but are strong recommendations for development design.

There are several benefits to design guidelines that provide commercial, industrial, and other property owners with an illustration of how to develop their property in a manner consistent with your community's goals.

Design guidelines can:

- improve the quality of physical changes,
- protect the value of investment,
- protect existing architectural character,
- act as a base for objective decision-making,
- increase public awareness of architectural quality, and
- prevent incompatible new construction.

Design guidelines cannot:

- regulate growth,
- control non-exterior changes,
- guarantee good design, or
- be law.

Source: Pregliasco, Janice, *Developing Downtown Design Guidelines*, 1988.

Design guidelines for big box development

Design guidelines have the added benefit of being flexible in their application, which allows for tradeoffs based on the uniqueness of the given situation. Design guidelines can be used in a number of different settings, including downtown areas, historical preservation districts, and along corridors. For communities concerned with the impact of sprawling big-box developments (i.e., over 25,000 square feet), here are some suggested design guidelines:

- Discourage long blank walls that discourage pedestrian traffic; instead, break up building facades with recesses.
- Place arcades, display windows, awnings, or some other feature to ground-floor facades in order to add visual interest to the structure.
- Make stores accessible to pedestrians and bicyclists by creating several entrances to reduce walking distances from cars where stores border two or more public streets.
- Have stores provide amenities such as patio seating areas, kiosks, or fountains.
- Locate no more than half of the store's parking between the store's front facade and the abutting street.
- Link stores to transit stops, street crossings, and building entrances with landscaped sidewalks.
- Clearly define store entrances with canopies, porticos, or arches.

Source: Beaumont, Constance M. *Better Models for Superstores: Alternatives to Big-Box Sprawl*, 1997.

Also refer to the Enhancing Commercial and Industrial Development section for some suggested design guidelines for infill development.

Steps for developing and adopting design guidelines

Your community can develop design guidelines by following a series of steps leading to adoption. It is important along the way to involve all of the stakeholders including your community's residents and elected officials. These steps include:

1. **Issues identification**. Solicit public and business owner input to identify issues that related to the design, through survey or a public forum.
2. **Inventory of visual resources**. Determine sense of place characteristics and sites. These include historic structures, scenic views, cultural sites, pastoral scenes, vernacular architecture, and other visual resources important to the community.
3. **Identify preferred future visual character**. Guide residents through an exercise to identify qualities of their community that they want in the future — through a futuring session, citizen survey, or visual preference surveys. Target those qualities when developing the design guidelines.
4. **Document preferred future character**. Provide the preferred visual character in a report, including relevant sections of the comprehensive plan.
5. **Develop design guidelines**. Use professionals such as landscape architects, architects, historic preservation experts, sign designers, and engineers to assist in the process, exploring a wide range of alternatives.
6. **Public review**. Draw from public input throughout the process and before presenting the guidelines for final approval. Gaining public acceptance is key.
7. **Planning commission adopts**. Formal adoption by the planning commission after a review period and refinements. Note that the planning commission should be part of guideline development at all stages.

Source: Warbach, John. *Design Guidelines: Promoting Good Design in Your Community*. Planning and Zoning News, 2001.

While some communities prefer the flexibility that design guidelines offer, others may decide to use their design guidelines as a basis for developing mandatory design standards. Depending on the situation, this could become an extensive process. However, the community needs to determine which approach is best suited for its situation.

Some additional planning, zoning, and design considerations for commercial development:

- Rezone land for commercial development only when the infrastructure can support this use.
- Limit the number of commercial sites at major intersections and designate remaining sites for less intense uses (office, higher density residential).
- Revitalize older commercial areas and, where appropriate, provide for expansion of existing commercial uses. Concentrate new commercial development at or near existing shopping center locations before locating new ones.
- Control the number of small strip centers by eliminating commercial zoning on isolated small parcels.

Design considerations for strip development

If your community would like to have strip development, ensure adequate access and visual controls. Such requirements could include:

- Sufficient setbacks to allow for off-street parking and a parallel access road to reduce traffic conflicts.
- Screening between commercial development and residential neighborhoods to maintain neighborhood character.
- Buffering and landscaping along the major highway to soften the visual impact from the highway.
- Landscaping along and adjacent to commercial buildings to soften the view of buildings.
- Sign control to limit the amount, height, size and type of signage and to soften visual impact from the highway. Overlay zoning could be used on land along roadways to regulate building design, setbacks, signage, lighting, driveway access and landscaping.

Additional considerations for industrial development

Because of the intensity of development and the nuisances associated with industrial uses, siting of industrial development needs to be carefully considered. Industrial uses should be confined to well-defined geographic areas within the community to avoid conflicts with residential neighborhoods and commercial areas. Industrial uses should have direct access to major highways, rail lines, and airports to accommodate the unique types and volume of traffic they generate. Some additional considerations when planning for industrial development include:

- Provide sufficient infrastructure to support industrial uses.
- Encourage industrial uses to locate in industrial parks.
- Provide existing industrial uses with room to grow and expand.
- Prohibit residential uses from encroaching on existing and planned industrial areas.

Manage various planning tools and programs

Communities can utilize a number of tools and programs that can encourage commercial and industrial development. In many cases these tools can be used by older and new communities alike to manage and enhance their commercial and industrial development: Downtown Development Authorities (DDAs), Tax Increment Finance Authorities (TIFAs), and Local Development Finance Authorities (LDFAs). A summary of these and other tools can be found in Table 11, along with a brief description of authorized communities, limitations, requirements, eligible projects, and funding sources. Additionally, further descriptions of these programs have been provided in the Enhancing Older Commercial and Industrial Areas section of this report.

Technology Park in Plymouth Township.

CASE EXAMPLE

Haggerty Road Corridor Plan

Community: Northville Township

Contact: Maureen Osiecki, (248) 348-5800

Northville Township determined that it would be facing issues related to development and redevelopment in the years to come. The township determined that it must evaluate current land uses and zoning in order to make recommendations for the future. It developed the Haggerty Road Corridor Plan for development along its eastern border. This corridor plan has assisted the township in a number of planning issues, such as McDonald's wanting to paint their roof red and Sunoco wanting to remove its cedar shake roof for both its building and gas pump canopy, and replace it with a rainbow of colors. The Firestone at Eight Mile and Haggerty Road had to comply with these standards as well, and has since been using this store as a model for new stores.

One of the community's goals with the plan was to establish design standards that complement recent development along the Haggerty Road corridor. Actions identified included:

1. Require earth tone color brick as the predominant building material.
2. Require peaked roofs, not simply a pediment wall, with earth tone or subtle roof colors that complement the building.
3. Encourage vertical architectural features such as clock towers, copulas, and atriums.
4. Require architectural features to break up long building walls such as: bands, accent materials, windows and well-defined stepped facades.
5. Require that all roof-top equipment be screened from view.
6. Ensure that sign bases, screen walls, and other structures are the same material as the building.
7. Discourage or prevent reflective glass as a dominant design feature.
8. All lighting should be directed downward with shoe box type fixtures, except for ornamental lighting.

Firestone at Eight Mile and Haggerty in Northville Township.

Table 11
Summary of Economic Development Tools

	DDAs	TIFAs	LDFAs	BRAs	EDCs	PSDs	BIDs
Authorized municipalities	Cities, villages and townships	Cities	Cities, villages and urban townships	Cities, villages and townships	Cities, villages and townships	Cities with designated principal shopping district(s)	One or more cities with an urban design plan
Limitations	One per municipality	No new areas established after 1989	One per municipality	Industrial or commercial property	Industrial area	Commercial area with at least 10 retail businesses	Commercial or industrial area with boundaries established by city resolution
Requirements	Deteriorating property values	Deteriorating property values	Industrial area	Enviro-nmental contamination	Industrial or 501(c)(3) nonprofit in master plan	Designated as a principal shopping area cities by resolution	Designated as a BID by one or more
Eligible projects	Located in DDA district with approved DDA/TIF plans	Within defined TIFA area	Public facility to benefit industrial park	Enviro-nmental cleanup	Issue bonds for private industrial development	Improve highways and walk-ways; promotion; parking, maintenance, security or operation	Improvement of highways and walk-ways; promotion; parking, maintenance, security or operation
Funding sources	TIF from District;	TIF from plan area	TIF on eligible property	TIF; Revenue Bonds	Tax exempt bonds	Bonds, special assessments	Bonds, special assessments, gifts, grants, city funds, other

BIDs – Business Improvement Districts; DDAs – Downtown Development Authorities; PSDs – Principal Shopping Districts; BRAs – Brownfield Redevelopment Districts; LDFAs – Local Development Finance Authorities. For a summary comparison of these and Economic Development Corporations (EDCs) and Tax Increment Finance Districts (TIFAs), see the Michigan Municipal Leagues's Economic Development Tools, June 2000.

Source: Michigan Municipal League. *Economic Development Tool*. Ann Arbor, MI: Michigan Municipal League, 2000.

Additional Resources

Beaumont, Constance M. *Better Models for Superstores: Alternatives to Big-Box Sprawl*, 1997.

City of Ann Arbor Zoning Ordinance, Chapter 55 – Ann Arbor City Code, 1996.

Fleming, Ronald Lee. *Saving Face: How Corporate Franchise Design Can Respect Community Identity*. Chicago, IL: American Planning Association, 2002.

Plymouth Township Master Plan, 1994.

Pregliasco, Janice. *Developing Downtown Design Guidelines*, 1988.

Warbach, John. "Design Guidelines: Promoting Good Design in Your Community." *Planning and Zoning News*, May 2001.

Enhancing Older Commercial and Industrial Areas

Development trends throughout Southeast Michigan have seen a shift of business centers away from older urban areas. Developers may consider untouched land to be attractive for their projects because of the availability of relatively inexpensive tracts of vacant land with lower taxes, access to growing suburban residential population, and freedom from the contamination found in some older sites. This shift has resulted in the abandonment of commercial and industrial facilities in older urban areas as well as the in-place infrastructure. This section focuses on the tools that are available to local units of government that can help enhance older commercial and industrial areas. Encouraging reinvestment in these areas is vitally important to the overall quality of life in both older urban communities and the region as a whole.

The tools that communities use to help facilitate the management of commercial and industrial development also apply in enhancing older areas as well. In addition to those tools, there are various programs, tools and techniques that are available to support redevelopment efforts. These tools can be employed to attract commercial and industrial business to under utilized areas and to enhance the viability of existing businesses. Likewise, some of the tools (such as the Local Development Financing Authority) can be used to manage newer commercial and industrial areas.

Keeping It Connected

Plan for the future transportation needs for your community, including those required to sustain your commercial and industrial areas. You may need to conduct a corridor study to identify the needs along a transportation corridor that identify the best combination of transportation improvements that will be effective in moving people and goods. Consider developing transit opportunities to aid in the movement of people to and from these areas.

Planning and Regulatory Considerations

The State of Michigan has provided local units of government with specific tools through enabling laws for use in development and redevelopment activities. The first four of the devices listed below make use of a mechanism referred to as tax increment financing (TIF). Essentially, the use of TIF provides the means for an eligible district to "capture" increases in property tax revenue to help fund capital improvements to that area. The remaining tools provide other means for facilitating targeted activities.

Mt. Clemens created a Downtown Development Authority to assist in enhancing its commercial district.

Downtown Development Authority (DDA) (PA 197 of 1975, as amended) may be created to promote growth in downtown business district and to increase property tax valuation.

Tax Increment Finance Authority (TIFA) (PA 450 of 1980, as amended) closed to new communities in 1987, its boundaries cannot be expanded. Effectively has been replaced by the LDFA.

Local Development Financing Authority (LDFA) (PA 281 of 1986, as amended) may be created to encourage local commercial or industrial development, to prevent conditions of unemployment, and to promote growth.

Brownfield Redevelopment Authority (BRA) (PA 381 of 1996, as amended) may be created to clean up contaminated sites and functionally obsolete or blighted properties in qualified communities.

Economic Development Corporation (EDC) (PA 338 of 1974, as amended) can be used to facilitate the assistance of industrial and commercial enterprises and to help prevent and reduce unemployment conditions.

Principal Shopping District (PSD) (PA 120 of 1961, as amended) may be created to develop or redevelop a principal shopping area and to collect revenues, levy special assessments, and issue bonds to pay for its activities.

Business Improvement District (BID) (PA 120 of 1961, as amended) may be created to develop a more successful and profitable business climate in a defined area, and

to collect revenues, levy special assessments, and issue bonds to pay for its activities.

Industrial Facilities Property Tax Abatement (PA 198 of 1974, as amended) permits local-initiated property tax abatements for qualified projects.

Historic Preservation Tax Credit (PA 534 of 1999, as amended; PA 535 of 1999, as amended) aims at residential and commercial historic preservation efforts in Michigan.

Obsolete Property Rehabilitation Act (PA 146 of 2000, as amended) permits qualified local governmental units to establish obsolete property rehabilitation districts, and allow the owner of obsolete property to apply for tax abatements for commercial facilities undergoing rehabilitation in these eligible districts.

Personal Property Tax Abatement (PA 328 of 1997, as amended) allows the governing body of an eligible local assessing district (a city, village, or township that contains an "eligible distressed area") to adopt a resolution to exempt from personal property taxes all new personal property of an "eligible business" located in an "eligible district" or districts designated in the resolution.

Tools for Enhancing Older Commercial and Industrial Areas

There are several tools communities can draw from to enhance their older commercial and industrial areas. This section focuses on the following techniques:

- Promoting development by creating local authorities.
- Establishing commercial districts.
- Managing the tools and programs.

Each of these methods is highlighted below. However, many sections of this book provide detailed information that may be helpful in enhancing older commercial and industrial areas. Additional tools include the federal empowerment zone and Michigan's renaissance zones.

Promoting development by creating local authorities

The ability to create local authorities provides local units of government with an important tool to promote development and redevelopment efforts. One of the primary benefits of creating an authority in Michigan is the ability to use tax increment financing (TIF) as a funding source to finance improvements to the district. The following types of authorities have the ability to use TIF in Michigan:

- Downtown Development Authority (DDA).
- Tax Increment Finance Authority (TIFA); closed to new communities in 1987, its boundaries cannot be expanded; effectively has been replaced by the LDFA.
- Local Development Financing Authority (LDFA).
- Brownfield Redevelopment Authority (BRA).

Using tax increment financing to raise funds for public improvements

Tax increment financing is a method for raising funds to cover public costs associated with development projects. To initiate tax increment financing, the local unit creates an eligible authority; establishes the tax base, set at the initial year within a specific district; and then uses the tax revenues generated by new development or reassessment in subsequent years that are over and above the initial tax base (the increment) to finance infrastructure improvements within the district. The money captured after the tax freeze goes to the district authority and its projects rather than going to other taxing units within the municipality. The captured funds can be used within the specified district for various allowable uses, as outlined in the pertinent legislation.

Benefits of tax increment financing are:

- access to a dedicated source of funds for an identified area,
- public investment encourages new private investment, and
- benefits to the entire community by making the municipality more competitive and attractive.

Creating a Downtown Development Authority to facilitate improvements

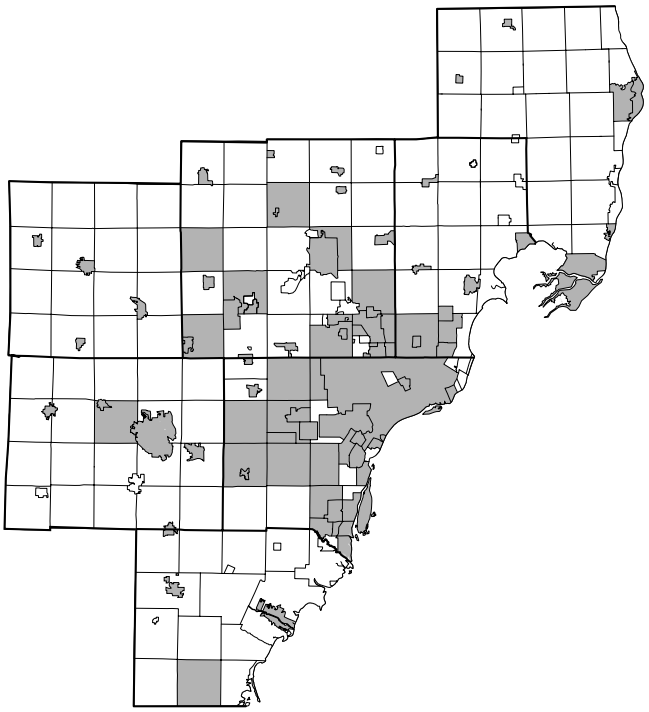
Local units of governments can create a Downtown Development Authority (DDA) in designated downtown areas that provides the means to plan and improve downtown areas through the construction of a broad range of eligible public facilities. DDAs can raise revenue through the use of tax increment financing, the issue of revenue bonds, and tax levies, as well as applying for grants. The DDA may expend these revenues for various types of services within their jurisdiction, such as:

- streetscape enhancement,
- improvement of sidewalks,
- beautification efforts,
- administration costs for operating the DDA, and
- lawn and garden maintenance and snow removal.

In addition to providing a tool for making physical improvements, DDAs also provide benefits in other ways:

- attracting commercial, office, and entertainment development,
- promoting economic growth and employment opportunities,
- encouraging opportunities for new development as a means of enhancing business activities and preventing deterioration,
- improving the community's tax base and helping to eliminate deterioration,

Figure 8
Communities with Downtown Development Authorities



Source: SEMCOG and State of Michigan.

Allen Park
Ann Arbor
Auburn Hills
Bedford Twp.
Belleville
Berkley
Beverly Hills
Brighton
Brownstown Twp.
Canton Twp.
Capac
Center Line
Chelsea
Clawson
Clay Twp.
Commerce Twp.
Dearborn
Detroit
Dexter
Dundee
Eastpointe
Farmington
Ferndale
Flat Rock
Fowlerville
Fraser
Garden City
Gibraltar
Grosse Ile Twp.
Grosse Pte. Park
Hamtramck
Hazel Park
Highland Twp.
Holly
Howell
Independence Twp.
Inkster
Lake Orion
Lathrup Village
Lincoln Park
Livonia
Lyon Twp.
Madison Heights
Marine City
Melvindale
Milan
Milford
Monroe
Mt. Clemens
New Baltimore
Northville
Ortonville
Oxford
Pinckney
Pleasant Ridge
Plymouth
Pontiac
Port Huron
Port Huron Twp.
Redford Twp.
River Rouge
Rochester
Romeo
Romulus
Roseville
Royal Oak
Royal Oak Twp.
Scio Twp.
South Lyon
Southfield
Taylor
Trenton
Troy
Utica
Van Buren Twp.
Walled Lake
Warren
Wayne
Westland
Wixom
Woodhaven
Wyandotte
Yale
Ypsilanti

- fostering cooperation between public and private entities with the same goal,
- following the National Main Street Program's four point approach — design, organization, promotion, and economic restructuring, and
- encouraging development of housing in the DDA district.

Many DDAs have created Web sites to help promote businesses and activities within their district. These web sites are typically located on the web site for either the local community or chamber of commerce.

Here are some considerations when forming a DDA:

- The governing body of the municipality must create the authority and designate the boundaries of the DDA by resolution.
- The district must be an existing business district zone and be primarily used for business purposes.
- A governing board and chief executive officer must be appointed. There must also be 8-12 additional members, several of whom must have property interests in the DDA district.
- A development plan must be prepared and approved by the municipality's governing body prior to the DDAs being able to finance projects.

Targeting development using a Local Development Finance Authority

Local units of government can establish a Local Development Finance Authority (LDFA) to target development. LDFAs, which may be established in cities, villages, or urban townships, are limited to business activities involving manufacturing, agricultural processing, high-technology activities, energy production, and business incubators.

Benefits of an LDFA include eligibility for tax increment financing, with tax capture of up to 50 percent of the K-12 and intermediate school district revenues, subject to State Treasurer approval. This revenue can be used for various projects including land acquisition and clearance, construction of public facilities, and other development activities within the defined areas. LDFAs can now be multi-jurisdictional, as a result of recent amendments.

When creating an LDFA its expenditures must be for public property and facilities, unless the LDFA contains a Certified Technology Park (or SmartZone), in which case the revenues may be used for non-public property in certain cases.

Recent amendments to the LDFA also created provisions for certified technology parks (SmartZones), and certified business parks (see next section for certified business parks).

Encouraging high-tech development in certified technology parks (SmartZones)

Certified technological parks, referred to as SmartZones, are intended for high tech development.

Benefits of certified technology parks are the ability to use a modified form of tax-increment financing, and special state funding to develop infrastructure.

The State of Michigan can designate up to 10 certified technological parks in the state. SmartZones must be a partnership between at least one local unit of government and one or more public universities.

Promoting development with Certified Business Parks

The Michigan Economic Development Corporation (MEDC) offers business park certification to promote uniformity and minimum standards for industrial parks. The LDFA provides the authority for certified business parks.

The benefit to certification is as a marketing tool designed to give confidence to investors that certain minimum standards for industrial parks are in place. This, in turn, will assist the community in enhancing its tax base. (The Michigan Economic Developers' Association maintains a current database of Certified Business Parks at www.medaweb.org.)

In order to receive business park certification, parks must:

- Contain more than 40 acres of land.
- Be zoned exclusively for use of eligible property, which includes the following activities:
  - the manufacturing or processing of goods or materials by physical or chemical change,
  - agricultural processing,
  - high-technology whose primary purpose is research,
  - product development, engineering, laboratory testing, or development of industrial technology,
  - site plan or plat approval from local unit of government, and
  - have the developer of the land agree to comply with other state-imposed requirements.

Table 12
Local Development Financing Authorities

Ann Arbor	Howell	St. Clair
Auburn Hills	Huron Twp.	Saline
Augusta Twp.	Marine City	Southfield
Brighton	Marysville	Taylor
Detroit	Monroe	Westland
Dexter	New Baltimore	Wixom
Dundee	Port Huron	Yale
Fowlerville	Rochester Hills	Ypsilanti
Garden City	Romulus	

Source: SEMCOG and State of Michigan Department of Treasury.

St. Clair Shores' Nautical Mile.

In order to keep park uniformity, business park certification also requires that the certain features, through local zoning, deed restrictions, or covenants, are legally enforceable. Briefly, requirements affect:

- compatible uses,
- types of building materials,
- landscaping,
- improved parking,
- screened outdoor storage,
- location of loading docks,
- continuous management,
- setback specifications, and
- signage.

Redeveloping brownfields

The United States Environmental Protection Agency defines "brownfields" as "abandoned, idle, or underused industrial and commercial properties at which real or perceived contamination interferes with efficient expansion or redevelopment efforts." Local communities can enhance their older commercial and industrial areas by facilitating the redeveloping of these brownfields.

Table 13
SmartZones in Southeast Michigan

Oakland County	Oakland Automation Alley SmartZone	Collaboration of Automation Alley, the City of Southfield, Lawrence Technological University, Oakland University, and Oakland County. The City of Southfield and the universities will work together in developing a business incubator. (Note: Oakland County is being recognized for its unique efforts with Automation Alley, but will not be able to utilize the Tax Increment Financing recapture capabilities offered under the law.)
Washtenaw County	Ann Arbor/Ypsilanti SmartZone	Joint proposal of the Cities of Ann Arbor and Ypsilanti, in partnership with the Ann Arbor IT Zone, the University of Michigan, Eastern Michigan University, ERIM and the Washtenaw Development Council. The zone will initially include 66 blocks in downtown Ann Arbor and 10 blocks in Ypsilanti, but may be expanded to take advantage of unique opportunities in the areas of MEMS, IT, or life sciences.
Wayne County	Pinnacle Aeropark SmartZone	This zone will be supported by the City of Romulus, Huron Township and Wayne County. The SmartZone seeks to create a state-of-the-art real estate development that builds on and complements airport investment. The vision is to transform approximately 1,200 acres of underutilized, county-owned land in the airport area into a high-quality, mixed-business/technology zone.
	Woodward Technology Corridor SmartZone	Submitted by the City of Detroit and Wayne State University, in cooperation with the General Motors Corporation, Henry Ford Health System and others.

Source: Michigan Economic Development Corporation, online, medc.michigan.org/smartzones/, April 2001.

With respect to the cleanup of contaminated property in Michigan, in 1995 the State of Michigan enacted major amendments to Michigan's primary environmental cleanup law, Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act (1994 PA 451, as amended). The objectives of these amendments were to accomplish the following:

- Assigned liability to parties who caused the contamination.
- Remove excess conservatism from the cleanup standards.
- Assist in returning contaminated property to productive use.

The Michigan Department of Environmental Quality conducted a survey of 33 municipalities in March 2001. Results of the survey indicated that projected development in the 33 municipalities, as a result of the June 1995 amendments, totaled over $3.5 billion in private investment and over 9,568 new jobs.

Source: Michigan Department of Environmental Quality, online, www.michigan.gov/deq

By rejuvenating brownfields, communities can position themselves to either encourage business and industry to consider locating to these properties, or to find other uses for this land. To help finance the cleanup activity of brownfields, the State of Michigan provided for the creation and use of local Brownfield Redevelopment Authorities (BRA), which are eligible to use tax increment financing. Brownfield authorities are community-wide, but they may only capture incremental taxes from Michigan Department of Environmental

Quality approved brownfield plan sites. Communities can use their BRA in conjunction with a DDA, LDFA, or TIFA. Additionally, approved brownfield projects in approved brownfield authorities are eligible for Single Business Tax credits. (See Table 14 on how to establish a BRA.)

Recent brownfield act amendments allow for qualified communities as defined in PA 146 of 2000 (Table 9), to make use of a BRA for cleanup activities related to properties that are either blighted or functionally obsolete. The brownfield act amendments define blighted properties as properties that meet any of the following criteria:

- Has been declared a public nuisance in accordance with a local housing, building, plumbing, fire, or other related code or ordinance.
- Is an attractive nuisance to children because of physical condition, use, or occupancy.
- Is a fire hazard or otherwise dangerous to the safety of persons or property.
- Has had the utilities, plumbing, heating, or sewerage permanently disconnected, destroyed, removed, or rendered ineffective so that the property is unfit for its intended use.
- Is tax-reverted property owned by a qualified local governmental unit by a county, or by the State of Michigan. The sale, lease, or transfer of tax-reverted property by a qualified local governmental unit, county, or the State of Michigan after the property's inclusion in a brownfield plan shall not result in the loss to the property of the status as blighted property for purposes of this act.

Functionally obsolete properties are defined in brownfield act amendments as properties that are unable to be used to adequately perform the function for which it was intended due to a substantial loss in value resulting from various factors. These factors might include overcapacity, changes in technology, deficiencies or super-adequacies in design, and other similar factors that affect the property itself or the property's relationship with other surrounding property.

Redeveloping brownfields using infill development

There are many benefits to developing brownfields with good infill development, including making use of the existing highway network and other infrastructure and proximity to historic districts and recreational amenities. Construction of new buildings on vacant lots downtown should be encouraged. Design guidelines should ensure that the infill development is compatible with surrounding environment. Some considerations include:

- building height,
- comparative width with surrounding buildings,
- proportion of height and width with existing facades,
- relationship to the street,
- roof and cornice forms,
- composition of the facade parts being compatible with surrounding facades,
- consistent window and door spacing and proportion along block, and
- materials and colors that complement the building's environs.

Source: National Trust for Historic Preservation. *Design Guidelines for New Infill.*

For further discussion on infill development please see the chapter on Enhancing Older Residential Areas.

Establishing commercial districts

Creating district areas concentrates enhancement activities to a specifically defined area.

Forming a principal shopping district

Cities can facilitate development or redevelopment of a commercial area within its boundaries by designating the area as a principal shopping district (PSD). This mechanism gives the city the ability to spread the cost of public improvements to all participants in the

Redevelopment in Warren at the former Detroit Tank Arsenal property.

district. The PSD must be in a portion of a city that is predominantly commercial and that contains at least ten retail businesses. A city can use this tool if it has a master plan for the physical development of the city that includes an urban design plan designating a principal shopping district or includes the development or redevelopment of a principal shopping district.

A city that provides ongoing activity that promotes economic development and provides for the maintenance, operation, and security of the PSD promotes a management board for the PSD. However, the board's legal status is in an advisory capacity to the city. The power of the act rests with the city.

Activities that cities can undertake under the PSD include:

- Open, widen, extend, realign, pave, maintain, or otherwise improve highways and pedestrian walkways.
- Prohibit or regulate vehicular traffic and parking on highways.
- Acquire, maintain, and operate properties, off-street parking lots, or contract for such operation by others.
- Construct, maintain, and operate malls with bus stops, information centers, and other buildings that serve the public interest.
- Acquire, maintain, and operate real or personal property necessary to implement the act.
- Promote economic activity and provide or contract for the maintenance, security, and operation of a PSD.
- Levy special assessments against land or interests in land, or both.
- Issue bonds to cover the capital costs of the project.

Organizing a Business Improvement District

Business Improvement Districts (BIDs) are an expanded form of Principal Shopping Districts (PSDs). The major distinction and benefit between the BID and PSD is that the BID may be located in one or more cities, while the PSD can only be located in one. Furthermore, there can be more than one BID in a city, but only one PSD.

The primary benefit of forming a BID, similar to those for a PSD, is to create a mechanism to finance necessary improvements and maintenance of business districts, above and beyond normal municipal services. By being designated as a BID, qualified downtown and commercial areas of cities can levy a special assessment for improvements in the district, and the BID can bond against tax revenues for the financing of district improvements.

Michigan law provides for BIDs under one of two formats. PA 260 of 2001 essentially provides for a bottom-up approach where local property owners initiate the process. Conversely, the provisions of PA 261 of 2001 provide for local units of government to create business improvement districts.

Establishing a BID initiated by local property owners (PA 260 of 2001). PA 260 of 2001 defined a bottom-up process for creating business improvement districts that allows eligible property owners to initiate the process. Essentially, a 60 percent majority of eligible commercial and/or industrial property owners determine that they want to form such a district, develop boundaries, identify eligible property, and develop the detailed scope of services and corresponding budget.

Benefits of BIDs to the district area include the ability to:

- Acquire, construct, develop, improve, maintain, operate, or reconstruct park areas, planting areas, and related facilities.
- Acquire, construct, clean, improve, maintain, reconstruct, or relocate sidewalks, street curbing, street medians, fountains, and lighting.
- Develop and propose lighting standards.
- Acquire, plant, and maintain trees, shrubs, flowers, or other vegetation.
- Provide or contract for security services with other public or private entities and purchase equipment or technology related to security services.
- Promote and sponsor cultural or recreational activities.
- Engage in economic development activities, including, but not limited to, promotion of business, retail, or industrial development, developer recruitment, business recruitment, business marketing, business retention, public relations efforts, and market research.
- Engage in other activity with the purpose to enhance the economic prosperity, enjoyment, appearance, image, and safety of the zone area.

Some things to consider when forming a local-property-owner-led BID:

- Person(s) may initiate the establishment of a BID by delivering a petition to the clerk of the city or village in which a proposed district area is located.
- The petition includes boundaries of the zone area; signatures of property owners representing a specified proportion of parcels; and a listing, by tax parcel identification number, of all parcels within the district area, separately identifying assessable property.
- There must be a meeting of property owners, notified by the clerk, to adopt a district plan that will be submitted to and approved by the governing body of the city or village in which the business improvement district is located.
- The district plan must include a number of items as instructed in the act, including items related to district boundaries, board of directors, and finances.

Table 14
How to Establish a Brownfield Redevelopment Authority

Steps	Tips
1. Hold one or more meetings with community leaders (i.e., mayor/ president/chairperson, commission/ council/board of trustees, finance department, planning departments, etc.) to explain the purpose and powers of a Brownfield Redevelopment Authority and the benefits to the community.	• If contemplating a county authority, it is a good idea to meet with each of the local units of government within the county to solicit their participation.
2. The local governing body (i.e., a city council, commission, township board, county commission) must adopt a resolution of intent to establish a Brownfield Redevelopment Authority. The resolution sets a date for a public hearing on the adoption of a resolution creating the authority.	• For a county authority, all participating local governing bodies must concur by resolution to be included in the county's authority. • A county authority is only able to exercise its powers over any eligible property within the municipal limits of those local governing units which have adopted a resolution to join the county. Authority and have concurred with the provisions of a Brownfield Plan. • Documents needed: - Resolution of Intent to Create an Authority. - Resolution of Concurrence by Municipality to Join County Authority.
3. The local governing body must publish two successive notices in a newspaper of general circulation in the area. The notices must state the date, time, and place of the public hearing on the adoption of a resolution creating the authority. Both notices must be published not more than 40 days and not less than 20 days before the hearing date.	• If the notice of the public hearing is published on the same day that the governing body adopts the resolution of intent and if the authority is created on the same day as the hearing, this process could be completed theoretically in as little as 30 days. To meet this schedule, the notice of the hearing would need to be published twice within about 10 days. In most instances, it is likely to take longer than 30 days in order for local units of government to effectively communicate and allow others potentially affected by the process to become familiar with the process. • Documents needed: - Notice of Public Hearing [for publication]. - Notice of Public Hearing [for posting].
4. The local governing body must hold the public hearing on the date stated in the notice (in accordance with the Open Meetings Act and any local requirements).	
5. The local governing body must adopt a resolution establishing the authority and appointing board members within 30 days after the date of the public hearing. The resolution may be adopted immediately after completing the public hearing, at the same session of the governing body required in Step 4.	• Document needed: - Resolution establishing a brownfield redevelopment authority and appointing board members.

Table 14
How to Establish a Brownfield Redevelopment Authority (continued)

Steps	Tips
6. Included in the resolution in Step 5, the local governing body must establish the authority's board.	• The governing body may designate as the authority's board, the trustees or governing board of the Economic Development Corporation, Downtown Development Authority, Tax Increment Finance Authority, or Local Development Finance Authority. • Or, the local governing body may establish a completely new board consisting of between five and nine individuals appointed by the chief executive officer of the municipality and approved by the governing body. • Establish the board and appointing the board members may be carried out in the same session in which the public hearing in Step 4 is held. • Michigan's incompatibility of offices statute should be reviewed by the local governing body's attorney when deciding whether to appoint an elected official as an authority board member.
7. The resolution establishing a Brownfield Redevelopment Authority, passed by the local governing body in Step 5, must be filed with the Michigan Secretary of State promptly after its adoption.	• There is a 60-day period after the filing of the resolution establishing the authority during which any person withstanding may challenge the establishment of the authority in court. • Document needed: - Letter to the Secretary of State.
8. The authority's board should conduct an organizational meeting.	• The organizational meeting elects the officers of the board, may adopt bylaws by majority resolution, shall adopt rules of governing, its procedure, and the holding of regular meetings; and, may employ a director subject to approval by the governing body that created the authority. • The director should not be a member of the board; however, a local government employee or official (i.e., city/village manager, chamber staff person, local economic development corporation staff person) may serve as the director on a shared-time basis. The authority may agree to reimburse the municipality for such services. • Documents needed: - Bylaws. - Resolution approving bylaws.

Source: Consumers Renaissance Development Corporation, "Criteria for Brownfield Incentives."

Note: After establishing the Brownfield Redevelopment Authority, the Brownfield Plan will need to be adopted.

- The governing body of the city or village reviews, amends, and approves the plan.
- Day-to-day activities for the BID and implementation of the plan is managed by a board of directors. The board consists of an odd number of directors not smaller than five and not larger than 15 in number. The board includes one director selected by the city or village.

Creating a BID by one or more local units of government (PA 261 of 2001). PA 261 of 2001 provides another means for creating business improvement districts. Under this act, cities or a combination of contiguous portions of two or more cities can create a BID. Additionally, cities can create more than one BID.

This form of BID has the ability to do one or more of the following:

- Open, widen, extend, realign, pave, maintain, or otherwise improve highways and pedestrian walkways

- Prohibit or regulate vehicular traffic and parking
- Acquire, maintain, and operate off-street parking lots, or contract for such operation by others; construct, maintain, and operate malls with bus stops, information centers, and other buildings that will serve the public interest
- Acquire, maintain, and operate real or personal property necessary to implement the act
- Levy special assessments against land or interests in land, or both
- Issue bonds to cover the capital costs of the project, and promote economic activity in the district, specifically by initiating market research, public relations campaigns, institutional promotions, and sponsorships of special events and related activities.

The city provides for the creation of a board for the management of those activities. Generally, the board of a BID is comprised of the following:

- One representative of the city; if the business improvement district is located in more than one city, then one representative from each city in which the BID is located.
- Other members of the board, as nominated by the businesses and property owners located within the BID, with certain parameters for makeup based on amount of property ownership.

Managing the tools and programs

Communities with older commercial and industrial areas may need to draw upon several of the above listed tools in order to address their needs. Most of these tools require that the municipality create an authority to administer the program. As a result, these communities are faced with a challenge to manage the several authorities within its boundaries. A comparison of the attributes of various authorities authorized in the State of Michigan is provided in Table 15.

Beautification awards, such as those given out by Farmington, is one incentive to consider when focusing on enhancing commercial districts.

Table 15
Comparison of Attributes of Various Tax and Finance Authorities in the State of Michigan

Attribute	**BIDs**	**PSDs**	**DDAs**	**BRAs**	**LDFAs**
Tax increment financing?	N	N	Y	Y	Y
Levy mills or special assessments for district improvement?	Y	Y (restrictions apply)	Y	N	N
Joint application/administration by multiple local units of government?	Y	N	N	N	Y
Set up more than one (non-contiguous) district?	Y	N	N	Y	Y
Seek grants for district improvements?	Y	Y	Y	Y	Y
Amend district boundaries?	Y	Y	Y	n/a	Y

BIDs – Business Improvement Districts; DDAs – Downtown Development Authorities; PSDs – Principal Shopping Districts; BRAs – Brownfield Redevelopment Districts; LDFAs – Local Development Finance Authorities. For a summary comparison of these and Economic Development Corporations (EDCs) and Tax Increment Finance Districts (TIFAs), see the Michigan Municipal Leagues's Economic Development Tools, June 2000.

Source: Citizens Research Council of Michigan. *Survey of Economic Development Programs in Michigan* (Report Number 334). Livonia, MI: Citizens Research Council of Michigan, 2001.

Case Example

Brownfield Redevelopment Authority

Community: City of Monroe

Contact: Robert Hamilton, (734) 243-0700

The City of Monroe created its Brownfield Redevelopment Authority (BRA) in January 1997. Since inception the city has engaged a total of eleven brownfield projects. All elements of the Michigan Brownfield Program have been used — MDEQ liability protection via baseline environmental assessments, grant and loan programs, and BRA tax increment financing coupled with the State of Michigan Single Business Tax credit for private investment. The total dollar value of public and private investment on these sites, when complete, will be $139,000,000 — more than 10 percent of all new brownfield investment in Michigan. In addition, Monroe developed the site-based reimbursement brownfield financing plan model currently used by most local units and recommended by MDEQ.

Monroe's best-known brownfield project is a residential neighborhood "Mason Run." The project's first phase (500 units) involves development of 50 acres of brownfield property used for most of the 20th Century as a cardboard paper mill. The project has been designed using traditional, or "New Urbanist," principles. When built out at more than 1,600 units, this project will represent the largest new subdivision in Monroe in more than 20 years, increasing the city's population by approximately 15 percent.

Initial due care activities, including remediation and basement debris removal will cost approximately $3 million. The Monroe Brownfield Redevelopment Authority (BRA) is the primary funding vehicle for environmental costs, using Michigan Act 381 tax increment capture from the new development to repay debt instruments totaling $2 million. Grant assistance from the State of Michigan Site Reclamation Program, in the amount of $1 million has also been received.

Mason Run development in Monroe included the excavation of the old Northside Consolidated Factory basement. The model homes are in the background.

Photo courtesy of Crosswinds Communities.

Re$tore Detroit

Community: Detroit

Contact: Alan Levy, (313) 224-2078

As part of a focus on neighborhood revitalization, five of Detroit's neighborhood commercial districts look forward to major improvements under the Re$tore Detroit! program. Each of the five districts will receive up to $640,000 in organizational funding and be eligible for additional program and project funding over seven years.

The Advisory Board of the Mayor's Office of Neighborhood Commercial Revitalization (ONCR) selected the five groups from a field of 16 nonprofit community associations for the first round of technical assistance and financial support. These groups are:

- Grandmont-Rosedale CDC (Grand River Avenue from Evergreen to Greenfield).
- Jefferson East Business Association (East Jefferson Avenue to Alter Road).
- Arab-American Chaldean Council (7 Mile Road from Woodward Avenue to John R).
- Mexicantown CDC (Bagley and West Vernor streets).
- NorthStar CDC (Livernois Avenue at McNichols Road).

The ONCR began operation in September 2001 as a catalyst to redevelop Detroit's commercial strips. It is a partnership between the mayor, city council, and foundation community. The ONCR was generated by twin reports from the city council and Community Development Advocates of Detroit's (CDAD) neighborhood commercial network.

In addition to the operational funding provided to each district by the Funders' Collaborative, a coalition of local philanthropic organizations and businesses, city council has allocated CDBG funds for facade improvements, training, technical assistance, and promotions funding for each district.

Additional Resources

Brownfield Redevelopment. Lansing, MI: Michigan Economic Development Corporation. 2001.

Citizens Research Council of Michigan. *Survey of Economic Development Programs in Michigan* (Report Number 334). Livonia, MI: Citizens Research Council of Michigan, 2001.

City of Farmington Downtown Development Authority. www.ci.farmington.mi.us/dda.htm.

City of Mount Clemens Downtown Development Authority. www.downtownmountclemens.com/events.cfm.

Consumers Renaissance Development Corporation, *Criteria for Brownfield Incentives*, 2000.

Michigan Economic Development Corporation. *Economic Development in Michigan: A Guide for Michigan Communities*. Lansing, MI: Michigan Economic Development Corporation, 2002.

Michigan Municipal League. *Economic Development Tools* (One-Pager Plus Report). Ann Arbor, MI: Michigan Municipal League, 2000.

Northwest Midwest Institute. *Strategies for Successful Infill Development*. 2001.

Community Design

Streetscape Layout and Design

Historic Preservation

Parking and Lighting Standards

Sign Regulation

Buffering/Screening/ Landscaping

Private Roads Regulations

Streetscape Layout and Design

As used in this document, streetscape refers to the design character of a particular street and the surrounding environment, including the street, the buildings along the street, facades at street level, sidewalks, street plantings, signs, and site furnishings. The streetscape determines the visual quality of the area and the manner in which both pedestrian and vehicular traffic travels through the space. All or some of the planning techniques discussed in this section can apply to downtown areas and business districts, as well as residential areas. An overarching goal of creating a good street environment is making it pedestrian friendly.

Typical design objectives include:

- promoting sidewalk activity,
- reinforcing community character,
- creating a safe environment with adequate lighting,
- providing for all modes of transportation,
- integrating civic and public art elements, and
- creating a connection to the natural environment.

In order for a streetscape design to be successful, it must address the underlying economic needs of the area. If, for example, a downtown or business area is not currently attracting enough shoppers to support the retail businesses, this is not likely to change simply by adding streetscape amenities, such as trees, benches, and lighting.

Keeping It Connected

It is important to address walkability issues, particularly pedestrian safety, in conjunction with streetscape planning. Remember that aesthetic issues such as lighting and signage, and congestion management and pedestrian safety are also important components of streetscape planning within your community.

Planning and Regulatory Considerations

A Downtown Development Authority (DDA) is a public/private entity created to plan and finance the redevelopment and revitalization of a central business district. DDAs are an excellent tool communities can use to prevent the deterioration of downtowns. Typically, a DDA finances infrastructure and public facility improvements. DDAs also promote urban redevelopment and create a mechanism for municipalities to compete more effectively with outlying shopping areas and newer commercial districts. Successful DDAs stimulate creation of jobs, preserve historic sites, and support the overall economic base of the district. DDAs are established and controlled under local ordinances and are enabled by the Downtown Development Authority Act (Act 197, Public Acts of Michigan of 1975).

Streetscape improvement funds are available through the Michigan Department of Transportation's Transportation Enhancement Program. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) established a fund for transportation enhancement activities. The Transportation Equity Act for the 21st Century (TEA-21) of 1998 continues this program through 2003. Specific streetscape enhancement activities included in this program are:

- Providing facilities for pedestrians and bicycles.
- Landscaping and other scenic beautification.
- Controlling and removing of outdoor advertising.

Tools for Streetscape Layout and Design

To be successful, a streetscape improvement plan and regulations should be adopted and incorporated into a community's master planning efforts.

The City of Plymouth's use of attractive, pedestrian-scale streetscape furniture, signage, and lighting enhances the vitality of its downtown commercial center.

This chapter discusses the following tools:

- Develop a streetscape plan.
- Scale street design and character to human use.
- Involve the public in the streetscape planning process.

Streetscape planning can be one of the key elements in strengthening the commercial cores of communities. Other significant advantages are:

- securing a consensus and cooperation among the groups that are involved in developing and maintaining the core,
- promoting the core area to customers, investors, existing businesses, and potential new businesses, and
- strengthening the economy of the commercial core by helping businesses to expand, recruiting new businesses, and increasing the use of underutilized buildings.

Streetscape improvements also affect attitudes about commercial cores simply through physical changes.

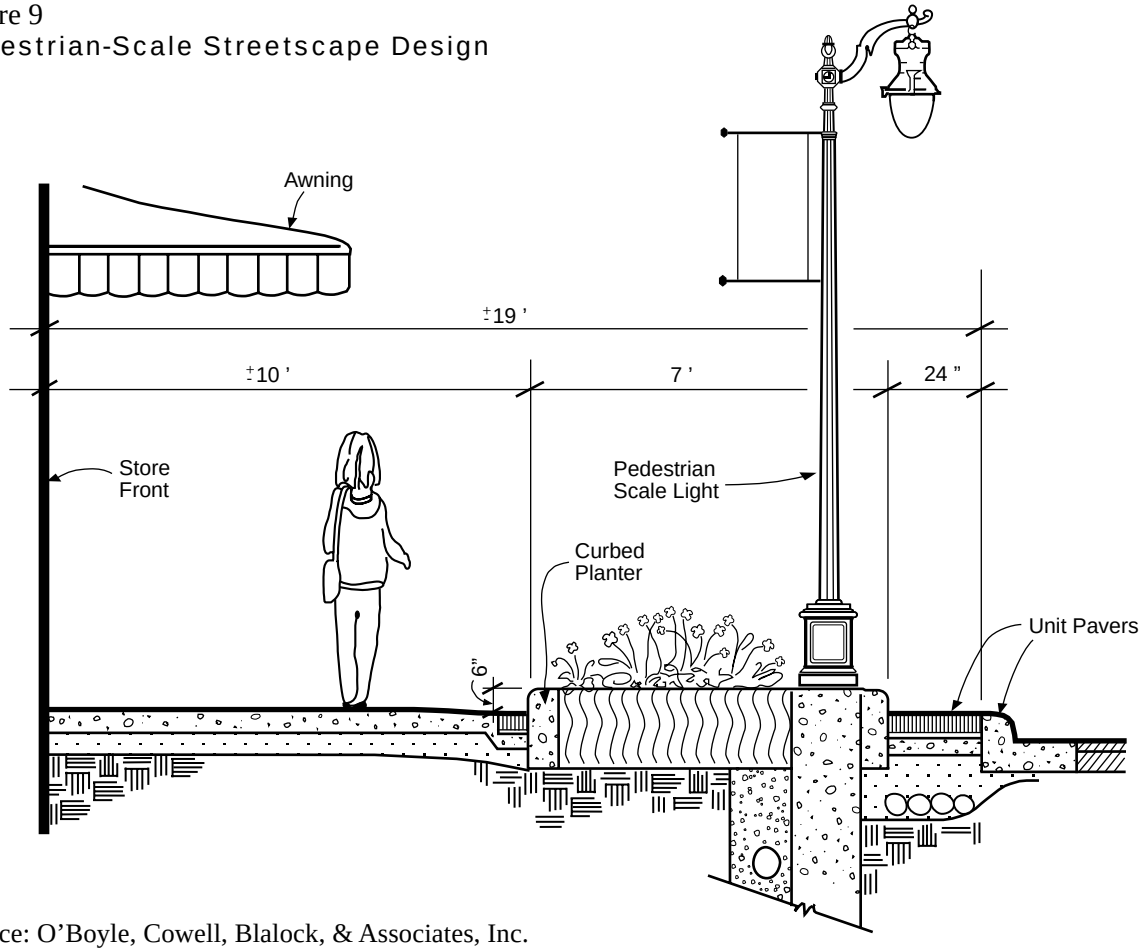
Develop a streetscape plan

A first step in streetscape layout and design is conducting a survey of the area to identify real issues and determine the appropriate types of streetscape improvements. The study should also examine the existing businesses and how they function and include recommendations for beautification and aesthetic improvements.

A comprehensive streetscape plan should include a variety of specific elements within the general areas of environment, street design, and character, as well as involving the public in the streetscape planning process.

The issues of safety, in particular traffic calming and buffering, should also be addressed.

Figure 9
Pedestrian-Scale Streetscape Design



Source: O'Boyle, Cowell, Blalock, & Associates, Inc.

A community is more livable when the public spaces are scaled to human use rather than to automobile use or as large, out-of-scale spaces. Human-scale or pedestrian-oriented spaces are obtained by:

• Enclosure by building walls, fences, plantings, overhead trees, trellises, and canopies.

• Architectural details such as recessed entries, bay windows, balconies, and windows with smaller panes of glass.

Scale street design and character to human use

A community is more livable when the public spaces are scaled to human use rather than to automobile use or as large, out-of-scale spaces.

- Streetscape improvements should be pedestrian oriented (safe and walkable) to create a more pleasant downtown environment for people to enjoy.
- Physical improvements, such as trees, lighting, paving, signs, and street furniture should be designed to complement downtown businesses and create a consistent character; for example, ensure that street furnishings (benches, waste receptacles, gratings, bicycle racks, kiosks, bus shelters, newspaper-machine enclosures) are consistent color, style, and material.
- Sidewalks should be of adequate width to accommodate window shoppers and through foot traffic.
- When considering outdoor sidewalk cafes, ensure that adequate enclosure is provided and that there is at least six feet of clear sidewalk passage for pedestrians.
- It is imperative that storefronts are not obscured by the placement of the streetscape amenities.
- Placement of streetscape amenities should be based on the manner in which people use the street, not on arbitrary equal spacing of benches, etc.
- Lighting can be utilized for several purposes and should be an integral part of the streetscape design. Lighting should be focused on the sidewalk as much as on the roadway environment.
- Encourage burying existing and future utility and telephone lines.
- Open lots and undesirable structures can be replaced with infill development or green space.

The following additional guidelines can assist communities in creating a safe and aesthetically pleasing atmosphere for pedestrians:

Vegetation

- Provide a list of urban-tolerant plant materials (e.g., pollution, salt, and drought tolerant), with minimum size and health standards.
- Street trees should be placed to provide shade but not obscure the storefronts, signs, or lighting. Pedestrian safety with regard to placement of shrubs and trees should also be considered. Current and future size of trees should be considered.
- Plant material can be used in concentrated "green zones," perhaps relating to sidewalk or café display areas or at intersections with green linkage streets.

Solar

- Awnings and canopies can mitigate glare and provide for interesting transition areas from the interior to the sidewalk amenities.
- These shading elements should provide stronger shading in the summer and allow sunlight penetration in the winter.
- Plastic awnings that are back-lit or awnings that are utilized primarily as signage should be avoided unless they are well integrated into the total design theme of the streetscape.

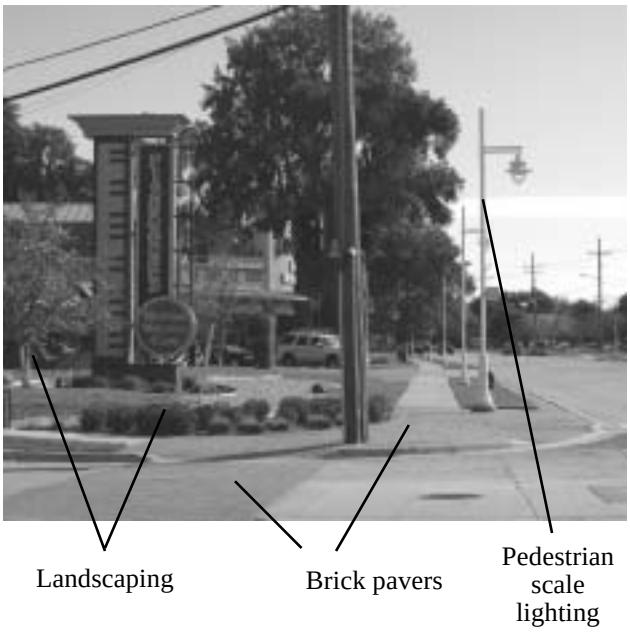
Involve the public in the streetscape planning process

It is important to involve interested members of the community in the planning process for streetscape improvements, the level of which will be determined by local officials, planning staff, and planning consultants.

- Hold one or a series of public meetings in which community members, business owners, officials, planners, and stakeholders generate specific streetscape design ideas in a collaborative workgroup setting.
- Hold public meetings to communicate streetscape plan options to the community and garner plan support. This exercise requires less in-depth involvement than the above mentioned meetings, while still involving the views and ideas of the public.

This outdoor, sidewalk statue adds additional character to the streetscape improvements made in Mt. Clemens.

Figure 10
Various Types
of Streetscape Improvements



Streetscape improvements at Nine Mile Road and Jefferson Avenue in St. Clair Shores include brick pavers, landscaping, attractive lighting, and a sign marking the Nautical Mile area.

Case Example

Streetscape Master Plan

Community: Trenton

Contact: John Iacoangelli, (734) 663-2622

Trenton is a Downtown Development Authority contracted with Beckett and Raeder Inc. in order to create a Streetscape Master Plan. The project included the inventory and analysis of existing conditions, DDA Board and Streetscape Committee involvement, development of design options, and conceptual designs.

Design considerations include improved pedestrian access, street trees and seasonal plantings, updates lighting fixtures, street furniture including benches, trash receptacles, bike parking hoops, and flower pots, as well as seasonal outdoor decorations.

The main objective of the master plan was to define the older portion of the Trenton community and create as many connecting and overlapping linkages between the various land uses and neighborhoods. Over time this will enhance the integrity of residential neighborhoods and strengthen the business district.

The final report submitted by Beckett and Raeder Inc. included conceptual designs, design considerations, estimates of construction costs, and agency involvement needed for the implementation of the Streetscape Master Plan.

Additional Resources

Duerksen, Christopher J., and Goebel, R. Matthew. *Aesthetics, Community Character and the Law.* Planning Advisory Service Report, 489/490. Chicago, IL: American Planning Association, 1999.

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Pegler, Martin M. *Streetscapes: Facades, Entrances, Storefronts.* New York: Retail Reporting Corporation, Inc. 1998.

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Historic Preservation

Historic structures represent tangible links with the past. They provide a community with a sense of identity, stability, and orientation. Within many Southeast Michigan communities, historical resources play an integral role in defining community character.

Historic preservation involves identifying and protecting those community resources most clearly associated with its unique historic character. Planning for historic preservation involves defining "community character," identifying those elements of the community that represent that character, and devising strategies for assuring their preservation.

Building a consensus is an important step in defining "community character." Historic and cultural resources that are 50 years old or more and can be targeted for preservation include:

- Single landmarks or development clusters that form landmarks areas.
- Entire blocks of buildings united in character.
- Historic settings, including farms, land and river corridors, trees, scenic vistas, and historic landscapes.

Keeping It Connected

Historic landmarks that are located in downtown areas can be integral to the design and style of streetscape improvements. Remember to incorporate historic features into your community's streetscape design plan and master planning efforts.

Planning and Regulatory Considerations

Historic preservation laws exist at the federal, state, and local levels. The National Historic Preservation Act of 1966, amended in 1980 and 1992, establishes federal policy for preserving of cultural and historic resources in the United States. The law establishes a national preservation program, encouraging the identification and protection of historic resources at the federal, state, and local level. The act has these major components:

- It authorizes the expansion and maintenance of the National Register of Historic Places.
- It establishes a protective review process to ensure that federal agencies consider the effects of federally licensed, regulated, or funded activities on historic properties listed in the National Register.
- It requires federal agencies to locate, inventory, and nominate such properties to the National Registry, assume responsibility for them, and to use them to the maximum extent possible.
- It authorizes each state to establish a State Historic Preservation Office (SHPO).

The historic Octagon House in Washington Township.

Established in response to the National Historic Preservation Act of 1966, the Michigan State Historic Preservation Office (SHPO) identifies, evaluates, registers, interprets, and protects Michigan's wealth of historic properties, from significant buildings to shipwrecked vessels. The SHPO provides individuals, communities, and preservation organizations with a variety of services, training, and funding opportunities. It also reviews nominations to the National Register of Historic Places and oversees the Michigan Historical Marker Program, the Centennial Farm Program, the Certified Local Government Program, the Michigan Historic Preservation Tax Credit Program, and the Federal Historic Preservation Tax Incentives Program. Under Section 106 of the National Historic Preservation Act, the SHPO reviews all federal undertakings for impacts on historic properties.

Local governments regulate private actions affecting historic properties through a special permitting process. They are typically granted authority to designate historic properties and districts and to prevent incompatible alterations, demolition, or new construction. Sometimes, enabling laws may also establish a specific process for considering economic hardship claims, special merit exceptions, demolition by neglect, and even appeals.

Tools for Historic Preservation

There are significant tools that can be used to shape, modify, strengthen, and improve preservation programs. Communities must determine what properties should be subject to protection. Communities can convene a

historic commission through which historic preservation efforts can be locally regulated, as well as coordinated at the state level. Use the tools discussed below:

- Identify and evaluate historic buildings and areas.
- Develop a historic preservation plan.
- Create a local historic preservation ordinance.
- Rehabilitate properties through historic preservation tax incentives.

Identify and evaluate historic preservation buildings and areas

Historic properties surveys identify and evaluate resources in communities, neighborhoods, and rural areas to determine their historical, architectural, archaeological, engineering, or cultural significance. This information provides a foundation for preservation and future development decision making. The survey data becomes part of the Michigan SHPO's comprehensive statewide survey.

With regard to historic districts, some communities recognize that buildings can have different degrees of historical importance. In order to define those differences, buildings may be classified into categories.

Identify significant historic buildings

These buildings contribute uniquely to the character of the historic district. In most cases they retain a basic integrity of architectural design, materials, and workmanship. They include buildings of individual prominence and buildings whose great value is their membership in a block of similar age and style. Some have special value because of the people and events associated with them.

Figure 11
Historic Structure Standards

The City of Ypsilanti Historic Commission maintains standards for historic residential homes which include design guidelines for porches, doors, windows, fences, roofing, and guidelines for paint color.

Identify complementary buildings

These buildings contribute to the overall historic character of the district by providing the essential, appropriate setting for the "significant" structures. While individually they are less outstanding, they are consistent in terms of age, materials, scale, mass, and architectural details.

Develop a Historic Preservation Plan

Developing a historic preservation plan is critical to the preservation and maintenance of a community's historically significant buildings and features. Officials should discuss what form the plan should take, either as a component of the community's master plan or comprehensive plan, or as a separate, stand-alone plan. There are several important elements to include when creating a historic preservation plan.

- Statement of the goals of preservation in the community, and the purpose of the preservation plan.
- Definitions of the historic character of the state, region, community, or neighborhood.
- Summary of past and current efforts to preserve the community's or neighborhood's character.
- Survey of historic resources in the community or neighborhood, or a definition of the type of survey that should be conducted in communities that have not yet completed a survey.
- Explanation of the legal basis for protection of historic resources in the state and community.
- Statement of the relationship between historic preservation and other local land use and growth management authority, such as the zoning ordinance.
- Statement of the public sector's responsibilities toward city-owned historic resources, such as public buildings, parks, streets, etc., and for ensuring that public actions do not adversely affect historic resources.
- Statement of incentives that are, or should be, available to assist in the preservation of the community's historic resources.
- Statement of the relationship between historic preservation and the community's educational system and program.
- A precise statement of goals and policies, including a specific agenda for future action to accomplish those goals.

Source: White, Bradford and Roddewig, Richard. *Preparing a Historic Preservation Plan*. Planning Advisory Service Bulletin No. 450. Chicago, IL: American Planning Association, 1994.

Create a local historic preservation ordinance

Besides establishing a historic preservation commission, local historic preservation ordinances generally set forth procedures and criteria for designating properties, along with procedures and criteria for reviewing requests to alter, move, or demolish such properties. Ordinances should also outline design and maintenance guidelines. Preservation ordinances also allow for consideration of hardship and other special concerns and establish a process for appeal and enforcement of its terms. Typical components of a preservation ordinance include:

- a statement of "Purpose" and "Powers and Authorities,"
- definitions of landmarks and historic districts,
- establishment and authority of a historic preservation commission or other administrative board,
- criteria and procedures for designation of historic landmarks and districts,
- statement of actions reviewable by the commission and the legal effect of such review,
- criteria and procedure for review of such actions,
- standards and procedures for the review of "economic hardship claims,"
- maintenance requirements and procedures governing situations of demolition by neglect,
- procedures for appeal from final preservation commission decision, and
- fines and penalties for violation of ordinance provisions.

While the above provisions are critical to historic preservation efforts, it is important that historic district ordinances also outline in detail design and maintenance guidelines that must be followed. It is important to note that communities can also incorporate and adopt a design review ordinance, for building design and renovation as part of a community's general zoning ordinance. A design review ordinance and guidelines provide a measure of control not normally part of site plan review. Strict adherence to these regulations will help to maintain the character of the area or site. General guidelines can include: paint color options, window design, porch design, door design, and general structural requirements.

Rehabilitate properties through historic preservation tax incentives

State tax credits are available to homeowners, commercial property owners, and businesses who rehabilitate their properties according to the Secretary of the Interior's Standards for Rehabilitation. The property and the rehabilitation must be certified by the Michigan SHPO.

Federal income tax credits are available for owners of national-register-listed, income-producing properties who rehabilitate their properties according to the Secretary of the Interior's standards. Federal tax credit projects must be certified by the National Park Service, in consultation with the SHPO. Local governments can contact the Michigan State Historic Preservation Office for more details about acquiring these credits.

Information on the programs outlined above can be obtained by contacting the Michigan State Historic Preservation Office at (517) 373-1630.

Receive assistance from the Historic Preservation Fund

This fund is the source of a 60- 40 matching grant-in-aid program. The federal funds provided through the grant must be matched by the grant recipient with private funds, local government funds, in-kind services, state funds, donated services, and/or donated equipment or material.

Register with the National Register of Historic Places

This identifies historic and cultural resources throughout the nation. While listing in the National Register is primarily honorary, it enables property owners to qualify for federal tax benefits and, in some cases, may be used as the basis for listing at the state and local level.

Case Example

Historic District Commission

Community: City of Ypsilanti

Contact: Jimar Wilson, (743) 483-9646

Ypsilanti is a community with a high concentration of historically and architecturally significant structures. The Historic District has been created to protect and develop this area so that it can continue to be an asset to the city.

City of Ypsilanti historic district.

The Historic District Commission operates under the authority of the city's Historic District Ordinance which was first established in 1978. The ordinance regulates in detail the types of allowable modifications to historic property from paint color, to porch, door, and window design. The Historic District Commission and Ordinance provide protection for the unique historic character of Ypsilanti while promoting growth through private rehabilitation and reuse of the buildings and houses in the district.

Greenmead Historic Village

Community: Livonia

Contact: Marian Renaud, (248) 477-7375

This historic property was placed on the National Register of Historic Places in 1971. The 103-acre site has most of the original buildings including barns, a farmhand's house, a caretaker's cottage, carriage house, Newburg School, and various smaller structures. Also located on the site are Hill House Museum and Hill House Gardens. The gardens are cared for and maintained by community volunteers. The preservation of a landmark such as Greenmead Village provides the community with a strong sense of its history and heritage.

Greenmead Historic Village in Livonia is one example of gathering historic structures into a village setting.

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Parking and Lighting Standards

Parking standards facilitate safe and efficient traffic flow by providing adequate off-street parking for public access to each land use. Parking requirements are dependent on the type of land use. There are several issues to consider when establishing parking standards. Businesses must have sufficient parking available to adequately serve their customers and remain viable. Typically the amount of off-street parking for various land uses is based on the peak demand — the amount needed to accommodate parking during the busiest time of the day or the season. However, such standards should also be based on the intensity of the land use, its location, accessibility, availability of transit, and socio-economic and demographic characteristics of the area.

Lighting standards are important in providing secure and safe streetscapes and parking areas, but must also prevent lighting from being a nuisance to adjacent properties. Adequate lighting must be provided for a given street or parking area to meet the needs but without creating a hazard for motorists or a nuisance for adjacent property owners. Many ordinances have detailed standards for the height, location, and orientation of on-site lighting, especially for parking lot lighting. Shielding and direction of illumination can dramatically reduce ambient light reflection. Along transportation corridors, location and scale of lighting, landscaping and other site materials utilized to buffer parking lots are significant design considerations. Parking standards should be flexible enough to balance parking needs with these other design objectives.

On-street parking in a commercial development in Novi.

Keeping it connected

When reviewing design plans for parking areas, remember to consider storm water management. Reducing the amount of impervious surface of parking lots reduces storm water runoff.

Bioretention areas, swales, sand filters, and filter strips are all effective in treating storm water within the parking lot.

Planning and Regulatory Considerations

Parking regulations should be an integral part of a community's site plan review and should be enforced through detailed regulations. Regulations should establish minimum and maximum standards for the stall sizes and number of parking spaces. It is also important to create standards for parking lot lighting, including height restrictions, landscaping requirements, and storm water guidelines. Standards are typically based on categories of land use types and a specified number of parking spaces per unit of measure such as each dwelling unit, number of seats, number of beds, square feet of usable floor space, and per employee.

The basic mechanism of regulating outdoor lighting is the local zoning ordinance, which includes regulations for various aspects of development. The types of outdoor lighting installations that communities may wish to regulate include parking lot lighting, street lighting, lighting of exterior sales areas, lighting of sports or performance facilities, security lighting, illuminated building facades and landscaping, illuminated signs, and illuminated walkways and park areas.

Tools for Parking Lot Design

Communities should evaluate their parking codes and design requirements to ensure that maximums and minimums are enforced in order to curb excess parking construction, which can have a number of positive environmental and redevelopment impacts. Parking requirements can be an effective land use management tool using the following objectives:

- Conduct surveys of parking lot utilization rates for different land uses. Set parking ratios that detail the number of parking spaces that must be provided for each land use.
- Require a greater sharing or joint use of parking facilities. In mixed-use developments, shared parking should be encouraged as an effective method for in-

creasing the efficiency of land use and controlling access to major roads. Common parking facilities must be close enough to all relevant land uses to facilitate use. If there is a change in land use or ownership within a mixed-use development, the new owner should be required to demonstrate that the existing parking will be adequate.

- Provide flexibility in parking standards to allow for reducing parking if a traffic analysis demonstrates that less parking is needed than that required by an ordinance.
- Reduce the amount of required parking in those areas where quality public transit is an alternative means of travel to and from businesses. Avoid excessive parking requirements that would discourage the use of transit.
- Offer reduction in the amount of parking as an incentive to businesses that encourage employees to take transit or rideshare with co-workers.
- Provide for deferred parking or land banking to allow flexibility in meeting changing parking needs. The land for additional parking should be identified in the approved site plan and should be part of the landscaped area.
- Require certain design elements to make parking lots safe for pedestrian use and visually attractive. Parking standards should allow for flexibility to place parking in the front, rear, or side of the site.
- Landscaped islands control traffic flow within the lot and provide visual relief to the otherwise open expanse of pavement. Minimum size of landscaped islands should be established to consolidate open space into large blocks, to avoid fragmentation of landscape spaces, and to enhance plant survival rates.
- Provide storm water treatment for parking lot runoff using bioretention areas, filter strips, and/or other practices that can be integrated into required landscaping areas and traffic islands.
- Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

(Note: Sport Utility Vehicles are typically less than seven feet wide and can comfortably fit into a standard parking space. Most of the "size" of SUVs is vertical; they stand taller than sedans, but are often not much wider or longer than a full-size car).

Tools for Lighting Regulation

A lighting section can be incorporated into a community's zoning ordinance to cover lighting in all or in portions of the community. The section regulates the types, styles, construction, installation, and uses of outdoor electrically powered illuminating devices, lighting practices, and systems, while maintaining safety, security, and aesthetics of a community. Typically, the key components of a lighting regulation ordinance or plan include the following:

- A requirement that a lighting plan be included in the site plan review and permitting process. The plan should detail light levels, evenness, patterns of light distribution, lamp type, and wattage.
- General design questions to address can include: Is the applicant clear about the lighting needs of the project? What are the outdoor tasks to occur on site in the evening? What area of the site is proposed to be lit? What light levels are appropriate and how will the proposed plan meet those needs? How does the proposed plan relate to lighting in the surrounding area? Is security lighting proposed?

Table 16
Street Lighting Standards

	Industrial/ Commercial	**Town Center**	**High-Density Residential**	**Rural**
Suggested Mounting Height	15-20 feet	15-20 feet	30 feet maximum	Discouraged
Spacing	600 feet at intersections	Main Street: 300 feet Elsewhere: 600 feet and at intersections	At intersections only	Discouraged

Source: Outdoor Lighting Manual For Vermont Municipalities, Chittendon County Planning Commission.

- Light levels should be appropriate for the proposed use of the site. It is important to know the maximum, minimum, and average levels that will be generated.
- Light levels should be compatible with the neighborhood.
- Exterior lighting should be a key component of the architectural and landscape design. Fixture style and design should be compatible with the building design.
- Site lighting "trespass" onto adjacent residential zones should be minimized.
- Site lighting should minimize light spill into the night sky.
- Pole heights should be compatible with the scale of the surrounding architecture and scale of the site.
- Lighting installations should include timers, dimmers, or sensors to turn lights off during daylight hours or when lighting is not needed.

Illuminate walkways and park areas

In some cases, communities may want to illuminate walkways or bikeways and portions of parks that are to be used after dark. These areas should be illuminated sufficiently to allow identification of hazards on the walkway surface. Lighting should be provided at specific hazardous locations such as sharp turns and intersections. In order to prevent glare, fixtures should be shielded or mounted relatively low at a pedestrian scale. Walkways along streets may be illuminated by street lights, although small fixtures at low mounting heights, such as bollards, might make the area seem more pedestrian friendly.

Incorporate illuminated signs into regulations

Illuminated signs are one way in which light is used for advertising. Externally illuminated signs may be too bright so that the reflection from the sign surface causes glare and illuminates surrounding areas. The lights might be improperly aimed and/or shielded so that they may radiate directly into the eyes of drivers and pedestrians.

Local sign regulations can include standards that limit the vertical illuminance of externally illuminated sign surfaces. In addition, standards can be established requiring that the lights to be properly aimed and shielded.

Utilize pedestrian-scale lighting along paths and walkways, such as this park in St. Clair Shores.

CASE EXAMPLE

Revision of Office and Retail Parking Standards

Community: City of Ann Arbor

Contact: Jeff Kahan, (734) 994-8184

The City of Ann Arbor changed its parking requirements for office and retail uses in an attempt to reduce the environmental impacts of auto-oriented development patterns, increase redevelopment opportunities, and improve pedestrian access. Prior to the 2001 revision, Ann Arbor required a minimum of four parking spaces per 1,000 gross square feet of office space. The revised code now requires a minimum of three spaces per 1,000 gross square feet and, for the first time, establishes a maximum of four spaces per 1,000 gross square feet. The maximum requirement is intended to prevent an excessive amount of impervious surface.

With regard to retail parking, prior to the revisions, Ann Arbor required five parking spaces per 1,000 gross square feet of retail space. Parking counts were taken at various retail centers in the area at various times of the year. No retail center came close to needing five spaces per 1,000 feet, even during the holiday season. The City then revised its retail parking standards to require a minimum of 3.25 spaces and a maximum of 3.75 spaces for retail centers under 300,000 square feet. Retail centers between 300,000-600,000 square feet have a range of 3.5-4, while centers above 600,000 square feet must provide between 3.75 to 4.25 spaces per 1,000 square feet.

The revised code allows developers to provide more than four spaces per 1,000 if the additional spaces do not increase imperviousness beyond that which would be provided by meeting the maximum required (i.e., providing extra spaces in the form of structured or understructure parking). Overall, the revisions to the parking standards achieve a balance between minimizing negative environmental impacts and the desire to ensure that an adequate amount of parking is provided.

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Urban Land Institute. *The Dimensions of Parking*. Washington, D.C.: NPA Parking Consultants Council, 2000.

SIGNAGE REGULATION

Marquee sign in Ferndale.

Signage is an important element of a community's quality of life. Signage provides a visual guide and a directional tool for pedestrians and drivers. Tourism, conventions, and businesses contribute to pedestrian and vehicular traffic. A lack of "way finding" tools such as signs and graphics can cause confusion and, most importantly, discourage walking and increase congestion. Sign regulations are intended to protect public health, safety, and welfare as they relate to traffic movement, visual obstructions, structure reliability, building identification, direction information, and community aesthetics. Sign regulations require a balance between the needs of businesses and other entities to communicate to the public, the need to inform the public, and the community's related safety and aesthetics planning objectives.

Source: *Sign Regulation for Small and Mid-size Communities.* APA Report 419.

KEEPING IT CONNECTED

In addition to addressing signage in an ordinance, incorporate sign regulations within your streetscape improvement plan. The style and placement of signage also plays an integral role in pedestrian mobility — primarily safety and efficiency of movement.

Planning and Regulatory Considerations

Billboards are subject to regulations under the Highway Advertising Act, Public Act 106 of 1972, MCLA 252.301. Under this act, the Michigan Department of Transportation issues permits to erect billboards on commercial or industrial zoned property along interstate highways, freeways, and state primary highways. However, communities can be more restrictive than the state law in regulating signs along these routes.

The act was amended in 1990 under P.A. 153 to give general law and charter townships full authority to regulate billboards. This amendment provides relief to rural townships where, in the past, the lack of authority to general law townships resulted in the proliferation of spot zoning because billboards must be in commercial or industrial zoning districts. With limited state and federal laws regulating signage control, local community action becomes increasingly important.

Tools for Sign Control

Sign regulations can be created as part of a community's zoning ordinance, established as a separate sign ordinance, and may be included as a section in the master plan. Clearly state purposes for which the ordinance or section of a plan has been enacted, and how the ordinance will assist in achieving those purposes.

The primary purposes of sign regulations are to:

- encourage the effective use of signs as a means of communication in the community,
- maintain and enhance the aesthetic environment and the community's ability to attract sources of economic development and growth,
- improve pedestrian and traffic safety,
- minimize the possible adverse effect of signs on nearby public and private property, and
- enable the fair and consistent enforcement of sign restrictions.

Simplifying a sign ordinance is practical. Providing clear definitions and publishing the ordinance in a user-friendly format, (e.g., newspaper format) can assist in effective sign regulation efforts. Consider the following guidelines when creating and implementing sign regulations:

- Effective regulation of signs in a community begins with an inventory of existing signs. The inventory should involve reviewing all signs and categorizing

Figure 12
Types of Signs

Freestanding sign

Pole sign

Marquee sign

Projecting sign

Wall sign

Ground sign

Awning sign

them to determine those signs that are a potential problem-traffic hazard, visual blight, restricts light and air, and inappropriate use of land.

- A sign regulation ordinance should include goals, objectives, and policies. It should be tied to the community's comprehensive plan to ensure that subsequent sign regulations are based on overall community goals, objectives, and needs.
- Signs should reinforce the overall visual image and character of the community or area. Style should remain consistent and, when possible, relatively consistent with or complementary to streetscape furnishings and materials.
- Sign regulations should address number, size, location, height, type, color, materials and illumination, but not content.
- Consider establishing an ad hoc committee (e.g., Beautification Committee) that offers free technical assistance to local businesses on sign design options.
- Assemble a list of quality sign designers and manufacturers and make the list available.
- A signage system should be flexible to allow for changes and additions over time.
- An effective tool in regulating billboards is overlay zoning. Billboards could be limited to the overlay zone and thus not permitted in all commercial and industrial zoning districts.
- Do not be reluctant to restrict billboards. In National Advertising v City of Troy, Michigan, the trial judge approved the following size restrictions on billboards: height of 25 feet maximum, size of 300 square feet maximum, a minimum setback of 200 feet from a right-of-way, and a minimum spacing requirement of 1,000 feet.

Case Example

Sign Ordinance

Community: Clinton Township

Contact: Joe Silbernagel, (586) 286-9325

This ordinance gives specific standards for regulating the location, number, type, size, and height of all signs and outdoor display structures in all of the community's zoning districts. The primary purposes are:

- reducing sign or advertising distractions, thereby reducing traffic hazards and accidents,
- reducing hazards that could occur if signs are located in, project into, or overhang any public right-of-way, and
- diminishing visual pollution caused by the unlimited number, type, and size of signs to increase their effectiveness.

The general conditions of the ordinance require that all signs (except non-electric directional, identification, real estate, and window signs) acquire a permit issued by the Clinton Township Building Department. External illumination of signs should be directed so that it does not cause visual interference to drivers and adjacent property occupants. In addition, signs are not permitted in any right-of-way and can not be attached to any utility pole.

Ground sign in Clinton Township.

Additional Resources

Finke, Gail. *Urban Identities: A Worldwide Guide to the Revolution in Urban Signage*. Madison Square Press. 2000.

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Buffering/Screening/ Landscaping

Buffering, screening, and landscaping are techniques for separating land uses using either natural or human-made features that address visual, light, and sound impacts. Buffers and screens serve to reduce conflicts between incompatible land uses, minimize soil erosion, reduce storm water runoff, and enhance community appearance. In addition, buffers can provide pedestrians with a sense of security from automobile traffic. Screens are generally used to reduce visual impact using fences, walls, trees, or shrubs. Buffers are used to reduce light and sound impacts, using water, hills, berms, groupings of trees, or other landscaped features.

Planning and Regulatory Considerations

Buffering, screening, and landscaping requirements should be included in the zoning ordinance and applied where different land uses abut, to all large-scale and nonresidential developments, and to residential and nonresidential developments along transportation corridors. Requirements should be administered during the site plan review process.

Keeping it connected

Buffers can also protect the area adjacent to a shoreline, wetland, or stream, and help to treat storm water. Creating riparian buffers is integral to protecting the water quality of streams in urban areas.

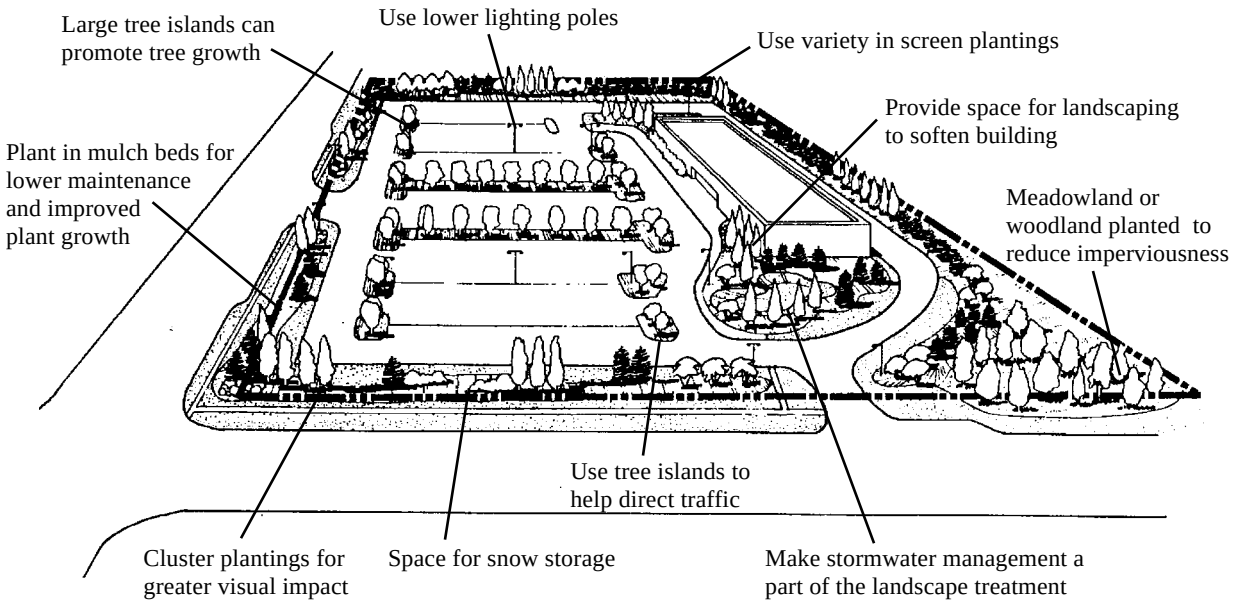
Tools for Buffering/Screening/ Landscaping

- Include policies or guidelines in the community's master plan regarding the use and extent of landscaping in residential and nonresidential areas in the community.
- Classify land uses by impact according to size, scale, and environmental impact.
- Provide flexibility in landscape design requirements, e.g., specify the use of landscaping for screening based on degree of conflict between adjacent land uses.
- Require landscaping area between roadways and residential and nonresidential developments to reduce the visual impact from the road and enhance community character.

The Wal Mart (above) in Chesterfield Township utilized vinyl fencing between its commercial area and a nearby residential subdivision (below).

- Concentrate landscaping to increase its impact; dense planting can effectively reduce headlight glare and muffle road noise.
- Control traffic flow and speed through careful placement of landscaping, buffering, and screening.
- Require landscaped islands in parking areas for safety and visual appearance. Base buffering, screening, and landscaping standards on public safety and security measures.
- Require landscaping along nonresidential buildings to soften visual impact.
- Establish percentage of new development acreage to be set aside for landscaping.
- Provide standards for quantity, quality, types, and placement of plant materials.
- Establish minimum sizes and spacing according to the category of plant material.
- Require continued maintenance of all plant materials by the property owner through a site-maintenance agreement.

Figure 13
Buffering/Landscaping Preferred Approach



Source: SEMCOG.

- Maintain existing natural vegetation as much as possible, especially the more mature vegetation to provide immediate buffering and screening, and cross-reference with provisions in the woodland or tree preservation ordinance.
- Require deciduous and ornamental trees to provide shade.
- Encourage the use of regionally native plant species in landscaping.
- Review site-specific security issues for placing fences, walls, berms, and landscaping.
- Maintain or create greenbelts along roadways through setback and landscaping requirements.
- Require provisions for snow disposition, especially when landscape islands are required.

Case Example

Buffer Regulation

Community: Washington Township

Contact: Gary Kirsh, (586) 786-0010

This 15-foot-high evergreen berm is located between adjacent commercial and residential land uses. The berm serves as a screen to reduce the visual and sound impacts of this retail store such as the bright parking lot lighting and automobile lights and noise. The Octagon House is a historically significant home that has been converted into a township attraction. The berm also serves as a means of maintaining the character of the property immediately surrounding this landmark.

This berm separates historic property from commercial property in Washington Township.

Additional Resources

Center for Watershed Protection. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Ellicott City, MD. 1998.

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Private Road Regulations

Private roads are often seen as a controversial land use tool. Communities that choose to use private roads primarily do so as a way to manage growth. This tool allows communities the opportunity to reduce the number of splits on a piece of property because a private road supports less dwelling units than a typical road. Communities also choose to use this tool because they believe private roads allow for flexible design standards and provide aesthetic benefits, such as limiting land clearing and protecting natural features.

Opponents to private roads have concerns about both the design standards and long-term maintenance of the road. They feel that private roads may not last as long as a public road and that the residents are often not knowledgeable about their role in paying for road reconstruction. Therefore, if a community decides to use private-road regulations, it is important that the community is committed to strong design standards, inspection during construction, and education of residents as to their role in maintaining the road. This section provides specific information to those communities interested in pursuing a private road ordinance.

Keeping It Connected

Private road regulations should be addressed during the site plan review process and should consider the impacts of storm water management.

Incorporate dry swales and vegetated channels into the road design to collect and treat storm water runoff.

Planning and Regulatory Considerations

The responsibility for planning, designing, constructing, maintaining, and monitoring private roads is vested in the organizations owning them, typically private property owners. Communities should, however, have language in their plans or ordinances that addresses private roads in conjunction with land division regulations. If not carefully designed and built, roads can become a significant source of storm water pollution. One way to reduce the amount of clearing, grading, and impervious surface in roadways is to allow for flexibility in constructing them in residential developments. A private road ordinance can allow small developments to construct roadways in narrower road easements than public road regulations allow. This minimizes the amount of clearing required, thus potentially preserving existing trees, reduces grading by allowing steeper grades and the ability to follow existing topography more closely. It also allows for less impervious surface through narrower pavement widths.

Private road in Washington Township.

Tools for Private Road Regulations

Private roads are best regulated in conjunction with land division regulations. Consideration should be given to matching private road standards with the scale of the development being served. Standards should be imposed for road design, surface material, road width, and right-of-way width. On one hand, private roads should be built to minimum engineering standards (such as those required by the Michigan Department of Transportation or the county road commission), so that if and when private roads are converted to public status they are built to county or city standards prior to conversion. On the other hand, such standards may be excessive for private roads that are intended to serve smaller developments in rural areas.

Standards for private roads should also be tied to the desired or anticipated future development of a community. If a community is likely to become fully developed at urban densities, consider constructing private roads to standards that could allow for future public dedication. In older urban communities, private roads can be an integral part of infill development. If a community's vision or goal is to retain its rural or open space character, then private roads could be constructed at lesser standards with the likelihood that they would remain private. If a community decides to allow private roads, it should adopt standards that guide the design and construction that will provide access for residents as well as emergency, delivery, and maintenance vehicles.

Typical private road ordinance provisions include:

Introduction

- Definitions of private road, easements, lots, permits, public street, and right-of-way.

Zoning provisions

- Prohibit private roads for commercial, industrial, or business uses (i.e., requiring public road frontage for such uses).
- Require a certain amount of frontage on the private road for each parcel benefitted.
- Specify which zoning districts' private roads are currently allowed in or allowed in upon approval of the planning commission as a special or conditional use.
- Require upgrades of the road if additional parcels or residences are added.
- Require an alternate or backup access or private road if the number of residences served is large.
- Require a storm water management plan to ensure that drainage has no adverse impact on neighborhood properties.

The following minimum standards can be adopted in a private road ordinance, the zoning ordinance, or as part of the land division ordinance:

- Require easement and right-of-way width (common standard is 66 feet, or smaller, or allow for sliding scale based on the number of lots to be served).
- Specify the maximum number of parcels served on a private road with a single connection to a public road (usually 25 units).
- Provide easement and right-of-way language for both access and utilities.
- Ensure that if the private road is connected to a state, county, or city road, the approach must conform to certain standards.
- Require stop or curve signage.
- Require that private roads be formally named and have street signs to assist location of the site by emergency and utility vehicles.
- Specify conditions under which paving is required.
- Specify the maximum length of private roads ending in a cul-de-sac (usually 600-800 feet in urbanizing areas).
- Specify the maximum width of private roads.
- Determine specifications for the turning radii in the cul-de-sac.
- Determine whether or not to regulate driveways involving only a single residence.
- Ensure a clear vision area at intersections and driveways (usually at least 20 feet).
- Provide drainage requirements.
- Specify grade requirements and pavement slope standards.
- Specify pavement type.
- Specify shoulder width and surface requirements.
- Specify requirements related to physical connections with public or other private roads.
- Specify driveway width requirement for driveways created along the private road.
- Outline engineering review requirements.
- Detail inspection requirements.

Review

- Require blueprints and plans for site plan approval.
- Obtain the review of appropriate county agencies.

Fee requirements and permit issuance

- Prohibit any building or commencement of construction on a private road until all appropriate permits and approvals have been obtained.
- Require preliminary private road permit (before construction begins).
- Require final private road permit (after construction and inspection).
- Require all other county and state permits be obtained.
- Require permit and inspection fees for certification by a municipal or other registered engineer confirming that the road, as built, meets the specifications and plans (optional).

Maintenance agreement

- Require a special assessment to generate necessary public funds for maintaining or improving private roads.
- Secure a joint maintenance agreement in recordable form that remains with the land and binds benefitted parcels.
- Provide a recorded statement remaining with the land informing subsequent purchasers that it is a private road which is not maintained by any governmental unit and may never be taken over by a governmental unit.
- Stipulate that, if the private road is not properly maintained, the municipality has the option of making the repairs and charging the costs back to the benefitted properties by placing the cost on the tax roll as a special assessment.

Case Example

Private Road Ordinance

Community: Scio Township

Contact: Doug Lewan, (734) 665-2123

Scio Township created a detailed private road ordinance to regulate the construction, maintenance, and use of private roads. The ordinance ensures that unobstructed, safe, and continuous access to lots is guaranteed to promote and protect the public health, safety, and welfare, and that police, fire, and emergency services can safely and quickly enter and exit private property at all times. The ordinance also stipulates that private roads are maintained and repaired by the private property owners who own and use the roads.

Scio Township separates private roads into three distinct classifications, Class A, Class B, and Class C private roads. Class A roads are defined as those that service 10 or more single-family homes, have reasonable potential to be extended in the future, and also serve nonresidential uses. Class C private roads are those that serve no more than four lots. Class B roads do not meet the Class A requirements, but exceed those of Class C.

Additional Resources

Bloom, Clifford H. "Regulating Private Roads." *Planning and Zoning News*. January 1990.

Hamburg Township, Michigan. Private Road Ordinance Number 28-C. March 24, 1992.

Planning and Zoning Center, Inc. *Community Planning Handbook: Tools and Techniques for Guiding Community Change*. Michigan Society of Planning. 1992.

Planning and Zoning Center, Inc. *Grand Traverse Bay Region Sample Regulations: Private Road Regulations*. 1992.

West Bloomfield Township, Michigan. Condominium Road Ordinance-C-527. 1997.

Williams, Kristine M. Planning and Zoning Center, Inc. "Private Road Ordinance-Frontage/Service Drive Regulations." Land Division and Access Controls. Michigan Society of Planning. 1990.

Environmental Protection

Storm Water Management

Soil Erosion and Sedimentation Control

Sewer Infrastructure Planning

On-Site Sewage Disposal System Management

Groundwater Management

Habitat Protection and Restoration

Floodplain and Stream Corridor Protection

Wetlands Protection

Protecting Woodlands

Storm Water Management

One of the challenges to local governments in protecting water quality is preventing and treating storm water runoff. Storm water runoff is one of the major sources of pollution degrading our water resources. This is largely due to the early focus on and success in reducing pollution from point sources (e.g., industrial plants) and the growing number of impervious surfaces such as roads, parking lots, and buildings. Impervious surfaces add to the amount and rate of storm water entering our surface waters. This storm water carries a variety of pollutants such as fertilizers, pesticides, oil, bacteria from animal waste, and increased flow into the system. This results in degradation to our water resources, increases in the magnitude and frequency of flood events, reductions in fish and other aquatic species diversity, increases in streambank erosion, and decreases in infiltration into the groundwater. As a result, new regulatory requirements are evolving that will affect the planning practices of local government.

In response, SEMCOG's *Water Quality Management Plan for Southeast Michigan* (Water Quality Plan) includes a framework for managing storm water runoff and encourages local land use decision making that is compatible with sustainable water quality. The tools in this section expand on the framework in the Water Quality Plan. They provide the information necessary to begin to incorporate water quality protection into local plans and ordinances.

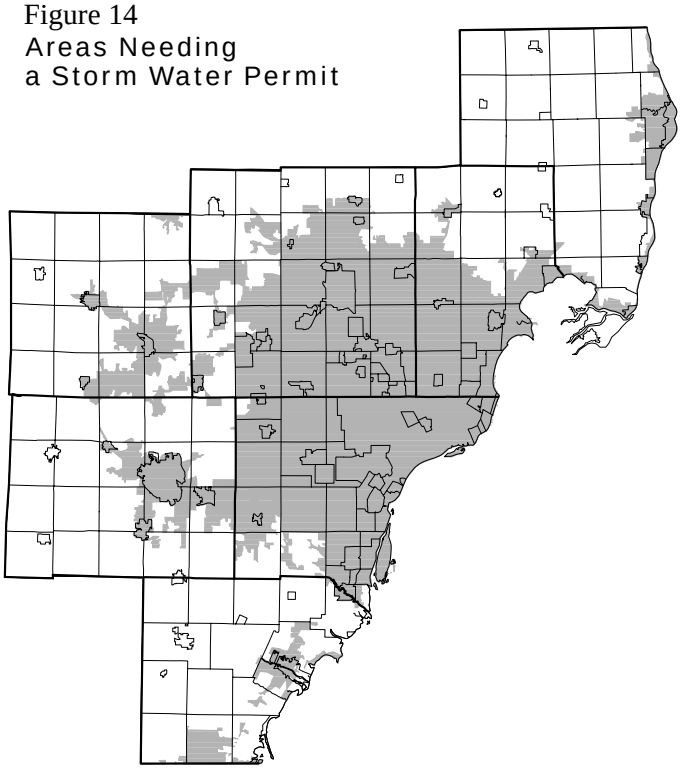
Keeping It Connected

Storm water management can go hand-in-hand with traffic calming. Both roundabouts and adding curves to straight roads are traffic calming techniques that offer storm water management opportunities. For example, bioretention areas with low, native plants could be placed at the center of roundabouts, in road medians, and along the curves of roads.

Planning and Regulatory Considerations

Initial efforts to improve water quality at the federal level primarily focused on reducing pollutants in industrial process wastewater and discharges from municipal sewage treatment plants. But as pollution control measures for these sources were implemented and refined, studies showed that more diffuse sources of water pollution were also significant causes of water quality impairment. Of specific concern was storm water runoff draining off large surface areas, such as agricultural and urban land.

Figure 14
Areas Needing
a Storm Water Permit



Source: SEMCOG.

Beginning in 1991, the federal Clean Water Act required communities with populations over 100,000 served by separate storm sewer systems to obtain a National Pollutant Discharge Elimination System (NPDES) permit to discharge storm water to creeks, streams, and rivers. Under this program, construction sites greater than five acres also are required to obtain storm water discharge permits.

Beginning in 1999, Phase II of the federal storm water program was implemented. Phase II requires permits for communities in urbanized areas with populations under 100,000 and for construction sites greater than one acre in size. In accordance with this rule, over 175 Southeast Michigan communities must receive a storm water permit from the Michigan Department of Environmental Quality.

The tools listed below are a starting point in meeting these storm water requirements.

Tools to Implement Storm Water Management

Land use tools can be utilized to aid storm water management in three ways:

- Incorporating storm water into the master plan.
- Reducing and preventing storm water runoff.
- Managing storm water runoff once it has occurred.

Incorporating storm water into the master plan

Community plans also need to acknowledge the importance of storm water management and relate it to the health, safety and welfare of its residents. Managing storm water protects water quality, reduces flooding, and preserves water features such as lakes, streams and wetlands so that they can continue to perform the functions that people depend on.

Storm water management goals within the master plan should not only address *quantity* of storm water, but *quality* as well. For example, an overabundance of nutrients in a lake will cause algae growth, which is a water quality problem for both people and the environment. Therefore, the goals for storm water management should include elements that:

1) Protect the land's natural ability to absorb, clean, and store storm water.
2) Minimize impervious surfaces in new construction and redevelopment projects to reduce the amount of runoff and improve infiltration.
3) Use Best Management Practices (BMPs) throughout the community to handle storm water.
4) Implement community programs that improve water quality and educate the public about their role in water quality.
5) Link protection of water quality through storm water management, impervious surface reduction, and erosion and sedimentation control, to the protection of residents' health, safety, and welfare.

Example goals

Goal: Storm drainage systems shall manage storm water runoff in a manner that allows as much water as possible to naturally infiltrate into the ground. Any water that does not infiltrate should be stored in a safe and environmentally sound manner, and released from the site at the same volume, velocity, and water quality as under pre-development conditions. Storm water shall not leave a site without sediments being allowed to settle out, and allowing the water to be filtered through an above-ground system to remove pollutants.

Goal: To the maximum extent possible, Best Management Practices (BMPs) shall be used to capture, store, and filter storm water runoff before release into any natural system. If possible, above-ground structures, such as vegetated swales, manufactured wetlands, and other similar BMPs shall be used. If necessary, a combination of above-ground and below-ground BMPs shall be used.

Goal: Improve storm water quality by implementing programs throughout the community that remove pollutants from storm water, and educate the public about ecologically safe practices to follow around their homes and businesses.

Storm water management incorporated into a local park in St. Clair Shores.

Policies pertinent to storm water management should address:

1) Storm water quantity: Limiting the amount of storm water that can enter natural systems from developed sites is important to the preservation of the community's natural features.
2) Storm water quality: Water quality from developed areas is dependent on the storm water systems ability to allow water to infiltrate into the ground, as well as filter the water leaving developed sites.
3) Community actions: These policies work to improve water quality by emphasizing actions that the community and its residents can take to protect water resources.

Example policies

Policy 1: Manage storm water *quantity* so that it leaves a developed site at the same volume and velocity as under pre-developed conditions.

- Minimize impervious surfaces in new construction and in redevelopment projects.
- Build infiltration areas into new development and redevelopment projects.
- Preserve open spaces in a natural condition as mechanisms for storm water *infiltration*.

Policy 2: Manage storm water *quality* so that it leaves a developed site at the same or better quality as under pre-developed conditions.

- Use Best Management Practices (BMPs) that minimize, collect, and treat storm water.
- Use BMPs that pre-treat or filter storm water of pollutants and sediments before it reaches natural water features.
- Maintain BMPs according to a pre-determined schedule that addresses the following:
  - Regular clean-out, maintenance, and/or inspection of structural controls (such as catch basins, vegetated swales, infiltration basins, etc.).
  - Label outfall structures that discharge runoff to natural systems.
  - Identify the funding source for the schedule of maintenance activities.
  - Monitor the maintenance program for effectiveness.

Policy 3: Develop and implement community programs that address storm water quality.

- Initiate a household hazardous waste clean-up day.
- Produce and distribute educational materials for residents that discuss the impacts of their actions on storm water quality.
- Commit to using lands owned and maintained by the community as demonstrations for desirable storm water management practices.
- Augment the county's street sweeping efforts to smaller, local roads. Strive to sweep these streets monthly in high construction areas.
- Work to (or coordinate with the county to) evaluate the amount of salt and/or sand that is applied to roads in the winter. Implement procedures to keep, as much as possible, salt/sand out of storm water systems.
- Collect leaves in the fall and compost them for use in community landscaping projects.
- Develop and follow building and vehicle maintenance procedures that keep hazardous substances out of storm drainage systems.

Reducing and preventing storm water runoff

Utilize low-impact development

Preventing storm water runoff from residential, industrial, and commercial property can result from efforts at the local planning and zoning level. One technology being utilized is low-impact development (LID). In LID technology, the traditional approach to site drainage is reversed to mimic the natural drainage functions. Instead of rapidly and efficiently draining the site, low-impact development relies on various planning tools and control practices to preserve the natural hydrologic functions of the site. Two important aspects of LID are minimizing impervious surfaces and preserving existing natural features.

Auburn Hills is managing parking lot runoff by capturing and treating the runoff instead of directing it to the storm drain.

Minimize impervious surfaces

Local ordinances and regulations can be passed minimizing impervious surfaces, resulting in less storm water runoff. Consider reviewing:

Parking standards

- The required parking ratio governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking space construction.
- Develop parking standards that reflect average parking needs instead of single peak day projections.
- Parking lots can be made more attractive at the same time they treat storm water. Bioretention areas, dry swales, perimeter sand filters, and filter strips are all effective at treating storm water within the parking lot.

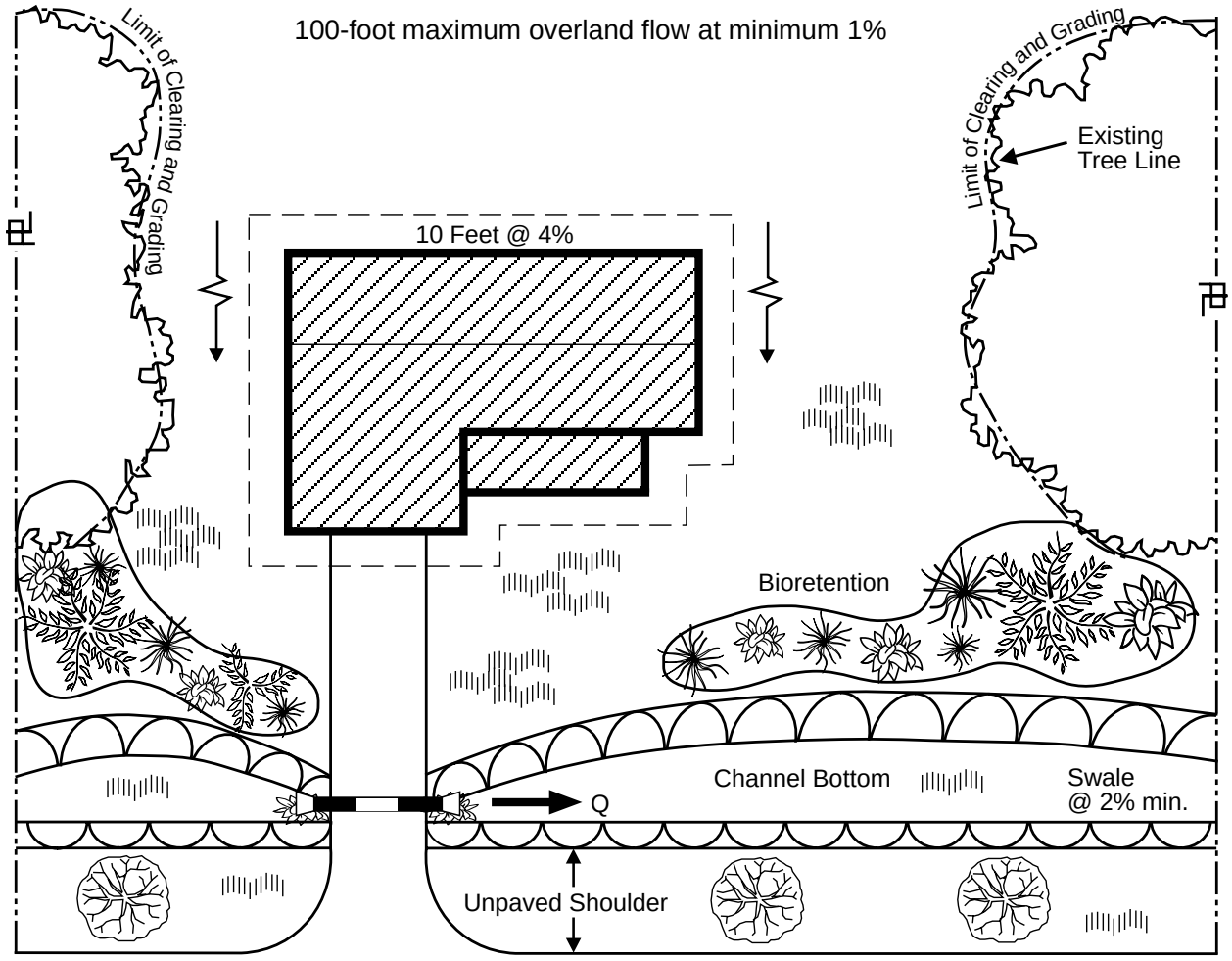
Lot setbacks/Lot width

- Relax side yard setbacks and allow narrower frontages. This reduces total road length in the community (and overall site imperviousness) and can be used to encourage traffic calming.
- Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.

Miscellaneous

- Retrofit existing cul-de-sacs with depressed vegetated islands or rain gardens designed to hold and treat storm water.

Figure 15
A Low-Impact Development: Residential Lot



Swale roadside drainage, storm water storage "bioretention" basins, and undisturbed areas are typical features of a low-impact lot.

Prepared by: Ron Struss, MN Board of Water and Soil Resources/U-M Extension Service.

Source: Dakota Soil and Water Conservation District and the Protecting Water Quality Through Low-Impact Development Workshop Handbook, May 14-15, 2001, Eagan, MN.

- Include in subdivision codes that downspouts should not be connected to the storm sewer.
- Reduce road lengths and widths. Not only does this reduce impervious surfaces, but can also be a traffic calming technique.

Preserve and restore natural features

Preservation and restoration of natural features is another practice that reduces storm water runoff in your community. Wetlands, woodlands, and open spaces allow precipitation to infiltrate into the ground. This not only reduces runoff, but replenishes the groundwater supply.

Use open space development

(See also section on Managing Residential Development.)

- Implementing open space design subdivisions incorporates smaller lot sizes which minimizes total impervious area, reduces total construction costs, conserves natural areas, provides community recreational space, and promotes watershed protection. These designs should be considered an option in a residential district.
- Leave as much open space as possible in its natural condition. This provides storm water infiltration and has a minimal annual maintenance cost.

- Link open space to existing wetlands, river systems, and other open space areas. This provides a buffer to these sensitive areas, allows scenic recreational opportunities for residents, provides a wildlife corridor, and could provide a location for nonmotorized transportation opportunities in the community.
- Minimize the amount of clearing and grading on a site. This will preserve natural areas and reduce soil erosion and compaction.

Managing storm water runoff

Initiate a storm water ordinance

A storm water management ordinance can be used to communicate to developers how storm water quality and quantity are viewed by the community, and can give them guidance to how they should approach storm water management on site through their designs. Storm water runoff is one of the major sources of pollution degrading our water resources. This is due, in part, because we have become very efficient at collecting runoff, and carrying it off site through underground pipes. These pipes, however, do not filter the storm water of pollutants before it reaches a stream or wetland.

Under the new federal Phase II storm water regulations, permitted communities are required to include provisions for developing, implementing, and enforcing programs to manage storm water from new development and redevelopment. Storm water ordinances are one mechanism to ensure not only that these requirements are satisfied, but that your community's storm water goals are being met.

A storm water ordinance regulates storm water runoff for the purpose of protecting local water resources from degradation, preventing flooding, and meeting other water quality and quantity goals. Regulating storm water runoff minimizes runoff rates and volumes, soil erosion, stream channel erosion, and nonpoint source pollution. This regulation falls under protecting the public interest and preventing threats to public health and safety.

Consider the following when developing a storm water ordinance:

- Require development and redevelopment projects to meet both flood control and water resource protection performance standards.
- Ensure that the storm water outlet does not exceed its reasonable share of the maximum capacity of the downstream watercourse or closed conduit.
- Limit land disturbance and grading.
- Require that storm water drainage improvements follow the natural drainage pattern of the land to the fullest extent possible.

Incorportating storm water standards into local ordinances is one mechinism local communities can utilize in managing storm water runoff.

- Manage storm water for the 100-year storm, bank full conditions and first flush volume. For stream channel protection, require that bank full volumes are managed on site and released gradually into the stream.
- Require that the first flush volume (approximately 35 percent of the bank-full flood storage volume) cannot be discharged until it is treated by capture and gradual release over a period of at least 24 hours.
- Maintain or establish buffer strips (minimum of 30 feet) from the top of bank of any watercourse or surface water.
- Ensure that the applicants demonstrate that storm water management systems will be maintained in perpetuity.
- Require that soils be aerated/decompacted after construction is complete. Compacted soils reduce infiltration and can cause storm water management practices to be ineffective. In fact, storm water best management practices should be clearly labeled on grading plans and flagged in the field to ensure heavy construction equipment avoids these areas.
- Rather than place specific storm water design criteria into an ordinance, it is often preferable to fully detail these requirements in a storm water design manual. This allows specific design information to change over time as new information or techniques become available without requiring the formal process needed to change ordinance language.

Use Best Management Practices

Communities should have policies and standards in place that encourage the use of Best Management Practices (BMPs) whenever possible to minimize, collect and treat storm water. Storm water BMPs consist of methods or a combination of methods that prevent or reduce water pollution generated from

nonpoint sources. In general, BMPs can be structural, or they can be non-structural policies that help protect water resources. Structural BMPs are most often described in a community's Engineering Design Standards, which provides minimum standards on how each type of facility is to be built. BMPs should function together as a system to ensure that the volume, rate, timing, and pollutant load of runoff remains similar to that which occurred under natural conditions.

Structural Best Management Practices. Structural BMPs are physical means of accomplishing the above goals and can be divided into four categories:

1) Detention structures. Structures that "detain water, and let it out slowly until the pond is dry.
2) Retention structures. Structures that "retain" water, holding it until it infiltrates into the ground or evaporates.
3) Vegetated swales and strips.
4) Other. Practices to reduce accumulated pollutants picked up by runoff, regulate the amount of impervious areas, and eliminate inappropriate discharges to drains and storm sewers.

Examples of various structural BMPs are listed below. Please note that some examples may fall under more than one category.

Detention structures

- detention ponds
- wet ponds
- storm water wetlands
- multiple pond systems

Retention Structures

- wet ponds
- infiltration trenches
- infiltration basins
- storm water wetlands
- multiple pond systems
- rain gardens

Vegetated swales and strips

- grassed swales
- filter strips

Other practices

- porous pavement
- grass pavers
- water quality inlets (e.g., oil/grit separators)

Where each of these structural BMPs can be used is site specific and dependent on soil type, infiltration rate of soil, the level of the water table at the particular location, amount of sediment at the site, thermal impacts, space constraints, drainage area, and cost. Therefore, a particular BMP should be selected based on the water quality needs as well as cost, drainage area, land use, soil and topography. Consideration should also be given to addressing maintenance and inspection of BMPs to ensure that they are functioning properly.

Storm water management in Northville Township.

Policy (non-structural) Best Management Practices. Prevention and/or reduction of pollution generated from nonpoint sources can also be accomplished through the use of a community's policy BMPs, standards or programs. These tools can be described in the community's property/facilities management manual, master plan, and/or zoning ordinance. Examples of policy BMPs are:

Storm water system maintenance

- street sweeping
- catch basin cleaning
- outfall inventory/inspection
- woody debris management
- stream bank stabilization
- floodplain/wetland management
- household hazardous waste disposal
- equipment/storage area maintenance
- fertilizer management

Site development

- cluster housing
- minimize street parking
- minimum/maximum parking space criteria
- lot coverage requirements
- open space requirements
- require use of structural BMPs
- enforce soil erosion and sedimentation control (SESC) practices
- development and maintenance agreements

Public education/outreach

- display boards

Table 17
Planning Criteria for Best Management Practices

BMP	Description	Function	Application
Extended wet detention pond	Small constructed lake or basin with emergent wetland vegetation around the bank.	Designed to detain runoff from storm events until it is displaced by subsequent events. Reduction of storm water peak discharge. Removal of suspended solids. Removal of metals and nutrients.	Generally used for drainage areas in excess of five acres.
Extended dry detention pond	A pond or basin that is usually dry between storms that captures runoff and releases it slowly enough to allow most sediment to settle.	Less effective than wet retention pond at removing pollutants. Reduction of storm water peak discharge. Removal of suspended solids.	Used for tributary watersheds 10 acres and larger to remove particulates.
Constructed wetlands	Constructed basin with a significant percentage covered.	Reduction of storm water. peak discharge.	Removal of suspended solids. Removal of metals and nutrients by wetland vegetation. Removal of pathogens.
Vegetated swales	Channels or flat surfaces lined with vegetation that filters flow.	Removal of nutrients.	Removal of suspended solids.
Storm water filters	System that uses a filter medium (sand, gravel, peat or compost) or surface vegetation to remove a fraction of the polluting constituents in runoff. Limitations in cold climates because of freezing of medium.	No affect on storm water flow attenuation. Removal of nutrients. Removal of suspended solids. Removal of pesticides. Used for reducing sediment, fertilizers, pesticides, etc. from drainage areas up to five acres with slopes up to two percent (e.g., along roads, around parking lots).	Used mostly for particulate removal of runoff from large paved areas.
Oil and grease separators	A device that removes abnormally high concentrations of petroleum compounds, grease, and grit.	Removal of petroleum or grease. Removal of suspended solids.	At commercial/industrial facilities that generate high levels of oil products or grease. In medium to large parking or motor vehicle storage areas.

Source: *Planning and Cost Estimating Criteria for Best Management Practices*, Rouge River National Wet Weather Demonstration Project, April 2001.

- cable programming
- fliers/brochures/newsletters
- public meetings/workshops
- volunteer opportunities
- website
- river/creek signage

BMP selection. Selecting the BMP for your site is an imperative step in meeting your community's storm water goals. The Center for Watershed Protection (CWP) has developed a Web site called Storm Water Manager's Resource Center to assist communities in this process. CWP provides a series of matrices that can be used as a screening process for selecting the correct BMP for a development site. Screening factors include:

- land use (practices best suited for the proposed land use at a site),
- physical feasibility (physical constraints that may restrict or preclude a BMP),
- climate/regional factors (regional characteristics that restrict or modify the use of certain BMPs),
- watershed factors (which BMP helps meet watershed protection goals),
- storm water management capability (which BMP or combination of BMPs are needed to meet storm water sizing criteria),
- pollutant removal (how does each BMP compare in terms of pollutant removal), and
- community and environmental factors (decide if the BMPs have any important community or environmental benefits or drawbacks that might influence the selection).

Case Example

Storm Water Management Program

Community: Canton Township

Contact: Tom Casari, (734) 394-5150

Canton Township developed a storm water manual in March 1997 to assist in implementing their storm water ordinance. Specifically, the purpose of the manual is to help property developers understand storm water management standards for new construction projects. Design guidelines for new storm water management facilities are detailed in this manual along with Best Management Practices (BMPs) which address both water quality and quantity issues.

Topics in the manual include:

- design runoff rates
- downstream improvement requirements
- enclosed systems design criteria
- outlet sizing
- road culverts
- open channel modifications
- BMPs (such as wet detention ponds, streambank stabilization, oil/water separators, extended detention basins, sand filters, constructed wetlands, and vegetated swales)

Procedures and Design Criteria for Storm Water Management Systems

Community: Washtenaw County

Contact: Janis Bobrin, (734) 994-2525

Washtenaw County's storm water program embodies a shift in storm water management philosophy from a flood control perspective to include design standards that provide more sophisticated quantity control and directly address water quality.

The office of the Drain Commissioner exercises authority over the design and construction of structural facilities that convey and treat stormwater runoff that will be generated from a site as a result of its design. The Drain Commissioner's Rules will govern the design of such management facilities with the following objectives:

- Incorporate design standards that control both water quantity and quality.
- Encourage innovative stormwater management practices that meet the criteria contained within these rules.
- Place greater emphasis on the maintenance of facilities.
- Make the safety of facilities a priority.
- Strengthen the protection of natural features.
- Encourage more effective soil erosion and sedimentation control measures.

Following is a sample of the hierarchy for structural controls that positively influences both water quantity and quality:

- In general, the most effective storm water quality controls are infiltration practices, which reduce both the runoff peak and volume. But, to date, structural infiltration devices such as basins and, to a lesser degree, trenches have suffered extremely high failure rates due to clogging. Therefore, an aggressive maintenance program must be incorporated into these controls. In addition, these practices are only feasible on small sites, with suitable soils and no potential for groundwater contamination.

- The next most effective storm water site controls reduce the runoff peak and involve storage facilities such as retention and detention ponds. In selecting an appropriate storm water pond design, wet ponds are generally preferable to detention ponds, since they hold storm water much longer, allowing more particulates to settle out. In addition, the aquatic plants and algae within wet ponds take up soluble pollutants (nutrients) from the water column. These ponds must manage storm water for the 100-year storm, bank-full conditions, and first-flush volume.

Additional Resources

Canton Township. *Canton Storm Water Management Manual*.

Center for Watershed Protection. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Ellicott City, MD: Center for Watershed Protection, 1998.

Center for Watershed Protection. "Comparative Pollutant Removal Capability of Stormwater Treatment Practices." Technical Note #95 *Watershed Protection Techniques*. 2(4):515-520.

Center for Watershed Protection, "Skinny Streets and One-sided Sidewalks: A Strategy for Not Paving Paradise." Technical Note #38 *Watershed Protection Techniques*. 1(3):135-137.

Center for Watershed Protection. *Storm Water Practices for Cold Climates* Prepared for: US EPA Office of Wetlands, Oceans, and Watersheds. Washington DC. 1997.

Center for Watershed Protection. www.cwp.org.

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SEMCOG, the Southeast Michigan Council of Governments. *Headwaters: The Lifeline of a River*. Video. Detroit, MI. 1995.

Stormwater Manager's Resource Center. www.stormwatercenter.net

Terrene Institute. *Urbanization and Water Quality: A Guide to Protecting the Urban Environment.* Alexandria, VA: Terrene Institute, 1994.

United States Environmental Protection Agency. Office of Wastewater Management. Post-Construction Storm Water Management in New Development and Redevelopment. www.epa.gov/OW/index.html

Soil Erosion and Sedimentation Control

Soil erosion from construction sites is a challenge for Southeast Michigan's growing communities.

Erosion and sedimentation occurs when wind, water, or gravity runoff carries soil particles from an area (e.g., a construction site) and transports them to a water body. As noted in the *Water Quality Management Plan for Southeast Michigan*, excessive erosion and sedimentation leads to various water quality problems that diminish the quality of life in our communities. These include:

- Lost fishing opportunities because of decreasing fish diversity and disturbing the food chain by burying eggs and bottom-dwelling species.
- Interference with light penetration and photosynthesis, reducing water depth, and increasing water temperature, thereby disrupting the water ecosystem.
- Lost recreational opportunities because of pollution from other sources such as phosphorus, bacteria, and heavy metals which attach to soil particles and are deposited in the water bodies with the sediment.
- Disrupting the ecosystem when removing sediment from streams and storm water conveyance systems (this can also be expensive).

Although erosion and sedimentation control programs are required throughout the region, the quality of our water resources is still threatened. Much of the erosion and sedimentation problem is associated with construction site activities. We have a choice. The growth in households and commercial development in the region can result in new pollution or can be an opportunity to implement practices that prevent pollution, making growth and environmental protection compatible.

State law regarding soil erosion and sedimentation control was amended in 2000 in response to this threat. This section details changes to the state law and provides communities with specific tools to prevent erosion and sedimentation. These include amending the site plan review process and incorporating soil erosion control into an overall storm water management program.

Keeping it Connected

Because soil erosion often comes from construction sites, growing communities have a significant challenge. However, economic development can still occur while protecting against soil erosion. Clustering (or open space subdivisions) as a residential development option can considerably reduce clearing and grading of a site, which reduces soil erosion coming from the development.

Planning and Regulatory Considerations

Part 91 of the Natural Resources and Environmental Protection Act (PA 451 of 1994), as amended, establishes a program to control soil erosion from most land-use earth-change activities. Permits are primarily required for construction activity occurring within 500 feet of the state's receiving waters or if the disturbed area is greater than one acre. The applicant applies for the permit directly with the enforcing agency.

The enforcing agency can be either the state, county, city, village, charter township, or general law township in counties with population over 200,000. The statute requires counties to administer the soil erosion program within their jurisdiction. However, the above mentioned municipalities can administer the program by adopting an ordinance that has been approved by the Michigan Department of Environmental Quality (MDEQ). MDEQ is required to review enforcing agencies every five years to ensure that their programs are meeting state requirements.

In some instances, permits are not required. Instead, state, county, or local agencies may undertake earth-change activities without obtaining a permit if they are Authorized Public Agencies (APA) designated by MDEQ. Designation is dependent upon having acceptable operating procedures for controlling erosion and off-site sedimentation.

In addition to the program administered under Part 91 of state law, MDEQ also administers the federal National Pollutant Discharge Elimination System (NPDES)

program, which is part of the Clean Water Act. Under this federally mandated program, permits are required for construction sites greater than one acre in size. The state has adopted a process called 'permit-by-rule' for issuing the necessary coverage. First, a permit must be obtained from the local enforcing agency (as required under state law). Once the permit is obtained, the applicant must submit a notice-of- coverage form directly to MDEQ, which provides for compliance with the federal requirement.

Tools to Implement Soil Erosion and Sedimentation Control

Local communities can employ the following to prevent soil erosion and sedimentation:

- incorporate soil erosion protection measures into ordinances.

Incorporate soil erosion protection measures into ordinances

As part of a site plan review process or a local soil erosion ordinance, communities can require developers to submit and comply with a plan that contains measures to reduce soil erosion and control sediments that do erode. In addition, the regulations may include specific requirements for clearing and grading a site.

Following is specific guidance that should be included in soil erosion ordinance or site plan review requirements:

- **Minimize needless clearing and grading**. Clearing and grading should only be performed in those areas actually needed to build structures and provide access. Restrictions on any clearing and grading should be put on the following areas: stream buffers, forest conservation areas, wetlands, highly erodible soils, steep slopes, storm water infiltration areas, and other environmental features. These areas should be delineated on site plans and must be clearly visible in the field through signage, staking, flagging, or most preferably, fences (i.e., silt fence, temporary safety/ snow fence).
- **Incorporate buffers into local plans and ordinances**. Stream buffers are an important tool in reducing pollutants and soil erosion from entering our lakes and streams. (See chapter on stream corridor protection for more information on implementing this technique).
- **Protect waterways and stabilize drainage ways**. The site plan should contain information on location of existing and future streams and drainage ways. The regulations should ensure that no clearing occurs adjacent to the waterway. As a secondary form of protection, a line of silt fence should be installed along the perimeter of the waterway buffer.
- **Include drainage patterns on site plan**. Drainage ways are not only the major route that eroded sediments take to reach streams and waterways, they are also prone to severe erosion due to the velocity of the runoff channeled into them. Including the drainage patterns on the site plan helps assure that erosion practices are incorporated at the proper locations on the site.
- **Phase construction to limit soil exposure**. Mass grading of larger construction sites should be avoided because it maximizes both the time and area that disturbed soils are exposed to rainfall and, therefore subject to soil erosion. Communities should coordinate with developers to ensure new phases are not initiated until the previous phase is stabilized.
- **Immediately stabilize exposed soils**. Regulations should clearly define time limits to establish grass and/ or mulch on exposed soils. They should also include the acceptable types of materials and a method to permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.
- **Avoid disturbing steep slopes**. Steep slopes are the most highly erodible surface of a construction site and require special attention. Wherever possible, clearing and grading of existing steep slopes should be avoided. If clearing cannot be avoided, techniques (e.g., diverting upland flow around slope) should be used to prevent upland runoff from flowing down a slope. (Temporary seeding or mulch, by themselves, are not as effective in preventing erosion on the exposed soils of a slope.)
- **Install perimeter controls to filter sediments**. Perimeter controls should be established at the edge of a construction site to retain or filter concentrated runoff from relatively short distances before it leaves the site. One of the most common options is a silt fence. Silt fences are moderately effective in filtering sediment, but only when properly installed, located, and maintained. Chronic problems have been reported in installing and maintaining silt fences. If your community is the enforcing agency for soil erosion, local soil erosion inspectors should monitor silt fences closely. If the community is not the enforcing agency, other local inspectors (e.g., building inspectors) should be trained to quickly review the adequacy of a site's soil erosion practices. Any problems should be reported to the county enforcing agency.
- **Employ advanced sediment settling controls**. Even when pollution prevention practices are employed, construction sites are prone to discharge high concentrations of suspended sediments during large storms. Therefore, a community's erosion regulations or storm water management program should include a trap or basin to capture sediments and allow them time to settle out. In addition, the requirements should include a detailed inspection and clean-out schedule for the basin, along with procedures for converting the basin

into a permanent storm water management facility.

- **Link necessary development approvals to compliance with soil erosion protections**. Numerous opportunities exist for local communities to link compliance with soil erosion regulations with further development of the site. One option for local communities is requiring soil erosion regulations are met before granting the building permit. In addition, upon completion of construction, local communities can assure that all erosion control permit requirements have been satisfied before issuing the local occupancy permit.
- **Protect storm water management features from soil erosion**. Make certain that storm water management features, such as infiltration devices, are well protected from eroded soil during construction. Excessive sedimentation could cause the stormwater practices to clog and fail to perform as designed.

Source: Center for Watershed Protection, *Water Quality Management Plan for Southeast Michigan*.

CASE EXAMPLE

Soil Erosion and Sedimentation Control Program

Community: Washtenaw County

Contact: Bev Barton, (734) 222-3863

Washtenaw County is implementing an innovative soil erosion and sedimentation control program. Key elements of the program include:

- **Certificate of occupancy transfer**. Allows the builder to transfer their permit to the new homeowner, saving the new homeowner the money in securing their own permit. This releases the builder from responsibility for their part of the permit when occupancy occurs, resulting in a permit holder who actually owns the property.
- **Partnership with the homebuilders association**. Washtenaw County works with the Homebuilders Association by asking for their input on program changes that affect their members, clearly outlining the requirements and regulations, and providing consistent enforcement. This has led to an increase in compliance.
- **Partnership with communities**. The county provides staff at various locations around the county in order to know the community and customer in that community better. This has also led to an increase in compliance.
- **Filing and billing systems**. The county keeps detailed files that are color-coded by major or minor projects and filed under the next inspection date and township for easy retrieval. This has led to an increase in inspections, more contact with the applicant, and an increase in compliance. The billing has allowed a choice for the customer in terms of a permit fee. For example, the less land disturbed or more stabilized, the less the fee.

Additional Resources

Center for Watershed Protection. “The Architecture of Urban Stream Buffers.” *Watershed Protection Techniques*. Volume 1 (Summer, 1995): 155-163.

Center for Watershed Protection. “Clearing and Grading Regulations Exposed.” (Technical note) #40 *Watershed Protection Techniques*. 1(3):141-142.

Center for Watershed Protection. “Construction Practices: The Good, the Bad and the Ugly.” (Feature article) *Watershed Protection Techniques*. 1(3):95-99.

Center for Watershed Protection. “Impact of Suspended and Deposited Sediment.” (Technical note) # 86 *Watershed Protection Techniques*. 2(3):443-444.

Center for Watershed Protection. “Keeping Soil in Its Place.” (Technical note) #81 *Watershed Protection Techniques*. 2(3):418-423.

Center for Watershed Protection. “Muddy Water In-Muddy Water Out?” (Feature article) *Watershed Protection Techniques*. 2(3):393-403.

Center for Watershed Protection. “Strengthening Silt Fence.” (Feature article) *Watershed Protection Techniques*. 2(3):424-428.

Michigan Department of Environmental Quality Soil Erosion and Sedimentation Control. www.michigan.gov/deq/0,1607,7-135-3311_4113---, 00.html

Sewer Infrastructure Planning

Ben Sherman and Mark TenBroek of CDM evaluate flow conditions in southwest Detroit as part of the Greater Detroit Regional Sewer System Combined Sewer Overflow (CSO) modeling work.

Photo courtesy: Camp Dresser & McKee.

Local units of government are challenged to both maintain and improve their existing sewer systems while planning for future economic growth and development. Providing adequate wastewater collection, transport, and treatment is essential not only to protecting public health, safety, welfare, and the environment, but to ensuring a sustainable quality of life as well. In order to adequately handle municipal wastewater, both the physical infrastructure and the financial capability to meet the operation, maintenance, and ultimate rehabilitation/ replacement needs must be addressed. This includes on-site sewage disposal systems which will continue to be used extensively by both households and business.

The financial resources needed to construct, maintain, and improve sewage systems are becoming more of a local responsibility than in the past. As state and federal grant programs for sewer construction were phased out, local governments often shifted this financial burden to the land developers, requiring they extend sewer service to new development. While this shifts the initial capital costs for the sewer collection system in growing areas, the operation, maintenance, and repair of the sewers usually becomes the responsibility of the municipality, as does providing additional treatment capacity, if needed.

In many cases, this resulted in an incremental approach to extending sewer lines, often on a subdivision-by-subdivision basis. This approach to sewer extensions has resulted in lost opportunities to attain more cost-effective and environmentally sound practices than could be achieved from a more holistic approach. Coordination of planning for both current and future sewer needs is essential in minimizing conflicts between local, county, and regional plans and policies.

A key theme of the *Water Quality Management Plan for Southeast Michigan* is that improving and sustaining rivers, streams, and lakes requires attention to and action on a wide range of contributors to water pollution. One prerequisite to achieving clean water is sewer infrastructure (either sewers or on-site sewage disposal systems) that adequately serves the needs of existing and future populations of the region. The relationships between provision of sewer service, land use, and sustaining designated uses within waterbodies are complex. The tools and techniques described here, when used in conjunction with comprehensive plans, zoning ordinances, and land division regulations, provide a basis for making land use and sewer infrastructure more compatible and sustainable.

Keeping it Connected

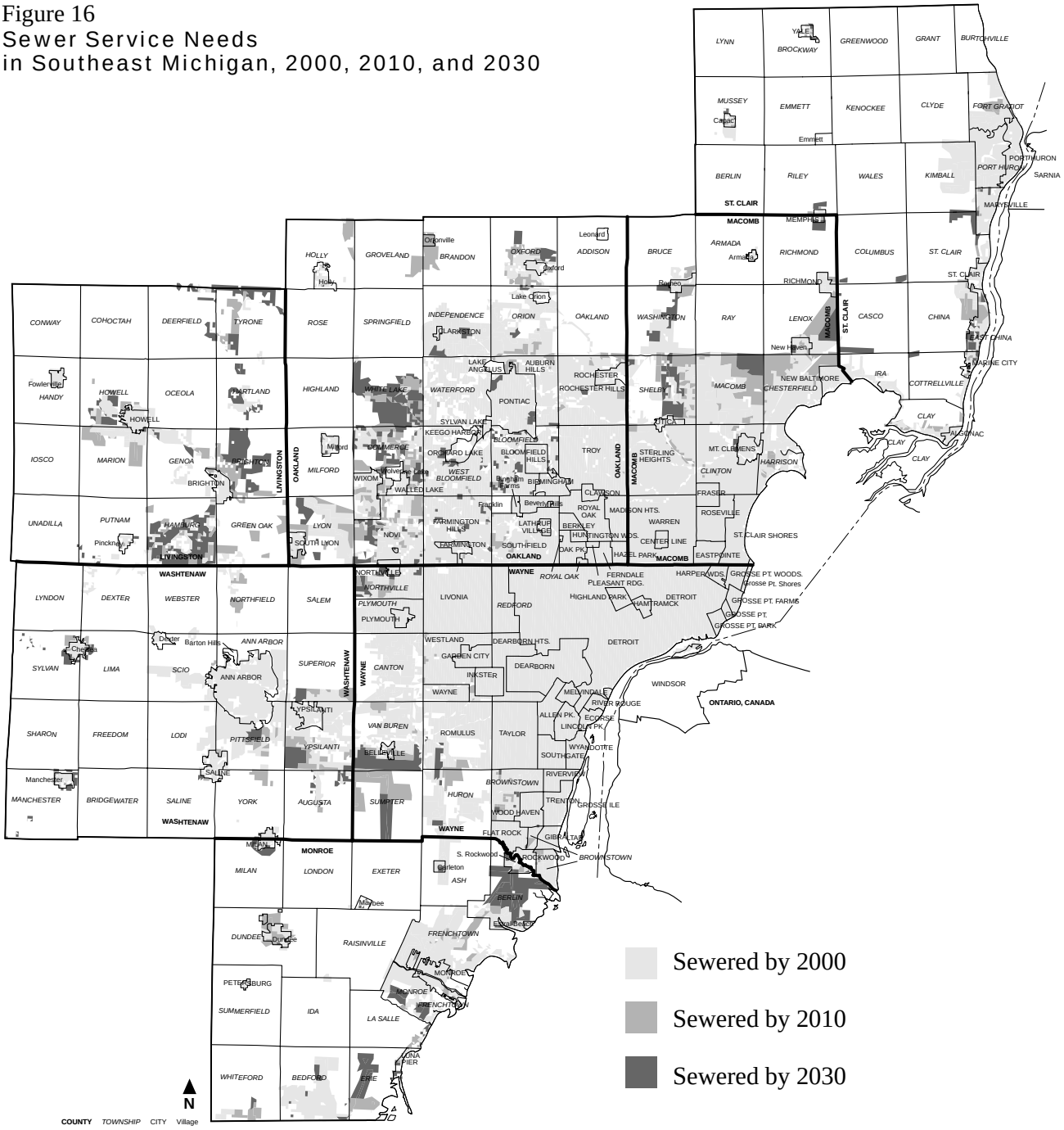
Ensuring adequate sewer infrastructure to meet future needs is as important in the master planning process as ensuring that future transportation needs are considered. However, sewage transport and treatment capacities frequently are not sufficiently addressed. Because providing adequate sewer infrastructure can substantially influence the quality of life within a community by enhancing the environmental character and opportunities for economic development, communities need to ensure adequate funding to operate, maintain, and replace its sewer infrastructure.

Planning and Regulatory Considerations

Municipalities in Michigan have the legal authority to construct, operate, and maintain sewer systems, either independently or collectively. Under Michigan law, municipalities are responsible for raw sewage discharges within their jurisdiction and can be required to take the corrective action necessary to protect public health and the environment.

Nonetheless, sewer infrastructure financing is often a critical constraint for local governments. Left unresolved, current unmet needs will lead to even greater problems in the future. Aging and deteriorating service in older, urban areas will inhibit revitalization efforts. As noted above, sewer infrastructure funding has, in recent years, become more of a local responsibility. State and federal funding has been declining, even as local needs have risen.

Figure 16
Sewer Service Needs
in Southeast Michigan, 2000, 2010, and 2030



Source: SEMCOG.

In order for municipal sewer collection and treatment facilities to be eligible under the federal and state grant and subsequent loan programs established by the Federal Water Pollution Control Act Amendments of 1972, (PL 92-500) municipalities are required to develop a waste treatment management plan. Most of these plans, commonly referred to as 201 facilities plans, were originally prepared in the 1970s and only a few have been updated to reflect current demographic and development patterns. The plans:

- identify and evaluate existing sanitary sewers, interceptors, lift stations, and treatment facilities,
- estimate the sources and impact of infiltration and inflow on the sewer system, and
- identify system improvements to meet the needs for the current population and the estimated population in 20-30 years.

Many communities use funds from the Michigan Clean Water State Revolving Fund (SRF) to finance sewer infrastructure, but increasing needs and significantly decreasing SRF funds is a concern for local communities within the region. SEMCOG's report, *Investing in Southeast Michigan's Quality of Life: Sewer Infrastructure Needs*, estimates that there will be between $14-26 billion in need by 2030 to maintain and improve Southeast Michigan's sewer infrastructure. Yet, recently the SRF has averaged less than $240 million per year for the entire state. Given the gap between actual and needed sewer funding, comprehensive planning and the need for cost efficiency in the delivery of service is all the more critical to local governments.

SEMCOG policy

The *Water Quality Management Plan for Southeast Michigan* designates SEMCOG as the Continuing Planning Agency under the federal Clean Water Act. One of SEMCOG's functions is to review sewer projects proposed for funding under the Clean Water Act. Project proposals are submitted to SEMCOG to ensure consistency with the plan. Part of the review for consistency includes a comparison of the proposed service area and the area designated for sewering on the map. SEMCOG policy supports state or federal funding only for those projects within areas designated for sewer service in the plan. SEMCOG's Regional Clearinghouse Review Committee can amend eligibility boundaries when there is sufficient documentation that sewers are needed to address a public health concern. This policy does not mean that sewers are prohibited in other areas, only that limited state and federal funding be targeted to those existing areas.

Tools for Sewer Infrastructure Planning

There are several tools communities can draw from to plan for their sewer infrastructure. This section focuses on the following techniques:

- Initiating sewer service planning.
- Developing a sanitary sewer ordinance.
- Financing sewer infrastructure.
- Engaging in intergovernmental cooperation.

Initiating sewer service planning

Master plans and capacity study

Sewer service planning should be integrated into the community master planning process. During the planning process, several items should be evaluated, followed by explicit decisions that are then reflected in local plans and ordinances, including:

- Determining future wastewater infrastructure needs and costs based on residential, industrial, and commercial growth, local zoning, and master plans.
- Identifying short-range sanitary sewer infrastructure needs, as well as the location and capacity of service needed to support full development of the master plan.
- Using forecasting information to analyze future growth and wastewater treatment capacity needs.
- Inventorying the age of existing infrastructure and developing a maintenance and replacement schedule. (Typically, a consultant is hired to perform such a study.)
- Addressing the impacts of infiltration and inflow, storm water and combined sewer overflows (CSOs), as well as dry-weather flow.
- Developing and adopting a wastewater system plan for financing: additional transport and treatment capacity, maintaining and replacing the existing system; and maintaining and replacing any new construction.
- Linking sanitary sewer planning to the protection of health, safety, and welfare of residents.

New sewer capacity should be planned for in a process that includes other community service and infrastructure needs. The community's master plan should seek to coordinate the provision of municipal services in a manner that reflects local and regional sustainable development goals and policies. Local governments need to work together with the state to consider how needs can most cost effectively be met.

Mapping wastewater collection and treatment infrastructure

To ensure that adequate collection and treatment infrastructure are available and appropriately scaled to handle current and future wastewater needs, municipalities should identify and map areas to be sewered, areas where on-site treatment will be used as the sewer infrastructure, and areas that will remain unsewered. Sewer infrastructure maps can then be used to direct development to areas where wastewater needs can be effectively and efficiently met.

Several steps should be part of developing this wastewater infrastructure map, including:

- Identifying current sewered area and capacity in a community.
- Identifying areas that are unsuitable for on-site sewage disposal systems and those that should not be sewered (e.g., environmentally sensitive lands, floodplains, and areas designated for open space).
- Identifying areas that will require sewers, based on density levels established in the community's zoning and master plans.
- Mapping the community's soil suitability for on-site sewage disposal systems. (This information can be

obtained from your county office of the Natural Resources Conservation Service.)

- Mapping other features that are important in determining future sewer needs (e.g., major roads, future commercial areas).

After identifying the current sewered areas and capacity, soils, roads, and commercial needs, the next step is to map the community's future sewer needs. This would then be used as a basis for updating or preparing a capital improvement plan.

Developing a sanitary sewer ordinance

The allowed uses of a public sewer system are generally controlled through a local sewer use ordinance. Communities should consider including a requirement that structures be connected to a sewer system as it becomes available in the area. Components of the ordinance could include a requirement that all structures (residential/commercial/industrial) within a specified distance of an existing sewer line to be connected to the public sewer system, establish connection and usage fees, installment contracts, and a provision for on-site sewage disposal system use when public sanitary sewer is not available. Requiring sewer hookups allows the community, based on zoning, to determine the sewer capacity needed to service an area, ensures that sewer lines are appropriately sized to serve the area, and that at least a portion of the cost associated with the sewer installation is distributed among the users through hookup fees.

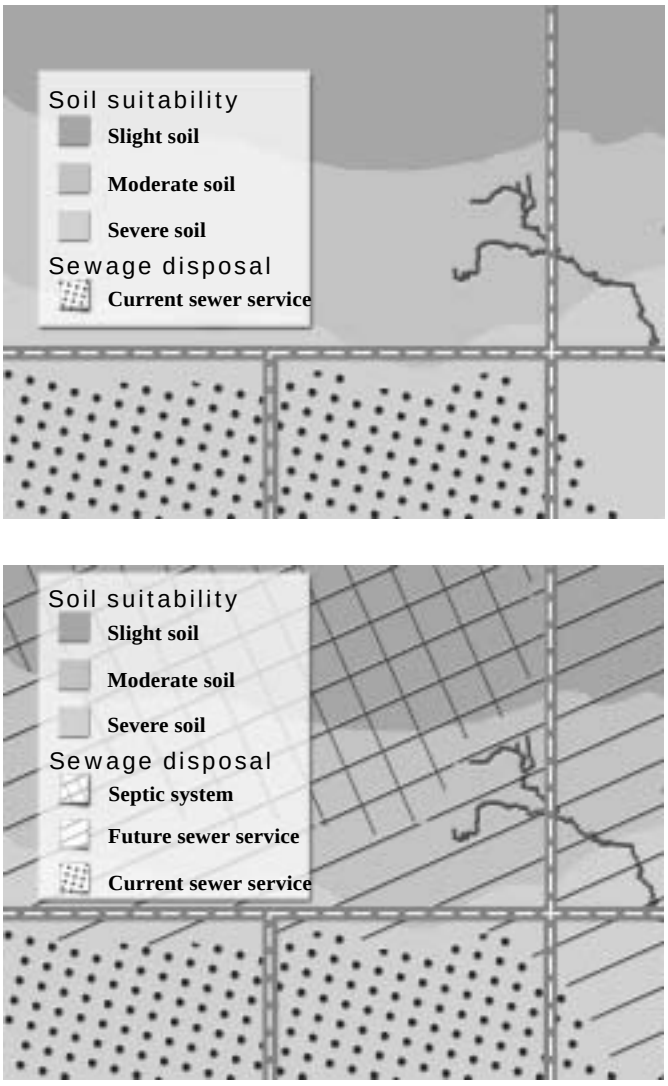
Financing sewer infrastructure

Capital Improvement Plan

Planning capital improvements within a community allows for a comprehensive approach to storm water management and sanitary sewer planning. It is also an important tool in land use and zoning decisions. Having a plan for future utilities will give planning commissions the tools they need to appropriately respond to new development proposals.

Every community should have a mechanism or system that allows for careful consideration of how existing facilities will be monitored, maintained, and replaced, and how and where future systems will be built and paid for. A capital improvement plan (CIP) lists all new major public facilities and associated infrastructure to be built, remodeled, or purchased in a community within the foreseeable future. Capital improvements consist of the major physical facility projects over and above annual operating expenses. A CIP helps establish a schedule or program for sewer projects according to community priorities. A CIP should be updated annually to reflect changing priorities and financial resources in the community.

Figure 17
Identifying Wastewater Infrastructure in Your Community



Top: Planning for sewer service should be an essential component in the community's master/comprehensive plan. The first step in designating areas to be sewered is to identify current sewers in the community. Next, map out the community's soil suitability for on-site sewage disposal systems. (This information can be obtained from your county office of the Natural Resources Conservation Service). Include other features on your map that are important in determining future sewer needs (e.g., major roads, future commercial areas).

Bottom: After analyzing the current sewer area, soils, roads, and commercial needs, map the future sewer needs for your community. After designing the future sewer service for your community, it's important to include this information in the community's capital improvement plan.

Consider the following components to include in a capital improvement plan:

- Include policies related to natural resource protection.
- Include standards as the basis for design of storm water and sanitary systems.
- Identify the location of both the current and future sanitary and storm sewer infrastructure and areas served or to be served in the future.
- Include capital improvement for installing, maintaining, and replacing storm and sanitary sewer utilities.
- Identify the financial resources needed and available to meet the sewer needs, including options for raising additional revenue and providing services at a lower cost.
- Call for the use, maintenance, and replacement of storm water best management practices.
- Include capacity contractual agreements with providers (for water) and receivers (for sewerage).
- Have special provisions for industrial users and require pretreatment of wastewater.

Municipalities have a variety of mechanisms available to generate revenues and lower costs. For example, there may be an opportunity for two or more communities to join together to meet their sewage transport and/or treatment needs with regional facilities or implementing an accelerated manhole maintenance program to reduce infiltration, thereby increasing transport and treatment capacity. Each municipality will have to determine the appropriate combination of mechanisms to best meet their unique circumstances.

Water and sewer rates

Sewer rates generally are the primary source of revenue for sewer operation and maintenance. Therefore, rates need to be established at a level that provides adequate funding for sewage collection, transport, and treatment, as well as any debt retirement and capital improvements assigned to sewer rates.

- Review sewer rates to determine the adequacy of revenue to properly operate and maintain sewer infrastructure systems and periodically reassess funding needed to provide a high level of operation and maintenance.
- Treatment facilities that serve more than one municipality should consider rate structures that offer incentives for developing and implementing sustainable growth and pollution prevention measures.
- Use the water and sewer billing system as an opportunity to disseminate water quality educational information, tips on water conservation, and promote environmental stewardship.

Engaging in intergovernmental cooperation

A significant number of municipalities in Southeast Michigan cooperate on meeting their sewer service needs. For example, the Detroit Water and Sewerage Department provides wastewater treatment for more than 75 municipalities. In fact, many of the more than 50 municipal wastewater treatment plants in Southeast Michigan serve more than one community. Additionally, several counties own and operate sewer interceptors that transport wastewater from several municipalities to different treatment facilities. Cooperation with neighboring communities on sewer service can reduce costs by achieving economies of scale in providing service and avoiding the expense of duplicative planning and sewer service availability.

At a minium, neighboring municipalities should be sharing and reviewing each other's sewer plans and maps in an effort to identify opportunities for cooperative arrangements and avoiding "hop-scotch" patterns of development that result in inefficient land use and infrastructure services.

Watershed management planning is another way to establish intergovernmental agreements related to sewer service. The storm water permitting program provides a prime opportunity for considering such intergovernmental cooperation through developing common (sub)watershed management plans. While this program is targeted primarily at controlling pollution from storm water, comprehensive watershed management plans often include a sewer service component. Active participation in local watershed management planning can also lead to designing and implementing sewer projects that focus on protecting water resources.

CASE EXAMPLE

Ypsilanti Community Utilities Authority (YCUA) Sanitary Sewer Master Plan

Contact: Larry Thomas, (734) 484-4600

The Ypsilanti Community Utilities Authority (YCUA) was formed in 1974 by combining the water and sewer departments of both the city and township of Ypsilanti. In addition to directly serving the city and township, YCUA contracts to provide bulk water and wastewater services to the townships of Pittsfield, Augusta, Sumpter and Superior. In 1993, YCUA began treating almost nine million gallons per day (mgd) of wastewater from portions of Canton, Northville, and Plymouth townships under a contract with the Western Townships Utility Authority (WTUA).

Constructed in 1982, the YCUA wastewater treatment plant is capable of providing tertiary treatment to 29 mgd of wastewater. The plant was designed to allow expansion to meet future wastewater treatment needs.

Growth within the YCUA wastewater service area and the expansion of service area to include WTUA prompted YCUA to commission the development of a comprehensive Sanitary Sewer Master Plan. Completed in 1999, the Master Plan assesses the performance of the existing sanitary sewer system and the impact of population growth upon the system's performance. The Master Plan provides recommendations for improvements to accommodate future population growth and how to prioritize projects. As a result of this study, future wastewater treatment needs are projected to be an additional 17 mgd, increasing the plant capacity to 46 mgd. Plant expansion is expected to be completed in 2006.

Based on this plan, each municipality within the YCUA system is assessed the costs (including capital costs) of providing the services it receives. However, through cooperative arrangements and the sharing of administrative and other costs has resulted in a lower per unit cost of service. By working together, the communities served by YCUA will ensure that their current and future wastewater treatment needs are met in a cost effective and environmentally sound manner.

Sanitary Sewer Allocation Policy

Community: Ira Township

Contact: John Jones, (586) 725-0263

In 1996, the Ira Township Board implemented a moratorium on sewer extensions until it could complete a sanitary sewer study to determine available capacity within its own system, the regional interceptor, pump station, and treatment plant. Based on the study, the township had the capacity to transport and treat a maximum of 682 additional Residential Equivalent Units (REUs). Based on existing plats and site plans, 212 REUs had already been committed. This left 470 REUs uncommitted and available for future development.

To assure an equitable distribution of the remaining sewer capacity, the township adopted a sanitary sewer allocation policy in 1997. One of the primary objectives of the policy is to make sure land use plans are compatible with the remaining sewer transport and treatment capacity. Following are some of the key components of this policy:

- 75 percent of the non-committed capacity was allocated to residential users and 25 percent allocated to commercial, institutional, and industrial users.
- The township was divided into three sewer districts, based on remaining vacant land.
- No single residential development can receive more than 20 percent of the allocation for that district.
- The policy will be reevaluated every two years and amended if necessary.

Based on the township's master plan, sewer and water master plan, existing sewer capacities, proximity to existing infrastructure, and surrounding zoning and land uses, Ira Township denied a request to rezone a large tract of land that would have increased its residential capacity from 117 to approximately 300 lots. Subsequently, the developer challenged the rezoning decision and filed suit against Ira Township in Circuit Court. The court decided the case in favor of the township, finding "Ira Township, in light of its sewage capacity problems in 1996, was not unreasonable in not granting (the developer's) request for rezoning; the fact that the Township took a coordinated view of getting its own update to its master plan, with it amending the zoning of the whole township before it ruled on (the developer's) request was not unreasonable . . ."

Ira Township recognized that real limits to its ability to provide sewer service for future development exist and that sewer capacity will be a limiting factor in the density of future developments. By developing and adopting of its comprehensive sanitary sewer allocation policy, the township is able to make decisions in a fair and equitable manner on how its remaining sanitary sewer capacity will be distributed to meet future needs. Without this policy in place, the rezoning would otherwise have created sewer and treatment plant capacity problems. This might have resulted in negative water quality impacts, poor service, and additional costs to the township to remediate these problems.

Additional Resources

Bowyer, Robert A. *Capital Improvements Programs: Linking Budgeting and Planning*. American Planning Association. 1993.

Intergovernmental Growth Management Consortium. *Infrastructure Management Options to Deal with the Impacts of Growth*. 1991.

Planning and Zoning Center, Inc. *Community Planning Handbook: Tools and Techniques for Guiding Community Change*. Michigan Society of Planning Officials. 1992.

SEMCOG, the Southeast Michigan Council of Governments. *Investing in Southeast Michigan's Quality of Life: Sewer Infrastructure Needs*. Detroit, MI: SEMCOG, the Southeast Michigan Council of Governments. 2001.

U.S. Environmental Protection Agency. www.epa.gov/OWM/

Williams, Kristine M. "Strategies for Managing Capital Improvements." *Planning and Zoning News*, February 1992.

On-Site Sewage Disposal System Management

Design, placement, and maintenance of on-site sewage disposal systems are important components in evaluating a community's approach to sanitary sewer planning and infrastructure. On-site sewage systems are an important component of sewer infrastructure and a common form of wastewater treatment systems in less densely populated areas. Commonly called septic systems, they are self-contained systems comprised of an underground tank that holds waste and a drainfield which disperses wastewater through tiles into the soil.

There is a significant amount of evidence demonstrating that failing septic systems impact groundwater and surface water quality. Most notably, failing systems can contribute to the bacteria problem which is limiting use of numerous local beaches in Southeast Michigan.

The *Water Quality Management Plan for Southeast Michigan* notes that when properly designed, located, installed, operated, and maintained, septic systems offer an alternative to sewers and municipal wastewater treatment plants. However, this also means that septic systems will constrain the amount and pattern of development in rural areas.

Sewage disposal facility in Madison Heights.

Keeping It Connected

On-site sewage disposal systems are an important component of Southeast Michigan's sewer infrastructure. When updating the community's master plan, consider incorporating sewer planning, including on-site sewage disposal systems, into the master plan.

Planning and Regulatory Considerations

Michigan law states, in part, that . . . "The discharge of any raw sewage of human origin, directly or indirectly, into any of the waters of the state shall be considered prima facie evidence of a violation of this part by the municipality in which the discharge originated unless the discharge is permitted by an order or rule of the department. If the discharge is not the subject of a valid permit issued by the department, a municipality responsible for the discharge may be subject to the remedies provided in section 3115." (Source: 1994 Act 451, Sec. 3109 (2), as amended.)

Municipalities are, therefore, responsible for ensuring that on-site sewage systems within their jurisdiction are operating properly and not contributing to water pollution problems. County health departments, through their county sanitary codes, issue permits for installing, repairing and replacing septic systems. In addition, they review proposed subdivision plats to determine if private on-site water and sewage disposal is feasible and adequate.

Phase II of the federal storm water program requires National Pollutant Discharge Elimination System (NPDES) storm water permits for communities in urbanized areas with populations under 100,000 and for construction sites greater than one acre in size. In accordance with this rule, over 170 Southeast Michigan communities must apply for an NPDES storm water permit from the Michigan Department of Environmental Quality. As part of this permit, communities must have a mechanism in place to identify and correct failing on-site sewage disposal systems. Some counties have initiated a time-of-sale inspection program to ensure continued functionality of on-site systems (see Wayne County case study).

Tools for Managing On-Site Sewage Disposal Systems

Numerous tools are available for local communities implementing on-site sewage disposal systems:

- Incorporate on-site disposal systems into plans and ordinances.
- Include on-site disposal systems in the site plan review process.
- Coordinate permit issuance.

- Monitor and inspect systems.
- Ensure proper operation and maintenance.

Incorporate on-site disposal systems into plans and ordinances

Local governments can direct development to areas which are likely to have suitable soils and groundwater conditions for septic systems.

- Identify areas unsuitable for septic systems in local master plans. This should be done in conjunction with the community sewer plan to ensure adequate sewage transport and treatment capacity will be available (see chapter on Sewer Infrastructure Planning). Soil suitability for septic systems can be determined through the use of soil data and maps available through soil conservation districts in each county. SEMCOG also maintains computerized maps of soils.
- Establish zoning district density regulations (number of dwelling units/acre). Density of development (and septic systems) can affect the function of systems. The use of overlay zoning could be used to regulate density based on soil suitability.
- Establish septic system setback requirements from lakes, rivers, and streams that exceed county sanitary code requirements in the zoning ordinance to further water quality protection. Figure 18 shows a septic system and a recommended minimum setback from a water body.

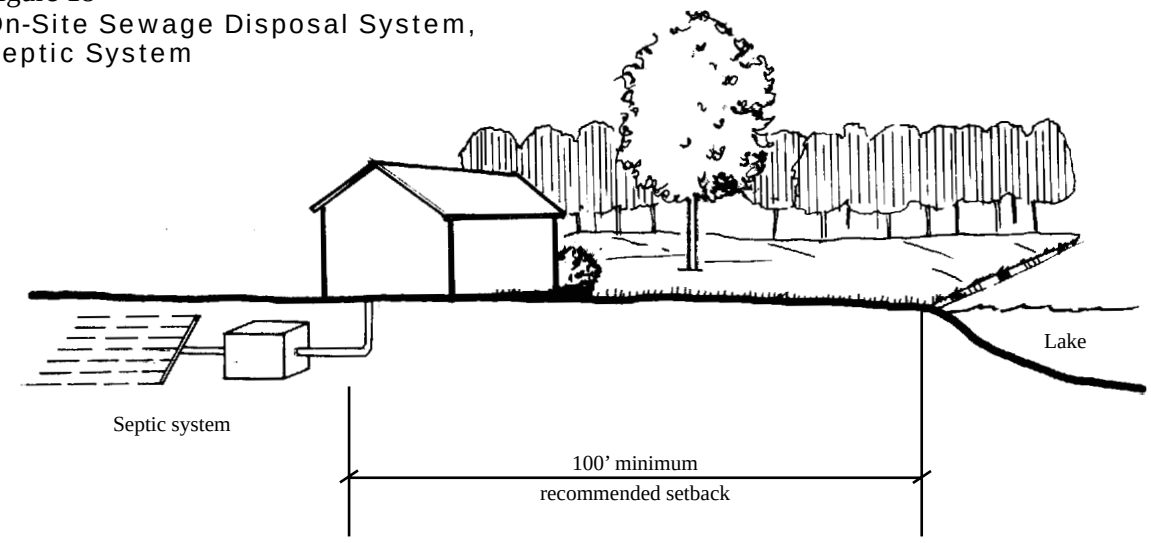
Including on-site disposal systems in the site plan review process

Review for potential septic system problems should become a part of local communities' site plan review processes to ensure compliance with community standards and policies. The following questions should be addressed in the review process:

Oakland County's Septage Unloading Facility located in Pontiac provides a convenient, controlled, and cost-efficient process to dispose of septage from residential septic tanks and sediment from municipal catch basins. The facility features easy access for loading and unloading septage, diversion provisions for storm water surface runoff, and watertight construction to prevent septage leaks and groundwater infiltration.

- What types of soils and groundwater conditions are found on the site? Are natural conditions suitable for on-site sewage disposal tanks?
- Will steep slopes create problems for on-site sewage disposal systems?
- Will on-site sewage disposal systems be located within 100 feet of any lake, stream, or river?
- Will on-site sewage disposal systems be located uphill from water supply wells, posing threats to drinking water supplies?

Figure 18
On-Site Sewage Disposal System, Septic System



Source: SEMCOG.

- Will on-site sewage disposal systems be located in storm water runoff pathways? Could overbank flooding from nearby streams create septic system problems?
- Is there room on the development site for a replacement drainfield?
- Is a road available on the site for maintaining the on-site sewage disposal system? Is there convenient access to the tank cover for regular inspection and maintenance?

Verification of county health department approval for the use and siting of septic systems should be required prior to local approval of site plans or preliminary plats. This will ensure that site planning and development proceeds in accordance with an approvable on-site sewage disposal system.

Coordinate permit issuance

Local government permit issuance should be coordinated with the process used by the county health departments.

- County septic system installation permits should be obtained before issuing of building permits (as required by the State Construction Code).
- County final septic system inspection and approval should be completed before an occupancy permit is issued by the local government.

Monitor and inspect systems

In addition to periodic (time of sale) inspections of septic systems, local governments can assist and support county enforcement efforts by helping to identify the location of on-site sewage disposal system problems in the community and notifying county health officials. In areas served by on-site sewage disposal systems, surface water quality monitoring programs should be modified to identify pollution from potential on-site sewage system failures.

Ensure proper operation and maintenance

Local governments, in cooperation with county health departments, could sponsor workshops and prepare brochures to make residents aware of the importance of maintaining septic systems. Local governments and county health departments together could establish septic system maintenance districts that call for regular maintenance and repair and creation of homeowner maintenance education programs. Property owners in a district would pay a fee to the responsible government agency for inspection and maintenance services. This service may also include contracting to pump out or repair the septic system.

Case Example

On-Site Sewage Disposal System Evaluation and Maintenance Ordinance

Community: Wayne County

Contact: Stephen Tackitt, (734) 727-7432

In September 1999, Wayne County passed an ordinance implementing a program to minimize seepage from septic systems into the storm water drainage system. To accomplish this, any residential or commercial establishment that depends on an on site sewage disposal system must have the system evaluated prior to the time of sale or transfer of the property. The owner, buyer, real estate agent, registered evaluator, septage servicer, the Wayne County Department of Public Health, and the local municipality all have specific responsibilities in implementing this ordinance.

Sanitary Code

Community: Monroe County

Contact: Carol Austerberry, (734) 240-7900

The Monroe County Health Department's Sanitary Code has a chapter containing sewage disposal regulations. An important aspect of this code is the establishment of certain specifications of on-site sewage disposal facilities. This section details the requirements that must be met in order to acquire an on-site sewage disposal permit. Permits will not be granted in situations where:

- A publicly operated sewer system is available.
- Property in question is too small to allow proper isolation distances from property lines, surface waters, and water supply systems.
- Property contains soils with high proportions of silt and/or clay.
- Natural ground level water is less than two feet from the natural ground surface.
- Property is subject to flooding by inclusion within the 100-year floodway, as determined by the United States Geological Survey.
- Slopes are greater than 12 percent.
- Conditions exist or may be created which may endanger the public health or environment.
- Septic tank would be inaccessible for cleaning or inspection.

The sewage disposal section of the code also addresses regulations such as requiring approved sewage disposal facilities, other requirements needed to acquire a permit, and establishing licensing and bonding requirements for sewage disposal contractors.

Additional Resources

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Groundwater Management

Communities dependent on groundwater can support a broad range of land uses, while protecting the groundwater supply.

Over one million people in Southeast Michigan rely on groundwater for their drinking water supply. However, increased development in areas dependent on groundwater results in increased possibility of contamination. This contamination could result from a variety of new "sources" associated with various types of developments.

The *Water Quality Management Plan for Southeast Michigan* recognizes the interrelationships between groundwater protection and land use planning. The plan encourages incorporating groundwater protection into the community zoning, site plan review and master planning processes and developing local groundwater protection programs. An effective groundwater protection program has a number of benefits that transcend the protection of drinking water sources and include, protection of surface waters and wetlands as well as enhancing land values.

Keeping It Connected

Communities dependent on groundwater can support a broad range of land uses, while protecting the groundwater supply. By mapping your community's groundwater recharge area, you can then appropriately plan for residential, commercial, and industrial land uses in the community. If possible, place parks and open space in the recharge areas, along with residential that is clustered to reduce impervious surfaces and allow water to infiltrate into the ground. Avoid certain commercial or industrial land uses in the recharge area, if possible. If these land uses do occur, require additional measures to ensure protection of the area groundwater supply.

Planning and Regulatory Considerations

The U.S. Environmental Protection Agency (EPA) is responsible for federal activities relating to the quality of groundwater. EPA's groundwater protection activities are authorized by a number of laws, including:

- The Safe Drinking Water Act, which authorizes EPA to set standards for maximum levels of contaminants in drinking water, regulate the underground disposal of wastes in deep wells, designate areas that rely on a single aquifer for their water supply, and establish a nationwide program to encourage the states to develop programs to protect public water supply wells (i.e., wellhead protection programs). In October 2001, EPA began the process of implementing a new standard for arsenic in drinking water. The standard has dropped from 50 parts per billion to 10 parts per billion, with implementation of the new standard by 2006.
- The Resource Conservation and Recovery Act, which regulates the storage, transportation, treatment, and disposal of solid and hazardous wastes to prevent contaminants from leaching into groundwater from municipal landfills, underground storage tanks, surface impoundments, and hazardous waste disposal facilities.
- The Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), which authorizes the government to clean up contamination caused by chemical spills or hazardous waste sites that could (or already do) pose threats to the environment, and whose 1986 amendments include provisions authorizing citizens to sue violators of the law and establishing community "right-to-know" programs (Title III).
- The Federal Insecticide, Fungicide, and Rodenticide Act, which authorizes EPA to control the availability of pesticides that leach into groundwater.
- The Toxic Substances Control Act, which authorizes EPA to control the manufacture, use, storage, distribution, or disposal of toxic chemicals that leach into groundwater.
- The Clean Water Act, which authorizes EPA to make grants to states for developing groundwater protection strategies and authorizes a number of programs to prevent water pollution from a variety of potential sources.

- Parts 31 and 22 of Michigan's Natural Resources and Environmental Protection Act govern groundwater protection. Part 31 is Michigan's primary water pollution control statute and applies to both groundwater and surface water quality. Part 22 sets forth the groundwater quality rules, designed to protect groundwater for all uses while allowing groundwater discharges.
- Where federal and state laws have provided for general groundwater protection activities (such as wellhead protection programs or development of state groundwater protection strategies), the actual implementation of these programs is by the states in cooperation with local governments. A major reason for this emphasis on local action is based on the premise that protection of groundwater generally involves making very specific decisions about how land is used.

Tools for Groundwater Management

There are several tools communities can draw from to protect their groundwater:

- Start a groundwater/wellhead protection program.
- Incorporate groundwater management into planning and zoning regulations.
- Utilize overlay zoning.

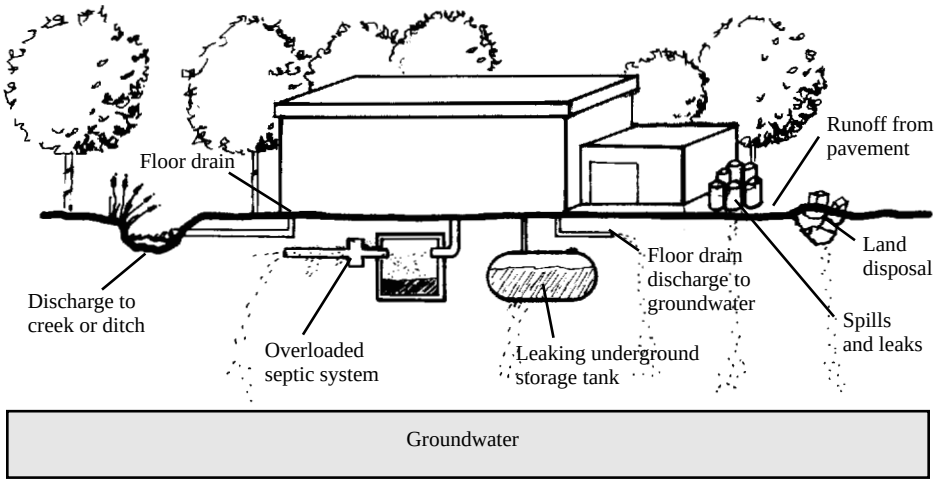
Starting a groundwater/wellhead protection program

One mechanism to effectively manage groundwater is to develop a groundwater or wellhead protection program. Such a program protects groundwater by:

- **Delineating the protection area**. A wellhead protection area is defined by the Michigan Department of Environmental Quality (MDEQ) as, "the area which contributes groundwater to a public water supply system well." Delineating this area often requires a hydrogeologic study to identify the contributing area. While the area contributing groundwater to a well may extend for miles, MDEQ suggests basing the delineation on a groundwater time-of-travel of 10 years. The 10-year, time-of-travel provides a reasonable length of time for responding to environmental problems within the protection area, while concurrently providing an area which can be reasonably managed.
- **Identifying potential sources of contamination**. The next step in a strong wellhead protection program is identifying existing and potential sources of contamination. At a minimum, known sites of environmental contamination may include leaking underground storage tanks, sites of environmental contamination (201 sites of Act 451), and oil and gas contamination sites. Known sites which represent a potential for contamination include registered underground storage tanks, hazardous waste generators, and groundwater discharges. Many of these databases are available online through Michigan's Center for Geographic Information, www.michigan.gov/cgi
- **Management and minimizing the threat**. The final step in a wellhead protection program is providing mechanisms which will prevent existing and potential sources of contamination from reaching the public water supply or wellhead area. This strategy should incorporate both public education and land use activities. A critical step is educating residents, busi-

Figure 19
Groundwater Protection: Contributors to Contamination

Pathways by which contaminants from business facilities can reach groundwater



Source: Adapted from Waste Systems Institute of Michigan, Inc.

nesses, and industries located within the wellhead protection area to emphasize their role in making wellhead protection work.

Incorporate groundwater management into planning and zoning regulations

Planning and zoning are critical components of any effort to protect a community's groundwater resources. Planning documents, such as the community master plan, provide an opportunity for the community to communicate their groundwater protection goals. This signals the value the community places on groundwater protection and provides a foundation for including groundwater protection measures in zoning ordinances.

Site plan review recommendations

Zoning regulations, such as site plan review standards, can be used to protect groundwater resources. Changes to the site plan review process occur in two major places, in the submission requirements and in the review standards. Following are recommendations for inclusion in the site plan submittal requirements:

- Existing topographic elevations at two-foot contour intervals. Indicate direction of drainage flow. (Including 100-foot off-site of subject property).
- Location and elevations of existing water courses and waterbodies, including county drains and surface drainage ways, floodplains, and wetlands.
- A storm water management plan that contains design of sewers, outlets, and retention or detention ponds. Sufficient data regarding site runoff estimates and off-site drainage patterns should be provided to understand the feasibility of storm water detention or retention as well as the impact on local surface and groundwater. Include soils information/classification that is verified with soil borings.
- Location and status of any floor drains in structures. The point of discharge for all drains and pipes should be specified on the site plan.
- Description and location of any existing or proposed outdoor storage facility.
- Description and location of on-site wastewater treatment and disposal systems.
- Location of existing and proposed private drinking wells, monitoring wells, test wells, irrigation wells, or wells used for industrial processes.
- Location, size, and description of any proposed interior or exterior areas of structures for storing, using, loading, or unloading of hazardous substances, hazardous wastes, and/or polluting materials.
- Delineation of areas on the site which are known or suspected to be contaminated, together with a report of the status of the cleanup or closure.
- Inventory of hazardous substances to be stored, used or generated on-site, presented in a format acceptable to the local fire marshal.

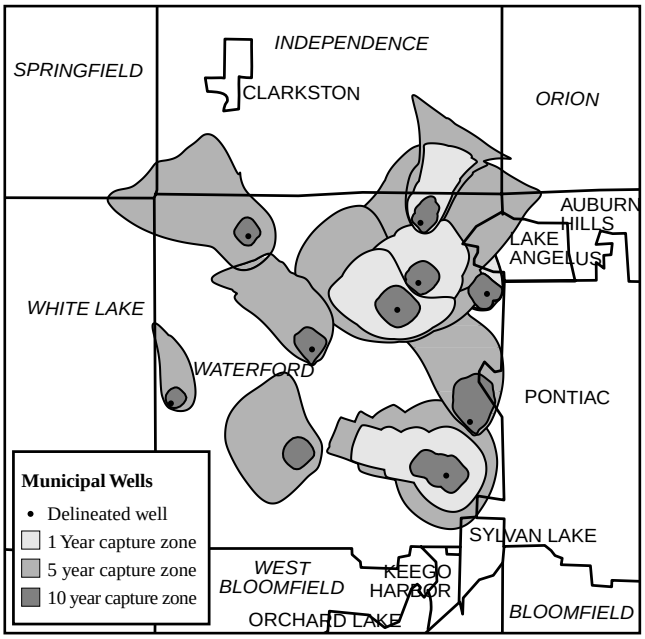
Groundwater discharge area.

Recommended practices for review standards

In addition to application information, following are recommended review standards:

- The project and related improvements shall be designed to protect land and water resources from pollution, including pollution of soils, groundwater, rivers, streams, lakes, ponds, and wetlands.
- Storm water detention, retention, transport, and drainage facilities should be designed to use or enhance the natural storm water system on-site. Storm water facilities should not cause flooding or the potential for pollution of surface or groundwater, on-site or off-site.
- General purpose floor drains should be connected to a public sewer system or an on-site holding tank (not septic system) in accordance with state, county, and municipal requirements, unless a groundwater discharge permit has been obtained from the Michigan Department of Environmental Quality. General purpose floor drains discharging to the groundwater are prohibited.
- Sites at which hazardous substances, hazardous wastes, or potentially pollution materials are stored, used, or generated must be designed to prevent spills and discharges of such materials to the air, surface of the ground, groundwater, lakes, streams, rivers or wetlands.
- Secondary containment facilities should be provided for above ground storage of hazardous substances, hazardous wastes, or potentially polluting materials in accordance with state and federal requirements. Above ground secondary containment facilities should be designed and constructed so that potentially polluting material cannot escape from the unit by gravity through sewers, drains, or other means, directly or indirectly, into a sewer system or into the waters of the state (including groundwater).

Figure 20
Wellhead Capture Zone
Waterford Township



Source: Waterford Township.

Utilize overlay zoning

Beyond the site plan review standards, communities can utilize an overlay zone to protect a community's groundwater supply. An overly zone is a geographical area that is subject to special regulations. For groundwater protection, the geographic area of the zone is typically based on the wellhead zone of contribution 10-year time of travel. This allows for zoning regulations to be placed directly on the wellhead protection area at risk.

Source: Michigan Society of Planning. Zoning and Management Tools for Groundwater and Wellhead Protection.

Case Example

Groundwater Protection Program

Community: Waterford Township

Contact: Robert Vallina, (248) 674-6245

In April 1991, staff from the Planning, Engineering, and Public Works Departments developed a working outline of a groundwater protection program for Waterford Township. The multi-faceted approach is designed to link the recently adopted master plan with the day-to-day activities of these departments in the area of groundwater protection. The intent of Waterford Township is to reach across departmental jurisdictions to ensure a comprehensive and coordinated approach to groundwater protection. The program received statewide recognition in 1992 when the Michigan Society of Planning (MSP) designated Waterford Township as one of only eight "Groundwater Protection Community" award recipients in the state. The award is intended to highlight communities which have taken the lead in groundwater protection planning as well as to publicize the importance of the groundwater resource.

Waterford Township continues to implement of their groundwater program, including:

- adopting ordinance requirements that mandate all site plan applicants review and complete an environmental permits checklist,
- delineating most of their 15 community wells, five and 10-year capture zones (see Figure 20),
- utilizing geographic information systems to map existing and potential sources of contamination, and
- writing a wellhead protection plan.

Additional Resources

Center for Applied Environmental Research at the University of Michigan, Flint. www.flint.umich.edu/Departments/RegionalGroundwater/rgchome.html

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Habitat Protection and Restoration

Wayne County Elizabeth Park in Trenton.

Habitat is an increasingly important quality of life component for many Southeast Michigan communities. While previously viewed as an issue of preserving plants and animals, there is growing recognition about the value of habitat to humans. Preserving and restoring habitat has several benefits, including:

- recreational and aesthetic opportunities (e.g., birdwatching, wildlife hikes, fishing, and hunting are just a few of the many recreational activities that depend on the availability of wildlife),
- economic values for homes and businesses, and
- environmental protection and protection from flooding, resulting from increased storage and/or infiltration of storm water runoff.

However, these important functions are often lost as a result of land use practices that lead to elimination of natural areas, fragmentation, and degradation of the natural resource. The potential loss of habitat could be exacerbated by major land use and demographic changes occurring in developing areas of Southeast Michigan. SEMCOG forecasts that 390,000 additional acres will become urbanized by 2030.

Keeping it connected

Think broadly about your environmental ordinances such as those reducing storm water runoff and those protecting floodplains, steep slopes, woodlands, and wetlands. These areas can all work toward creating and maintaining both site and corridor open space areas which also serve to support habitat and provide recreational opportunities.

Planning and Regulatory Considerations

At the federal level, certain areas are protected under the Endangered Species Act of 1973 (ESA). Section 9 of the act prohibits the "taking" of an endangered species. Through various court cases, the U.S. Fish and Wildlife Service began to use a definition of "taking" of an endangered species to include any significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

These areas are also directly affected by the following state laws:

- Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act 1994 PA 451 (NREPA), as amended,
- Part 31, Water Resources Protection, of NREPA, and
- Part 301, Inland Lakes and Streams, of NREPA.

A detailed summary of these laws can be found in the Wetlands and Floodplain/Stream Corridor chapters.

Tools for Implementing Habitat Protection and Restoration

Local land use decision making is a vital element in protecting and maintaining habitat. There are numerous opportunities for local communities to incorporate habitat preservation and restoration into their planning and zoning process, including:

- Utilizing the master plan.
- Developing a natural areas plan.
- Utilizing regulatory approaches for habitat protection and restoration.
- Incorporating native landscaping.

Utilizing the master plan

If habitat is a valued community asset, it is necessary to include provisions for habitat protection and restoration in the master plan. Below are some suggested goals and policy statements for the master plan:

Goal

- To the maximum extent possible, preserve existing natural features and the systems that support them so that these ecosystems can continue.

Policies

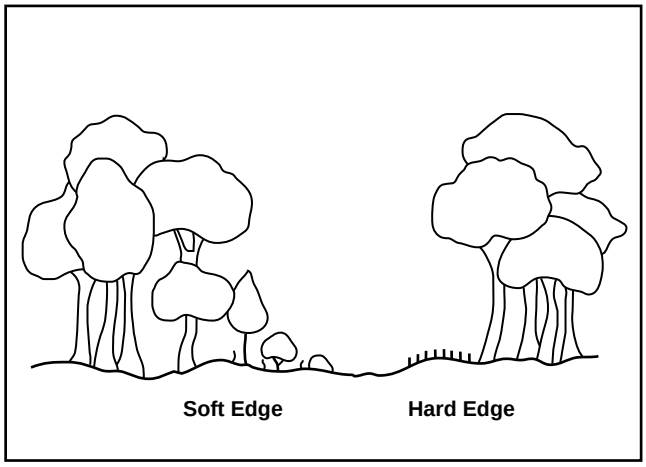
- The intensity of the land use should depend on the natural capability of the land to support the degree of development.
- Preserving/restoring of natural areas is essential to maintaining the community's unique heritage and character.
- Preserve patches of high-quality habitat, as large and circular as possible, feathered at the edges and connected by wildlife corridors. (Figure 21)

Source: Holly Township Master Plan, September 1998 and Ewing, *Best Management Practice*s, 1996.

Developing a natural areas plan

The purpose of a natural areas plan is to identify environmentally significant areas of the community that should be preserved in their natural state and those that can be compatibly integrated with development. Furthermore, the natural areas plan can work toward creating a system of open spaces that are linked to one another through naturally-occurring or human-made corridors. It can be included as a chapter of the master plan, or can be a stand-alone plan. If stand-alone, the natural features inventory and background data should be included as part of the plan.

Figure 21
Soft vs. Hard Edge for Habitat Areas



Habitat areas should be as large as possible and circular in nature to minimize edge effects. Edges result in increased competition from predator species and human disturbance. The edges themselves should be gradual and meandering rather than hard and straight. This provides better habitat for certain wildlife by reducing problems from predator species.

Source: American Planning Association Habitat Protection Planning, 1994.

L.W. Adam. *Urban Wildlife Habitats – A Landscaped Perspective.* Minneapolis: University of Minnesota Press, 1994, p.108.

The natural areas plan represents an ecosystem approach to open space planning because it helps preserve both the natural areas themselves, but also the functioning of the systems these areas represent. It is an "ecosystem" approach to land preservation, which takes into account not only the natural feature identified as significant, but also the other adjacent land elements that allow that natural feature to be sustained.

A natural areas plan can be developed using the following steps:

Combining the available data

Available natural features data are combined on a map that identifies important natural and human-made features. This data can include:

- **Natural feature inventories**. Any natural feature inventories conducted for parcels within the community, such as wetlands, woodlands, high quality wildlife habitat, etc.
- **Wetland riparian systems**. These data include rivers, streams, floodplains, lakes, and wetlands. These landscape features are important because, with their plant and animal communities, they filter out pollutants and protect water quality for all the organisms that use surface waters and protect the physical health of citizens through clean groundwater.
- **Upland landscape fabric**. These data include woodlands, tree rows, and severe slopes. These elements offer an opportunity for establishing a network of natural landscape corridors linking patches, and larger natural areas establishing habitat corridors. Linkages provide continuity between various areas of the landscape fabric, offering more and varied landscape types for wildlife.
- **Publicly owned properties and recreational lands**. All publicly owned recreational lands, including state, county, and locally owned parcels are identified.
- **Other corridors**. These data include human-made corridors such as natural beauty roads and utility corridors. Also included are existing and planned bicycle paths and trail systems.

Analyzing the data

Once the data are combined on a map, it is possible to see where several data elements overlap, signifying the environmentally important areas. Areas should be identified as "ecosystems," or combinations of natural features that impact one another.

Identifying connections

The next step is to connect the environmentally significant sites to create an interrelated network of natural areas. The connecting corridors, such as rivers, existing tree rows, natural beauty roads, and utility lines,

help preserve the natural functioning of these systems. If kept in their natural state, these corridors preserve the hydrologic connections between the river and its wetlands, between wetlands, and between adjacent uplands and wetlands. The corridors also provide spaces for wildlife to move between the natural areas and allow them to play their role in the functioning of the entire system.

Prioritizing areas and identifying protective tools

The last step in the process is to prioritize the natural areas based on their quality. This can be done by assessing the areas size, intactness (level of fragmentation), riparian corridor, upland/wetland connection, restorability, and known occurrence of rare plant communities or species. Some of this information, such as "restorability" and "rare plant communities or species" can be assessed on a case-by-case basis as land is being developed through the site plan review process.

As part of the Shiawassee & Huron Headwaters Resource Preservation Project — a partnership between Oakland County, six local communities, and other parties to protect the unique landscapes in western Oakland County — Michigan Natural Features Inventory (MNFI) developed a ranking system for evaluating natural areas. This enables the community to use objective information to prioritize areas for further inventorying or preservation efforts. Table 18 summarizes the ranking criteria developed by MNFI. For more information on MNFI, visit their Web sites www.msue.msu.edu/mnfi or contact them via e-mail at mnfi@msue.msu.edu.

Utilizing regulatory approaches for habitat protection and restoration

Enacting new zoning regulations or revising existing regulations is often one of the most effective ways to protect and restore important habitat areas. Following are specific areas in the zoning ordinance that can affect habitat preservation in the community:

Use restrictions

Often, the most dramatic way to protect habitat is to control the permitted uses on habitat and surrounding areas. Through its listing of uses by right, conditional uses, and the criteria for approval of conditional uses, a zoning ordinance can prevent traffic-intensive or people-intensive activities from occurring close to prime habitat areas.

Density restrictions

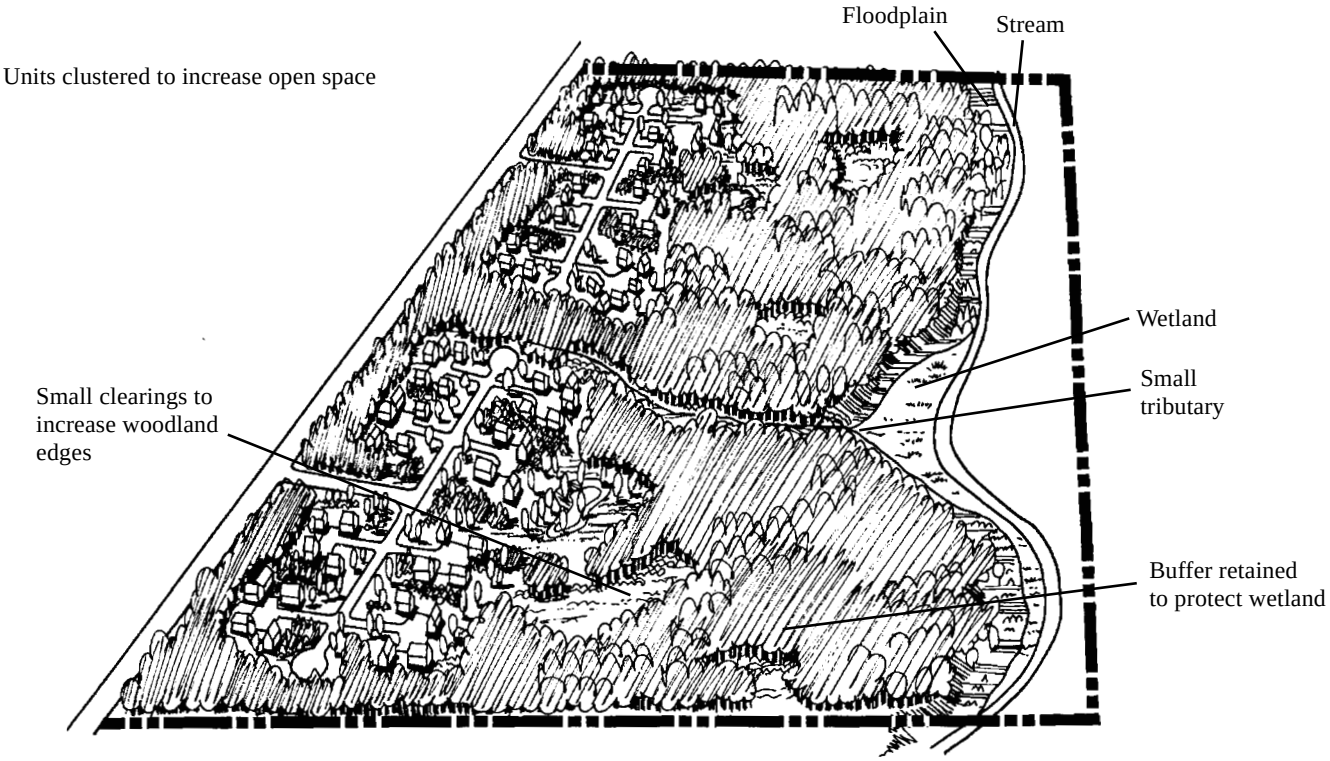
Another effective way to reduce impacts on habitat and the accompanying wildlife is to control the density of development in and around these areas. One alternative that allows development to occur while protecting habitat is to cluster houses in an area away from the sensitive habitat areas.

Table 18
Ranking Criteria of Natural Areas

Criterion	Detail	Points	Detail	Points	Detail	Points
Size	<40 acres	1	40-160 acres	2	>160 acres	3
Intactness	High level dispersed fragmentation	1	Low level dispersed fragmentation	2	Little or nondispersed fragmentation	3
Riparian corridor	No	0	Minor corridor	1	Major corridor	2
Upland/Wetland Connection	No	0	Yes	1		
Restorability	Low	0	Medium	1	High	2
Known rare community or species	No	0	1-2	1	3+	2

Source: Shiawassee & Huron Headwaters Resource Preservation Project, March 2000.

Figure 22
Utilizing Cluster Development for Habitat Protection



Source: SEMCOG.

Phasing development

In some cases, significant wildlife benefits can be gained by requiring new development to occur in phases, with the first development occurring far from the prime habitat areas. This would prevent a dramatic disruption of habitat and would allow animals unable to adjust to nearby development time to find alternative habitat areas.

Other zoning mechanisms

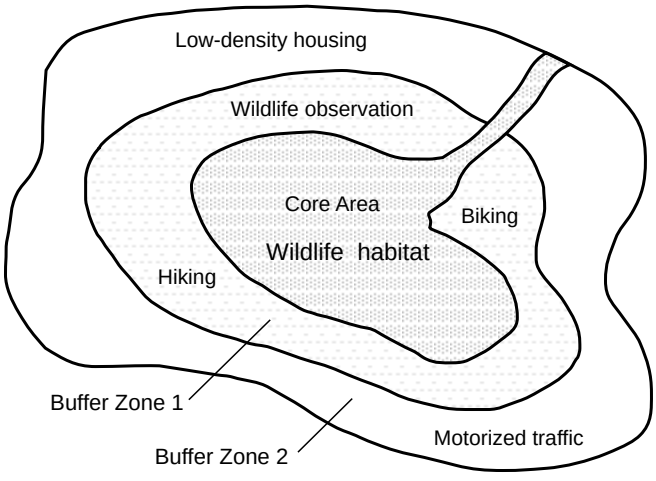
Tree, wetlands, floodplain, and corridor protection are all elements that should be incorporated in a habitat protection plan. To learn more about the zoning mechanisms available for each of these areas, see the corresponding chapters in this book.

Incorporating native landscaping

Using plant species that are native to the area and adapted to the particular climate and soil conditions has many benefits including reducing the need for water, pesticides, and fertilizers; providing habitat protection and restoration; and reducing the amount of storm water runoff.

Native plants are the trees, shrubs, flowers, grasses, and ferns that have evolved in a particular area, such

Figure 23
The Core/Buffer Concept



Buffers help protect core wildlife habitat areas. Consider two types of buffers. Buffer zone one is directly next to the core area is limited to wildlife observation, biking, and hiking. Buffer zone two could allow motorized traffic, but primarily include low-density housing.

Source: American Planning Association Habitat Protection Planning, 1994.

as Southeast Michigan, over thousands of years, and existed in the area before European settlement. Over this long period of time, these plants have adapted to the particular growing conditions present here, including temperature, rainfall, winds, soils, slopes, and fauna. A native plant community is a combination of different plant species that have evolved together, and share the same site conditions, including soils, climate and hydrology. An example of a plant community native to Southeast Michigan is an Oak-Hickory woodland, which occurs in upland areas on dry, well-drained soils, and where drought is a major habitat characteristic.

When selecting native plants for landscaping it is important to ensure that a variety of different species are used, and that the species planted are disease and pest resistant. Diversity in planting helps protect against large-scale decimation of landscaped areas, should a destructive disease or pest invade the area. When a community relies heavily on single plant species in its landscaping, the risk of losing plants to disease or pests is greater. One example of this is the large-scale replacement of elm trees with ash trees in Southeast Michigan. Since the 1930s, almost all of the elm trees in the northern United States have been killed by Dutch elm disease. Many of the elm trees in Southeast Michigan were replaced with ash trees, which are now being destroyed by the Asian emerald ash borer. The cost to local governments to remove and replace the ash trees on public land will likely run into the millions of dollars, at least some of which could have been avoided with more diversified landscaping techniques.

Local communities can modify ordinances and municipal procedures to accommodate native landscaping:

- Provide leadership by increasing the use of native landscaping on public properties.
- Provide information to residents and businesses on the benefits of habitat preservation and native landscaping.
- Develop a multi-year plan for retrofitting natural landscaping on existing sites.
- Develop policies and specifications for new site planning to encourage the use of natural landscaping.
- Include prohibited plant species, such as exotic invasive species, in the landscaping ordinance requirements.
- Review and amend or replace the local weed ordinance so that it encourages natural landscaping.
- Ensure that your storm water management program utilizes native landscaping in the design, to perform their vital functions of water quality protection, flood and storm water storage, runoff attenuation, shoreline and streambank protection, floral diversity and wildlife habitat, fishery and herpetile habitat, and community character and recreation.
- Retain the unique character and desirability of the community as a place to live, work, and play, maintaining and promoting the abundance of recreational opportunities. Preserve natural features, to the maximum extent possible, to protect residents' health, safety and welfare through protection of vital air, land and water resource quality, buffering air and noise pollution, moderate local climate, and preserve aesthetic value and the community's beauty.
- Utilize native plants to enhance and restore existing natural resources that have suffered degradation.

Case Example

Shiawassee & Huron Headwaters Resource Preservation Project

Contact: Larry Falardeau, (248) 858-5438

In March 2000, Oakland County Planning and Economic Development Services, along with White Lake Township, Milford Township, Village of Milford, Highland Township, Rose Township, and Springfield Township completed initial work on the Shiawassee & Huron Headwaters Resource Preservation Project. This partnership was formed to protect the unique landscapes in western Oakland County. There were three goals:

- to comprehensively identify and prioritize natural resources and ecosystems,
- to identify and develop implementation tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development, and
- to provide public information and education regarding the natural resource ecosystem.

In fulfilling goal two, the project:

- investigated current land use policies, master plans, and zoning ordinances,
- identified methods of acquiring and conserving natural resources, including land conservancies, easements, and homeowners associations,

- identified new and existing successful tools and techniques,
- developed model ordinance language, and
- explored the advantages of resource preservation for the benefit of property owners, developers, and the community.

As of this writing, many of the six communities are striving to incorporate the findings and recommendations of this project into their local plans and ordinances.

Shiawassee and Huron Headwaters Resource Preservation Project in northwest Oakland County.

Photo courtesy of Oakland County Planning and Economic Development Services.

Additional Resources

American Planning Association. *Habitat Protection Planning: Where the Wild Things Are*. Chicago, IL: American Planning Association, 1994.

Ewing, Reid. *Best Development Practices: Doing the Right Thing and Making Money at the Same Time*. Chicago, IL: American Planning Association, 1996.

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SEMCOG, the Southeast Michigan Council of Governments. *Headwaters: The Lifeline of a River*. Video. Detroit, MI: SEMCOG, the Southeast Michigan Council of Governments, 1995.

U.S. Environmental Protection Agency (native landscaping). www.epa.gov/greenacres

Wild Ones (native landscaping). www.for-wild.org

Floodplain and Stream Corridor Protection

Use of the land adjacent to a stream has a major impact in protecting water quality, avoiding flood damages, maintaining fish and wildlife habitat, and accessing water-related recreation. Also known as the floodplain, this area adjacent to the main stream channel serves as a natural reservoir for storing excess water during a flood. When the main stream channel cannot accommodate the level of runoff from precipitation or melting snow, the spreading of flood waters into the floodplain helps reduce the amount of damage incurred by flooding. The native vegetation found in this area also serve as a buffer to protect the stream from pollution and provide a rich diversity of habitat. In general, planning that includes floodplain and stream corridor protection can serve the multiple purposes of protecting water quality, protecting property, and enhancing community character.

Keeping It Connected

Open space, parks, and recreation areas are all naturally compatible with floodplains. Greenways are linear open spaces that are planned at the regional and local level. Greenways can accomplish many goals of floodplain management. Greenways:

- protect the natural functions of floodplains,
- minimize the potential for flood damage by limiting development,
- restrict development in environmentally sensitive areas, and
- provide residents with recreational opportunities.

Source: *Subdivision Design in Flood Hazard Areas*, 1997.

Maintaining native vegetation adjacent to the stream is one tool to protect water quailty, reduce erosion, and provide recreational opportunities.

Planning and Regulatory Considerations

Federal, state, and local governments all have roles in floodplain management. The federal government runs the National Flood Insurance Program. This program offers flood insurance coverage to property owners within those communities participating in the program. It is the only source of flood insurance. To participate, communities must adopt and enforce development regulations in flood-prone areas.

The State of Michigan's Floodplain Regulatory Authority (found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended), requires that a permit be obtained prior to any alteration or occupation of the 100-year floodplain of a river, stream, or drain. The floodplain is divided into two parts, the floodway which carries most of the flow during a flood event, and the floodplain which is an area of very slow moving water. The purpose of Part 31 is to assure that the flow-carrying capacity of a watercourse is not harmfully obstructed, and that the floodway is not used for residential construction.

The state also regulates inland lakes and streams through Part 301 of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended. This law prohibits numerous activities without a permit, including:

- creating, enlarging, or diminishing an inland lake or stream,
- structurally interfering with the natural flow of an inland lake or stream, or
- connecting any natural or artificially constructed waterway with an existing inland lake or stream.

The following sections detail what local communities can implement for floodplain and stream corridor protection.

Tools for Implementing Floodplain and Stream Corridor Protection

There are several tools local communities can utilize to protect the floodplain and stream corridor, including:

- Incorporating stream corridor protection into the master plan.

- Establishing a natural features setback or buffer ordinance.
- Implementing a resource protection overlay district.
- Protecting floodplains through regulations and site plan review.

Incorporating stream corridor protection into the master plan

Stream corridor protection can be regulated as either an overlay zone or as a separate classification or category in your ordinance. Whichever method your community pursues, it is important to include the buffer area on both the zoning map and future land use map. Amending the master plan and including the buffer designation on the future land use map is imperative to provide the legal foundation for your buffer zone. Master plan policies should indicate the importance of floodplain and stream corridor protection to:

- assist in flood control,
- protect the streambank from erosion,
- remove pollutants from storm water runoff,
- provide food and habitat for wildlife,
- prevent sediment from settling in the watercourse,
- provide habitat linkages for wildlife,
- provide tree canopy to shade and protect temperature of waterways, and
- promote scenic value and recreational opportunities.

Establishing a natural features setback or buffer ordinance

A natural features setback establishes a minimum setback from natural features to prevent physical harm or destruction of the feature. This ordinance recognizes the relationship that adjacent ecosystem types have to one another.

The natural features setback creates a naturally vegetated strip of land adjacent to the natural feature that is left intact during and after construction. The size of the vegetated strip is up to the community, but should be a minimum of 25 feet wide.

When establishing shoreline or buffer regulations consider the following:

- Establish a minimum setback (30-100 feet) for a vegetative buffer along a lakeshore or stream. The setback width should be based on such determinants as slope, soils, and drainage area.
- Provide ample setbacks for septic tanks and drainfields along shoreland areas.
- Expand the buffer to include adjacent sensitive features, such as steep slopes and wetlands.
- Restrict clearing of buffers.
- Establish setbacks for building structures.
- Include a system to permanently mark the buffer, both physically on-site and in the land records.
- Include reference to floodplain, soil, and sedimentation control administered by other agencies in shoreline regulations.
- Screen new structures with natural vegetation through the use of a viewshed ordinance.
- Limit height of buildings so they do not intrude on the natural bluff or treelines.
- Limit commercial or industrial uses and regulate through special use permits, subject to adopted standards.
- Reclaim old development sites (industrial and utility uses) along rivers and streams to create a mix of residential development and parkland and public open space.
- Control visual impacts from public access sites (e.g., set parking areas back from the lake or river and disperse access sites along the shoreline).
- Limit the number and size of signs visible from the stream or lake.
- Promote intergovernmental coordination of regulations among communities along lake shorelines and river corridors.
- Include maintenance guidelines and enforcement procedures for buffer violations.

A strong buffer ordinance is only the first step to preserving stream buffers. In addition, communities will need an effective buffer program to manage buffers and enforce buffer regulations. During the construction phase, communities need to ensure that the clearing and grading permit is well integrated with the forest buffer application. After construction, programs that educate citizens about the importance of the buffer and how to manage it can help preserve the buffer's integrity.

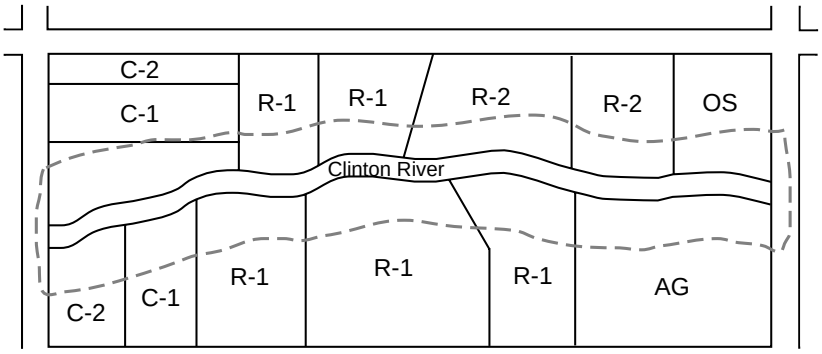
Source: Grand Traverse Bay Region Sample Regulations and the Center for Watershed Protection.

Another effective way to protect corridors of lakes and streams is through public acquisition. There are various land acquisition tools and techniques available to local governments. (See chapter on Public Open Space for more information.)

Implementing a resource protection overlay district

Overlay districts are one approach to applying special restrictions to areas with unique conditions. Properties included within these districts retain their underlying zoning classification, but are subject to additional requirements specified in the overlay district ordinance. In preparing an overlay district, it is first necessary to identify the geographic limits of the areas to be included.

Figure 24
River Protection Overlay Zone



Overlay zoning can be used to protect the environmental quality of a river. In this example, an overlay zone was created with boundaries extending 100 feet from the river's edge. Although the underlying zoning designations of the parcels vary, the community can impose additional requirements on properties within the overlay zone. Such provisions may include increased setbacks from the river, additional storm water management controls, or additional landscaping to reduce erosion.

Source: Macomb County Planning and Economic Development.

This involves clearly stating the purpose for creating a district as well as reflecting established local preservation policies. Adopting a resource protection overlay district accomplishes three objectives:

- It requires all parcels within the district to be inventoried, although this may be done one parcel at a time. Potential development of the site is what generally triggers the required inventory.
- It alerts a developer of the site's potentially significant resources and that it would be subject to special restrictions.
- It allows the community to identify those priority protection areas on a site that a developer must refrain from developing or develop with minimal site disturbance.

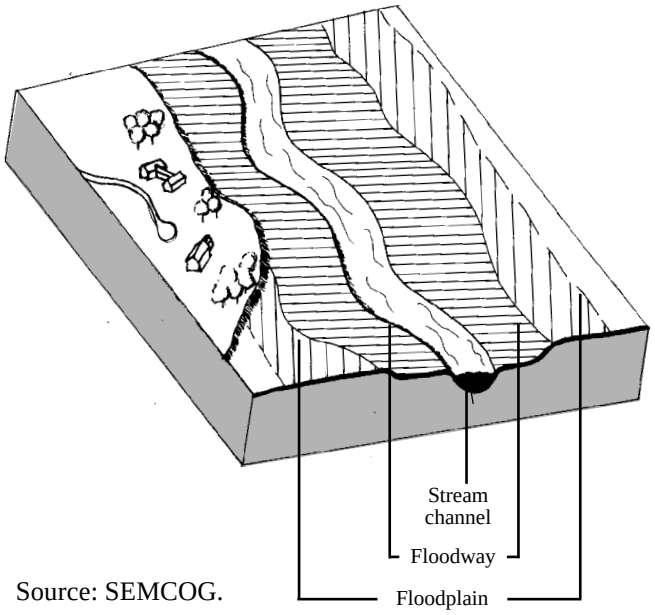
With an overlay zone, sites will get inventoried either lot by lot, or through a comprehensive survey initiated by the community. In the inventory process, it is important to determine the full ecological significance of a parcel in relationship to its surroundings. If a lot-by-lot inventory process is adopted, it is better to have sites prioritized for inventory, so as money is made available for a full ecological field study, priorities will have been established and permission granted by property owners for site access.

Protecting floodplains through regulations and site plan review

Floodplains can be controlled by local ordinance and subjected to local site plan review procedures. Local regulation of floodplains can be part of the zoning ordinance and subdivision regulations or can be a separate floodplain protection ordinance. Provisions should include:

- Prohibit construction of buildings and facilities subject to water damage in the 100-year floodplain.
- Require flood-proofing measures on redevelopment or expansion proposals for buildings presently in the floodplain.
- Remove flood-prone structures from the floodway portion of the floodplain.
- Establish construction standards for development in the floodplain.
- Adopt provisions to protect natural vegetative cover in the floodplain.
- Require tree and shrub planting in floodplains to prevent erosion.
- Restrict dredging, filling, dumping, or backfilling of floodplain areas.
- Avoid land divisions within floodplain areas that will create parcels or lots that cannot be used.
- Require that flood insurance be obtained for all facilities existing in the floodplain under the National Flood Insurance Program.

Figure 25
River Floodplain Components



Source: SEMCOG.

Floodplain management can help reduce the problems associated with flooding.

Other regulatory considerations are:

- Require that proposed new structures or modifications to existing structures be subject to special land use approval by the local planning commission.
- Create an overlay zone within a prescribed setback from the river, stream, or creek that regulates development and use of the floodplain based on the severity of flooding hazard.
- Require that before local approval can be granted, a permit must be secured from the Michigan Department of Environmental Quality.

Two nationally recognized building codes, BOCA (Building Officials & Code Administrators) and UBC (Uniform Building Code), have regulations concerning construction in the floodplain and are commonly used by local governments.

As part of regulating floodplains, these areas should be mapped to show the extent of the 100-year floodplain (those areas that have a one percent chance of flooding in any given year). There are various sources to help determine floodplain boundaries, including the Federal Emergency Management Agency flood insurance studies and maps. There are also county soil inventories prepared by the Natural Resource Conservation Service.

An important element in a complete floodplain management strategy is establishing intergovernmental cooperation. Cooperation among communities along the floodplain is vital to ensure consistent application of regulations and to avoid one government transporting flooding problems to another. Review by the county drain commissioner's office may help ensure that upstream and downstream areas are not adversely affected. Working with the federal and state agencies, local officials will ensure that proposed development and use in floodplains meets all requirements of federal and state laws and regulations.

Case Example

Floodplain, Floodway, Watercourse, and Wetland Protection – Chapter 12 of the Charter Code of Ordinances

Community: West Bloomfield Township

Contact: Anne Vaara, (248) 451-4876

The township has comprehensive regulations for the protection of floodplains, floodways, watercourses, and wetlands. Article IV of the ordinance specifically provides for flooding and flood hazard protection. The ordinance states that it shall be unlawful to locate the following improvements or structures within the 100-year floodplain: public and private structures for the purpose of assembly, new residential structures unless the lowest floor is elevated at least one foot above the 100-year floodplain, and mobile homes. A permit is required to:

- alter the topography on lands in a floodplain,
- allow to remain or make alterations to any operation, obstruction, or structure within the floodway or 100-year floodplain.

No permit is required for cultivating and harvesting crops, grazing pasture, forestry, outdoor plant nurseries, orchards, wildlife sanctuaries, woodland preserves, and recreation uses (parks, day camps, picnic areas, or golf courses).

Natural Rivers District and Davis Creek Overlay District, Zoning Ordinance

Community: Green Oak Township

Contact: Lesa Brookins, (810) 231-1333 ext. 104

The township has developed a natural rivers district to preserve and enhance the recreational, ecological, and aesthetic values of a natural river area for future generations. In addition, the township has developed a Davis Creek overlay district to meet many of the same goals. Specific standards found in these districts include:

- requiring a minimum setback for new buildings of 125 feet from the ordinary high water mark,
- prohibiting cutting and/or filling for building on the floodplain and filling for buildings on the upland within 500 feet of the river's edge where the groundwater table is within six feet of the surface,
- preserving a natural vegetation strip adjacent to the river on all private and publicly owned land,
- restricting placement of septic system drain fields to 150 feet from the river, and
- prohibiting use of pesticides, herbicides, and fertilizers.

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Wetlands Protection

Protection of wetlands help prevent costly pollution, flooding, and erosion problems. In addition, wetlands provide many benefits, including water quality improvements, food and habitat for fish and wildlife, flood control, shoreline erosion control, and recreation. However, with the increased growth forecasted for Southeast Michigan, wetlands and the benefits they provide are threatened.

The *Water Quality Management Plan for Southeast Michigan* recognizes both the important functions of wetlands and the threats to these resources. It also emphasizes providing opportunities for preventing degradation of resources using sustainable practices. Wetland protection is a prime example of this type of pollution prevention.

Keeping it connected

It's important that wetland protection is not done in a vacuum. Have you considered linking goals in your master plan for wetland protection with other environmental protection goals, such as storm water management and providing buffers along wetlands?

To take this further, consider connecting in your plans community buffers around natural features with walkability, aesthetic, and other quality of life goals for the community.

Planning and Regulatory Considerations

In 1979, the Michigan legislature passed the Goemare-Anderson Wetlands Protection Act, which is now Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act 1994 PA 451 (NREPA), as amended. The Michigan Department of Environmental Quality (MDEQ) has adopted administrative rules which provide clarification and guidance on interpreting Part 303. This law states that MDEQ has jurisdiction over wetlands of five acres or more and of wetlands within 500 feet or contiguous to a lake or stream.

In 1984, Michigan received authorization from the federal government to administer Section 404 of the Clean Water Act in most areas of the state. Whereas in other states, an applicant must apply to the U.S. Army Corps of Engineers and a state agency for wetland permits, applicants in Michigan generally submit only one wetland permit application to the MDEQ.

Constructed wetland located in Inkster.

The U.S. Army Corps of Engineers retains federal jurisdiction over traditionally navigable waters including the Great Lakes, connecting channels, and other waters connected to the Great Lakes where navigational conditions are maintained.

While the state has jurisdiction over vast wetland areas, many smaller wetlands can only be protected through local action. Part 303 authorizes municipalities to regulate wetlands as long as they use the same wetland definition, regulatory standards (local governments can still regulate wetlands smaller than five acres), and application process as the state.

Tools for implementing wetlands protection

A variety of tools are available for a community interested in wetland protection. Although many environmental ordinances can have a protective wetland component, the most applicable tools that a community has for protecting wetlands are:

- Utilizing the master plan.
- Developing a wetland ordinance and inventory.

Utilizing the master plan

Because the master plan sets forth goals and policies to guide future land use and development of the community, it is important to articulate goals that will preserve wetlands. These goals are typically general in nature and could include maintaining the community's existing wetland resources, enhancing or restoring degraded wetlands, and allowing for development that respects the land's ability to support it.

After developing wetland protection goals, wetland protection policies based on these goals should be written. Often, these policies can be written to incorporate

various types of natural features protection. Examples of key policies to include in the master plan include:

- A primary determinant in any land use and development decision will be the natural capability of the land and physical support systems.
- Planning decisions shall recognize the interdependence of natural resource features and other community priorities (e.g., strong economy, safety). It is the intent of this plan to ensure the sustainability of ecosystems by preserving systems of open space, while maintaining other community priorities. Such an open space system may be any combination of natural features such as uplands, grasslands, streams, woodlands, water bodies, and wetlands.
- Encourage use of native species of vegetation in wetland restoration and other landscaping.

Another way to support natural resource preservation is to include areas of particular sensitivity on a map in the master plan. This should identify specific areas that the communities want to preserve. Two mechanisms are creating a separate land use category (e.g., resource conservation/residential) and creating a resource conservation overlay district. Both methods can promote preservation of natural systems while allowing low intensity land uses. These designations can also promote innovative development techniques such as open space development, which preserve natural resources while allowing reasonable use of the land. (Source: Wetland Stewardship for Local Governments, Clinton River Watershed Council.)

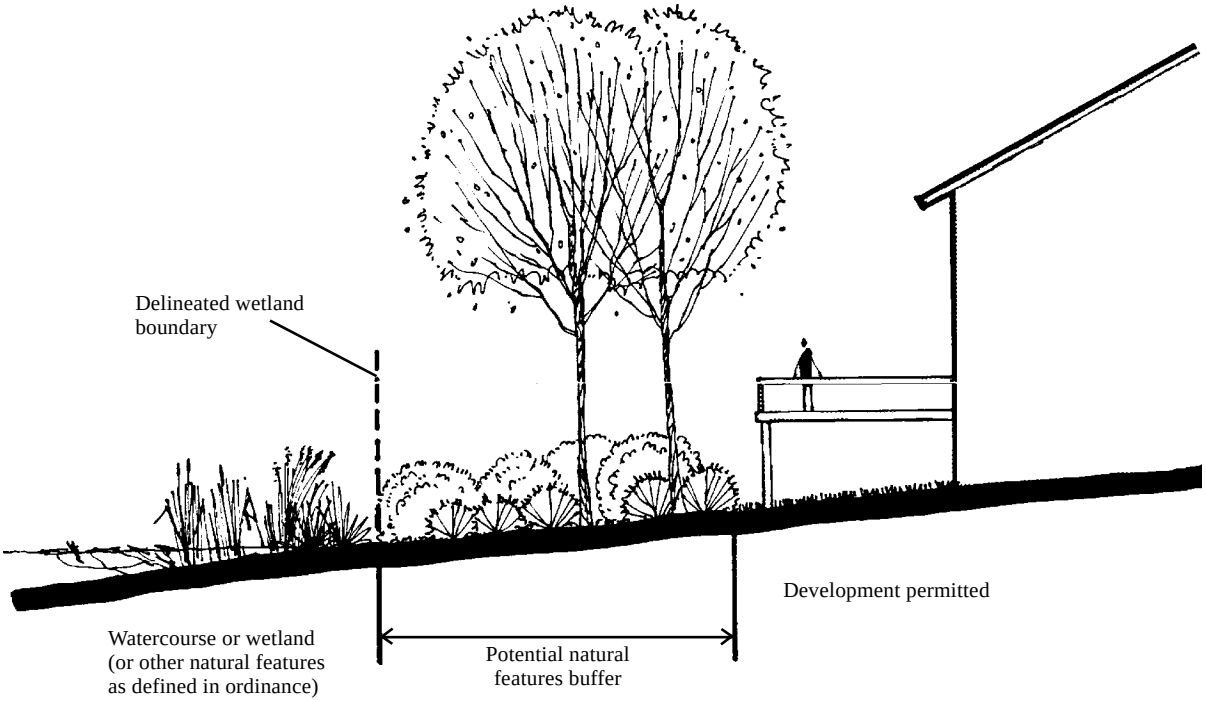
Developing a wetland ordinance and inventory

Although state and federal laws protect many Southeast Michigan wetlands, local communities can build on these laws and provide protection for smaller or isolated wetlands that would otherwise be threatened by development. These smaller wetlands are placed into two categories: wetlands less than five acres but at least two acres in size and wetlands under two acres in size. (Note that state law applies special standards for determining if wetlands less than two acres are essential to preserving of natural resources in the community.)

Components of a wetlands ordinance

Statement of wetland protection goals. As with any ordinance, a list of goals for wetland protection should be stated at the beginning of the ordinance to set the stage for the rules that follow. Ties between wetland protection and protecting citizen health, safety, and general welfare should also be made by stating the values that wetlands bring each community and the problems that can arise if wetlands are not properly protected.

Figure 26
Wetland Protection and Regulations:
Natural Features Buffer



Source: Planning and Zoning Center, Inc.

Definition of wetland. Part 303 of NREPA requires that local governments use the same definition as state statute. State law defines a wetland as "land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly known as a bog, swamp, or marsh." (Part 303, Wetland Protection, of the Natural Resources and Environmental Protection Act.)

A wetland inventory map. Another requirement of communities that adopt wetland ordinances is to create a wetlands map that inventories wetlands throughout the community. This map, in conjunction with aerial photographs and field inventories on a case-by-case basis, is used to administer the wetland ordinance. Many communities utilize existing resources when developing wetland maps.

Following is a list of existing sources:

- Natural Resource Conservation Service soil surveys indicating hydric soils.
- U.S. Fish and Wildlife Service national wetlands inventory maps.
- SEMCOG's land use map showing wetlands. (Although readily available, this information is generalized and should not be used as a map showing exact locations of wetlands).

Some communities choose to make their wetlands map by using these three maps and digitally entering them into a geographical information system (GIS). Using GIS, the maps are overlapped and where two or more of these sources overlap there is high likelihood that a wetland exists. This new map is then used by the community as their wetland map. Other options include hiring a consultant to map your wetlands based on such sources as color infrared aerial photographs and field identifications.

On the map itself, the local community should note that this map shows approximate location of wetlands and were not delineated in the field. Therefore, there may or may not be a wetland on the property, but it is used as an indicator that a wetland assessment should be done on the property prior to alteration of land.

A list of prohibited and permitted uses. Michigan law distinguishes between exempted uses (uses that do not require a permit) and activities that need a permit. There are certain uses that can occur in a protected wetland that do not require a permit. The local ordinance may not require a permit for those uses that are allowed under state law. The law allows farming, fishing, hunting, trapping, boating, installation of seasonal docks, rafts, hiking, bird-watching, and similar recreational activities that do not alter the wetland. It also allows grazing of animals; most lumbering activities; maintenance, operation, and improvement of drains; drainage necessary for agriculture; and road or street maintenance.

Uses that require a permit include depositing fill material in a wetland; dredging or removing soil or minerals from a wetland; constructing, operating, or maintaining any use or development in a wetland; and draining surface water from a wetland.

Permit application, review, and administration. With the decision to develop a wetlands ordinance, comes the responsibility for implementing and enforcing of the ordinance. Following are the steps the community should undertake in reviewing wetlands permits:

- The applicant submits a wetland application (utilizing a form provided by MDEQ) directly to the local government.
- The local government forwards a copy of the application to MDEQ, who will begin their review process, depending on the wetland in question.
- The local government reviews the application and must approve or deny the application within 90 days. If the permit is denied, the local government must provide a written statement giving the rationale for denial.

Also, with a wetland permit application, it is important that a qualified professional complete a wetland delineation on the wetland in question. A community can make this step the applicant's responsibility, or they can hire a wetland consultant and charge the applicant as part of the wetland permit fee schedule.

A section on penalties. Most ordinances include penalties for violations of the wetlands ordinance. Penalties can include fines and/or a requirement that the affected wetland area be restored or mitigated in some way. Minimum and maximum fine amounts should be considered.

Lastly, enforcement is the key to wetland protection. Field inspections should be made by those enforcing the ordinance to ensure wetlands are properly protected during construction.

Source: Wetland Stewardship for Local Governments, Clinton River Watershed Council.

Case Example

Natural Features Advisory Committee and Wetland and Watercourse Protection and Restoration Ordinance

Community: Ann Arbor Township

Contact: Diane O'Connell, (734) 462-4400 ext. 5238

The Ann Arbor Township Board of Trustees established the Natural Features Advisory Committee in 1997. This committee develops of long-term policies and strategies for protecting natural features such as wetlands, woodlands, streams, farmland, and open spaces. The committee develops and recommends to the township board, ordinances and regulations that protect of natural features. The committee also promotes the importance of and methods for preservation of natural features by designing and implementing educational initiatives for township residents.

In 1998, the township board approved the wetland and watercourse protection and restoration ordinance. The ordinance was the product of more than 12 months of study and design effort by the Natural Features Committee. This included mapping township wetlands, extensive community education, and public hearings on the importance of wetlands and watercourse protection to the quality of life in Ann Arbor Township. This ordinance has become an important factor when development is proposed on lands with wetlands or watercourses, and has led to substantial improvements in wetland protection.

Novi wetland replacement project.

Other communities in Southeast Michigan with wetland ordinances are Addison Township, Ann Arbor, Auburn Hills, Bloomfield Township, Brighton Township, Franklin, Genoa Township, Grosse Ile Township, Hamburg Township, Independence Township, LaSalle Township, Milford Township, Novi, Oakland Township, Orchard Lake, Orion Township, Oxford Township, Pinckney, Rochester Hills, Salem Township, Scio Township, Southfield, Superior Township, Waterford Township, West Bloomfield Township, White Lake Township, and Wixom.

Source: Michigan Department of Environmental Quality, October 2001.

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Protecting Woodlands

Woodlands are an important natural resource, providing an enriched environment for people, animals, and plants. Benefits include:

- providing recreational and aesthetic opportunities,
- providing protection from flooding and high winds,
- stabilizing slopes and river banks,
- acting as a barrier to reduce noise,
- reducing erosion and sedimentation,
- filtering water percolating through the ground, and
- acting as a traffic calming device.

The *Water Quality Management Plan for Southeast Michigan* notes the importance of preserving woodlands as habitat as part of good watershed management. The Plan encourages communities to strive for a balance between protecting habitat and changing land use patterns, leading to a more sustainable region.

Keeping it connected

Woodlands offer numerous opportunities to communities, but one not so obvious is erosion protection. In agricultural areas, woodlands and hedge rows provide windbreaks that protect fields from wind erosion. They control soil erosion by reducing wind speed at ground level and by trapping snow, leaving soil less exposed during the winter months. Woodlands also prevent water erosion by stabilizing soils with its roots and capturing eroded soil as it passes through a woodland.

Planning and Regulatory Considerations

Indirectly, oversight of woodlands can be effected by the federal Endangered Species Act of 1973 (ESA). If a threatened or endangered species is located within a woodland area, this could result in limited disturbance and additional regulations. Also, some area woodlands could also be regulated if they are located within a state or locally regulated wetland area.

State and federal laws protecting area woodlands are limited. Thus, local planning and action is imperative for those desirous of protecting wetlands. The following section provides details on regulations and standards local communities can adopt to protect woodlands.

Tools for Protecting Woodlands

Numerous tools exist for local communities to protect their area woodlands. This section discusses:

- Utilizing the master plan and recreation plan.
- Adopting tree/woodland regulations.

Utilizing the master plan and recreation plan

The purposes of local woodland protection should be clearly identified in the master plan and recreation plan. Typical purposes include:

- preserving woodlands (and wooded wetland),
- protecting open space,
- preserving aesthetic/community character,
- replacing dead or diseased trees,
- maintaining natural green landscape,
- protecting wildlife habitat,
- component of storm water management, and
- noise buffering.

Adopting tree/woodland regulations

Tree/woodland preservation ordinances acknowledge that trees are an important community resource for both environmental and aesthetic reasons. Trees in wetlands and around other water bodies play an important role of taking up large amounts of water, thus aiding in flood control and nutrient absorption.

The goal of tree and woodlands preservation ordinances is to encourage creative design and construction techniques that will preserve as many trees, both as individuals and as woodland areas, as possible. This tool sets up a permit process if taking trees is unavoidable, a replacement scheme, a permit fee schedule,

Holliday Forest and Wildlife Preserve in Canton Township.

Consider preserving landmark trees as part of woodland regulations. Above is a landmark Bebb Oak in Rochester Hills.

and penalties for illegally removing trees. It also identifies specific sizes for "Landmark Trees," which are particularly large trees for the given species.

Guidelines for developing tree/woodland ordinances

Conduct an assessment of the community's tree and woodland resources. This can be accomplished as a community project, or as properties are developed. The assessment should note the type and location of plant communities, including tree species and sizes, the presence of any unique ecosystems, and the location of large "landmark" trees.

Establish priorities for preservation. Once the assessment is completed, areas with significant trees or woodlands can be prioritized for preservation.

Set goals for tree and woodland preservation. This should address the different types of resources (such as woodland trees and understory plants, tree rows, landmark trees) that the community wants to preserve. Goals could include a maintenance program for existing trees, reducing tree loss during and after development, and providing for replacement trees.

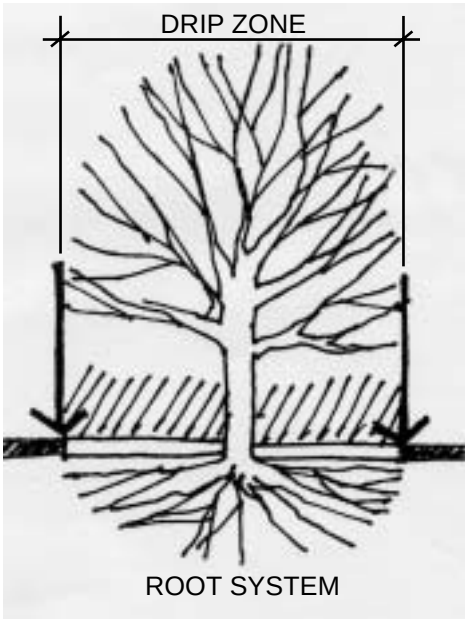
Provide pre-construction, on-site monitoring, and post-construction maintenance. Ordinance requirements for pre-construction meetings to discuss tree protection, and on-site monitoring during construction ensure that existing trees are protected as planned. Post-construction monitoring also ensures that trees impacted by construction receive the appropriate care.

Enforcement. The ordinance should include an enforcement process with penalties for violations.

In addition, many woodland/tree regulations require:

- A permit before the removal or impact to any woody vegetation exceeding a specified trunk diameter (size varies, depending on the ordinance).
- A site inventory of trees greater than six inches in diameter, stating size, species, and location.
- A specific percentage of trees greater than a specified size in diameter be left intact on a parcel when development occurs (e.g., 50-90 percent). The portion of trees to be preserved is applied outside the building envelope.
- Minimum spacing or density requirements for on-site vegetation.
- Replacement guidelines to mitigate unavoidable loss of trees.
- Tree replacement list that includes native species of trees.
- Natural planting plans where appropriate.

Figure 27
Protecting Trees During Construction



It is important during construction to protect both the tree and the trees drip zone from construction activity. Typically, the drip zone is the area around the base of the tree that lies within the circumference of the crown and contains the majority of the trees root system. Damage to the root system, or compacting the soil above the roots, can lead to stunted tree growth or even loss of the tree. Ideally, there should be no disturbance within the drip zone. This means no grading, digging, trenching, paving, or operating/parking heavy equipment and vehicles on the area. In order to protect trees during construction, consider requiring fencing around the drip zone.

Source: Oakland County Planning and Economic Development Services.

- Guidelines to encourage structures to blend with the natural setting of a woodlot.
- More stringent tree protection standards on sites with severe design limitations, such as steep slopes and highly erodible soils.
- Tree preservation areas (e.g., 35 feet in width) be established along front and side lot lines.
- Standards for specimen trees and/or landmark trees that are not allowed to be moved or transplanted. Landmark trees are those trees of significant size, depending on species, that stand out from other trees in the woodlot in form and size.
- Measures on construction sites to protect trees that are designated for preservation (e.g., protecting root systems from compaction or grading too close).
- Placing of guard fences prior to construction to protect remaining trees.
- Protecting the root zone of trees from stockpiling of soil, building supplies, or paints and other chemicals.
- Controlling placement of parking to protect tree root systems from inadequate water due to paved surfaces.
- Prohibiting changes in soil elevation within the dripline of trees that are not permitted to be moved.

Source: "Woodland Protection." *Community Planning Handbook*. pp. VIII-55-VIII-58.

CASE EXAMPLE

Tree Protection Ordinance, Ordinance No. 60

Community: Oakland Township

Contact: Mary Collins, (248) 651-4440

The township is a comprehensive tree protection ordinance containing 18 articles which clearly state the purpose and requirements for removing, altering, relocating or replacing trees in the township on parcels of 25 acres or greater. The ordinance prohibits destroying, removing or transplanting any tree having a six inch or greater diameter at breast height (dbh) or any conifer greater than 25 feet in height, without obtaining a permit from the township. Historical trees or large trees of 36 inches or greater dbh are also protected.

The ordinance requires that any development subject to a tree removal permit must preserve a minimum of 40 percent of the total number of protected trees, except those trees within the designated building envelope or drainage retention area. The ordinance has minimum requirements for replacing both deciduous and coniferous trees and provides a list of tree species that can be used to replace trees that have been removed.

The ordinance also addresses tree harvesting, tree management, and tree removal related to agricultural use.

Natural Features Guidelines

Community: City of Ann Arbor

Contact: Karen Popek Hart, (734) 994-2800

The city adopted additional provisions to its Subdivision and Land Use Control Ordinance called "Land Development Regulations" (LDR). The purpose of the LDR is to specify the procedures by which land developers can obtain approval of proposed developments and to specify certain materials which must be prepared and submitted to assist the city in determining if the proposed development is in compliance with local ordinance and state and federal statutes. The regulations also include "Natural Features Guidelines."

These guidelines encourage the continued existence of natural features by providing direction for protecting, managing, identifying, and using watercourses, wetlands, woodlands, hedgerows, landmark trees, and steep slopes.

Additional Resources

Center for Watershed Protection. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. 1998.

Oakland Township Woodlands Ordinance. 1990.

Planning and Zoning Center, Inc. "Tree Protection Regulations." *Grand Traverse Bay Region Sample Regulations*. September 1992.

Planning and Zoning Center, Inc. "Woodland Protection." *Community Planning Handbook: Tools and Techniques for Guiding Community Change*. Michigan Society of Planning Officials. 1991.

Enhancing Transportation

Creating Walkable and Bikeable Communities

Creating Elderly Mobility and Safety

Planning for Transit-Oriented Development

Development Along Transportation Corridors

Implementing Safety Management

Providing for Transportation Infrastructure

Creating Walkable and Bikeable Communities

Local governments realize the importance of providing for safe pedestrian and bicycle movements within their community. They understand that all trips have a nonmotorized component. These nonmotorized trips may be as short as a walk from a parked vehicle into a store or a bike ride from one's home to the neighborhood dry cleaner. Whether the trip is on foot or on a bike, all require individuals to travel along streets and sidewalks, often within close proximity to vehicles on roads.

A walkable and bikeable community provides facilities and amenities to encourage safe pedestrian and bicycle trips. These amenities range from the most basic — providing walkways and bicycle facilities — to redesigning neighborhoods and corridors to encourage and accommodate short-distance journeys using these alternative modes of travel. Typically the focus of transportation considerations in the land-use planning process has been on automobile needs (e.g., parking). Becoming a walkable and bikeable community requires a more balanced approach to transportation planning.

As a result, developing and maintaining a walkable and bikeable community requires careful integration of a community's land-use planning and policies. The benefits of providing safe, viable, and enjoyable walkways and bikeways are important to a community's quality of life, and can positively impact mobility, travel safety, recreation options, and vehicle travel time. These benefits create opportunities for improved health, and may also reduce air and noise pollution, decrease wear and tear on roads, and reduce congestion.

Keeping It Connected

Planning for walkable/bikeable communities has many issues common with other topics covered in this report including transit oriented design, safety management, and elderly mobility.

Planning and Regulatory Considerations

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and its successor, the Transportation Equity Act for the 21st Century (TEA-21) of 1998 identify nonmotorized transportation issues as important elements of an integrated, intermodal transportation system that provides travelers with alternatives.

Birmingham provides a pedestrian-friendly community by implementing signage for increased safety and walkability.

The Michigan State Long-Range Transportation Plan reflects the intent of ISTEA and TEA-21 by including creation and maintenance of on-road and off-road nonmotorized facilities as part of its transportation goals and objectives.

The 2025 Regional Transportation Plan for Southeast Michigan, developed by SEMCOG, recommends an increase in the "development and use of nonmotorized facilities.

Local master plans, zoning ordinances, capital improvement plans, subdivision regulations, and other local planning practices are used to support and regulate walking and bicycle friendly development.

See Tables 23 and 24 for information on federal and state funds available for walkable and bikeable development.

Tools for Walkable and Bikeable Communities

There are many tools and techniques available for creating and/or enhancing a walkable and bikeable community.

Success of these tools relys on proper application. Careful consideration must be given to both intended and unintended impacts of applying a tool. No one tool works in every situation – even if the scenarios appear similar. An integrated approach should be used that considers such things as landuse, area residents' and business operator's concerns, travel patterns on area streets and sidewalks (i.e., not just the facilities that will receive the application), and the interrelationship between land use and transportation planning. Creating or improving the

safety, continuity, and connectivity for motorists, pedestrians, transit users, and bicyclists is key.

Typical concerns that arise when these treatments are proposed may revolve around liability issues, emergency response times, and road maintenance. Often the objections result from a lack of familiarity with the successful application of these planning practices. Communities that have been successful in applying these techniques are those who actively involve all of the key stakeholders, such as residents, elected officials, emergency personnel (police, fire, etc.), merchants, maintenance personnel (e.g., snow removal), engineers, and planners in the process.

This chapter describes the following tools that can help achieve a walkable, bikeable community:

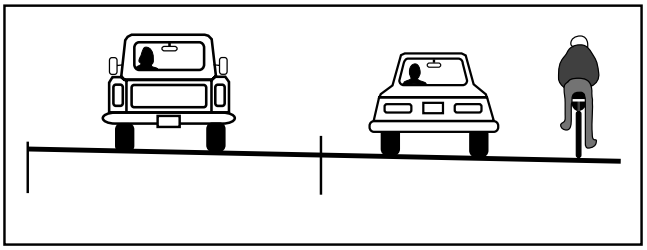
- Utilize pedestrian and bicycle friendly land use design.
- Street network design.
- Federal and state resources for walkable and bikeable development.

Utilize pedestrian and bicycle friendly land use design

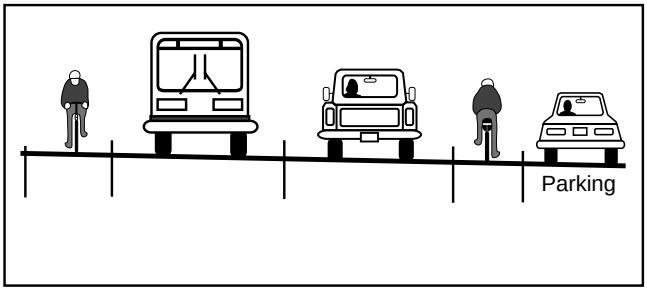
Pedestrian and bicycle friendly land use design requires equal treatment of different modes of travel, creates integrated land use, and provides convenient, safe, and direct travel routes. Pedestrians and bicyclists travel without protection from the elements, and at much slower speeds, shorter distances, and are more vulnerable to crashes than motorists. This makes their transportation facility needs much different from automobile travelers. However, many transportation systems have been designed with an almost singular focus on automobile travel where distances are less relevant and safety is measured from an automobile, not a nonmotorized perspective. Making land use design pedestrian and bicycle friendly therefore requires a rethinking of how communities are built or rebuilt so that it accommodates more than one mode of travel.

Many of the land use/transportation techniques described here can be found in older cities and villages built in the first half of the 20th century. During that time most communities carefully considered the location of homes, shops, schools, offices, industries, and services. This was out of necessity as nonmotorized trip making played a much bigger role than it does now. Developing communities can learn from these older communities by integrating walkable and bikeable elements in land use and transportation planning. In established communities, many of the goals of a walkable and bikeable community can be met by carefully developing certain parcels which were previously undeveloped and incorporating walkable and bikeable components in redevelopment projects.

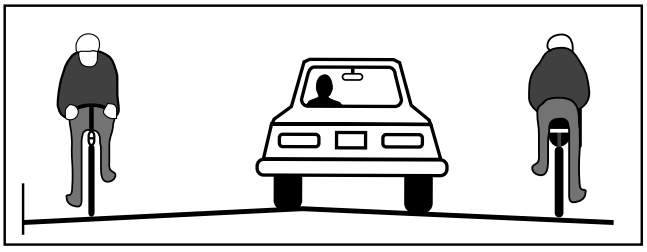
Figure 28
Bicycle Lane Options



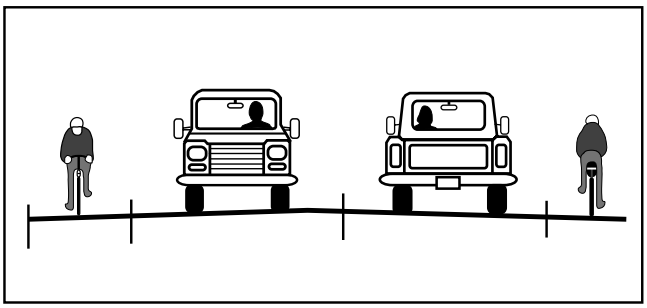
Wide lane.



Bike lane next to parking lane.



Wide shoulder.



Wide shoulder.

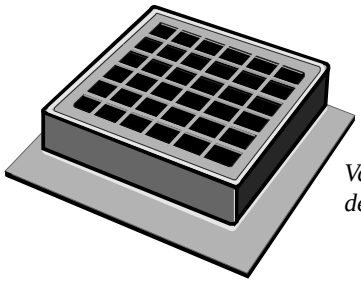
Source: National Center for Bicycling and Walking.

Table 19
Bicycle Friendly Street Network and Design Tools and Techniques

Tools and Techniques	Effect
Create bicycle facilities on-road and off-road. These include bicycle lanes, separate side paths, wide outside lanes, and paved shoulders. (See Figure 28)	Creates safe travel ways for bicyclists.
Design local streets so that they form connected patterns.	Makes it easier for bicyclists to take direct routes to destinations.
Use traffic calming and access management techniques (discussed in following sections).	Slows speeds and increases safety.
Work closely with state and county road agencies.	Creates consistent bikeways.
Provide bicycle safe drainage grates and rail road crossings.	Prevents wheels getting caught and reduces risks of crashes.
Use traffic signals that respond to bicyclists (e.g., use intelligent transportation detectors that are sensitive to the weight of a bicyclist).	Provides greater safety and ease of use by bicyclists.

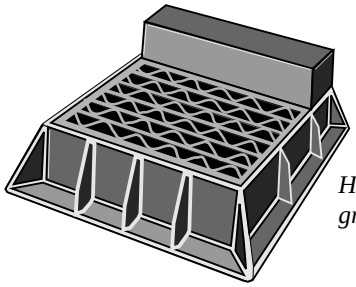
Figure 29
Comparison of Bicycle Unsafe and Safe Drainage Grates

Grates that are not flush with the roadway surface can stop or divert a cyclists wheels, causing wheel damage and a serious injury.



Vane grate design

These grates are bicycle safe and hydraulically efficient.



Honeycomb grate design

Source: National Center for Bicycling and Walking.

The following local planning areas should include bicycle and pedestrian friendly elements.

Master plan and/or recreation plan

- Require pedestrian and bicycle access throughout the community and in open spaces (e.g., call for continuous sidewalks).
- Preserve open spaces within and between communities. This creates a "greenbelt" which is a natural buffer and provides other environmental benefits such as storm water filtration and habitat.
- Include a proposed network of pedestrian and bicycle access in the master plan map, which connects activity areas and other points of interest. This provides an interconnected, transportation network-wide plan for bikeways and walkways that connects the places community members are most likely to travel to and from. Coordinate the development of this plan with county level plans such as greenways plans.

Zoning provisions

- Create zoning laws and regulation policies that allow mixed-use development. This allows a wider variety of services to locate in closer proximity to each other and residential areas.
- Locate buildings close to the street. This allows easy access by pedestrians, has a traffic calming effect, and reduces impervious surfaces.
- Subdivision regulations.
- Create shortened trips and shortcuts by creating pathways between cul-de-sacs, through parking lots, and other places. This allows pedestrian and bicyclists to take the shortest distance routes.
- Require sidewalks.

Site plan standards and review

- Require pedestrian and bicycle facilities in site plans and as part of the site plan review checklist.
- Community Recreation Plan.
- Include pedestrian and bicycle access in the community's recreation plan .
- Capital Improvements Program.
- Provide capital funds for phasing development of bicycle and pedestrian facilities.

Improve street network and design

There are several tools that communities use to design and create street networks that are conducive to bicycling and walking including the following techniques:

- Use roadway treatments to improve bicycle use.
- Use roadway treatments to improve pedestrian use.
- Create intersections that improve bicycle and pedestrian mobility and safety.
- Use buffering, screening, and landscaping for improved walkability.
- Use access management techniques to create walkability and bikeability.
- Create bicycle parking standards for better bikeability.

Rethinking how street networks are designed so they support multi-modal transportation is key to creating walkable and bikeable communities. This includes locating walkways and bikeways both on and off the road, designing intersections and streets for bicycle and pedestrian safety, and including other street design factors that increase safety and allow the use of the right-of-way by pedestrians and bicyclists. The main components of street network design are explained below.

Use roadway treatments that improve bicycle use

Accommodations to the roadway are required when the volume and speed of cars are high enough to make sharing roadway lanes dangerous and uncomfortable for bicyclists. There are a number of roadway treatments that improve safety for bicyclists (see Table 19).

Bicycle lanes, such as those in Ann Arbor, should be clearly labeled.

Table 20
Pedestrian Friendly Street Network and Design Tools and Techniques

Tools and Techniques	Effect
Require new residential and pedestrian development and redevelopment to include sidewalks and sidewalk continuity.	Creates safe, continuous walkways.
Require sidewalk development as a part of all capital projects (e.g., roads).	Ensures creation of sidewalks wherever capital projects occur.
Develop consistent standards for sidewalk construction based on state and federal recommendations for safety.	Ensures consistency and safety. See Additional Resources for recommended standards.
Install pedestrian amenities wherever possible (e.g., benches, shade trees, transit shelters, and buffers).	Creates a safe and welcoming pedestrian friendly environment that provides added protection from the elements and vehicles.
Consider adding medians to narrow wide streets.	Increases safety of pedestrians by decreasing crossing exposure and providing a safe break point to cross the street.
Design convenient and safe midblock crossings for pedestrians at regular intervals.	Reduces unsafe and unpredictable crossings by pedestrians. See Additional Resources for recommended distances.
Set up regular maintenance schedules for sidewalks and walkways in capital improvement program.	Ensures that sidewalks and walkways are clean, debris free, and remain safe.
Use buffering between streets and pedestrian sidewalks and walkways.	Creates a feeling of safety and protection from automobile travel.

Table 21
Pedestrian and Bicycle Friendly Intersection Design Tools and Techniques

Tools and Techniques	Effect
Make on-road bicycle facilities direct, logical, and as close to the motor vehicle traffic as safely possible.	Improves safety by making bicyclists visible and their movements predictable. See Additional Resources for recommended standards.
Create pedestrian crosswalks that are clearly marked and well maintained.	Improves safety where pedestrians cross streets.
Install ADA approved curb ramps with all new construction and as part of any repairs or improvements.	Allows greater accessibility for the physically impaired, elderly, and strollers.
Ensure traffic signals allow adequate crossing time.	Allows enough time for pedestrians to comfortably cross streets.
Develop pedestrian friendly design guidelines for intersections to be followed whenever new intersections are built or when existing intersections are improved or reconstructed.	Creates consistency in intersection design that allows greater safety and predictability for bicyclists and automobile drivers.
Consider making right turns on red illegal at corners with high pedestrian traffic.	Creates greater safety and predictability for pedestrians and bicyclists by making automobile turns more predictable.

Table 22
Bicycle Friendly Parking Standards Tools and Techniques

Tools and Techniques	Effect
Install bicycle parking where it is clearly visible, accessible, and does not interfere with other street uses.	Improves access to parking.
Install bicycle racks and lockers in areas of high pedestrian travel.	Reduces security concerns.
Place bicycle lockers near areas of long term bicycle parking (such as transit stations).	Improved safety against theft.

Use roadway treatments to improve pedestrian use

People tend to walk on the roadway or discontinue walking altogether when sidewalks and walkways are not provided, are in poor repair, or have missing sections. These conditions make it very difficult for people without automobiles or with disabilities to get around. There are multiple ways to improve pedestrian facilities. A key component to this is to create incentives, through regulations, for facilities to be developed (see Table 20).

Create intersections that improve bicycle and pedestrian mobility and safety

A large percentage of pedestrian and bicycle crashes occur at intersections. Proper design can reduce crashes and improve safety. Although each intersection has unique features requiring individual treatments, there are some primary principles to be applied to all intersections (see Table 21).

Use buffering, screening, and landscaping for improved walkability

Creating barriers between walkways and roadways make walkers feel comfortable and safe from automobile traffic. Use four to six foot planting strips between walkways and roadways when possible and select plants that do not impair visibility of motorists and pedestrians. In addition, buffers serve to reduce conflicts between incompatible land uses, minimizes soil erosion, reduces stormwater runoff, and enhances community appearance.

Use access management techniques to create walkability and bikeability

Unlimited access on urban thoroughfares creates conflicts between both cars entering or leaving a roadway and bicyclists and pedestrians riding or walking along the roadway. Access management techniques assist pedestrian, motor vehicle traffic, and bicyclists by:

- reducing the number of conflict points,
- redirecting motor vehicles to intersections with appropriate control devices,
- increasing pedestrian crossing opportunities,
- reducing the need for special treatments at driveways and, thus, accommodate the disabled, and
- making the streetscape more attractive.

Please see section on access management under transportation infrastructure for specific tools and techniques.

Create bicycle parking standards for better bikeability

The lack of safe and convenient parking for bicycles is often overlooked when designing site plans. Potential bicycle riders will not risk themselves or their bicycling equipment when safe, secure, and convenient parking facilities are unavailable (see Table 22).

Federal and state resources for walkable and bikeable development

Resources are available at both the federal and state level for walkable and bikeable development. Tables 23 and 24 provide a summary of these available resources.

Table 23
Federal Resources for Walkable and Bikeable Development

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Are Funds Distributed	When to Seek Funds
Surface Transportation Program - Enhancement	Non-motorized, facilities.	$3.1 (annual average award to Southeast Michigan).	Cities, villages, county road commissions, MDOT, transit agencies.	Funds distributed twice annually statewide based on merit by project category.	Applications accepted by MDOT throughout the year.
Congestion Mitigation Air Quality	Programs to limit portions of road surface to the use of non-motorized vehicles or pedestrian use; programs for secure bicycle storage and bicycle lanes and other facilities.	Depends on projects submitted.	Cities, villages, county road commissions, MDOT, transit agencies.	Based on impact on mobile source emissions.	Applications accepted by SEMCOG every two to three years. No set schedule.
Section 5307 Urbanized Area Formula Program	Project and project elements designed to enhance mass transportation services or use including pedestrian access and walkways, bicycle storage and bus bicycle racks.	One percent of formula apportionment (see above) for urban areas greater than 200,000.	DDOT, SMART, AATA, and BWATC.	Based on formula.	No schedule for developing projects as funds are distributed via formula.

Table 24
State Resources for Walkable and Bikeable Development

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Are Funds Distributed	When to Seek Funds
Michigan Transportation Funds	Operations, maintenance, construction reconstruction, resurfacing of non-motorized paths and sidewalks.	See roadways.	Cities, villages, county road commissions, MDOT.	Based on formula.	No application required.

Case Example

Streetscape – The Mexicantown International Welcome Center and Mercado

Community: Detroit

Contact: Margaret Gary, (313) 967-9898

The Mexicantown International Welcome Center and Mercado is a $12.5 million project to be built in the heart of Mexicantown, at the base of the Ambassador Bridge. It is designed to create a good pedestrian area and includes plans for streetscape improvements. The project will incorporate many different programs that are intended to serve a wide range of people, and provide a locale for economic and cultural development in Detroit, Mexicantown, and Southeast Michigan. It is scheduled to open in 2003. The developers of this project are working with the Michigan Department of Transportation to improve streetscapes in a number of ways including the creation of a pedestrian bridge to span the highway in order to connect Bagley Avenue Mexicantown.

Proposed improvements to Mexicantown.

Source: Mexicantown Community Development Corporation.

Additional Resources

American Association of State Highway and Transportation Officials (AASHTO). *Guide for the Development of Bicycle Facilities.* American Association of State Highway and Transportation Officials, 1999.

Burden, Dan. "Building Communities With Transportation." Distinguished Lecture Presentation, Transportation Research Board Washington, 2001. www.walkable.org/trbpaper.pdf

Burden, Dan and Peter Lagerway. "Road Diets, Fixing Big Roads." www.walkable.org/download/rdiets.pdf

Ewing, Reid. *Transportation and Land Use Innovations: When You Can't Pave Your Way Out of Congestion*. Chicago, IL: Planners Press, 1997.

Flink, Charles, Olka, K., and Searns, R. *Trails for the Twenty-First Century: Planning, Design, and Management Manual for Multi-Use Trails*. Island Press. 2001.

Forrester, John. *Bicycle Transportation: A Handbook for Cycling Transportation Engineers*. Cambridge, MA: MIT Press, 1994.

Forester, John. "Ideas In Motion: The Bicycle Transportation Controversy." *Transportation Quarterly*, v 55, no. 2, pp. 7-19.

Hunter, William J., Richard Stewart, and Jane C. Stutts. "Study of Bicycle Lanes Versus Wide Curb Lanes." Transportation Research, paper No. 99-0208, volume 1674, pp 70-77.

Mid-America Regional Council. "Creating Walkable Communities: A Guide for Local Governments." Bicycle Federation of America and Campaign to Make America Walkable, 1998.

Oregon Department of Transportation Bicycle and Pedestrian Program. "Oregon Bicycle and Pedestrian Plan." 1995.

Rails to Trails Conservancy and the Association of Bicycle and Pedestrian Professionals. “Improving Conditions for Bicycling and Walking: A Best Practice Report.” Federal Highway Administration, 1998.

U.S. Department of Transportation. “Pedestrian/Bicycle Safety Resource Set.” (multimedia CD-ROM version), Federal Highway Administration Publication No. FHWA-SA-00-005.

U.S. Department of Transportation Federal Highway Administration. “A Summary: Bicycle and Pedestrian Provisions of the Federal Aid Program.” US Department of Transportation, Federal Highway Administration, Publication No. FHWA-PD-98-049, HEP, 1998. www.fhwa.dot.gov/environment/bikeped/bp-broch.htm.

U.S. Department of Transportation, Federal Highway Administration.“ Bicycle Safety-Related Research Synthesis.” U.S. Department of Transportation, Federal Highway Administration, FHWA-RD-94-062, 1995.

US Department of Transportation, Federal Highway Administration. *Manual on Uniform Traffic Control Devices*. Federal Highway Administration, 2000.

U.S. Department of Transportation, Federal Highway Administration. “Selecting Roadway Design Treatments to Accommodate Bicyclists.” U.S. Department of Transportation, Federal Highway Administration, FHWA-RD-92-072, 1994.

U.S. Department of Transportation, Federal Highway Administration. *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*. 1998. www.hsrc.unc.edu/research/pedbike/98095.

Creating Elderly Mobility and Safety

Henry Ford Village Retirement Community in Dearborn.

The elderly represent the fastest growing segment of the region's population. SEMCOG estimates that by 2030, Southeast Michigan will be home to nearly twice as many people over age 65 than there were in the 2000 Census. Contrary to popular belief, not all elderly people retire and move to warmer climates. In fact, a growing percentage of elderly persons prefer to age in place — remaining in their own homes, or at least their own communities, for as long as physically, psychologically, and economically possible. As their numbers increase, this segment of the population will continue to impact many aspects of society. Local communities need to plan now for expected changes.

Planning and Regulatory Considerations

Given the impact of the elderly on society in general, addressing elderly mobility and safety issues is advocated at various levels of government — federal, state, regional, and local. In fact, SEMCOG's 2025 Regional Transportation Plan calls for recognizing and addressing barriers to elderly mobility and safety. In addition, local governments can implement various planning, policy, and design standards in their master plans and zoning.

Tools for Creating Elderly Mobility and Safety

Numerous tools and techniques are available to address elderly mobility and safety issues at the local level. Comprehensive land use planning at the community level can help communities:

- Provide the needed array of elderly housing options.
- Make elderly housing accessible to community resources.
- Make the transportation system accessible and safe.

Provide the needed array of elderly housing options

The elderly are not a homogeneous group and, therefore, require varying levels of housing. Communities must provide for a comprehensive system of housing options to adequately meet those needs, including home-ownership assistance, shared living, independent senior living, and assisted senior living. Essentially, a continuum of care must be provided to address the needs of seniors in various stages of life cycle and circumstance.

Many zoning ordinances do not make allowances for the unique characteristics of elderly housing options — varying parking allowances, density provisions, floor area requirements, occupancy regulations, safety features, and ancillary facilities. There is a clear need to examine and, where necessary, provide appropriate zoning provisions for elderly housing. For example, elderly apartment complexes may not need as many parking spaces as typically required for traditional multi-family housing; per unit square footage requirements may be less, allowing for higher densities than normally allowed (but with limited impacts); and mixed-use development should be encouraged to allow location of retail services within close proximity of elderly residences.

Keeping it connected

Planning for elderly mobility has many issues common with other topics covered in this handbook including walkable communities, safety management, and transit-oriented development.

Make elderly housing accessible to community services

In order for elderly housing to be successful, it must be integrated into a system providing adequate services such as retail, social activities, social services, and medical care. In order for services to be accessible, housing must be conveniently located near these services and connected via transit and pedestrian walkways. Again, revised master plan and zoning codes may be necessary to accommodate the location of amenities near housing and on-site at appropriate living facilities.

Make the transportation system accessible and safe

It is imperative that the transportation system itself be accessible and safe for elderly drivers, pedestrians, and bicyclists. This can be accomplished by:

- implementing appropriate traffic engineering standards,
- developing a pedestrian-friendly environment, and
- promoting sensible access management strategies.

Traffic engineering standards

The present day transportation system was constructed, in large part, using design standards based upon performance characteristics of an average driver. However, yesterday's average driver no longer represents today's driver mix. Design standards are based on assumptions regarding visual, cognitive, and physical performance levels, which many of today's elderly drivers are unable to meet. Table 25 provides suggestions that can facilitate safer conditions for the entire population.

Pedestrian environment

Walking can be a healthy, and sometimes required, social means of travel for the elderly, provided they are made to feel safe and comfortable and are given consideration by motorists. Table 26 provides suggestions that can facilitate a safe and productive environment for all pedestrians.

Access management

Access management is a comprehensive process of maintaining reasonable access to adjacent development, while preserving the safe and efficient flow of traffic. Effective access management has many benefits, including increased traffic flow and associated decreases in delay, congestion, and air pollution. Access management can also have a beneficial impact on traffic crashes and crash potential (see Table 27).

Table 25
Traffic Engineering Standards Tools for Elderly Mobility

Tool	Effect
Develop a consistent approach to design sign placement, and maintenance by: • increasing sign letter size to six inches minimum, • avoiding or reducing excessive sign clustering, • mounting signs above the roadway, and • utilizing illuminated signs.	Increase visibility and comprehension.
Develop a consistent approach to pavement marking placement and maintenance by: • increasing the longitudinal line width (edge lines, lane lines, etc.) to six inches, • increasing stop line width to 24 inches, • utilizing alternate pavement markings for crosswalks (such as zebra, ladder, and solid markings), and • painting all curb and raised median faces at intersections and providing cross-hatched pavement markings in advance of raised obstructions.	Increase visibility and demarcation.
Develop a consistent approach to intersection signalization and maintenance by: • increasing the size of signal lenses to 12 inches, • utilizing signal backplates (a thin plate attached to the back of the signal head to help motorists distinguish the signal from trees and sky background), • considering left-turn phasing, • providing all-red clearance intervals, • providing street lighting at signalized intersections, and • prohibiting right turns on red at skewed intersections.	Increase visibility and comprehension.

Table 26
Pedestrian Environment Tools for Elderly Mobility

Tool	Effect
Provide adequate, well-designed, and continuous sidewalks and walkways with curb cuts and ramps.	Facilitate safe and productive pedestrian trip making.
Provide properly placed and adequately marked crosswalks.	Channel pedestrian flow to safe crossing points, which are clearly marked for pedestrian use.
Provide street furniture and native landscaping, being careful not to create visual screens.	Increase pedestrian comfort, safety, aesthetics, and environmental benefits.
Install street lighting along high-volume pedestrian corridors and at all intersections.	Increase visibility.
Encourage clustering of amenities and provide pedestrian access from residential areas to points of interest and transit lines.	Facilitate safe and productive pedestrian trip making.
Install pedestrian-activated pedestrian signals and education signs.	Emphasize pedestrian right-of-way and promote understanding of pedestrian signals.
Retime traffic and pedestrian signals utilizing an appropriate walking speed (2.5 feet/second to 3.5 feet/second).	Provide adequate crossing times for pedestrians with slower walking speeds.
On very wide streets, construct raised pedestrian refuge islands (e.g., medians) with appropriate curb cuts and/or ramps, and pedestrian signals.	Decrease the distance that must be crossed during each signal cycle.
Reduce turning radii at intersections.	Decrease speed of turning vehicles.
Prohibit right turns on red at intersections with high pedestrian volumes.	Emphasize pedestrian right-of-way.
Evaluate and implement traffic calming techniques. (See section on walkable/bikeable communities).	Calm vehicular traffic and promote pedestrian travel.

Table 27
Access Management Tools for Elderly Mobility

Tool	Effect
Use medians to create right-in, right-out driveway movements. Consolidate access points.	Limit the number of conflict points associated with access points.
Maintain proper spacing of adjacent and opposite access points.	Limit the number of conflict points associated with access points.
Prohibit driveway access within the functional boundary of intersections.	Limit the number of conflict points associated with access points.
Properly design driveways (width, length, slope, radii, etc.) based on the speed limit and traffic volume of the adjacent roadway and driveway.	Better ease of ingress and egress.

Case Example

Sign Maintenance Program

Community: Rochester Hills

Contact: Marc Matich, (248) 841-2494

In 1993, Rochester Hills instituted a routine sign maintenance program to upgrade the size and retroreflectivity of city guide signs (street name signs, parking signs, etc.). The goal was reducing traffic crashes, particularly for the city's older drivers. Street name signs at intersections of local streets and major roads now utilize six-inch letters, while major street name signs use seven-inch letters. Sign materials are designed for high-grade intensity or retroreflectivity. In 2000, the Traffic Improvement Association of Oakland County conducted a study of the impact of the upgraded signs on traffic safety along two city corridors, indicating night-time crashes decreased after installation of the larger and brighter signs.

Senior Pedestrian Safety Study

Community: Dearborn

Contact: Tom Bruff, (313) 961-4266

In 1996, SEMCOG, with funding from the Michigan Office of Highway Safety Planning, conducted a community-based study to identify and address elderly pedestrian issues for Dearborn. The final report outlines the overall procedures performed in the project, describes in detail the methods and techniques used for data collection and analysis, and summarizes proposed pedestrian countermeasures.

Newberry Square

Community: City of Wayne

Contact: Peter J. McInerney, (734) 722-2002

This recently completed, five-story brick building provides affordable living opportunities for low- and middle-income seniors as well as space for retail establishments. The building has 64 apartment units on four floors with 16 units each, while the first floor is planned for commercial space. The complex is located on former city-owned land, is in the heart of downtown Wayne, next door to the city-owned State Wayne Theater and within walking distance of retail services, parks, the library, museum, and senior activity center. Accessible by public transit, there is also ample parking for private vehicles in the adjacent city-owned lot.

Older Driver Toolkit

Contact: Steve Betterly, (517) 373-4089

An older driver toolkit has been developed by Michigan State University to help communities and older driver advocates assess how friendly communities are toward older drivers. The tool can be used to understand key traffic engineering standards, assess community roadways, and identify resources for pursuing older driver traffic safety issues. The toolkit (www.townsafety.com/ACTSweb/ODT/Overview.htm) includes a PowerPoint presentation outlining pertinent issues, an older driver roadway friendliness assessment tool (outlining 15 recommendations contained in the Highway Design Handbook for Older Drivers and Pedestrians), and county-level crash and population data.

Additional Resources

U.S. Department of Transportation, Federal Highway Administration. *Guidelines and Recommendations to Accommodate Older Drivers and Pedestrians*. 2001.

U.S. Department of Transportation, Federal Highway Administration. *Highway Design Handbook for Older Drivers and Pedestrians*. 2001.

Planning for Transit-Oriented Development

Transit-oriented development creates a transit friendly environment through general land-use characteristics, access management, traffic engineering, and urban aesthetics. (See also section on Walkable and Bikeable Communities.)

Successful transit systems combine high-quality transit service with transit-oriented development. This requires coordinated planning between local governments and transit operators. Communities can create transit-friendly environments but, if the transit service itself is poor, then it will not be used. Conversely, an operator can provide excellent service but, if the environment around transit stops is not pedestrian friendly, few people will use it. The two must go hand-in-hand. Communities should meet with the transit operator early in the planning process to coordinate and compliment each others activities.

Planning and Regulatory Considerations

For transit, local regulations (zoning, site plan review) must promote a pedestrian friendly environment. Requiring sidewalks in both residential and nonresidential areas, limiting building setbacks to reduce walking distance to and from transit vehicles, and encouraging higher residential and commercial development densities are several examples of regulations that can increase transit usage. The Walkable and Bikeable Communities chapter has additional recommendations.

The federal Americans with Disabilities Act (ADA) requires that all new or renovated public facilities be readily accessible to, and usable by, persons with disabilities. Local governments need to ensure that any transit-oriented development adheres to the design standards prescribed in the ADA. The U.S. Department of Transportation enforces ADA provisions related to public transportation. All other ADA provisions are enforced by the U.S. Department of Justice.

Tools for Planning for Transit-Oriented Development

There are many tools available to assist in planning for transit-oriented development. Here are land use tools for promoting transit-oriented development:

- Encourage general land use characteristics.
- Consider access management.

Covered transit stop in Detroit.

- Promote roadway/transitway design.
- Encourage transit use through urban aesthetics.
- Utilize potential funding sources for transit-oriented development.

Keeping it connected

Creating a transit friendly environment involves many of the same issues relevant to nonmotorized transportation such as pedestrian friendly land use characteristics, access management, traffic engineering, and urban aesthetics. These concerns are addressed in the sections on walkable/bikeable communities, safety management, and planning for elderly mobility.

Encourage general land use characteristics

General land use characteristics deal with the amount and type of development. To increase the success of transit service, certain land-use characteristics should be encouraged.

- **Increase densities** — Medium-to-high development densities are required to create sufficient demand for fixed-route transit service. A minimum of three households and/or four jobs per acre is required for hourly service. Higher-level, more desirable service requires at least double these densities.
- **Encourage mixed-use development** — Providing a mix of residential, retail, light industrial, and recreational development in and around transit stops/stations creates a strong and steady transit demand over the course of the entire day, not just during peak

travel hours. Special zoning categories could be established for transit stops that encourage large, mixed-use developments.

- **Identify and promote transit-friendly development** — Identify and place transit friendly land uses, such as professional offices and retail establishments selling small items are very conducive to transit trips and should be encouraged to locate in the vicinity of transit stops/stations. Conversely, other establishments such as garden centers, home improvement, and furniture stores may be difficult to patronize using transit because of the nature of the goods sold. These type of businesses should probably be located in areas more designed for automobile use.

Consider access management

A number of factors should be considered in order to make transit more accessible.

- Sidewalks — Sidewalks should be required along all arterial, collector, and local streets and maintained throughout the year to facilitate pedestrian movement. In particular, snow removal must be prompt to ensure that pedestrians can navigate these pathways and access transit vehicles.
- Building setback — Building setbacks should be minimal to reduce walking distance and provide easier and more attractive access by pedestrians. Building entrances should be close to public walkways.
- Bike access — Safe and attractive bike access, using sidewalks and bike paths, should be provided to and from transit stops. Bike storage racks, both on and off transit vehicles, are also necessary to make this a viable option for travelers.
- Parking management — Placing parking lots behind, rather than in front, of businesses should be encouraged to create easier and safer access by pedestrians. Parking structures rather than surface lots should be developed to minimize the amount of land used for parking. It is preferable to design structures that incorporate retail and other land uses on the first floor with parking located above. Consider reducing parking requirements for businesses that locate near transit stops. Encourage joint-use parking facilities for complementary land uses.
- Driveway design — All pedestrians should be protected from vehicular traffic. Joint use driveways minimize pedestrian crossings and make walking more attractive. Providing a physical separation between the roadway and sidewalk also increases the safety and attractiveness of transit areas.

Promote roadway/transitway design

When designing roadways, a number of factors should be considered to make transit more successful.

- Avoid sharp turns or steep grades which make it difficult for transit vehicles to maneuver.
- Allow for direct travel (no backtracking or circuitous routing).
- Provide safe and frequent pedestrian crossings at desirable locations. Many major streets only provide crossings at one-mile intervals; consequently, many establishments along these roadways are inaccessible by transit because there is no safe means of crossing the street to access transit. Transit friendly land uses should be clustered around areas with safe and convenient street crossings, maximizing pedestrian safety and minimizing walking distance.
- Provide adequate stopping areas for transit vehicles. Vehicles must have reserved, convenient stopping locations that allow for safe stops and easy reentry to the traffic flow. Stops need to be located near transit friendly land uses to minimize passenger walking distance.

Encourage transit use through urban aesthetics

The attractiveness of areas at or near transit stops has a great impact on use. Local governments, working with the transit operator and/or local businesses can take a number of actions to encourage transit use.

- Make the general area serviced by transit attractive, someplace people want to go.
- Work with businesses to create attractive facades on buildings. This makes the walk from the transit stop to the person's final destination more enjoyable.
- Work with the transit operator to design attractive transit stations/stops that reflect the identity of the surrounding community.
- Work with the transit operator to provide shelters that clearly display transit information and directions to surrounding activities. Transit stations or timed transfer facilities should also be climate controlled.
- Provide adequate lighting at all transit stops, along with good visibility.
- Provide a landscaped buffer between the roadway and sidewalk to increase the safety and attractiveness of transit areas.

Utilize potential funding sources for transit-oriented development

In recent years, the federal government has taken an interest in promoting transit-oriented development and has made some funds available for this purpose. In addition to public dollars, private funds can sometimes be acquired from local businesses that would benefit from the transit-oriented improvements. Below are several potential funding sources.

- Federal Transit Administration (FTA) Livable Communities Initiative (Section 5309(a) funds). These funds are for joint development projects that enhance the attractiveness of transit projects and provide improvements that increase ridership.
- The FTA Transportation and Community and System Preservation Pilot Program (TCSP) supports joint transportation and land use planning projects that address five goals: improving the efficiency of the transportation system; reducing the future cost of transportation infrastructure; providing efficient access to jobs, activities, and business centers; reducing the environmental impacts of transportation; and examining patterns of private-sector development.
- Congestion Mitigation and Air Quality (CMAQ) funds. These funds are available for programs that reduce traffic congestion and improve air quality. All states receive these funds; over half are spent on transit programs each year. CMAQ funds are typically used to purchase transit vehicles or operate service. However, they have also been used for transit marketing and guaranteed ride home programs.
- Community Development Block Grants (CDBG). Improvements to transit facilities can be included as part of a broader development project in the vicinity of a transit station/stop.
- Private businesses. Businesses such as hospitals, supermarkets, retailers and educational institutions, surrounding proposed transit stations may be willing to provide funds for attractive, easily accessible transit service to their establishments.

Case Example

Encourage Transit-Oriented Development

Community: Ferndale

Contact: Christina Sheppard-Decius, (248) 546-1632

As an older urban community, Ferndale has a lot of the characteristics that make it transit friendly: dense, single-family home development focused around an established downtown area; sidewalks on all streets; and building entrances located close to public walkways with parking located behind businesses. In addition, the Downtown Development Authority (DDA) has sponsored a program to help businesses improve their building facades to make the downtown area more attractive. The city also implemented an extensive downtown streetscape project that widened sidewalks, installed new decorative street lights for better visibility and aesthetics, and restored on-street parking.

For more ideas on specific land use regulations to promote transit-oriented development, consult *Creating Transit-Supportive Land-Use Regulations*, a 1996 report by the American Planning Association. It lists regulations that have been adopted by many different local governments to promote transit use in their communities, including regulations on provision of sidewalks, bicycle paths and storage, parking design, building setback, mixed-use development, land use density, and more.

The established downtown and building entrances located close to public walkways are two characteristics of Ferndale's transit-friendly community.

Additional Resources

Beimborn, E., Rabinowitz, Gugliotta, P., Mrotek, C., and Yan, S. *Guidelines for Transit Sensitive Suburban Land Use Design*. Report No. DOT-T-91-1. Washington, D.C.: U.S. Department of Transportation, Urban Mass Transportation Administration, University Research and Training Program. 1991.

Chicago Transit Authority. *Guidelines for Transit-Supportive Development*. Chicago, IL. 1996

Corbett, Judy and Pau Zykofsky. *Building Livable Communities: A Policymakers's Guide to Transit-Oriented Development.* Center for Livable Communities, CA. 1996.

Federal Transit Administration. *Planning, Developing, and Implementing Community-Sensitive Transit: The Federal Transit Administration Livable Communities Initiative*. U.S. Department of Transportation, Federal Transit Administration. 1996.

Morris, Marya, Editor. *Creating Transit-Supportive Land-Use Regulations: A Compendium of Codes, Standards, and Guidelines*. American Planning Association. December 1996.

Puget Sound Regional Council. Transit station communities Web site. www.todcommunities.org.

Regional Transportation Authority. *Fostering Transit-Oriented Development in Northeastern Illinois*. Chicago, IL.

The Role of Transit in Creating Liveable Metropolitan Communities. National Academy Press, Transportation Research Board. 1997.

www.psrc.org/projects/tod/index.htm. Transit Station Communities Web site of the Puget Sound Regional Council. The site provides many different ideas for encouraging transit-oriented development and livable communities.

Development Along Transportation Corridors

The nearly 6,289 miles of major surface roads in Southeast Michigan move goods and people in a safe and efficient manner. Most of these roads were originally built to serve a rural population's limited traffic, but now serve higher-volume urbanized populations.

Commercial strips tend to locate along these routes. This type of development can often cause traffic congestion and safety problems that discourage walking, bicycling, or public transit. These corridors and commercial strips are very often aesthetically unattractive, with inadequate buffering or landscaping and poor sign control.

This section provides information on comprehensive planning for corridors and describes some of the tools and techniques available for guiding development along transportation corridors.

Keeping It Connected

Buffering, screening, and landscaping are additional tools to consider when improving development along transportation corridors. As well, parking and lighting can help make the corridor safer. Please see these additional topics in this handbook.

Planning and Regulatory Considerations

The connectivity of the various modes and how they impact a community are important both locally and nationally. In fact, the requirement for corridor studies grew out of the Transportation Equity Act for the 21st Century (TEA-21) which required some type of independent analysis of any transportation or transit improvements that receive federal aid. Although local communities conduct multi-modal corridor studies as a requirement to receive funding, they have found that these studies are beneficial tools in addressing transportation and land use issues.

The key legal issue related to traffic impact and land use development has been the ability to extract roadway improvement funding from developers. One way communities in Michigan have achieved this is by creating special land use provisions within zoning ordinances. These provisions state that conditions may be placed on approval of a special land use to ensure public services can accommodate increased traffic caused by the proposed land use.

Tools for Development Along Transportation Corridors

There are many tools available to help improve development along transportation corridors:

- Develop a multi-modal corridor study.
- Use access management to reduce traffic congestion.
- Use traffic impact analysis to make land use decisions.
- Establish overlay zoning.

Develop a multi-modal corridor study

Major development and infrastructure improvements require careful thought and consideration of a wide variety of community concerns, perspectives, costs, and potential impacts. A corridor study assists in that process and is completed whenever there is a significant project in both metropolitan and rural areas. It considers the technical and institutional aspects of transportation, community, and environmental planning issues along with financial considerations. As such, the goal of a corridor study is to identify the best mixture of transportation improvements that will be effective in moving people and goods in specific travel corridors, within available funding limits, while addressing neighborhood and community concerns.

A multi-modal corridor study considers all existing and potential modes (e.g., transit, automobiles, pedestrian, freight) to see how they relate to each other and how they impact the community. How the existing modes work together and how they impact land uses needs to be considered before transportation improvements are made.

Development along Telegraph in Taylor.

A corridor study should contain the following parts:

- purpose,
- defined study area including a map,
- defined study approach which includes:
  - public involvement and participation,
  - traffic congestion and safety,
  - social, economic, and environmental elements,
  - relationship between land use and transportation,
  - transportation alternatives, and
  - funding and feasibility analysis.

Corridor studies are often considered in two phases. Phase one concentrates on defining data needs and compiling these data. It includes assembling available transportation data, identifying gaps in the data, reviewing land use forecasts, and creating a database to store and illustrate the information. The database should include the following types of information:

- existing and future traffic conditions,
- roadway system,
- transit system,
- goods movement (include analysis of truck and rail routes),
- special transportation generators (establishments with unique transportation characteristics, in terms of travel patterns, trip generation, and periods of operations),
- growth patterns in the area,
- population,
- approved and anticipated development projects,
- housing,
- employment,
- summary of issues and concerns, and
- funded roadway improvements.

Phase two includes testing and identifying transportation improvements and enhancements that will effectively accommodate future growth and travel patterns. This phase includes:

- Reviewing "data gaps," developing data collection plan, collecting missing data, and updating assumptions,
- Identifying and validate critical issues with stakeholders,
- Forecasting future traffic demands,
- Performing capacity analysis and identifying system deficiencies for roadway and transit,
- Developing an initial list of transportation system improvements,
- Evaluating improvement effectiveness,
- Developing overall evaluation methodology (based on performance measures, needs, system connectivity/ integration, etc.), and
- Prioritizing the improvements package.

Use access management to reduce traffic congestion

Local governments face providing adequate access to and from various land uses without increasing congestion, reducing safety, impairing access to other land uses, or harming aesthetics. Access management is a tool for considering all of these elements in the planning and design process. The Michigan Department of Transportation (MDOT) defines access management as "a set of techniques that can help reduce traffic congestion, preserve traffic flow, improve traffic safety, prevent crashes, preserve existing investment in roads by managing the location, design, and type of access to property." The tools required to achieve effective access management include both policy regulations and physical considerations implemented at various stages of the development process (Figures 30, 31, 32).

Access management is closely related to overlay zoning because overlay zoning is a tool used to implement access management strategies. Access management is also an important part of improving safety. (See Official Maps, Private Road Regulations, Elderly Mobility, and Overlay Zones sections of this handbook.)

All access management decisions should be coordinated between the roadway's operating agency and local government(s). This involves a coordinated review of development applications for development projects by the local jurisdiction responsible for land use issues and the road agency responsible for roadway issues.

Developing an access management plan will provide a coherent framework for planning and locating future access points, promote intergovernmental consistency and coordination, and facilitate administration of access regulations and permitting. In addition, many of the best access management techniques are implemented through zoning and private road regulations as well as local subdivision, lot split, and condominium regulations. This includes the use of overlay zoning to provide a more detailed access regulation where needed.

Other considerations include:

- Flexible zoning to accommodate changes in frontage, setbacks, parking setbacks, and access management requirements.
- An official map may be used to formally designate future rights-of-way, show new, extended or widened streets, avenues, place, or public ways.
- Obtain rights-of-way for frontage roads or rear access roads.
- Regulate number and spacing between driveways to reduce traffic hazard areas. This should be based on

Figure 30
Individual Access – Front Parking

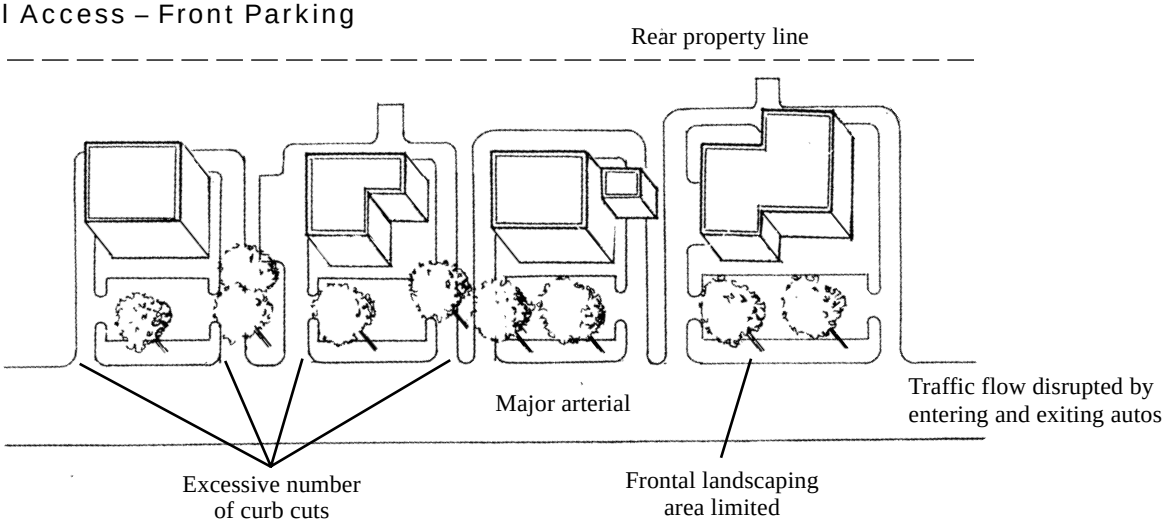


Figure 31
Marginal Access – Front Parking

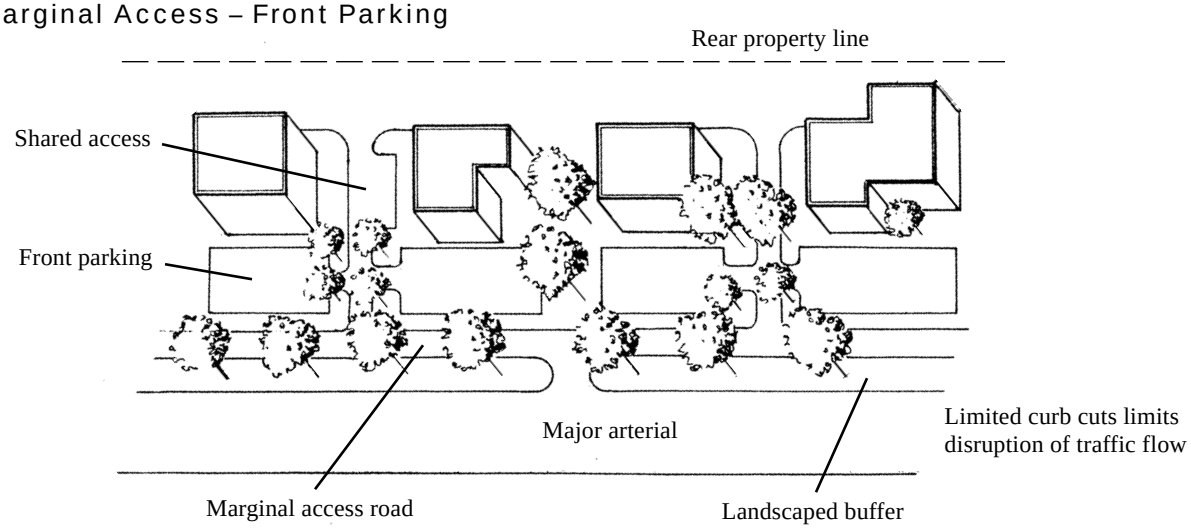
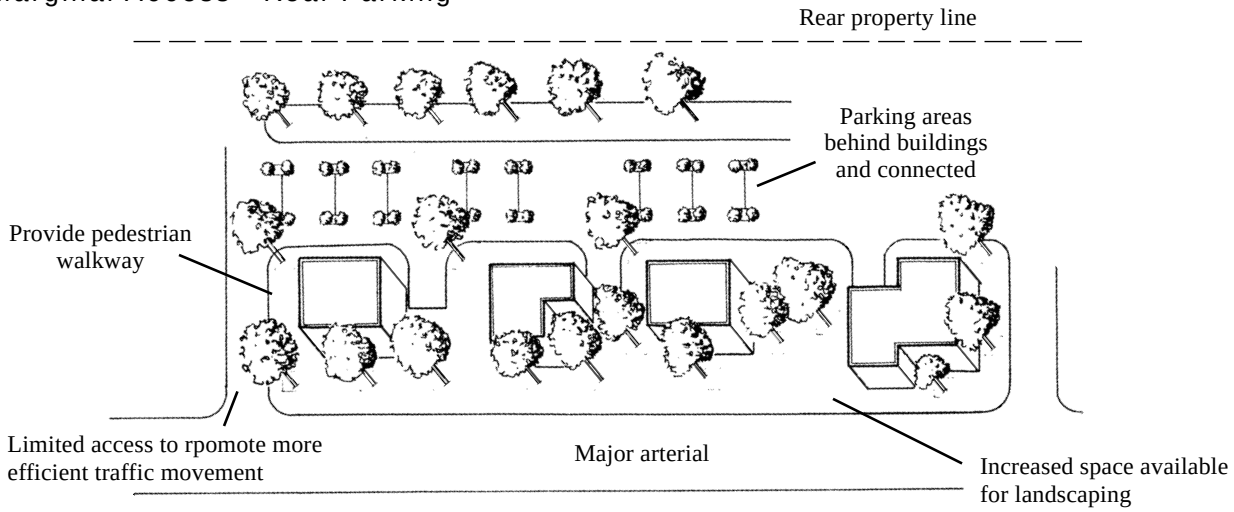


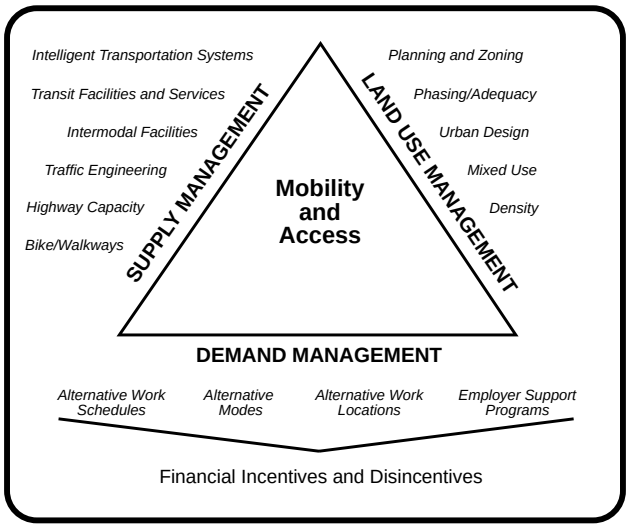
Figure 32
Marginal Access – Rear Parking



the road's speed limit and the distance from signaled intersections.

- Provide for safe and efficient traffic movement by reducing conflicts between through traffic and local traffic.
- Increase coordination between land use planning and transportation planning to foster a better understanding of land use/traffic relationships.
- Improve aesthetics of the area.
- Provide pedestrian access.

Figure 33
Elements of a Mobility/Congestion Reduction Program



Source: Meyer, Michael. *A Toolbox for Alleviating Traffic Congestion and Enhancing Mobility*. 1997.

Use traffic impact analysis to make land-use decisions

A traffic impact analysis assesses the effects of a particular development's traffic on a community's transportation network. The analysis varies in range of detail and complexity depending upon the type, size, and location of the development. A traffic impact analysis is important in helping public agencies make land-use decisions.

- Develop a traffic impact study. The traffic impact study should be done when a proposed development's trip generations reach a specified threshold level. (For recommended threshold tables, consult the MDOT publication, "Evaluating Traffic Impact Studies.")
- Develop a site plan. Site plans are based on the specific characteristics of the proposed development. They should include some combination of the information in Table 28.

Table 28
Site Plan Tasks

Task	Task Descriptions
Pre-Application Meeting or Discussion	Includes developer, traffic consultant, community representative, an adjacent community's represen tative when appropriate, and a road agency or MPO representative.
Impact Analysis	Describes existing conditions at the site and at nearby intersections. Evaluates the trip generation associated with the proposed development and for specific uses. Evaluates the trip distribution. Outlines future conditions analysis of study area and nearby intersections. Describes mitigation identification and evaluation.
Site Issues	Evaluates access points, design, and site circulation.
Other Analysis	Evaluates crash data and mitigation measures.

Establish overlay zoning

Overlay zoning allows a separate zone to be applied on top of an area of pre-existing zones, thereby imposing an additional set of requirements without altering the requirements imposed by the underlying zoning district. Development can only occur in these areas when the conditions for both zoning districts are met.

Corridor overlay zones can be used to manage development and access along transportation corridors. For example, a corridor overlay zone can be established for a given road between two particular cross roads and within a stated distance of the corridor road. Standards that can be included in the corridor overlay zone standards are: 1) structure setback, 2) parking setback and green zone, 3) limited development zone, 4) minimum lot width, 5) vehicular access. All of these standards are important to transportation planning issues that include community walkability and bikeability, elderly mobility and access, traffic safety, limiting congestion, and transit development.

The process for implementing overlay zoning is quite similar to traditional zoning. Overlay zoning is described in the zoning text, the location of the zone is mapped, and the overlay zone is adopted by the governing body. The overlay zones are administered through the usual zoning process.

Boundaries for overlay zones can be established for specified areas without regard to property lines or land

use. Overlay zoning is a method that allows for mixed use within conventional zoning and is an alternative to rewriting the existing zoning provisions.

A floating overlay zone is another variation that allows flexibility in the standards set forth in the zoning ordinance if certain conditions are met. The intent is to allow flexibility in the area, height and placement of buildings if such flexibility would result in preserving natural features, maintaining open space, preserving historic features and providing improved site design for transit access and pedestrian use. The conditions and criteria for applying the provisions of the floating overlay zone should be contained in the zoning ordinance.

CASE EXAMPLE

Multi-Modal Corridor Studies – A Vision for Eight Mile

Contact: Eight Mile Boulevard Association (248) 559-8633

Eight Mile Road runs along Wayne, Oakland, and Macomb counties. These counties joined in an effort to resolve the problems along that road by creating the Eight Mile Corridor Task Force. The task force worked with the Greater Detroit Economic Development Group in commissioning a comprehensive corridor study and developing a plan for revitalizing Eight Mile Road. This study has been used as the springboard for development of the Eight Mile Boulevard Association which works to implement the recommendations established in the Vision for Eight Mile Boulevard document.

Review SEMCOG's corridor studies link for several local examples of ongoing corridor studies.

www.semcog.org/TranPlan/RTP/index.htm.

Access Control Provisions

Community: Farmington Hills

Contact: Richard Lampi, (248) 474-6115

The city has access controls for both residential and planned office service districts. In residential areas where there are a number of narrow lots adjacent to each other that could each be developed independently, the planning commission can reduce the number of access drives to a major or secondary thoroughfare by requiring a marginal access road in accordance with requirements set forth in the master plan. In office service districts, the planning commission may require marginal access drives in those areas that have excessive driveways, thereby diminishing the carrying capacity of the thoroughfare. The planning commission may require connecting contiguous parking lots on abutting properties to allow traffic circulation from one property to another without reentering the public thoroughfare.

Freeway Overlay District

Community: Scio Township

Contact: Spalding Clark, Supervisor, (734) 665-2123

The Freeway Overlay District covers an area surrounding the I-94 exits in Scio Township. Its purpose is to manage the development adjacent to the exit ramps so that the land uses are compatible with the highway exits and are compatible with the environment and characteristics of the area. Planning and development regulations include access management, and the requirement of a traffic impact analysis when it is deemed appropriate by township officials.

EXO Exposition Overlay District

Community: Novi

Contact: Dave Evancoe, (248) 347-0475

The EXO Exposition Overlay District is located near the Novi City Town Center District. It was designed to accommodate the development of a planned exposition, convention, and conference facility and to make provisions for the special needs of this development. The development is designed to support a high-tech business base within the city and to respond to a regional demand for an exposition facility located near the city's town center district as shown on the master plan for land use.

This overlay zoning project was designed to direct the character of the EXO exposition area and to ensure uniformity in development. It allows some uses prohibited otherwise and limits other uses that would have otherwise been allowed.

Additional Resources

Ann Arbor Creek Management Project. “Protecting Creeks in a Changing Landscape.” School of Natural Resources. University of Michigan. April 1991.

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Planning and Zoning Center, Inc. *The Access Management Guidebook*. The Michigan Department of Transportation. October 2001.

Smith, Steven A. and Transportation Research Board. *Guidebook for Transportation Corridor Studies: A Process for Effective Decision-Making*. Washington D.C.: National Academy Press, 1999.

South Bay Cities Coastal Corridor Study. www.southbaycities.org/docs/coastal-study.htm

Strader, Bradley K. and LaMourie, Peter C. *Evaluating Traffic Impact Studies: A Recommended Practice for Michigan Communities*. Michigan Department of Transportation. 1994.

Western Oakland Corridor Study. www.oaklandcorridor.com/overviewfrm.htm

Implementing Safety Management

Providing a safe environment for all road users (e.g., motorists, pedestrians, bicyclists) is important to communities and is a typical goal of all local governments. Safety management achieves safe roadways by focusing on assuring that the various modes of a transportation system operate safely on an individual basis and together as an interlinked transportation system. An unsafe system results in multiple crashes, the impacts of which are felt by everyone, including medical facilities, police and other public and private institutions, in addition to the physical and emotional sufferings of the victims and their families.

Keeping it Connected

Traffic calming is an important element of many other transportation and land use issues. It is especially useful in designing communities for elderly mobility and to improve safety.

Planning and Regulatory Considerations

The U.S. Department of Transportation has recommended that cities with a population greater than 50,000 employ at least one full-time traffic engineer and cities with a population of 25,000 to 50,000 have access to traffic engineering services through consultants or other governmental agencies.

In the instance that a traffic engineer is not employed (full or part-time), or the services of a consultant are not contracted, the Michigan Vehicle Code requires traffic engineering issues be addressed by the local government's chief of police (Michigan Department of State, Michigan Vehicle Code, 2000-2001, Act 300 of 1949). In some instances local public works personnel might also be asked to fill in on occasion. While these substitutes for a traffic engineer often do well at addressing traffic safety issues, it is not the primary focus of their jobs.

Roundabout in Rochester Hills.

Tools for Implementing Safety Management

Improving highway safety results from an effective safety management process. There are several tools that aid in successfully analyzing and implementing highway safety plans. That process and some specific tools for developing a good safety management process are described below:

- Develop a safety management process.
- Use road safety audits for highway safety improvement.
- Implement a safe communities program to promote a safer transportation system.
- Use the SEMCOG's Traffic Safety Manual and Comprehensive Analysis Safety Tool (CAST) software for analyzing highway safety strategies.
- Initiate traffic calming techniques.

Developing a safety management process

The ultimate goal of highway safety management is to reduce the number and severity of highway-related crashes. Developing a safety management process is the first step toward identifying highway safety problems and implementing effective solutions. An effective safety management process uses a variety of tools that provide the information necessary for making efficacious decisions.

Safety management is built on a solid foundation of stakeholders, who care about safety by working together. It brings together all interested parties intent on improving highway safety. When these diverse safety interests work together, there is an integrated approach to safety planning and programs. This ensures that safety is given adequate consideration in transportation decision making.

An effective safety management process should include, at a minimum, the following elements:

- Communication, coordination, and cooperation among the organizations responsible for the roadway, human,

and vehicle safety elements (both public and private).

- A focal point for coordination of the development, establishment, and implementation of safety management among agencies responsible for these major safety elements.
- Short and long-term highway safety goals to address identified safety problems.
- Collection, analysis, and linkage of highway safety data.
- Identified safety responsibilities of units and positions
- Public information and education activities.
- Identified skills, resources, and training needs to implement highway safety programs.

Use road safety audits for highway safety improvement

Road Safety Audit (RSA) is a program sponsored by the United States Department of Transportation. It is, according to their web site "the formal examination of an existing or future road or traffic project by an independent team of trained specialists. Its main objective is to address the safe operation of a roadway and to ensure a high level of safety for all road users. The RSA team assesses the crash potential and safety performance of a roadway project and prepares a report that identifies potential safety problems. RSA's can identify deficiencies before they are built into the project and espouse quality improvement by building in safety from the beginning. Project officials or managers can then evaluate, select, and justify appropriate project changes." Please see their web site for further information about Road Safety Audits.

Source: U.S. Department of Transportation. safety.fhwa.dot.gov/programs/rsa.htm.

Implement a Safe Communities program to promote a safer transportation system

The Safe Communities program is a program designed to "promote and implement a safer national transportation system by combining the best injury prevention practices into the Safe Communities approach to serve as a model throughout the nation." Please visit the Safe Communities Web page at www.nhtsa.dot.gov for detailed information about the program. Or visit the Michigan Safe Communities Web site at www.michigan.gov

Source: National Highway Traffic Safety Administration.

Use SEMCOG's Traffic Safety Manual and Comprehensive Analysis Safety Tool (CAST) software for analyzing highway safety strategies

The manual describes a comprehensive approach to traffic safety analysis, from collecting potentially useful information to ranking tentative solutions. Individual chapters can also be consulted and applied independently, such as to check a location's crash ranking (Chapter 3), alternative crash countermeasures (Chapter 4), or the relative safety benefits and costs of a specific countermeasure (Chapter 5). The CAST software was developed to provide communities in Southeast Michigan a tool, complimenting the manual, that provides users with the most current three years of crash data. Both the manual and software prescribe a step-by-step manner to identify, evaluate, and suggest solutions for high-crash locations.

Specific tools used to implement safety management include tools covered in other sections of this book. They include access management (development along transportation corridors), buffering, screening, landscaping, parking, and lighting standards, and the use of traffic impact analysis (development along transportation corridors).

Initiate traffic calming techniques

Traffic calming techniques, when used correctly, are an integral part of creating a walkable and bikeable community and safety management. Traffic calming is

Figure 34
Using Bulbouts for Traffic Calming

Source: SEMCOG.

Figure 35
Traffic Calming Design Treatments

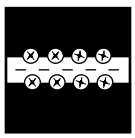
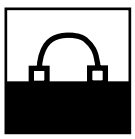
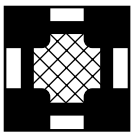
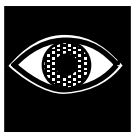
Drawing	Technique	Description
	Traffic	Circular raised islands centered within intersections. Circles can be landscaped or surfaced with special paving. Landscaping can be maintained by the local jurisdiction or by neighborhood volunteers.
	Chicanes	Alternately placed curb extensions into the street that force motorists to drive in a serpentine pattern. Chicanes are offset from each other in mid-block locations and can be used to keep through-trucks versus local delivery off residential streets.
	Curb Bulbouts Chokers/ Neckdowns	Curb extensions placed at mid-block locations or intersections which narrow the street to provide visual distinction to and reduce pedestrian crossing distances. Bulb-outs help to provide a clear visual signal to drivers that a crossing is approaching and makes waiting pedestrians more visible. Neckdowns are often longer than bulb-outs and often line-up with and help to define parallel street parking areas. They narrow the appearance of the street and can be attractive, especially when landscaped.
	Diagonal Diverters	Eliminates through traffic while providing partial access in opposite directions; island can become amenity and provide refuge for pedestrians.
	Forced Turns and Partial Diverters	Truncated diagonal diverters (one end remains open) and other types of partial diverters discourage commuter traffic by forcing turns but provides local access opportunities.
	Cul-de-Sac/ Street Closures	Street is closed and turned into a cul-de-sac; end of street becomes a neighborhood amenity and focal point (landscaped mini park); the ongoing provision of pedestrian and bicycle access is important.
	One Way Entry and Exit	Curb bulbs/extensions are used to close one lane of traffic at intersections; stops through traffic but allows ingress or egress depending on the direction and location of the closure.
	Narrower Streets	Narrower streets limit the expanse of pavement visible to the driver and can be effective in slowing traffic, especially when lined with trees or on-street parking.
	Speed Humps/ Tables	A speed hump is wider and smoother than a speed bump, and effective in slowing cars as they approach pedestrian zones. These are most appropriately used on neighborhood streets.
	Signs and Neighborhood Gateways	Signs such as “residential street”, “local access only”, or monuments that identify neighborhood districts can be effective, especially when used in conjuction with other techniques, including those listed above and others, such as pavement markings and textured warning strips.

Figure 35
Traffic Calming Design Treatments

Drawing	Technique	Description
	Special Paving	Alternative road surfaces, such as brick, colored concrete or special pavers, can be used at crossings, intersections or along the sides of the street to break up the visual expanse of pavement and define areas of pedestrian travel.
	Speed Watch Programs	Citizens and organizations can utilize a radar device and electronic sign board to measure speeds of passing vehicles in their neighborhoods. Letters of warning can be sent to the registered owners of offending vehicles, The programs promot neighborhood cooperation.

Source: Seattle Engineering Department, *Making Streets that Work.* Seattle, WA. 1996.

achieved by narrowing streets (visually, physically or both), diverting traffic, and creating obstructions. Results can include improved safety for pedestrian, bicyclists, and auto-mobile drivers. It can also reduce noise pollution, crashes, and traffic congestion. In addition, traffic calming also provides environmental benefits by reducing impervious surfaces and providing a location for storm water treatment.

Objections to the use of traffic calming tools often result from lack of familiarity with the effectiveness of traffic calming, but may also revolve around liability, slowing emergency responses, and maintenance. Educating and involving the public about the planning process can relieve many of these concerns. Appropriate application of traffic calming techniques requires careful analysis of all impacts such as unintentionally diverting traffic and safety concerns to an adjacent street. It is also important to consult with legal council to clarify liability issues.

Figure 34 and 35 illustrate different traffic calming design techniques.

CASE EXAMPLE

Local Government Engineering Assistance Study

Community: Grosse Pointe Woods

Contact: Dan Koerber, (313) 343-2400

In order to address some community traffic safety issues, Grosse Pointe Woods enlisted the services of SEMCOG as part of a grant received by the regional planning organization from the Office of Highway Safety Planning (Michigan State Police).

SEMCOG coordinated meetings with the communities public safety officer, city and school officials, and Wayne County (Division of Roads). The safety issue the committee focused its attention on regarded a fatal pedestrian-car crash that took place at the signalized entrance to the Grosse Pointe North High School (along Vernier Road).

SEMCOG followed its own guidelines documented in the *Traffic Safety Manual* to identify high-crash locations, suggest possible countermeasures to corresponding crash causes, and perform a benefit/cost analysis on the selected solutions to implement the most cost-effective solution.

Having performed the study on the intersection and surrounding area, SEMCOG identified several deficiencies including:

- need for added signs identifying the pedestrian cross walk (for motorists and pedestrians),
- lack of a left-turn bay and signal phasing causing drivers entering the school to take unnecessary chances due to the lack of gaps,
- eight-inch signal heads which decreased the visibility of the signal,
- closely spaced adjacent driveways causing conflicting turns, and
- inadequate egress green time for school during lunch break and at dismissal.

Each of these deficiencies were reviewed by the committee and a list of solutions were developed using the CAST software.

The committee chose to improve the signalized intersection by adding a left-turn bay and separate left turn signal phasing to give motorists turning into the school their own lane of traffic rather than sharing it with the others vehicles proceeding westbound through the intersection. Also, adjustments were made to the timing of the signal which generated a better flow of traffic out of the high school. Finally, pedestrian

crossing signs, freshly painted pavement markings, and a heightened police presence was added so that those traveling through the intersection, or entering and exiting the high school, would be more aware of the location's pedestrian traffic.

Since implementing of these improvements there has been a considerable decrease in the number of incidents (both pedestrian and vehicle). The success of this study prompted the city to pursue other safety studies on their own using the manual with the guidance of SEMCOG.

Traffic SAFE-TE3 Program

Community: Farmington Hills

Contact: Kevin McCarthy, (248) 473-9590

The Traffic SAFE-TE3 Program is a community wide program that involves both citizens and professional staff in developing traffic calming measures. The program provides a systematic way to identify traffic problems, recognize alternative solutions to the problem, and choose the solution to implement. The solutions always begin with the least restrictive. If unsuccessful at resolving the problem more restrictive approaches can be used. Thus far the community has installed many speedhumps and they have the option of utilizing traffic circles.

Additional Resources

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Provisions for Transportation Infrastructure

A community's infrastructure includes those public facilities which support many of the community's daily needs, including roads, sanitary sewers, storm sewers, and water lines. The presence or absence of these facilities has a significant impact on the development pattern of a community. Often, pressures for new infrastructure precede a community's ability to provide such infrastructure improvements, resulting in undue hardship on the financial well-being of the community.

Planning for infrastructure improvements is a key component of managing development. In planning for such improvements, communities are not just responding to where development should go or how to maintain desired community character, but how such improvements are going to be financed. Because expanded infrastructure is necessary to support growth in population, improved efforts are needed to coordinate the timing of new development with provisions for infrastructure. A concurrence-based approach to infrastructure and land development planning means that infrastructure needs created by new development should be in place at the time the new land uses become functional. At the same time, it is argued that a community should not have to extend or improve public facilities before the time they have been programmed in the capital improvements plan (CIP). The rezoning of property for more intense uses should be tied to the availability of infrastructure.

When used in conjunction with the community's comprehensive plan, zoning ordinances, and land division regulations, the tools and techniques described here provide a basis for phasing development with provisions for infrastructure. Although the CIP is rarely used as effectively as it could be, the management of infrastructure can be significantly improved with the development of a CIP that is based on a clear understanding of the community's growth and land-use objectives. When coordinated with the comprehensive plan, zoning ordinances, and land division regulations, the capital improvements program can be effective in determining the extent and timing of infrastructure improvements.

An official infrastructure map of a community can be used to support land use plans by creating assurances that infrastructure can be constructed as proposed. Designation of urban service areas can provide added support by directing development to areas where infrastructure already exists or can be provided. The use of special assessment mechanisms to finance infrastructure improvements is also presented as an approach to ease the burden on the community as a whole and as a way to have those benefitting from such improvements also pay for them.

Renovating the transportation system.

Keeping It Connected

Providing for transportation infrastructure involves a comprehensive look at community land use, economic development, and capital improvement financing. It is important to create these plans in conjunction with environmental and community development issues relevant to the community.

Planning and Regulatory Considerations

The Transportation Improvement Program (TIP) is a capital improvement program which is required by the U.S. Department of Transportation for federal aid or regionally significant projects. A TIP prioritizes federal, state, and local funding which will be used to implement the Regional Transportation Plan (RTP). Like the RTP, the TIP must be based upon reasonably available funds, analyzed for impacts on air quality, and reviewed to ensure that it serves all segments of the region's population including environmental justice populations. SEMCOG works with the state, counties, cities, villages, and other public transportation agencies to produce the document. For more information about the process, please see SEMCOG's publication, *A Citizens' Guide to Transportation Planning in Southeast Michigan.*

Official maps can be effective tools but are rarely used. Reasons cited include: the uncertainty regarding the le-

gal authority to adopt official maps under Michigan law; concern about a taking without just compensation; the cost of preparing such maps; and the use of the master plan or right-of-way plan to accomplish the same objective. However, the Certification of City and Village Plats, P.A. 222 of 1943 (MCLA 125.51), sometimes referred to as the Map Street Act, allows official maps for cities and villages if the community has an adopted master plan. In the act, Certified Plat is the term used for an official map.

Provisions of the Certification of City and Village Plats, P.A. 222 of 1943 (MCLA 125.51).

- Any proposed right-of-way location must also appear in the adopted master plan.
- All property owners whose property is within or abutting the proposed right-of-way must be notified by mail when and where the certified plat will be considered for adoption.
- Subsequent changes to the certified plat require the approval of the planning commission (disapproval by the planning commission requires a two-thirds vote of the entire membership of the legislative body).
- Once a certified plat has been adopted, the planning commission must estimate the time period for acquisition of the property identified.
- Cities and villages are authorized to restrict, by ordinance, the issuance of building permits within the proposed future rights-of-way.
- Variances may be granted by the zoning board of appeals under certain conditions related to property owner hardship.

Source: "Reserving Right-of-Way with Official Maps." *Planning and Zoning News.*

Tools for Providing Transportation Infrastructure

There are many tools available for providing transportation infrastructure:

- Use a Capital Improvements Plan.
- Create official maps.
- Finance infrastructure improvements through special assessment districts.
- Create urban services areas.

Source: Reserving Right-Of-Way with Official Maps. Planning and Zoning News.

Use a Capital Improvements Plan

The CIP is a document prepared by the planning commission to ensure consistency of proposed new public improvements with the adopted master plan. The primary tool used in a CIP is a capital improvements document that lists all new major public facilities such as sewer, water and roads, to be built, substantially remodeled or purchased in a community within the foreseeable future. Capital improvements (sometimes called public improvements) are all major physical facility projects over and above annual operating expenses. These facilities can include: sanitary and storm sewers, water lines and roads. The CIP establishes a schedule or program for each capital improvement project according to its priority in the community. The program also includes cost estimates and identifies sources of financing for each project. A six-year programming period is most commonly used, although the CIP must be updated annually to reflect changing priorities and financial resources in the community. Therefore, it is both a budgetary policy and a planning document. For a CIP to be effective it must be based on a clear understanding of the community's growth and land use objectives. This is best achieved when the CIP is developed in conjunction with the local comprehensive plan, zoning ordinance, and land division regulations.

Ideally, a CIP takes into account the areas of the community where development is both desired and likely to occur when developing project priorities. Unfortunately, many communities neglect to develop the CIP in conjunction with long-range plans and end up making land use decisions based on outside funding opportunities. The result is that capital funds are spent in areas of the community where growth is not taking place.

Under state enabling legislation, the planning commission of cities, villages, townships, and counties have the primary responsibility for reviewing a CIP so that it is consistent with the goals, objectives, and policies of the community's master plan. Often, a special CIP committee, with representation from the planning commission and legislative body as well as the finance and budget departments, is formed to oversee the process. Planning or budget staff generally coordinate the process, reviewing project requests from individual operating departments and preparing the final document.

A formal set of criteria developed by the CIP committee is used to include projects in the document and to set their priorities. After the planning commission formally adopts the completed program, it is forwarded to the legislative body for adoption and inclusion in the municipal budgetary process.

Steps in preparing a CIP

- Define what constitutes a capital improvement project, and projects that are major, infrequent, and nonrecurring.
- Solicit project proposals and appropriate documentation (facility condition, repair/replacement or new

facility, schedule, relative priority) through interviews with various departments.

- Review each project in light of the community's comprehensive plan, development policies, goals and objectives.
- Investigate the financial resources of the community for capital expenditures during the programming period (typically six years).
- Develop a project schedule based on project priorities and available financial resources.
- Select projects for the capital budget year (first year) and those for the multi-year, long-term capital improvements program.
- Conduct public hearing on recommended CIP document and make necessary changes.
- Based on public input, the planning commission and the city council/township board consider action to adopt the CIP.

Source: "Capital Improvements Program." Community Planning Handbook, V-5 –V-8.

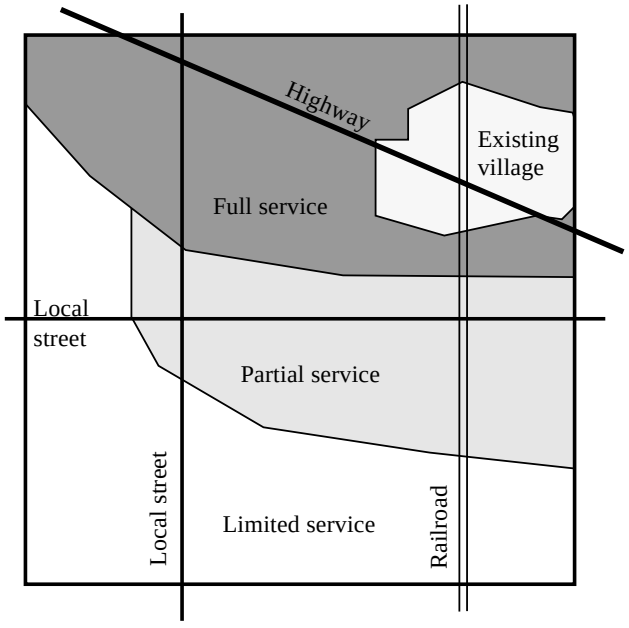
Create official maps

Official maps identify and designate land for future location of public facilities within a community. An official map depicts the locations and right-of-way widths of proposed streets and storm drains and the locations of future parks, fire stations and other proposed public facilities. After its adoption, the issuance of building permits within the proposed future rights-of-way and in locations targeted for future acquisition is usually restricted. The official map is often used to establish setback lines for future street widening. The map serves to guide subdivision design, ensuring that new plats tie into the existing and planned road system.

- Official maps must be coordinated with all planning efforts in the community, including the adopted master plan and public facilities plan.
- An official map should be directly tied to the capital improvements program.
- Official maps are often implemented through adoption of a separate regulatory ordinance which restricts building within designated future rights-of-way.
- Always consult with a professional planner and a municipal attorney before developing an official map.

Source: "Official Maps." Community Planning Handbook, V-9 –V-11.

Figure 36
Urban Service Areas



Source: SEMCOG.

Finance infrastructure improvements through special assessment districts

Special assessments can be an effective tool for financing the cost of infrastructure improvements needed to construct new residential, commercial, and industrial development as well as refurbishing aging infrastructure in older urban areas to promote infill development. It provides a mechanism to finance infrastructure improvements while assuring that the property owners who benefit from the improvements bear the cost of the improvements. Examples of infrastructure improvements financed by special assessment districts are drains, sidewalks, curbs and gutters, road improvements, sanitary and storm sewer improvements, and the like.

Special assessments are an effective approach to addressing the difficulties in financing new infrastructure development during a time of diminishing fund availability. The steps to establish such a special assessment district are the same as those for any other special assessment district. For further details on these steps, see chapter on Enhancing Older Residential Areas.

Create urban service areas

Urban service areas are geographic areas within a community that are designated to have public infrastructure and services sufficient to support development at urban densities. Generally, public infrastructure includes: sanitary sewer, water, drainage and roads. However, it may also include such services as garbage collection, fire and police protection, and parks and recreation. This technique can be an effective tool in managing the location, timing, and extent of development in a community. Through the use of comprehensive planning and regulatory measures, communities can manage growth and development by coordinating land use decision making with provisions for adequate infrastructure.

Table 29
Federal Resources for Capital Improvements

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Funds Are Distributed
Congestion Mitigation Air Quality	Signal systems, ITS, intersection improvements, non-motorized facilities, transportation demand management, transport-ation control measures	$39.6 (Statewide) $23.7 (Southeast Michigan)	Cities, villages, county road commissions, MDOT, public/ private partnerships	Funds awarded based on cost-effectiveness and geographic equity
National Highway System	Construction, reconstruction, resurfacing, restoration and rehabili-tation of the National Highway System, ITS, other operational improve-ments, safety improvements	$196.2 (Statewide)	MDOT	Not distributed to other agencies
High-Priority Projects	All improvements to the roadways and transit systems	Determined by Congress	Cities, villages, county road commissions, MDOT, transit agencies	Funds awarded based on need and merit
Interstate Maintenance	Reconstruction, resurfacing, restoration and rehabilitation	$162.5	MDOT	Not distributed to other agencies
Surface Transportation Program - Enhancement	Landscaping, streetscaping, historic preservation, historic bridges, environmental mitigation	$27.5 (Statewide) Amount varies based on complex variables (Southeast Michigan)	Cities, villages, county road commissions, MDOT, transit agencies	Funds distributed twice annually statewide based on merit by project category
Surface Transportation Program - Flexible	Reconstruction, resurfacing, rehabilitation, operational improvements	$82.6	MDOT	Not distributed to other agencies
Surface Transportation Program - Safety	Safety improvements on roadways; at rail-highway grade crossings; other hazard elimination activities	$1.1 (Annual average award to Southeast Michigan)	Cities, villages, county road commissions, MDOT, transit agencies	Funds awarded based on need. Maximum of $200,000 award per project.
Surface Transportation Program - Rural	Reconstruction, resurfacing, rehabilitation, operational improvements on roads outside urban areas	$3.1 (Southeast Michigan)	County road commissions	Funds distributed to each county based on formula

Table 29
Federal Resources for Capital Improvements (continued)

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Funds Are Distributed
Surface Transportation Program - Urban	Reconstruction, resurfacing, rehabilitation and operational improvements on roads inside urban areas	$56.1 (Urban areas in Southeast Michigan)	Cities, villages, county road commissions	Funds distributed to each urban area based on formula
Transportation Economic Development Fund- Category C	Widening of roads to address congestion in developed areas, also some operational improvements	$20.7 (Macomb, Oakland and Wayne counties)	Cities, villages, county road commissions	Funds distributed based on formula
Transportation Economic Development Fund- Category D	Resurfacing and reconstruction of rural roads to all-season standards	$2.3 (Livingston, Monroe, St. Clair and Washtenaw counties)	County road commissions	Funds distributed based on formula

Communities can direct new development to areas where facilities and services already exist or are planned to be phased in and only permit development when public services are sufficient to support it. For example, it is important that on-site water and sewage disposal improvements, water and sewer lines, or soils that can support a septic system and potable water, are adequate before a development plan is approved. Such an approach not only results in the most efficient use of infrastructure, but also discourages premature development in areas not having adequate services. The use of this technique means that services could be provided in a more timely and cost effective manner while at the same time protecting natural resource areas and preserving community character.

The key to implementing this technique is to base it on the community comprehensive plan. It is beneficial for the land use plan element to contain policies calling for the phasing of development with provisions for infrastructure. The plan map directs higher density development in areas with existing infrastructure or designated to receive infrastructure improvements in the short-term. In areas not having adequate infrastructure and not scheduled for such service in the short-term, development could be permitted but only at low densities (i.e., development that does not require substantial infrastructure). To avoid possible legal challenges it is important to ensure that the service area is large enough to provide a reasonable amount of developable land. Figure 36 illustrates the concept of urban service areas. The map shows a hypothetical community with full service, partial service and limited service areas depicted.

- The zoning ordinance, land division regulations, and capital improvement plan are key regulatory measures in implementing this technique. They need to be modified as follows: The zoning map should reflect the phased development policy in the comprehensive plan by zoning areas with existing facilities for more intensive uses and areas not having infrastructure in place for lower intensity uses.
- Subdivision regulations should tie plat approvals to provisions requiring adequate infrastructure.
- A land division ordinance that deals with lot splits not covered by the State Plat Act should include provisions to ensure that adequate access (roads) is provided before approving lot splits.
- The capital improvements plan (CIP) specifies when, where, and how services will be provided and can be used to phase infrastructure and service development over a predetermined period of time. Priority infrastructure improvements contained in the CIP should coincide with those areas in the community targeted for immediate or near-term development.
- Adopt an “adequate public facility ordinance.” This is a separate ordinance that conditions development approval upon a finding that adequate public facilities are available to serve the proposed development. This ordinance includes quantitative standards for re-

Table 30
State Resources for Capital Improvements

Program	Eligible Projects, Programs and Activities	Available Funds FY 2002 (millions)	Eligible Recipients	How Funds Are Distributed
Michigan Transportation Funds	Operations, maintenance, construction reconstruction, resurfacing of the road and street system	$1,643.2 (Based on CY 2000 revenues)	Cities, villages, county road commissions, MDOT	Based on formula including population, road and street mileage, road classification and tax collections
Transportation Economic Development Fund-Category A (See: http://www.michigan.gov/minewswire/)	Construction and reconstruction of the system to support tourism, forestry, high technology research and mining industries and office centers over	$18.1 (Distribution to program for FY 2002)	Cities, villages, county road commissions, MDOT	Based on jobs and taxes created and/or retained by related economic development
Transportation Economic Development Fund-Category F	Construction and reconstruction of roads and streets	$2.5 (Statewide)	County road commissions, cities and villages of 5,000 or greater in population in rural counties	Based on merit
State Infrastructure Bank (See: http://www.michigan.gov/mdot)	All types of improvements	Varies depending upon available capital	Cities, villages, county road commissions, MDOT, port authorities, and non-profit organizations developing public facilities.	Funds distributed via loan program based on merit

quired public service levels and links development approval to the ability of public services that serve the proposed development to comply with these standards. The findings are based on a set of Level of Service standards for each facility type set forth in the ordinance. There have been opposing views regarding the legal authority to adopt such an ordinance. Therefore, community officials should consult with their municipal attorney.

- Overlay zoning can be used in developing an urban service area. Development proposals in areas with overlay zones would be required to include specified public facilities improvements. These required improvements should be spelled out in the zoning ordinance.
- Coordinate the urban service area program with neighboring communities through voluntary joint planning efforts. The joint use of this technique would be particularly effective between villages, small cities, and adjoining rural townships to direct future development in areas contiguous to existing development and to prioritize areas to guide the rate and direction of future development. The extension of services and the cost of doing so could be accomplished more efficiently.
- Include flexibility in providing infrastructure. Development may be approved in an area currently without adequate infrastructure if the developer agrees to pay for the necessary infrastructure improvements and service extensions.

Case Example

Huron Woods Special Assessment Districts

Community: Flat Rock

Contact: Dennis Mowbry, (734) 782-2455

The city used special assessments to finance $1 million worth of infrastructure (utilities and roads) and streetscape construction in the Huron Woods residential development. The 46-acre parcel contains 74 lots and a 13-acre condominium PUD (planned unit development). The PUD allowed for varied lot sizes and clustering to preserve woodlands and wetlands. The special assessment bond will be paid back on a lot-by-lot basis. Because there are 74 lots, the infrastructure improvement cost will be equal to $13,513 per lot. When a lot is purchased, this amount goes towards retiring the bond.

Urban Growth Staging Plan

Community: Dewitt Township, Clinton County

Contact: Ray St. Pierre or Doug Riley, (517) 668-0270

The township's Urban Growth Staging Plan, an element of the comprehensive plan, is intended to promote an orderly and concentrated development pattern by directing development to those areas of the township that can best be supported by urban services. Conversely, it also delineates those areas that are not suitable for major development within a specified planning period. Development priority areas are established through an urban growth boundary. This boundary represents the approximate extent to which urban types of services and development should occur within the 20-year long-range planning period. Within the urban growth boundary, there are three development stages:

1. Existing/Committed Urban Areas.

   Includes areas of existing urban development and areas of vacant land that are essentially committed to development. Sanitary sewers exist along with some public water. Infill and redevelopment are encouraged. Emphasis is placed on maintaining and upgrading the physical condition of existing residential areas and housing stock through enforcement. High-priority projects in the capital improvements program are recommended to maintain and upgrade existing infrastructure.

2. Primary Stage Urban Growth Areas.

   These areas are intended to accommodate the vast majority of new growth and development over the next ten years. These areas can be served by extension of the existing sanitary sewers and water system. Rezoning must be done incrementally based on the availability of sanitary sewer and public water. New development that will not be served by public sewer or water is limited to low density. The plan recommends that the cost of extension of public water, sanitary sewer, and stormwater lines be paid by the developer, with the township funding any over sizing of such lines. The financing of road improvements should be shared by developers. New development should not result in an excessive expenditure of public funds to provide infrastructure improvements and urban services.

3. Secondary Stage Urban Growth Areas.

   These are areas within the 20-year urban growth boundary that are not intended to support new development until such time that the majority of the primary stage areas are developed or it is determined that a proposed development will not adversely impact the townships ability to provide services. The plan recommends that infrastructure improvements and provisions for public services be programmed as low priority. Development should be low density.

Beyond the urban growth boundary are rural transition/agricultural preservation areas. These areas are intended primarily for agricultural production and rural estate residential development. Urban type development and the extension of services are not recommended until the primary and secondary stages can no longer satisfy projected needs for future development.

The plan recommends the adoption of a land subdivision and utility extension ordinance to tie all division of land to the availability of public water and sewer. The plan also recommends the use of a point system to objectively evaluate the impact of development proposals on the township.

Public Service Districts, Comprehensive Plan

Community: Tyrone Township

Contact: David Kuzner, (810) 629-8631

The township recently adopted a revised master plan which includes a Public Services Strategy. This strategy works hand-in-hand with the future land use strategy and identifies the manner and degree to which public infrastructure and services are provided in the township to support the planned future land use pattern to the year 2010. Public services and related infrastructure include sewage disposal, potable water, roads and highways, police and fire protection, recreation and general government services. The strategy is based on the principle that new developments should occur concurrent with or after the public services necessary to serve an area are in place. It attempts to minimize the opportunities for ur-

ban sprawl and leapfrogging of more intensive urban development into the area of the township planned for short-term agricultural use and long-term rural residential use.

The two public service established districts, rural and partial, prescribe particular levels of public services available to land uses within the district. The Rural Service District includes areas in the township characterized by the lowest existing development densities, limited existing public infrastructure and services, and planned for very low density development. These areas have mostly unpaved roads, no public water and sewer, and limited police and fire services. Land in this district does not require extensive public services and is not likely to require them in the future.

The Partial Services District includes those areas of the township with higher existing development densities, more existing public infrastructure, higher public service levels, and greater potential for a higher density development pattern than the Rural Services District. The level of services intended in this district will be able to accommodate a small degree of urban growth, but not capable of accommodating extensive commercial and industrial uses or high density residential development.

It is recognized that an Urban Services District may ultimately be established in the township. This district would provide a level of public services to accommodate extensive urban development. The regulatory measures to implement the Public Services Strategy are now being developed.

Additional Resources

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Planning and Development Basic Terminology

One purpose of this handbook is to provide local communities specific tools and techniques they can use in their community. However, there are some overarching planning and development terminology that deserves some attention. Throughout the handbook there is discussion of incorporating specific tools into the master plan, regulations, or site plan review process. This section defines these and other basic planning tools.

Master Plan Development

The master plan is an official statement of goals and policies that expresses a vision for the orderly and desirable future development of the community. The plan serves as a long-range vision to guide present day decision-making by the planning commission, other officials, and individuals concerned with the future physical form of the community. A master plan provides the legal basis for the establishment of, and amendments to, the zoning ordinance, subdivision regulations, and capital improvement programs.

The plan serves many functions and can be used in a variety of ways:

1) The plan is a general state of the community's goals and policies and provides a single, comprehensive view of the community's desires for the future.
2) The plan serves as an aid in daily decision-making. The goals and policies in the plan guide the planning commission and elected officials in their decisions on zoning, subdivisions, capital improvements, and other matters relating to land use and development.
3) The plan provides the statutory basis upon which zoning decisions are based. Both the Township Rural Zoning Act (P.A. 184 of 1943, as amended), and the City and Village Zoning Act (P.A. 207 of 1921) require that the zoning ordinance be based upon a plan designed to promote the public health, safety, and welfare.
4) The plan is an educational tool and gives citizens, property owners, developers, and adjacent communities a clear indication of the community's direction for the future.

Basic elements that are incorporated into the master plan include the following:

- Goals and policies
- Future land use plan
- Natural areas and greenways plan
- Historic preservation plan
- Population and housing information
- Transportation
- Existing environment
- Parks and recreation
- Community facilities
- Utility plans
- Capital improvement plans

Source: Michigan Society of Planning. *Community Planning and the Master Plan*.

Changes to the State Planning Laws

Public Acts 263, 264, and 265 of 2001 amend Michigan planning law in several significant ways. The following bullets outline the new planning process set forth in the new acts:

- The new law requires all municipal jurisdictions to first notify neighboring jurisdictions, the county, the region, and any registered public utility company, railroad, or other governmental entities (such as a DDA) of the municipality's intention to amend, revise or create a totally new plan.
- The notice requests the recipient's cooperation in the planning process and asks for the recipient's comments.

Once a draft plan is created and authorized for distribution by the proposing community, the notified entities are asked to review and make comment on the proposed plan.

- The review comments are transmitted to the jurisdiction proposing the new plan. Additionally, the neighboring jurisdictions and the regional planning commission must also send a copy of their comments to the county government within which the proposing municipally resides.
- The county then provides comments, including a two-part consistency review. First, the county must make a statement regarding whether the proposed plan is inconsistent with the neighboring jurisdiction's plan, and second, determine whether the proposed plan is inconsistent with the county's plan, if such a county plan exists.

This amendatory act requires all municipalities to be in conformance by January 9, 2003. The new laws attempt to open constructive communication among neighboring governmental units in an effort to promote more coordinated land use planning.

Source: Michigan Society of Planning.

Michigan Land Division Act

In January 1997, Public Act 591, the Land Division Act, became law. It replaced the Subdivision Control Act and changed the rules on land division in Michigan. Specifically, P.A. 591 changed the Subdivision Control Act of 1967 to do the following:

- Assign a total number of permissible splits to a parcel or tract of land to allow developers to design the splits in any manner permitted by the local municipality's zoning and land use ordinances.
- Change the manner in which land divisions are taken that are exempt from the platting process.
- Provide local review of land divisions that were previously not subject to local review.
- Encourage development of real estate by the use of common driveways and minimize the number of intersections of private drives with public streets and roads. Rewards are given to those who use shared roads instead of creating additional driveway access points on public roadways.
- Control the allocation of permissible splits between grantors and grantees.

Subdivision Regulations

Subdivision regulations govern the process by which lots are created out of larger parcels of land. In guiding the division of land into multiple lots or a plat, subdivision regulations address many factors including grading, erosion control, utility easements, street alignments, circulation, lot size, and emergency access. These regulations ensure that new lots conform with zoning requirements for area, height, setback and density requirements; streets are properly aligned with the broader road system; water, drainage, and sanitary sewer facilities are adequate; the site is not overcrowded; and open space is sufficient for utilities, recreation, light, air, emergency access, and traffic safety. A major purpose of such regulations is to prevent the creation of lots which are "unbuildable" under access controls, zoning requirements or environmental protection regulations.

Source: "Subdivision Regulations." *Community Planning Handbook*. pp. VII-79.

Subdivision regulations establish:

- The administrative review and evaluation procedure for processing preliminary and final plats.
- What must be included in the plat.
- Design principles and standards for lots, blocks, streets, public places, pedestrian ways, and utilities.
- Required improvements, which may include streets, sidewalks, water, sewer, curbs, and gutters.
- Financing and maintenance responsibilities.

Source: *Land Division and Access Controls*. p. 29.

In recent years, site condominium subdivisions have been developed under the Condominium Act, P.A. 59 of 1978 (MCLA 559.1). While the Land Division Act also prescribes an application and review process and uniform standards for proposed plats, it is the locally adopted subdivision regulations that can ensure a more comprehensive

approach in site design, relationship to adjacent properties, and the site review process. Such regulations can contain more strict standards, establish design standards, and address issues relative to the local comprehensive plans and development policies of the community.

In addition to being a site design tool, subdivision regulations, when used in conjunction with the capital improvements program and environmental protection ordinances, can also be an effective growth management tool. Together these tools can discourage premature subdivision of unserviced or natural resource areas and instead, guide land division and development to locations where services are available or planned.

There are several factors to be considered in reviewing proposed subdivisions:

- Major streets align with existing or proposed streets adjacent to the property.
- Avoid residential lots fronting on major roads, which would result in excessive curb cuts.
- Utility lines are properly sized to fit the community-wide system.
- Drainage or other natural hazards will not create problems for abutting properties or for future residents in the subdivision.
- Improvements are sufficient to serve the proposed uses and are of quality of construction to minimize future public maintenance costs.
- Natural features are preserved.
- Size and shape of the lots and blocks are compatible with the proposed uses and meets zoning and land use restrictions.
- Subdivision can be served with necessary public services and facilities.
- Construction timing is in phase with the community's ability to provide services.
- Nature of the site plan is compatible with the neighborhood and community.
- Design of the subdivision creates maximum safety for the future occupants.

Source: *The Practice of Local Government Planning*. p. 391.

Local subdivision regulations should incorporate good design standards and a comprehensive review process. These regulations should encourage flexibility to allow for the protection of natural resources and maintenance of open space.

Condominium Regulations

A condominium is a form of ownership under which a tenant of a dwelling or building holds full title to a unit and joint ownership in the common grounds, including associated land and facilities. The land upon which a condominium development is located remains one parcel as opposed to being subdivided into separate lots. Condominium developments are of two forms– "standard" and "site." The standard form includes only the dwelling unit under individual ownership and either attached or detached units. "Site" condominium developments include both the dwelling unit and an area of land immediately surrounding each dwelling or building unit, referred to as the building envelope. The building envelope is defined by the required building setbacks contained in the zoning ordinance. Site condos are typically single-family, detached, residential complexes which very often look like platted subdivisions once developed. Condominium developments can also include structures that are used for commercial or industrial purposes.

Source: "Condominium Regulations." *Community Planning Handbook*. p. VII-89.

Local regulation of condominiums is authorized under the Condominium Act, P.A. 59 of 1978, MCLA 559.101. The act requires filing specified legal documents with the Michigan Department of Commerce. This statute requires that condominium developments comply with local zoning ordinances. It also prohibits local units of government from treating condominium developments differently simply because of the form of ownership.

Site Plan Review

Site plan review is a process whereby development projects are reviewed by a municipality to determine compliance with provisions contained in the community's zoning ordinance. As defined by Michigan law, a site plan is the document and drawings required by the zoning ordinance to ensure that a proposed land use or activity is in compliance with local ordinances and state and federal statutes. The site plan itself shows the physical layout of a project, including buildings, lot lines, roads, utilities, landscaping, etc.

Site plan review can be an effective and powerful land use decision-making tool. Before approval for a use is granted, the proposed development project must be in compliance with all applicable local, state and federal standards and procedures. Any deficiencies in compliance can result in denying the proposed use for the land. From the local government perspective, site plan review can be used to ensure that development projects are consistent with the goals and objectives and satisfy the policies of the comprehensive plan and that the standards for height, bulk, setback, density, lot sizes, parking, landscaping and other zoning requirements set forth by local ordinances are met. It works well to ensure that the development has a good physical design, that it relates to the presence of the community's infrastructure, that it is compatible with adjacent land uses and that it will not have an adverse impact on the natural environment. It is a tool that can help a community achieve and maintain its desired community character.

Site plan review can be applied to all development projects. State enabling legislation requires local site plan review for subdivision plats, planned unit developments (PUDs), cluster housing and special or conditional uses specified in the zoning ordinance. For other types of permitted uses to be subject to site plan review, the procedures and standards must be spelled out in the zoning ordinance. Such permitted uses may include:

- multiple family,
- site condominiums,
- commercial and industrial uses,
- institutional uses, and
- public projects, such as utilities.

Site plan review should also be required for any changes to existing development, (e.g., expansions, demolition, moving of structures). Individual single family homes are usually exempt from site plan review, requiring only a plot plan which may include drainage provisions for a building permit.

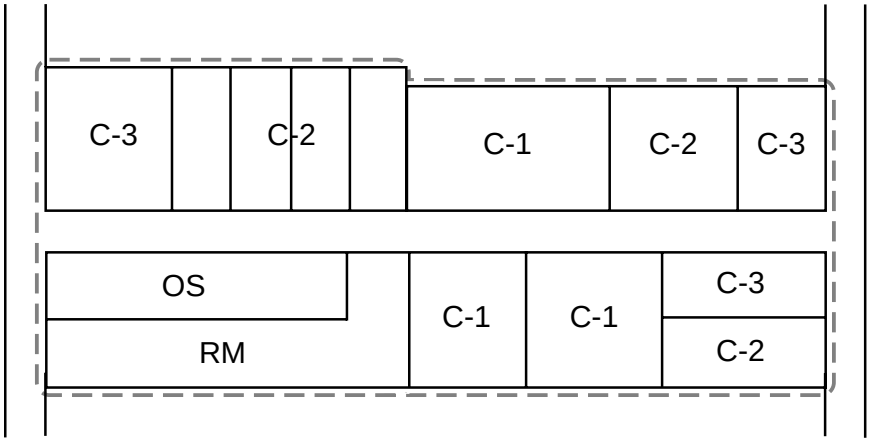
Site plan review should be used in conjunction with other local review requirements, including community impact analysis, traffic impact analysis, soil erosion and sedimentation compliance and environmental impact review. These analyses and reviews should be completed prior to any site plan approval action. They provide information concerning environmental, economic, social, and cultural impacts that proposed development projects may have on the community and allow local officials to make rational decisions on the development requests.

Overlay Zoning

The concept of an overlay zone or district implies that, for a specific area within a municipality, because of some unique characteristic of that area, more than one zoning district regulates development. An overlay can be used as a layer over more than one zoning district. It can even cross municipal boundaries if applied at a multiple-municipal or county level by the participating municipalities. While the underlying zoning district(s) designates basic zoning regulations, such as permitted uses, the overlay district may establish more restrictive development regulations, such as setbacks, design guidelines, signage, buffers, and an additional list of uses. The overlay district regulations will generally prevail over those of the underlying zoning district(s).

For infrastructure planning, overlay districts can be used in a variety of ways for managing concerns related to such things as safety, access, environment, mobility, aesthetics, and land use planning. Examples of layers include a wetlands overlay district and a floodplain district.

Figure 37
Commercial Development Overlay Zone



Overlay zoning can be an effective tool in protecting natural resources and maintaining the vitality of a commercial corridor. The example illustrates the use of a Commercial Development Overlay Zone for properties abutting a highway. In this particular case, the overlay zone could require additional sign controls, enhanced landscaping, and architectural design controls, regardless of the underlying zoning district.

Source: Macomb County Planning and Economic Development.

Incentive (Bonus) Zoning

Through incentive or bonus zoning, developers are encouraged to voluntarily provide amenities such as parks, additional landscaping, plazas, streetscape improvements, or access improvements. In return for the developer's investment in public improvements, the municipality allows a higher density or intensity of development of a site. As alternatives to increasing the amount of development, some communities devise bonuses that reduce development costs, such as reduced parking or setback requirements.

Open Space Zoning/Conservation Design

Open space zoning/conservation design is a zoning technique which allows the preservation of land for recreation and conservation uses, while still allowing full-density development. Such activities include both active recreational uses and protecting farmland, woodlands and woodland habitats, scenic views, and historic sites. Under this technique, subdivisions are required to dedicate a significant portion of the land to permanent open space uses. House lots are sited on the remaining parts of the property, with views of and access to the open space. The open space is typically owned by a homeowner association, land trusts, or the municipality.

In 2001, Michigan passed amendments to the County, City and Village, and the Township Zoning Acts requiring all qualified communities amend their zoning ordinances by December 16, 2002, to provide landowners the option of utilizing open space/cluster development in some residentially zoned areas.

Qualified communities:

- are cities, townships, villages, and counties with a population of 1,800 or more,
- have an adopted zoning ordinance, and
- contain undeveloped land that is zoned for residential development at two dwelling units per acre or less (if no public sewer is available), or three dwelling units per acre or less (if served by public sewer).

The ordinance must allow the same number of dwellings as permitted under conventional zoning, with at least 50 percent of the land to remain undeveloped for townships and 20 percent remain undeveloped for cities and villages.

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www.semcog.org has maps, publications, and databases.

Glossary

Abatement – Any action taken to reduce, relieve, or suppress another continuing action. A tax abatement is a release or forgiving of a certain tax liability for a specific period of time and under certain circumstances.

Access management – A comprehensive process of maintaining reasonable access to adjacent development, while preserving the safe and efficient flow of traffic. Effective access management has many benefits, including increased traffic flow and associated decreases in delay, congestion, and air pollution. Access management can also have a beneficial impact on traffic crashes and crash potential.

Agricultural buffer zoning – A zoning technique that can be used to protect the long-term integrity of prime or unique agricultural lands. A residential/agricultural zone is created in appropriate areas of the community between more intensive development and large tracts of agricultural land.

Arterial road – A road that carries traffic not carried by freeways to important traffic generators, such as airports or regional shopping centers.

Berm – An earthen mound designed to provide visual interest on a site, screen undesirable views, reduce noise, or fulfill other such purposes.

Best management practices (BMPs) – A structural or nonstructural management-based practice used singularly or in combination to reduce nonpoint source inputs to receiving waters in order to achieve water quality protection goals.

Bioretention – A water quality practice that utilizes landscaping and soils to treat storm water runoff by collecting it in shallow depressions before filtering it through a fabricated planting soil.

Blight – Unsightly condition including the accumulation of debris, litter, breaks, rot, crumbling, cracking, peeling, or rusting; dead landscaping characterized by uncontrolled growth or lack of maintenance; and any other similar conditions of disrepair and deterioration regardless of the condition of other properties in the neighborhood.

Brownfield – Abandoned, idled, or underused industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination.

Brownfield Redevelopment Authority (BRA) – Created to clean contaminated sites and functionally obsolete or blighted properties in qualified communities.

Buffer – An area of land, including landscaping, berms, walls, fences, and building setbacks, that is located between land uses of different character and is intended to mitigate negative impacts of the more intense use on a residential or vacant parcel.

Capital improvement plan/program – Establishes a plan for capital investments in a community's infrastructure, which can include sewers, water, storm water, solid waste, transit, and parks and recreation.

Hedgerow – A row of closely planted shrubs, bushes, or any kind of plant forming a boundary or fence.

Illicit connections – Connections of sanitary sewers to the storm sewer system.

Impervious surface – Any hard-surfaced, man-made area that does not readily absorb or retain water, including but not limited to building roofs, parking and driveway areas, graveled areas, and sidewalks.

Infill development – Development or redevelopment of land that has been bypassed, remained vacant, and/or is underused as a result of the continuing urban development process. The areas are usually served by or are readily accessible to the infrastructure provided by the local government.

Infiltration – The downward movement or seepage of water from the surface to the subsoil and/or groundwater.

Large lot zoning – A widely used zoning technique that establishes large minimum lot sizes to discourage non-farm residences because purchase prices are higher than smaller lots.

Local Development Financing Authority (LDFA) – Encourages local commercial or industrial development, prevents conditions of unemployment, and promotes growth.

Master plan – A comprehensive long-range plan intended to guide growth and development of a community. A master plan typically includes analysis, recommendations, and proposals for a community's population, economy, housing transportation, community facilities, and land use.

Mixed-use development – A tract of land, building, or structure developed for two or more different uses such as residential, office manufacturing, commercial, public, or entertainment.

Neighborhood Enterprise Zone (NEZ) – Geographic areas designated for the purpose of fostering improvements in housing stock and helping to stabilize neighborhoods in cities and townships.

Nonpoint source pollution – Sources for pollution that are less definable and usually cover broad areas of land, such as agricultural land with fertilizers that are carried from the land by runoff, or automobiles.

Official maps – Identify and designate land for future location of public facilities within a community.

Open space development – The use of designs that incorporate open areas into a development site. These areas can be used for either passive or active recreational activity or preserved as naturally vegetated land.

Overlay zone – Zoning districts that extend on top of more than one base zoning district and are intended to protect certain critical features and resources.

Planned unit development (PUD) – An area to be planned and developed as a single entity containing one or more residential clusters and one or more public, quasi-public, commercial, or industrial areas.

Principal Shopping District (PSD) – Created to develop or redevelop principal shopping area and to collect revenues, levy special assessments, and issue bonds to pay for its activities.

Quarter/quarter zoning – Zoning that allows one residential non-agricultural lot per 40 acres of farmland.

Retention basin – A natural or man- made holding area for storm water that does not have an outlet to adjoining water courses or wetlands.

Right-of-way – Land or property acquired for or devoted to transportation purposes.

Riparian land – Land that is comprised of the vegetative and wildlife areas adjacent to perennial and intermittent streams. They are delineated by the existence of plant species normally found near freshwater.

Sedimentation – The process of forming and depositing of suspended matter carried in suspension water through the action of gravity.

Septic system – A sewage treatment system that includes a settling tank through which liquid sewage flows and in which solid sewage settles and is decomposed by bacteria in the absence of oxygen. These systems are used for individual home waste disposal where a sewer system is not available.

Setback – The distance a structure must be located from property lot lines or other structures as specified in the local zoning ordinance or plan.

Site condominium – This condominium includes both the dwelling unit and an area of land immediately surrounding each unit, often referred to as the building envelope.

Site plan review – The review of a proposed parcel of land including lot lines, streets, building sites, open space, buildings, major landscape features, and proposed utilities.

Sliding scale zoning – Zoning that limits the number of lot splits allowed in agricultural areas for other than agricultural uses.

Soil erosion – The wearing away of the earth's surface and the transportation of rock and soil debris by wind, rain, or running water.

Special Assessment District (SAD) – Established to help finance capital improvements such as drains, sidewalks, curbs and gutters, road improvements, and sanitary and storm sewer improvements.

Steep slope – An area of land characterized by a change in elevation of fifteen percent or greater but not exceeding 25 percent over the specified distance or contour as specified in an ordinance.

Storm water runoff – Surplus surface water generated by rainfall that does not seep into the earth but flows over land to flowing or stagnant bodies of water.

Streetscape – The visual image of a street, which includes building design and facades, signage, furniture, parking and street design, and landscaping.

Swale – A low-lying grassed area with gradual slopes that transports storm water, either on-site or off-site.

Traditional neighborhood design (TND) – Development characterized by a discernable town center with commons and civic buildings, a variety of housing types, connected streets, and shopping along the edge. Lots are aligned to a grid street system pattern and continuous sidewalks provide convenient pedestrian movement.

Traffic calming – A technique that involves the creation of safe environments for pedestrians and bicyclists through the use of specific design treatments that slow traffic.

Transfer of development rights (TDR) – A program that can relocate potential development from areas where proposed land use or environmental impacts are considered undesirable (the "donor" site) to another ("receiver") site chosen on the basis of its ability to accommodate additional units of development beyond that for which it was zoned, with minimal environmental, social, and aesthetic impacts.

Wetland – An area that is inundated and saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, and bogs.

Woodlands – Land covered with woody vegetation.

Zoning ordinance – An enacted ordinance that controls and regulates land use within a community.

Other SEMCOG Resources

Accessing SEMCOG's Ordinance Index Database

Over the years, the SEMCOG Library has collected ordinances from communities in Southeast Michigan and around the country. In order to better respond to member communities seeking samples of ordinances which they could use as guidelines for revising or developing their own ordinances, SEMCOG has created the Lazar Ordinance Database*.

Using a database, the SEMCOG Library is indexing the ordinance collection. The Index is arranged by topic and currently includes more than 5,000 items on approximately 700 topics; this is an ongoing project with new items indexed weekly. In addition to actual ordinances from other communities, the database indexes articles from newspapers, journals, and magazines, as well as books that are related to specific ordinances including subsequent litigation. The ordinances cover everything from abandoned housing to yard sales.

Searches of SEMCOG's Lazar Ordinance Database are available to SEMCOG members only, free of charge.

For further information on how this service may assist your community, contact SEMCOG's Librarian, Amanda G. Polanco at (313) 961-4266.

*The SEMCOG Ordinance Database was dedicated on September 20, 2002 in memory of Pamela L. Lazar, Librarian and Coordinator of Information Services from 1978-2002.

Accessing the Local Government Information Network (LOGIN)

Many local governments are facing similar challenges in all types of issues including land use planning and regulation. At the same time they are being asked to do more with less. Some communities have been able to successfully address some of these challenges. To find out who they are and what they did, SEMCOG has obtained access to a nationwide database called LOGIN, the Local Government Information Network.

The LOGIN database includes solutions from thousands of other local units of government on subjects ranging from cemeteries to police and fire service. It contains more than 40,000 documents, each describing a solution to a local government challenge, a conference available, a noteworthy publication, or other valuable data.

SEMCOG makes this service available to its members only, free of charge. A member government may call for information on a topic in the morning, and by that afternoon be mailed not only the information on the topic contained in the LOGIN system, but also information from SEMCOG's Library.

For further information on how LOGIN may be of use to you, contact SEMCOG's Librarian, Amanda G. Polanco at (313) 961-4266.

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