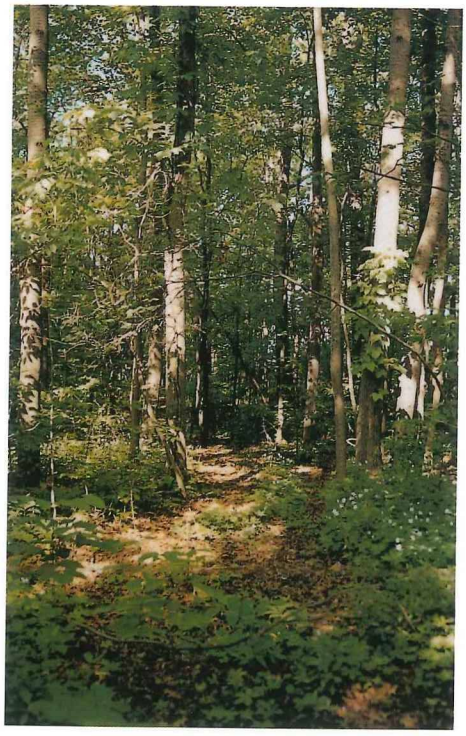
Chapter V Tools and Techniques



Chapter V. TOOLS AND TECHNIQUES

Introduction

One of the goals of the S&H Project is to identify and develop tools and techniques that conserve natural resources and create open space linkages while allowing for economically viable development. This chapter addresses that goal. There are three categories of tools and techniques addressed in this chapter

1.) Planning Support

A) Community Plans
- a. Master Plans
- b Capital Improvements Plan/Expenditures
- c Area/Special Purpose Plans
- d. Parks and Recreation Plans

B) Intergovernmental Cooperative Measures

C.) Growth Boundary/Service Areas

2.) Regulatory Measures and Site Design Techniques

A.) Large Lot Zoning
B.) Lot Averaging/Lot Sizes
C.) Site Plan Review Standards
D.) Overlay Zones
E.) Planned Unit Development
F) Clustering/Open Space Regulations
G) Woodland Regulations
H.) Wetland Regulations
I.) Floodplain Regulations
J) Stormwater Management/Impervious Surface Regulations
K) Steep Slope Regulations
L.) Development Agreements
M.) Subdivision Control Ordinances
N.) Traditional Neighborhood Development
O.) Native Landscaping/Landscape Restoration
P.) Roadway and Street Tree Preservation
Q.) Infill Development

3.) Open Space Acquisition and Protection

A.) Land Trusts/Conservancies
B.) Open Space/Conservation Easements
C.) Transfer of Development Rights (TDR)
D) Purchase of Development Rights (PDR)
E.) Land Acquisition
F.) Donation
G.) Private Restriction· Subdivision Deed Restrictions and Condominium Documents
H.) Land Banking
I.) Wetland Mitigation and Banking

J.) Natural Areas Registry
K.) Public Private Partnerships (PPP)
L.) Michigan Natural Features Inventory

In addition, a Community Evaluation was done, which analyzes the extent to which each S&H Project community employs these various tools and techniques. The Community Evaluation portion is in the Appendix titled Literature Search Report 5.1.

1.) Planning Support

Planning Support, the first category, addresses planning tools and techniques that are implemented at the local or regional level, and are tailored to address the specific issues and concerns of a defined area.

The Planning Support section is divided into three subsections.

- **Community Plans:** those plans which are conducted at a local level, encompass a defined area, address several types of issues, and are carried out to coordinate community development

- **Intergovernmental cooperative measures:** the coordination of goals and management in order to optimize scarce resources and to ensure that various agencies are not working against one another.

- **Growth Boundary/Service Areas:** geographic delineations within a community that are designated to have public infrastructure and services sufficient to meet the urban densities.

A.) Community Plans

Community planning is a process for coordinating community development. Community plans attempt to address issues ranging from environmental, social, cultural, political, physical, to economic issues within an area. They also attempt to coordinate a planning effort that can be local or regional in perspective. The following are descriptions of various types of community plans.

a. Master Plans

One of the most common type of community plan is the Master Plan. Also known as comprehensive planning, master planning establishes the basis or framework of community planning. It is a process that seeks to consider all relevant factors that currently, or in the future, may influence community growth or decline. A master plan encompasses a broad array of elements (sometimes separate plans) for achieving local goals, and covers a broad scope of community issues. It is the community's vision of the future, which can include meeting the goals and principles of the S&H Project.

As part of the S&H Project, lands to be preserved have been inventoried, mapped, and evaluated. All community master plans within the study area should coordinate the inventory and analysis of sensitive areas within their boundaries. Model policies and recommendations have been developed which foster their preservation. These model policies are provided for the consideration of the communities to incorporate into their Master Plans. Municipalities can

benefit from a coordinated approach to the implementation of preservation techniques where overlap occurs and common problems exist.

Model master plan policies are included in *Chapter VI* For an example of master plans, please see Literature Search Report 5 0, II.D. Literature Search Report 5.0 is in the Appendix

b. Capital Improvements Plan/Expenditures

Another type of community plan is the Capital Improvements Plan/Expenditures. A capital improvements plan (CIP) establishes a community's priorities for new major public facilities to be built, substantially remodeled, or purchased within the foreseeable future. A CIP establishes a schedule or program, for each capital improvement project according to its priority in the community. It should be used to coordinate the activities of various departments within the community, as well as agencies outside the community A CIP should also reflect the changing priorities and financial resources of a community.

The CIP is a very important tool that a community has to ensure that proposed public improvements are consistent with the adopted master plan and goals of the community. The CIP can be used to identify capital outlays that are spent by the local unit of government, as well as other levels of government that support or vary from resource protection goals.

Capital improvement plans can also be used to identify problems that cross municipal or jurisdictional boundaries Coordination of CIP activities with similar activities in neighboring and overlapping jurisdictions can result in the sharing of costs and area-wide benefits

For an example of Capital Improvement Plans, please see Report 5.0, II G

c. Area/Special Purpose Plans

Area or special purpose plans focus on a geographic area identified in the comprehensive plan as requiring special attention, such as commercial corridors, highway interchange areas, historic districts, or areas requiring resource protection. Areas including or in proximity to resource sites can provide more focused attention on addressing and implementing resource protection goals.

An example of an area or special purpose plan would be a greenway plan. Greenway plans focus on corridors of land recognized for their ability to connect people and places These plans identify ribbons of open space within linear corridors that are either natural, such as rivers and streams, or manmade, such as abandoned railroad beds and utility corridors Greenways identified in greenway plans act as vegetative buffers that serve to protect natural habitats, improve water quality, and reduce the impacts of flooding in floodplain areas. Most provide routes for alternative transportation, and improve the overall quality of life in an area.

Greenway plans can be regional in scope, and therefore can be multi-jurisdictional. They provide communities with a regional vision, and they help identify what lands must be acquired to make the greenway complete in a local and regional context. Another unique quality of a greenway plan is that it takes a team approach to look beyond the boundaries of each community.

For an example of Area Plans, please see Report 5.0, II.I. For an additional example of Greenway Plans, please see Report 5.0, V.A.

d. Parks and Recreation Plan

The parks and recreation plan is an expression of a community's objectives, needs, and priorities for the provision of leisure space, services, and facilities. This plan should provide a guide for public policy and private decisions related to the scope, quality, and location of leisure opportunities to meet the needs of residents and visitors.

Frequently, parks and recreation plans solely emphasize physical development of park space. However, integrating such plans with the S&H Project goals and principles can provide a long-range, comprehensive, and policy-oriented document. Parks and recreation plans can: 1) describe alternatives, recommendations, and guidelines for public and private decisions related to the use and preservation of open space for passive or less intensive recreational use and, 2.) make recommendations for acquisition, development, and management of both public and private spaces

Advantages:

- Provides the policy basis for decision-making.
- Reflects the wishes and the attitudes of the community.
- Inventories current conditions.
- Proposes alternatives based on current conditions and future need
- Acts as a reservoir of information: contains maps, inventories, and land use policy in one document.
- Details a plan on how to attain a preferred future.
- Plans for and schedules public improvements

Disadvantages:

- The plan is policy not law.
- Must be updated periodically to reflect changes.
- Must be coordinated with adjoining jurisdictions, and county and state agencies. Otherwise, region wide opportunities and savings will be lost
- Some more regional in focus, making it difficult to coordinate efforts.

For an example of Parks and Recreation Plans, please see Report 5.0, II.E.

B.) Intergovernmental Cooperation

Oftentimes, local governments can achieve a common goal by joining together and pooling scarce resources. Intergovernmental cooperation is a good tool to address natural resource protection due to the fact that natural features are often located across governmental boundaries. A formal cooperation agreement can be established with exact operational and financial details for providing a service or program. The contents of the agreement will vary, but typically include: purpose, duration, establishment of a board/commission, formula for computing each municipality's contribution for capital and operating expenses, and method for allocating revenues and costs.

Communities have great flexibility in the use of intergovernmental cooperation agreements. Some typical examples include the following: joint operation of municipal services, joint fire or police departments/joint service agreements, joint administration of zoning ordinances, joint public transportation systems, and creation/maintenance of parks and trail systems. Agencies that are eligible for participation in such agreements include local governments, special/multi-purpose districts, school districts, state or federal governments, and any of their agencies or subdivisions.

Intergovernmental cooperation is especially important in the S&H Project study area because there are several separate municipalities and other governmental agencies that operate in the region and affect the area's environmental health

Advantages:

- An intergovernmental agreement allows great flexibility in establishing joint agreements, for the provision of services and programs, between any governmental agency on the local, regional or state level
- Agreements are locally negotiated to fit specific local needs
- Because agreements, including the powers and duties assigned to a new board/commission, are locally negotiated, communities can safeguard against a loss of local control.

Disadvantages:

- Local units may perceive a loss of control or autonomy in such agreements
- Board/commission established cannot issue revenue bonds

For examples of Intergovernmental Cooperation, please see Report 5.0, V.C.

C.) Growth Boundary/Service Areas

Growth boundaries/service areas are geographic delineations within a community that are designated to have public infrastructure and services sufficient to meet the urban densities These boundaries/areas are created to identify the outer limits of growth, encourage redevelopment within the boundary, and promote the preservation of farmland and open space outside of the boundary. With appropriate design, growth boundaries/service areas ensure that development is directed into areas that can support higher densities and away from sensitive lands. Both techniques can be applied at varied scales, ranging from a Township to a Village.

The zoning ordinance, land division regulations, and capital improvements program are key regulatory measures in implementing this technique Additionally, an "adequate public facility ordinance" can be adopted that conditions development approval upon a finding that adequate public facilities are available to serve the proposed use.

Advantages:

- Ensures that the municipality does not have to extend the existing infrastructure to outlying developments.
- Infrastructure can be provided to outlying developments only if the developer pays the necessary expenses.
- Maintains development within the boundaries/areas without creating unnecessary sprawl.

Disadvantages.

- To be most effective, additional coordination with adjacent communities should be made prior to adopting the boundaries/areas.
- May limit the tax base expansion opportunities for the community.
- Increases the cost of developing within the community.

For an example of Urban Growth Boundaries, please see Report 5.0, V.E.

2.) Regulatory Measures and Site Design Techniques

Introduction

Regulatory measures and site design techniques are tools and techniques that local governments can implement through their planning policies and zoning ordinances. These tools and techniques direct the design of new development in a way that is least disruptive to the natural environment, optimizes preservation of natural features, and creates an aesthetically pleasing landscape While the emphasis of the S&H Project has not been to implement legal and binding restrictions, the following regulatory measures and site design techniques can be adopted by local communities to help support the S&H Project's goals.

A.) Large Lot Zoning

Large lot zoning is intended to provide for the compatible coexistence of low density residential uses, agricultural uses, and valuable natural resources.

The principal purpose of most large lot zones is to provide some land in the community for a permanent rural residential lifestyle. This lifestyle is one of a full range of lifestyles offered in a community through development codes and land use plans balanced with other lifestyles necessary for the full economic functioning of the locality

The current trend in large lot zoning has been for the minimum lot area to decline from 5 and 10 acres per lot to 1 to 2 or 3 acres, most commonly only 1 or 2 acres. The decline in lot size has been accompanied by a decline in the number of large lot zones in zoning codes from 3 to 4 such zones to one zone. This is in response to an increased acceptance and use of exclusive farm zones and to the exclusionary issue.

The single large lot zone is positioned in the zoning code between an exclusive agricultural zone and the conventional district that accommodates single family uses/subdivisions with 1 acre lots or smaller.

Advantages·

- Preserves the character of the rural countryside.
- Can reduce the need for services and utilities.

Disadvantages·

- May be viewed as exclusionary.
- Final land use pattern can be unsuccessful - may lead to re-divisions of larger parcels.
- Agriculture is heavily restricted in large lot zones, unless specifically dedicated to agriculture.
- Can lead to a fragmenting of the landscape.

For an example of communities with large lot zoning, please see Report 5.0, II.A.

B.) Lot Averaging/Lot Sizes

Lot averaging permits one or more lots in subdivision to be undersized, providing the same number of lots in the same subdivision are oversized by an equal or greater area. Lot averaging is a technique that has been frequently overlooked as communities adopt more sophisticated

cluster or open space development regulations However, it can be used as a "scaled down" version of clustering to address situations that may not warrant requiring the submission of more extensive cluster plans.

Lot averaging has particular applicability to the headwaters area, especially in communities with large lot zones. It is also a technique that may be used with land divisions in order to offer a more simplified version of clustering. Allowing lot sizes to be averaged over an entire site offers flexibility to adjust lot sizes where resource protection goals are met Providing the incentive of downsizing certain lots should be coupled with certain requirements for open space protection.

Advantages:

- Communities are free to choose the range and variety of lots to fit the market.
- Lot averaging as part of the land division process solves lot size/design problems that are not allowed under regular zoning regulations
- Varying the size of lots allow the developer to take into consideration natural amenities such as topography and other environmental features and constraints.

Disadvantages·

- Too wide a range of lot sizes may be difficult to administer for some communities
- May require a trained staff and more administrative oversight

Model lot averaging ordinance language is included in *Chapter VI* For an example of communities that employ lot averaging/lot sizes regulations, please see Report 5.0, II.A.

C.) Site Plan Review Standards

Site plan review can be an effective 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. From the local perspective, site plan review can be used to ensure that development projects are consistent with the goals and principles of the S&H project. Furthermore, the site plan review process can be used to implement more specific objectives of resource protection, provided the appropriate standards are incorporated in a community's ordinance.

Advantages·

- Incorporates design considerations into development review
- Provide a regulatory framework for development review.

Disadvantages:

- Requires the use of professional assistance and well informed reviewers to be effective and to avoid exposing the community to liability.
- Site plan review standards are not self-administering like conventional zoning standards.

Model site plan review ordinance language is included in *Chapter VI.* For an example of site plan review standards employed by communities, please see Report 5.0, II.H.

D.) Overlay Zones

Overlay zones are special districts that supplement, but do not replace, the existing applicable zoning regulations. Overlay zones can be used for any number of objectives, ranging from commercial corridor improvement to river protection efforts. Overlay zones are especially useful

when an area containing unique opportunities or constraints is under several different zoning designations. Important elements of overlay zones for natural resources protection include: protection of vegetation and trees; setbacks from sensitive areas such as wetlands and streams, percentage requirements for open space preservation; and avoidance of critical habitat areas.

Advantages.

- Boundaries may be fit to the target area without consideration of property lines or land use.
- Fills gaps where standard controls are ineffective.
- A simple way to allow mixed use development within the confines of conventional zoning
- More politically expedient than rezoning or revamping the entire regulatory system.

Disadvantages:

- Can fragment the regulatory process.
- Adds another layer of regulation and review.
- If not carefully structured, can create conflicting regulations or make the reasonable use of property very difficult.

Model overlay zone language is included in *Chapter VI.* For an example of overlay zones created by communities, please see Report 5.0, II.A.

E.) Planned Unit Development

The Planned Unit Development (PUD) process is an alternative to conventional rezonings. It combines project elements such as housing, streets, open space, recreation areas, and commercial/office uses into a functional unit that is integrated with the natural features of the site

PUDs allow for developer flexibility while meeting overall density and land use goals. PUDs can allow for a mix of land uses, reduction of lot size, increase in height, or other waivers from conventional zoning regulations in exchange for some public benefit. PUDs have been used to promote historic preservation, open space preservation, affordable housing, and other community goals.

The planned unit development is a common regulatory tool available to local municipalities that allows them to preserve sensitive areas and open space. The potential flexibility and emphasis on resource protection has particular applicability to the S&H Project. It enables local municipalities within the study area to negotiate with developers in order to create a compatible relationship between the built and natural environment

PUDs may be used to preserve open space, natural features, and farmland by permitting sufficient flexibility in the development process to allow significant land areas to be set aside for preservation. For example, most open space in a conventional zoning district is in the yard of each individual lot or in a park. A PUD offers the opportunity to provide the same mixture of land uses without the need for individual rezoning, resulting in a much more coordinated compatible plan. Some communities include a density bonus depending upon the extent of the public benefit.

Advantages.

- Provides opportunities for creative, quality design.
- Creates larger areas of open space rather than just lot-by-lot development
- Preserves natural features, advances environmental protection, improves drainage, provides for better housing sites.
- Allows greater administrative discretion and negotiation between the developer and community.

Disadvantages:

- PUDs are not self-executing, like conventional zoning standards.
- May draw Political opposition due to lack of understanding and contemporary views on density.
- Can create small pockets of development that are inconsistent with the rest of the community.
- Requires considerable technical planning support.

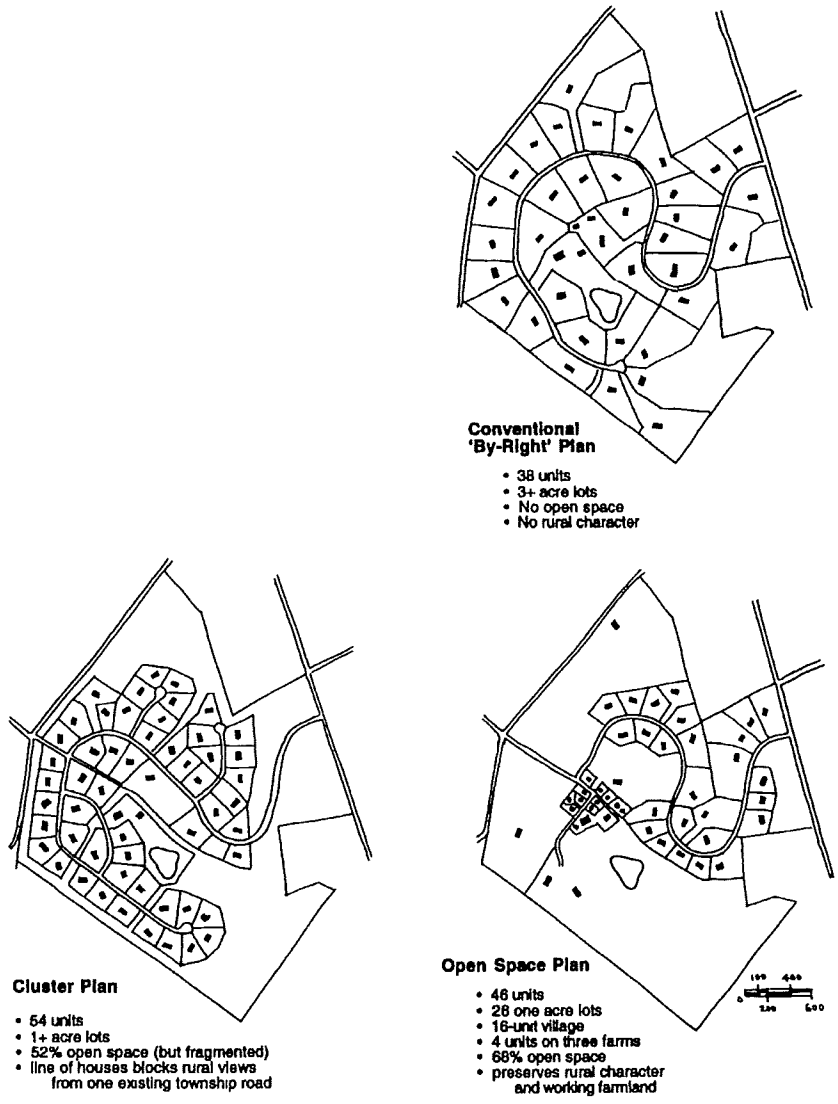
Model planned unit development ordinance language is included in *Chapter VI.* For example of existing PUDs, please see Report 5.0, II.A.

F.) Clustering/Open Space Regulations

Open space/cluster option provisions are becoming more common in zoning ordinances as a means of varying the usual pattern of development. Known under a variety of names -- open space development, clustering or cluster development, conservation development, open space zoning or rural clustering -- this option is a technique that encourages grouping homes in those areas of a development site that are best suited for development Open space development does not increase the development density permitted by the individual district, unless incentives are provided to do so It allows only the development that would be permitted under conventional zoning regulations, but allows that development to be placed on a smaller portion of a site. Often large parts of a site are permanently protected open space, protected by a restoration covenant or, in some instances, deeded to a non-profit land trust or the township

This design technique is particularly suited to the S&H Project because residential units may be located away from the roadway view, out of sensitive environmental areas, and cultural features or agricultural land may be preserved. Also, the reduced impervious surfaces, a result of utilizing a smaller portion of the site, directly influences surface water runoff, and by extension, water quality.

This technique generally applies to developments that contain unique natural or cultural features. Density bonuses may be granted in order to encourage this type of development, but are not necessarily needed since clustering can reduce a developer's construction costs for road paving, grading, etc.



(adapted from Arendt, Rural by Design, p 227)

Advantages:

- Provides opportunities for creative, quality design and preservation of open space.
- Creates larger areas of open space rather than just lot-by-lot development.
- Preserves natural features, advances environmental protection, improves drainage, and provides for better housing sites.
- Allows greater administrative discretion and negotiation between the developer and community.
- Reduces development costs by maintaining overall residential density developed over a smaller area

Disadvantages:

- Political opposition due to lack of understanding and conventional views on density.
- Requires considerable technical planning support.

- Does not provide open space linkage beyond the property
- Can be misused to set aside areas that are not highly valuable or developable

Model clustering regulation language is included in *Chapter VI* For an example of clustering regulations employed by communities, please see Report 5 0, III.A and IV.B.

G.) Woodland Regulations

Woodland regulations aim to protect, preserve, and ensure proper maintenance of woodlands located in a community. Woodland regulations seek to promote development that minimizes impacts on a community's woodland resources. Woodlands serve many valuable functions including providing wildlife habitat, protecting against erosion and sedimentation, buffering against noise, and cooling and cleansing air. They also provide an important element of community character. Protection of woodlands is most acute in rapidly urbanizing communities where significant losses of wooded areas are dramatically changing the character of the communities.

Woodlands are one of the most visible natural resources that can be easily identified by most individuals They are also the most recognizable and common resource that crosses all municipal boundaries in the headwaters study area. Under the woodland canopy other sensitive areas are often found - wetlands, streams, sensitive soils, unique land formations, vernal pools, endangered fauna and flora, and an irreplaceable microclimate created by the shade of the trees.

Woodland protection ordinances are generally intended to preserve community character by limiting the clearing of large stands of trees. This is different from landscaping requirement regulations, the usual intent of which is the planting, protection, and establishment of care standards of street trees that are usually located on public property. Large stands of trees are still a prominent natural feature in the S&H Project area, and would benefit from woodland protection The requirements of woodland protection ordinances are easily linked to, and can be enhanced by, other regulatory measures in the zoning ordinance, such as planned unit developments or cluster development options.

Advantages·

- Helps retain rural or community character
- Protects the natural functions of trees.
- Contributes to the quality of life through aesthetics.
- Increases property values.
- Preserves wildlife habitat.

Disadvantages.

- Can be viewed as anti-growth
- If too restrictive can be viewed as a taking.
- Can increase the cost of private development.

Model woodland protection language is included in *Chapter VI.* For an example of woodland regulations within communities, please see Report 5.0, II.B.

H.) Wetlands Regulations

There are federal and state programs that protect wetland areas both through acquisition and regulation. The Michigan Department of Environmental Quality (MDEQ) administers the Natural Resources and Environmental Protection Act of 1994, Act 451. The U.S. Army Corps of Engineers regulates fill activities in wetlands areas adjacent to the Great Lakes, pursuant to the Clean Water Act and fill and dredge activities in navigable waters of the U.S. pursuant to Section 10 of the Rivers and Harbors Act. The Michigan DEQ coordinates permitting through a joint process for wetlands that fall under mutual jurisdiction

Some communities are enacting local wetland ordinances to fill the gaps in state and federal legislation and exemptions The Wetlands Protection Section of Act 451 states that local governments can adopt more restrictive regulations for wetlands than contained in the act. However, local governments are advised to contact MDEQ early in the process to ensure coordination

Some principal objectives of local wetland regulations are to.

- Prevent filling, dredging, alteration, or removal of material from a wetland area.
- Prevent alteration to drainage patterns that may affect a wetlands system.
- Provide a protective, natural greenbelt around wetlands
- Prohibit deposition of any material - including hazardous chemicals, non-biodegradable aquatic pesticides, herbicides and fertilizers - into, within or upon the wetland or the greenbelt buffer area adjacent to a water body or wetland area

Wetland regulations are essential to the S&H Project. Wetlands are instrumental in maintaining water quality, and are important habitat for numerous forms of wildlife.

For more tools and techniques specifically addressing wetland issues, also see "Wetland Mitigation and Wetland Banking" under *Open Space Acquisition and Preservation Incentives*

Advantages·

- Preserves open space, wildlife habitat, and unique and endangered vegetation.
- Provides natural retention and purification of runoff water.
- Provides groundwater recharge.

Disadvantages:

- Wetland regulations can be viewed as anti-growth.
- Takings issues may arise

Model wetlands regulation language is included in *Chapter VI.* For an example of communities with wetlands regulations, please see Report 5.0, II.B.

I.) Floodplain Regulations

Floodplains are the areas adjacent to riparian corridors that are susceptible to flooding due to their relatively low lying topography. Floodplain regulations seek to modify the susceptibility to flood damage and disruption by avoiding dangerous, uneconomic, undesirable, or unwise use of the floodplain.

Regulations potentially have the greatest impact on flood loss reduction than any other single floodplain management tool, and have been widely used over the last 15-20 years. Development that conforms to the regulations is less prone to flood damage than pre-existing development.

The most widespread floodplain regulations are the minimum requirements of the National Flood Insurance Program, which must be enacted and enforced by communities participating in the program The minimum regulations vary depending upon the risk of flooding as determined by studies and mapping that have been done in a community Minimum regulations may include.

- Permitting for all proposed development;
- Reviewing subdivision proposals to assure that they will minimize flood damage;
- Anchoring and flood proofing structures to be built in known flood prone areas,
- Safeguarding new water and sewage systems and utilities from flooding, and
- Enforcing risk zone, base flood elevation, and floodway requirements after the flood insurance map for the area becomes effective.

Advantages:

- Protects against human injury and property damage associated with flooding
- Protects unique and diverse riparian habitat.
- Helps retain the natural character of a stream or river system.
- Helps reduce the need for costly flood damage prevention measures.
- Presents opportunities for trails and related recreation development.
- Protects against reduced property values.

Disadvantages.

- May be perceived as an infringement on personal property rights
- Many people may not respect, or be aware of, the damage and injury that can be inflicted by floodwaters; not viewing floodplain regulations as a critical public safety issue.
- The term "100-year flood" seems to connote that the threat of a flood is remote.

Model floodplain regulations language is included in *Chapter VI.* For an example of communities with floodplain regulations, please see Report 5 0, II.B

J.) Stormwater Management/Impervious Surface Regulations

Stormwater management addresses water that falls directly onto properties. Storm drainage systems have historically been constructed in urban and agricultural areas to remove excess rainfall and pass it on to downstream properties. A significant problem occurs when vacant or agricultural land is developed. Large areas are paved with roof, roads, and parking lots, thus contributing to additional runoff. Often, development is placed within natural drainage ways The pre-existing stormwater network becomes inadequate for its new urban uses, resulting in localized flooding.

As the percentage of impervious surfaces increases on building lots or sites, rain drains from sites at a faster rate and at a greater amount. The increased runoff exceeds the natural capacity of downstream areas to receive the rate and volume of stormwater draining from these sites when they were undeveloped.

The percentage of impervious surface increases significantly as undeveloped and rural local drainage areas become urbanized The accumulation of developed building lots with impervious

surfaces increases storm drainage from higher to lower areas within the drainage area. This increases the possibility of flooding in lakes, ponds, rivers, and streams downstream, potentially impacting wetland areas, and increasing the probability of the flooding of yards, streets, basements, and houses within the urbanizing drainage area. In addition, the water heats up as it runs over these impervious surfaces and picks up oil, car fluids, and debris. These contaminants and warmer waters can have a significant negative impact on water quality, wetlands, and other sensitive natural areas

Because many of the stormwater management problems today are related to development, communities seek to minimize damage and public costs by enactment of local stormwater regulations Some communities have successfully included soil erosion and sedimentation control as part of their stormwater management ordinances. The stormwater management ordinance should require the review of site plans for proper drainage and stormwater management. Stormwater management is essential to water quality and the health of riparian corridors For this reason, this tool is of great importance in the watershed preservation area.

Establishing stormwater drainage districts within the community, perhaps tied to the watersheds and subwatersheds, can be effective in managing stormwater runoff and protecting water quality in a systematic way Within each district, there could be large, shared retention basins (serving more than one development) or a combination of both on-site and area-wide retention basins based on the land and groundwater characteristics of each district. Larger, area-wide stormwater retention basins could be combined with a wetland banking program to form an integrated, effective stormwater management system

Planning and Regulatory Considerations·

- Determine watershed boundaries and use as basis for stormwater management planning.
- Stormwater management plan must address existing runoff, erosion characteristics, condition of water resources, soil characteristics, slopes, detention areas, and natural features to be protected, as well as existing conditions and strategies for handling future development.
- Establish area-wide systems and require developers to pay a portion of the area-wide retention facility and its maintenance.
- New development should minimize the amount of impervious surfaces, and any increase in flows resulting from development should not adversely impact surrounding properties.
- Require a stormwater management review as part of the site plan review process.

Closely related to stormwater management is the issue of imperviousness of surfaces. Impervious surface regulations are currently and commonly accomplished under the term "Lot Coverage" in zoning codes. The term "Maximum Lot Area as Impervious Surface" or some other derivative is slowly replacing the term "Lot Coverage" which traditionally applied to coverage of a lot by buildings and other structures.

Maximum impervious surface requirements are most commonly represented as a percentage in zoning codes. The percentage of lot coverage ranges from 15-40% in large lot and estate single-family zones (1-3 acres in size) with 20% typical. Lot coverage ranges from 20-50% in 1/2 acre to 6000 s.f lots, with 20-30% typical in zones with 1/2 acre lots and 40% in zones with smaller lots. Percentage of allowable lot coverage by impervious surfaces typically rises as density increases or the lot size decreases.

Non-residential lot coverage is about 50-80% in neighborhood commercial zones, with 70% typical; 50-70% in light industrial zones, and office/industrial park zones.

Standards for Impervious Surfaces-Maximums from Research Sources

District	Size	Range	Typical
Single Family			
Large Lot/Estate	1-3 Ac.	15-40%	20%
Other	1/2 Ac.-6,000 s f	20-50%	20-30% in 1/2 Ac , 40% in smaller.
Multiple Family			
Two Family	---	40-70%	45%
Medium Density		45-60%	---
Higher Densities	---	70-85%	---
Townhouse/Apt.	---	30-45%	35-40%
High Rise Apt. ---		35-45%	---
Urban High Density/Central City - no limitation or use FAR			
Non-Residential			
Neighborhood Com	---	50-80%	70%
Light Ind. Office Pk	---	50-70%	---

Advantages:

- Helps promote water quality and natural resource protection by reducing the amount of pollutants reaching surface waters.
- Helps reduce or control the amount of eroded material reaching natural watercourses.
- More cost effective than piecemeal or emergency measures.
- Helps reduce costs of public improvements associated with transporting stormwater.
- Reduces flooding problems.

Disadvantages:

- Increases the costs of new private development.
- May increase public costs up front, but reduces them in the long run. It may be difficult to communicate what is saved in terms of reduced property damage
- May increase administrative cost for permits and inspections.
- Requires high maintenance such as regulating clearing to make sure the system does not clog up over time

Model stormwater management regulations language is included in *Chapter VI.* For an example, please see Report 5.0, II.I.

K.) Steep Slope Regulations

Slopes in land surfaces offer attractive areas for development, but steeper slopes may require protection. The stability of slope depends on its unique combination of vegetation, climate, soil, and underlying geology. In general, the steeper the slope, the more sensitive it is to change Some steep slopes are relatively stable and can remain so with the proper regulation of the extent and character of development. Others, however, are geologically unstable or environmentally valuable, and therefore should be retained in their natural state. The following techniques should be considered in preparing slope protection regulations.

- Identify steep slopes using USGS maps or other sources and map them for your community.
- Include specific policies in the comprehensive plan
- Adopt a slope overlay zone and apply certain flexible development/protection standards based on the degree of slope.
- Include slope protection/use provisions through special land use, planned unit development or site plan review regulations
- Include slope retention/protection requirements in the subdivision control ordinance to address slope concerns when land is divided.

Advantages:

- Protects vegetation, unique habitat, and soils that are sensitive to erosion.
- Prevents against property loss or damage.
- Preserves community character.
- Preserves natural drainage pattern, reduces runoff.

Disadvantages.

- Local ordinances may increase administrative costs
- Regulations may be viewed as an imposition on private property rights.
- Enforcement can be sporadic and difficult without properly trained staff.

Model steep slope regulations are included in *Chapter VI.* For example of communities with steep slope regulations, please see Report 5.0, II.B.

L.) Development Agreements

Development agreements can be used to restrict some future uses of property, and are generally developed prior to the approval of a site plan. Development agreements ensure that both ordinance requirements and other mutually agreed to items are enforced and may include the following: architectural character, maintenance agreements, and other natural and built environmental issues. Development agreements may also be associated with subdivisions and site condominium developments which require formal recording of the agreed upon issues within deed restrictions. Development agreements are legally enforceable only by the local municipality.

Site condominium and subdivision development agreements/deed restrictions may include any reasonable restrictions, along with others that may be part of the development approval process.

Advantages:

- May protect water quality, wildlife habitat, environmentally sensitive lands and resources, in addition to built environment issues, when more likely required as part of the subdivision and site condominium process.
- The land remains in private ownership.
- Avoids zoning "takings" challenge by applying a private or public deed restrictions agreement.
- When associated with a subdivision or site condominium, they are legally enforceable and must therefore be recorded with the proper authorities.

Disadvantages.

- Must formally document the agreement and submit to subsequent monitoring
- May require additional enforcement and administrative oversight
- Home/land owners, especially within subdivisions and site condominiums, may not be aware of such agreements/restrictions.

A model development agreement is included in *Chapter VI* For an example of a development agreement, please see Report 5 0, II F

M.) Subdivision Control Ordinances

Subdivision control ordinances guide the division of land into multiple lots, and address many factors including grading, erosion control, utility easements, street alignments, circulation, lot size, and emergency access Subdivision control ordinances help ensure that new lots conform with zoning requirements; streets are properly aligned with the broader street system; water drainage and sanitary sewer facilities are adequate, the site has appropriate density given its restrictions; and open space is sufficient for utilities, recreation, light, air, emergency access and traffic safety.

The local subdivision control ordinance establishes review and evaluation procedures for processing plats, information which must be included on the plat, site design principles and standards, required improvements, and financing and maintenance responsibilities.

Advantages.

- Reserves land for streets and other public facilities
- Provides municipality with detailed information on site characteristics and proposed layout, and allows municipal input into subdivision design
- Helps ensure adequacy of on-and off-site facilities.
- Prevents premature subdivision of unserviced land if properly linked to zoning.

Disadvantages:

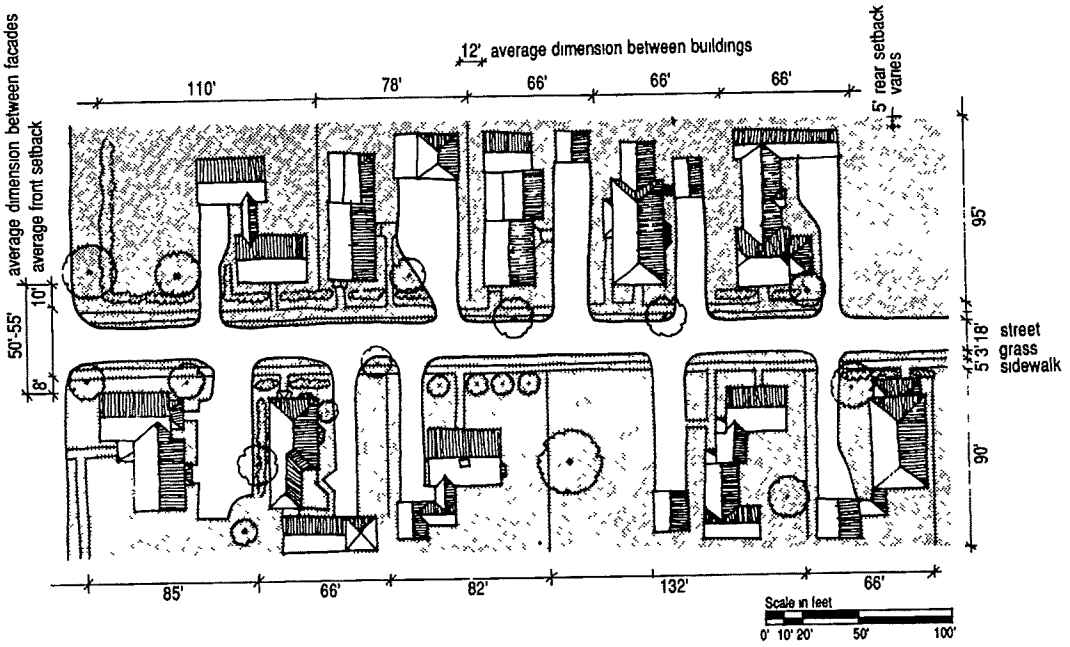
- Conventional subdivision regulations impose rigid lot restrictions that do not preserve distinctive natural characteristic of the lands.
- Lack of flexibility often results in monotonous subdivisions.
- Long process of platting has discouraged developers Most pursue residential projects as site condominiums.

For example of subdivision control ordinances, please see Report 5.0, II.H

N.) Traditional Neighborhood Development

This type of development is modeled after neighborhoods typically built during the late 19th and early 20th centuries. Common elements of this type of development include: a strong pedestrian orientation, grid street pattern, mixed land uses, central and intensively used open spaces such as a town square, narrow, tree lined streets, and architectural character and continuity including shallow setbacks, front porches, alleys, and rear garages. Traditional neighborhood development uses land more efficiently than standard subdivisions, provides affordable housing, allows people to walk to school, work or stores, fosters a sense of community, and allows people of mixed ages and incomes to live in the same neighborhood. Traditional neighborhood development design principles can be used for new development, large redevelopment areas, or small infill projects

Use of this technique would be useful to the S&H Project because it concentrates development towards existing centers and away from highly sensitive environmental areas.



(adapted from Arendt, Rural by Design, p 7)

Advantages·

- Encourages more intense residential development to concentrate in environmentally suitable areas for development.
- Provides a variety of housing options.
- Improves traffic flow.
- Creates pedestrian friendly neighborhoods.
- Encourages a sense of community.
- Reduces residential sprawl.
- Communities may develop design guidelines setting these standards.

Disadvantages.

- May create sterile communities if done without regard to the site's particular cultural and natural context.

For an example of traditional neighborhood development, please see Report 5.0, III.C.

O.) Native Landscaping/Landscape Restoration

Native landscaping refers to using plant species that are native to the area and adapted to the particular climate and soil conditions. Highly developed root systems allow them to use the moisture and nutrients available in the soil, reducing the need for outside resources like water, pesticides, and fertilizers. The use of native vegetation can also provide habitat and food for local wildlife, help maintain biodiversity of ecosystems, conserve energy and water by requiring less maintenance, and save time and money over the more conventional approach to landscaping. In addition, promoting or maintaining native vegetation preserves Michigan's natural heritage.

Homeowners and developers alike are beginning to appreciate the environmental, economic, and aesthetic benefits of native landscaping Native landscaping has been gaining acceptance across the country As a result, many sources of information are now available to provide expertise on the subject

Advantages.

- Reduces need for water, pesticides, and fertilizers
- Reduces installation and maintenance costs.
- Reduces soil erosion and promotes good water quality
- Provides habitat protection and restoration.
- Helps control stormwater runoff.

Disadvantages·

- Misconception about native "unkempt" landscapes needs to be overcome.
- Some communities might have weed control ordinances that prevent using native landscaping

For an example of Native Landscaping, please see Report 5.0, II.C.

P.) Roadway and Street Tree Preservation

This technique involves promoting the design of narrow streets and roadways in new residential development Good residential streets are ones that encourage people to walk and ride bicycles. This is accomplished through designing narrower roadways, shorter blocks, T-intersections, landscape buffers, and ample sidewalks. These design elements not only calm traffic, but also create a safe and pleasurable way for people to access neighborhood destinations and commercial centers.

Roadway and/or street tree preservation is done in order to preserve the area's natural character and vegetation. Other beneficial results of using this technique within the headwaters area include the reduction of impervious paved surface that results in increased water infiltration and quality and the increased preservation of existing vegetation.

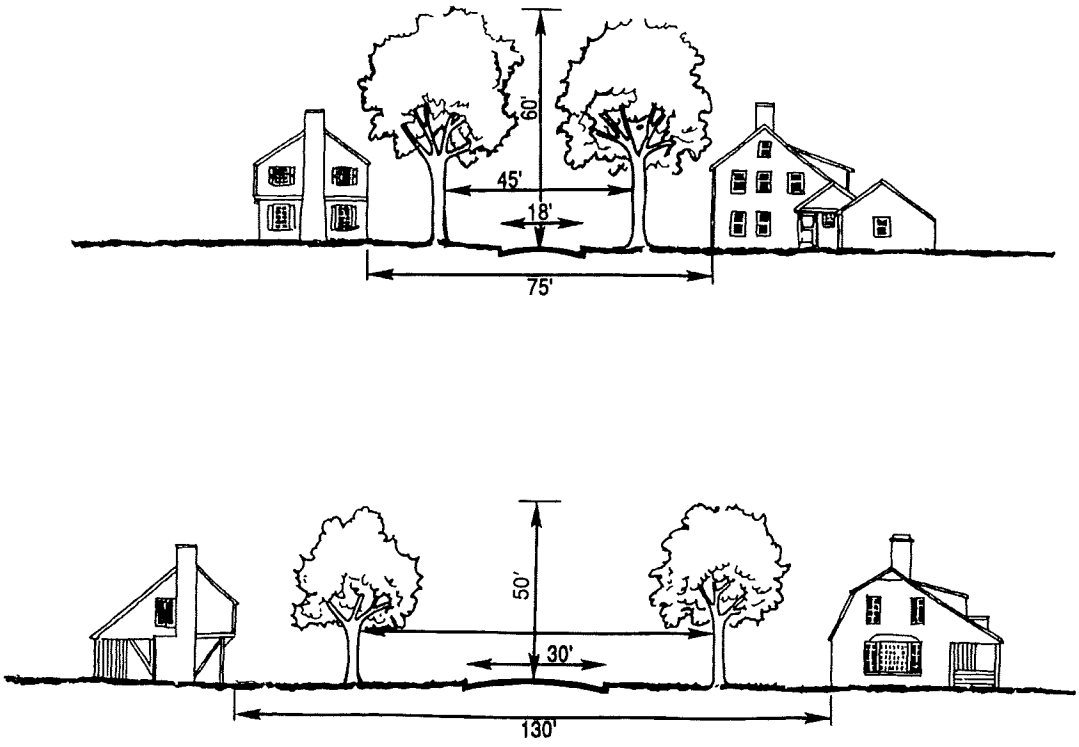
Advantages:

- Reduces pavement and impervious surfaces and increases open space or pervious surfaces
- Increases road tree preservation
- Reduces car speeds and increases safety.
- Promotes human scale and pedestrian orientation.

Disadvantages:

- Need to coordinate with utility companies and road commission, and change well established standards and attitudes

For an example of roadway and street tree preservation, please see Report 5.0, II.J. The illustration on the next page shows the difference between a typical road cross section and a cross section where roadway and street tree preservation has been applied.



(adapted from Arendt, Rural by Design, p 10)

Q.) Infill Development

Infill development is filling in vacant lots within an existing developed area. It concentrates development where it already exists, thereby reducing new impervious cover. This is done in order to preserve the remaining natural areas and open spaces.

Design guidelines for infill development may be established by communities to ensure that new infill housing respects its context. Criteria usually addressed in the guidelines include respecting the street character with building height, roof profile, front yard setback, entrance and porch, garage location, and window form and style. The guidelines also address architectural compatibility, including building character, massing, and construction materials

Advantages.

- Reduces pavement and impervious surfaces and increases open space or pervious surfaces.
- Encourages preservation of open space.
- Reduces residential sprawl
- Reduces development costs by maintaining overall residential density developed over a smaller area.

Disadvantages:

- Real or perceived pollution may dissuade investment from areas appropriate for infill.

3.) Open Space Acquisition and Protection

A.) Land Trusts/Conservancies

Land trusts, also known as conservancies, are local, regional, state, or national nonprofit organizations directly involved in protecting land for its natural, recreational, scenic, historical, or productive value There are over 1,100 local and regional land trusts throughout the country today that collectively manage many tracts of land Some of the land trusts/conservancies within the headwaters area include. Michigan Nature Association, North Oakland Headwaters Land Conservancy; Oakland Land Conservancy, and Southeast Michigan Land Conservancy.

Land trusts have a variety of land protection measures which include the following: acquisition and outright ownership, receiving and holding conservation easements, and facilitating the transfer of ownership or conservation easements to other conservation organizations who will ensure the perpetual protection of the land.

Conservancy and land trust groups and foundations can provide the technical and financial assistance for acquisition of land for conservancy purposes Land conservancies often 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.

Advantages.

- Can be established for a single property or for larger land holdings.
- Can be specific to a particular resource or a general protection measure
- Are often afforded more flexibility and can usually act more quickly than a government agency
- Tax benefits from non-profit status
- Can foster public private partnerships.

Disadvantages:

- Sometimes property values are artificially escalated when a property owner suspects a private entity related to a unit of government wants to acquire their land
- In areas with large amounts of undeveloped lands, it may be difficult to obtain needed public support for advance acquisition because there is a lack of perceived need to acquire land.

For an example of land trusts and conservancies, please see Report 5.0, IV.A.

B.) Open Space/Conservation Easements

The easement is the most commonly used preservation tool in the United States, and can be defined as a restriction on private property that is legally binding on present and future homeowners Initiation of easements by the landowner is voluntary, however, when an owner places a conservation easement on land, certain rights are transferred to another person or organization. Easements are often donated, but can also be purchased. Easements are most commonly received by land trusts that enforce and monitor its terms.

An open space easement allows for certain limited uses and activities such as farming, grazing, or recreational uses. The purpose of such easements is to maintain open space for human use, and to ensure that development does not encroach within its environs. The intent of the conservation easement is to protect land that is environmentally sensitive or unique

Under Michigan law, conservation easements may range from 10 years to an indefinite amount of time. However, to benefit from the federal income and estate tax reductions, a permanent easement must be recorded. Additionally, the easement must be designated as a charitable donation as determined by the IRS, and be used for the following public benefits: outdoor recreation, maintain natural habitat/ecosystem, scenic enjoyment, or historical significance. The Michigan Farmland and Open Space Preservation Act P.A. 116 of 1974 also offers financial incentives for creating conservation easements. The Act provides up to a 10-year tax relief through the enactment of a development rights easement. One type of easement provides State tax relief, while the other provides local tax relief.

Advantages·

- Protects water quality, wildlife habitat, environmentally sensitive lands and resources
- Provides financial incentives to landowners.
- Saves taxpayers from outright purchase.
- The land still remains in private ownership.
- Avoids "takings" challenge by purchasing rights

Disadvantages.

- Restrictions set forth in easements may limit marketability of a parcel of land
- Monitoring easements in perpetuity may be difficult.
- Problems can arise if new landowners are not made aware of easements.
- Easements may not have been properly documented and monitored.

A model conservation easement is included in *Chapter VI.* For an example of communities with open space/conservation easements, please see Report 5.0, IV.B.

C.) Transfer of Development Rights (TDR)

Transfer of development rights (TDR) is a land use management tool utilized by local governments to support the achievement of comprehensive planning goals. A TDR program is designed to transfer the development potential from certain types of land, such as valuable resource lands and historic sites (sending zone), to areas designated for growth (receiving zone). The program revolves around the idea that ownership of land includes owning a "bundle of rights" (i.e., the right to access, to mine mineral deposits, etc.). TDR establishes a market driven, incentive based mechanism by which it becomes possible to sell development rights without actually buying or selling the land. Therefore, this tool does not require public funds, as the developer pays for the development rights. The result of such a program creates an opportunity to achieve community growth and development goals, promotes more efficient and less costly patterns of growth, compensates landowners in preservation areas for lost development potential, and provides the private sector with incentives to grow in designated growth areas.

Advantages:

- Preserves environmentally sensitive resources and lands.
- The developer pays for the development rights

- Landowners are compensated for growth and development restrictions
- Incentive based planning tool achieves overall community growth and development goals.

Disadvantages.

- Potential for higher taxes in receiving areas, due to the increase in services that are needed to accommodate additional growth and development.
- Start-up costs to implement a TDR program can be costly
- There is often a lack of constituent support for the implementation of TDR programs

Model language for Transfer of Development rights is included in *Chapter VI* For an example of Transfer of Development Rights, please see Report 5.0, IV C.

D.) Purchase of Development Rights (PDR)

This tool involves using public funds to purchase the development rights to privately owned land PDR has become an increasingly popular mechanism to preserve agricultural and environmentally sensitive land, as well as open spaces. Typically, the program requires a landowner to voluntarily sell the development rights (also known as a conservation easement) and receives compensation for the development restrictions placed on the land. The price consists of the difference between the value of the land based on the development potential, and the value of the land in agricultural use or other limited use. The landowner retains title to the land, and can sell or pass along the land to others, although the use must remain as a farm or open space The conservation easement runs with the land as specified in the easement document.

Advantages·

- Provides fairness in treatment to property owner.
- Provides permanent, greater assurance of protection than zoning
- Enables the possible reduction in property and estate taxes, which provides greater security of farming.
- Landowners often find the voluntary aspects of the program highly acceptable.

Disadvantages:

- May not achieve critical mass of farmland, open space, or resource protection due to voluntary nature of program.
- Development rights may cost over 50% of the fair market value.
- Compensation may be paid for value that landowner did not create
- Landowners may refuse to participate due to concern that program administration is too cumbersome, or that sale of rights eliminates future options to transfer development rights or sell at full market value.
- Funds may be unavailable to purchase the rights.

For an example of purchase of development rights, please see Report 5.0, IV.D.

E.) Land Acquisition

Although this can be an expensive option, communities or organizations can outright purchase lands for protection purposes. Purchasing is simple and makes it easier to manage and protect open space and natural resources. A variety of options for land acquisition exist, some of which may be voluntary while others may proceed through condemnation. These techniques include,

but are not limited to, the following: land banking, whereby land is systematically purchased (fee simple) and set aside for future use, lease-back or sell-back, whereby the governmental unit purchases the land and either leases or sells it with deed restrictions; and partial property rights purchase (see Conservation Easement technique in this section).

Many communities assume that land acquisition is unobtainable for them due to the cost associated with the action. However, there are a variety of financing options and means available to leverage funds available to municipalities. They include sale of bonds to raise capital for land purchase; estate donations of land; state and federal grants for acquisition of land for parks and recreation; public/private partnerships, donations of funds from foundations; and third party acquisition, such as by a conservancy group.

Advantages:

- Ensures control over lands held in the public trust.
- Can reduce costs of providing services over the long run.
- Can eliminate or prevent nuisance land uses.

Disadvantages:

- Sometimes property values are artificially escalated when property owners suspects a unit of government wants to purchase their land.
- Managing idle lands under public ownership can be difficult.
- In areas with large amounts of undeveloped lands, it may be difficult to obtain needed public support for advance acquisition because there is a lack of perceived need to acquire land.

For an example of communities that employ land acquisition, please see Report 5.0, IV.E.

F.) Donation

Interested landowners can donate their property to a land trust, municipality, or other organization. Landowners can donate lands with conservation value so that the land can be managed and preserved for its ecological value. Additionally, land owners can donate other real estate, such as a house, to a private non-profit entity which can then turn around and sell the property and use the proceeds for purchasing other lands with conservation value. Both types of donations can be claimed as a tax deduction. Another option includes the "reserved life estate" which allows the landowner or others designated to live on the property for their lifetime; in this case the "remained interest" is donated to the organization. A landowner can also sell their land to an organization at a price less than the fair market value, considered a "bargain sale", and the difference in price can be claimed for a tax deduction.

Advantages.

- Provides the property owner with income tax relief.
- The municipality receives the land with no financial output.
- The previous landowner may still occupy the property until a predetermined date.

Disadvantages:

- Access to the land may not be granted immediately.
- The land donated may not be valuable or desirable.

For an example of land donation, please see Report 5.0, IV.F

G.) Private Restrictions: Subdivision Deed Restrictions and Condominium Documents

Restrictions can be placed upon private property that limit its future uses. Subdivision Deed Restrictions and Condominium Documents are both types of private restrictions Subdivision deed restrictions are used in conventional, platted subdivisions. Site condominiums are developments which are divided into condominium units and common areas Site condominium restrictions are usually found in a project's master deed and by-laws.

The restrictions are generally developed at the time of real estate transfer. Private restrictions may contain limitations similar to those of a conservation easement; however, enforcement may only be carried out by the prior owner or other parties to the transaction, and the restrictions may be canceled at any time by mutual consent Examples of what private restrictions may limit include the following· no construction activities within fifty feet of the wetland, seventy-five percent of the existing woodlands shall remain; the existing structure shall not be altered; limited pesticide application, natural landscaping, impervious surface limitations; etc.

While both techniques manage common open space and natural features, site condominium documents are more effective at enforcing these restrictions. A site condominium's property owners' association has the power to assess residents, and each resident is a shareholder in the condominium project, thus providing a stronger mechanism for maintenance of common areas

Advantages.

- May protect water quality, wildlife habitat, environmentally sensitive lands, and resources. Site condominium process is more effective at enforcing and protecting these resources
- The land remains in private ownership.
- Avoids zoning "takings" challenge by applying a private or public deed restrictions agreement.
- When associated with a site condominium, they are legally enforceable and must therefore be recorded with the proper authorities.

Disadvantages:

- Enforcement can only be carried out by the prior owner or representative party.
- Restrictions may be canceled at any time upon an agreement between the parties to the agreement.
- Problems can arise if new landowners are not made aware of the restrictions
- Only deed restrictions associated with a site condominium development must formally document the restrictions and submit to subsequent monitoring.

Model language for Master Deeds and By-Laws is included in *Chapter VI.* For an example of deed restrictions, please see Report 5.0, IV.J.

H.) Land Banking

Land banking involves the purchase of lands by a community for later use or development. Basically, land banking is a government operated land trust funded by real estate transfer taxes at the local or state level, therefore, increasing amounts of funding is available for purchase as real estate transfers (development) increase. The following expected achievements are typical for a comprehensive land banking approach: land can be acquired well ahead of need; land can be acquired before development value is attached to it, land can be assembled into large enough

tracts for major developments or preservation purposes; public investment in land/improvements can be averaged over the long run; gains in land value from public development decisions will not accrue to the public at large; all landowners are treated equitably, speculations are curbed; land can be committed to the building of infrastructure and then to development in any orderly, efficient manner; and if land is leased rather than sold, the pubic will continue to profit from its increasing value.

Advantages·

- Aids private enterprise or pubic agencies in the speedy and orderly conversion of lands formerly used for obsolete purposes.
- Can be used to redevelop "blighted" areas.
- Larger areas can be acquired over time through small purchases thus limiting the initial public burden.
- Property can be purchased at today's price for usage in the future.

Disadvantages.

- It can take years to acquire enough land sufficient for the desired purpose.
- Requires a sufficient investment on the part of the municipality

For an example of land banking, please see Report 5 0, IV.G

I.) Wetland Mitigation and Banking

Wetland banking follows the same general purpose and process as land banking, except that wetland banking is designed to create a large, connected system of wetlands.

Wetland mitigation is required when a significant amount or quality of a wetland would be unavoidably impacted by a development proposal. In such cases a developer is required to create a new wetland area to replace that which is lost. The result is an abundance of small, disjointed wetland areas. To combat these scattered wetland areas, a developer can instead create the new wetland area in the land banked area under the management of the community and/or conservancy. This small wetland area created by a developer as a result of required mitigation can than become part of a larger system when sufficient amounts of land banked areas have been mitigated The following expected achievements are typical for a comprehensive wetland banking approach: land can be acquired in sufficient quantities to create a substantial resource; land can be acquired before development value is attached to it; all landowners benefit from the resulting new wetland ecosystem; land can be committed to the creation of an ecosystem without creating a burden for the public; the ecosystem can be developed in an orderly, efficient manner; and if land is leased rather than sold, the pubic will continue to benefit from its presence

Advantages:

- Aids private enterprise and/or public agencies in the orderly conversion of mitigated lands into a viable ecosystem.
- Prevents the creation of disjointed wetland ecosystems that are often nonviable due to their size.
- Larger areas can be acquired over time through small private banking initiatives.
- Eliminates the private developers need to provide on-site mitigation areas.

Disadvantages.

- It can take many years to acquire enough land sufficient for the desired system
- Requires a sufficient investment on the part of the municipality.
- Requires maintenance initiatives on the part of the municipality

J.) Natural Areas Registry

A natural areas registry is a voluntary protection program in which the landowner agrees to notify a conservancy of any changes to the natural area, or if they wish to sell their land. In return, the landowner receives a plaque, periodic newsletters, and the satisfaction of knowing they have helped to preserve natural diversity. Through The Nature Conservancy, a systematic inventory of key elements observed on a property are identified; however, only if agreed upon by the landowner Or a binding agreement can be written in which the landowner provides the conservation organization a "right of first refusal" when the property is to be sold. For a small fee (consideration), the land holder agrees to allow a government or private organization the right to match a legitimate offer for the property, if one is tendered, and obliges the landowner to approach that organization first so that it can make an offer when the property is placed on the open market. The commitment on the part of the property owner may include the following· continue protecting the special features on the property, notify the conservancy of any plans to change land or water uses or of any potential threats to the ecological features; allow conservancy naturalist to visit occasionally; and inform the conservancy of intent to sell/transfer property ownership

Advantages:

- A relationship with the property owner can be cultivated and strengthened through communication.
- For a minimal cost the program can increase the protection of biodiversity resources.

Disadvantages:

- The strength and duration of protection provided by the registry program is only afforded by notification.
- A registry takes time to work and is probably not the single best tool to be used, if a threat to the resource needs to be addressed quickly.

K.) Public/Private Partnerships (PPP)

Public/private partnerships for open space protection capitalize upon the joint resources of governments (federal, state, and local), private groups, and property owners. Partnerships are becoming increasingly popular solutions to open space protection because of the flexibility of private organizations compared to the government, the ability of private groups to purchase open space with matching governmental funds, and a new emphasis on landscape-scale preservation. The PPP is generally set up as a tax-exempt lease, whereby a public partner finances capital assets/facilities by borrowing funds from an investor/financial institution, on a property of which the private partner has title, but then transfers it to the public partner under the lease term.

Advantages:

- Can provide the necessary improvements and/or purchases without the lag time associated with public funding sources
- Primarily a funding source, but can also be used to gain consensus from the private sector for any given project

- Provides a funding source for capital improvements that does not count against the local debt limits.

Disadvantages:

- The regulations must be in place to allow a public partner to enter into a tax-exempt lease arrangement with private parties
- Can be expensive to start-up and monitor.

For an example of pubic/private partnerships, please see Report 5.0, IV.I

L.) Michigan Natural Features Inventory

The Michigan Natural Features Inventory (MNFI) is a partnership between the Wildlife Division of the Michigan Department of Natural Resources (MDNR) and The Nature Conservancy The MNFI maintains an information database of endangered, threatened, or special concern plant and animal species, natural communities, and other natural features within the State The MNFI is responsible for inventorying and tracking each of the above noted environmental resources in concert with the Biological and Conservation Database (BCD), the Michigan Resource Information System (MIRIS), and the Coastal and Inland Waterways Program Information System (CIWPIS). The data is derived from museum and herbaria records, published and unpublished accounts, fieldwork by staff, and from private consultants and knowledgeable individuals. The inventory process has not been completed for the entire State, therefore an absence of data should not be interpreted as the nonexistence of natural resources

Advantages·

- Upon completion of the inventory, all known significant environmental resources will be mapped and can become a predominant part of the development pattern within a community.
- The program can increase the protection of biodiversity resources.
- Can alert communities to the presence of unique resources and species and provides a basis for appropriate planning.

Disadvantages:

- The strength and duration of protection provided by the inventory program is only afforded by notification
- An inventory takes time to complete and maintain, and is therefore probably not the single best tool to be used if a threat to known resources needs to be addressed quickly.

Summary

A variety of tools and techniques can be employed to address the river watersheds' specific opportunities and threats

- **Overlay District:** No specific zoning measures are currently in place to protect the important riparian corridors and other surface waters throughout the entire watershed. Development of an overlay district, which supplements but does not replace the existing applicable zoning regulations, requires increased protection for unique areas with severe limitations.

- **Wetland Remediation and Habitat Restoration:** In areas where there has been considerable disruption of a site's hydrology and natural environment, wetland remediation and habitat restoration can help improve the health of key areas.

- **Wetland and Woodland Preservation:** The protection of wetlands and woodlands, especially in a way that reduces habitat fragmentation and encourages linkages, permits a more diverse natural habitat and increases overall water quality and environmental health.

- **Smart Growth Policies:** Tools such as Open Space/Cluster Development, Subdivision Control Ordinances, and Stormwater Management can all be used to guide development in land areas which are less sensitive and more suitable to development. These policies still recognize that even though these land areas may not be as sensitive to disturbance, they still have a considerable influence on the entire watershed due to surface water drainage into the various waterways.

- **Native Landscaping and Stormwater Management:** In all areas, but especially transitional and lowland areas, native landscaping offers an excellent way to control stormwater runoff, prevent the spread of exotic species into more sensitive areas, reduce soil erosion, reduce the need for polluting fertilizers and pesticides, and improve overall water quality.

- **Open Space Acquisition, Greenways, and Parks and Recreational Areas:** Continued preservation and the addition of dedicated open space, especially along the riparian corridor of the Huron and Shiawassee Rivers and other key areas where highly diverse habitats exist or are able to be restored, can ensure improved water quality and protection from any development. These tools are especially useful in the most sensitive areas, such as existing prairie fens or other wetland/upland complexes

- **Conservation Easements:** Restrictions on private property that is legally binding on present and future property owners enables the protection of environmentally sensitive lands and resources in perpetuity, while having the benefit of providing financial incentives to land owners and retaining private ownership.

The matrix on the following page provides a quick reference of which tools and techniques may be more appropriate given the natural resource conditions and the landform sections.

Summary - Applicable Tools and Techniques and Landform

	Non-Forested Upland		Forested Upland	Forested Wetland	Non-Forested Wetland		
	Man-altered/ Developed	Open/ Old or Cultivated Field			*Shrub/ Scrub*	Wet Meadow/ Fen	Open Shallow Water
PLANNING SUPPORT							
Community Plans	✔	✔	✔	✔	✔	✔	✔
Intergovernmental Cooperation				✔	✔	✔	✔
Growth Boundaries/Service Areas	✔	✔	✔				
REGULATORY MEASURES							
Large Lot Zoning	✔	✔	✔				
Lot Averaging/Lot Sizes	✔	✔	✔				
Site Plan Review Standards	✔	✔	✔				
Overlay Zones				✔	✔	✔	✔
Planned Unit Development (PUD)	✔	✔	✔				
Clustering/Open Space Regulations	✔	✔	✔				
Woodland Regulations			✔	✔			
Wetland Regulations				✔	✔	✔	✔
Floodplain Regulations				✔	✔	✔	✔
Stormwater Management/Impervious Surface Reg	✔	✔	✔				
Steep Slope Regulations	✔	✔	✔				
Development Agreements	✔	✔	✔				
Subdivision Control Ordinances	✔	✔	✔				
SITE DESIGN TECHNIQUES							
Open Space/Cluster Development	✔	✔	✔				
Traditional Neighborhood Development	✔	✔	✔				
Stormwater Management	✔	✔	✔				
Natural Landscaping/Landscape Restoration	✔	✔	✔	✔	✔	✔	✔
Roadway and Street Tree Preservation	✔	✔	✔				
Infill Development	✔						
ACQUISTION/PRESERVATION INCENTIVES							
Land Trusts/Conservancies			✔	✔	✔	✔	✔
Open Space/Conservation Easements			✔	✔	✔	✔	✔
Transfer of Development Rights (TDR)			✔	✔	✔	✔	✔
Purchase of Development Rights (PDR)			✔	✔	✔	✔	✔
Land Acquisition			✔	✔	✔	✔	✔
Donation			✔	✔	✔	✔	✔
Land Banking			✔	✔	✔	✔	✔
Wetland Mitigation and Banking				✔	✔	✔	✔
Deed Restrictions			✔	✔	✔	✔	✔
Natural Areas Registry			✔	✔	✔	✔	✔
Public-Private Partnerships (PPP)			✔	✔	✔	✔	✔
Michigan Natural Features Inventory			✔	✔	✔	✔	✔