RRC BEST PRACTICE 2.6

Supplemental Green Infrastructure Guide

A resource for Michigan communities seeking to advance sustainability and resilience through planning and zoning best practices.

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Overview

This Green Infrastructure Guide is a resource for Michigan municipalities planning to incorporate green infrastructure elements into local zoning practices to advance sustainability goals and achieve Redevelopment Ready Communities (RRC) Certification. The following Guide outlines the purpose and benefits of deploying green infrastructure, describes different types of green infrastructure that can be incorporated into local zoning and planning policies, and provides example ordinances that can be used as a model. It is not intended to provide detailed design, engineering, or hydrology techniques for the various green infrastructure methods. However, there are several resources for more detailed guidance and design considerations included at the end of the Guide.

The provided examples and next steps should be used to generate ideas regarding the implementation of green infrastructure elements, as zoning codes are unique and designed to best meet the needs of each individual community. Any zoning code language adopted locally should undergo a rigorous review to ensure it addresses the community's specific desires.

Green infrastructure: ecological systems that are preserved or designed and created to filter and absorb stormwater where it falls.

Versus

Gray infrastructure: the system of gutters, pipes and tunnels that move stormwater away from properties to treatment plants or straight to local water bodies.

What is Green Infrastructure?

Green infrastructure can be seen all around us. It is the parks, wetlands and trees we see every day as well as man-made green roofs, bioswales and rain gardens. Specifically, green infrastructure refers to ecological systems, both natural and engineered, that help manage stormwater by slowing the movement of water, naturally treating runoff, and mitigating flood issues. Green infrastructure is an excellent supplemental tool to gray infrastructure (for e.g., concrete stormwater pipes or detention basins) in managing stormwater because it often costs less and provides concurrent health and environmental benefits. While the majority of green infrastructure techniques here are focused on water/stormwater management, RRC Best Practice 2.6 also includes options for communities to address renewable energy in its zoning policies as a means of advancing community sustainability. Among green infrastructure's myriad of benefits are improved air quality, improved stormwater quality, reduced heat stress, community social and economic benefits, reduced costs for traditional stormwater systems, physical and mental health benefits and more. Studies by The Center for Neighborhood Technology (CNT), ECONorthwest, U.S. Environmental Protection Agency and others have found that green infrastructure can save communities hundreds of thousands, even millions of dollars, in net benefits from reduced gray infrastructure capital costs alone.[1] Green infrastructure can be used to sustain and maintain natural resources in communities and help establish sustainable development processes that can evolve as communities grow and change.

1 Center for Neighborhood Technology (CNT). 2020. *Green Values Strategy* Guide. https://www.cnt.org/sites/default/files/publications/Green%20Values%20Strategy%20Guide.pdf; ECONorthwest. 2011. Economic Benefits of Green Infrastructure: Great Lakes Region.https://s3-us-west-2.amazonaws.com/econw-publications/2012 -Economic-Benefits-of-Green-Infrastructure-in-the-Great-Lakes-Region.pdf; and U.S. EPA. 2013. Case Studies Analyzing the Economic Benefits of Low Impact Development and Green Infrastructure Programs. https://www.epa.gov/sites/default/files/2015-10/documents/lid-gi-programs_report_8-6-13_combined.pdf

Understanding Green Infrastructure Methods

As noted in the Overview section, there are many types of green infrastructure that communities can adopt in their zoning code to help protect water resources, manage flooding, provide ecosystem benefits, and generate clean energy. In the following pages are descriptions of nine (9) types of green infrastructure techniques that can be utilized to achieve RRC Certification, including benefits of the methods and examples of ordinance language from other communities that can be adapted to fit your local needs.

City of West Branch Zoning Ordinance

Section 3.31: Stormwater Management/Onsite Drainage and Runoff

The use of swales, rain gardens, and vegetated buffer strips is encouraged in cases where the Planning Commission deems it to be safe and otherwise appropriate as a method of stormwater conveyance so as to decrease runoff velocity, allow for natural infiltration, allow suspended sediment particles to settle, and to remove pollutants. Such systems shall be permitted within required setbacks.

Best Practice 2.6 outlines the expectation that communities will incorporate environmental preservation and green infrastructure standards into the zoning code. Communities seeking RRC certified level can incorporate three (3) or more of the following Green infrastructure techniques into their zoning standards to meet the expectations of RRC Best Practice 2.6:

CRITERIA: The zoning ordinance includes standards for green infrastructure.

ESSENTIAL EXPECTATIONS	CERTIFIED EXPECTATIONS
Not required.	The ordinance includes regulations for three or more of the following: low impact development techniques (rain gardens, bioswales, etc.); rain water collection (blue roofs, cisterns, water harvesting, stormwater vaults, etc.); green roofs; pervious pavement; steep-slope protections; street-tree planting standards; tree preservation or replacement standards; parking lot internal landscaping standards; open space preservation development (i.e., cluster housing); required native or low-maintenance plantings, renewable energy; buffering standards around water bodies or other natural resources; and/or off-site stormwater regulations allowing site developers to participate in district-scale stormwater management plans.

Low-Impact Development Techniques

The term low-impact development (LID) is sometimes used interchangeably with broader green infrastructure. For the purposes of the RRC program and this guide, LID is considered to be applied methods to collect and/or convey stormwater runoff in order to slow the amount and velocity of runoff and provide filtration of non-point source pollutants. This helps prevent flooding and reduce stress on gray water systems. The most common types of LID techniques are rain gardens and bioswales.

Rain gardens are shallow spaces below the existing grade that are lined with rock or other permeable substrate and planted with water tolerant plants. They collect precipitation or runoff from impervious surfaces and provide slower infiltration and filtration of the water to the ground below. Rain gardens can be connected to storm/sewer systems but are usually designed to hold and infiltrate stormwater within a few days.

Bioswales are linear, planted channels that run along roads, parking lots, and/or sidewalks and provide a natural conveyance channel for stormwater runoff. Because they are planted (rather than concrete or pipe), they allow for natural infiltration of the stormwater which slows the velocity and improves the quality of the water that ultimately enters gray infrastructure systems.

Example Rainwater Harvesting Rules within Zoning Ordinances

In all yards, the following projections are allowed:

- Pergolas, arbors, trellis
- Flagpoles
- Awnings
- Window air conditioning units
- Fences and walls subject to applicable standards
- Rain barrels and rainwater harvesting systems, with a total capacity of 350 gallons or less

- Greater Lansing Stormwater Committee. In draft. Green Infrastructure Code and Ordinance Manual.

In addition to their flooding and water quality benefits, rain gardens and bioswales can be an excellent peacemaking tool as they create attractive flowering garden spaces along sidewalks, parking lots and more. As with many of the green infrastructure methods described here, maintenance of rain gardens and bioswales is critical to their effectiveness and should be included in zoning requirements and plan approval.

Rainwater Collection

Rainwater collection includes methods as simple as using rain barrels to collect runoff from roof gutters on individual homes or buildings, to more complex methods such as stormwater cisterns and vaults. Rain barrels are items that can be purchased at local hardware and home goods stores and are easily set up and connected to gutter downspouts. Cisterns and stormwater vaults are more complex and require construction of (usually) underground storage spaces that store water directed to them from roofs and other surfaces. Collecting rainwater in barrels or underground vaults or cisterns helps decrease the amount of rainwater leaving a site and enables property owners to use that water for irrigation of plants during dry times, cleaning, or for other non-potable water needs. This puts less demand on the water delivery and stormwater systems in the community. Zoning code updates should specify applicability of these methods to different types of developments (e.g., rain barrels for use on single family homes only).

Green Roof on the Jackson National Life building.
Photo credit: Studio Sustena

Green Roofs

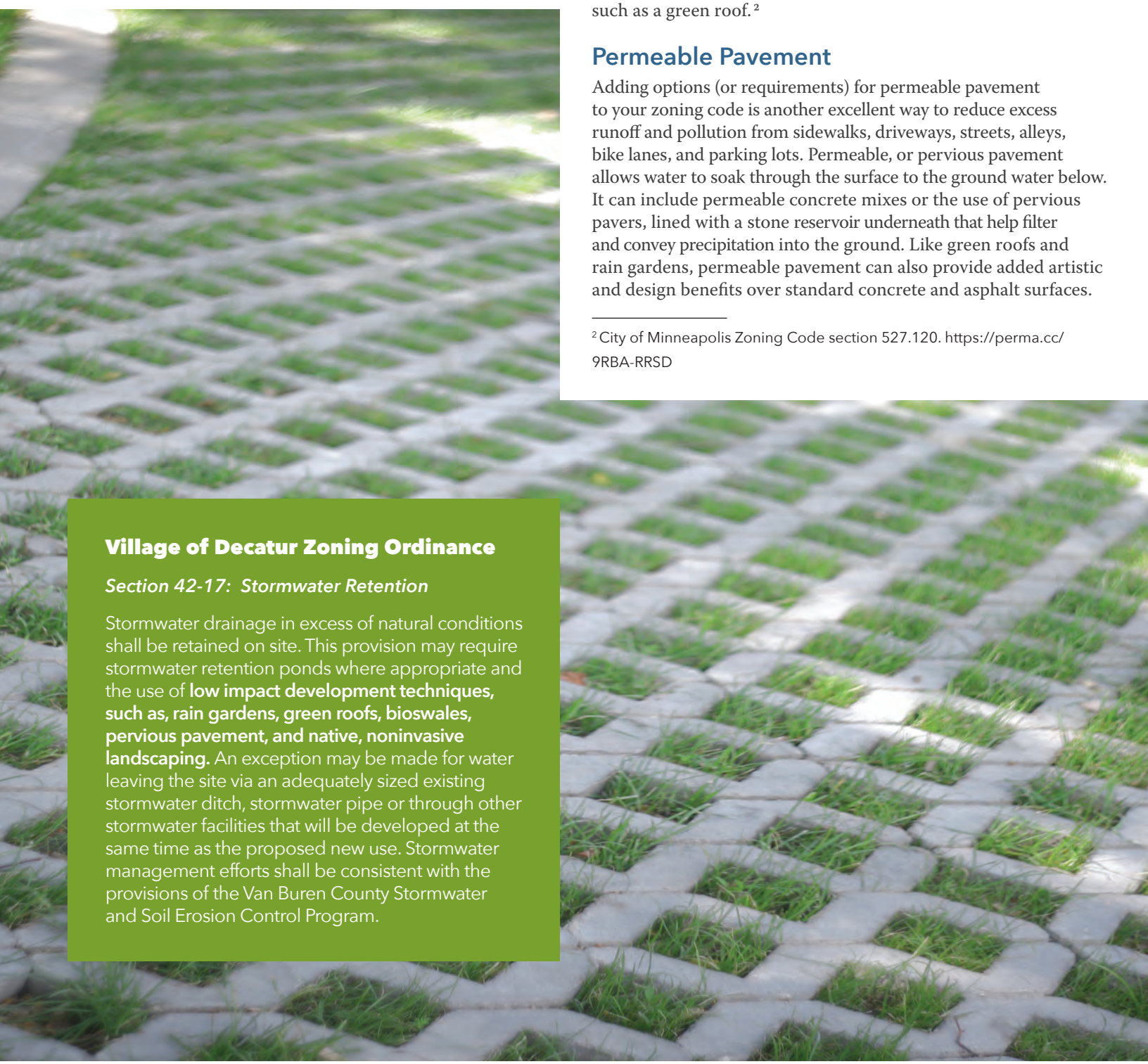
Green roofs are another technique that helps capture and filter rainwater. They can be installed on a portion or entire roof areas and are constructed using a waterproofing layer, drainage layer, and drought tolerant plants—usually grasses and succulents. In addition to their stormwater collection and storage benefits, green roofs are also insulating and provide building energy efficiency benefits.

When allowing for green roofs in your zoning code as a green infrastructure method, communities should specify design standards and applicable plant species based on climate and building load capacities and should require ongoing maintenance to ensure continued performance. Some communities have adopted zoning standards that require the use of green roofs for developments over a certain size, while others—such as the City of Minneapolis—have allowed for alternatives to zoning regulations if a developer implements other beneficial elements such as a green roof.[2]

Permeable Pavement

Adding options (or requirements) for permeable pavement to your zoning code is another excellent way to reduce excess runoff and pollution from sidewalks, driveways, streets, alleys, bike lanes, and parking lots. Permeable, or pervious pavement allows water to soak through the surface to the ground water below. It can include permeable concrete mixes or the use of pervious pavers, lined with a stone reservoir underneath that help filter and convey precipitation into the ground. Like green roofs and rain gardens, permeable pavement can also provide added artistic and design benefits over standard concrete and asphalt surfaces.

[2] City of Minneapolis Zoning Code section 527.120. https://perma.cc/9RBA-RRSD



Village of Decatur Zoning Ordinance

Section 42-17: Stormwater Retention

Stormwater drainage in excess of natural conditions shall be retained on site. This provision may require stormwater retention ponds where appropriate and the use of **low impact development techniques, such as, rain gardens, green roofs, bioswales, pervious pavement, and native, noninvasive landscaping.** An exception may be made for water leaving the site via an adequately sized existing stormwater ditch, stormwater pipe or through other stormwater facilities that will be developed at the same time as the proposed new use. Stormwater management efforts shall be consistent with the provisions of the Van Buren County Stormwater and Soil Erosion Control Program.

Buchanan Township Zoning Ordinance

Section 300-15.05: Open Space Preservation Option (Design Requirements)

b. Permanent open space shall include the site's most significant natural, environmental, agricultural and/or cultural features including, but not limited to, the following:

1. Wetlands, floodplains, and natural watercourses;
2. Woodlands;
3. Recreational pathways and other permitted recreational facilities, but not including a golf course;
4. Buffers from major thoroughfares and more intense land uses; and
5. Similar features acceptable to the approving body.

Street Trees & Tree Preservation

Regulating tree planting and removal can provide many benefits to a community such as improving aesthetics, increasing pedestrian safety, and addressing environmental aspects like reducing stormwater runoff and providing weather protection.

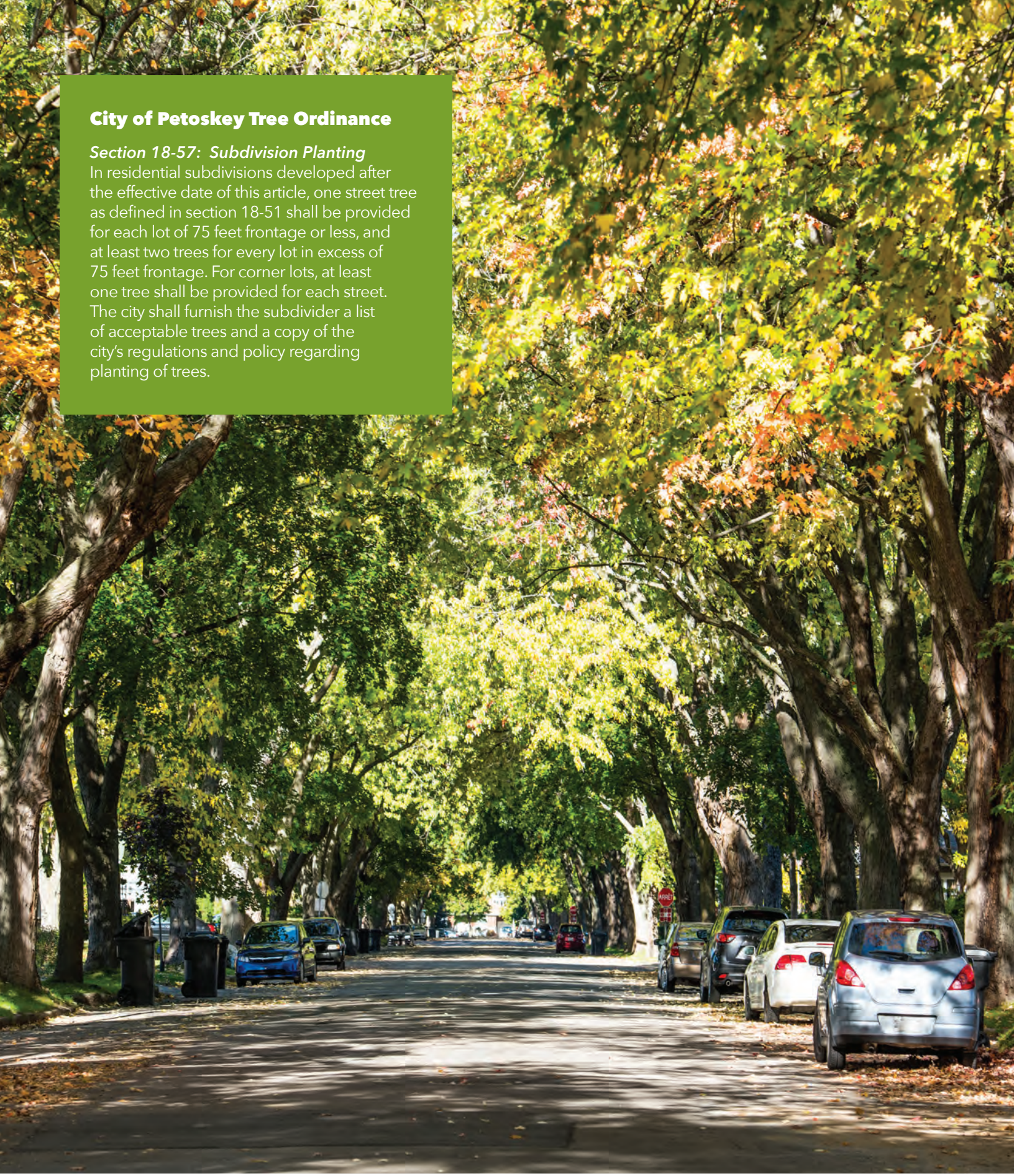
Zoning ordinances that provide for the protection, preservation and reforestation of the community tree canopy can include regulations for both public and private property. Many municipalities, for example, have adopted ordinances that specify requirements for removing and planting of street trees. These ordinances generally specify the conditions for removing street (or other public) trees, spacing and appropriate species for replanting street trees, and considerations for ensuring compatibility with adjacent road type and utilities.

In addition, communities can update their zoning to provide for broader tree preservation and reforestation on private lands as well. This might include further detail on community goals for tree preservation, requirements for tree removal and replaning as part of development, types of permitted tree replacements, designation of heritage trees, requirements for preservation of certain percentages of existing trees as part of a site plan, maintenance, and care requirements, and/or installation procedures. Subdivision Codes and Complete Street policies are other tools communities can use to direct tree preservation and protection standards.

Open Space Preservation Development

The preservation of open space is important to consider when thinking about sustainability and peacemaking goals. Preserving open space can allow for the protection of important environmental elements, such as wetlands, and improve quality of life by providing dedicated recreational green space for community use. Incorporating open space preservation development standards in the zoning code can address these goals by allowing for cluster housing and planned unit developments (PUDs). These types of development are designed to integrate the natural features of a site and can be used to provide protection to a specific natural element located on the site.

Cluster development in suburban areas allows for the development of small residential lots on a portion of a development site while the remaining area is preserved as natural or recreational open space. There is less emphasis on minimum lot size, but the total number of homes on a given acreage does not necessarily increase over traditional suburban designs. This type of development can provide a design that is more suitable for the pro vision of infrastructure and result in less disturbance or damage to natural resources. In order to fully provide green infrastructure benefits, zoning codes should ensure that cluster developments are carefully designed to protect the integrity of sensitive resources, provide ecological connectivity between natural resources, and that there are methods in place to protect, maintain and monitor open space areas over the long-term.



City of Petoskey Tree Ordinance

Section 18-57: Subdivision Planting

In residential subdivisions developed after the effective date of this article, one street tree as defined in section 18-51 shall be provided for each lot of 75 feet frontage or less, and at least two trees for every lot in excess of 75 feet frontage. For corner lots, at least one tree shall be provided for each street. The city shall furnish the subdivider a list of acceptable trees and a copy of the city's regulations and policy regarding planting of trees.

Native Landscaping

To further improve water quality and stormwater filtration, implementing standards that address the use of native plantings can be beneficial. Native plantings refer to planted vegetation (e.g., trees, shrubs, grasses, etc.) that have historically grown in Michigan "without human intervention."[3] These types of plantings develop roots that are more suitable for Michigan soil than non-native plants, and that can grow deep enough to absorb stormwater runoff and filter pollutants. When integrating native landscaping standards into the zoning code, it is important to note that not all Michigan native plants are suitable for every site in a community. Native plantings should be chosen based on the characteristics that best match the conditions of the specific site in consideration, such as type and acidity of soil or water holding capacity.

The *U.S. Natural Resources Conservation Service Soil Survey* is one tool for understanding site characteristics, and *Michigan State University Extension* provides regional native plant lists and native landscaping resources.

[3] Wilson, M. (2016, May 11). Smart gardening: *Trees and shrubs suitable for Michigan landscapes. MSU Extension*. https://www.canr.msu.edu/resources/smart_trees_and_shrubs_for_michigan_landscapes

Village of Cassopolis Zoning Code

Section 370-406: Minimum Landscaping Requirements

C. Landscaping standards. All areas to be landscaped shall meet the following standards:

1. ….
2. At least 75% of required trees shall be native to Lower Michigan. At least 30% of all other required landscape material shall be native to Lower Michigan. For information on native plants and lists of trees and shrubs, see the following websites: www.nativeplants.msu.edu; www.plant.native.org; and www.wildflower.org/collections/Michigan.

City of Novi Zoning Ordinance

Section 5.5: Landscaping Standards

Landscape designs shall utilize native plant materials which enhance infiltration of storm water. Designs to lessen runoff are preferred. Wherever possible, designs should utilize vegetated swales, weirs and basins within and around the parking areas to create an attractive storm water system that promotes storm water infiltration. storm water infiltration.

Parking Lot Landscaping

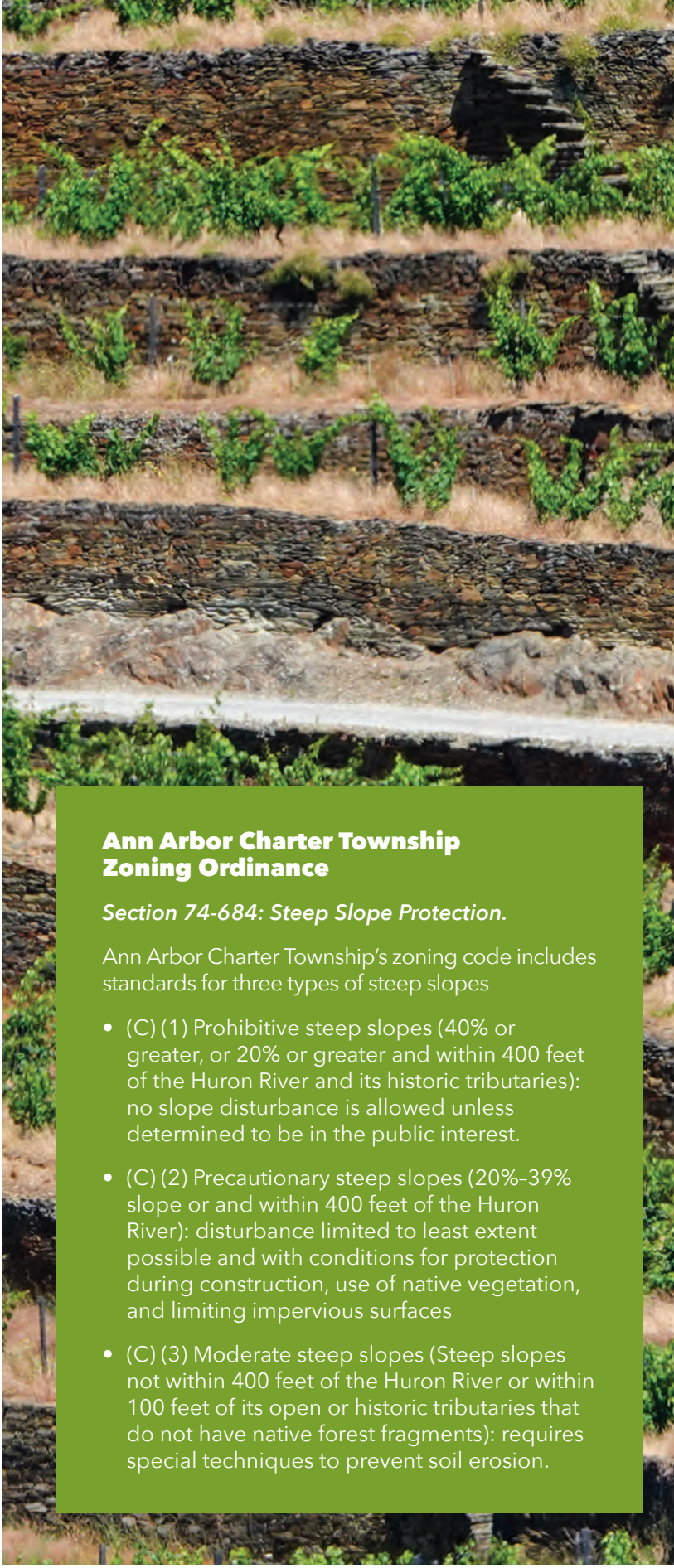
Many communities have increased efforts and adopted zoning code language aimed at reducing overall impervious surface throughout the community. Ordinances that allow for a reduction of parking space requirements and/or require landscaped parking lots are actively aiding in these efforts. Reducing parking requirements is one of the most straightforward ways to decrease net site runoff from parking lots. Adding zoning requirements for greater parking lot landscaping can also reduce the percentage of impervious surface while simultaneously enhancing the appearance of the site, providing shade cover, and reducing carbon dioxide by planting trees. To assist project developers in meeting these requirements, communities can maintain a list of acceptable landscaping materials, including native plantings, and identify required maintenance standards.

Buffering Standards

Incorporating buffers around natural water features, called riparian buffers, can help reduce damage to and/or reduce pollution of the identified feature(s) from development. Natural features such as streams, ponds, and wetlands can be protected with the implementation of setback requirements and buffer zone standards into the zoning code. These standards can limit the amount and type of development near a water body, and specify the types of shrubs, grasses, and other plantings (particularly native species).

Steep Slope Protections

In addition to buffering standards, specific development standards for steep slopes may be implemented to establish protections for natural features and minimize erosion. Best practices for utilizing steep slope protections will vary and it is important to determine what characteristics will best identify what steep slopes look like in your community. One way to do this is by utilizing topographic maps that show land elevations and other additional slope information (obtained from the U.S. Geological Survey). Local ordinances can specify various types of slope protections including full restrictions on disturbance, or use of wood retaining walls, riprap (or loose rock), terracing, and vegetation. The types of slope protection may also vary based on what material is best suited for the identified slope.



Ann Arbor Charter Township Zoning Ordinance

Section 74-684: Steep Slope Protection.

Ann Arbor Charter Township's zoning code includes standards for three types of steep slopes

- (C) (1) Prohibitive steep slopes (40% or greater, or 20% or greater and within 400 feet of the Huron River and its historic tributaries): no slope disturbance is allowed unless determined to be in the public interest.
- (C) (2) Precautionary steep slopes (20%–39% slope or and within 400 feet of the Huron River): disturbance limited to least extent possible and with conditions for protection during construction, use of native vegetation, and limiting impervious surfaces
- (C) (3) Moderate steep slopes (Steep slopes not within 400 feet of the Huron River or within 100 feet of its open or historic tributaries that do not have native forest fragments): requires special techniques to prevent soil erosion.

Allowing for Participation in District-Scale Stormwater Management Plans

In some communities, there are large planning and redevelopment areas (e.g., brownfields or other former commercial and industrial areas) that are zoned at a district-scale, using overlay districts, incentive zoning, or other land use tools. Often these areas have multiple property owners, may have separate district master plans, and could be fully developed in phases. In these situations, there are significant ecological, infrastructure, and cost benefits for planning green infrastructure across the district (including public and private areas) and allowing developers to participate in the proposed green infrastructure elements identified for the district as their regulatory requirements.

The City of Detroit, for example, took this approach through its Greater Eastern Market Neighborhood Framework and Stormwater Management Network Plans (SWMNP). The plan "proposes guidelines that will eventually result in the creation of a network of owner-constructed green spaces to aid in the management of stormwater" throughout the district (p. 108). It provides specific green infrastructure guidelines that supplement the City of Detroit Stormwater Regulations for developers.

Communities wishing to enable district-scale stormwater management as part of their RRC certification should update zoning for these large redevelopment areas or districts to include a detailed green infrastructure plan that can be implemented over a longer-term scale as individual sites are developed.

Renewable Energy

Renewable energy is energy produced from sources like the sun and wind that are naturally replenished and do not run out. Renewable energy development, particularly solar and wind projects, are rapidly growing in Michigan as costs have decreased, technology has improved, and the public's interest in cleaner energy and climate reduction has grown. The state recently published its MI Healthy Climate Plan which includes plans to reduce GHG emissions 28% below 2005 levels by 2025 and 52% by 2030, and ultimately achieve economy-wide carbon neutrality by 2050.[4] Renewable energy is a key part of meeting these carbon neutrality goals.

Michigan's utilities have also established bold plans to expand renewable energy throughout the state in the coming decade, including both wind and solar power. Consumers Energy for example has made a commitment to use 90% renewable energy by 2040.[5] DTE currently has 18 wind parks and 32 solar parks generating renewable power for over 670,000 homes—and they plan to double that in the next few years.[6] And an increasing number of businesses and homeowners are seeking to add renewable energy on-site to their own properties.

City of Bay City Zoning Code

Section 122-602 and 122-622: Wind Energy and Solar Systems

Wind conversion/solar systems may be erected, relocated, enlarged, structurally changed or altered in accordance with the provisions of this article.

As more utilities, businesses, and homeowners have pursued renewable energy projects, communities have often found themselves unprepared for how to address related planning, zoning, and siting issues. A 2019 survey done by the University of Michigan Graham Institute, on behalf of the state, found that "fewer than 20% of Michigan communities have zoning regulations in place to address all scales of solar energy systems."[7] A 2020 MSU study found that "as of December 2019, less than half of all Michigan communities had adopted wind energy zoning ordinances."[8]

Given the sometimes-contentious local debates around proposed solar or wind projects, proactively evaluating what type of renewable energy will be permitted in your community and where/how it should be located will help make the process smoother, reduce time and costs for all parties, and minimize disagreements between property owners.

There are numerous local considerations for how to incorporate renewable energy into community master plans and zoning codes, including issues around noise, size of systems, accessory versus primary uses, farmland preservation, and more. The University of Michigan and MSU Extension zoning guides for solar and wind energy referenced above are both valuable tools for communities to use in evaluating renewable energy planning and zoning options. Both guides provide sample ordinance language for various types of renewable energy systems.

[4] Michigan Department of Environment Great Lakes and Energy. (2022). *MI Healthy Climate Plan*. https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Offices/OCE/MI-Healthy-Climate-Plan.pdf?rev=d13f4adc2b1d45909bd708cafccbfffa.

[5] Consumers Energy. https://www.consumersenergy.com/community/sustainability/our-hometown-stories/renewable-revolution.

[6] DTE Renewable Energy. https://www.newlook.dteenergy.com/wps/wcm/connect/dte-web/home/community-and-news/common/renewable-energy/introduction.

[7] Michigan Office of Climate and Energy. (2019). *Michigan Zoning Database.* Available at https://www.michigan.gov/climateand-energy/0,4580,7-364-85453_85458-519951--,00.htm and Michigan State University Extension/University of Michigan Graham Institute (2021). *Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments.* https://www.canr.msu.edu/planning/uploads/files/SES-Sample-Ordinance-final-20211011-single.pdf.

[8] Michigan State University Extension. October 6, 2020. *Sample Zoning for Wind Energy Systems.* https://www.canr.msu.edu/outreach/uploads/files/wind%20sample%20zoning%2010062020_FINAL.pdf.

Getting Started

Communities seeking to adopt green infrastructure standards as part of the RRC Certification process should begin by assessing how and where their current ordinances address green infrastructure. Many jurisdictions already have stormwater management and landscaping requirements that meet green infrastructure standards (or which could be tweaked to more proactively integrate green infrastructure techniques). The audit of existing ordinances should identify what green infrastructure elements are already included as well as any provisions that might act as a barrier to adopting green infrastructure (e.g., concrete or asphalt parking requirements or minimum parking requirements). Wisconsin Sea Grant created a free green infrastructure audit tool that may be helpful as your community gets started. Updates to the zoning code should always be guided by the goals and vision outlined in the community's master plan and other key guiding documents.

Communities should also identify any unique natural resources or features that would benefit from greater preservation standards (e.g., wetlands, wildlife corridors). State agencies and other environmental organizations may be able to provide information and maps of these resources that can assist communities in understanding the extent and value of these ecological resources.[9]

Once existing ordinances and unique natural resources have been assessed, communities should discuss and identify their sustainability goals. As a first step, communities can evaluate community sustainability goals/vision that might be included in your current master plan. Are there certain types of sustainability actions that have already been identified as important in the community? As master plan updates are done, this should be an opportunity to specifically engage the community on sustainability and green infrastructure goals.

[9] E.g., Michigan Natural Features Inventory (https://mnfi.anr.msu.edu/); *Environment Great Lakes and Energy wetlands and waterbodies map viewer* (https://www.mcgi.state.mi.us/wetlands/mcgiMap.html)

Quick Start to Implementing Green Infrastructure

- Assess how and where your current ordinances address green infrastructure
- Identify any unique natural resources or features that would benefit from greater preservation standards
- Evaluate community sustainability goals/vision that might be included in master plan
- Engage your residents on community sustainability goals
- Update zoning ordinance

RRC's community engagement practices can be used to get input from local stakeholders on potential sustainability goals that could be included in a master plan, separate sustainability plan, and ultimately your community's zoning ordinance. In addition, the Michigan Green Communities (MGC) program and the Michigan Department of Environment Great Lakes and Energy's Catalyst Communities[10] program both provide significant resources and tools for helping communities identify goals and actions for advancing green infrastructure. The MGC program offers an annual Challenge that allows communities to benchmark their sustainability progress across over 120 action items, including several green infrastructure actions. Communities are encouraged to work with staff from MGC and Catalyst communities to help identify relevant and appropriate green infrastructure measures.

With sustainability vision and goals identified, staff and elected officials can begin updating the local zoning code to encourage and/or require (where relevant) green infrastructure and other sustainability measures.

[10] www.migreencommunities.com and https://www.michigan.gov/egle/outreach/catalyst-communities


s McClellan st
2800
17 Ave S
STOP
ALL WAY

Resources and Tools

Center for Neighborhood Technology. 2020. Green Values Strategy Guide.
https://www.cnt.org/sites/default/files/publications/Green%20Values%20Strategy%20Guide.pdf

This guide provides definitions of green infrastructure types and outlines the health, economic, climate, and transportation benefits of green infrastructure. Additionally, this guide provides key actions to take when getting started with implementing stormwater management techniques.

Eskin, Jack, Tom Price, Jason Cooper, William Schleizer. August, 2021. A Design Guide for Green Stormwater Infrastructure Best Management Practices: Scalable Solutions to Local Challenges. https://www.miplace.org/4a72a6/globalassets/documents/rrc/rrc-library/guides/enabling-better-places-commercial-corridors-and-shopping-centers.pdf

This document details various aspects of stormwater management such as different forms of green infrastructure, maintenance requirements, and potential costs; and provides design templates to promote implementation of the green infrastructure forms.

Michigan State University Extension and University of Michigan Graham Institute. 2021.
Planning and Zoning for Solar Energy Systems: A Guide for Michigan Local Governments.
https://www.canr.msu.edu/planning/uploads/files/SES-Sample-Ordinance-final-20211011-single.pdf

This guide is developed for Michigan communities to utilize when addressing solar energy systems within key planning policies and the zoning ordinance. This document focuses on the different aspects of solar and how it can adapt to different land use patterns.

Michigan State University Extension. 2020. *Sample Zoning for Wind Energy Systems.*
https://www.canr.msu.edu/outreach/uploads/files/wind%20sample%20zoning%2010062020_FINAL.pdf

This document focuses on policy guidelines and provides sample zoning ordinance language related to utility scale and small-scale wind energy systems.

Wisconsin Sea Grant. 2018. Tackling Barriers to Green Infrastructure: *An Audit of Local Codes and Ordinances.* https://www.seagrant.wisc.edu/wp-content/uploads/2018/09/GIAT.pdf.

This resource provides information on sustainable practices that can be implemented to manage municipal stormwater runoff and examples of green infrastructure.

Baches, et al. December 2020. *Enabling Better Places: Commercial Corridors and Shopping Centers.*
https://www.miplace.org/4a72a6/globalassets/documents/rrc/rrc-library/guides/enabling-better-places-commercial-corridors-and-shopping-centers.pdf

This guide focuses on incremental zoning reform and provides recommendations on how to apply code reform in areas of a community where it will be most beneficial. This guide also provides success stories, examples, and additional resources related to code reform.

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