COMPREHENSIVE PLAN
CITY OF MASON

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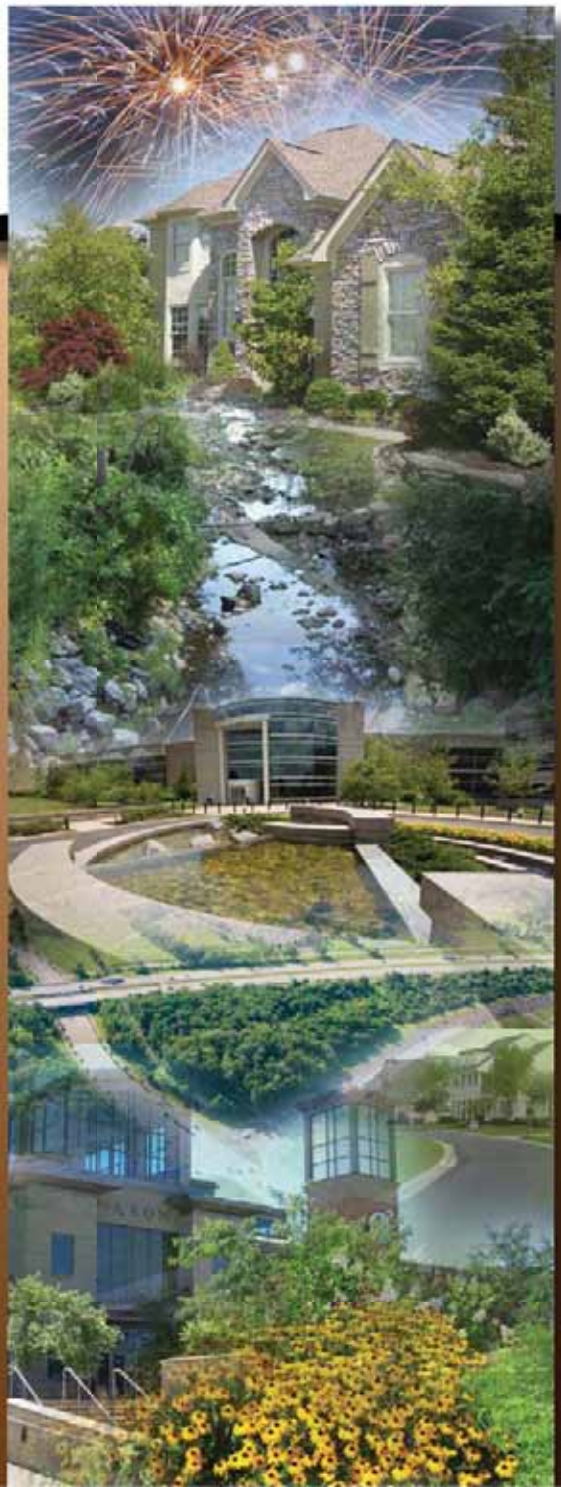
Chapter 5
Infrastructure



Chapter 5: Infrastructure

Vision Statement

The City of Mason will ensure sustainable drinking water, sanitary sewer service and technology for its residents and businesses. These efforts will support the continued vitality of the City of Mason as well as the region to which its economy and quality of life are linked.

Section 5.1. Purpose

The Infrastructure Element provides policies to maintain and improve the quality of the City's infrastructure, including water, sewer, and technology in a sustainable and cost efficient manner as the community grows.

The primary components of this element include:

1. An analysis of existing Greater Cincinnati Water Works (GCWW) water supply and treatment, wastewater treatment, stormwater management utilities and their respective capacities.

2. Recommendations to address existing shortcomings in utilities and services.

3. Recommendations to ensure an adequate supply of water and water/wastewater treatment capacity.

4. Recommendations to maintain and improve the quality of the City's water supply, as well as the quality of wastewater and stormwater.

5. Strategies for Low-Impact Development that conserves water, reduces stormwater runoff and improves stormwater quality.

Highlights

- Mason has access to an abundant supply of water through an agreement with the GCWW.
- A recently constructed Water Reclamation Plant serves Mason's current needs and allows for future growth. Minor modifications could increase capacity to more than double the current average daily usage.
- Mason continues to make improvements to its Stormwater Management Program, which includes public education and outreach, illicit discharge detection and elimination, construction site runoff management, post-construction stormwater management, and pollution prevention/good housekeeping for municipal operations.

Section 5.2. Infrastructure Snapshot

This section contains a summary of existing water, sewer and information technology infrastructure conditions, issues and opportunities. Detailed information can be found in the Existing Conditions Report.

Chapter Cover Photo

This is a "Rain Garden" located in Pine Hills Lake Park. This rain garden intercepts stormwater runoff from an adjacent parking lot. The rain garden holds and filters stormwater and reduces ground water and surface water contamination. Rain gardens add utility and aesthetic quality, using natural processes, to Mason's high-quality infrastructure.

Water

- Studies in the 1990s showed that the City's water sources were insufficient to meet the demands of future growth. The City signed a 30-year contract in 2002 that transferred all water operations to GCWW. GCWW currently provides water treatment for most of the community.
- The Warren County Water Department services a small percentage of the City on its eastern boundary.
- GCWW obtains a dominant amount of its water from the Ohio River via its Miller Plant, located near the mouth of the Little Miami River.
- The City's current contract with GCWW stipulates a limit of 15 million gallons per day (MGD) of water to be supplied to Mason. It would be possible for the City to increase this limit by amending the contract if the need arises.

Sewer

- The City of Mason provides sanitary sewage treatment and maintains sewer lines for the entire Mason community. A new Water Reclamation Plant (WRP), completed in 2006, provides sewage treatment with an average capacity of 8.67 million gallons per day (MGD), with a theoretical peak capacity of 30 MGD. Relatively minor modifications could expand the plant's average capacity to 13 MGD.

Stormwater Management

- Stormwater runoff in urban areas can carry pollutants into water sources and aquatic habitats and can increase flooding and erosion.
- The City of Mason established a Stormwater Utility in 2001, and a Stormwater Management Program in 2003. The Stormwater Utility provides a funding stream for stormwater management projects.
- Some examples of stormwater management projects include:
  - Regional detention along the Muddy Creek near Snider Road, and near Fairway Drive on the Golf Center at Kings Island golf course.
  - Installation of new stormwater systems in older neighborhoods to address flooding problems and a lack of prior stormwater management infrastructure.
  - Installation of a rain garden in Pine Hill Lakes Park and pervious pavement at the Pine Hill Lodge.

Information Technology

- Cincinnati Bell and Time Warner Cable provide high-speed internet and other telecommunication services for both residential and business purposes in Mason. Advanced Technology Consulting and Embarq concentrate on business telecommunication needs.
- A 1,600-mile fiber optic network that connects Ohio's major metropolitan areas includes a segment that runs parallel to I-71 between Columbus and Cincinnati.

Rain Garden at Pine Hill Lakes Park after initial planting - compare with the cover photo taken two years earlier.

Section 5.3. Goals and Strategies

Goal IF-1.
Improve Technology Infrastructure for Business Parks and neighborhoods.

Education and innovation, both of which fuel economic development, depend on effective sharing of information. The telecommunications infrastructure is now just as vital to economic growth as transportation systems. Proactive efforts to expand broadband infrastructure will help business recruitment efforts, attract desired jobs, and possibly promote higher education in Mason.

Strategy IF-1.1.
Develop a plan to expand fiber-based broadband infrastructure in Mason and connect to the statewide fiber-optic network.

Action IF-1.1.1. Form a task force, including City officials, service providers, and representatives of local businesses and higher education institutions to explore the expansion and/or improvement of fiber-optic infrastructure throughout the community.

Strategy IF-1.2.
Require easements and conduit installation with new development and through capital improvement projects.

Action IF-1.2.1. Update Zoning and Subdivision Regulations to require empty conduit for future fiber-based broadband infrastructure.

Action IF-1.2.2. Assign a portion of the Capital Budget to development of "backbone" elements of the broadband infrastructure.

Goal IF-2. Improve stormwater quality and maintenance throughout the City.

Runoff from agricultural or developed land can increase flooding and erosion and carries pollutants into groundwater, streams and rivers. The Ohio EPA continues to address this issue by adopting stricter stormwater management requirements that local communities like Mason must enforce. There are also several innovative, low-impact stormwater management strategies that can be applied at a variety of scales as a supplement to or (with special Ohio EPA approval) substitute for Ohio EPA requirements.

Strategy IF-2.1.
Modify building and zoning codes to promote Low-Impact Development (LID) practices such as bio-infiltration swales, rain gardens, xeriscaping or low-moisture landscape plantings (see Figure 5.3A).

Action IF-2.1.1. Educate development review officials about Low-Impact Development approaches.

Action IF-2.1.2. Encourage reduced parking and driveway areas with regulatory changes such as parking maximums, "shadow" or land-banked parking, and narrower driveway width requirements. This action will complement the reduced local street widths recommended under Chapter 6, TR-2.1. (See Figure 5.3B)

Action IF-2.1.3. Allow pervious pavement materials on driveways and parking lots.

Figure 5.3B "Shadow" or "land-banked" parking (See IF-2.1.2)

This regulatory technique reduces impervious surfaces by permitting the reduction in the amount of required parking to be installed by setting aside "green space" for future parking if warranted.

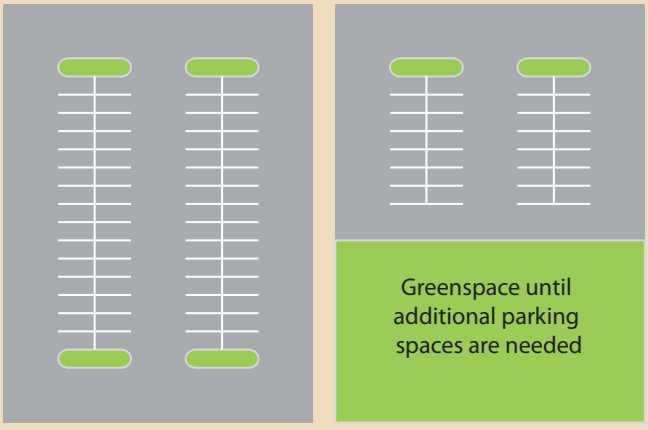
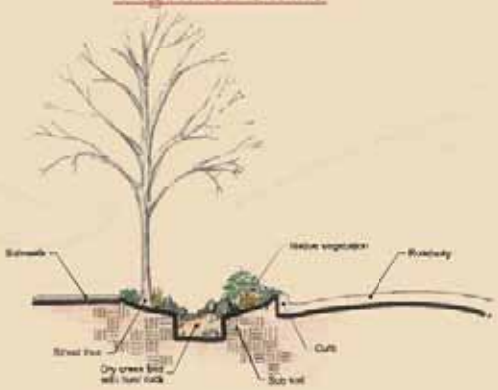


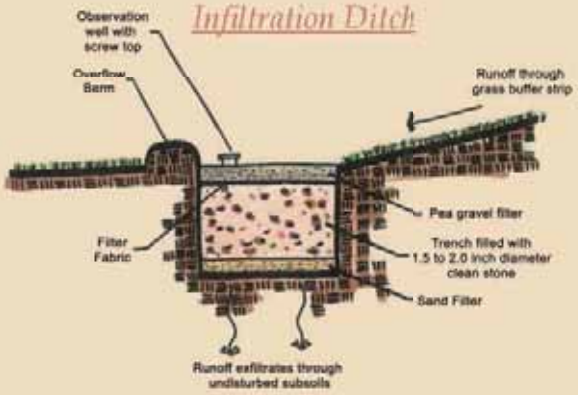
Figure 5.3A Low-Impact Development (See IF-2.)

Low-Impact Development (LID) is an approach to stormwater management at the site level that seeks to mimic natural hydrology and processes with small-scale, decentralized practices that in ltrate, evaporate, detain and transpire stormwater. LID practices known as Integrated Management Practices (IMP's) are designed to minimize disturbance and manage stormwater at its source, rather than relying solely on centralized BMP's such as detention basins. Below are several examples of common IMP's.

Vegetated Swale



Infiltration Ditch



Green Roof

Dry Well

Pervious Pavement

Rain Barrel

Source: Ohio Department of Natural Resources (ODNR) Rainwater Manual

Action IF-2.1.4. Develop design guidelines for Integrated Management Practices and incorporate them into the site plan review process as an alternative to conventional stormwater management practices.

Action IF-2.1.5. Develop educational materials that instruct property owners on how to implement and maintain Low-Impact Development features such as bioswales and rain gardens.

Action IF-2.1.6. Promote energy efficient and environmental design principles for sustainable development. (See NR-3.1)

Strategy IR-2.2.
Continue the development of regional detention basins in strategic locations.

Action IF-2.2.1. Select site location for future regional detention that ties into the City's Green Infrastructure network (described in NR-2).

Action IF-2.2.2. Design future regional detention basins as aesthetic and recreational assets to the community. Integrate the basins with gateway or streetscape designs where applicable and connect the sites to the City's bicycle and pedestrian path network.

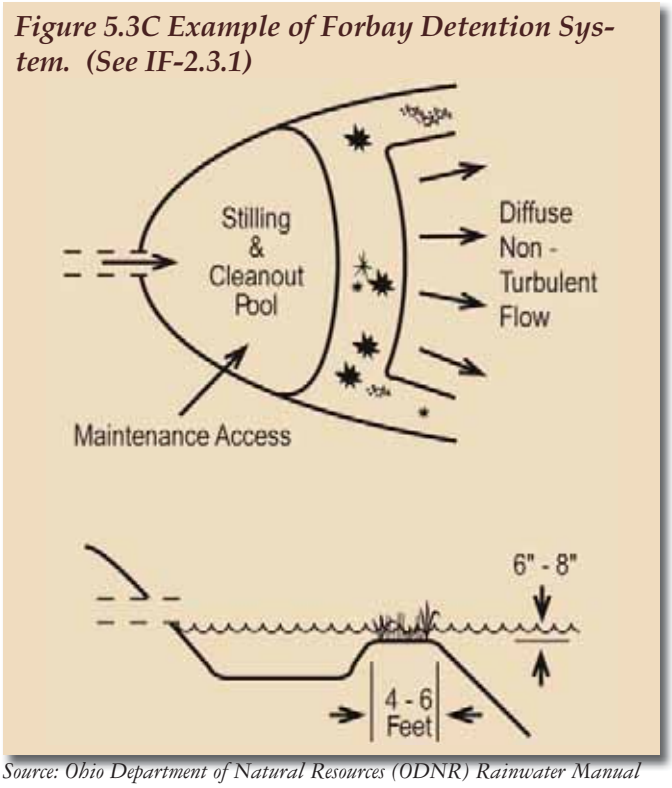
Strategy IF-2.3.
Incorporate current Ohio EPA standards for stormwater detention into existing stormwater regulations and detention basins in order to improve stormwater quality and facilitate detention basin maintenance.

Action IF-2.3.1. Retrofit existing regional detention basins to include "forebays" and other Ohio EPA design requirements. (See Figure 5.3C)

Action IF-2.3.2. Update stormwater regulations to reflect current Ohio EPA requirements.

Strategy IF-2.4.
Restore and stabilize damaged floodplain areas as described in Chapter 2, NR-1-3.

Figure 5.3C Example of Forbay Detention System. (See IF-2.3.1)



Source: Ohio Department of Natural Resources (ODNR) Rainwater Manual

Goal IF-3.
Grow in a fiscally responsible manner.

Mason will encourage development within the existing municipal boundary (see Chapter 8) to maximize the investment made in existing infrastructure and services.

Strategy IF-3.1.
Direct development to planned growth areas that have adequate sewer and water infrastructure.

Action IF-3.1.1. Upgrade water and sewer lines as needed to facilitate development in priority growth and reinvestment areas - see sub-areas identified in Chapter 8.

Action IF-3.1.2. Modernize and maintain existing water and sewer lines in order to promote continued investment, infill and redevelopment in existing neighborhoods. Coordinate with strategies identified under Goal HN-1 in Chapter 1.

Strategy IF-3.2.
Evaluate growth-related capital improvements and costs of services against anticipated economic returns for new projects and proposed annexations.

Action IF-3.2.1. Use the OKI model or develop an interactive fiscal analysis tool that projects the future capital and operating costs and anticipated revenues of annexations, new development and infrastructure projects.

Action IF-3.2.2. Explore opportunities for additional revenue streams such as user fees, agreements with adjacent jurisdictions and other solutions as needed.

Strategy IF-3.3.
Consider adopting an adequate public facilities ordinance.

Action IF-3.3.1. Require a determination by the City for planned development and site plan review applications that adequate water, wastewater, and roadway infrastructure and services are or will be in place when development occurs.

Action IF-3.3.2. Require developers to offset increased public costs when existing public infrastructure, facilities and services are inadequate to accommodate new demand.

Strategy IF-3.4. Account for true, long-term infrastructure costs in annual budgeting.

Action 3.4.1. Budget for long-term maintenance and replacement costs on an annual basis. Annual set asides will accumulate over time commensurate with anticipated maintenance and replacement costs.

Goal IF-4.
Monitor future drinking water supply.

Strategy IF-4.1.
Work with Greater Cincinnati Water Works to estimate future water needs and secure adequate supply and pressure to meet the needs of future growth.

Action IF-4.1.1. Evaluate the need to amend the City's contract with Greater Cincinnati Water Works to increase limits of water provided in the future.

Goal IF-5.
Improve floodplain, floodway and waterway maintenance.

Waterways form the backbone of the City's Green Infrastructure network. Maintaining riparian vegetation and avoiding damage and obstructions to the floodplain (discussed further under Goal NR-1 in Chapter 2) will improve stormwater management efforts and flooding hazards. Preserving stream corridors as recreational greenways will raise awareness of natural systems, provide recreational amenities and preserve natural drainage functions.

Strategy IF-5.1.
Promote development of greenways and paths along the Muddy Creek and other riparian corridors as discussed under Strategy NR-2.2 in Chapter 2 and TR-1.2 in Chapter 6.

Goal IF-6.
Monitor sanitary sewer treatment capacity.

Strategy IF-6.1.
Implement findings of City-wide Inflow/Infiltration Analysis by identifying and constructing remedial sewer projects in areas of high inflow and/or infiltration.

Action IF 6.1.1. Prioritize projects that are in highly sensitive areas and ones that provide the best results for the cost.

Strategy IF-6.2.
Develop electronic Operation & Maintenance Manual with standardized procedures and computerized maintenance inventory system.

Strategy IF-6.3.
Update the Wastewater Master Plan to take into account newly developed and annexed areas.

Goal IF-7.
Upgrade sanitary sewer treatment capacity.

Strategy IF-7.1.
Complete planned expansion of Water Reclamation Plant timed to accommodate planned growth.

Strategy IF-7.2.
Examine existing lift stations.

Action IF-7.2.1. Upgrade existing lift station near the Beach Water Park to improve service and provide for future expansion of sewer system.

Action IF-7.2.2. Eliminate existing Parkside lift station and provide for future system expansion by construction of a new gravity sewer in Bethany Road west of Mason-Montgomery Road.

Goal IF-8
Examine ways to provide cost effective secondary benefits of Water Reclamation Plant.

Strategy IF-8.1.
Prepare a feasibility study to turn the Water Reclamation Plant into a regional system.

Action IF-8.1.1. Proactively contact area wastewater treatment facilities such as Warren County Water and Sewer, Butler County Water and Sewer, Cincinnati MSD, the City of Lebanon and the Village of South Lebanon to explore sharing of excess capacity.

Strategy IF-8.2.
Develop ways to use by-products of Water Reclamation Plant.

Action IF-8.2.1. Study re-use of effluent water.

Action IF-8.2.2. Study re-use of bio solids as fertilizer for residential and agricultural uses.

Action IF-8.2.3. Study re-use of bio solids as alternative energy source and/or production.

Action IF-8.2.4. Construct facilities to treat and convey WRP effluent to Mason Sports Park for irrigation, replacing purchased water.

An earial and street level view of Maon's Water Reclamation Plant located on Mason-Morrow-Millgrove Road.