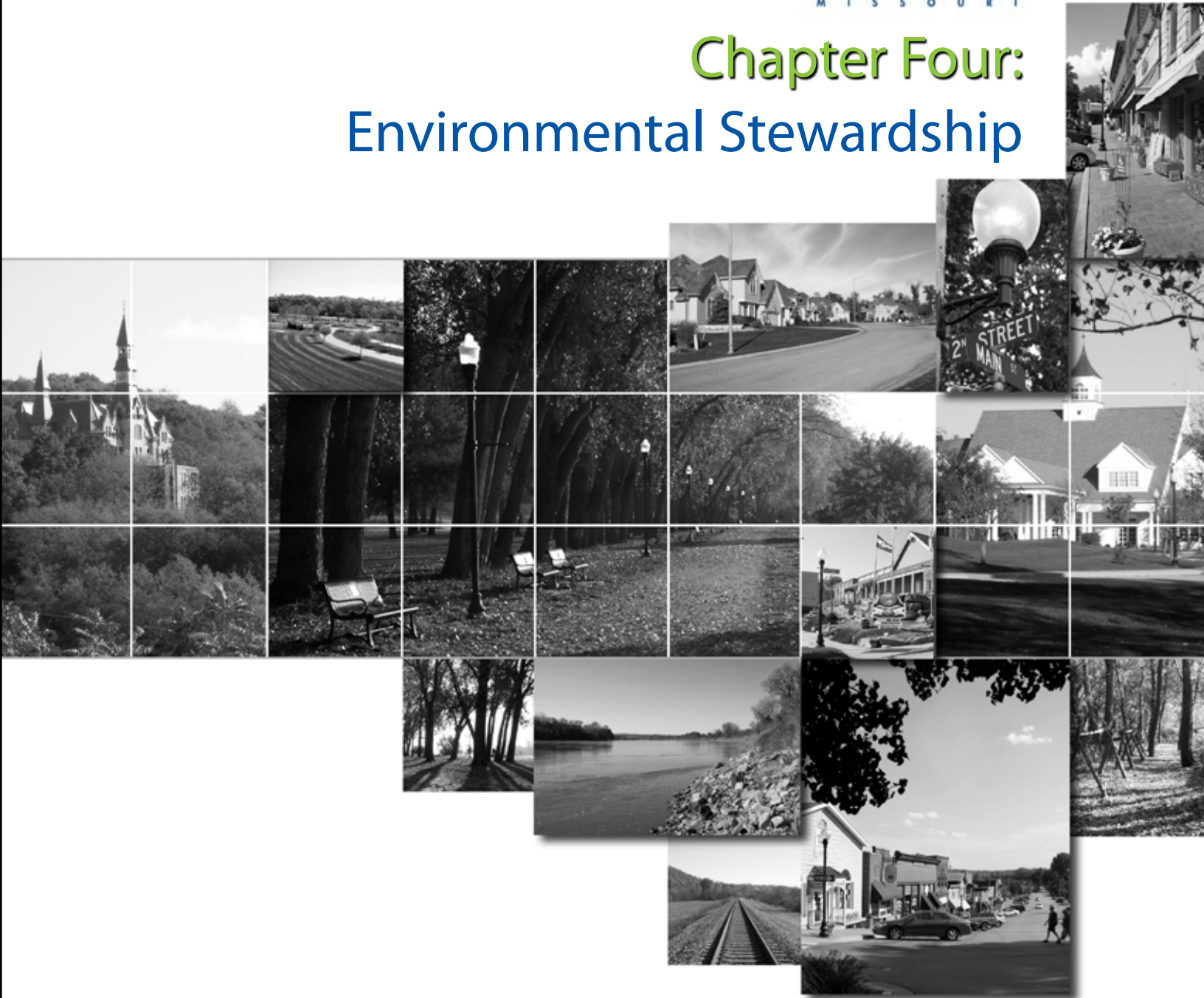




# Chapter Four: Environmental Stewardship





### Introduction

Future development in Parkville should retain the natural infrastructure and visual character derived from topography, woodlands, streams, and riparian corridors. A proactive approach to protecting environmental assets should incorporate natural storm water treatment practices and include preservation of woodlands, extreme slopes and stream buffers.

Protection of natural streams in the Parkville planning area occur in accordance with storm water management regulations adapted from the American Public Works Association Guidelines for Storm Drainage Systems and Facilities. They provide applications and design criteria for storm water management, conveyance, detention and natural stream protection that applies directly to the unique environmental assets in Parkville's planning area.



*Environmental assets should be protected by integrating new development with the natural environment to create an economically viable community through sustainable design.*

## Natural Storm Water Treatment Practices

Natural storm water treatment practices can help reduce storm water runoff and non-point source pollutant loading rates, and can be used to preserve the city's unique terrain and woodlands. A sustainable community approach to storm water management addresses adverse impacts of storm water runoff by:

- reducing the potential amount of sediment/pollutants carried off by storm water runoff from rainfall and treat storm water runoff before it reaches the receiving stream;
- increasing infiltration (water absorbed by the soil) of storm water runoff while in the drainage basin;
- increasing the amount of time for storm water runoff to reach its receiving stream;
- reducing downstream overbank flooding; and
- safely passing or reducing the runoff from extreme storm events.

Development planning should implement appropriate Best Management Practices (BMPs) to reduce the “quantity” of storm water runoff and also improve the “quality” of the water as it passes through. Limiting the “quantity” of storm water runoff may also reduce the amount of detention storage required for the development, which in turn reduces development costs. The use of natural buffers and native vegetation should be promoted to reduce the need for grading and the need for larger enclosed pipe systems—thus reducing up front development costs as well as long-term maintenance needs.



*Green street design can help reduce storm water runoff.*



*Rain Gardens*



*Permeable Surfaces*

Typical Best Management Practices recommended for new development areas include:

- limiting disruption of natural hydrology and water pollution by reducing impervious cover, increasing on-site infiltration, managing storm water runoff, and removing pollutants from storm water runoff;
- conservation and minimization through narrower streets, reductions in impervious surfaces, use of pervious pavement and grid pavers, replacement of existing pavement with pervious structures, vegetated roofs, and creation of vegetated swales and landscaped bioretention areas;
- conveyance through grassed channels, bioretention channels, and disconnection of impervious areas to redirect runoff to vegetated areas;
- storage to reduce peak discharge via rainwater capture and use, rainwater recycling, green roofs, and yard, curb or subsurface storage;
- infiltration through trenches and basins, and exfiltration devices; and
- landscaping measures such as bioretention cells, rain gardens, slope reduction, constructed wetlands, vegetated filters, planter boxes and native ground cover.



*Vegetated Swale*



*Natural Vegetation Restoration*

## Floodplain Management

Preservation and management of the floodplain plays a crucial role in flood-prone Parkville. The floodplain and flood-prone areas should generally not be developed. Instead function and capacity of flood-prone areas should be preserved, and where possible enhanced to minimize flooding. Partnerships to minimize impacts from upstream development outside Parkville, and to mitigate existing flood hazards, will be necessary components of a comprehensive flood management strategy.



*Infiltration planter/bioretention area*

### Stream Buffers

Protecting natural streams throughout the Parkville planning area must occur with the City's stream buffer and setback standards to limit degraded waterways from urbanization. Stream buffer standards are intended to mitigate the adverse environmental impacts that development may have on streams and associated natural resource areas.

While Parkville currently has buffer standards in place, additional measures are necessary to ensure the City's development regulations adequately protect area watersheds. Because Parkville is at the bottom of the watersheds it's critical that Parkville partner with other jurisdictions at the top of the

watersheds to minimize storm water run off and mid- and bottom-shed impacts. The purpose of a stream buffer is to:

- improve storm water management and water quality;
- provide additional watershed level detention capacity and ensure the protection and quality of existing natural stream channels, while preventing flooding;
- increase the public's knowledge and understanding of natural resource protection issues; and
- decrease infrastructure construction and maintenance costs.



*This stream is experiencing extensive erosion. Improved storm water management by Parkville and surrounding jurisdictions will help minimize degradation to streams and preserve their health and water quality.*

## Woodland and Slope Preservation

A sensible balance should be employed to preserve existing noteworthy environmental features, while accommodating new development in Parkville. Enhanced measures in development design should be used to preserve significant trees or tree masses where possible. These measures may include:

- **Tree Preservation:** Adoption of a tree preservation ordinance and standards for tree surveys will assist with the identification of significant tree clusters and specimen trees worthy of preservation, as well as, mitigation measures for those areas that will be impacted by development. Areas to be preserved should be protected from all construction activities, including earthwork operations, the movement and storage of equipment and materials, and dumping of toxic materials.
- **Slope Preservation:** Adoption of a slope preservation ordinance will help preserve environmentally sensitive areas, particularly in stream buffer areas. Such regulations identify excessive slopes in which development should not occur and should retain existing woodlands and native vegetation. Development encroachment in such areas can be managed through the use of cluster development, density credits and establishing no-build lines through the development approval process.

*Measures should be taken to preserve significant tree clusters in new developments by conserving existing natural areas and restoring damaged areas to promote biodiversity. On greenfield sites, the area of site disturbance should be minimized around building, utility and other site improvements.*

## Cluster Development

Clustering is a form of planned development that concentrates buildings on part of the site (the cluster area) to allow the remaining land (the open space) to be used for recreation, common open space or preservation of environmentally sensitive areas. The open space may be owned by either a private or public entity.

City development regulations should accommodate and promote flexibility in density, lot sizes, setbacks, street design and other infrastructure designs.

Density credits should be considered in situations where landowners designate or preserve land for conservation on one part of the site that otherwise may be developable in exchange for increased development density in other parts of the site with less impact on the natural environment and are more suitable for development.

Conventional Subdivision



Cluster Development





### Goals, Policies and Implementation Actions

**Goal:** Protect natural resources and ensure that future development occurs in harmony with existing environmental assets.

**Policy:** Integrate new development with the natural environment to create an economically viable community through sustainable design.

**Policy:** Protect environmental assets including stream corridors, floodplains, woodlands and steep slopes.

**Policy:** Use development practices that limit the quantity of storm water runoff and increase the quality of storm water.



*The use of BMPs and green infrastructure in new development and public improvement projects should be used to help minimize downstream flooding and improve the water quality of storm water runoff*

#### Implementation Actions:

- Update City development regulations to limit development on steeply slopes area.
- Update City development regulations to allow for and promote the use of Best Management Practices (BMPs) in development design.
- Update City development regulations to include a tree preservation ordinance.
- Update City development regulations to increase natural storm water infiltration in new developments and reduce the amount of enclosed storm water pipe systems.
- Update City development regulations to incorporate low impact development measures for flood mitigation and increased water quality.
- Update City's development regulations to protect the City's watersheds.
- Partner with the County and jurisdictions at the top of the watersheds to minimize storm water runoff and related impacts in downstream Parkville.
- Update City development regulations to include cluster development standards which may be used to offset the preservation of open space and areas of environmental significance.
- Manage storm water runoff by reducing impervious cover and increasing on-site infiltration through methods such as vegetated roofs, pervious paving, and reuse of storm water for non-potable uses including landscape irrigation, toilet and urinal flushing and custodial uses.
- Partner with other cities and counties, businesses, and the state to promote environmental strategies.
- Develop a floodplain management plan that identifies floodplain preservation areas, likely threats and strategies for mitigating existing hazards.





