Fourmile Creek Watershed

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9.20.2017
ONLINE
INTERACTIVE

GREENWAY

Work is underway to create a greenway that will run along the lower half of Fourmile Creek, starting at the Des Moines River and ending just South of Interstate 80. This greenway will serve as a corridor of undeveloped land that is set aside for environmental protection and recreational use.

The greenway boundaries will reflect those of the 500 year flood plain set by FEMA. Traditionally, houses and buildings have been built within these flood plains. This creates potentially hazardous conditions for the residents and businesses due to their increased risk of flooding. Greenways allow recreational use of these high flood risk areas without putting residential and commercial infrastructure in jeopardy.

There will be endless recreational opportunities throughout this greenway. Stream access points may be created in order to allow individuals to get down to the stream to play and fish. Current playgrounds and parks along Fourmile Creek will remain and more may be developed. A trail will also exist along the entirety of the greenway creating walking and biking opportunities.

Water quality is an important environmental factor that will benefit from the future greenway. Since infrastructure will be located further away from the stream, pollutants from traveling along the surface will have a harder time reaching the creek. Strategic wetlands and other conservation practices will also be placed throughout the greenway in order to treat the water before it reached Fourmile Creek.

Animals also benefit from greenways, especially in highly urbanized areas. Most wildlife such as birds, mammals, and aquatic species require corridors of green space in order to survive. The Fourmile Greenway will create a safe place for animals to travel from place to place and find food sources.

A Lower Fourmile Greenway Master Plan has been completed and showcases the potential aspects of this greenway and the area it will cover. **Please visit the link below to view this plan.**

Lower Fourmile Creek Greenway Master Plan

Chapter 3: Blue Print for the Future

September 19

2017

Fourmile Creek Greenway Master Plan

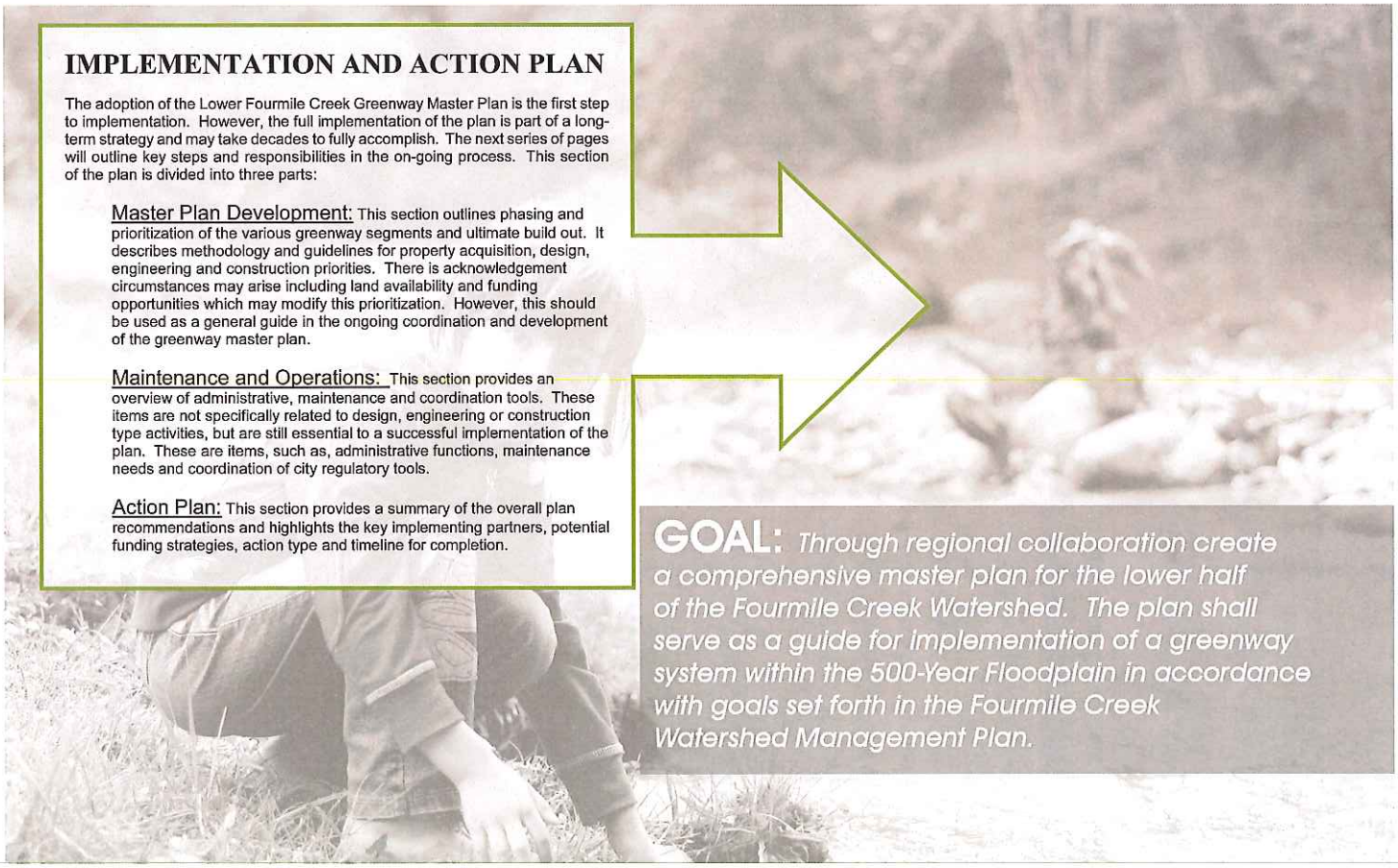
IMPLEMENTATION AND ACTION PLAN

The adoption of the Lower Fourmile Creek Greenway Master Plan is the first step to implementation. However, the full implementation of the plan is part of a long-term strategy and may take decades to fully accomplish. The next series of pages will outline key steps and responsibilities in the on-going process. This section of the plan is divided into three parts:

Master Plan Development: This section outlines phasing and prioritization of the various greenway segments and ultimate build out. It describes methodology and guidelines for property acquisition, design, engineering and construction priorities. There is acknowledgement circumstances may arise including land availability and funding opportunities which may modify this prioritization. However, this should be used as a general guide in the ongoing coordination and development of the greenway master plan.

Maintenance and Operations: This section provides an overview of administrative, maintenance and coordination tools. These items are not specifically related to design, engineering or construction type activities, but are still essential to a successful implementation of the plan. These are items, such as, administrative functions, maintenance needs and coordination of city regulatory tools.

Action Plan: This section provides a summary of the overall plan recommendations and highlights the key implementing partners, potential funding strategies, action type and timeline for completion.



GOAL: *Through regional collaboration create a comprehensive master plan for the lower half of the Fourmile Creek Watershed. The plan shall serve as a guide for implementation of a greenway system within the 500-Year Floodplain in accordance with goals set forth in the Fourmile Creek Watershed Management Plan.*

MASTER PLAN DEVELOPMENT

An ambitious vision for the greenway has been put in place by the master plan. The plan provides an outline for 46-miles of potential trail improvements and 1,696-acres of land set aside for public use and flood hazard mitigation. Implementing and developing such a complex and comprehensive large-scale plan required the establishment of key steps and priorities as part of the planning process. Priorities are based on the following criteria...

Project Already in Design or Construction

- Several parcels and easements have already been acquired along the greenway primarily for trail and streambank stabilization projects.
- Recent streambank stabilization projects have been completed and two are currently under design. Priorities for additional stabilization projects were provided in the Watershed Management Plan.
- Grant Funding was recently awarded for a sediment basin forebay and stormwater wetland improvements near Grandview Park.

Completion of a Greenway

- Does the acquisition or improvement help create or enhance existing park facilities.
- Would it provide a significant connection between other related facilities?
- Does the acquisition help create an easily maintainable and defensible boundary.

Resources Available

- Are the resources (i.e. funding, property) needed already in secured or highly likely to be made available.

Community Support

- Has the improvement been identified as a community priority through comprehnsive planning and other community-based planning efforts

Step 1: Catalyst Site Designation

CATALYST SITE

With long-term plan, such as this, designating a catalyst site where the various goals and components of the greenway master plan can be demonstrated is beneficial. The catalyst site would be the primary location for demonstrating the future breath of the greenway potential. This would not preclude any other opportunity-based improvements within the larger greenway. The catalyst site provides a chance to showcase and set in place standards for the remaining greenway corridor. It also provides an educational and public outreach opportunity concerning the aesthetic and use of the greenway corridor. The selection of the catalyst site was evaluated by its proximity to the various impacted communities and ability to showcase all of the master plan components:

01 | Natural Resources

- Water Quality Improvements
- Habitat Management, Restoration and Establishment
- Educational Opportunities

02 | Trail Improvements

- Trail Connections
- Diversity of Trail Types
- Destination

03 | Econcomic Resiliency

- Flood Management (i.e. Policy and Zoning Provisions)
- Recreation Improvements
- Multimodal Transportation
- Re-Envision Local Food

04 | Design Standards

- Sustainable Practices and Performance Based Measures
- Corridor Branding and Signage

The catalyst site was identified through the needs assessment and master planning process as a potential location for multiple natural resource improvements including wetland and oxbow restoration, streambank stabilization and habitat enhancements. The site's proximity to Fourmile Creek Park Community Center, Straser Woods, Copper Creek Lake Park and four schools make this a distinctive location for providing complimentary educational and recreational improvements. See Appendix Exhibit E showing potential catalyst site improvements.

Step 2: Acquisition Priorities

PROPERTY ACQUISITION

One of the most critical aspects to completing the greenway vision is land acquisition. This was identified early on in the master planning process as a necessary step in achieving the Watershed Management Plan's goal of water quality improvement and flood hazard mitigation.

Specific criteria were used to identify acquisition needs. The criteria were also used to help establish a tier system for acquisition priorities.

Additional Criteria Used for Prioritization:

- Located in 500-year floodplain
- Environmental benefits and water quality improvements through habitat enhancements, stormwater infiltration, flood storage and conveyance
- Helps ensure health safety and welfare; as well as, threat reduction to residents and first responders from flood events
- Reduce or prevent future property damage/losses
- Minimize need for infrastructure that would be required to support isolated properties and those areas prone to flood damage. (i.e. streets, storm sewer, sanitary sewer, water, electrical etc.)
- Properties should be acquired in a manner that creates a large unified parcel to help reduce maintenance and operation costs and creates clearly identifiable and defensible boundaries
- Provides community benefit through recreation and open space enhancements

ACQUISITION PRIORITIES

- **Tier 1 (0 to 5 Years):** Set in place funding for the acquisition of all Tier 1 properties over the next five years. Actively seek out willing sellers.
- **Tier 2 (6 to 10 Years):** properties shall be acquired within the next ten years. These properties should generally be actively sought after Tier 1 properties are acquired unless they become available for purchase at an earlier date.
- **Tier 3 (11-25 Years):** properties shall be acquired within the next twenty-five years. These properties should generally be actively sought after Tier 2 properties are acquired unless they become available for purchase at an earlier date.

Note: Property acquisition is anticipated to be primarily based on willing sellers. The use of eminent domain is only anticipated as a last resort for critical parcels needed to accomplish the greenway's primary goals and objectives.

ACQUISTION TIER PRIORITIES

The sheer number of acquisitions needed to complete the greenway is substantial and a significant public investment that offers immense public benefit. The total number of properties is expected take decades to acquire, as funding and opportunity become available.

The acquisition priorities maps, see Appendix Map 1.0, provides a breakdown of the various tier designations and their locations along the greenway. Due to the large scale and long-term nature of this project, the tiers themselves have been broken down further into a phasing plan for acquisition to assist with budgeting and planning. These are located on Appendix Maps 1.1 through 1.3B.

The phasing plan does not preclude acquisitions from future phases if opportunity and funding are available. This is intended to a working document and may be updated to accommodate changes to each community's comprehensive plans, stormwater and recreation goals.

SITE MANAGEMENT TYPE

In order to further define the greenway boundary, a management type was assigned to each parcel based on the type of use anticipated. The greenway boundary was defined by the areas designated for conservation management. These parcels form the primary linear corridor along Lower Fourmile Creek. The remaining parcels designated for acquisition and adjacent to the primary corridor are designated for recreation and city park management.

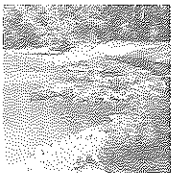
GREENWAY - Conservation Management: Primary Use conservation, flood hazard mitigation, water quality enhancement and passive recreation activities.

PARK NODES - Recreation Management: These are parcels within the 500-year floodplain identified for acquisition which will be developed and managed by the individual jurisdiction. These sites will be managed more like a typical city park and may have more active recreation activities. Although these will provide compatible services to the greenway, they will be managed and maintain separately.

Related Maps & Exibits in Appendix:

- Map 1.0 - Acquisition Tier Priorities
- Map 1.1 to Map 1.3B - Acquisition Tier Phasing Maps
- Map 1.4 - Lower Fourmile Creek Greenway Site Management Type Map
- Exhibit C: Greenway Boundary

Step 3: Potential Improvements



DEVELOPMENT IMPROVEMENTS

As land is acquired, improvements will need to be made early on to reduce maintenance needs, provide safe public access and meet the goals for water quality improvements and flood hazard mitigation. The master plan provides a vision for the future use and development of the greenway. The potential projects identified will often require collaboration between the various jurisdictions and the Watershed Management Authority. The full build out of the plan will also take decades to accomplish. While not a formal checklist, the prioritization of the proposed master plan improvements is broken down into two key categories:

1. Natural Resource Improvements
2. Recreation and Public Access Improvements

Related Exhibits in Appendix:

- Master Plan Exhibit A – Natural Resources
- Master Plan Exhibit B - Recreation

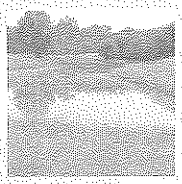
KEY CATEGORIES

1. Natural Resource Improvements:

- Water Quality Improvements
- Habitat Management, Restoration and Establishment
- Educational Opportunities & Outreach

2. Recreation and Public Access Improvements:

- Trail Improvements
- Trailheads and Trail Nodes
- Water Access for Wading and Fishing
- Outdoor Teaching Facilities
- Other Recreational Opportunities



NATURAL RESOURCE GOALS

The prior Watershed Management Plan and master plan needs assessment identified several key natural resource improvement opportunities.

See Appendix: Exhibit A – *'Master Plan – Natural Resource Improvements'* further defines potential improvements throughout the greenway and adjacent park nodes.

Criteria Used for Prioritization:

- Flood Management: Helps ensure the health, safety and welfare; as well as, threat reduction to residents and first responders from flood events
- Benefits to water quality
- Existing habitat and vegetation
- Proximity to other natural resource areas and improvements

NATURAL RESOURCE PRIORITIES

- **Top Priority (Short Term Goal 0 to 5 Years):**
  - Site Stabilization and Seeding
  - Stream Restoration and Streambank Stabilization
  - Program for Water Quality Monitoring
  - Study for Identifying Major Sources of Preventable Bacteria
  - Plan for Addressing Preventable Bacteria in Stream
- **Mid-Term Priority (Medium Term Goal 6 to 10 Years):**
  - Wetland Restoration/Establishment & Oxbow Restoration
  - Sedimentation Basin Construction
  - Native Riparian Vegetation Establishment and Enhancement
  - Undesirable Bacteria Prevention & Reduction Projects
- **Long-Term Priority (Long Term Goal 11 to 25 Years):**
  - Other Habitat Restoration
    (i.e. Prairie/Woodland/Savanna Restoration and Reconstruction)

RECREATION AND PUBLIC ACCESS GOALS

The prior master plan needs assessment identified several key recreation and public access improvement opportunities.

See Appendix: Exhibit B – *'Master Plan – Recreation Improvements'* further defines potential improvements throughout the greenway and adjacent park nodes.

This is intended to a working document and may be updated to accommodate changes to each community's comprehensive plans and recreation goals. It is anticipated each community will hold additional public information and input sessions to determine the specific desired recreation improvements within and adjacent to the greenway.

Criteria Used for Prioritization:

- Enhances existing economic hubs and parks
- Consistent with water quality and flood mitigation goals
- Provides unique recreational feature
- Cost share benefit with other improvement(s)
- Provides amenities to an underserved area
- Helps achieve related community based initiatives and comprehensive plan goals

RECREATION AND PUBLIC ACCESS PRIORITIES

- **Top Priority (Short Term Goal 0 to 5 Years):**
  - Gay Lea Wilson Trial Extensions and Regional Trail Connections
  - Critical Crossings (i.e. Safe Roadway Trail Crossings)
  - Water Access for Wading and Fishing
  - Signage at Existing Trailheads
- **Mid-Term Priority (Medium Term Goal 6 to 10 Years):**
  - Neighborhood, Community and Park Trail Connections
  - Trail Nodes (i.e. small grouping of boulders or natural seating areas along the trail, area may be mown and vegetation maintained to enhance views of the stream)
  - Trailheads (i.e. Parking, Restrooms, Access Points, Signage)
- **Long-Term Priority (Long Term Goal 11 to 25 Years):**
  - Interior Trail Development (Soft Surface & Paved Trails)
  - Interpretive Trails and Educational Signage
  - Other Recreational Improvements
  - Outdoor Teaching Facilities

2 MAINTENANCE AND OPERATIONS

In order to best implement the greenway, all project partners will be responsible for some level of services, resources and funding. Successful implementation and coordination of the greenway operations and maintenance will be critical to the greenways success. In order to implement a successful and well-coordinated plan, a single entity must be charged with following up on the plans recommendations. Services, resources and funding by each partner shall be further and clearly defined through a Memorandum(s) of Understanding (MOU) or Cooperative Service Agreement(s). The following section provides initial recommendations for the following tasks, which shall be further defined in these agreements…

Greenway Operations

- Greenway Oversight Structure
- Rules and Regulation
- Winter Operations

Maintenance Needs

- Understanding Greenway Function
- Key Maintenance Needs
- Frequency of Maintenance and Maintenace Level Expectations

Monitoring and Data Management

- Implementation of Water Monitoring Program as part of the Master Plan natural resource and water quality improvement goals.
- GIS Data Management
- Greenway Website Management

Education Programming and Outreach

- Public Outreach
- Environmental Education Programming

Greenway Operations

GREENWAY OVERSIGHT STRUCTURE:

The existing public properties within the greenway are currently owned and maintained by various jurisdictions and owners. Establishing a set of guidelines and recommendations for the oversight of the plans implementation; as well as, the greenway is managed and maintained will help provide a successful, consistent and well-coordinated greenway system.

RECOMMENDATIONS:

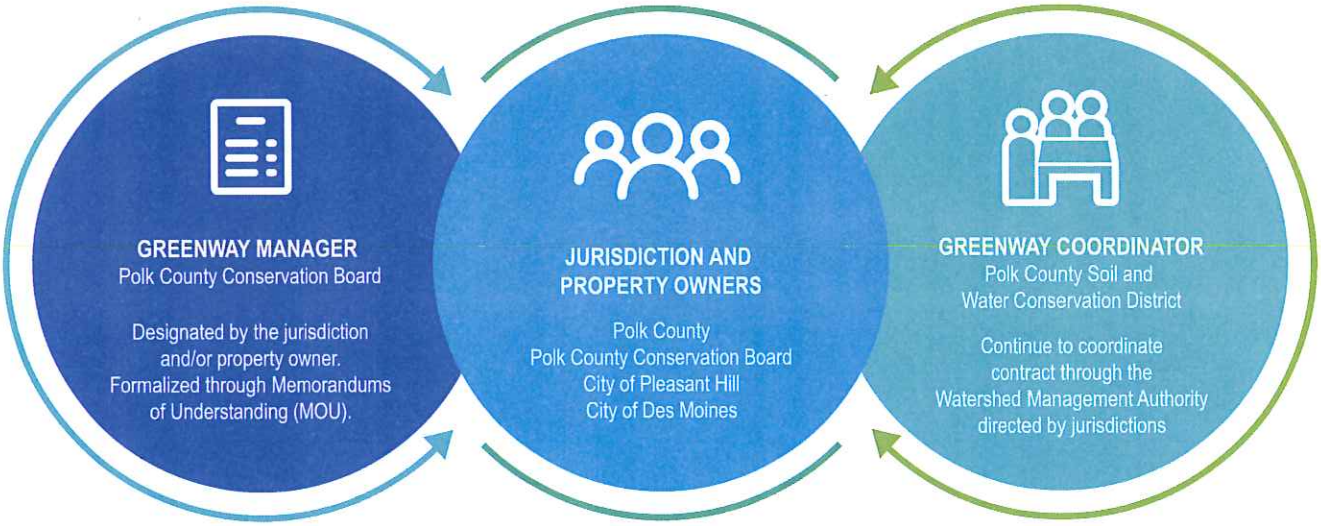
- Assign a Greenway Coordinator: A single entity should be charged with oversight of the master plans implementation. Polk County Soil and Water Conservation District (SWCD) has already been designated by the Fourmile Creek Watershed Management Authority to oversee the implementation of the Fourmile Creek Watershed Management Plan. They are responsible for the coordination of extensive work being done throughout the larger 76,000-acre watershed draining to Lower Fourmile Creek and are already coordinating with the impacted jurisdictions and other partners to help achieve the Watershed Management Plan goals. Polk County SWCD is a natural fit for coordinating the implementation of the master plan. Their responsibilities would include:

  1. *Master Plan Coordinator:*
     - ✓ Oversee the implementation of the Lower Fourmile Creek Greenway Master Plan. The coordinator is the central contact responsible for helping maintain a high level of communication and collaboration between the various partners. Services would include coordination of development improvements, planning, design and construction projects.
     - ✓ Ensure that the goals and tasks proposed in the master plan are achieved and updated as the partners mutually agree.
     - ✓ Ensure that the goals are consistent with the overall goals and strategies set forth in the Watershed Management Plan and Fourmile Creek Watershed Management Authority.

  2. *Story Map and Website Manager:*
     - ✓ Designated maintainer of the Story Map and website for the Fourmile Creek Watershed and Lower Fourmile Creek Greenway. In order to keep the plan current, all partners will need to provide any proposed updates to Polk County SWCD.

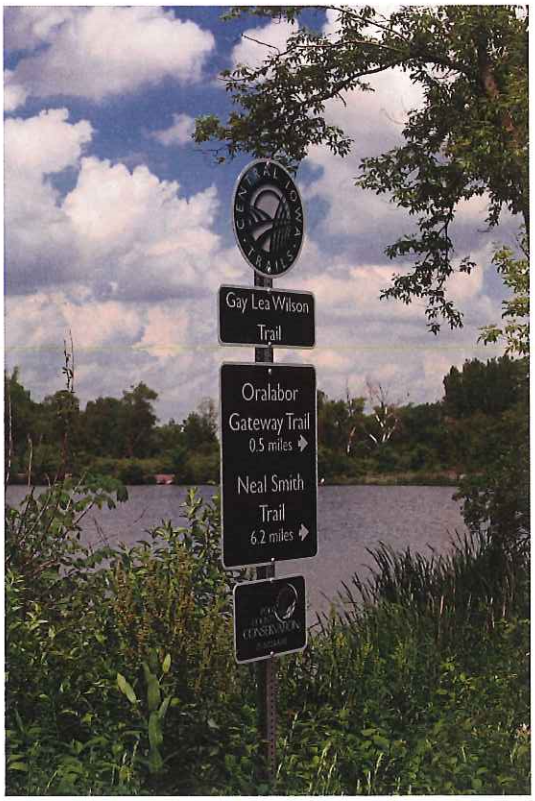
- Assign a Primary Greenway Manager: A single entity should be charged with overseeing and providing the primary municipal resources for the entire greenway system. The manager would be responsible for the primary greenway maintenance and operation of services including public safety. The Polk County Conservation Board is recommended for this position because of their familiarity with successfully managing and balancing similar restoration, conservation and recreational resources.

Greenway Oversight Structure Matrix:



OVERSIGHT PROCEDURE RECOMMENDATIONS

- ESTABLISH A GREENWAY REVIEW PROCESS: Due to the complexity of projects and activities that will affect the development of the greenway, a review procedure should be institutionalized that requires review and approval by the Greenways Coordinator on any private or city projects that will have a direct or indirect impact on the greenway system and properties.



RULES AND REGULATIONS

There has been a growing request from commuters and the multi-modal transportation movement to open up regional trail connections like this to 24-hour access or extended hours in the winter months. There are legitimate reasons for this extension and legitimate concerns about impacts to safety along dark unlighted trails. Having set hours' aids enforcement of rules and making sure certain activities do not occur during these evening hours. Coordination with the greenway and adjacent jurisdiction's park and trail hours should be considered in order to provide consistency and promote greater public safety.

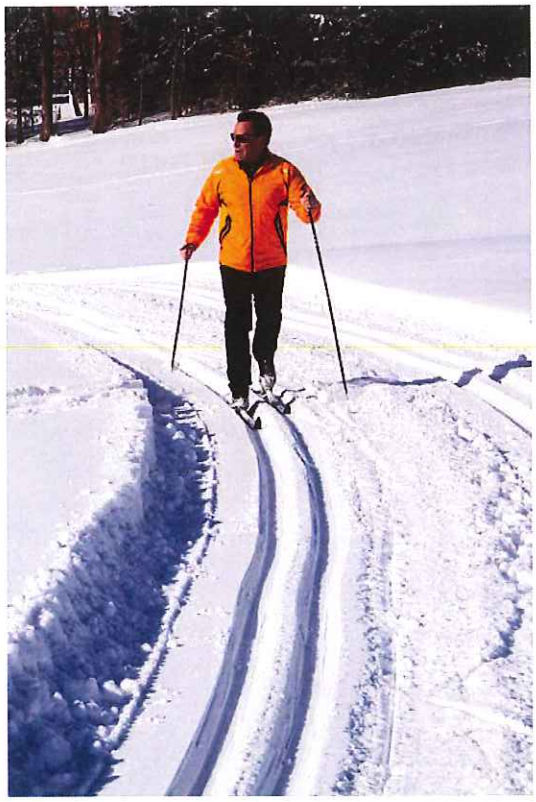
RECOMMENDATIONS:

- Establish an Hours of Operation Agreement: The greenway partners should continue to work with each other, the community and public safety officials to develop the most appropriate set of hours. Any changes to the hours of operation should be reviewed and discussed at a regional level in order to provide consistency across the region and various sections of the greenway. Any changes may require policy changes within an impacted jurisdiction.

- Establish a Rules and Regulations Agreement: The greenway bisects several jurisdictions. Currently the Gay Lea Wilson Trail runs the majority of the greenway length. Polk County Conservation Board currently manages and maintains the existing trail and has a set of existing rules and regulations policies they use for their existing park and trail sites. The partners should establish a consistent set of rules and regulations throughout the greenway in order to eliminate potential discrepancies and confusion from greenway visitors.

- Utilize Consistent Signage: Providing consistent signage at key access points and throughout the greenway will help define the greenway boundary and provide aid in visitor's wayfinding. At minimum, signs should be provided for rules and regulations, directional information and trail-related services. The signage using the "Central Iowa Trails Communication Master Plan" developed in 2006 has already been implemented along the Gay Lea Wilson trail. This should continue to be used as a design guide for future trail signage within the greenway. The Greenway Manager should be clearly defined on the signage and provided as the primary contact for the public to report maintenance and safety concerns.

- Develop and Use a Greenway Logo: A Lower Fourmile Creek Greenway logo should be developed and used on greenway signage, funding applications, outreach and promotional material. This helps create a sense of place and brand for the corridor while helping to define the greenway's boundaries for visitors.



WINTER OPERATIONS

Similar to other community parks the greenway is anticipated to be used year around for recreation, commuting, health and fitness. Ensuring year-round use of trails is growing with the bicycle culture as more individuals choose to use the growing system of trails for commuting. Currently snow and ice removal does not occur along the Gay Lea Wilson Trail. After snow events the trail is left open for cross-country skiing on an un-groomed trail.

RECOMMENDATIONS:

- Develop a Winter Maintenance Policy: A clear and concise policy or agreement should be put in place outlining trails dedicated for snow and ice removal. Clearly advertise which trails will receive this treatment. Outline the priority and timelines expected for snow removal on these routes. The primary Gay Lea Wilson trail should be highly considered for snow removal within the more developed areas for commuters. Consideration could be given to providing separate groomed trails at strategic locations where walkers, runners and bicyclists are not allowed for designated snowshoe and snow skiing activities.
- Promote Winter Recreation Activities: Polk County Conservation should continue to promote trails not scheduled for snow removal for cross-country skiing and snowshoes activities. They currently have a rental program out of Jester Park. Consideration could be given to encouraging this type of rental through a local business or public entity closer to the greenway corridor.

Maintenance Needs

GREENWAY FUNCTION

Successfully maintaining such a large area of public land requires a well-defined understanding of the primary function and design intent of the greenway system. It also requires a strong understanding of the physical setting of each particular segment of the greenway. All the greenway functions are interconnected; however, each segment may have a primary function or design intent. For example, certain segments of the greenway will have higher concentrations of visitors and some areas will only be used primarily for seasonal recreation activities. Other segments and areas have been primarily designated for flood mitigation and water quality enhancement; therefore, land management and conservation will drive the key maintenance needs and strategies.

The following pages provide recommendations for on-going maintenance activities based on the type of maintenance and frequency. These recommendations should be further reviewed and refined in the formal agreements with the Greenway Manager.

KEY MAINTNENACE NEEDS:

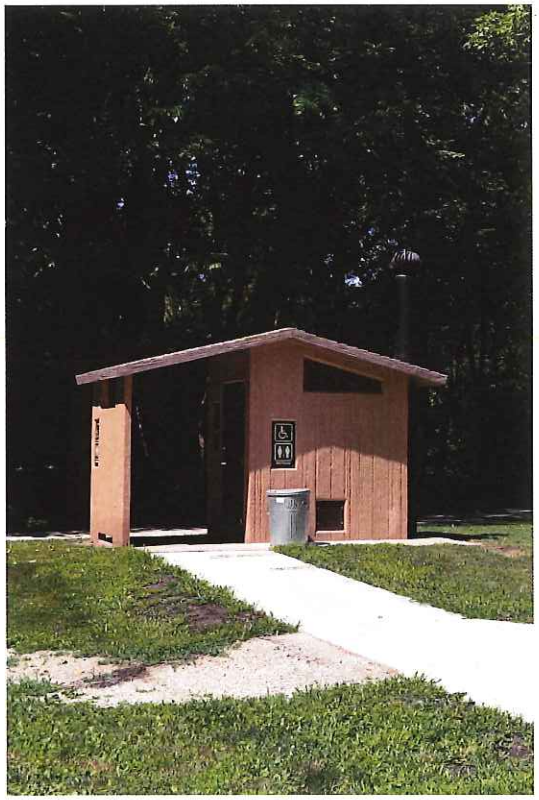
- Determine Trail Management and Maintenance Expectations
- Determine General Maintenance Expectations for Support Facilities and Amenities
- Develop a Vegetation Maintenance and Management
- Establish a Waterbody Maintenance and Management
- Develop Strategies for Implementing an Action Plan for Access Control, Safety and Emergencies
- Establish Timing and Priority of Maintenance Activities
- Determine Staffing and Personal Needs

Recommendations for:
TRAIL MANAGEMENT AND MAINTENANCE

1. Weekly Inspection(s): Greenway trails should have a visual inspection once a week at minimum. High traffic areas should include a second weekly inspection. During the inspection, facilities and trails should be checked and level of urgency determined for any matters discovered along the trail.
   - This should include driving or walking the entire length of trail system and observing the conditions along the trail.
   - Visual Inspections should identify:
     - Physical condition of trail surfaces (i.e. damage to surface)
     - Conditions of homeless populations' presence, illegal dumping or other issues that should be coordinated with local jurisdictions code enforcement officials.
     - Fallen tree or debris (i.e. broken glass, litter) near or on trail
     - Erosion or drainage concerns

2. Conditions Requiring Immediate Maintenance: Some tasks will need to be identified as critical to the safe use and operation of the trail system. These should be performed as soon as they are reported.
   - Have a plan in place for what requires immediate attention and whom to contact if immediate maintenance needs are reported. Examples include:
     - Removal of trees or branches that have fallen across the trail
     - Broken glass or debris on trail that could be harmful to users or damage bicycles
     - Trail washouts, infrastructure damage to bridges or other crossings

3. Seasonal Maintenance, Clearing or Sweeping: The need for snow removal, snow grooming, clearing and sweeping should be defined based on the designated trail type, intended use and frequency of use.
   - Any trail designated as a regional trail or commuter route should be swept and cleared at least bi-weekly. Additional clearing may be necessary during the Fall months in areas with heavy tree cover. Access trails should be swept and cleared monthly or as conditions warrant.
   - Any trial designated for snow removal should be given a priority rating. Heavy use and commuter routes should be given first priority and cleared within 24 hours of the end of a snow event.
   - Any trails designated for grooming for cross-country skiing should follow Polk County Conservation's standard policies. Currently, trails are groomed after a 6-inch snowfall.



Recommendations for:
MANAGEMENT AND MAINTENANCE OF GENERAL SUPPORT FACILITIES AND AMENITIES

1. Daily or Weekly Inspection(s): Similar to greenway trails, and preferably during the same visit, support facilities should have a visual inspection once a week at minimum. High traffic areas should include a second weekly or daily inspection. During the inspection, facilities should be checked and level of urgency determined for any matters discovered.
   - This should include visiting all restrooms and other structures within the greenway, parking/trailheads, trail nodes, creek access points, recreational amenities and site amenities (i.e. litter receptacles, signage, bike racks, benches etc.)
   - Visual Inspections should identify:
     - Damage to physical condition (i.e. vandalism or storm event)
     - Damage or missing signage
     - Conditions of homeless populations' presence, illegal dumping or other issues that should be coordinated with local jurisdictions code enforcement officials
     - Fallen tree or debris (i.e. broken glass, litter) near facility or amenity
     - Erosion or drainage concerns
     - Ensure restrooms or other structures are clean and functioning well. Restrooms in higher-use months and areas should be cleaned and inspected daily.

2. Conditions Requiring Immediate Maintenance: Some tasks will need to be identified as critical to the safe use and operation of the trail system. These should be performed as soon as they are reported.

3. Seasonal Maintenance: During the winter months some facilities and amenities may be closed or unavailable (i.e. restrooms and drinking fountains). They require seasonal winterization and must be re-opened in the spring.

4. Trash Collection: Trash collection will likely vary long the trail system depending on use. On high-volume trails trash collection should occur daily or as needed in high-use months (May-October). At a minimum, litter receptacles should be checked and trash removed on a weekly basis during high-use months and bi-weekly during the winter months.

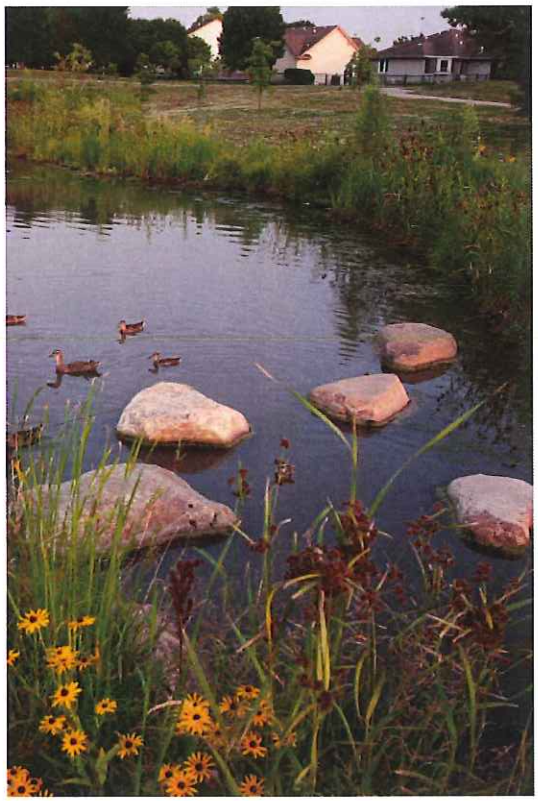
Recommendations for:
VEGETATION MAINTENANCE AND MANAGEMENT

1. Ecology Management Plan: A natural resource inventory should be conducted of existing properties and when properties are acquired within the greenway boundary to further establish existing locations and qualities of existing natural resources. An inventory would also help develop a habitat suitability model for defining habitat construction and restoration focus areas.

2. Mowing: Designated turf areas and a minimum 3-foot width mowed trail edge should be mowed regularly during the growing season. Mowing needs will vary depending on seasonal conditions and rain events. Turf areas and trail edges should be mowed when turf reaches 5-inches in height. For a typical year mowing is anticipated to be a weekly maintenance activity primarily from April thru June and a bi-weekly activity from July thru September. Choosing drought tolerant and short growing varieties of grasses for designated mowing areas, such as Buffalo Grass, can reduce mowing and maintenance needs.

3. Trimming and Pruning of Woody Plant Material: Trimming and pruning of plant material will be needed to help maintain the health of plants and provide safe and user friendly trails.
   - Normal trimming and pruning is recommended once a year in accordance with best practices established for a particular type of plant material.
   - Trimming and pruning to ensure safe use of trails and provide clear sightlines for trail users should occur as needed.
   - Broken branches and unhealthy/hazardous trees should be removed or cleanly pruned as needed.

4. Invasive Species Control: a plan for identifying and monitoring invasive species growth throughout the greenway should be developed. Aggressive invasive species (i.e. honeysuckle and garlic mustard) should be removed as quickly as possible to prevent their spread. Invasive species removal near designated restoration sites and higher quality native vegetation sites should be given a higher priority than more disturbed locations along the greenway.



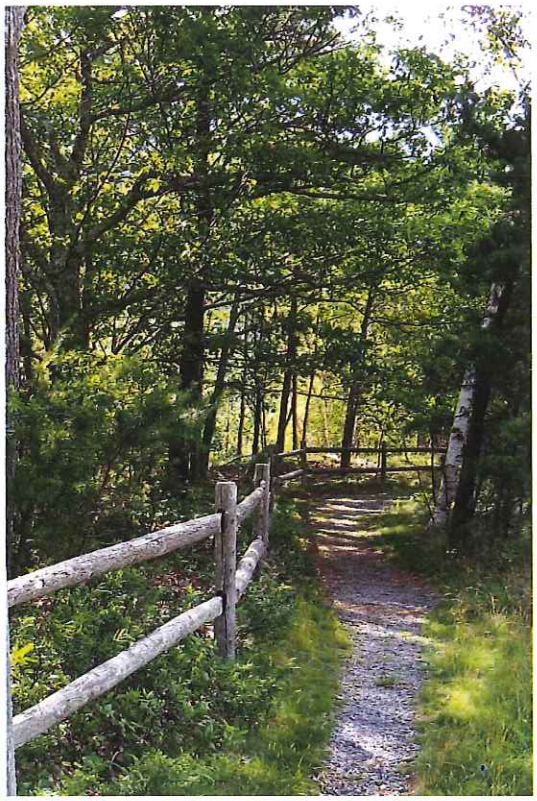
Recommendations for:
WATERBODY MAINTENANCE AND MANAGEMENT

1. Stream Maintenance and Log Jam Removal: As improvements are made, streambanks stabilized and volatility of the watershed is reduced, the streams water quality and habitat will improve. Log jams that currently obstruct the channel will likely be reduced from the reduction in tree fall along banks from erosion and flooding. Until then, log jams will continue to be a concern. Some log jams are beneficial and provide habitat. However, log jams that cause immediate safety concerns or anticipated to cause infrastructure damage should be removed. General maintenance of the stream shall be coordinated with the Greenway Manager, Polk County Conservation.

2. Stream Wading Access: The greenway master plan further layouts a broad vision for potential water access points for wading and fishing. The Des Moines Area Metropolitan Planning Organization (MPO) and their Water Trails and Greenways Advisory Committee are currently leading an engineering study that will further refine proposed locations and specific improvements. The MPO's plan is a significant investment from several generous donors through a public-private partnership. As the greenway master plan is developed coordination with the MPO's *"Greater Des Moines Water Trails and Greenways Master Plan"* and the current *"Water Trails Engineering Study"* should be highly considered. The engineering study is anticipated to be completed in 2018 and will provide conceptual designs and cost estimates for these types of improvements along Fourmile Creek. As these areas are developed the maintenance and management is anticipated to be primarily by the Greenway Manager, Polk County Conservation.

    - Sargent Park: The existing access point at Sargent Park has some proposed improvements already in the final design stages. These improvements are anticipated to be completed by Fall 2017. They are also anticipated to be maintained and managed by the City of Des Moines because of its location within an existing city park and not the greenway boundary.

3. Fish Habitat and Fishing Access:
    - Stream Access: As the greenway is developed, proposed stream restoration improvements should consider fish habitat structures. Angler access points will also be further defined by the MPO's study. Coordination with this plan for these types of improvements is also recommended.
    - Pond Access: Several ponds are part of the greenway master plan. Some of them are proposed water quality sedimentation basins and others are existing quarry sites with ponds that will require extensive restoration. As part of the greenway improvements fish habitat construction and stocking should be considered. As well as, a management plan, by the Greenway Manger, implemented for stocking and monitoring pond health.



Recommendations for:

- **STRATEGIES FOR ACCESS CONTROL, SAFETY AND EMERGENCY ACTION PLAN**

1. Access Control: One of the acquisition goals is to develop a greenway with defensible boundaries. This means the ideal boundary of the greenway is easy to identify, manage and maintain. The easiest way to do this is for the edge of the greenway property to abut an existing public roadway. However, this may not always be feasible. If the greenway boundary abuts up against private property, the boundary should be made identifiable using vegetation or fencing.

2. Develop and Implement a Safety and Emergency Action Plan: Protocols and procedure for responding to reports of potentially hazardous conditions within the greenway boundary should be implemented. The Greenway Manager should be the designated contact for non-emergency concerns. In emergencies, existing Polk County Conservation protocol and services should be utilized (i.e. Park Ranger & Park Advocacy Patrol Services). Signage and promotional materials for the greenway should provide clear direction to the public who they should contact for emergency, safety and maintenance concerns.

3. Use Signage and Technology: Utilize technology platforms to improve navigation and location-based mapping applications for reporting concerns. Provide consistent wayfinding signage throughout the corridor to help encourage exploration and improve safety.

4. Provide Access Routes for Emergency Vehicles Where Applicable: As improvements are made for public access. Consideration should be given to how emergency service providers will access the site and reach greenway visitors.

Maintenance Frequency and Policy Matrix:

MAINTENANCE ACTIVITY			TIMING OF MAINTENANCE ACTIVITY								
			Immediate Attention	As Needed	Daily	Weekly	Bi-Weekly	Seasonal Weekly	Seasonal Bi-Weekly	Monthly	Yearly
TRAIL AND FACILITY MANAGEMENT	Weekly Greenway Inspections	DAMAGE TO TRAIL SURFACE (i.e. Wash Outs)	X	X							
		DRAINAGE AND EROSION CONCERNS	X	X							
		DAMAGED OR MISSING SIGNS	X	X							
		REMOVAL OF FALLEN TREES OR BRANCHES ACROSS TRAIL	X	X							
		BROKEN GLASS OR OTHER DEBRIS	X	X							
		VANDALISM REMOVAL AND/OR REPAIR (i.e. Grafitti)	X	X							
		CODE ENFORCEMENT ISSUES (i.e. Access Control)	X	X							
	Other Needs	DAILY RANGER PATROLS AND SAFETY CALL		X	X						
		CLEARING / SWEEPING OF TRAIL SURFACE		X					X		
		SNOW REMOVAL		X							
		TRASH COLLECTION						X	X		
		CLEANING OF FACILITIES (i.e. Restrooms)						X			
		FACILITY WINTERIZATION									X
NATURAL RESOURCE MANAGEMENT		MOWING						X	X		
		TRIMMING AND PRUNING PLANT MATERIAL		X							X
		CONSERVATION AREA VEGETATION MANAGEMENT (i.e. Prairie Burning, Spraying, Invasive Species Removal)									X
		STREAM MAINTENANCE (i.e. Log Jam Removal)	X	X							

GENERAL MAINTENANCE POLICY RECOMMENDATIONS

- The master plan outlines some significant investment in trail and recreation infrastructure; as well as, natural resource improvements. The success of the plan will require a similar level of investment and attention to the proper level of maintenance and management. Maintaining the system should be considered as important as building the system. Devoting the appropriate resources, staffing and funding will be critical. Above is a matrix summarizing the recommendations outlined in this section for various activities relating to greenway maintenance.
- This is an anticipated matrix of maintenance needs and frequency of need. The full impact and need will be revealed over time. As particular areas develop maintenance levels may change based on the number of visitors, the types of activities/amenities and expectations of the community.
- As the greenway develops, it will be important to monitor and seek input from the public. Create partnerships to help with monitoring and identifying qualitative and quantitative data on greenway use.
- Identify potential partners and expand the existing Polk County Conservation volunteer program to assist with maintenance activities where applicable.

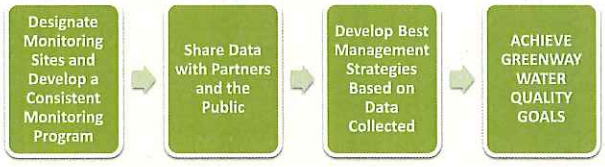
Monitoring and Data Management

MONITORING PROGRAM

Successfully implementing a monitoring plan to further understand current water quality conditions is critical to the success of future improvements and identifying the best solutions for restoration and water quality investments. 'Monitor for Success' was a key goal in the Fourmile Creek Watershed Management Plan.

RECOMMENDATIONS:

- Monitoring Locations: Monitoring sites were designated in the Watershed Management Plan. These locations were identified in the greenway 'Needs Assessment' portion of the Story Map report. Any changes to these locations should be clearly identified and communicated to the greenway partners and entities involved in data collection and analysis.
- Continue to Facility the Polk County Conservation Water Quality Monitoring Program (PCCWQMP): The PCCWQMP was started in spring 2015. The program is managed by Polk County Conservation Board and includes a series of biweekly monitoring events assessing water quality of watersheds throughout Polk County, including Fourmile Creek. PCC should continue to be the primary record keeper for all data collected and share findings with their project partners and the public (i.e. IOWATER database and Water Quality Monitoring Program Annual Reports). The assessments should continue to monitor stream health based on chemical, physical, habitat and biological parameters.
- Partnerships and Volunteers: As monitoring needs grow, it will be important to continue to foster relationships and develop new monitoring partners such as universities and non-profit organizations.
- Consistency and Frequency: The current PCCWQMP conducts assessments at selected locations twice per month, during the first and third full weeks of each month. It is important for the monitoring to be consistent and allow for the data from all sites to be compared. The monitoring frequency may need to be assessed and modified depending on the information being collected and as the program is further implemented.



TECHNOLOGY PLATFORM OBJECTIVES:

Communicate:
- Notify the public of closures, current events, policy changes, planning efforts or current construction activites and milestones.
- Share data between multiple entities.

Engage:
- Build a network of informed and active supporters.

Investment:
- Develop a platform to recognize where public funding have been used to improve the greenway, recognize donors, generate revenue and use as a resource for funding opportunties.

Potential Future Uses:
- Enhanced user experience and accessibility through mobile application technology platforms. Mobile devices can be used by the public to access supplemental interpretive and mapping information; as well as, report and share feedback about concerns or user trends within the greenway.

GEOGRAPHIC INFROMATION SYSTEM (GIS) DATA MANAGEMENT

Another key resource for providing the best management and development strategies for the greenway system is to keep the complexity of spatial and geographic data collected organized and accessible to the various entities proposing improvements throughout the system. Providing effective storage, management and distribution of this data can be an extremely useful tool for future greenway planning efforts and improvements.

RECOMMENDATIONS:

- The Greenway Coordinator should be the GIS data administrator for the greenway.
- All project partners are responsible for providing there most current GIS data related to the greenway to the Greenway Coordinator.

GREENWAY WEBSITE

The internet has become a primary resource for the public to seek additional information about community offerings, places and policies. The existing Fourmile Creek Watershed website is currently managed by Polk County Soil and Water Conservation District and is the recommended domain for the Lower Fourmile Creek Greenway Master Plan. As the Greenway Coordinator, Polk County SWCD, should continue to take the lead on keeping the website current. The master plan report format was chosen for this specific reason. The online Story Map can easily be linked to the website and provides an interactive resource that can be updated as new information becomes available and improvements are made within the greenway.

RECOMMENDATIONS:

- Provide a user friendly website as a definitive source of information pertaining to the greenway
- Ensure web resources are mobile friendly
- Provide access to greenway and watershed studies, long range plans and current improvements
- Promote partnerships and provide interconnectivity between the local jurisdictions websites for parks and recreational activities.
- Continue to maintain and consider increasing social media presence and pubic engagement opportunities.
- Consider the use of or expansion of a technology platform that provides interactive and printable mapping, location-based mapping and navigation, supplemental interpretive information, alternative language and visually impaired support resources, problem hotline for reporting none emergency concerns and enhanced emergency alert system.

Education Programming and Outreach

ENGAGING THE PUBLIC

Successfully engaging the public through technology platforms, environmental programming and community outreach opportunities can have huge impact on the success of the greenway.

RECOMMENDATIONS:

- Environmental and Ecological Programming: The greenway will provide immense opportunity for educational programming. A host of opportunities will exist to continue the education plan goals set forth in the Watershed Management Plan. Designating outdoor teaching facilities and opportunities should be considered throughout the greenway. The catalyst site provides a unique location for a primary outdoor teaching facility with its proximity to local schools and the Four Mile Creek Community Center. Polk County Conservation Board already considers educating the public about conservation and outdoor recreation as one of the key components of their mission. The implementation of the greenway should continue to expand their programming and education goals.
- Promote Stewardship Opportunities: Sometimes hands on learning can provide the greatest impact. Encourage volunteer and stewardship programs within the greenway.
- Employ Technology: Increase and ease the accessibility of greenway information using technology. The greenway website, apps, QR scans on interpretive signage, digital kiosks and bird cams are a few ways to encourage more in-depth public interaction with the amenities the greenway offers.
- Continue to Foster Partnerships: Seek out opportunities to collaborate with public and private organizations, individuals and businesses to further strengthen research, funding and educational opportunities.
- Continue to Emphasize the Three P's: A healthy watershed and active greenway system enhances the livability and economic resiliency of our communities through Profit, People and Planet.

3 ACTION PLAN

This section outlines anticipated budgetary costs for proposed improvements, recommendations for funding opportunities, potential policy and regulatory tools and techniques for measuring the greenways success.

Budgetary Project Costs

- Acquiring the Greenway Property
- Primary Stream Restoration and Water Quality Improvement
- Primary Facilities, Trails and Infrastructure
- Primary Habitat Restoration and Enhancements

Funding Strategies

- Responsible Parties
- Partnerships
- Capital Funds
- Federal and State Funds
- Grants

Policy and Regulatory Tools

- Policy Changes (Regional Coordination and Stormwater Requirements)
- Urban Agriculture
- Strategic Greenway to Business Connections
- Design Standards

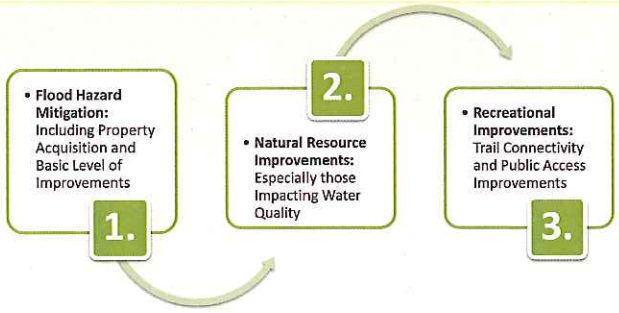
Measuring Success

- Biodiversity
- Resilincy and Water Quality
- Public Support and Services

Budgetary Project Costs

PROJECT COSTS

The initial cost impact is anticipated to be the property acquisitions required to create the greenway proper and critical natural resource improvements such as stabilizing Fourmile Creek streambanks. The properties acquired will have initial costs to transition the acquisitions into manageable greenway properties and address any potential safety concerns. Recreational improvements are anticipated to occur in conjunction with other park and trail project, in accordance with current local comprehensive plans and as related funding becomes available.



SUMMARY OF COSTS

Below is a summary of the initial anticipated costs for completing the Lower Fourmile Creek Greenway Master Plan. It is important to note this is a robust and evolving plan. The cost summary below provides an overview of potential costs associated with the proposed acquisitions and improvements. Funding a vision, such as this, will require joint efforts and will take place over the next twenty-five years through a series of public and public/private partnerships. A more detailed summary is located in the Appendix.

Overall Acquisitions Costs **($62.1 Million)**

- Tier 1: $8.32 Million
- Tier 2: $16.85 Million
- Tier 3: $36.87 Million

Overall Anticipated Natural Resource Restoration **($11 – 40 Million)**

Overall Potential Recreation Improvements **($30 - 50 Million)**

Note: Costs based on 2017 pricing.

Funding Strategies

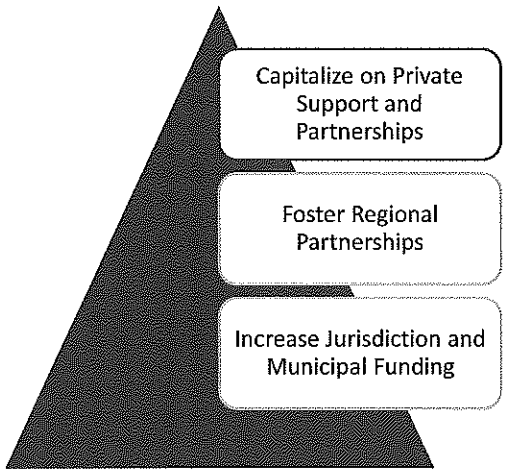
RESPONSIBLE PARTIES

The sheer level of investment and quantity of projects identified in the master plan will require multiple funding sources. Implementation of a plan of this scale will include significant public investment supplemented by grant funding and public-private partnerships.

The Greenway Coordinator is responsible for coordinating the improvement and implementation efforts and the Greenway Manager is responsible for managing and maintenance of the constructed greenway improvements. All partners will be asked to seek and administer funding for implementation of the capital improvement projects. However, the primary responsibility for leading the implementation and funding of capital improvement projects will fall to the individual jurisdictions.

FUNDING STRATEGIES

Several strategies are provided within this section for potential funding opportunities.



Recommendations for:
FUNDING STRATEGIES

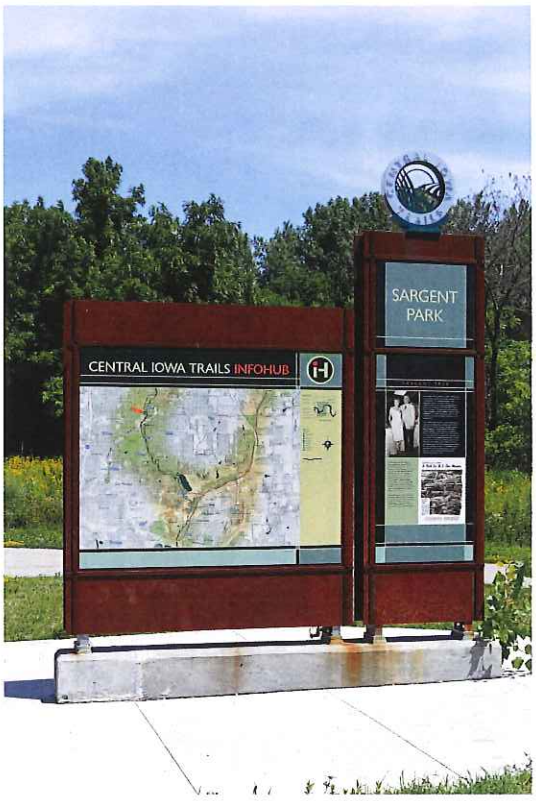
- Adoption of the Plan: Individual jurisdictions are asked to integrate the master plan into their long-range plans and capital improvement budgets.
- Increase Park, Recreation and Natural Stormwater Utility Funding: A goal of the greenway master plan is to spur economic resiliency and vitality. Well implemented greenways help encourage new development and redevelopment resulting in increased property tax base. The use of the greenway as a natural stormwater utility can also reduce the need and cost for other public infrastructure costs. Cities should consider leveraging and allocating infrastructure savings and additional tax revenue towards parks and recreation improvements that will continue to support the community's livability goals, health and wellness initiatives and multimodal connection opportunities.
- Continue to Engage Regional Partners: The greenway is a regional asset. The entire Fourmile Creek Watershed and the greater Des Moines River will benefit from the greenway improvements. Development within the entire watershed will have environmental impacts on the greenway and its success. Regional and statewide attractions, such as the Sleepy Hollow Sports Park and Iowa State Fair Grounds, can benefit from potential greenway improvements.
- Encourage Private Sector Participation and Funding Resources: The greenway will continue to be impacted by private development within the watershed. Projects that may fully funded or partially funded by private partners include stream stabilization and restoration, stormwater management improvements, recreation amenities and trails.
- Create a Wetland Development Bank: Establish a wetland development bank program and sell wetland bank credits to developers as a way to monetize the wetland's natural resource and water quality improvements.
- Continue to Foster and Develop Partnerships: A project of this scale will likely require many partnerships and creative funding strategies. It will be important to continue to develop new partnership opportunities. It will also be important to seek out new funding opportunities as they continue to evolve. Greenways promote environmental and human health. Utilize partnerships with the Healthiest State Initiative and Polk County Public Health to promote public health. Continue to foster and build relationships with infrastructure partnerships such as the Metro Waste Authority (WRA) for stream restoration, the Metropolitan Planning Organization (MPO) for water trail improvements, and MidAmerican Energy for improvements along the Fourmile and Des Moines River confluence.
- Leverage Joint Partnerships and Planning Efforts to Capture Grant Funding: There are a few grant funds available through state and federal programs. Highlighting the joint efforts and regional impact will help provide a stronger story for capturing grant funding. Some of the grants available include the State REAP (Resource Enhancement and Protection) fund, Vision Iowa's Community and Tourism Grants, The Land and Water Conservation Fund through the Iowa Department of Natural Resources (Iowa DNR), and the Recreational Trails Program through the Iowa Department of Transportation (Iowa DOT).
- Continue to Build Community Support: Private contributions, endowments and volunteer efforts can help support general greenway operations and help fund the implementation of proposed improvements. Public support is critical in helping form support for increased local appropriations for city parks and recreation operations. Some individuals and businesses may consider providing funding for improvements that can offer donor acknowledgement, dedication or naming rights. Continue to educate and empower citizens through educational and volunteer programming. Volunteers can assist with general greenway litter cleanup and ecological restoration efforts, such as invasive species removal.

Policy and Regulatory Tools

Recommendations for: POLICY AND REGULATORY TOOLS

- Regional Coordination: Due to the nature of the jurisdictional boundaries in Central Iowa, coordination on a regional basis is critical to the overall success of the adoption of consistent policies. The establishment of the watershed management authorities in the region provides a great opportunity for communication on a regional level.
  - Successful stormwater management ordinances and floodplain development policies and standards throughout the watershed and the region should be reviewed by a WMA subcommittee for possible inconsistencies and synergies. Many of the model ordinances that should be reviewed can be found on the Iowa Storm Water Education Program's website (www.iowastormwater.org).
  - Consider using a Natural Resource Overlay District to provide guidelines and strategies for development in and adjacent to the 500-year floodplain.
  - A few examples: The City of Coralville's Post-Construction Stormwater Ordinance, Cedar Falls Flood Prone Ordinances, and Clive's Post-Construction Stormwater Management Ordinance and Clive Stormwater Management Manual.
  - Once this review is complete, a model ordinance tailored for the Fourmile Creek Watershed should be presented to the full FCWMA for comment. Once a final ordinance has been drafted, it should be shared with member jurisdictions for adoption consideration.

- Consistent Stormwater Management Requirements: In accordance with the 2015 Fourmile Creek Watershed Management Plan, jurisdictions should work together to adopt consistent stormwater management requirements for both water quality and quantity.
  - *Water Quality Volume Management:* all communities within the watershed should adopt standards that require infiltrating the water quality volume on site (as opposed to detaining and releasing that volume). Infiltration practices have a high removal rate for suspended solids which may include metals, bacteria, hydrocarbons and phosphorus. The water quality volume in central Iowa is defined as the runoff that occurs during a 1.25" rainfall event.
  - *Channel Protection Volume Management:* adopt standards that require the detention of the channel protection runoff volume and release this volume slowly over a 24-hour period. The channel protection volume is defined as the runoff that occurs from a 2.4" rainfall event. Detaining this additional runoff volume and releasing it slowly allows for a reduced, although sustained, flow that would otherwise be released into a drainage-way. This helps reduce the depth of flow in the channel. This, in turn, reduces the saturated condition of the channel banks and thereby decreases the likelihood of channel bank sloughing. Therefore, runoff control practices reduce stream bank erosion.



Recommendations for:
POLICY AND REGULATORY TOOLS

- Encourage Urban Agriculture: The partners agree that urban agricultural activities can be allowed within or adjacent to the corridor. Urban agriculture within the greenway and greenway fringe should follow current jurisdiction requirements and ordinances. Each jurisdiction shall update and revise their ordinance requirements as they see best meets their community needs. When allowed, sustainable agricultural practices shall be encouraged so not to negatively impact the water quality and flood management goals of the master plan.

- Encourage Strategic Greenway to Business Connections: Allow for policies that leverage cohesive opportunities businesses and the greenway can offer the community. Encourage policies that allow for pop up businesses, like food trucks, wine bars or farm stands to help increase greenway use, community livability and economic vitality.

- Develop Greenway Design Standards: Develop a set of design standards for greenway improvements. Design standards help provide a consistent feel and expectation from the public along the greenway. Standards could provide guidelines for trail nodes and trailheads, trail widths, infrastructure materials, signage and marketing materials.

MEASURING SUCCESS

Recommendations for:
MEASURING SUCCESS

- RESILIENCY AND WATER QUALITY: Continue to model and monitor the success of the greenways ability to mitigate flood hazards and improve water quality so the best practices can be utilized.
- BIODIVERSITY: As restoration efforts continue throughout the greenway it will be important to monitor biodiversity improvements. Programs like BioBlitz can encourage collaboration between scientists, naturalists and volunteers in conducting intensive field studies, while encouraging public interest in the greenway's health.
- PUBLIC SUPPORT AND SERVICES: As the greenway develops it will be important to collect public feedback and input. Identify qualitative and quantitative measures for tracking the use and appreciation of the greenway. Online and drop box surveys, technological apps and installed counters are just a few of the ways feedback can be collected. Continue to hold public meetings in local jurisdictions to identify specific desired recreational and public access improvements.

The Ultimate Success of a Greenway

This master plan is just one of the initial steps in developing a bold vision for this greenway. A vision that will have a lasting impact on the surrounding communities it serves. The vision and successful implementation will require considerable amount of continued support and multiple actors. The large-scale ideas put in place within this plan will continue to be interpreted and developed further as each community and the region continue to strategically decide the best methods to improve the places we live and natural systems that influence them.

APPENDIX