Final Report & Feasibility Study

Massena, Iowa

Program Partners:

Iowa Department of Transportation
Trees Forever
Iowa State University

Iowa's Living Roadways
community visioning

Participants

Town Steering Committee

Linda Reineke
John Curry
Kevin McCunn
TJ Venteicher
Judy Wolford
Dean Hosfelt
Phil Przychodzin
Cody Reineke
Ashley McCunn
Chase Wheatley
Beulah Follman
Peg Wheatley
Coni Curry

Trees Forever

770 7th Avenue
Marion, IA 52302
319-373-0650
www.treesforever.org

Brad Riphagen
515-370-1291
briphagen@treesforever.org

Iowa State University

Landscape Architecture Extension
2321 North Loop Drive, Suite 121
Ames, IA 50010
515-294-3721
www.communityvisioning.org

Julia Badenhope, Program Director and Professor of Landscape Architecture
Sandra Oberbroeckling, Project Manager and Extension Program Specialist

RDG Planning & Design

900 Farnam on the Mall, Suite 100
Omaha, NE 68102
402-392-0133
www.rdgusa.com

Jennifer Cross, PLA, ASLA
402-449-0801
jcross@rdgusa.com

Nate Byro
Landscape Architecture Intern
Iowa State University

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About RDG Planning & Design

From our newest team members to the founding principals who began their practices in the 1960s, RDG Planning & Design is a multifaceted network of design and planning professionals. Diverse in knowledge and experience, we are united in the pursuit of meaning for our clients and ourselves. Officially formed in 1989 as the Renaissance Design Group Corporation and crafted to bring well established firms together into practice, our two business centers of RDG IA Inc. and RDG Schutte Wilscam Birge, Inc. create one distinct organization with the shared purpose of creating meaning together.

SERVICES:

- Architecture
- Art Studio
- Engineering
- Graphic Design & Multimedia
- Interior Design
- Landscape Architecture
- Lighting Design
- Strategic Facilities Planning
- Sustainability

MARKETS:

- College & University
- Community Planning
- Regional Planning
- Corporate
- Early Learning
- Government
- Healthcare
- K-12 Education
- Parks & Recreation
- Public Safety
- Restoration
- Senior Living
- Sports
- Urban Design
- Worship

CREATE.

Creation is a result of every interaction with our clients and those they serve. Ultimately, we help create lasting relationships between people and the places they live and love.

MEANING.

We find meaning in relationships, and in people and the deep connections they have to their environments. When we find meaning, we achieve a deeper understanding of how to create the very best spaces to work, live, and play.

TOGETHER.

The most important member of our team is you. You know your needs better than anyone else, and you're the advocate for the effort because you'll love and care for your space long after we celebrate its completion.

Over fifty years of dedication to success have taken us around the world. Today, our commitment to communication and technology allows us to engage our clients anywhere they may be from our offices in Omaha, Nebraska; Des Moines and Dubuque, Iowa; St. Louis, Missouri, and Ft. Myers, Florida. We're free from boundaries and able to work on a regional, national, or global scale. Our interdisciplinary approach allows us to integrate our broad areas of expertise and apply the right team members to any given endeavor.

167 EMPLOYEES | **70** LICENSED PROFESSIONALS | **34** LEED APS | **72%** OF STAFF ARE STOCKHOLDERS

Program Overview

Massena is one of 10 communities selected to participate in the 2017 Iowa's Living Roadways Community Visioning Program. The program, which selects communities through a competitive application process, provides professional planning and design assistance along transportation corridors to small Iowa communities (populations of fewer than 10,000).

Goals for the Visioning Program include:

- Developing a conceptual plan and implementation strategies with local communities
- Enhancing the natural, cultural, and visual resources of communities
- Assisting local communities in using external funds as leverage for transportation corridor enhancement

Each visioning community works through a planning process consisting of four phases of concept development:

- Program initiation
- Needs assessment and goal setting
- Development of a concept plan
- Implementation and sustained action

Each visioning community is represented by a steering committee of local residents and stakeholders who take part in a series of meetings that are facilitated by field coordinators from Trees Forever. Iowa State University organizes design teams of professional landscape architects, design interns, and ISU faculty and staff. The program is sponsored by the Iowa Department of Transportation.

Community Goals

The Massena visioning committee identified a number of goals and priority areas during the visioning process, which are included below:

- Main Street Improvements
- Heritage Park Improvements
- City Park
- Trails & Signage
- City Stormwater Management Initiatives

Capturing the Massena Vision

Based on the needs and desires of the local residents, as well as a detailed inventory of community resources, the design team developed a conceptual transportation enhancement plan. This plan, as well as the inventory information, is illustrated in the following set of presentation boards. These boards include the Program Overview, Bioregional Assessment, Transportation Assets and Barriers Assessment, Transportation Behavior and Needs Assessment, Transportation Inventory and Analysis, Concept Overview, and Community Design Boards.

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- Program Overview
- Local Geography
- Bioregional Assessment
- Transportation Assets and Barriers Assessment
- Transportation Behavior and Needs Assessment
- Transportation Inventory and Analysis
- Concept Overview
- Main Street Improvements
- City Park Improvements
- Trails & Signage
- Stormwater Management Practices

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Massena
Community Overview

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Bioregional Assessment

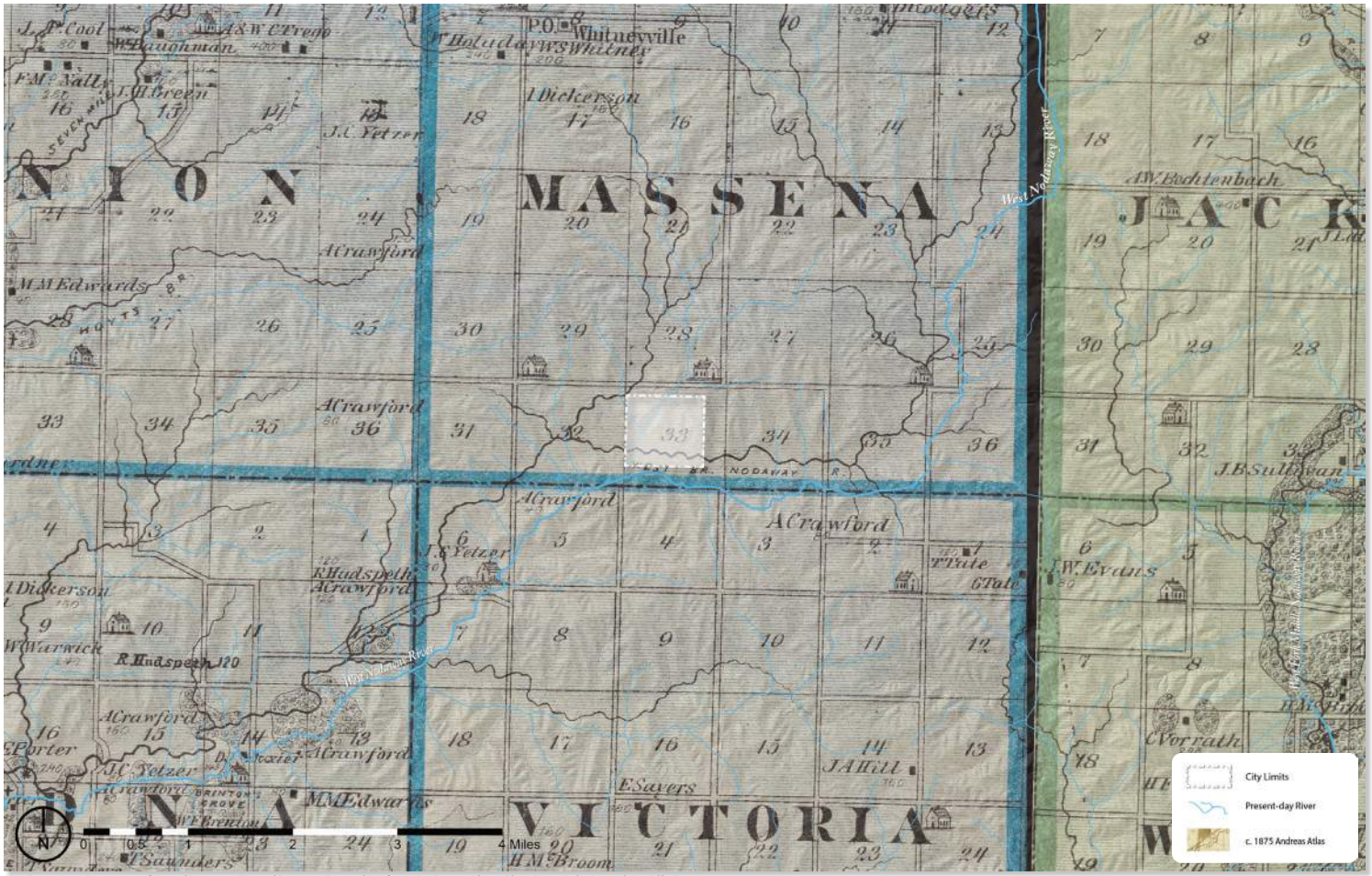
Settlement Patterns

This board uses maps from A.T. Andreas' Illustrated Historical Atlas of the State of Iowa, 1875 overlaid with present-day town boundaries and water bodies. Published in 1875, Andreas' Atlas is an extraordinary resource showing the post-Civil War landscape of Iowa including settlement features (towns and villages, churches, schools, roads, railroads, etc.) and landscape features (water bodies, vegetated patches such as "timber" and "swamp," and major topographic features.) High-quality scans of the Atlas have been arranged to correspond closely with present-day maps revealing major landscape changes as well as features that have persisted, such as railroad rights-of-way and in some cases remnant vegetation patches.

Massena in Context

Compare the 1875 boundaries of your town to the current boundaries. How much has your town grown?

Compare the course of the rivers in 1875 to their current course, are there major changes in alignment or location? Are there vegetation patches shown in the 1875 map still in existence?



Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," http://www.igsb.uiowa.edu/nrgislibx/.

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Massena

Settlement Patterns

Bioregional Context
Julia Badenhope, Matthew Gordy, Colby Fangman, Henry Herman
Iowa State University | Trees Forever | Iowa Department of Transportation

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Historical Vegetation

The vegetation information shown here is derived from township maps made by the General Land Office (GLO) surveys beginning in 1836 through 1859. The vegetation information was digitized in 1996 as a resource for natural resource management and is useful "...for the study of long term ecological processes and as baseline data for the study of present day communities."1

The plant communities mapped by the GLO surveyors varied in classification and the terminology from the original maps has been preserved.

The vegetation types are defined[2]:

1. Field: Cultivated lands of early pioneers.
2. Grove: Isolated dense young stand of trees.
3. Marsh: Perennial wetlands, basins of irregular shape.
4. Prairie: Dominated by prairie grasses with individual or few scattered trees.
5. Thicket: Impenetrable blocks of young trees, often thorny.
6. Timber: Contiguous blocks of trees extending to the horizon in at least one direction.
7. Slough: Like marsh but more linear in shape.

1 J.E. Ebinger, "Presettlement Vegetation of Coles County, Illinois," Transactions of the Illinois Academy of Science (1987): 15-24, quoted in Michael Charles Miller, "Analysis of historic vegetation patterns in Iowa using Government Land Office surveys and a Geographic Information System" (master's thesis, Iowa State University, 1995), 8.

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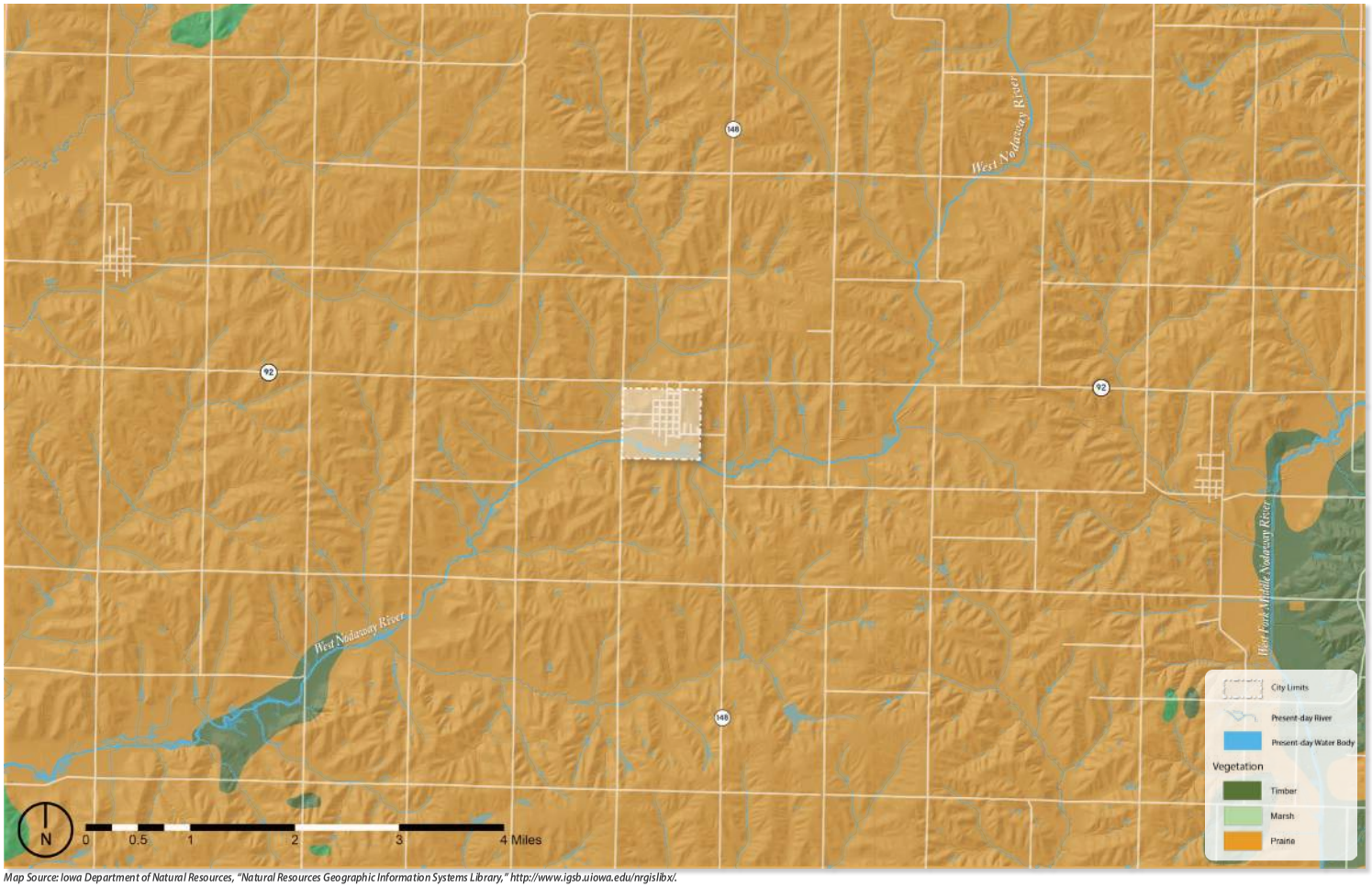

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Historical Vegetation

Bioregional Context
Julia Badenhope, Matthew Gordy, Colby Fangman, Henry Herman
Iowa State University | Trees Forever | Iowa Department of Transportation

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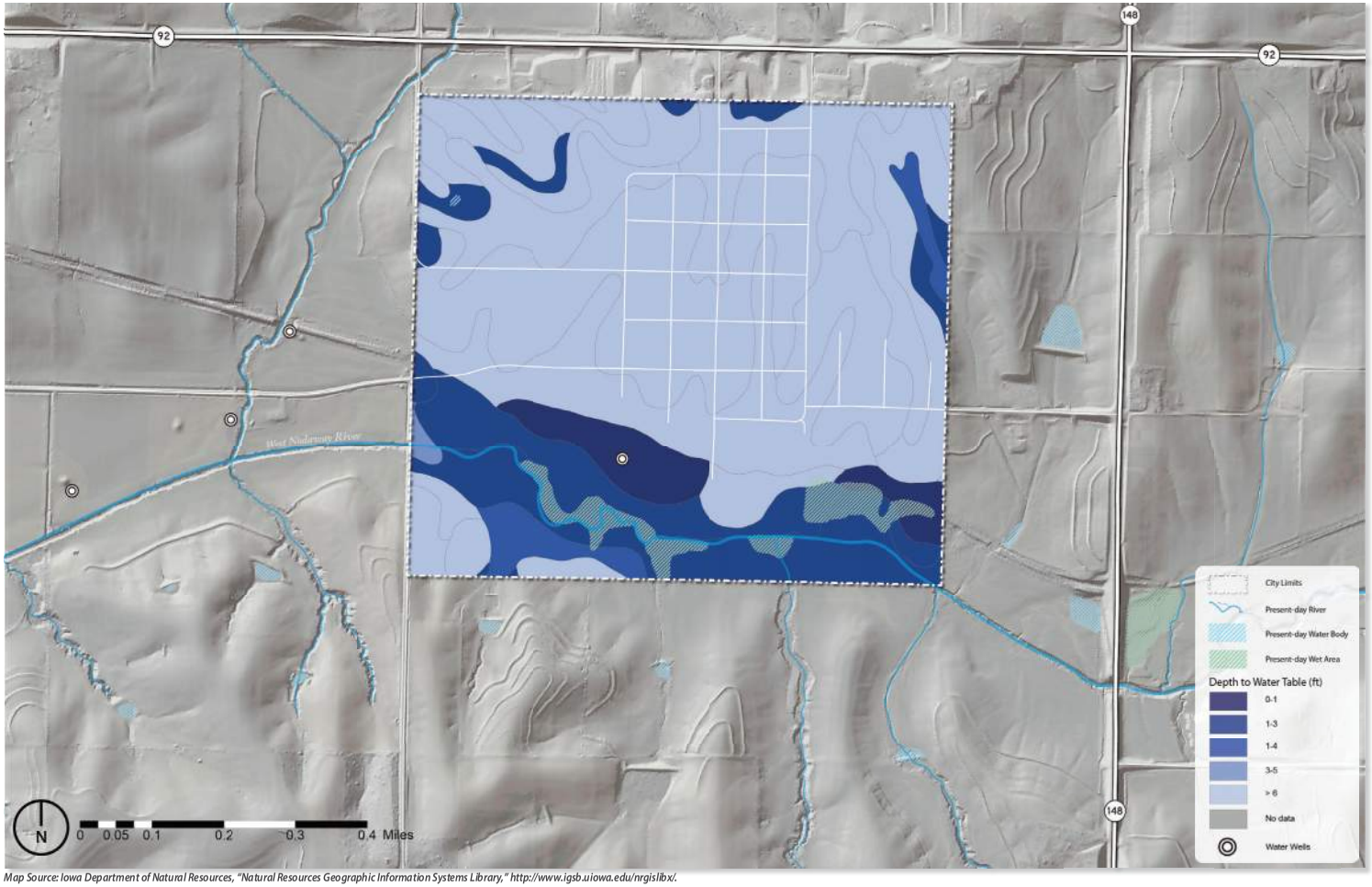
Depth to Water Table

The water table is defined as the level below which the ground is saturated with water. The water table generally mimics surface topography, but there are differences depending on localized conditions such as the permeability and porosity of soils and depth to bedrock. Depth to water table is represented as a range because it varies due to seasonal changes and precipitation volumes. For example, following spring snow-melt an area with a depth to water table ranging from one foot to three feet is likely to be at or near one foot depth. Impermeable layers such as concrete also affect the depth to water table by preventing precipitation from infiltrating into the soil which could result in a lowered water table.



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Depth to Water Table

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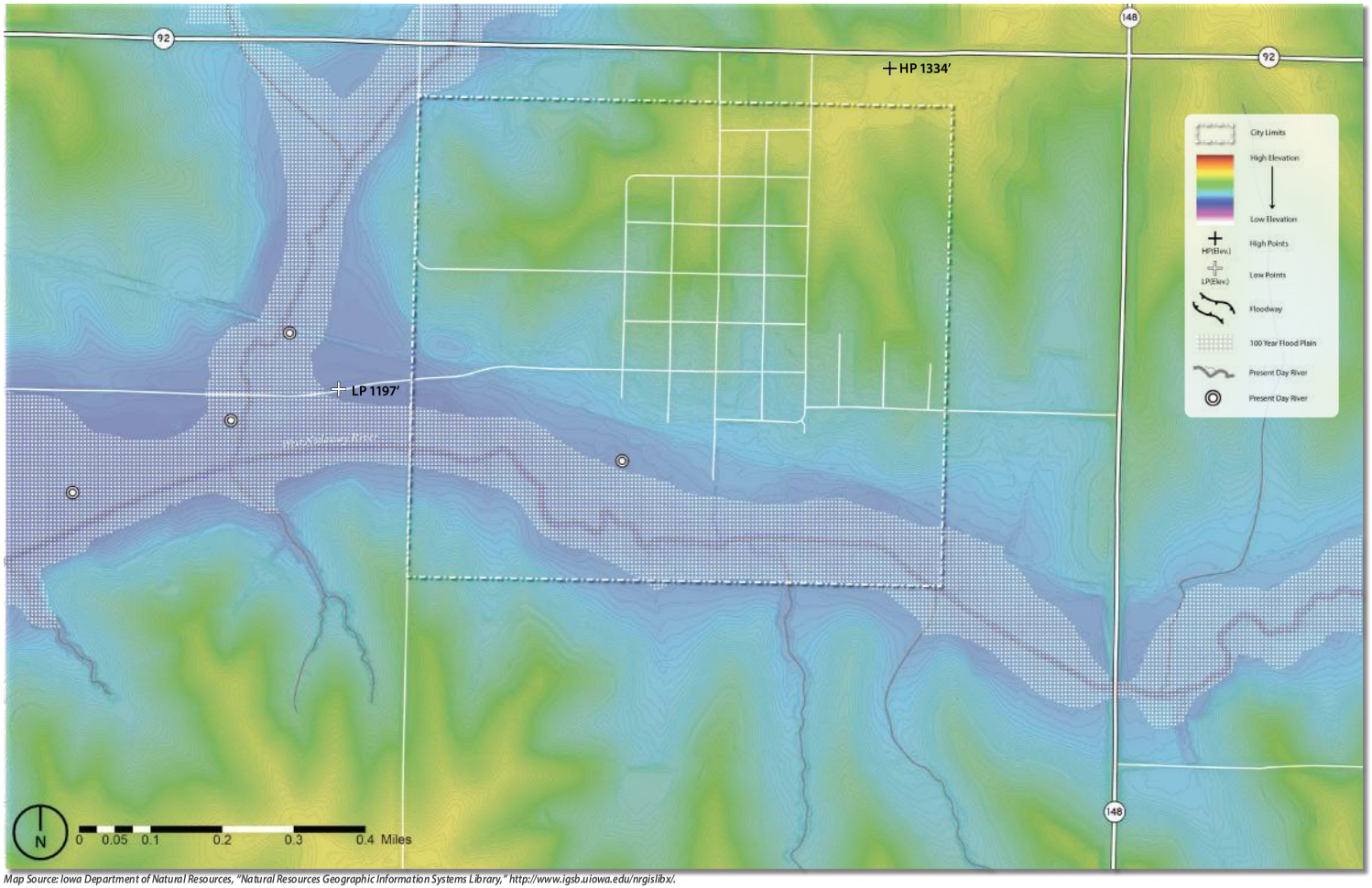
Elevation and Flood Risk

The map to the left displays topographic differences in elevation using a combination of contour lines and the color gradient depicted in the legend. The high points and low points have also been located.

Note the relationship of your community to the surrounding elevation; is it located in a valley or on high ground, or is it split between the two? Flood risk is correlated to low-lying land, this map also shows your community's flood risk as defined by the Federal Emergency Management Agency (FEMA) Flood Map Service Center. This map shows the two most important flood zones, the Base Flood and the Regulatory Floodway (consult legend.) Base Flood is the zone having a one percent chance of being equaled or exceeded in any given year, also referred to as the "100-year floodplain." The Regulatory Floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% flood discharge can be accommodated without increasing the base flood elevation.



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Elevation

Bioregional Context
Julia Badenhope, Matthew Gordy, Colby Fangman, Henry Herman
Iowa State University | Trees Forever | Iowa Department of Transportation

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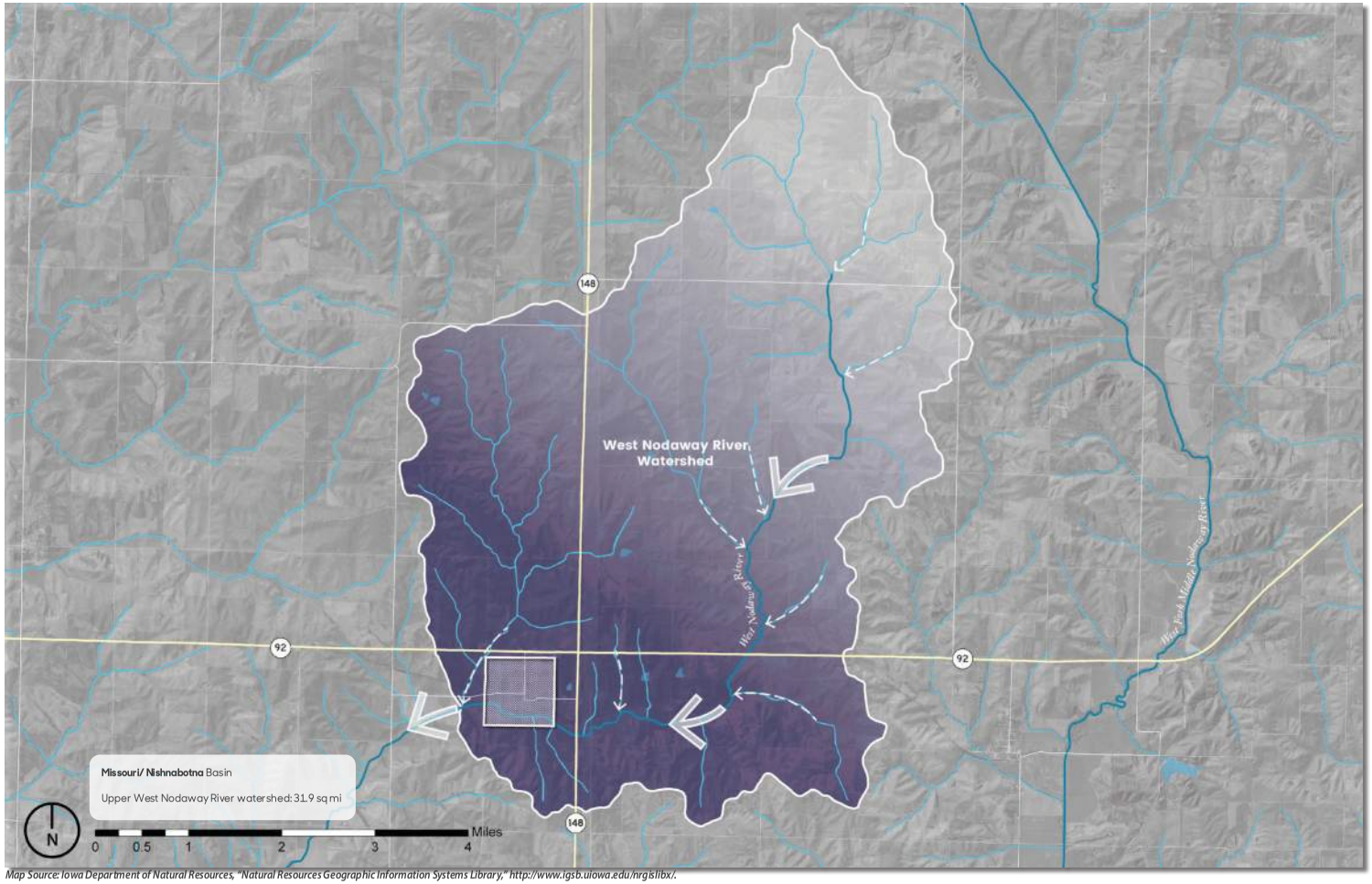
Regional Watershed

A watershed is a defined area or ridge of land with a boundary that separates waters flowing to different rivers, creeks, or basins. Watershed boundaries show the extent of a drainage area flowing to a single outlet point, and determines whether precipitation is directed into one watershed or an adjacent watershed. It is important to note that there are multiple levels of watersheds, for instance the Iowa River watershed has a dozen smaller watersheds, and the Iowa River watershed is a sub-basin of the Mississippi River watershed.

Where a community is located in relation to its surrounding watershed(s) determines its capacity to manage regional watershed issues such as flooding. For example, a community located near the end of a watershed (close to the outlet point) will have little capacity to reduce the amount of water draining toward it from upland areas.



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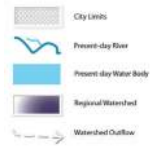

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Regional Watershed

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Present Day Land Cover

The land cover map depicts both natural and man-made land cover types with aerial imagery. The Iowa DNR created 15 unique classes for this dataset to differentiate land covers. Refer to the legend for a breakdown of land cover types.

What do you observe about the dominant land cover types in your community? Where is the tree canopy most concentrated? Compare the amount of impervious surfaces (e.g., parking lots, roads, buildings) to the other surfaces (e.g, water, grass, and agriculture.) What parts of town are covered with the most impervious surfaces and what patterns do you observe about these locations?

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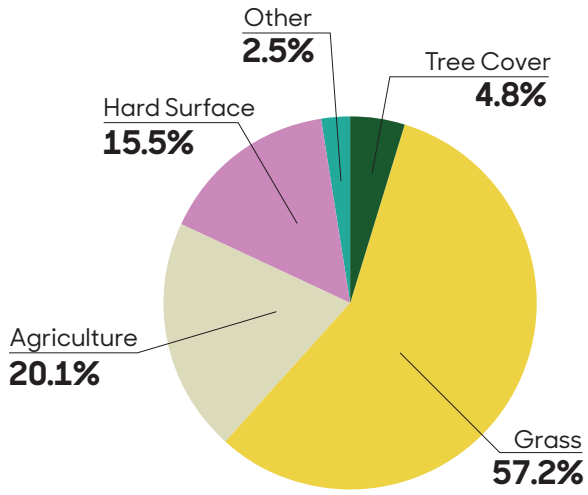

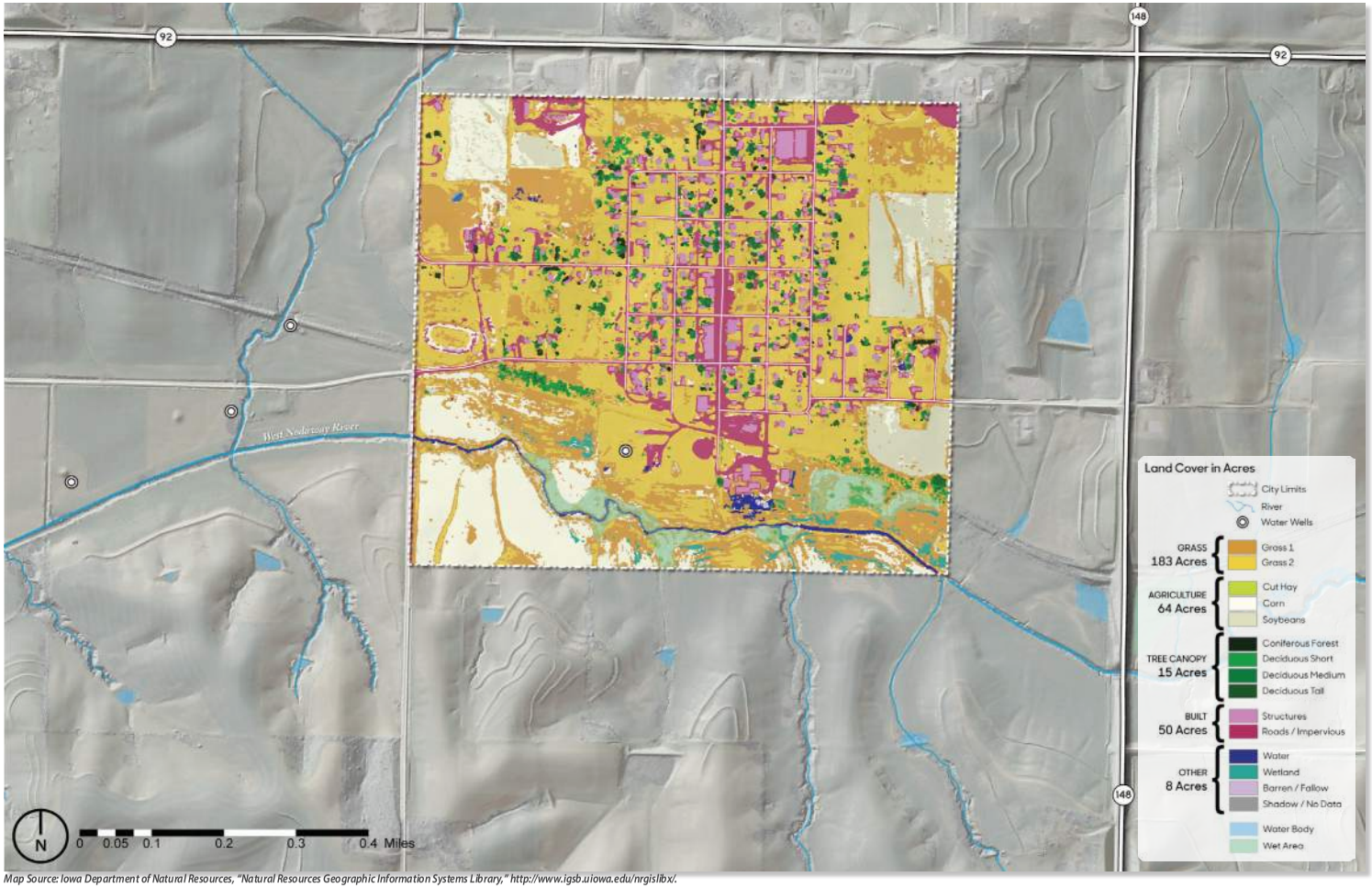

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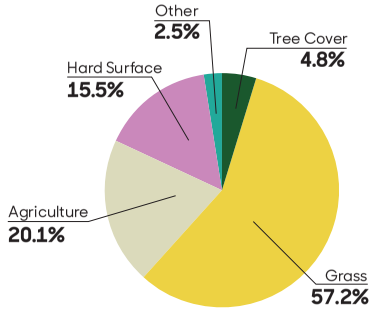

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Present Day Land Cover

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Iowa's Living Roadways community visioning

Present Day Vegetation

Overlaying a present-day aerial image on the historic, 1875 Andreas Atlas shows how management of the land over several decades has changed the locations of trees and other native vegetation in the landscape.

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Present Day Vegetation

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Iowa's Living Roadways community visioning

Transportation Assets and Barriers

Overview

Transportation is integral to small-town life and a vibrant economy. In the context of the Community Visioning Program, we recognize walking, biking, and driving as quintessential modes of travel to various destinations important to residents and visitors. Access to these destinations is crucial for many everyday activities—getting to work and school, participating in community events, and providing for basic needs such as food, health care, and healthy activity.

In this participatory assessment, we want to find out which factors and conditions affect transportation use in Massena, where these factors and conditions are most prevalent, and how they influence route and transportation choices locally. Because residents have the best knowledge of how Massena's transportation system works, we use focused, small-group conversations, mapping, and photos of the best and worst places taken by residents to understand local transportation.

Different Users = Different Needs

To capture insights about transportation from a variety of perspectives, we invited Massena residents with different transportation needs to participate in focus groups. A total of 50 residents attended Massena's workshop. Participants were separated into five user groups and the Massena steering committee.

Actives

This user group represents those in the community who engage in outdoor recreation, including cycling, walking, running, swimming, skiing, etc. The availability of multiple venues for outdoor recreation matters to this group.

Mobility Impaired

This user group is directly affected by accessibility barriers such as high curbing and uneven sidewalks that make it difficult to operate mobility-aiding equipment effectively. Handicapped parking, curb ramps, and smooth surfaces are critical transportation features.

Older Adults

Accessibility—both in terms of physical access and proximity—is a major concern for this user group. Because some people in this user group do not or are unable to drive, having goods and services within walking distance is important.

Youth

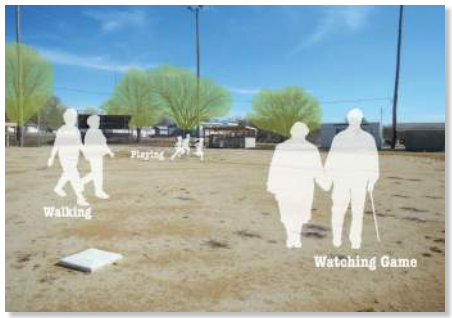
This group uses primarily non-motorized modes of transportation, so pedestrian- and bike-friendly streets and sidewalks are important. These users value the ability to get to destinations on foot or via bicycle and having goods and services within walking distance.

Parents

Safety of their children is a primary concern of this user group. Access to safe and easy routes to school activities is another significant factor to this group. Parents of young children desire smooth, wide surfaces for strollers.

Steering Committee

The common denominator for this user group is that their observations are influenced by special knowledge of the transportation system acquired during the Community Visioning assessment process. As a result, this group is more representative of decision makers.



Asset: City Ball Park

Barrier: Flooding Issues on Pine Street Gravel

Asset: Massena City Park

Barrier: No Sidewalk on Main Street

Asset: Old Rail Line

Barriers: Bad Equipment in City Park

What Factors Affect Transportation in Massena?

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Mobility Impaired — **(7 participants):** This user group is directly affected by accessibility barriers such as high curbing and uneven sidewalks that make it difficult to operate mobility-aiding equipment effectively. Handicapped parking, curb ramps, and smooth surfaces are critical transportation features.

Older Adults — **(9 participants):** Accessibility—both in terms of physical access and proximity—is a major concern for this user group. Because some people in this user group do not or are unable to drive, having goods and services within walking distance is important.

Youth — **(11 participants):** This group uses primarily non-motorized modes of transportation, so pedestrian- and bike-friendly streets and sidewalks are important. These users value the ability to get to destinations on foot or via bicycle and having goods and services within walking distance.

Parents — **(6 participants):** Safety of their children is a primary concern of this user group. Access to safe and easy routes to school activities is another significant factor to this group. Parents of young children desire smooth, wide surfaces for strollers.

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Massena
Overview

Transportation Assets and Barriers
Julia Badenhope, Sandra Oberbroeckling, Matthew Gordy, Zhi Chen
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

What People Said

"If you walk in the evenings or early mornings, the lighting isn't the best."

"We walk [west on 1st Street]...to get to [740th Street]...there [are] no shoulders for you to get off. I've jumped down in the ditch before because I think [drivers] aren't going to see me."

"It's kind of nice to walk all the way to the highway."

"The sidewalks on Main Street, they're bad."

"Some people walk at the school [in winter]."

Actives

"I see countless kids practically 18 hours a day...in the park playing on that basketball court, which brings up the significant need we have for recreation for our young people."

"...quite a few of us used to walk [along the old railroad track], and it would be a perfect place if we planted some bushes, put a bench down there...our city garden is down there."

"With the wind, what really bothers me is if you're out walking the dirt from the sale barn blows right up Main Street."

"One of the problems in town is parking."

"You can walk a half a block and there's nice sidewalk, and then there'll be a block and no sidewalk."

Older Adults

"It would be nice to make a hiking trail [along the old rail line]."

"A lot of people walk [on] the streets, so it would be very beneficial to have a safe walking trail."

"The library is on the north side of Main Street; they have a ramp to go up."

"The handicapped parking on Main Street is all wrong."

"I think East Cedar Street carries [a lot of] traffic basically because of [the school]."

Mobility Impaired

Parents

Youth

Steering Committee

Emerging Themes

Discovering themes and consistencies among user groups helps the steering committee to identify solutions to address the needs of all. The chart on the opposite page displays each user group's collective thoughts on particular issues in comparison with the other user groups in the community.

Actives walk, drive, and bike regularly, either as part of a daily commute or as recreational/sports training. This group would like improvements such as a walking trail to make walking and biking more comfortable.

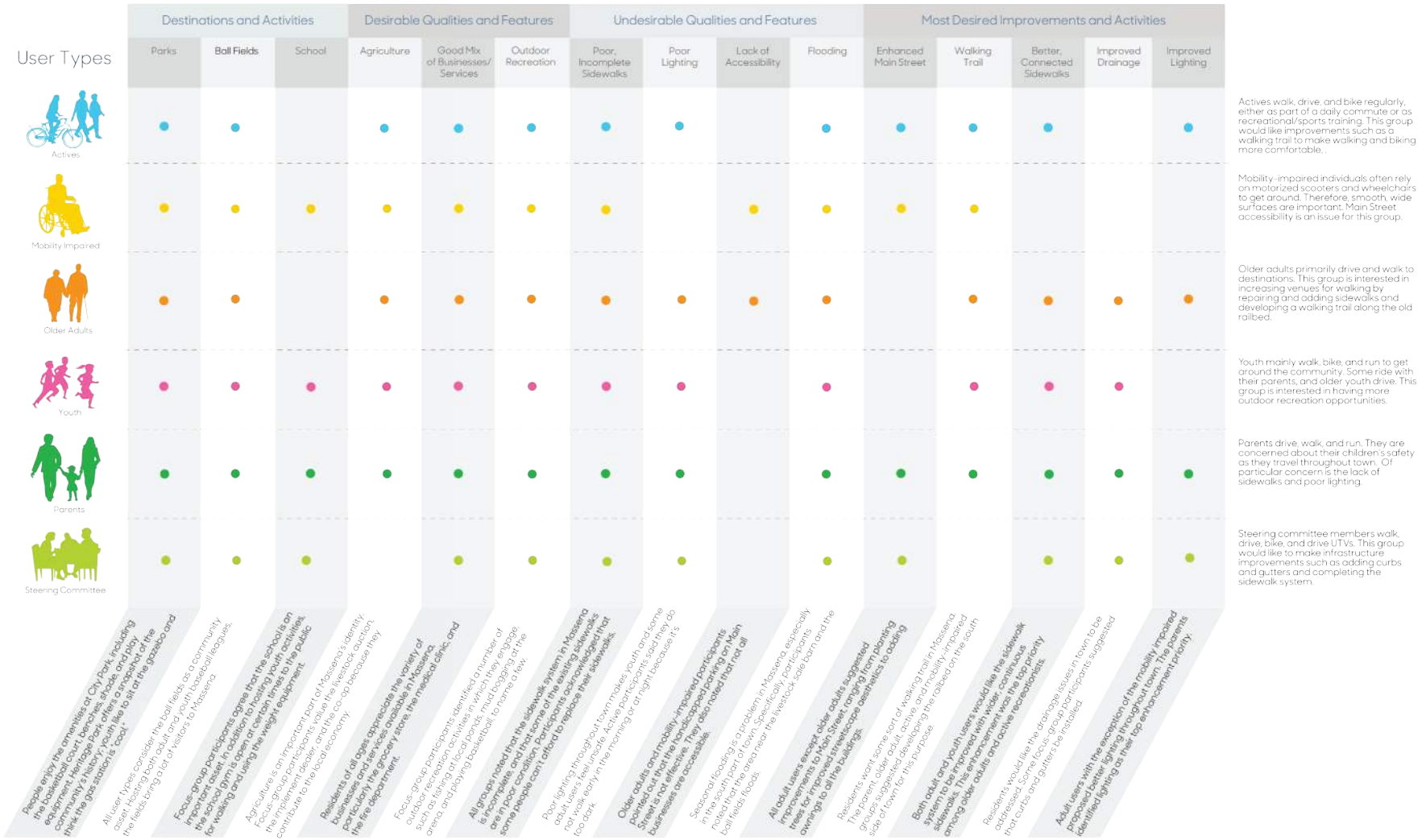
Mobility-impaired individuals often rely on motorized scooters and wheelchairs to get around. Therefore, smooth, wide surfaces are important. Main Street accessibility is an issue for this group.

Older adults primarily drive and walk to destinations. This group is interested in increasing venues for walking by repairing and adding sidewalks and developing a walking trail along the old railbed.

Youth mainly walk, bike, and run to get around the community. Some ride with their parents, and older youth drive. This group is interested in having more outdoor recreation opportunities.

Parents drive, walk, and run. They are concerned about their children's safety as they travel throughout town. Of particular concern is the lack of sidewalks and poor lighting.

Steering committee members walk, drive, bike, and drive UTVs. This group would like to make infrastructure improvements such as adding curbs and gutters and completing the sidewalk system.


User Types
Destinations and Activities
Desirable Qualities and Features
Undesirable Qualities and Features
Most Desired Improvements and Activities
Parks
Ball Fields
School
Agriculture
Good Mix of Businesses/ Services
Outdoor Recreation
Poor, Incomplete Sidewalks
Poor Lighting
Lack of Accessibility
Flooding
Enhanced Main Street
Walking Trail
Better, Connected Sidewalks
Improved Drainage
Improved Lighting
Actives
Mobility Impaired
Older Adults
Youth
Parents
Steering Committee
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Steering committee members walk, drive, bike, and drive UTVs. This group would like to make infrastructure improvements such as adding curbs and gutters and completing the sidewalk system.
People enjoy the amenities at City Park, including the basketball court benches, shade, and play equipment. Heritage Park offers a snapshot of the community's history; youth like to sit at the gazebo and think the gas station is "cool."
All user types consider the ball fields as a community asset. Hosting both adult and youth baseball leagues, the fields bring a lot of visitors to Massena.
Focus-group participants agree that the school is an important asset. In addition to hosting youth activities, the school gym is open at certain times to the public for walking and using the weight equipment.
Agriculture is an important part of Massena's identity. Focus-group participants value the livestock auction, the implement dealer, and the co-op because they contribute to the local economy.
Residents of all ages appreciate the variety of businesses and services available in Massena, particularly the grocery store, the medical clinic, and the fire department.
Focus-group participants identified a number of outdoor recreation activities in which they engage, such as fishing at local ponds, mud bogging at the arena, and playing basketball, to name a few.
All groups noted that the sidewalk system in Massena is incomplete and that some of the existing sidewalks are in poor condition. Participants acknowledged that some people can't afford to replace their sidewalks.
Poor lighting throughout town makes youth and some adult users feel unsafe. Active participants said they do not walk early in the morning or at night because it's too dark.
Older adults and mobility-impaired participants pointed out that the handicapped parking on Main Street is not effective. They also noted that not all businesses are accessible.
Seasonal flooding is a problem in Massena, especially in the south part of town. Specifically, participants noted that the area near the livestock sale barn and the ball fields floods.
All adult users except older adults suggested improvements to Main Street, ranging from planting trees for improved streetscape aesthetics to adding awnings to all the buildings.
Residents want some sort of walking trail in Massena. The parent, older adult, active, and mobility-impaired groups suggested developing the railbed on the south side of town for this purpose.
Both adult and youth users would like the sidewalk system to be improved with wider, continuous sidewalks. The enhancement was the top priority among older adults and active recreationists.
Residents would like the drainage issues in town to be addressed. Some focus-group participants suggested that curbs and gutters be installed.
Adult users with the exception of the mobility-impaired proposed better lighting throughout town. The parents identified lighting as their top enhancement priority.

Analysis of Barriers

Massena's Barriers: Common Factors

The analysis of barriers synthesizes the feedback we received from the five transportation user groups. Although not summarized below, input from the steering committee is incorporated into the map of all five user groups.

Participants in all groups identified the broken and disconnected sidewalks throughout town as a barrier that forces people to walk in the street.

Another common barrier cited by both adults and youth is frequent flooding, particularly at the livestock sale barn and the ball fields. Adult users pointed out that the winds from the south and southwest blow dust into town, specifically up Main Street.

Actives

Active recreationists are not comfortable cycling along the highways because there are no shoulders. The hills in town also hinder their activities. This group noted that snow is piled in front of the gas station in winter, making it difficult to see up the hill.

Mobility Impaired

Mobility-impaired individuals identified the hills on Pine Street and West Cedar Street as barriers. Like the active recreationists, this group pointed out drifting snow as a barrier, specifically on 6th Street. The handicapped parking on Main Street is problematic because the stalls and the curb cuts are not aligned.

Older Adults

Older adults noted parking problems at various locations in town as barriers, including limited parking on Main Street, at the school, and at the Baptist Church. They also pointed out the issue with handicapped parking on Main Street.

Youth

Youth perceive maintenance issues with the city's parks as the primary barriers in Massena. For example, they pointed out dirty drinking fountains, graffiti in the restrooms, and broken playground equipment.

Parents

The barriers pointed out by parents are related to the safety of their children. For example, they pointed out speeding traffic at the S-curve on Rockport Road, the lack of lighting in town, and the deep ditch located near the ball fields. They also noted the lack of maintenance and curbing along city streets.

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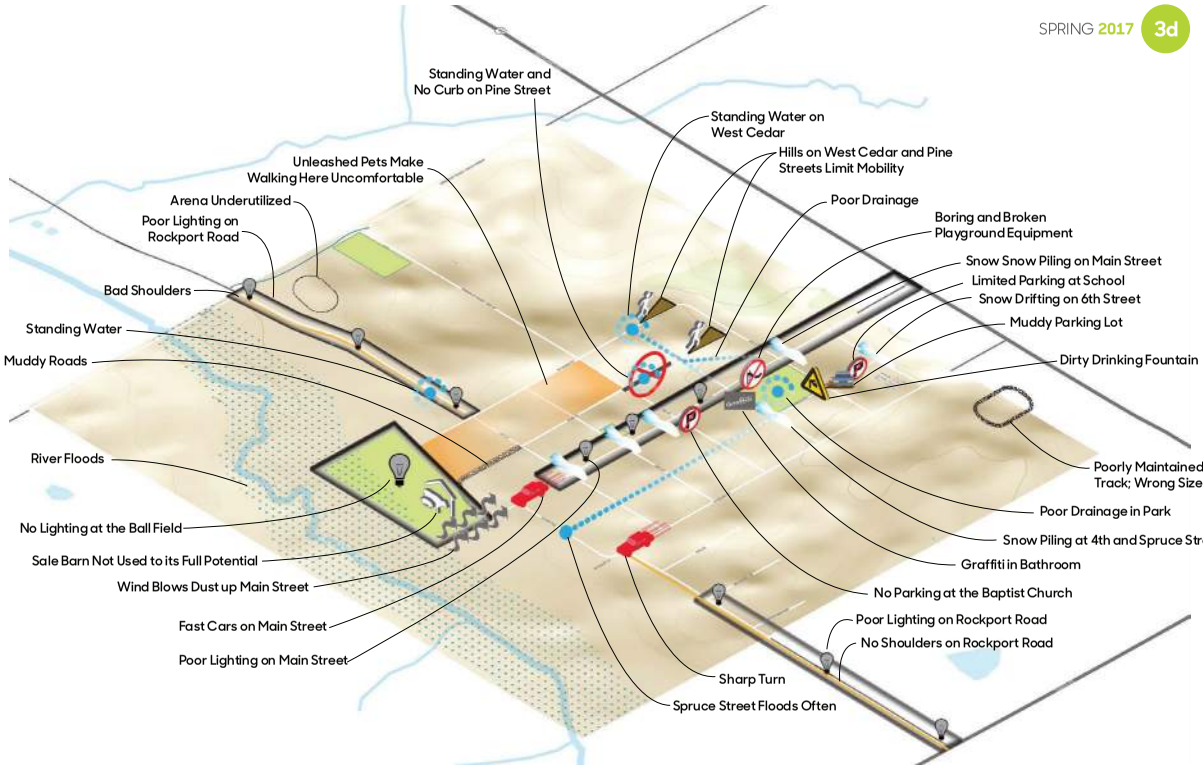

Legend

- Livestock Sale Barn
- Muddy Parking Lot
- No Parking
- Dusty Wind
- Snow Piling
- Standing Water
- Poor Drainage
- Muddy Streets
- Steep Hills
- Diry Water Fountain
- Broken Playground
- Graffiti
- Poor Lighting
- Uncomfortable Environment
- Fast Moving Traffic

Massena Barriers

Transportation Assets and Barriers
Julia Badenhope, Sandra Oberbroeckling, Matthew Gordy, Samuel Thompson
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Analysis of Assets

Massena's Assets: Common Factors

The analysis of assets synthesizes the feedback we received from the five transportation user groups. Although not summarized below, input from the steering committee is incorporated into the map of all five user types.

All types of users appreciate the variety of businesses and services available in town, such as the school, clinic, grocery store, restaurant, convenience store, and library, to name a few. Massena residents value the many recreation venues available to them as well. Adults like walking on the old railbed and see potential for a nature trail. Participants in all groups identified the baseball fields, the park, and the school facilities in winter as popular recreational destinations.

Actives

In addition to walking on the old railbed, active recreationists like to walk at the Massena Arena and at the school during the winter. This group appreciates the shade in City Park, the good snow removal in town, and the wild turkeys that sometimes roam throughout town.

Mobility Impaired

Mobility-impaired individuals use the track at the football field for walking. They appreciate that the Catholic church is accessible and that there are benches in City Park. This group considers Heritage Park a valuable community asset.

Older Adults

Like the mobility-impaired group, older adults walk the track at the football field. They also walk around the baseball fields. They value the shade throughout town, the historic preservation in Heritage Park, and the wild turkeys and other wildlife.

Youth

Massena's outdoor recreation opportunities are important to youth. They engage in activities such as fishing at the river, ice fishing at local ponds, sledding by the Methodist Church, and playing basketball in the park.

Parents

Parents appreciate the new playground at City Park, as well as benches in the park and on Main Street. This group also walks the track at the football field and drives ATVs on the old railbed. Parents take their children sledding by the Methodist Church.

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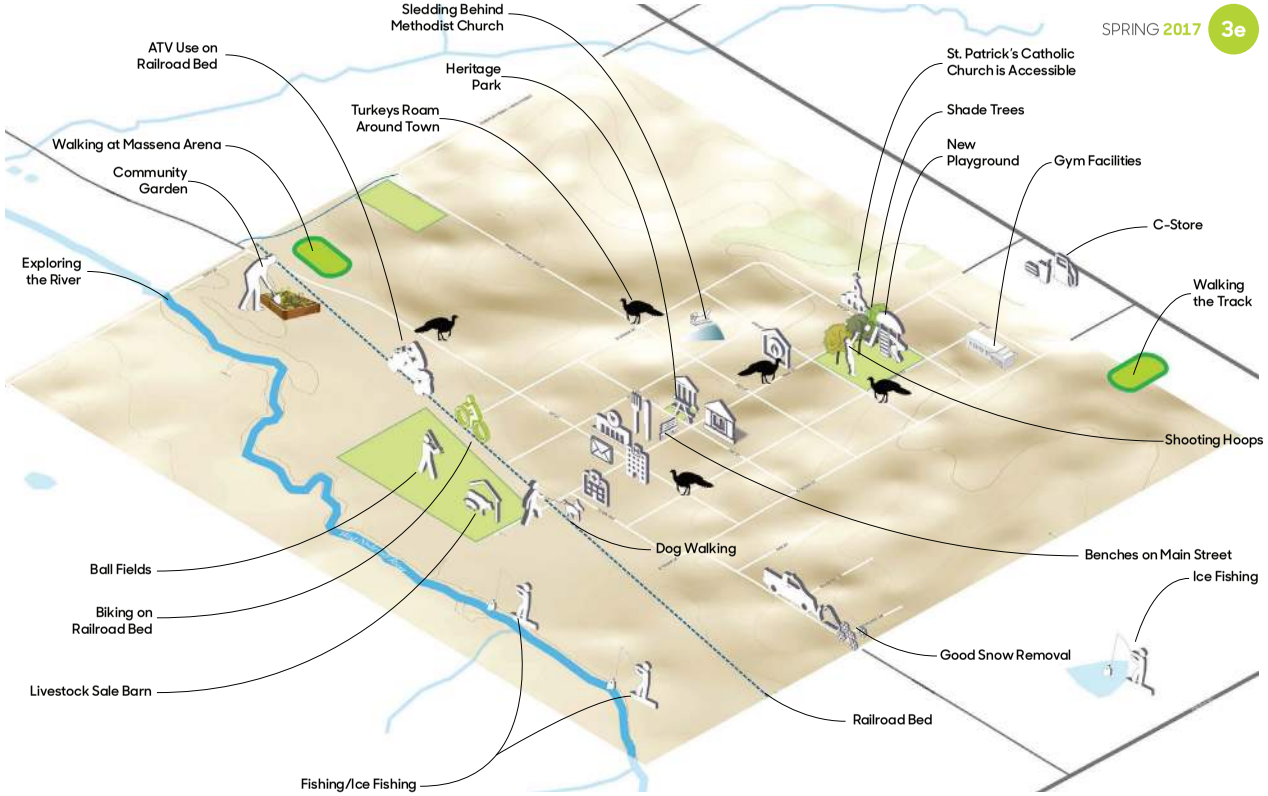

Massena Assets

Transportation Assets and Barriers
Julia Badenhope, Sandra Oberbroeckling, Matthew Gordy, Richard Garcia
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Desired Improvements

Desired Improvements: Common Factors

The analysis of desired improvements synthesizes the feedback we received from the five transportation user groups. Although not summarized below, input from the steering committee is incorporated into the map of all five user groups.

Desired improvements among Massena focus-group participants are concentrated on three main areas: the sidewalk system, a walking trail, and lighting. All user types noted that the community's sidewalk system is disconnected and in poor condition in some areas. They also expressed the need for more light throughout town. Adult users would like a walking path in Massena; parents and older adults suggested converting the old railbed.

Actives

Active recreationists suggested adding more amenities downtown; such as a drinking fountain, benches, and trees. They would like to slow the traffic on Main Street.

Mobility Impaired

Mobility-impaired individuals focused their desired improvements on the ball fields, proposing structured parking, and the addition of batting cages. This group would also like more shade trees throughout town.

Older Adults

Older adults would like to have curbs and gutters throughout town to alleviate drainage issues. They would also like some type of windbreak at the livestock sale barn. Enhanced entrance signage is also a desired improvement among older adults.

Youth

Desired improvements among the youth focused on outdoor recreation opportunities. They suggested replacing the concrete at the basketball courts in the park and fixing the drinking fountain at the pool. Youth also want fish habitats created.

Parents

Like the youth, the parents would like the basketball courts repaired. Parents also suggested improving the middle school track, adding benches along the proposed walking trail, and installing curbs and gutters throughout town.

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Massena
Desired Improvements

Transportation Assets and Barriers
Julia Badenhope, Sandra Oberbroeckling, Matthew Gordy, Samuel Thompson
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Transportation Inventory and Analysis

Transportation Inventory & Analysis
Knowledge of the transportation systems in and around the community of Massena is critical for sustainable transportation enhancement planning. Transportation systems include paved and unpaved roadways, pedestrian and bike trails, waterways, and railroad lines.

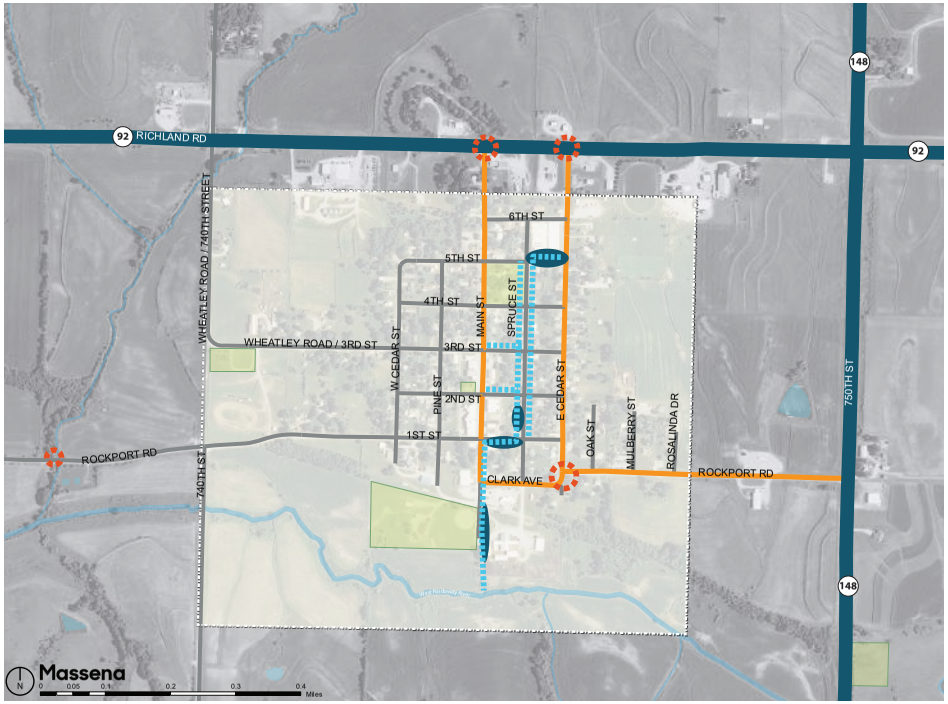
The Massena visioning design team worked with the Iowa Department of Transportation (IDOT) personnel and local officials to identify past, present, and future transportation systems in the area. They discussed possible transportation-related restraints and opportunities that could potentially affect project areas.

Iowa Highway 92 runs north of the Massena Corporate limits. It is a major thoroughfare for traffic through this region of Cass County, averaging 1,530 vehicles per day, according to an IDOT study in 2012. IA92 provides access into Massena through Main Street and E Cedar Street. Massena can also be accessed through Rockport Road on the south side of Massena, and Wheatley Road to the west.

Main Street is a major collector for trucks bound for the Massena Livestock Sales. The existing width of Main street, including its steep topography, causes vehicles to speed. Pedestrians currently have to walk 75 feet of street and parking width to cross Main Street. No crosswalks currently exist in town.

Rockport Road is a minor farm to market collector. Future plans include the straightening and widening of the s-curve at the intersection of Rockport Road and East Cedar Street. This project will provide a safer alternate route for trucks headed to the sale barn via Iowa Highway 148 and Rockport Road.

Major drainage issues occur along E Spruce Street throughout town. Main Street to the east and E Cedar Street to the west drain to Spruce Street, where large ditches formed to carry stormwater to First Street. It is then directed west towards Main Street, then down a large ravine along Main Street to the West Nodaway River south of Massena. Only five blocks of curb and gutter exist throughout town.



92 State Highway

Major Road

Areas of Concern/Major Intersections

Parks

Stormwater Issues

Major Erosion Locations

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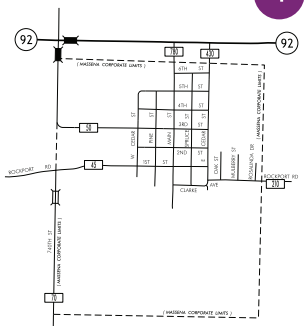


Massena
Transportation Inventory

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Community Concept Plan

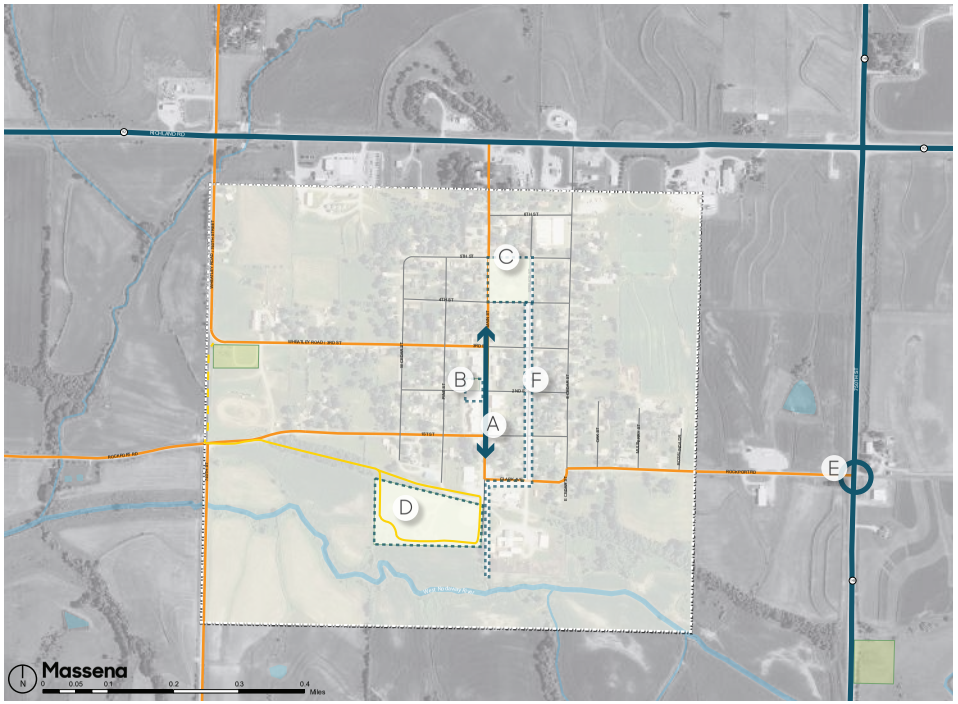
Community Concept Overview

Massena utilized the results of the special places mapping, focus group findings, and transportation inventory to identify a list of goals and opportunities to create a vision for the community. Drawing on this vision, the design team developed a preliminary concept plan at a design workshop that was open to the public.

The concept plan is based on the priorities of the community with guidance from the Massena visioning committee. The improvements illustrated on this plan and in more detail on the following boards are intended to recognize and reinforce important community features and make Massena more enjoyable for all residents and visitors. The goals that the visioning committee ranked as the highest priority and that the design team will address in this plan include:

A) Main Street Improvements
B) Heritage Park Improvements
C) City Park
D) Trails Improvements
E) Signage
F) City Stormwater Management Initiatives

The concept plan creates a cohesive identity for Massena through materials and patterns that improves the overall landscape, highlights local businesses, provides recreational opportunities, promotes community values, and reduces stormwater runoff.



Improved Entrance Signage

Main Street Improvements

Proposed Trail

Community Focus Areas

Community Concept Overview

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Massena
Concept Overview

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Conceptual Totals – Opinion of Probable Cost

Description	Extended Amount
MAIN STREET BEAUTIFICATION	
SUB-TOTAL - Base Bid	**$ 428,597.46**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 21,429.87**
CONTINGENCY - 15%	**$ 64,289.62**
DESIGN AND ENGINEERING - 10%	**$ 42,859.75**
Inflation - 3%	**$ 12,857.92**
CONSTRUCTION COST	**$ 570,034.62**

SEAT WALL OPTION A	
SUB-TOTAL - Base Bid	**$ 36,488.89**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 1,824.44**
CONTINGENCY - 15%	**$ 5,473.33**
DESIGN AND ENGINEERING - 10%	**$ 3,648.89**
Inflation - 3%	**$ 1,094.67**
CONSTRUCTION COST	**$ 48,530.22**

HERITAGE PARK IMPROVEMENTS	
SUB-TOTAL - Base Bid	**$ 107,910.74**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 5,395.54**
CONTINGENCY - 15%	**$ 16,186.61**
DESIGN AND ENGINEERING - 10%	**$ 10,791.07**
Inflation - 3%	**$ 3,237.32**
CONSTRUCTION COST	**$ 143,521.28**

CITY PARK IMPROVEMENTS	
SUB-TOTAL - Base Bid	**$ 506,446.15**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 25,322.31**
CONTINGENCY - 15%	**$ 75,966.92**
DESIGN AND ENGINEERING - 10%	**$ 50,644.61**
Inflation - 3%	**$ 15,193.38**
CONSTRUCTION COST	**$ 673,573.37**

CITY PARK INTENSIVE STORMWATER BIORETENTION	
SUB-TOTAL - Base Bid	**$ 86,753.24**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 4,337.66**
CONTINGENCY - 10%	**$ 8,675.32**
DESIGN AND ENGINEERING - 10%	**$ 8,675.32**
Inflation - 3%	**$ 2,602.60**
CONSTRUCTION COST	**$ 111,044.15**

ENTRANCE SIGNAGE	
SUB-TOTAL - Base Bid	**$ 9,500.00**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$ 475.00**
CONTINGENCY - 15%	**$ 1,425.00**
DESIGN AND ENGINEERING - 10%	**$ 950.00**
Inflation - 3%	**$ 285.00**
CONSTRUCTION COST	**$ 12,635.00**

RECREATIONAL TRAILS - PHASE ONE		
SUB-TOTAL - Base Bid	**$**	**204,187.22**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**10,209.36**
CONTINGENCY - 15%	**$**	**30,628.08**
DESIGN AND ENGINEERING - 10%	**$**	**20,418.72**
Inflation - 3%	**$**	**6,125.62**
CONSTRUCTION COST	**$**	**271,569.00**

RECREATIONAL TRAILS - PHASE TWO		
SUB-TOTAL - Base Bid	**$**	**45,953.33**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**2,297.67**
CONTINGENCY - 15%	**$**	**6,893.00**
DESIGN AND ENGINEERING - 10%	**$**	**4,595.33**
Inflation - 3%	**$**	**1,378.60**
CONSTRUCTION COST	**$**	**61,117.93**

TRAIL NODE (PRICE PER NODE)		
SUB-TOTAL - Base Bid	**$**	**19,315.00**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**965.75**
CONTINGENCY - 15%	**$**	**2,897.25**
DESIGN AND ENGINEERING - 10%	**$**	**1,931.50**
Inflation - 3%	**$**	**579.45**
CONSTRUCTION COST	**$**	**25,688.95**

VEGETATED SWALE STORMWATER PLANTER, NARROW RIGHT-OF-WAY		
SUB-TOTAL - Base Bid	**$**	**96,436.94**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**4,821.85**
CONTINGENCY - 10%	**$**	**9,643.69**
DESIGN AND ENGINEERING - 10%	**$**	**9,643.69**
Inflation - 3%	**$**	**2,893.11**
CONSTRUCTION COST	**$**	**123,439.28**

INTENSIVE STORMWATER BIORETENTION		
SUB-TOTAL - Base Bid	**$**	**27,875.75**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**1,393.79**
CONTINGENCY - 10%	**$**	**2,787.58**
DESIGN AND ENGINEERING - 10%	**$**	**2,787.58**
Inflation - 3%	**$**	**836.27**
CONSTRUCTION COST	**$**	**35,680.96**

INTENSIVE STORMWATER BIOSWALE AT RECREATION FIELDS		
SUB-TOTAL - Base Bid	**$**	**253,082.41**
MOBILIZATION/GENERAL CONDITIONS - 5%	**$**	**12,654.12**
CONTINGENCY - 10%	**$**	**25,308.24**
DESIGN AND ENGINEERING - 10%	**$**	**25,308.24**
Inflation - 3%	**$**	**7,592.47**
CONSTRUCTION COST	**$**	**323,945.48**

Main Street

Main Street Improvements

Main Street is the heart of the local business in Massena, as well as the heart of the downtown district overall. The plan proposes the introduction of bump-outs on the corners and mid-block crossings in the main business district. These bump-outs showcase plantings, overstory trees, and the added benefit of being a stormwater management tool. Massena does not have an integrated storm drain system, therefore installing a trench drain at the curb line would aide in diverting overflow run-off from the bioswales. The mid-block stormwater area could feature a small seating area to accommodate the Main Street Bar and Grill patrons, as well as offer a pleasant spot for residents to rest along the streetscape. Implementing these types of planters without changing the existing drainage systems is a cost-effective way to increase use during the warm weather without impeding snow removal.

In conjunction with the bump-outs the plan features new pedestrian scale street lights with banners and hanging planter baskets. Utilizing LED lights will offer extended use and increase the distance required between street lights on the sidewalk. The proposed plan replaces additional planters, benches, and litter receptacles to provide a consistent streetscape aesthetic. The proposed streetscape family will showcase a modern twist on the traditional style furnishings and preserve the historic character of the street, while embracing the modern flair of proposed branding and signage. In addition to the streetscape elements, custom seat walls are proposed along the eastern side of Main Street in vacant city lots. These seat walls will provide a place to rest and an opportunity to include at grade planter boxes to add seasonal interest and break up the large span of the vertical wall.

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Massena
Main Street

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Main Street

Seat Wall Options

Option A provides a consistent line as the fence marches down the hillside. Wooden boards slide into metal supports, topping out at 6', where thin wire cables take over to reach the height at the top of the hill.

Option B reflects the shades of blue theme seen throughout the signage in town and City Park. This option uses blue acrylic panels to create the fence, showcasing unique shadows during the day.

Option C is a precast concrete wall. This wall is embossed with the veination of a leaf with small circular insets throughout. These areas are highlighted through the use of colors.

Existing Streetscape

Proposed Streetscape

Coronado Bench, Pewter (Anova)

Exposition Receptacle, Pewter (Anova)

Circle Bike Rack, Stainless (Anova)

UrbanScape LED (Philips)

ClassicStyle LED (Philips)

Proposed Streetscape Banner

Seat Wall Option A

Option A provides a consistent line as the fence marches down the hillside. Wooden boards slide into metal supports, topping out at 6', where thin wire cables take over to reach the height at the top of the hill.

Seat Wall Option B

Option B reflects the shades of blue theme seen throughout the signage in town and City Park. This option uses blue acrylic panels to create the fence, showcasing unique shadows during the day.

Seat Wall Option C

Option C is a precast concrete wall. This wall is embossed with the veination of a leaf with small circular insets throughout. These areas are highlighted through the use of colors.

Massena
Main Street

Design Team

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Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Main Street – Opinion of Probable Cost

Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	$10,000.00	$ 10,000.00
DEMOLITION				
REMOVAL				
Temporary Erosion Control	1	LS	$5,000.00	$ 5,000.00
PCC Walk	3,600	SF	$3.00	$ 10,800.00
PCC Curb & Gutter Roadway	320	LF	$12.00	$ 3,840.00
HMA Surface Milling	5,496	SY	$1.50	$ 8,243.50
HARDSCAPE				
HMA Surface Course	151	TON	$85.00	$ 12,835.00
Concrete Paving Curb & Gutter	756	LF	$35.00	$ 26,460.00
Concrete Paving - Walks	1,550	SF	$5.00	$ 7,750.00
Special Paving - Brick	5,300	SF	$16.00	$ 84,800.00
Crosswalk Paint	1,080	SF	$2.00	$ 2,160.00
Pavement Markings	1,761	LF	$1.00	$ 1,761.00
UTILITIES				
Site Lighting	16	EA	$4,000.00	$ 64,000.00
LANDSCAPE				
Mulch - Shredded Hardwood	45.5	CY	$40.00	$ 1,819.63
Amended Soil	182.0	CY	$45.00	$ 8,188.33
Deciduous Shade Trees - 2" Caliper	13	EA	$350.00	$ 4,550.00
Deciduous Ornamental Trees		EA	$250.00	$ -
Shrubs & Perennials	4,913	SF	$30.00	$ 147,390.00
SITE IMPROVEMENTS				
Pole-mounted Sign	16	EA	$500.00	$ 8,000.00
Bike Rack	4	EA	$750.00	$ 3,000.00
Benches	9	EA	$2,000.00	$ 18,000.00
SUB-TOTAL - Base Bid				**$ 428,597.46**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 21,429.87**
CONTINGENCY - 15%				**$ 64,289.62**
DESIGN AND ENGINEERING - 10%				**$ 42,859.75**
Inflation - 3%				**$ 12,857.92**
CONSTRUCTION COST				**$ 570,034.62**

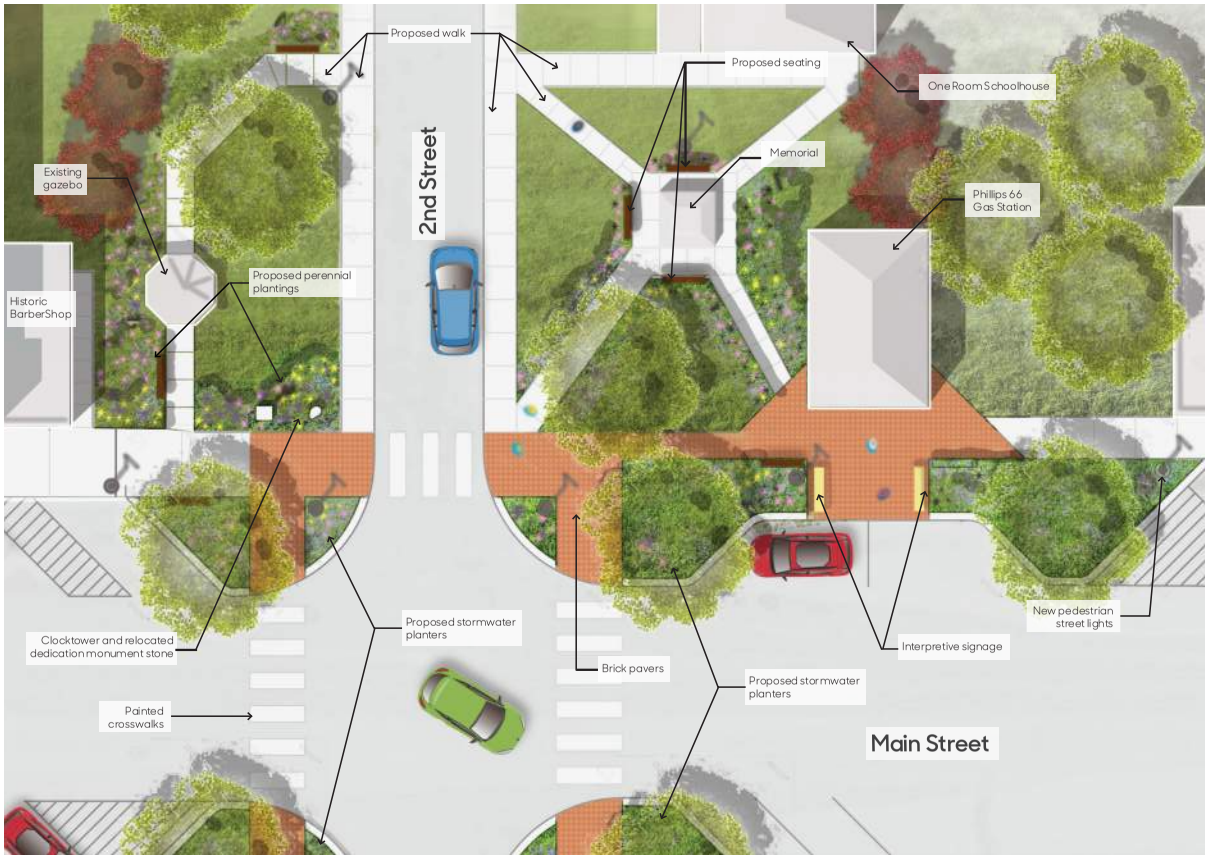
Description	Quantity	Unit	Unit Cost	Extended Amount
SEAT WALL OPTION A				
Fence Removal	1	LS	$1,500.00	$ 1,500.00
Cast in Place Concrete Bench	50	LF	$200.00	$ 10,000.00
Metal & Wood Fence	50	LF	$300.00	$ 15,000.00
Concrete Planter Curb	120	LF	$40.00	$ 4,800.00
Amended Soil	8.9	CY	$45.00	$ 400.00
Mulch - Shredded Hardwood	2.2	CY	$40.00	$ 88.89
Shrubs & Perennials	120	SF	$30.00	$ 3,600.00
PCC Walk Patching	220	SF	$5.00	$ 1,100.00
SUB-TOTAL - Base Bid				**$ 36,488.89**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 1,824.44**
CONTINGENCY - 15%				**$ 5,473.33**
DESIGN AND ENGINEERING - 10%				**$ 3,648.89**
Inflation - 3%				**$ 1,094.67**
CONSTRUCTION COST				**$ 48,530.22**

Heritage Park

Heritage Park Improvements

Heritage Park is located along Main Street and 1st Street in Massena. The historic district showcases a former one room rural school house, barber shop, historic memorabilia, and a 1930s Phillips 66 gas station. The existing district maintains minimal plantings and the memorial markers. The memorabilia is either low to the ground or not in an accessible location to be viewed properly.

Proposed improvements include implementing brick pavers around the gas station, similar to how it was originally built. The addition of interpretive panels and modification of existing site elements will give the user the ability to interact within Heritage Park. New walks provide accessible routes to the park and new perennial and tree plantings create unique spaces within the district.



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Existing view west

Proposed view west

Existing Historic Gas Station

Proposed improvements

Massena
Heritage Park

Design Team

LA: Jen Cross, PLA, ASLA
Intern: Nate Byro

Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Heritage Park - Opinion of Probable Cost

Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	$3,500.00	$ 3,500.00
HARDSCAPE				
Concrete Paving - Walks	950	SF	$5.00	$ 4,750.00
LANDSCAPE				
Mulch - Shredded Hardwood	19	CY	$40.00	$ 740.74
Amended Soil	76	CY	$45.00	$ 3,420.00
Deciduous Shade Trees - 2" Caliper	5	EA	$350.00	$ 1,750.00
Deciduous Ornamental Trees	3	EA	$250.00	$ 750.00
Shrubs & Perennials	2,000	SF	$30.00	$ 60,000.00
SITE AMENITIES				
Site Lighting	1	LS	$15,000.00	$ 15,000.00
Benches	7	EA	$2,000.00	$ 14,000.00
Interpretive Signage	2	EA	$2,000.00	$ 4,000.00
SUB-TOTAL - Base Bid				**$ 107,910.74**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 5,395.54**
CONTINGENCY - 15%				**$ 16,186.61**
DESIGN AND ENGINEERING - 10%				**$ 10,791.07**
Inflation - 3%				**$ 3,237.32**
CONSTRUCTION COST				**$ 143,521.28**

City Park

City Park Improvements

City Park a great asset to the community of Massena. It is currently utilized for public events and gatherings, community recreation, and by the adjacent school on a daily basis. The park has significant grade change along with erosion from the existing run-off patterns. The concept plan proposes reconfiguring existing programmed uses, modifications to the existing drainage ditches, and redefining programmed space to function in concert with the current community usage.

Improvements to the park include: reconfiguration of programmed elements and regrading of portions of the park to provide accessible routes, improved stormwater management systems, relocated basketball court, new open green space for multi-use, new nature play area, relocated outdoor exercise stations, accessible routes to the existing shelters, and selective removal and replanting of the existing trees.

The primary entrance to the park from the school will be realigned to allow ease of access and create bioretention cells for stormwater to collect and infiltrate from one bioretention cell to another along the eastern edge of the park. Managing stormwater in City Park will provide additional benefits downhill for residents of Massena and reduce the extensive erosion taking place due to the speed the water is moving along Spruce Street and through the grass swales currently in place.

Existing Site Photos

Existing playground, erosion patterns

Existing site access, undersized grass swale

Existing basketball court and green space

Proposed City Park Perspective

Massena City Park

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Iowa's Living Roadways community visioning

City Park - Opinion of Probable Cost

Description	Quantity	Unit	Unit Cost	Extended Amount
CITY PARK				
REMOVAL				
Temporary Erosion Control	1	LS	$5,000.00	$ 5,000.00
PCC Walk & Court Removal	5,666	SF	$3.00	$ 16,998.00
CL Fence Removal	245	LF	$2.00	$ 490.00
Retaining Wall Removal	95	LF	$4.00	$ 380.00
Site Grading	2,600	CY	$30.00	$ 78,000.00
Tree Removal	10	EA	$1,500.00	$ 15,000.00
Play Equipment Relocation	1	LS	$10,000.00	$ 10,000.00
HARDSCAPE				
Concrete Paving - Basketball Court	4,500	SF	$7.00	$ 31,500.00
Rubberized Surfacing	5,759	SF	$18.00	$ 103,662.00
Concrete Paving - Walks	9,015	SF	$5.00	$ 45,075.00
Pavement Markings - Crosswalk	184	LF	$2.00	$ 368.00
Site Retaining Wall	70	LF	$225.00	$ 15,750.00
Seat Wall	40	LF	$225.00	$ 9,000.00
LANDSCAPE				
Mulch - Shredded Hardwood	62	CY	$40.00	$ 2,470.37
Amended Soil	47	CY	$45.00	$ 2,125.00
Deciduous Shade Trees - 2" Caliper	15	EA	$350.00	$ 5,250.00
Evergreen Ornamental Trees	10	EA	$250.00	$ 2,500.00
Shrubs & Perennials	425	SF	$30.00	$ 12,750.00
Sod	5,000	SF	$1.50	$ 7,500.00
SITE AMENITIES				
Site Lighting	1	LS	$30,000.00	$ 30,000.00
Benches	5	EA	$2,000.00	$ 10,000.00
Bike Racks	4	EA	$750.00	$ 3,000.00
Basketball Hoops	2	EA	$1,500.00	$ 3,000.00
New Playground Equipment	1	LS	$50,000.00	$ 50,000.00
City Park Signage	1	EA	$3,500.00	$ 3,500.00
Nature Play Area				
Rubberized Surfacing	200	SF	$18.00	$ 3,600.00
Logs - Natural Climb	10	EA	$1,500.00	$ 15,000.00
Boulders	25	EA	$350.00	$ 8,750.00
Hillslide	1	EA	$7,000.00	$ 7,000.00
Mulch - Fiber @ 6" depth	219	CY	$40.00	$ 8,777.78
SUB-TOTAL - Base Bid				**$ 506,446.15**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 25,322.31**
CONTINGENCY - 15%				**$ 75,966.92**
DESIGN AND ENGINEERING - 10%				**$ 50,644.61**
Inflation - 3%				**$ 15,193.38**
CONSTRUCTION COST				**$ 673,573.38**

Description	Quantity	Unit	Unit Cost	Extended Amount
INTENSIVE STORMWATER BIORETENTION				
Site Grading	300	CY	$30.00	$ 9,000.00
Check Dam	44	LF	$125.00	$ 5,500.00
Amended Soil & Aggregate	8,062	SF	$8.50	$ 68,527.00
Mulch - Shredded Hardwood	74.6	CY	$40.00	$ 2,985.92
Native Retention Planting	0.19	AC	$4,000.00	$ 740.31
Underdrain - as needed	1	LS	Varies	
Substitute #1 Plants in lieu of seeding	8,062	SF	$20.00	$ 161,240.00
SUB-TOTAL - Base Bid				**$ 86,753.24**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 4,337.66**
CONTINGENCY - 10%				**$ 8,675.32**
DESIGN AND ENGINEERING - 10%				**$ 8,675.32**
Inflation - 3%				**$ 2,602.60**
CONSTRUCTION COST				**$ 111,044.14**

Trails & Signage

Massena Recreational Trail
During the special places mapping assessment, committee members noted that there are no existing trail routes in the community. Creating a dedicated trail that connects to the community is a top priority. The proposed trail would connect from the southern area of town to the western edge and circle back to the downtown.

The creation of a smaller defined recreational trail loop allows for continuous access for community members. The loop trail would utilize existing city property around the existing baseball/softball/tee ball complex and the former rail bed leading to the west of town. The trail maintains an opportunity to connect to Massena to the north through an abandoned street ROW with the creation of an easement with an existing property owner. This trail connection would need to have protective bollards installed at each roadway entrance to prevent vehicles from driving on the trail or adjacent properties. Trail nodes are proposed for opportunities for rest and use of the relocated exercise equipment from City Park.

Massena Recreational Complex
Massena has the desire to expand their recreational complex to include additional fields for tee ball and softball for youth and high school age groups. Re-orienting the existing ball field to have all the infields in the same location, reduces sun glare for the players, offers the ability to share concessions, condense the distance to parking, and allows fans to interact with multiple events that might be happening at the same time.

The additional ball fields require relocating the community gardens to just north of the old rail line and the proposed ball fields. The new site offers better soil conditions and easier access for community members.

Signage and Branding
Massena has unique character and attributes that make their community stand out in southwest Iowa. They are considered the "home of friendly people" and the current signage does not echo the characteristics of their motto or the town's aesthetic.

Creation of sign panels for the existing signs highlight Massena's motto and showcase the identifying character of the community. The blue color is consistent with their previous branding efforts and can be carried through the proposed streetscape banners, website, and materials if desired. Trail markers could utilize the same type of branding to help people determine the distance traveled on the proposed trail loop.

Former Rail Bed - Existing Conditions

Proposed Trail Node

Proposed Fitness Trail

Existing Sign at 750th Street

Proposed Welcome Sign

Massena Recreational Trail

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Proposed Banner and Welcome Sign

Massena
Trails & Signage

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Trails & Signage - Opinion of Probable Cost

Description	Quantity	Unit	Unit Cost	Extended Amount
ENTRANCE SIGNAGE				
Graphic Production & Printing	1	LS	$3,500.00	$ 3,500.00
Solar Powered Lighting	1	LS	$4,000.00	$ 4,000.00
Landscaping	1	LS	$2,000.00	$ 2,000.00
SUB-TOTAL - Base Bid				**$ 9,500.00**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 475.00**
CONTINGENCY - 15%				**$ 1,425.00**
DESIGN AND ENGINEERING - 10%				**$ 950.00**
Inflation - 3%				**$ 285.00**
CONSTRUCTION COST				**$ 12,635.00**

Description	Quantity	Unit	Unit Cost	Extended Amount
PHASE ONE (1.8 MILES OF TRAIL)				
Site Preparation	5,111	SY	$4.00	$ 20,444.44
H.M.A. Trail	5,111	SY	$35.00	$ 178,888.89
Lawn/Seed Mix & Prep	2,044	SY	$0.65	$ 1,328.89
Clearing & Grubbing	1.75	AC	$1,500.00	$ 2,625.00
SIGNAGE				
Mileage Marker Sign	18	EA	$50.00	$ 900.00
SUB-TOTAL - Base Bid				**$ 204,187.22**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 10,209.36**
CONTINGENCY - 15%				**$ 30,628.08**
DESIGN AND ENGINEERING - 10%				**$ 20,418.72**
Inflation - 3%				**$ 6,125.62**
CONSTRUCTION COST				**$ 271,569.01**

Description	Quantity	Unit	Unit Cost	Extended Amount
PHASE TWO - NORTH TRAIL EXTENSION (0.3 MILES OF TRAIL)				
Site Preparation - Subgrade for off street segmen	1,167	SY	$4.00	$ 4,666.67
H.M.A. Trail	1,167	SY	$35.00	$ 40,833.33
Lawn/Seed Mix & Prep	467	SY	$0.65	$ 303.33
SIGNAGE				
Mileage Marker Sign	3	EA	$50.00	$ 150.00
SUB-TOTAL - Base Bid				**$ 45,953.33**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 2,297.67**
CONTINGENCY - 15%				**$ 6,893.00**
DESIGN AND ENGINEERING - 10%				**$ 4,595.33**
Inflation - 3%				**$ 1,378.60**
CONSTRUCTION COST				**$ 61,117.93**

Description	Quantity	Unit	Unit Cost	Extended Amount
Trail Node (Price Per Node)				
Site Preparation - Subgrade	1	LS	$2,000.00	$ 2,000.00
H.M.A. Trail Node	450	SF	$5.00	$ 2,250.00
Shade Structure	1	EA	$4,000.00	$ 4,000.00
Exercise Equipment Station	1	LS	$2,500.00	$ 2,500.00
Bench	1	EA	$2,000.00	$ 2,000.00
Mulch - Shredded Hardwood	2.50	CY	$40.00	$ 100.00
Amended Soil	12.0	CY	$45.00	$ 540.00
Deciduous Shade Trees - 2" Caliper	3	EA	$350.00	$ 1,050.00
Perennial Plantings	300	SF	$15.00	$ 4,500.00
Lawn/Seed Mix Prep	250	SF	$1.50	$ 375.00
SUB-TOTAL - Base Bid				**$ 19,315.00**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 965.75**
CONTINGENCY - 15%				**$ 2,897.25**
DESIGN AND ENGINEERING - 10%				**$ 1,931.50**
Inflation - 3%				**$ 579.45**
CONSTRUCTION COST				**$ 25,688.95**

Description	Unit	Unit Cost
ADDITIONAL SITE AMENITIES TO CONSIDER		
Informational Kiosk	EA	$8,000.00-$12,500.00
Mileage marker	EA	$50.00
Pole-mounted Sign	EA	$3,000.00
Site Lighting	EA	$3,000.00-$5,000.00
Bench	EA	$2,000.00
Trash Receptacle	EA	$1,250.00
Bick Rack	EA	$750.00
Security Bollards	EA	$250.00

Stormwater Management

Large elevation change in Massena presents challenges and unique opportunities for stormwater management. Current drainage patterns divert most of the stormwater over land, rather than into a traditional stormwater system. The top of the watersheds in Massena begin near Highway 92 and direct most of the runoff down Pine, Cedar, Spruce, and Main Streets. The high problem areas occur on Main Street with minimal storm inlets, and Spruce Street which maintains a highly eroded grass swales on both sides of the street.

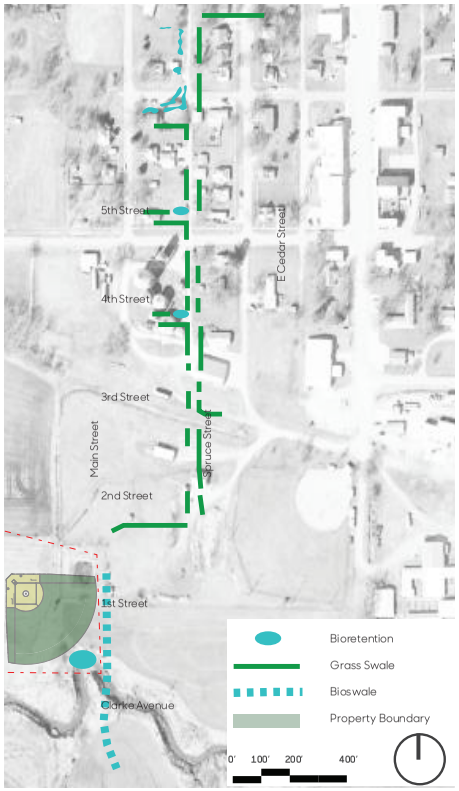
Slowing down the water and implementing vegetated grass swales, bioswales, and check dams in key locations will help improve the extensive erosion occurring in Massena. Basic stormwater modeling and watersheds have been identified to determine that this strategy would be sufficient to handle typical stormwater events. The creation of a larger chain of bioswales in City Park to collect and infiltrate much of the initial flow and deter washout is needed to provide significant impact downstream.

A bioswale conveys flow from small storms at slow speeds (< 1 fps) so that pollutants are filtered and runoff has time to infiltrate into the soil media. The underdrain reduces the potential for standing water. The total watershed area to this practice would be just under 50 acres, so a bioswale of this size and length is certainly possible. For pretreatment, we might need to configure the outlet pipe from the swale upstream (where runoff from Main and Clarke empties) with a staged outlet so that some of the heavier sediments will drop out prior to being routed into the bioswale.

Improving the existing condition of the vegetated grass swales is needed along Spruce Street. A typical section of the swale is provided. Key components to the success of this system:

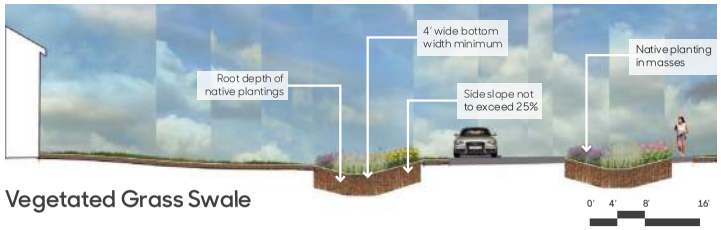
1. The creation of long linear grass swales with a minimum of 4′ wide base with a 4:1 side slope. The wider base allows the water to spread out and slow down as it moves through the swale.
2. Topsoil for plants to develop an established root system or adding amended soils to the swale will improve the vegetation quality.
3. Short grass prairie mix that can tolerate both wet and dry conditions. The height of this prairie mix is typically around 3′. Providing additional length to the vegetated grass swales will slow the water flow and increase infiltration rates, reducing erosion.

Near the recreational complex the recommendation is to expand the existing ditch into a bioswale. The ditch would need to be expanded with the slope relatively flat. We would need to install check dams at 200′ intervals (approximate). This type of bioswale will need engineered soil media, an underdrain, and an overall depth of 3-4 feet.

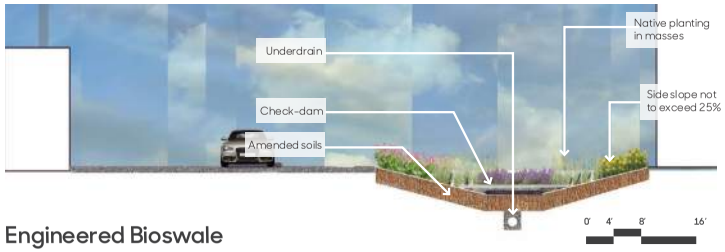


Stormwater Improvement Plan

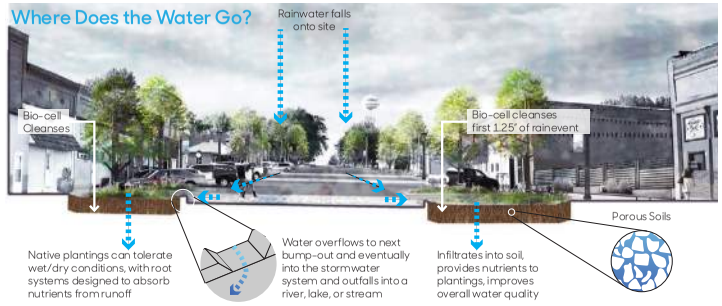
Large elevation change in Massena presents challenges and unique opportunities for stormwater management. Current drainage patterns divert most of the stormwater over land, rather than into a traditional stormwater system. The top of the watersheds in Massena begin near Highway 92 and direct most of the runoff down Pine, Cedar, Spruce, and Main Streets. The high problem areas occur on Main Street with minimal storm inlets, and Spruce Street which maintains a highly eroded grass swales on both sides of the street.



Vegetated Grass Swale



Engineered Bioswale



Streetscape Water Management

Slowing down the water and implementing vegetated grass swales, bioswales, and check dams in key locations will help improve the extensive erosion occurring in Massena. Basic stormwater modeling and watersheds have been identified to determine that this strategy would be sufficient to handle typical stormwater events. The creation of a larger chain of bioswales in City Park to collect and infiltrate much of the initial flow and deter washout is needed to provide significant impact downstream.

A bioswale conveys flow from small storms at slow speeds (< 1 fps) so that pollutants are filtered and runoff has time to infiltrate into the soil media. The underdrain reduces the potential for standing water. The total watershed area to this practice would be just under 50 acres, so a bioswale of this size and length is certainly possible. For pretreatment, we might need to configure the outlet pipe from the swale upstream (where runoff from Main and Clarke empties) with a staged outlet so that some of the heavier sediments will drop out prior to being routed into the bioswale.

Improving the existing condition of the vegetated grass swales is needed along Spruce Street. A typical section of the swale is provided. Key components to the success of this system:

1. The creation of long linear grass swales with a minimum of 4' wide base with a 4:1 side slope. The wider base allows the water to spread out and slow down as it moves through the swale.
2. Topsoil for plants to develop an established root system or adding amended soils to the swale will improve the vegetation quality.
3. Short grass prairie mix that can tolerate both wet and dry conditions. The height of this prairie mix is typically around 3'. Providing additional length to the vegetated grass swales will slow the water flow and increase infiltration rates, reducing erosion.

Near the recreational complex the recommendation is to expand the existing ditch into a bioswale. The ditch would need to be expanded with the slope relatively flat. We would need to install check dams at 200' intervals (approximate). This type of bioswale will need engineered soil media, an underdrain, and an overall depth of 3-4 feet.

Typical Bioswale & Precedent Examples


Diagrammatic section-perspective of a bioswale


Black River Falls, Wisconsin


Black River Falls, Wisconsin

Planting Palette


Blue Grama Ht: 2'
Bouteloua gracilis


Blue Fescue Ht: 1'
Festuca glauca


Butterfly Weed Ht: 2.5'
Asclepias tuberosa


Lanceleaf Coreopsis Ht: 2'
Coreopsis lanceolata


Heath Aster Ht: 3'
Symphyotrichum ericoides


Blanket Flower Ht: 3'
Gaillardia x grandiflora


Purple Coneflower Ht: 5'
Echinacea purpurea


Blazingstar Ht: 4'
Liatris spicata

Massena
Stormwater Management

Design Team
LA: Jen Cross, PLA, ASLA
Intern: Nate Byro
Iowa State University | Trees Forever | Iowa Department of Transportation

Iowa's Living Roadways community visioning

Stormwater Management - Opinion of Probable Cost

Description	Quantity	Unit	Unit Cost	Extended Amount
VEGETATED SWALE STORMWATER PLANTER, NARROW RIGHT-OF-WAY				
Landscape Edger - Aluminum	4,942	LF	$5.00	$ 24,710.00
Site Grading	4,942	LF	$5.00	$ 24,710.00
Native Seeding	2.27	AC	$4,000.00	$ 9,076.22
Mulch - Shredded Hardwood	915.2	CY	$40.00	$ 36,607.39
Amended Soil	1.9	CY	$45.00	$ 83.33
Deciduous Shade Trees	1	EA	$350.00	$ 350.00
Shrubs & Perennials	50	SF	$18.00	$ 900.00
Underdrains - as needed	1	LS	Varies	
SUB-TOTAL - Base Bid				**$ 96,436.94**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 4,821.85**
CONTINGENCY - 10%				**$ 9,643.69**
DESIGN AND ENGINEERING - 10%				**$ 9,643.69**
Inflation - 3%				**$ 2,893.11**
CONSTRUCTION COST				**$ 123,439.28**
LINEAR FOOT COST				**$ 24.98**

Description	Quantity	Unit	Unit Cost	Extended Amount
INTENSIVE STORMWATER BIORETENTION				
Site Grading	175	LF	$10.00	$ 1,750.00
Amended Soil & Aggregate	2,458	SF	$8.50	$ 20,893.00
Mulch - Shredded Hardwood	22.8	CY	$40.00	$ 910.37
Amended Soil	91.0	CY	$45.00	$ 4,096.66
Native Retention Planting	0.06	AC	$4,000.00	$ 225.71
Underdrain - as needed	1	LS	Varies	
SUB-TOTAL - Base Bid				**$ 27,875.75**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 1,393.79**
CONTINGENCY - 10%				**$ 2,787.57**
DESIGN AND ENGINEERING - 10%				**$ 2,787.57**
Inflation - 3%				**$ 836.27**
CONSTRUCTION COST				**$ 35,680.95**
LINEAR FOOT COST				**$ 203.89**

Description	Quantity	Unit	Unit Cost	Extended Amount
INTENSIVE STORMWATER BIOSWALE AT RECREATION FIELDS				
Site Grading	765	LF	$10.00	$ 7,650.00
Amended Soil & Aggregate	22,950	SF	$8.50	$ 195,075.00
Mulch - Shredded Hardwood	212.5	CY	$40.00	$ 8,500.00
Amended Soil	850.0	CY	$45.00	$ 38,249.98
Native Retention Planting	0.53	AC	$4,000.00	$ 2,107.44
Underdrain - as needed	1	LS	Varies	
Check Dams	3	EA	$500.00	$ 1,500.00
SUB-TOTAL - Base Bid				**$ 253,082.41**
MOBILIZATION/GENERAL CONDITIONS - 5%				**$ 12,654.12**
CONTINGENCY - 10%				**$ 25,308.24**
DESIGN AND ENGINEERING - 10%				**$ 25,308.24**
Inflation - 3%				**$ 7,592.47**
CONSTRUCTION COST				**$ 323,945.49**
LINEAR FOOT COST				**$ 423.46**

Implementation Strategies

The Community Visioning Program is just the beginning of the planning process for the implementation of projects that will contribute to an enhanced quality of life in Massena. Although there is value in data gathering, analysis, conclusions, and recommendations, the greatest value is providing the residents of Massena with the opportunity to look at their community from different perspectives and to motivate future change. It is the design team's intent to provide the community with a framework for significant future development and enhancement of community resources.

Key Recommendations: Based on economic return and increased quality of life, it is recommended that projects be approached individually, keeping in mind that some may run concurrently and others may require phasing. It is important to have two goals related to implementation: create success and build on those successes. Initial projects should most likely require the least funding and present the fewest barriers to implementation. Many of the projects proposed in this document and through this process have numerous elements incorporated with one another. These elements have the potential of being separated out and completed systematically. This will provide an opportunity to address smaller, more affordable portions of work to build success without huge fundraising efforts.

Main Street Enhancements: When looking for funding sources for the work proposed downtown, focusing on safety and stormwater management will be key. Proper signage and attracting people to the district is important. Funding sources for facade restoration should be investigated for those buildings that need to be rehabilitated. Often, investigating opportunities typically reserved for main street communities is beneficial to small towns in Massena's position. There are other opportunities for funding in relationship to infrastructure replacement, specifically if Massena utilizes sustainable solutions. The Iowa DOT continues to be a source for grant funding. This should be kept in mind throughout all implementation. Smaller funding opportunities can help too. Bike racks, site furniture, and plant material are often easily paid for by smaller funding sources. This project holds a larger community investment; however, could be implemented in phases, or along with the milling and overlaying work that is slated in the near future.

Dedicated Recreational Trails: This improvement has been a long-time goal of many community residents. Creation of a trail system offers opportunities to promote wellness, while ensuring a safer route through the community. Acquiring property, easements, or long-term leases will be a portion of making accessible trail loops to connect to Massena. The logistics of working in the right-of-way and negotiating access to private property will require careful consideration and a possible phased approach. These improvements will greatly improve the walkability of Massena, which is very important in any health-based funding sources.

Park Improvements - Heritage Park and City Park: Bringing new life to these community spaces is a goal of community members. Re-envisioning the parks offers opportunities to promote health and wellness within Massena. The goal to implement stormwater management practices and integration into the park systems offers opportunities for grant funding. Dual-purpose use for the school playgrounds offers other unique opportunities for grants. U.S. Communities offers discounts on play equipment and supplies for schools and other local funding may also be available. Natural play provides learning opportunities for children of all ages and integrating this into the park will create a unique experience. Implementing natural play can be done in phases, or to varying degrees of intensity based on funding available. Completing this project in phases by regrading the site, reconfiguring the play areas, and installing a new basketball court will help increase the function of the park and improve ADA accessibility. The final phases of implementation should include the stormwater infrastructure to slow the water collected from the surrounding environment. Implementing this piece as a final phase will reduce the risk of the soils being compacted by other work on site, improve infiltration rates, and slow/reduce the amount of runoff downstream. Funding sources are available for this type of infrastructure work (see appendix.)

Stormwater Management & Green Infrastructure: Slowing down the water and implementing vegetated grass swales, bioswales, and check dams in key locations will help improve the extensive erosion occurring in Massena. This is a top priority for many residents and city leaders. Through this process basic stormwater modeling and watersheds have been identified to determine that this strategy would be sufficient to handle typical stormwater events. The creation of a larger chain of bioswales in City Park to collect and infiltrate the initial flow and deter washout is needed to provide significant impact downstream. This system should be able to manage the water quality volume (or the runoff generated by the 1.25" storm event – 90% of rainfall events in Iowa are equal or less than this amount). This would make these types of improvements eligible for WQI grants or loan funding through the sponsored projects program. Massena is connected to the Nodaway River Watershed, and grants may also be available through funding projects in this larger watershed area through the NRCS. Implementing these improvements in phases, and educating the public on the goals will also benefit the overall health and performance of the intended stormwater system. Implementing some pilot projects to raise awareness will alert Massena residents that progress is being made. Seeing this progress invites residents to become involved as projects continue to move forward by providing physical and/or financial support.

Massena has strategically identified community projects with great potential for success. The community should take a two-pronged approach to project implementation which includes: completion of select projects within a short timeframe and commencement of the fundraising and planning process for larger-scale, keystone projects. These improvements will increase the quality of life for all citizens of Massena, as well as develop and enhance a positive identity for the community.

Available Resources

There are many creative ways that communities can raise the resources necessary to fund and implement projects. The following list is a compilation of various sources and opportunities for funding the projects conceptualized during the visioning process. This list is not all-inclusive; it is meant to serve as a tool to assist in brainstorming ideas.

Funding Opportunities

- Grants
- Partnerships (private and public)
- Trusts and endowments
- Fund-raising and donations
- Memorials
- Volunteer labor
- Low-interest loans
- Implementation of project in phases

Funding Sources

- Iowa Department of Transportation
- Iowa Department of Natural Resources
- Iowa Department of Education
- Iowa Department of Economic Development
- Utility companies
- Trees Forever

Grant Programs

- Alliant Energy and Trees Forever Branching Out Program
- Federal Surface Transportation Program (STP)
- Iowa Clean Air Attainment Program (ICAAP)
- Iowa DOT/DNR Fund Iowa
- Iowa DOT Iowa's Living Roadways Projects Program
- Iowa DOT Living Roadways Trust Fund Program
- Iowa DOT Pedestrian Curb Ramp Construction Program
- Iowa DOT Statewide Transportation Enhancement Funding
- Iowa DNR Recreation Infrastructure Program
- Land and Water Conservation Fund
- National Recreational Trails Program
- Pheasants Forever
- Revitalization Assistance for Community Improvement (RACI) Grant Program
- State Recreational Trails Program
- Transportation Alternatives Program (TAP)

Stormwater Management Funding Opportunities:

Urban Conservation
http://www.iowaagriculture.gov/FieldServices/urbanConservation.asp

Sponsored Project dollars (if the community will be doing a waste water project financed through the iowa finance authority and dnr)
http://www.iowasrf.com/about_srf/sponsored-projects-home-page/

Water Quality Initiative through IDALS-DSCWQ (there won't be anything on the website until later fall 2017) http://www.iowaagriculture.gov/soilConservation.asp

Urban Stormwater Loan
http://www.iowaagriculture.gov/FieldServices/stormwaterBMPloans.asp

REAP funding (through the local soil and water conservation district and nrcs office) available for private landowners and businesses, but not units of government.

Appendix A

Common Contacts for Community Visioning

Signing

- General questions: District 4 Planner - Scott Suhr 712-243-7627 or Scott.Suhr@iowadot.us
- Specific types of signing: Office of Traffic & Safety at http://www.iowadot.gov/iowaroadsigns/index.aspx

Funding

- General questions: District 4 Planner - Scott Suhr 712-243-7627 or Scott.Suhr@iowadot.us

- Federal and State Rec Trails Program:
  http://www.iowadot.gov/systems_planning/fedstate_rectrails.htm
  Yvonne Diller (Office of Systems Planning)
  515-239-1252 or yvonne.diller@dot.iowa.gov

- Statewide Transportation Alternatives Program:
  http://www.iowadot.gov/systems_planning/trans_enhance.htm
  Pam Lee (Office of Systems Planning)
  515-239-1810 or pamella.lee@dot.iowa.gov

  Safe Routes to Schools: http://www.iowadot.gov/saferoutes
  Deb Arp (Office of Systems Planning)
  515-239-1681 or debra.arp@dot.iowa.gov

- Regional Transportation Enhancement Program: Shirley Helgevold (MIDAS Council of Governments) 515-576-7183, ext 212 or shelgevold@midascog.net

Roadside Vegetation

- Mark Masteller (Office of Design)
  515-239-1424 or mark.masteller@dot.iowa.gov
  or
  Evelyn O'Loughlin (Office of Design)
  515-239-1078 or evelyn.oloughlin@dot.iowa.gov

Appendix B

The Iowa Department of Transportation's

Guide to Transportation Funding Programs

can be found online at the following address:

http://www.iowadot.gov/pol_leg_services/Funding-Guide.pdf

The Title Page and Table of Contents can be found on the following three pages.

Guide to Transportation Funding Programs

of interest to local governments and others

In this document you will find information regarding state and federal programs that provide transportation project funding of interest to local governments and other entities. This information is intended to serve as a guide for preliminary funding searches. For more detail, we encourage you to contact the Iowa Department of Transportation (DOT) office listed for each program. (In some cases, the DOT district office or a Regional Planning Affiliation/Metropolitan Planning Organization is the recommended contact – maps and information for your area can be found beginning on page 81.)

Please note: the FAST Act, a surface transportation reauthorization bill passed in Dec. 2015, made several changes to funding programs. While this document incorporates many of the changes, USDOT guidance has not yet been received for some programs. You are advised to contact the offices listed for the most current information.

As always, to help you find as many potential funding sources as possible, we have included some programs under more than one heading.

IOWA DOT
SMARTER | SIMPLER | CUSTOMER DRIVEN

Contents

Common Stormwater Management Plantings

Recommended Plants for Iowa Rain Gardens, Biocells and Bioswale		BMP Use			Sun Exposure			Soil Moisture				Location in BMP			Height				Blooming Period							Comments
Common Name	***Botanical Name***	Rain garden	Biocell	Bioswale	Full sun	Part shade	Shade	Wet	Moist	Mesic	Dry	Bottom	Sides	Top of Berm	6"-12"	12"-24"	24"-36"	>36"	April	May	June	July	August	September	October	
Native Forbs (Flowers)																										
American Columbine	*Aquilegia canadensis*	x	x	x	x	x	x		x	x		x	x	x		x				x	x					Will spread
Anise Hyssop	*Agastache foeniculum*		x	x	x				x	x	x	x	x	x		x	x				x	x	x			Will spread
Aster, Lance Leaf	*Symphyotrichum lanceolatum*		x	x	x	x	x		x	x		x				x	x	x				x	x	x		Can be too tall for a biocell
Aster, New England	*Symphyotrichum novae-angliae*		x	x	x	x				x		x				x	x						x	x	x	Can be too tall for a biocell
Aster, Smooth Blue	*Symphyotrichum laeve*	x	x		x					x		x		x		x							x	x	x	
Aster, Upland White	*Solidago ptarmicoides*		x	x	x	x				x		x				x						x	x	x		
Blazingstar, Prairie	*Liatris pycnostachya*	x	x	x	x					x	x	x		x		x						x	x	x		
Blazingstar, Rough	*Liatris aspera*	x	x	x	x					x	x	x				x						x	x	x		
Blue Vervain	*Verbena hastata*	x	x	x	x	x		x	x	x		x		x		x						x	x	x		
Bracted Spiderwort	*Tradescantia bracteata*	x	x	x	x	x			x	x	x	x				x					x	x				Will spread
Butterfly Milkweed	*Asclepias tuberosa*	x	x	x	x	x				x	x	x		x							x	x	x	x		
Canada Anemone	*Anemone canadensis*	x	x	x	x	x			x	x	x	x	x	x	x					x	x					Will spread
Canada Milkvetch	*Astragalus canadensis*		x	x	x	x			x	x		x				x	x	x			x	x	x			
Canada Wildrye	*Elymus canadensis*		x	x	x	x						x				x	x	x								
Common Ironweed	*Vernonia fasciculata*		x	x	x	x		x	x	x		x						x				x	x	x		Can be too tall for a biocell
Common Milkweed	*Asclepias syriaca*		x	x	x	x		x	x	x		x						x			x	x	x			Can be too tall for a biocell
Coneflower, Greyheaded Prairi	*Ratibida pinnata*		x	x	x	x			x	x		x					x				x	x	x	x		
Coneflower, Orange	*Rudbeckia fulgida*	x	x	x	x	x			x	x		x					x				x	x	x	x		
Coneflower, Pale Purple	*Echinacea, pallida*	x	x	x	x					x	x	x				x	x					x	x	x		
Coneflower, Purple	*Echinacea purpurea*	x	x	x	x	x			x	x		x	x	x			x	x				x	x	x		
Coreopsis	*Coreopsis palmata*	x	x	x	x	x			x	x		x				x	x				x	x	x			
Coreopsis, Lance Leaf	*Coreopsis lanceolata*	x	x	x	x				x	x		x	x	x		x					x	x	x			
Culvers Root	*Veronicastrum virginicum*	x	x	x	x	x			x	x		x					x	x				x	x			Tall but does not flop
False Sunflower (Ox-eye)	*Heliopsis helianthoides*		x	x	x	x			x	x	x	x						x				x	x	x		
Fern, Maidenhair	*Adiantum*	x	x				x		x			x		x	x											
Fox Sedge	*Carex vulpinoidea*	x	x	x	x			x	x			x				x										
Foxglove Beards Tongue	*Penstemon digitalis*		x	x	x	x			x	x		x					x				x	x				Can be too tall for a biocell
Gentian, Bottle	*Gentiana andrewsii*	x	x	x	x	x			x	x		x	x	x		x							x	x		
Gentian, Cream	*Gentiana flavida*	x	x	x	x	x			x	x		x	x	x		x							x	x		
Golden Alexander	*Zizia aurea*		x	x	x	x			x	x		x					x	x			x	x				
Goldenrod, Showy	*Solidago speciosa*			x	x					x	x	x	x					x					x	x	x	
Goldenrod, Stiff	*Solidago rigida*			x	x					x	x	x	x					x					x	x	x	
Great Blue Lobelia	*Lobelia siphilitica*	x	x	x	x	x		x	x	x		x	x	x			x	x				x	x	x	x	Will spread
Indigo, White Wild	*Baptisia alba*	x	x	x	x	x			x	x	x	x						x			x	x				Bush-like, tall for a rain garden
Indigo, Wild Blue	*Baptisia australis*	x	x	x	x	x				x		x						x		x	x					Bush-like, tall for a rain garden
Leadplant	*Amorpha canescens*	x	x	x	x					x	x	x	x				x				x	x				
Monkey Flower	*Mimulus ringens*	x	x	x	x	x		x	x			x	x			x					x	x	x			
Nodding Onion	*Allium cernuum*	x	x	x	x	x				x		x	x	x	x	x						x	x			
Obedient Plant	*Physpstegia virginiana*				x	x			x	x		x		x			x				x	x	x	x		

Common Stormwater Management Plantings

Recommended Plants for Iowa Rain Gardens, Biocells and Bioswale		BMP Use			Sun Exposure			Soil Moisture				Location in BMP			Height				Blooming Period							Comments
Common Name	***Botanical Name***	Rain garden	Biocell	Bioswale	Full sun	Part shade	Shade	Wet	Moist	Mesic	Dry	Bottom	Sides	Top of Berm	6"-12"	12"-24"	24"-36"	>36"	April	May	June	July	August	September	October	
Prairie Phlox	*Phlox pilosa*	x	x	x	x	x			x	x		x	x	x		x			x	x	x					
Prairie Smoke	*Geum triflorum*	x	x		x					x	x	x	x	x	x				x	x						
Purple Meadow Rue	*Thalictrum dasycarpum*		x	x	x	x			x	x		x				x	x	x			x	x				Can be too tall for a biocell
Purple Prairie Clover	*Dalea purpurea*	x	x	x	x					x	x	x	x	x		x					x	x	x			
Rattlesnake Master	*Eryngium yuccifolium*			x	x				x	x	x	x				x	x	x				x	x			
Showy Tick Trefoil	*Desmodium canadense*				x					x	x	x	x			x	x	x				x	x	x		Can be too tall for a biocell
Silky Aster	*Symphyotrichum sericeum*	x	x	x	x	x				x	x	x	x	x	x	x							x	x		
Smooth Blue Aster	*Symphyotrichum laeve*	x	x	x	x					x	x	x	x	x	x	x							x	x		
Sneezeweed	*Helenium autumnale*	x	x	x	x			x	x			x				x	x	x					x	x	x	Tall for rain gardens and biocells
Solomon's Seal	*Polygonatum multiflorum variegat*	x				x		x	x	x		x	x	x		x			x	x						
Spiderwort, Ohio	*Tradescantia ohioensis*	x	x	x	x	x			x	x		x	x			x				x	x	x				Will spread;sometimes blooms again in fall
Spiderwort, Prairie	*Tradescantia bracteata*	x	x	x	x				x	x		x	x			x				x	x	x				
Susan, Black-eyed	*Helenium autumnale*	x	x	x	x					x	x	x				x	x				x	x	x	x		
Susan, Brown-eyed	*Rudbeckia triloba*				x	x				x	x	x				x	x	x			x	x	x	x		Tall for rain gardens and biocells
Turtlehead	*Chelone glabra*	x	x	x	x			x	x	x		x				x	x	x					x	x		
Virginia Mountain Mint	*Pycnanthemum virginianum*	x	x	x	x	x			x	x	x	x	x	x		x					x	x	x			
Western Ironweed	*Vernonia fasciculata*		x	x	x				x	x		x					x	x				x	x	x		Can be too tall for a biocell
White Prairie Clover	*Dalea candida*	x	x	x	x					x	x	x	x			x					x	x				
Wild Bergamot (bee-balm)	*Dalea candida*		x	x	x	x						x					x	x			x	x	x			Can be too tall for a biocell
Wild Geranium	*Geranium maculatum*	x	x	x		x	x		x	x		x	x	x		x				x	x					Will spread
Wild Petunia	*Ruellia humillis*	x	x	x	x					x	x		x	x		x	x				x	x	x			Spreads; grows well along the edge
Wild Ginger	*Ascarum canadense*	x	x				x		x	x		x	x	x	x				x	x						Will spread, very unique flower
Wild Onion	*Allium textile*	x	x		x					x	x	x	x	x	x					x	x					
Winged Loosestrife	*Lythrum alatum*				x			x	x	x		x	x			x	x	x			x	x	x	x		
Native Grasses and Sedges																										
Big Bluestem	*Andropagon gerardii*			x	x				x	x	x	x	x	x				x								> 48" tall, spreads
Blue Grama	*Bouteloua gracillis*	x	x	x	x				x	x	x	x	x		x											Can use for turfgrass
Bur-Reed Sedge	*Carex sparganioides*	x	x	x		x	x	x	x			x				x	x									
Eastern Woodland Sedge	*Carex blanda*	x	x			x		x	x			x			x				x	x						
Indian Grass	*Sorghastrum*			x	x	x			x	x		x						x								
Little Bluestem	*Schizachyrium scoparium*	x	x	x	x	x				x	x	x		x		x										
Prairie Dropseed	*Sporobolus heterolepis*																									
Sedge, Bicknell	*Carex bicknellii*	x	x		x	x				x		x	x	x	x											
Sedge, Bur Reed	*Carex sparganioides*	x	x			x	x		x			x	x	x		x	x									Shade conditions
Sedge, Brown Fox	*Carex vulpinoidea*	x	x	x	x	x		x	x	x		x	x				x									
Sedge, Common Fox	*Carex stipata*	x	x	x	x	x	x	x	x			x	x				x									
Sedge, Common Wood	*Carex blanda*	x					x	x	x			x	x	x	x											Shade conditions
Sedge, Wooly	*Carex pellita*	x			x	x		x	x			x			x	x	x									Could potentially be used as turf
Sideoats Grama	*Bouteloua curtipendula*	x	x	x	x					x	x	x	x	x		x										
Switch Grass	*Panicum virgatum*		x	x	x	x				x	x	x	x	x				x								Can be too tall for a rain garden and biocell

Common Stormwater Management Plantings

Recommended Plants for Iowa Rain Gardens, Biocells and Bioswale		BMP Use			Sun Exposure			Soil Moisture				Location in BMP			Height			Blooming Period						Comments
Common Name	*Botanical Name*	Rain garden	Biocell	Bioswale	Full sun	Part shade	Shade	Wet	Moist	Mesic	Dry	Bottom	Sides	Top of Berm	6"-12"	12"-24"	24"-36"	>36"	April	May	June	July	August	September	October	
Horticultural Cultivar Flowers and Ferns																										
Autumn Joy Sedum	*Sedum*	x	x		x			x	x	x		x				x	x					x	x	x		
Balloon Flower	*Platycodon*	x	x		x	x		x	x			x				x					x	x				
Beebalm Hybrids	*Monarda*	x	x		x	x		x	x			x				x					x	x				
Chinese Astilbe	*Astilbe chinensis 'Pumila'*	x	x			x	x	x	x			x			x	x						x	x			
Cinnamon Fern	*Osmundastrum cinnamomeum*	x	x			x	x	x				x	x	x		x	x									
Columbine Hydrids	*Aquilegia hybrids*																			x	x					
Coreopsis	*Coreopsideae*	x	x		x	x			x			x				x					x	x	x		Deadheading will extend bloom period
Hosta Hybrids	*Hosta*	x	x				x		x			x			x	x	x				x	x				
Purple Coneflower	*Echinacea purpurea*	x	x	x	x	x			x	x	x	x				x	x				x	x	x			
Siberian Iris	*Iris sibirica*	x	x		x	x			x	x		x				x	x			x	x					
Spike Gay Feather	*Liatris apicata*	x	x																	x	x					
Stella De Oro Day Lily	*Hemerocallis* 'Stella de Oro'	x	x		x	x			x	x		x				x					x	x	x			
Yarrow, Paprika, Terracotta	*Achillea hybrids*	x	x		x											x	x					x				
Ornamental Grasses																										
Fountain Grass	*Pennisetum alopecuroides*	x	x		x				x	x	x	x				x										
Karl Foerster	*Calamagrostis acutifora cultivars*	x	x		x							x					x	x								
Switchgrass	*Panicum virgatum*		x	x	x	x			x	x	x	x	x				x	x								Some shorter growing cultivars are availabl