

Final Report and Feasibility Study Madrid, Iowa



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Iowa Department of Transportation
Trees Forever
Iowa State University



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Table of Contents

- About RDG Planning & Design 3
- Program Overview 4
- Bioregional Assessment 6
 - Settlement Patterns..... 6
 - Historic Vegetation 8
 - Regional Watersheds 10
 - Depth to Water Table 12
 - Elevation and Flow 14
 - Present-day Land Cover 16
 - Present-day Vegetation..... 18
 - Urban Forest 20
- High School Transportation Survey and Focus Groups..... 22
 - Overview 22
 - Priorities and Desired Features 24
 - Students’ Biking Routes 26
- Transportation Behaviors and Needs 28
 - Overview 28
 - Willingness To Help..... 30
 - Priorities 32
 - Commuting Routes 34
 - Walking Routes 36
 - Desired Features 38
- Transportation Inventory and Analysis..... 40
- Community Concept Plan 42
- Downtown 44
- High Trestle Trail 52
- Highway 17 Underpass..... 60
- Highway 17 Median..... 64
- Highway 210..... 68
- Proposed School Crossing 72
- Signage..... 76
- Implementation Strategies 80

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 Wilsam 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, Iowa City, 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.

171 EMPLOYEES | **72** LICENSED PROFESSIONALS | **34** LEED APS | **75%** OF STAFF ARE STOCKHOLDERS



Program Overview

Madrid is one of 10 communities selected to participate in the 2020 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:

1. Program initiation
2. Needs assessment and goal setting
3. Development of a concept plan
4. 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 interns, and ISU faculty and staff. The program is sponsored by the Iowa Department of Transportation. Because of COVID-19, much of this year's engagement with the visioning committee and the public has taken place virtually and through carefully planned socially-distanced events. Kiosks were placed in Madrid for the community to review designs and feedback was received through online surveys.

Community Goals

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

- Highway 17 Improvements
- Trail Improvements
- Downtown Beautification
- Way-finding

Capturing the Madrid 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, Local Geography, Bioregional Assessment, High School Transportation Survey and Focus Groups, Transportation Behavior and Needs Assessment, Transportation Inventory and Analysis, Concept Overview, and Community Design Boards.



Intersection of Highway 210 and Highway 17



High Trestle Trail crossing at Highway 17



Signage along the High Trestle Trail



View of existing pocket park downtown

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- Local Geography
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- High School Transportation Survey and Focus Groups
- Transportation Behavior and Needs Assessment
- Transportation Inventory and Analysis
- Concept Overview
- Downtown
- High Trestle Trail
- Highway 17 Intersection
- Highway 210
- School Crossing
- Signage and Way-finding

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Touring Madrid with the steering committee



Virtual design workshop setup



Program Overview

RDG Planning & Design

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Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation



Bioregional Assessment

Settlement Patterns

This board uses a map 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). A high-quality scan of the Atlas has been arranged to correspond closely with present-day map, revealing major landscape changes as well as features that have persisted, such as railroad rights-of-way and in some cases remnant vegetation patches.

Madrid 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?

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. This 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 community names mapped by the GLO surveyors varied. The original terminology they used has been preserved in the original data, but we have renamed them on this map to reflect names used to describe contemporary vegetation communities.

Not all communities will have all vegetation types, because various conditions that affect vegetation—such as geology, wind exposure, seasonally high water or groundwater, and frequency of fire—differ from place to place. Early land surveyors mapped the following vegetation types, some of which may not be present in the vicinity of your community:

The vegetation types are defined¹:

1. Forest: Tree dominated, with a mostly closed canopy. Ground vegetation; shade tolerant. Developed under infrequent fire.
2. Prairie: Perennial non-woody plants, fire dominated.

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.

SPRING 2020 2b

Historical Vegetation

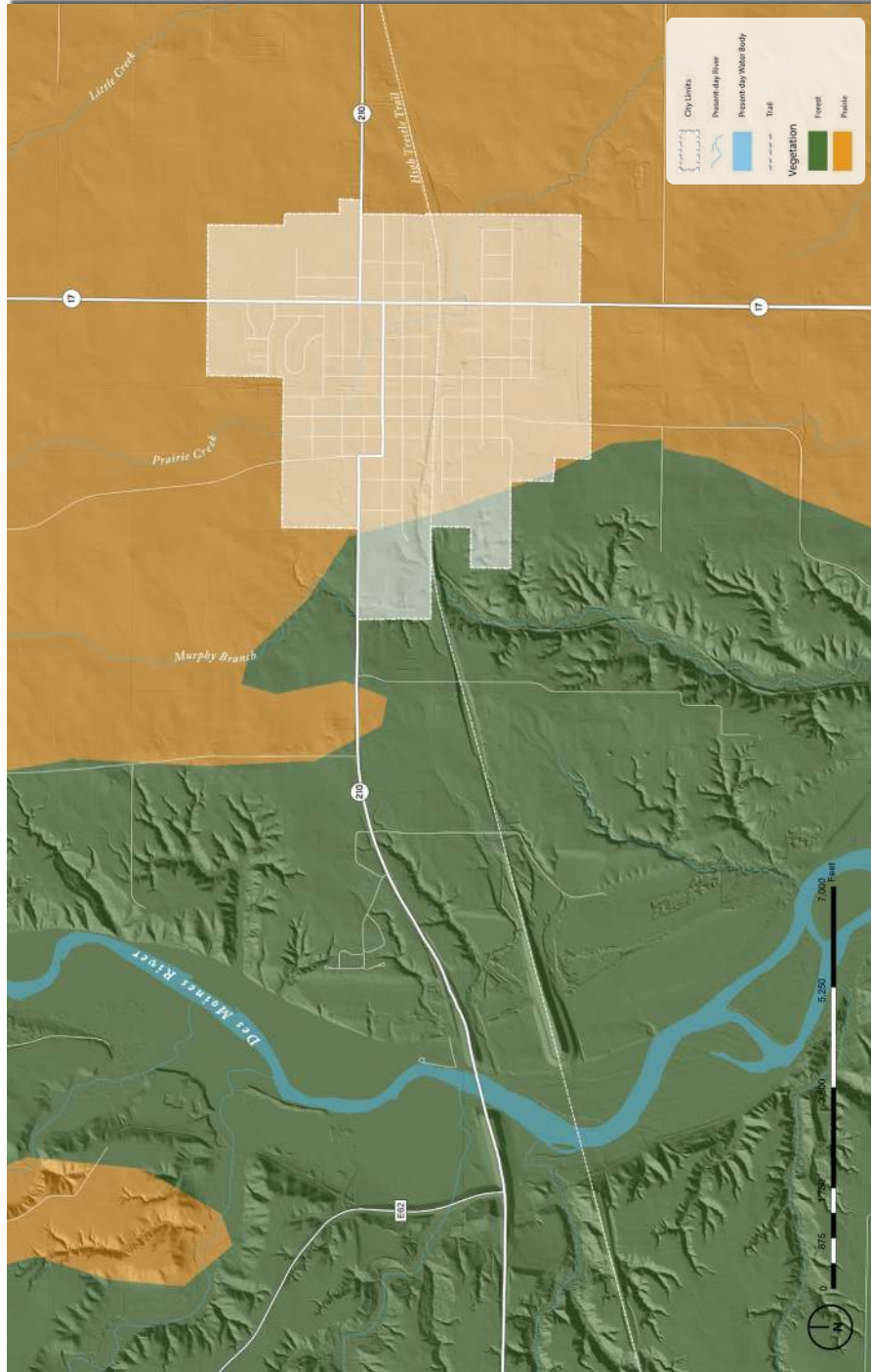
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Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," <http://www.iwisgw.iowa.gov/englib/>.

Madrid

Historical Vegetation

Bioregional Context

Julia Badenhop, Riley Dunn, Parmiss Sazgar, Jonathan Sherwood
Iowa State University | Trees Forever | Iowa Department of Transportation

¹ J.E. Bittiger, "Presentment Vegetation of Cedar County, Illinois," *Transactions of the Illinois Academy of Science*, (1887), 15-24, quoted in Richard Charles Miller, "Analysis of historic vegetation patterns in Iowa using Government and Office Survey and Geographic Information Systems," *Master's Thesis*, Iowa State University, 1995, 4.



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 determine 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 is composed of 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.

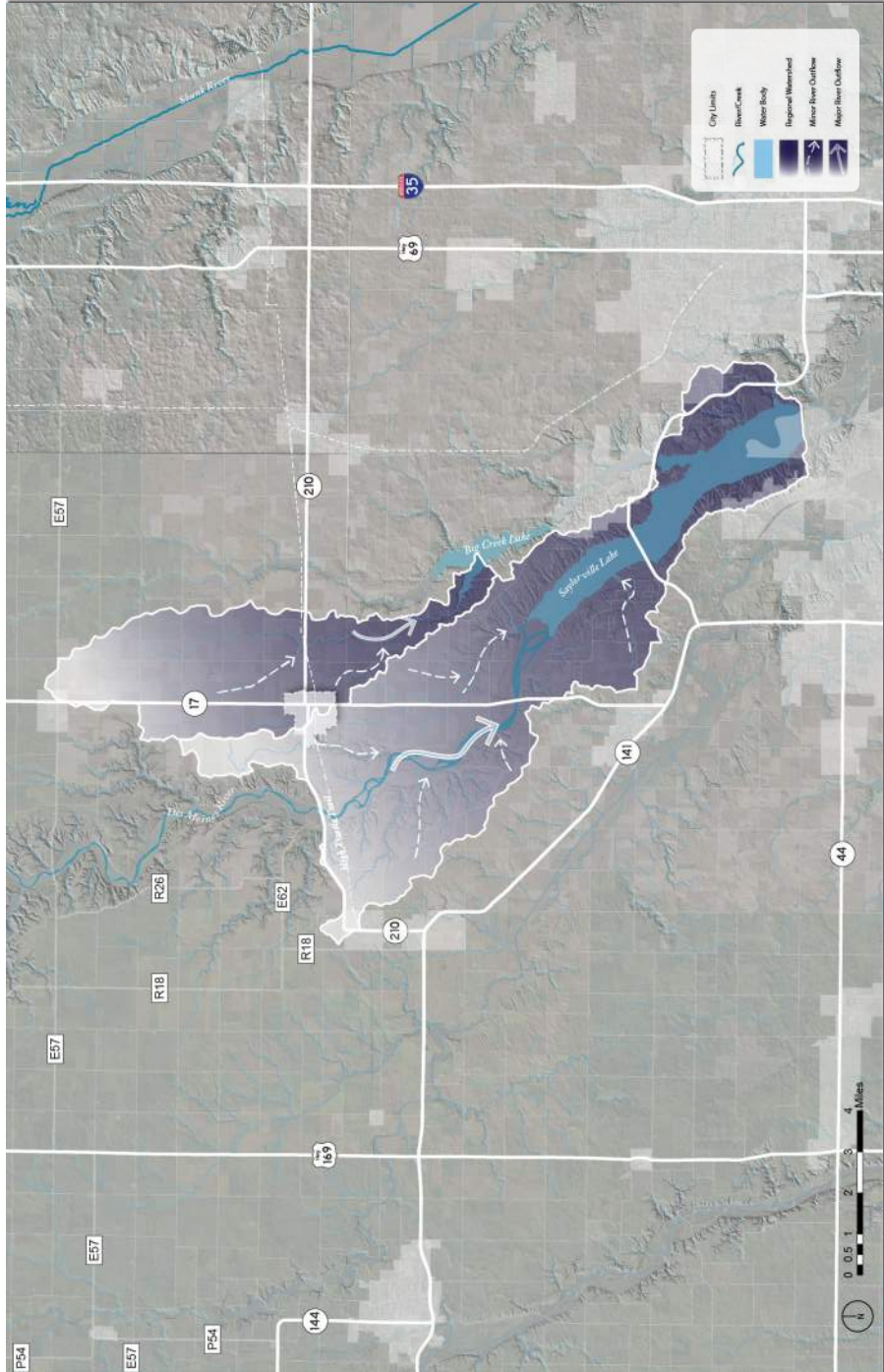
SPRING 2020 2c

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Madrid

Regional Watershed

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Depth to Water Table

The water table is defined as the distance below the surface at which the ground is saturated with water. Depth to water table is represented as a range because it varies due to seasonal changes and precipitation volumes. For example, following spring snowmelt, 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.

The map shows how close to the surface groundwater can be. Pavement and foundations are affected by groundwater near the surface. Freezing and thawing and upward pressure of rising groundwater can cause cracks or "frost boils" in pavement. Foundations can be wet and require "dewatering," which can be expensive.

Where the value is less than zero feet, water can well up out of the ground. This causes localized flooding, even if there is no surface water draining to the area.

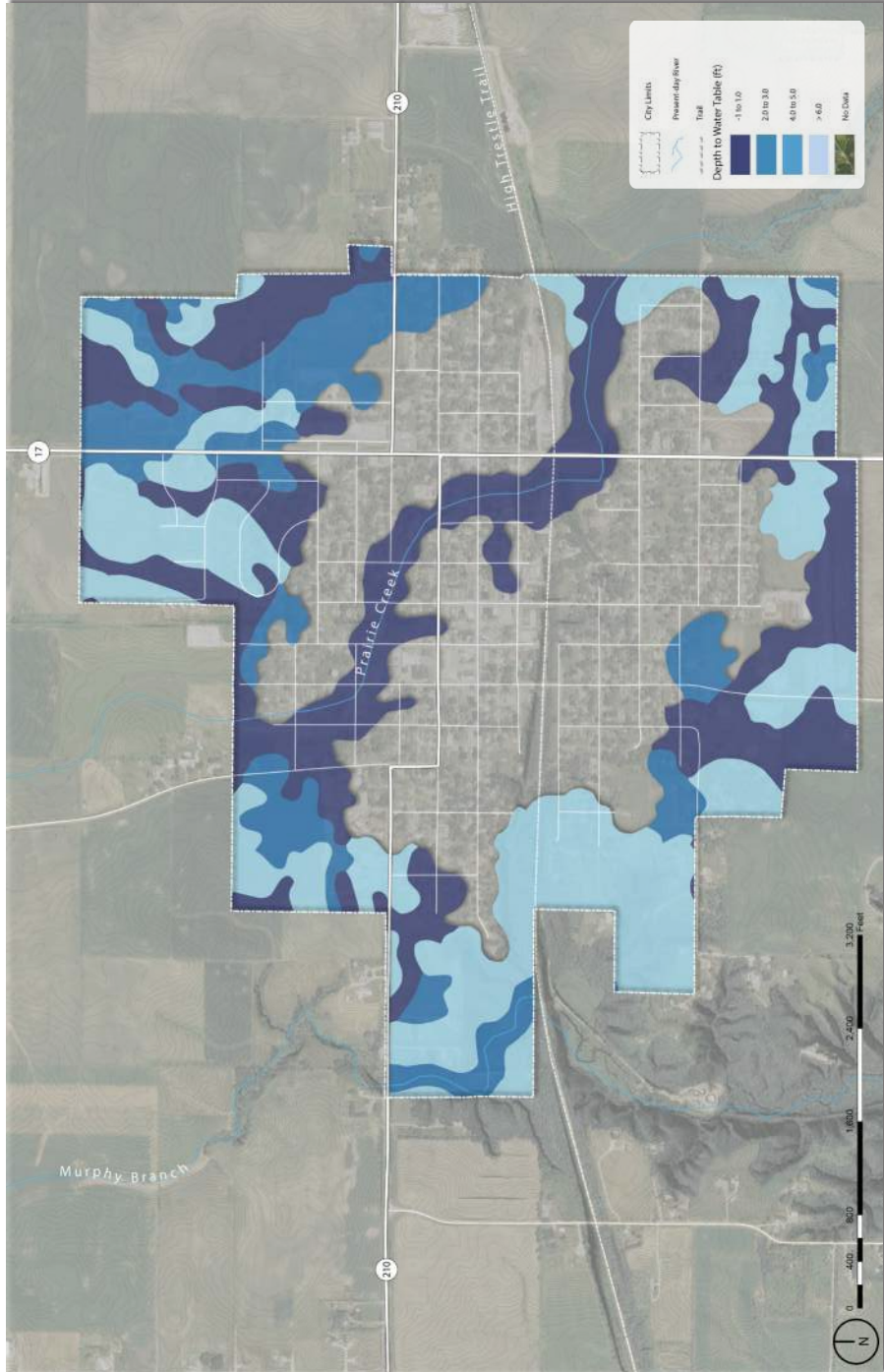
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Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," <http://www.iwisgw.iowa.edu/ngis/bv/>.

Madrid

Depth to Water Table

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Elevation and Flow

This map displays topographic differences in elevation using a combination of contour lines and the color gradient depicted in the legend. The high 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?

If your community lies within or near a floodplain or floodway, the map reflects these features. Not all communities will have these elements; if they are absent on this map, none are present.

Flood risk is correlated to low-lying land. This map shows your community's flood risk as defined by the Federal Emergency Management Agency (FEMA) Flood Map Service Center. The map shows the two most important flood zones if present: the Base Flood and the Regulatory Floodway (consult legend). Base Flood is the zone having a 1% 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.

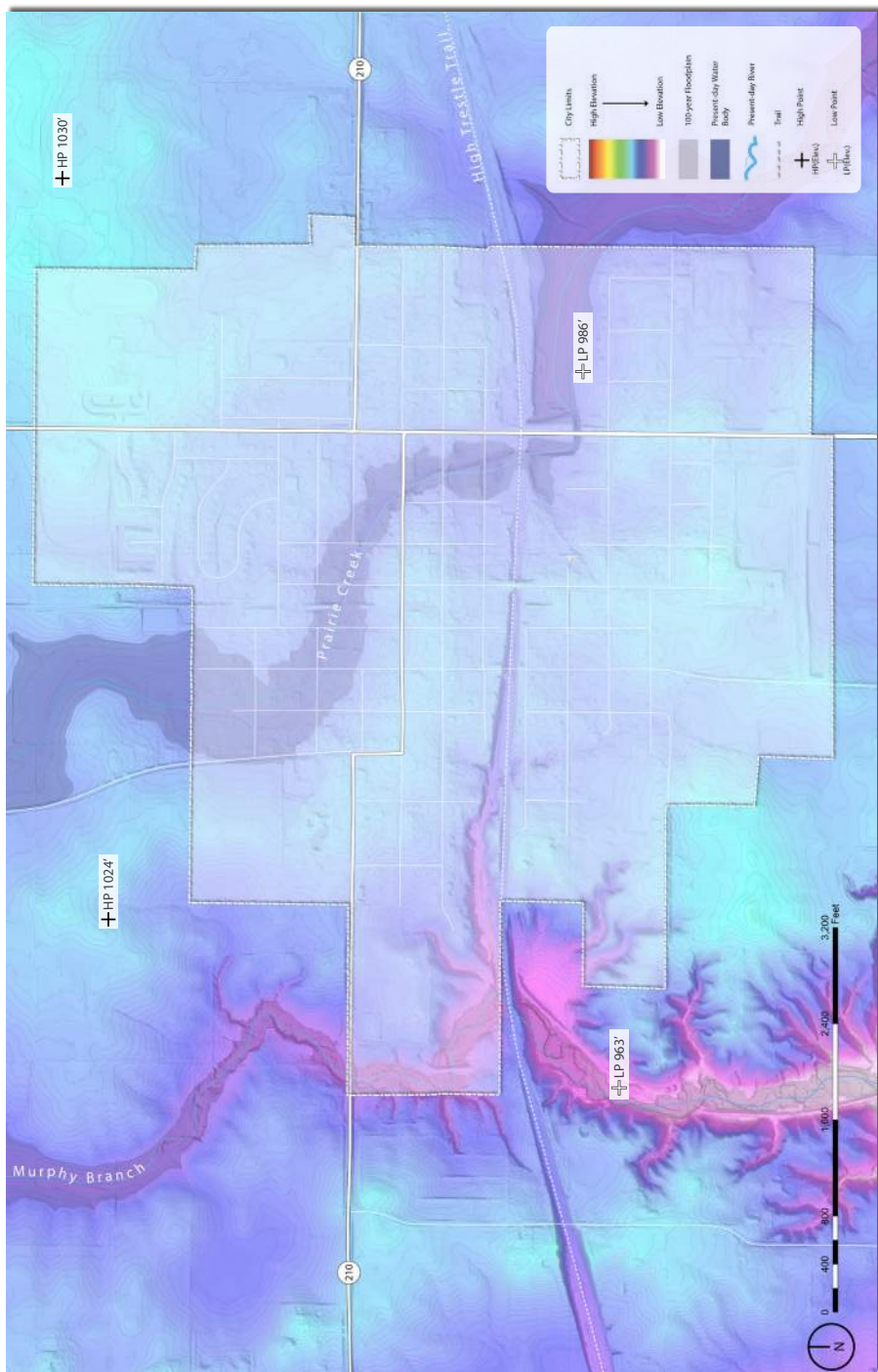
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Present-day Land Cover

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 within your community boundaries.

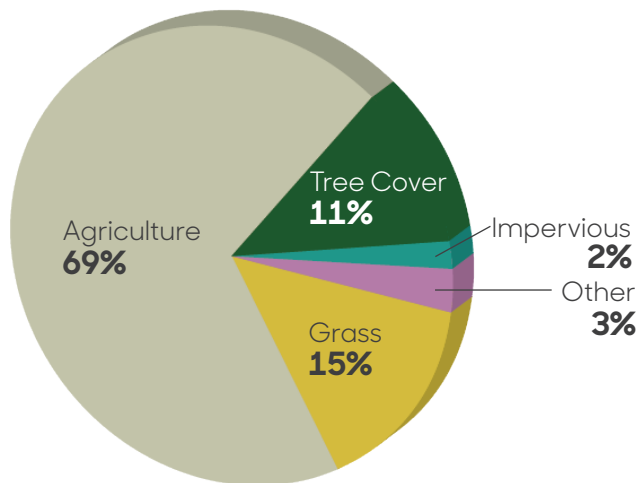
What do you observe about the dominant landcover types in your community?

Where is the tree canopy most concentrated?

Look at how much of your community consists of impervious surfaces (e.g., parking lots, roads, buildings) compared to the other surfaces (e.g, water, grass, and agriculture). What does this mean for surface-water movement?

Tree cover affects microclimate. Are places surrounded by canopy more pleasant in the summer? How do these places feel in the winter?

Percent Land Cover Type



Present-day Land Cover

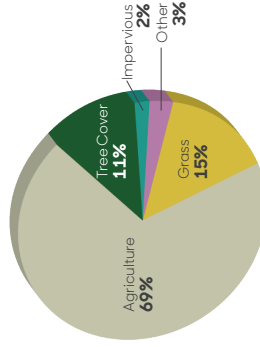
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Present-day Vegetation

This map shows the present-day vegetation in an aerial image, indicating where trees, shrubs, and other plants create shade, line streets, buffer edges, and provide other services.

Notice how much the vegetation has been altered since government land office surveyors mapped the historic vegetation. People alter vegetation to produce crops and provide shelter, and for other amenities.

Also notice how the community and its vegetation have changed since the Andreas' Atlas was drawn. Development typically removes vegetation where infrastructure is built, and then re-introduces vegetation for its functional and amenity value.

SPRING 2020 2g

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Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," <http://www.dnr.iowa.gov/dnrgislib/>

Madrid

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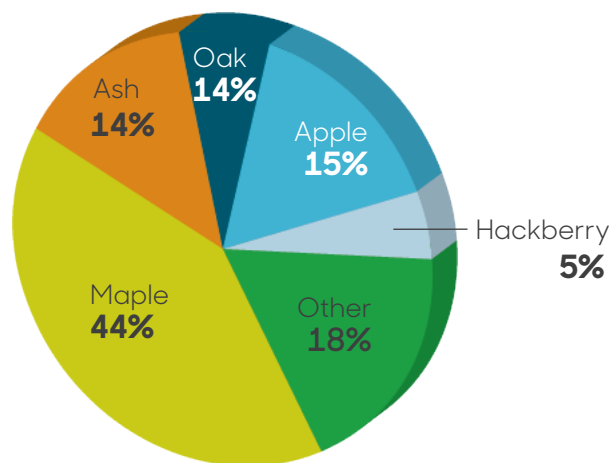
Urban Forest

This map depicts city-owned trees that were surveyed by the Iowa Department of Natural Resources (Iowa DNR) in 2013.¹ The trees are divided into three categories: healthy trees, hazard trees, and ash trees.

A yellow triangle indicates a hazard tree. The hazard designation reflects tree condition using the Iowa DNR's priority rating. Hazard trees are "dangerous, dead, or dying, and no amount of maintenance will increase longevity or safety;" or are infected by "insects, pathogens, or parasites."

A purple cross indicates an ash tree. They are under imminent threat from the Emerald Ash Borer (EAB), an invasive beetle that disrupts circulation in the tree resulting in the loss of tens of millions of ash trees in North America.² EAB was first discovered in Iowa in 2010 and was confirmed in 66 Iowa counties as of 2019.³

The graph shows how many of the city's trees are of the same species. There is a strong possibility that 14% (ash trees) of Madrid's city-owned trees will die once EAB reaches the area. With proper planning and management, the city can improve its canopy by planting suitable trees to gradually replace hazard and ash trees. Improving species diversity will create a more resilient urban forest.



1 Iowa Department of Natural Resources Community Tree Inventories, <http://www.iowadnr.gov/Conservation/Forestry/Urban-Forestry/Community-Tree-Inventories>.

2 Emerald Ash Borer the Green Menace, USDA Program Aid No. 1769, 2008, [https://www.aphis.usda.gov/publications/plant_health/content/printable_version/EAB-GreenMenace-reprint June09.pdf](https://www.aphis.usda.gov/publications/plant_health/content/printable_version/EAB-GreenMenace-reprint%20June09.pdf).

3 "Iowa Tree Pests," Entomology and Plant Science Bureau of the Iowa Department of Agriculture and Land Stewardship (IDALS), accessed August 12, 2019, http://www.iowatreepests.com/eab_locations.html.

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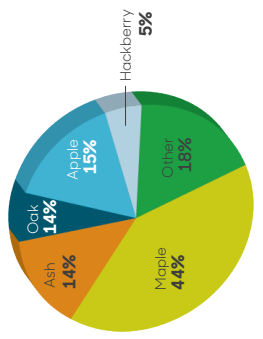
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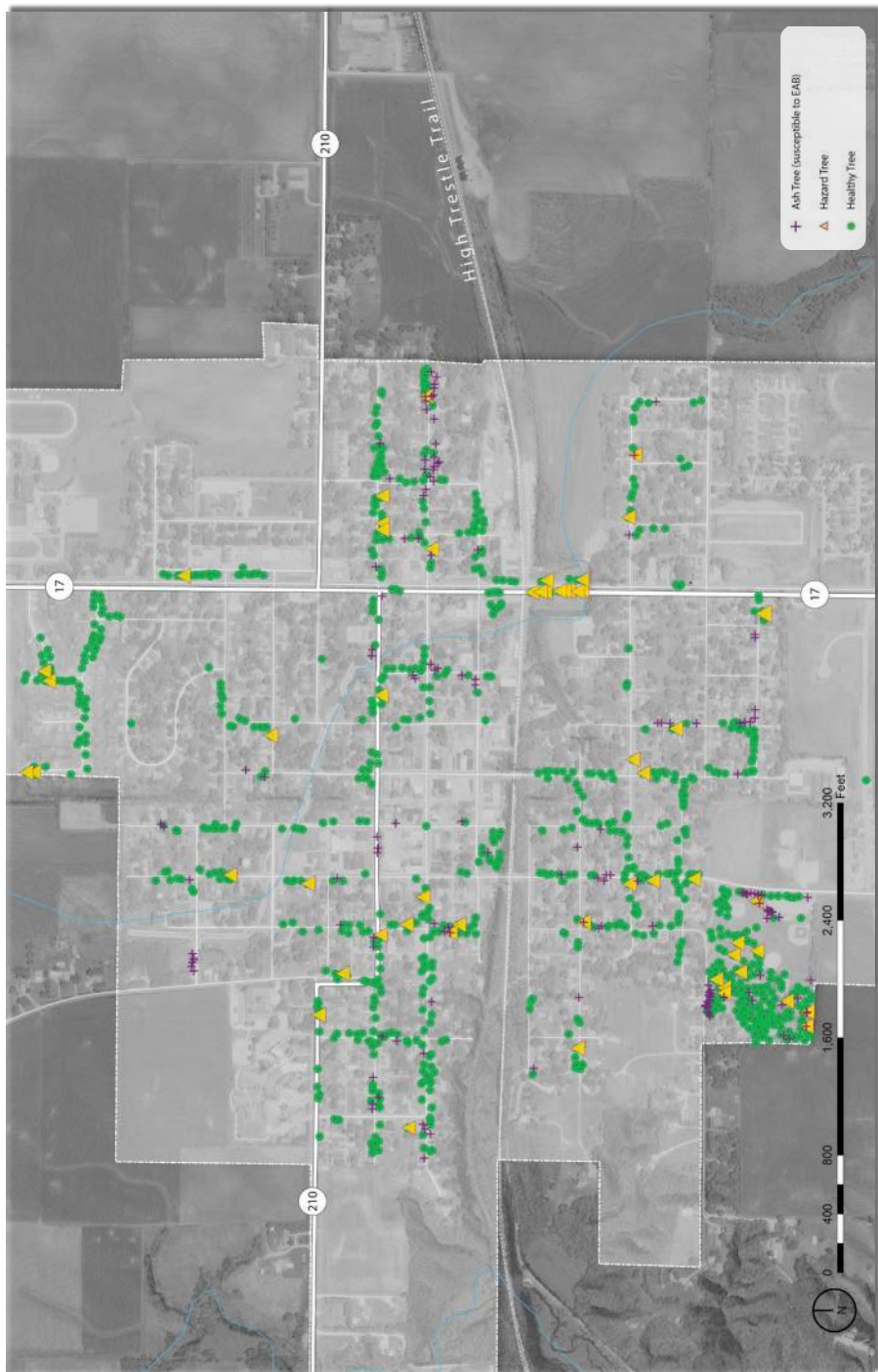
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Urban Forest

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High School Transportation Survey and Focus Groups

High School Study Overview

What We Did

To supplement the data collected from adult residents, Community Visioning Program staff at Iowa State University conducted focus groups and a survey at Madrid Junior/Senior High School in January 2020.

ISU design interns held focus groups with five 9th graders and seven upperclassmen to understand the factors and conditions that affect transportation use among these unique users. The high school focus groups employed small-group conversations, mapping, and photos of the best and worst to understand local transportation.

The survey addressed high school students' experiences and needs as drivers, pedestrians, and cyclists. The questionnaire was similar to that used in the random-sample survey mailed to adult Madrid-area residents. Respondents were asked to identify routes to school, walking routes, and biking routes. In addition, we asked what qualities and features are important to youth when they engage in these activities. Survey respondents were selfselected; a total of 12 students completed the questionnaire.

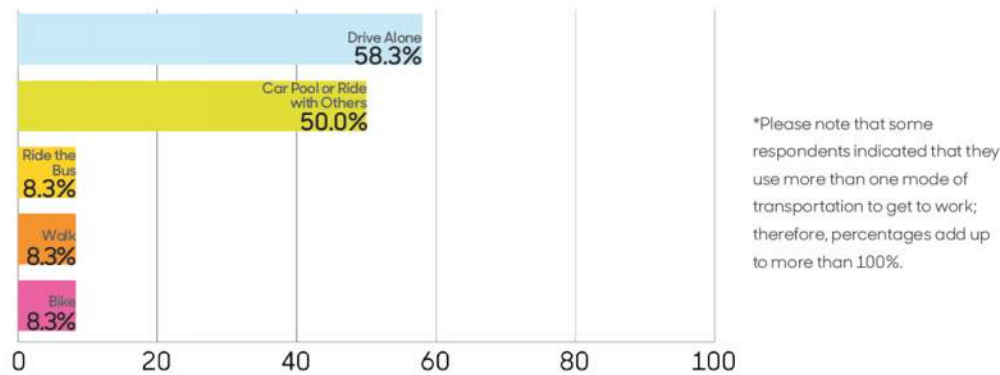
Focus Groups: What They Said

High school focus-group participants drive, walk, and bike to local destinations in town. They also skateboard and run. Students frequently walk, bike, and run on the High Trestle Trail, and Grant's Woods is a popular destination. Their concerns include the conditions of the sidewalks, rough streets, lighting and visibility, and flooding. Traffic flow into and out of the high school is a significant barrier to students, as well as congestion on Highway 17 at the trail crossing. Participants would like to have a second entrance to the high school to relieve congestion.



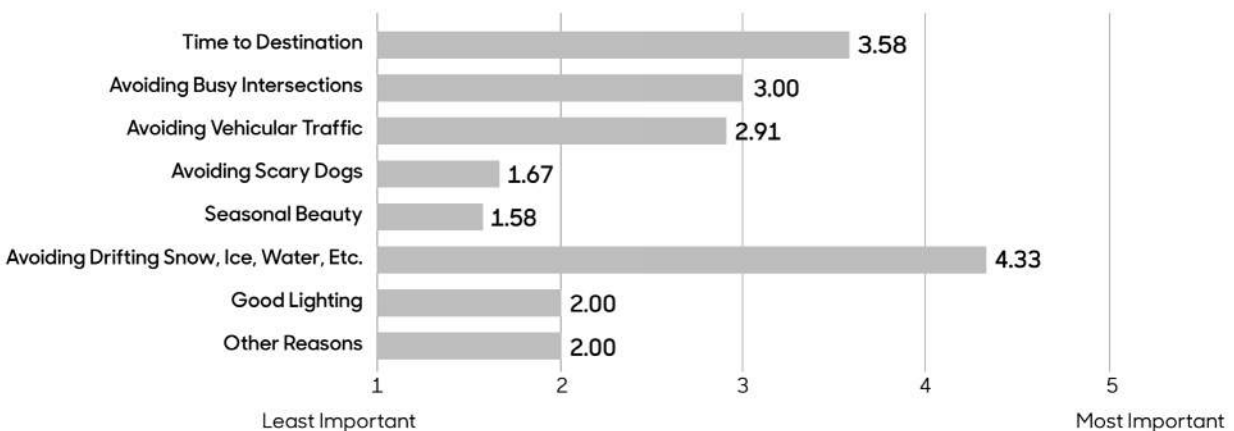
How They Travel

Most high school survey participants car pool or ride with others to local destinations (54.5%). An equal percentage of students drive alone or ride the bus (27.3%). None of the high school survey respondents walk or bike to destinations



Why They Go That Way

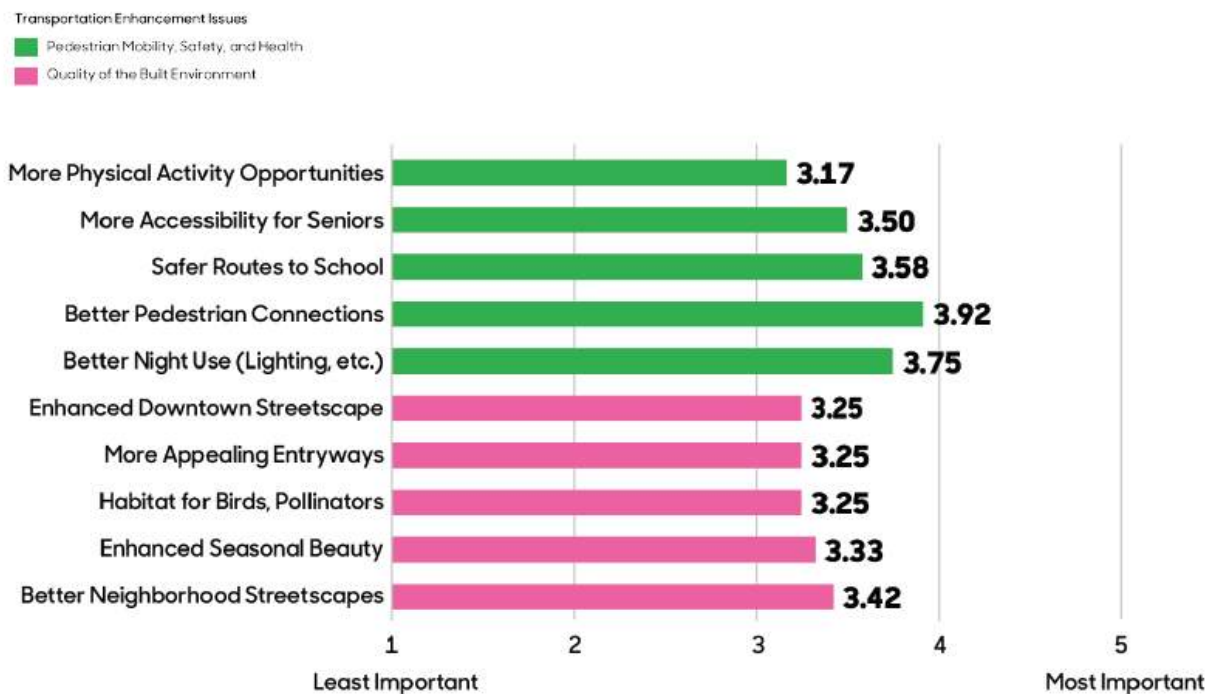
High school survey respondents were asked to draw the routes that they take to school on a map. These routes are included with the commuting routes identified by Madrid residents, shown on board 4d. They were also asked to rank characteristics and features that factored into their choice of route to school on a scale of 1 to 5, with 5 being the most important. Among high school survey participants, avoiding weather-related issues such as snow and ice is the most important factor, with a mean value of 4.33. Time to destination (3.58) is the second most important factor determining routes to school. Avoiding busy intersections (3.00) and vehicular traffic (2.91) are somewhat important, and avoiding scary dogs, seasonal beauty, and lighting are not considered important.



Priorities and Desired Features

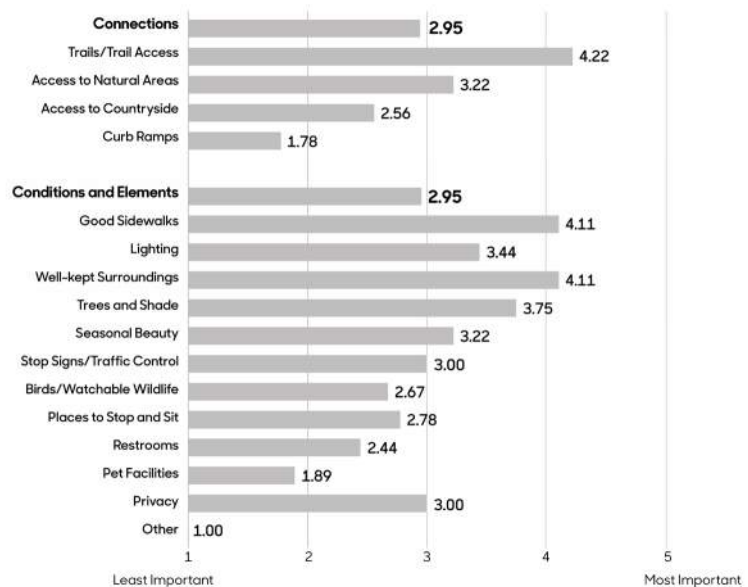
What Types of Enhancements are Important? Pedestrian Mobility, Safety, and Health!

On a scale of 1 to 5, with 5 being the most important, high school survey participants ranked creating better pedestrian connections as most important, with a mean value of 3.92. Other types of transportation enhancements that address pedestrian mobility, health, and safety are also considered important, such as providing better lighting for night use (3.75), creating safer routes to school (3.58), and creating more accessibility for seniors (3.50). In terms of quality of the built environment, survey respondents consider better neighborhood streetscapes as most important (3.42). These results are similar to those of adult survey respondents and consistent with themes that emerged during the focus groups.



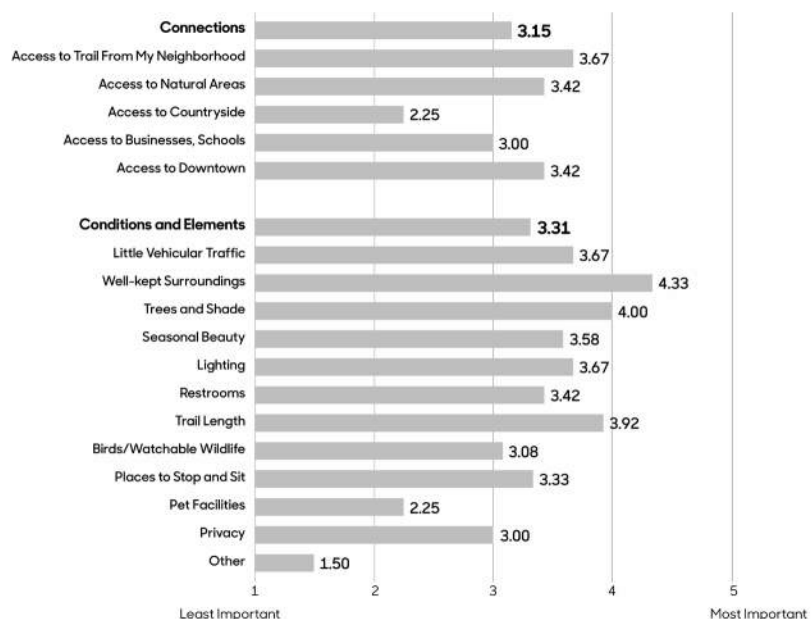
Desired Walking Route Features

High school survey respondents were asked to draw the routes that they take when walking on a map. These routes are included with the walking routes identified by Madrid residents, shown on board 4e. They were also asked to rank characteristics and features that factored into their choice of walking routes on a scale of 1 to 5, with 5 being the most important. These features are categorized as either "connections" or "conditions and elements." Among participants, connections and conditions/elements are equally important, both with a mean value of 2.95. In terms of connections, access to trails is most important with a mean value of 4.22. Good sidewalks and well-kept surroundings (4.11 each) are the most important elements to walkers, followed by trees and shade (4.00). Lighting and privacy are somewhat important, with a mean values of 3.44 and 3.00, respectively.



Desired Trail Features

On a scale of 1 to 5, with 5 being the most important, survey participants ranked the characteristics and features that made their trail experience better. Like the walking route features, they are categorized as either "connections" or "conditions and elements." Conditions/elements are more important than connections, with mean values of 3.31 and 3.15, respectively. In terms of connections, access to the trail from neighborhoods is considered most important, with a mean value of 3.67. In terms of conditions/elements, well-kept surroundings (4.33) is the most important element, followed by trees and shade (4.00).



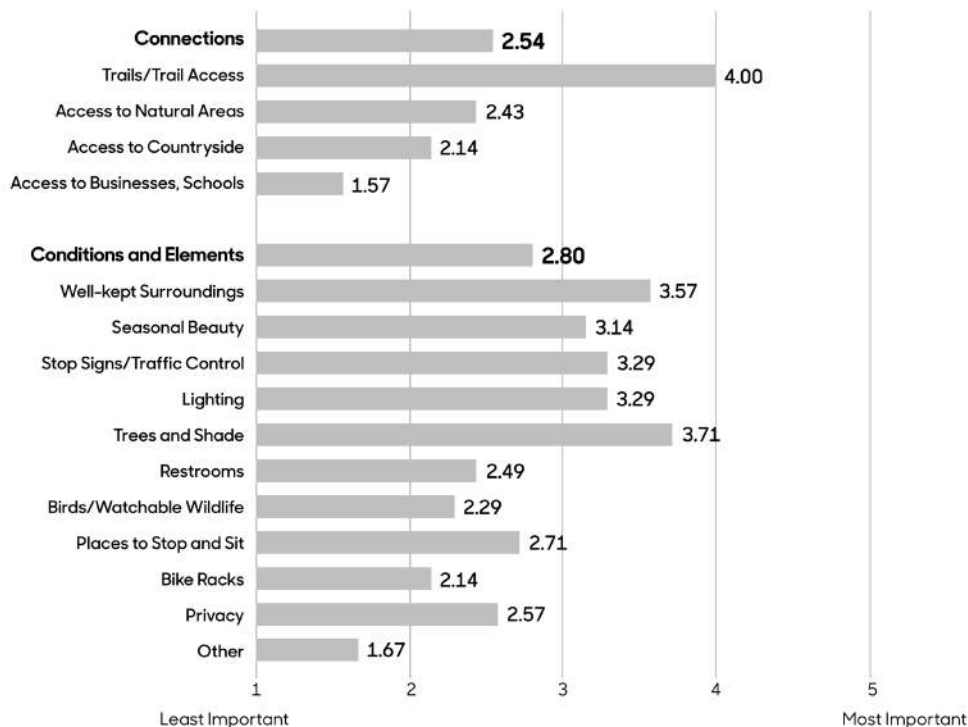
Students' Biking Routes

Where They Walk

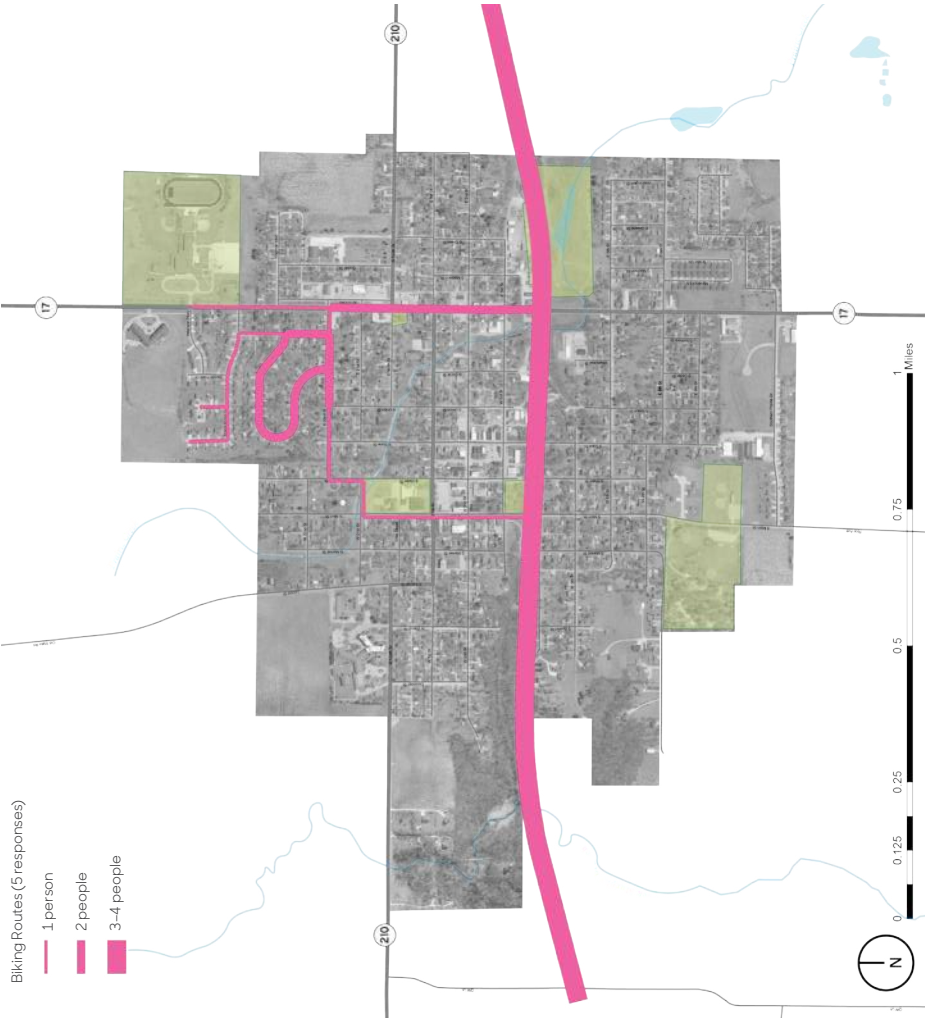
This map shows the biking routes identified by five high school students who completed the survey. The frequency that the routes are used is depicted by their width, with most frequently used routes being the thickest. The primary biking route in Madrid is the High Trestle Trail. High school students also bike on S Avenue (Highway 17) north of the trail, as well as on East 22nd Street and Fairview Drive.

Why They Go That Way

On a scale of 1 to 5, with 5 being the most important, high school survey participants ranked the characteristics and features that factored into their choice of biking route. These features are categorized as either "connections" or "conditions and elements." Among participants, conditions/elements are relatively more important than connections, with mean values of 2.80 and 2.54, respectively. In terms of conditions/elements, trees and shade are most important with a mean value of 3.71, followed by well-kept surroundings (3.57). In terms of connections, trails/trail access is most important, with a mean value of 4.00. High school students do not consider the other factors as important when selecting biking routes.



Biking Routes (5 responses)
1 person
2 people
3-4 people



Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," <http://www.igbb.iowa.edu/ngisb/v/>.

Madrid

Students' Biking Routes

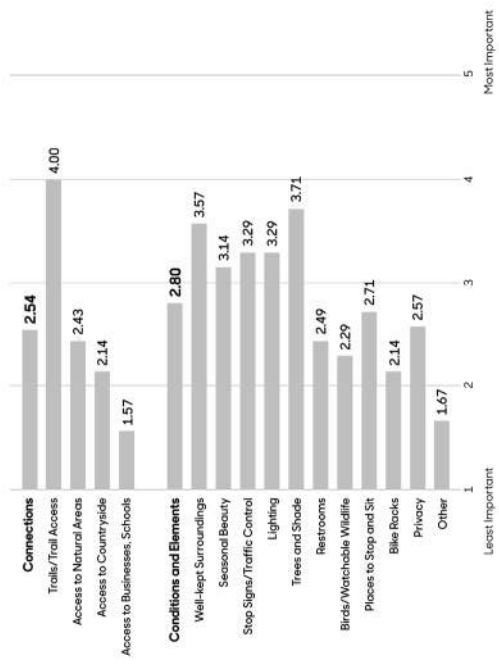
Where They Walk

SPRING 2020 3c

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Transportation Behavior and Needs Survey

Julia Badenhop, Sandra Oberbroeckling, Aaron Lewis, Austin Alexander, Lexi Blank, Kristian Schofield, Minni Davis, Clare Kiboko, Abby Schafer
Iowa State University | Trees Forever | Iowa Department of Transportation



Transportation Behaviors and Needs

Overview

The survey gives the visioning steering committee objective, representative information for the goal-setting phase of community visioning. The quantitative data collected from survey responses complements the qualitative information gathered from the focus groups at the transportation assets and barriers workshop.

The modes of transportation that residents use and the routes they take suggest suitable types of transportation enhancements in these areas. Having a sense for people's willingness to help either financially or with their time is important because many transportation enhancements are funded from multiple sources, including grants, private donations, in-kind contributions, and volunteers. Understanding what types of improvements are important to residents gives the committee insight into how to prioritize projects.

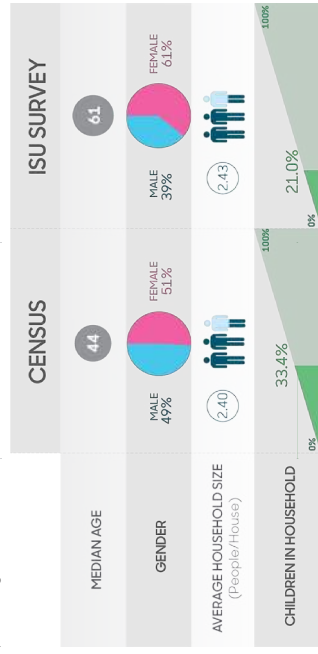
With assistance from Iowa State University's Survey Research Services staff in the Center for Survey Statistics and Methodology (CSSM-SRS), ISU visioning program staff conducted a survey to better understand the transportation patterns and behaviors, needs and desires of Madrid residents. Surveys were mailed to 300 randomly selected residents living in Madrid and the surrounding area. To increase the response rate, the study was publicized through the local media and follow-up packets were mailed to nonrespondents. With adjustments for ineligible respondents (e.g., incorrect addresses, no longer living in the community), the final sample size was 279. A total of 102 people returned surveys, for a response rate of 36.6%. (A response rate of 20% is considered valid.)

We asked survey recipients what routes they used most often for going to work, walking, and biking. We also asked whether or not residents would like a recreation trail and where they think it should be. We also discovered what residents think is most important in terms of transportation enhancements that address issues such as accessibility, mobility, and safety. Finally, we learned whether or not residents are willing to contribute their time or their financial resources to making enhancements to Madrid. This series of boards summarizes the results of the survey as follows:

- Willingness to Help
- Enhancement Priorities
- Commuting Routes
- Walking Routes
- Desired Features

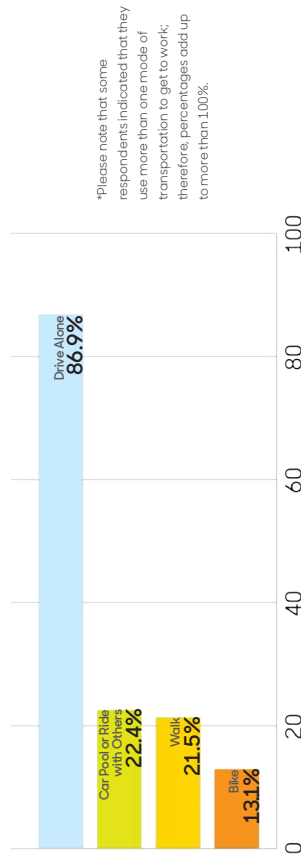
How Did We Do?

The demographics of the respondents are somewhat different from those obtained from the 2019 American Community Survey Five-Year Estimate. For example, the survey respondents median age of 61 is significantly older than the 2019 estimated average age for Madrid residents of 44. In terms of gender, the percentage of female survey respondents is 10% higher than that of the census. Average household size of survey respondents is slightly higher than the 2019 estimate. The percentage of households with children among survey respondents is significantly lower than that of the 2019 estimated percentage.



How Do Madrid Residents Travel?

Most survey respondents drive to important destinations such as the convenience store, the post office, school, and church (86.9%). More than 22% car pool or ride with someone else. More than 21% of participants indicated that they walk, and 13.1% bike to destinations.



*Please note that some respondents indicated that they use more than one mode of transportation to get to work; therefore, percentages add up to more than 100%.

Madrid Overview

Transportation Behavior and Needs Survey

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Why Do A Survey?

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The modes of transportation that residents use and the routes they take suggest suitable types of transportation enhancements in these areas. Having a sense for people's willingness to help either financially or with their time is important because many transportation enhancements are funded from multiple sources, including grants, private donations, in-kind contributions, and volunteers. Understanding what types of improvements are important to residents gives the committee insight into how to prioritize projects.

How Is It Done?

With assistance from Iowa State University's Survey Research Services staff in the Center for Survey Statistics and Methodology (CSSM-SRS), ISU visioning program staff conducted a survey to better understand the transportation patterns, behaviors, needs, and desires of Madrid residents. Surveys were mailed to 300 randomly selected residents living in Madrid and the surrounding area. To increase the response rate, the study was publicized through the local media and follow-up packets were mailed to nonrespondents. With adjustments for ineligible respondents (e.g., incorrect addresses, no longer living in the community), the final sample size was 279. A total of 102 people returned surveys, for a response rate of 36.6%. (A response rate of 20% is considered valid.)

What Did We Find Out?

We asked survey recipients what routes they use most often for going to work and walking. In addition, we asked what qualities and features are important to cyclists and trail users. We also discovered what residents think is most important in terms of transportation enhancements that address issues such as accessibility, mobility, and safety. Finally, we learned whether or not residents are willing to contribute their time or their financial resources to making enhancements to Madrid. This series of boards summarizes the results of the survey as follows:

- Willingness to Help
- Enhancement Priorities
- Commuting Routes
- Walking Routes
- Desired Qualities

Willingness to Help

Most survey participants who answered this question are willing to contribute their time to community improvements (55.8%), while 30.8% would contribute their time and talent. More than 13% of respondents indicated that they would be willing to contribute financially.

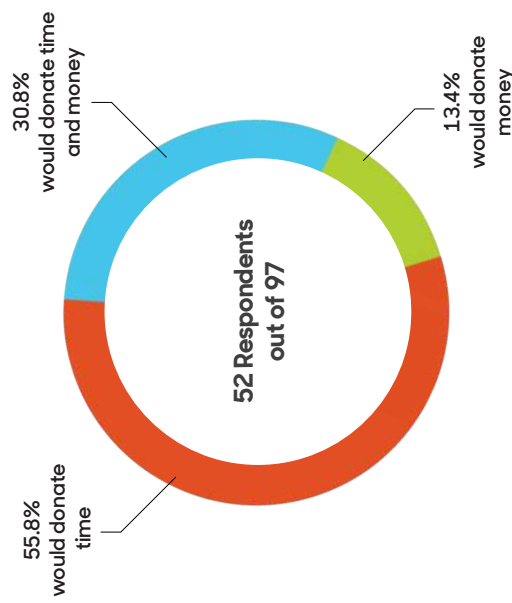
Compared to other small towns in Iowa, Madrid residents are more willing to become involved in improving their community. In 2014, on average, 43% of residents in small, rural towns volunteered to help with a community project.¹ Madrid exceeds this average by more than 10%.

In 2014, the most common reason residents in small-town Iowa said they didn't become involved in community projects is that no one asked them (34%). Twenty-eight percent on average said that they don't have time, which is significantly lower than the 2004 average of 59%. Sixteen percent indicated that they didn't know how to become involved, and 7% said that no community project needed volunteers.¹ These results indicate that the best ways to get people involved in community projects is to simply ask, along with advertising opportunities through traditional and social media outlets.

1 *Sigma: A Profile of Iowa Small Towns 1994 to 2014* (Ames, IA: Iowa State University College of Agriculture and Life Sciences, 2015).

ARE PEOPLE WILLING TO HELP?

More than 53.6% said YES!



Willingness to implement change

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Madrid

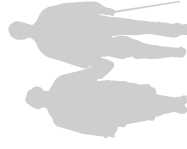
Willingness to Help

WHAT DID PEOPLE SAY?

Survey Participants Said...



"There are no biking lanes on streets and streets are not wide enough."



"Widening Highway 17 for left-turn lanes at intersections would be safer for commuters and allow a quicker, smoother flow of traffic through town."



"Our household appreciates that the city is interested in improving sidewalks, as our children walk to/from school. We are also sorely in need of improved streets...We can hardly ride our bikes on most streets because of the poor conditions and no sidewalks available."

HOW DO YOU GET PEOPLE TO HELP?

Ask, Show, and Advertise Opportunities

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Transportation Behavior and Needs Survey

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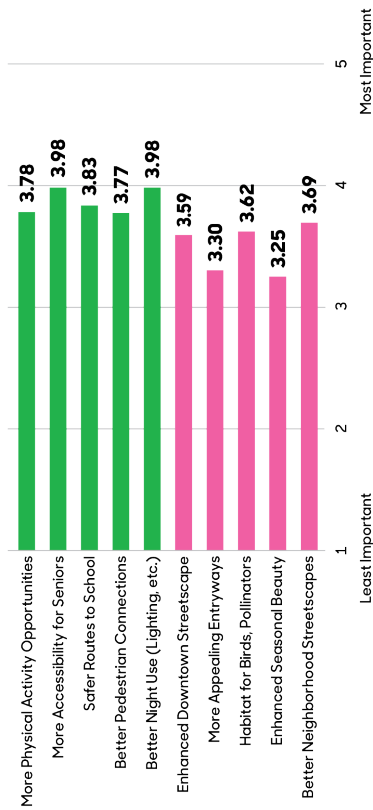
Priorities

Importance of transportation enhancement by type (94 responses)

On a scale of 1 to 5, with 5 being the most important, participants in Madrid ranked both more accessibility for seniors and better night use (lighting, etc.) as most important, with a mean value of 3.98 each. Other types of transportation enhancements that address pedestrian mobility, health, and safety are also considered important, such as creating safer routes to school (3.83), providing more opportunities for physical activity (3.78), and creating better pedestrian connections (3.77). In terms of quality of the built environment, survey respondents consider better neighborhood streetscapes as most important (3.69), followed by habitat for birds and pollinators (3.62), and enhanced downtown streetscapes (3.59).

WHAT TYPES OF ENHANCEMENTS ARE IMPORTANT? Mobility, Safety, and Health!

Transportation Enhancement Issues
■ Pedestrian Mobility, Safety, and Health
■ Quality of the Built Environment



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Madrid Priorities

WHAT DID THEY SAY? Survey Participants Said...

SPRING 2020 4c



"Lighting [in] residential areas should be increased."



"It would be great if Madrid would invest in spur trails leading into the community from the [High] Trestle Trail. It would get visitors to the trail into the community and [get the] community on to the trail."



"I do think the trail should be lit at night."



"Safe routes to school are very important in Madrid. New development is across Highway 17 and kids need [a] safer route. [We] also need to better connect the High Trestle Trail and walking routes to [the] senior home and local businesses."

Transportation Behavior and Needs Survey
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Commuting Routes

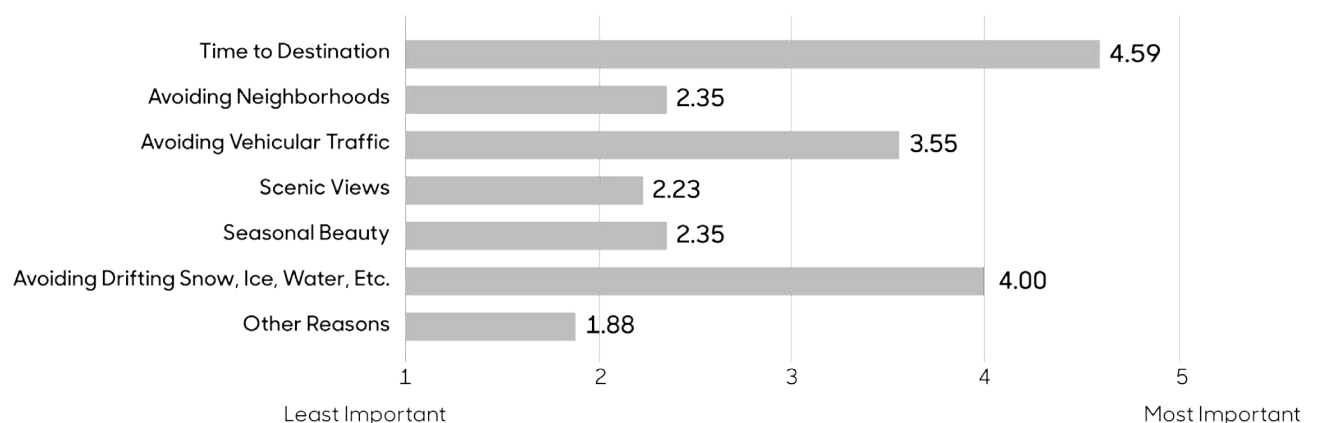
How They Get There

This map shows the commuting routes identified by 51 survey respondents, 12 of whom were self-selected high school students who identified the routes they take to school. The frequency that the routes are used is depicted by their width, with most frequently used routes being the thickest. The primary commuting corridors in Madrid are Highway 17 north-south and Highway 210 east-west. Highway 17 is most heavily traveled between East First Street and the high school. Other streets used by commuters include South Main Street, Southern Prairie Drive, East 6th Street, West 8th Street, and Locust Street.

The circulation patterns that emerge when routes for biking, walking, and commuting are overlaid suggest suitable types of transportation enhancements. For example, where pedestrian and vehicular traffic intersect, such improvements could include creating better visibility, defining crossing points, or improving signage.

Why They Go That Way

On a scale of 1 to 5, with 5 being the most important, survey participants ranked the characteristics and features that factored into their choice of commuting route. Among Madrid participants, time to destinations is the most important factor, with a mean value of 4.59. Avoiding weather-related issues such as snow and ice (4.00) is the second most important factor determining commuting routes. Avoiding vehicular traffic is also considered somewhat important, with a mean value of 3.55. Scenic views, seasonal beauty, and avoiding neighborhoods are not critical factors in determining commuting routes.

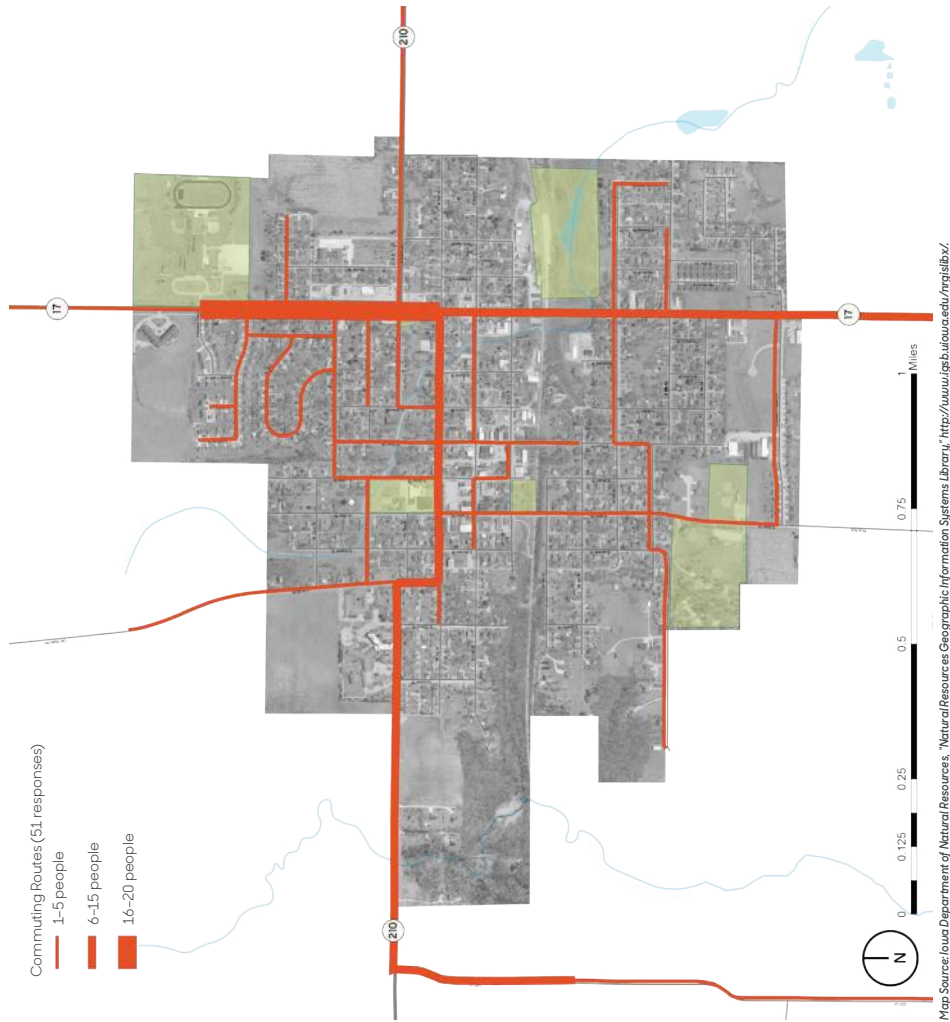


SPRING 2020 4d

How They Get There

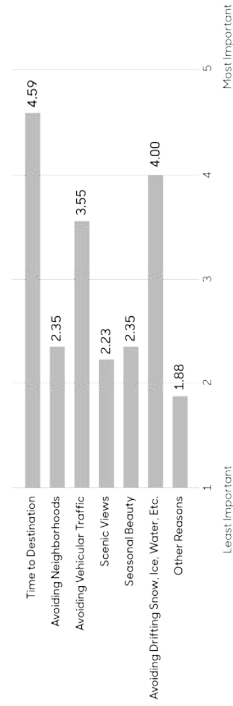
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Madrid Commuting Routes

Transportation Behavior and Needs Survey

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Iowa State University | Trees Forever | Iowa Department of Transportation



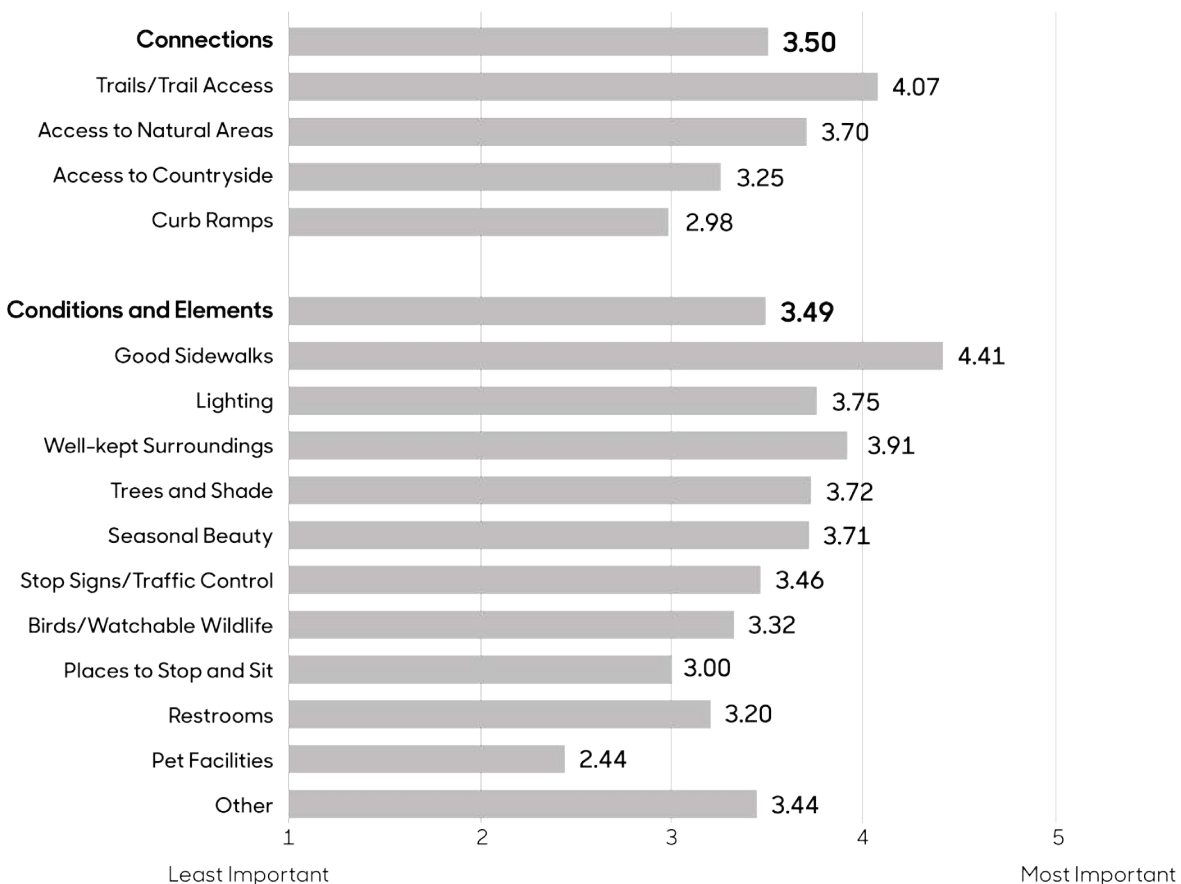
Walking Routes

Where They Walk

This map shows the walking routes identified by 49 survey respondents, eight of whom were self-selected high school students. The frequency that the routes are used is depicted by their width, with most frequently used routes being the thickest. Survey respondents indicated that they walk primarily on the High Trestle Trail, particularly the section west of Highway 17. Streets in town popular among walkers include South Market Street, South Main Street, West 7th Street, East 22nd Street, West 1st Street, and West 2nd Street.

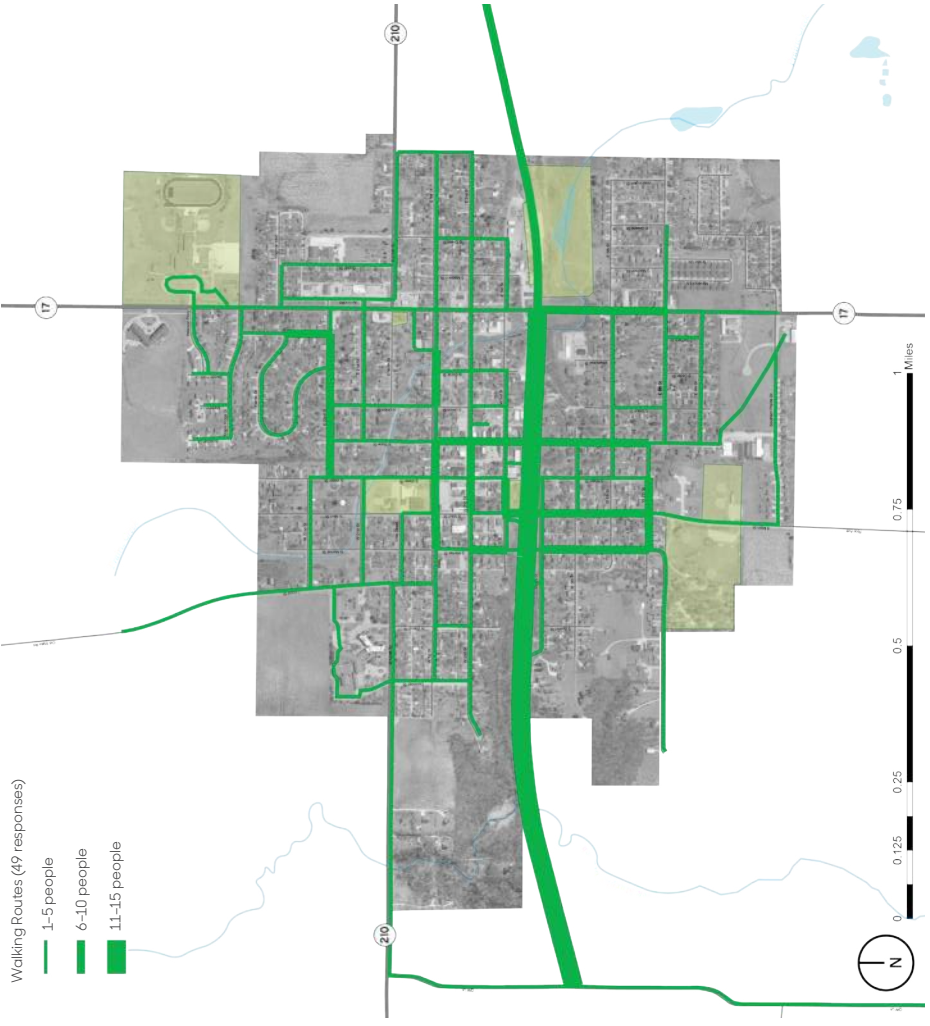
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Walking Routes (49 responses)

- 1-5 people
- 6-10 people
- 11-15 people



Map Source: Iowa Department of Natural Resources, "Natural Resources Geographic Information Systems Library," <http://www.igb.uiowa.edu/ngislib/>.

Madrid

Walking Routes

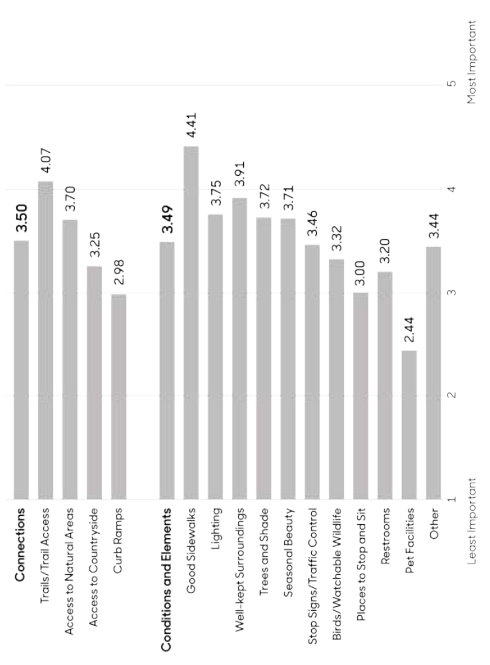
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SPRING 2020 4e

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Transportation Behavior and Needs Survey

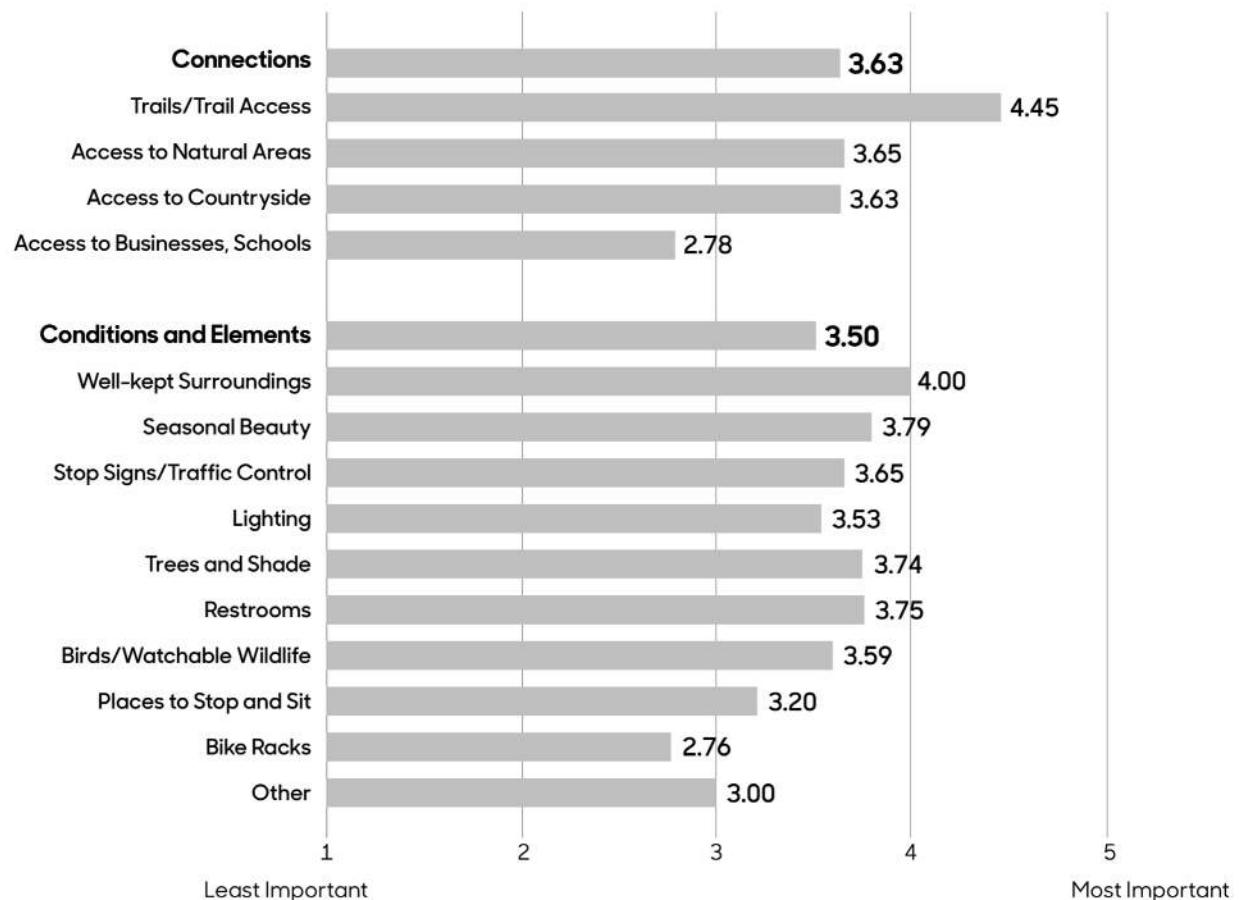
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Desired Features

Desired Bike Route Features

On a scale of 1 to 5, with 5 being the most important, survey participants ranked the characteristics and features that made their biking experience better. These features are categorized as either “connections” or “conditions and elements.” Among Madrid participants, connections are more important than conditions/elements, with mean values of 3.63 and 3.50, respectively. In terms of connections, access to trails is most important with a mean value of 4.45. Well-kept surroundings are the most important elements to cyclists, with a mean value of 4.00. Seasonal beauty (3.79), restrooms (3.75), and trees and shade (3.74) are also important features.

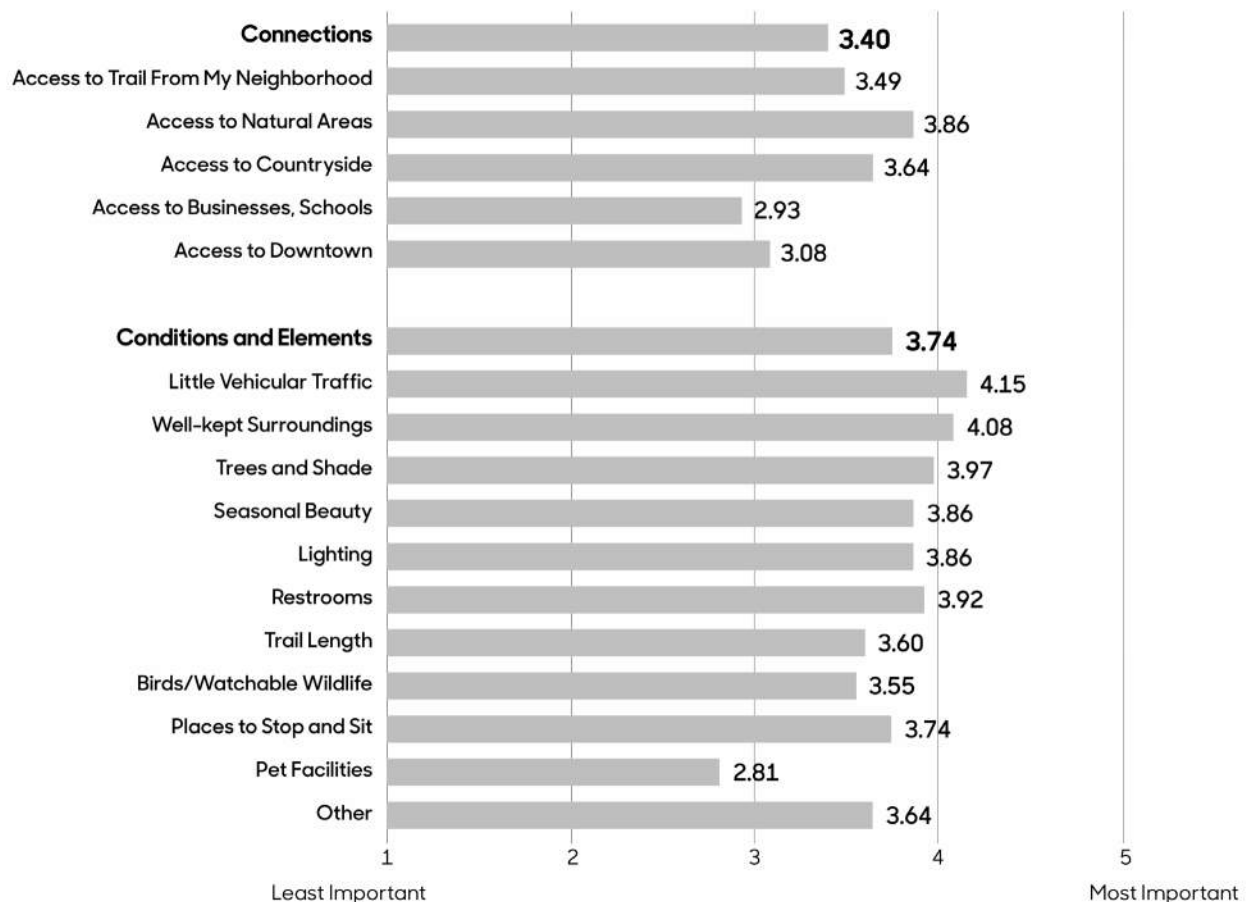
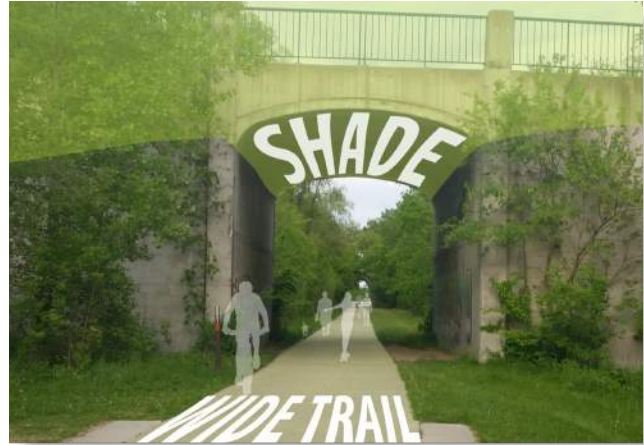


Desired Trail Features

On a scale of 1 to 5, with 5 being the most important, survey participants ranked the characteristics and features that made their trail experience better. Like the bike route features, they are categorized as either “connections” or “conditions and elements.” Conditions

and elements are more important to Madrid trail users than conditions/elements, with mean values of 3.74 and 3.40, respectively. In terms of connections, access to natural areas is considered

most important, with a mean value of 3.86. In terms of conditions/elements, little vehicular traffic (4.15) is the most important element, followed by well-kept surroundings (4.08), and restrooms (3.92).



Transportation Inventory and Analysis

Knowledge of the transportation systems in and around a community is critical for sustainable transportation enhancement planning. Madrid's transportation system includes paved and unpaved roadways, active railroad lines, sidewalks, and trails for walking and biking.

One of the highlights and recreational opportunities of Madrid is the High Trestle Trail. Where the trail meets Iowa Highway 17, there are added speed markers but unsafe conditions exist for cyclists and pedestrians crossing the trail. During the winter, snow consistently drifts across the trail just east of Madrid's city limits.

Additional areas of concern related to transportation involve pedestrian and vehicular conflicts along Iowa Highway 17. There are unsafe walking conditions for students trying to cross Highway 17 to get to Madrid Junior & Senior High School. There is one crosswalk at East 1st Street that students use to cross Highway 17. Additional conflicts arise where the road intersects Iowa Highway 210, which is also a difficult intersection for pedestrians to cross.

There are opportunities to connect the vehicular transit within the downtown district to promote more traffic in the area. More pedestrian connections can be added along Highway 17 to increase safety for residents and visitors crossing the road. Additional connections and provisions to get to the High Trestle Trail and Madrid Junior & Senior High School are highly important.

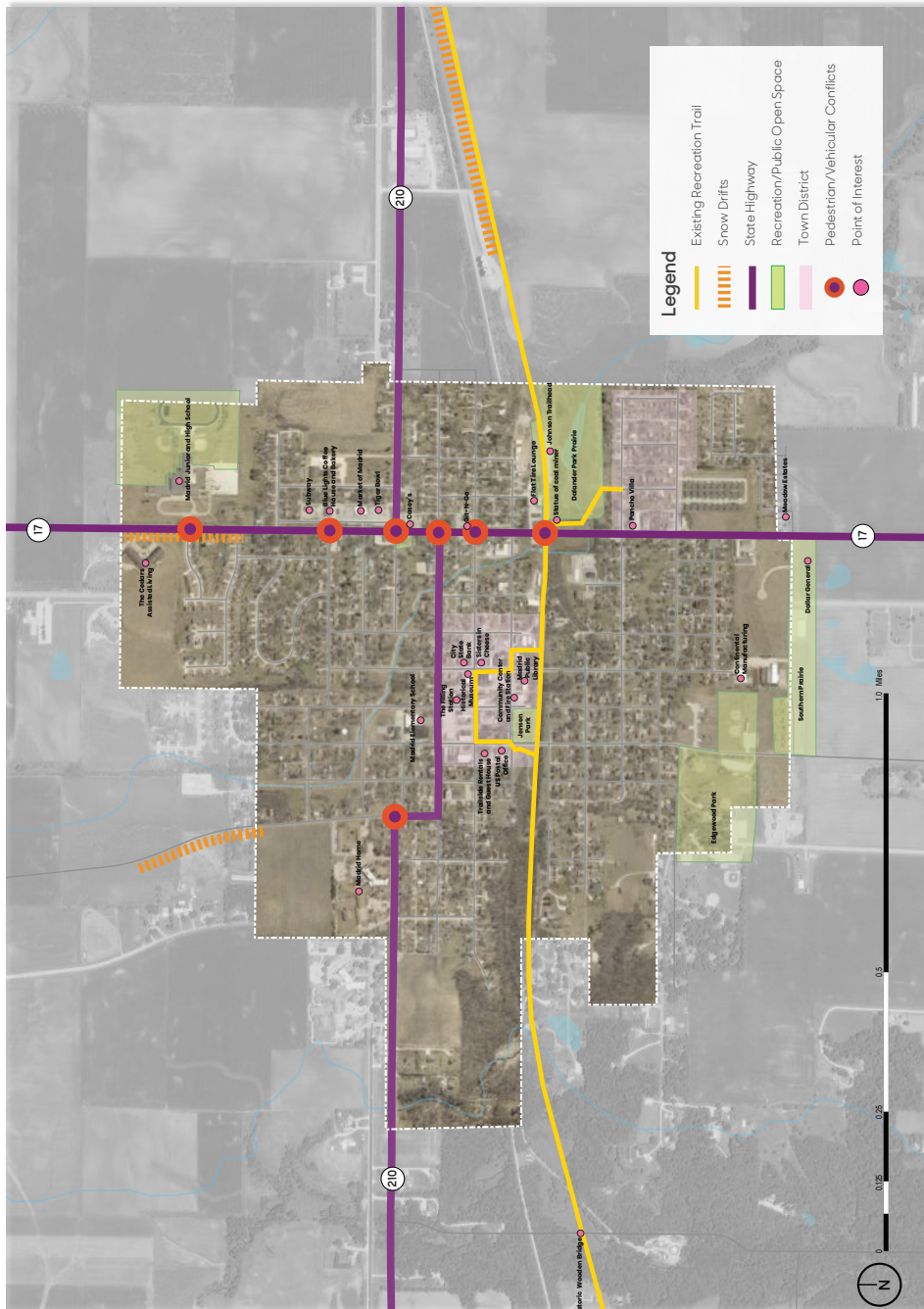
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Madrid

Transportation Inventory

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation



Community Concept Plan

Community Concept Overview

Madrid utilized the results of mapping, a survey, 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 and hosted virtually to comply with CDC guidelines in relation to the COVID-19 pandemic.

The concept plan is based on the priorities of the community with guidance from the Madrid visioning committee. The improvements illustrated on this plan are intended to reinforce pedestrian connectivity and make Madrid more enjoyable for all residents and visitors. The goals that the visioning committee ranked as the highest priorities and that the design team will address in this plan include:

- A) Highway 17 Improvements
- B) Trail Improvements
- C) Downtown Beautification
- D) Way-finding

The concept plan promotes the identity of Madrid through way-finding and pedestrian improvements that increase safety at intersections of Highway 17 and promote connectivity from the High Trestle Trail to downtown.

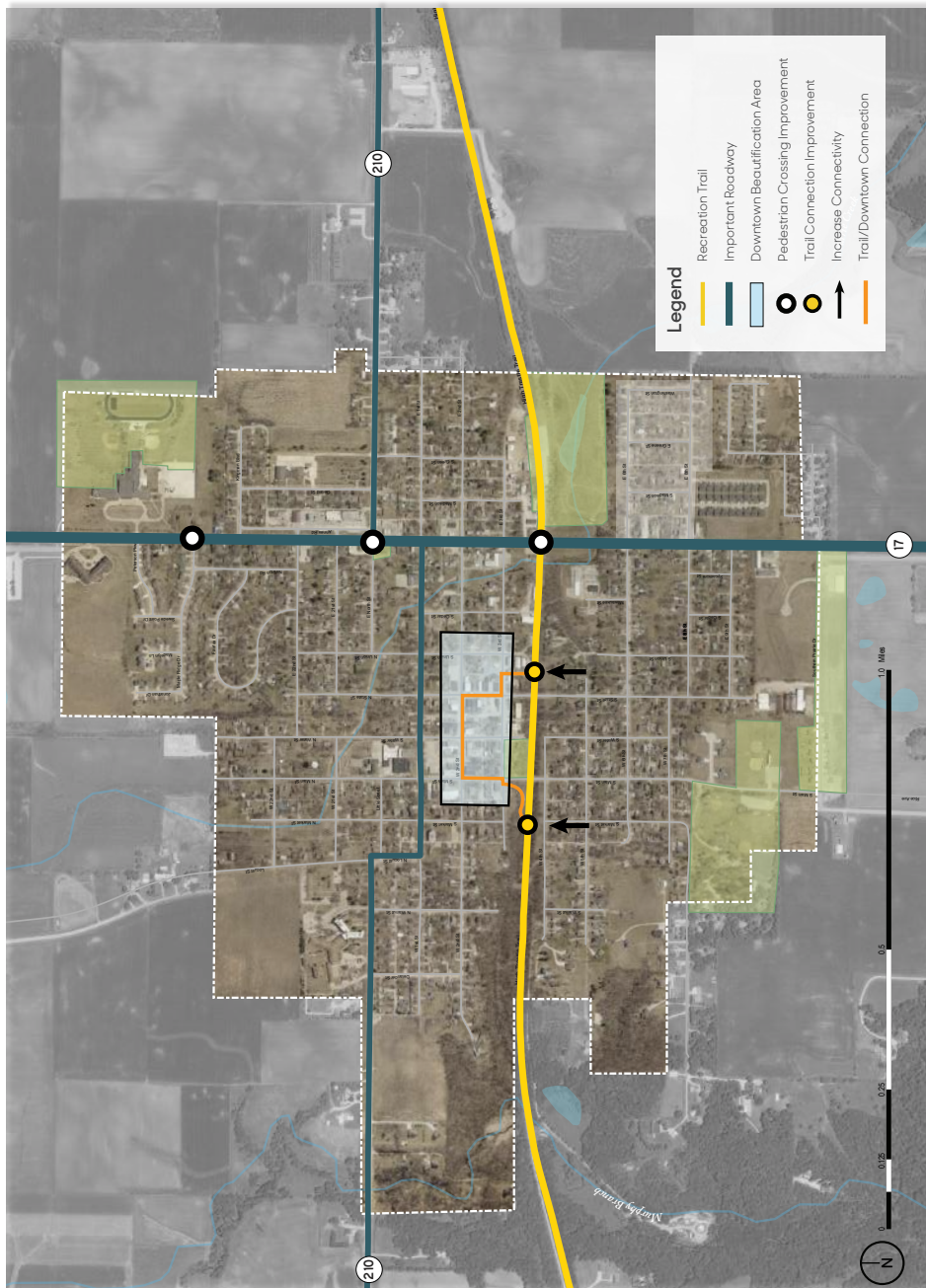
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Madrid

Concept Overview

RDG Planning & Design

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Iowa State University | Trees Forever | Iowa Department of Transportation



Downtown

The downtown corridor of Madrid lies a few blocks west of Highway 17 and just south of Highway 210, making it an easily accessible area for vehicular traffic. The High Trestle Trail borders downtown to the south. Except for a few businesses, the area lacks amenities to attract cyclists and pedestrians to inhabit downtown for longer than a short stay. This design proposes streetscape improvements that make the downtown corridor more desirable through pedestrian lighting, street trees, plantings, sidewalk enhancements, furnishings, and safety improvements at the intersections.

Due to the limited right-of-way through the downtown, this design encourages cyclists to use the road while traveling through the area. Instead of the typical "sharrow" markings, indicating the designation of a shared street, this design uses abstracted coal pieces painted onto the concrete. These icons reference back to the rich history of coal mining in the region, and as a uniting thread to the iconic High Trestle Trail bridge without overtly referencing the cribbing. The icons follow the business loop, guiding cyclists through the downtown and showing where they will rejoin the trail. This design could shift to incorporate icons on both sides of the road to account for both directions of bicycle traffic, if desired.

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continued on Board 7b



Sharrow example



Madrid

Downtown

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation

Downtown

Looking in more detail, the streetscape elements become more visible and speak to the emphasis of the pedestrian experience. At the intersections along 2nd Street, the curb bumps out to the width of the parallel parking to create shorter distances for pedestrians to cross the street. This curb would be rolled to still allow larger vehicles to safely turn. Street trees would be planted at corners of these bump-outs to create shade and improve the scenic quality of downtown. These trees would need to be adequately maintained to allow for safe lines of sight. Sitting areas are created throughout the downtown, such as in the pocket park at the corner of 2nd Street and State Street.

In this design, the pocket park is enhanced through multiple improvements to make it a pleasurable, accessible space that contributes to the downtown. Additional paving has been added to allow for easier gathering in this space. Festoon lighting above the plaza creates a unique character in the space that is reminiscent of the industrial and railroad history.

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continued on Board 7c



Example of a pedestrian-focused streetscape



Example of a historical mural



Madrid

Downtown

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP
Intern: Dani Hodgson
Iowa State University | Trees Forever | Iowa Department of Transportation



Downtown

The design team looked at building upon the existing parklet to create a destination for photos and small gatherings that would promote activity within the downtown corridor. A mural reflecting the history of Madrid would be the backdrop to an industrial-themed plaza that continues the connection to Madrid's mining past. Lighting will make the space more inviting and active during more hours of the day. The pedestrian lights were selected as an homage to Madrid's railroad history, utilizing a mixture of steel and wood and having a design reflective of railroad power support poles. The festoon lights are reminiscent of the power lines above historic railroads. The visibility of this location on the intersection of 2nd and State Streets will immediately attract residents and visitors, and thus help bring more vehicular and pedestrian traffic into downtown.

Additional downtown streetscape improvements are visible through this perspective. The pedestrian lighting could have banners. The bump-outs shown reduce the crossing distance on the street, while also making pedestrians more visible at crossings. Perennial plantings and street trees at the bump-outs soften the streetscape. The proposed plantings would be a hardy species tolerant of winter roadway salt, and low-growing to maintain clear visibility for drivers.



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Existing view of downtown looking southwest

Madrid

Downtown

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

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Downtown

Opinion of Probable Cost

DOWNTOWN				
Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	\$20,000.00	\$20,000.00
DEMOLITION				
P.C.C Curb and Gutter	660	LF	\$3.00	\$1,980.00
P.C.C. Walk	16,493	SF	\$3.00	\$49,479.00
HARDSCAPE				
Concrete Paving, Curb & Gutter	1,296	LF	\$35.00	\$45,360.00
Concrete, Patching Around Bumpouts	3,900	SF	\$10.00	\$39,000.00
Asphalt, Parking Area in Alley	4,560	SF	\$4.00	\$18,240.00
Special Paving - Brick	16,493	SF	\$20.00	\$329,860.00
Crosswalk Paint	2,740	SF	\$2.00	\$5,480.00
UTILITIES				
Site Lighting, Structura Pole	49	EA	\$5,000.00	\$245,000.00
Electrical Distribution	1	LS	\$100,000.00	\$100,000.00
LANDSCAPE				
Deciduous Shade Tress - 2" Caliper	20	EA	\$350.00	\$7,000.00
Shrubs and Perennials	1,820	SF	\$30.00	\$54,600.00
Sod	790	SF	\$1.50	\$1,185.00
SITE IMPROVEMENTS				
Bike Rack	10	EA	\$750.00	\$7,500.00
Bench	6	EA	\$2,000.00	\$12,000.00
Festoon lighting	1	LS	\$10,000.00	\$10,000.00
Mural	1	LS	\$10,000.00	\$10,000.00
Coal Sharrow Stencil	75	EA	\$50.00	\$3,750.00
SUB-TOTAL				
				\$960,434.00
MOBILIZATION/GENERAL CONDITIONS - 5%				\$48,021.70
CONTINGENCY - 15%				\$144,065.10
DESIGN AND ENGINEERING - 10%				\$96,043.40
INFLATION - 3%				\$28,813.02
CONSTRUCTION COST				\$1,277,377.22

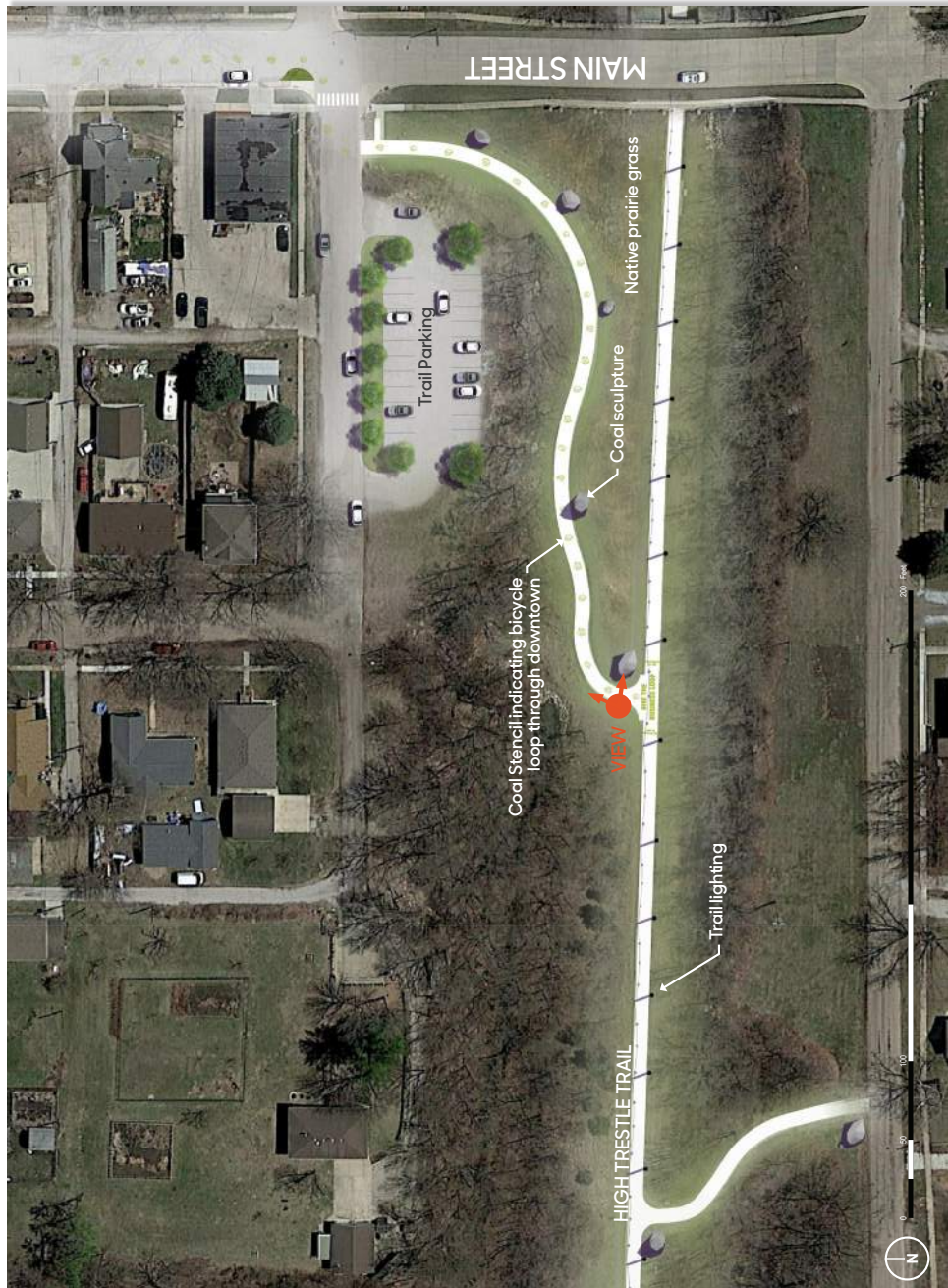
High Trestle Trail

The High Trestle Trail is an incredibly important recreational amenity in Madrid. Emphasizing and improving the connection to Madrid's downtown will help integrate trail users with local businesses. The visual bike sharrow is continued from the road and onto the entry path until it meets with the High Trestle Trail. The ground-plane sharrow is supplemented by large sculptures that resemble pieces of coal, promoting the connection to Madrid's mining history. This design solidifies the informal parking area with an asphalt lot to provide additional access to the trail from downtown. The coal sculptures and the rail treatments on the ground plane help act as signifiers of the access to downtown and where to get off/on the trail. Lighting along the trail will also create a safer and more enjoyable environment for trail users at night. These lights could be programmed to turn off at certain times of night or during periods of low use to limit disturbances to neighboring homes and communities.

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continued on Board 8b



Madrid

High Trestle Trail

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

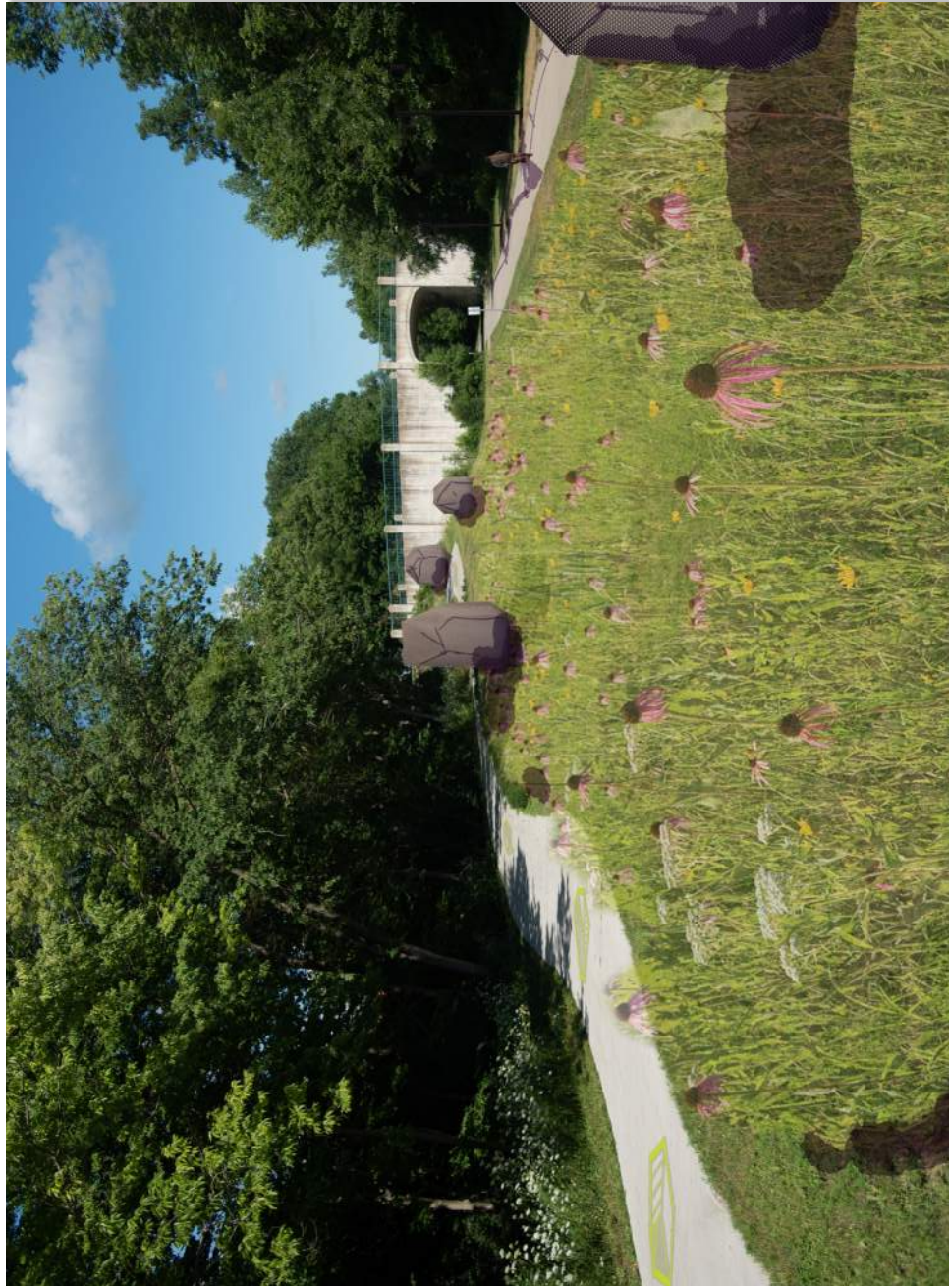
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Proposed Trail – Daytime

Proposed at all trail connections within the city is a series of coal sculptures. These sculptures emphasize the connection, while becoming a monumental symbol to connect the High Trestle Trail to Madrid. These sculptures continue the theme around which the iconic High Trestle Trail bridge was conceptualized, without distracting from the power of that destination. Madrid is very proud of its mining history, and these sculptures celebrate it.

Made from a metal mesh material, the sculptures take on an industrial feel to coincide with the proposed identity of Madrid. Because of the steep slope of this hill connecting the two paths, planting native prairie grasses in this area would help control stormwater runoff and add aesthetic value to the landscape.



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continued on Board 8c



Existing view of trail looking east

Madrid

Proposed Trail – Daytime

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

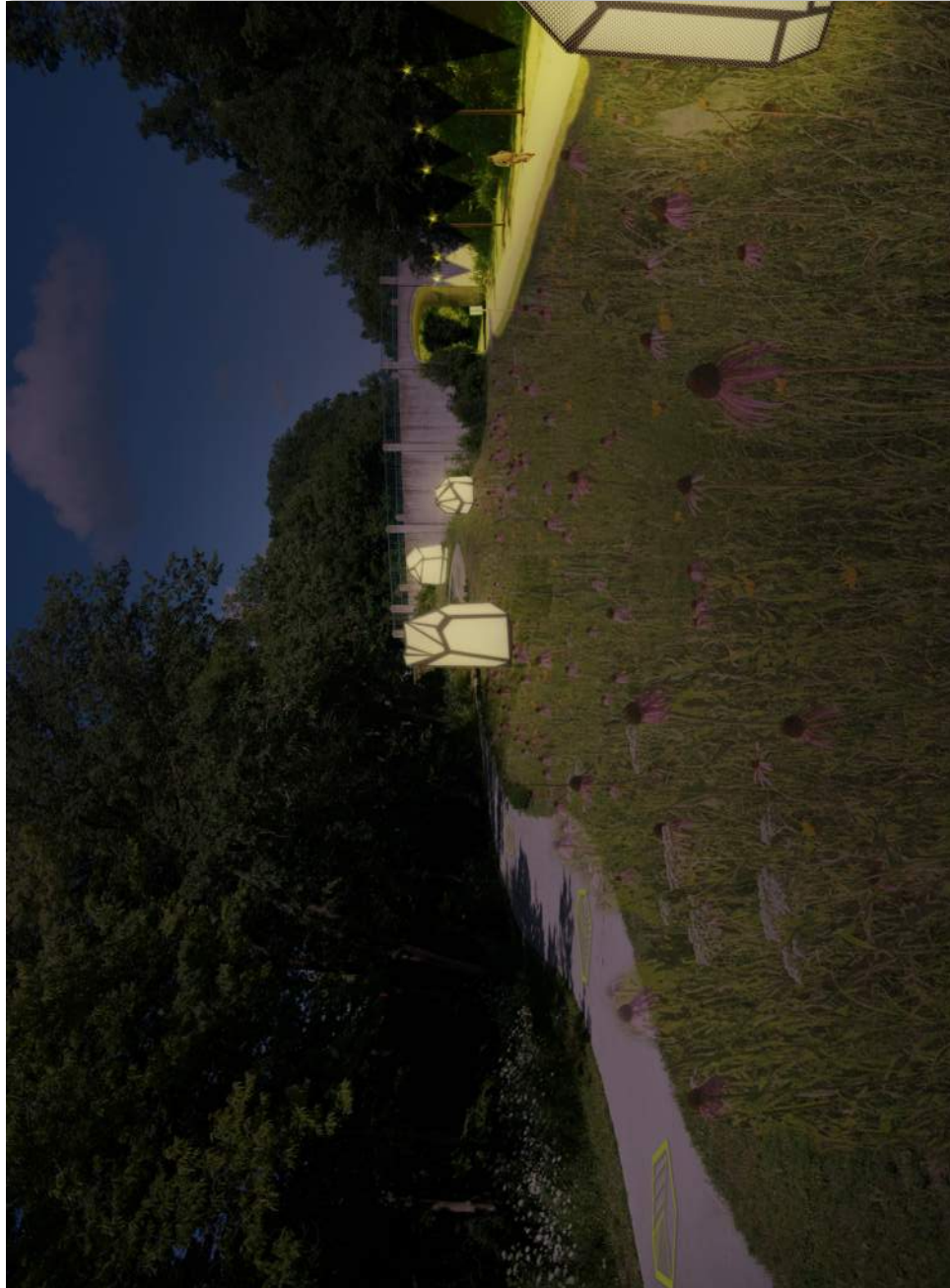
Intern: Dani Hodgson

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Proposed Trail – Nighttime

It is important to add lighting along the trail to increase safety for its users. It was a heavily requested improvement from the community survey. An industrial-style overhanging light will be located along the trail throughout the city of Madrid to provide visibility. Additional lighting could be provided through a catenary lighting system that would attach on tethers connected to light posts. The coal sculptures also provide a soft glow at night, and could have the ability to change colors to match town holidays or events. These monumental icons continue to aid with way-finding toward the city of Madrid as they are stationed along entries/exits of the trail.



Madrid

Proposed Trail – Nighttime

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

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SUMMER 2020 8c

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Trail pathway lights example



High Trestle Trail

Opinion of Probable Cost

TRAIL ENHANCEMENTS				
Description	Quantity	Unit	Unit Cost	Extended Amount
HARDSCAPE				
Concrete Paving Curb & Gutter, Trailhead Pkg	828	LF	\$35.00	\$28,980.00
Asphalt, Trailhead Parking	10,997	SF	\$4.00	\$43,988.00
Crosswalk Paint	205	SF	\$2.00	\$410.00
LANDSCAPE				
Sod	954	SF	\$1.50	\$1,431.00
Deciduous Shade Tress - 2" Caliper	8	EA	\$350.00	\$2,800.00
Native Prairie, Seeded	0.50	AC	\$5,000.00	\$2,500.00
SITE IMPROVEMENTS				
Trail Lighting (@ 60' O.C.)	88	EA	\$2,500.00	\$220,000.00
Electrical Distribution	1	LS	\$120,000.00	\$120,000.00
Coal Lighting Sculptures	1	LS	\$150,000.00	\$150,000.00
Coal Sharrow Stencil	23	EA	\$50.00	\$1,150.00
SUB-TOTAL				\$571,259.00
MOBILIZATION/GENERAL CONDITIONS - 5%				\$28,562.95
CONTINGENCY - 15%				\$85,688.85
DESIGN AND ENGINEERING - 10%				\$57,125.90
INFLATION - 3%				\$17,137.77
CONSTRUCTION COST				\$759,774.47

Highway 17 Underpass

A major point of potential conflict along Highway 17 through Madrid is the crossing of the High Trestle Trail. Although there has not been a single recorded accident at this location, there are many “close calls” that go unrecorded. The intersection is plagued with the following issues:

- Most cyclists fail to completely stop when crossing the road to properly access oncoming traffic.
- Vehicular traffic may stop on one side of the road to let cyclists through, which can cause issues with the opposite lane or vehicles coming up behind the stopped vehicle.
- According to a 2014 study by Snyder & Assoc., 98% of cyclists did not stop when vehicles weren't present.

These boards propose three design solutions that need to be studied further to understand which solution is appropriate and discussed further with the Iowa DOT.

All three design improvements include another key design change that should be implemented regardless of which route is chosen for the trail crossing. The entry drive to the trailhead parking to the east is far too close to the trail crossing. This creates additional conflict and confusion at this location. The design team recommends putting further distance between that entry drive by shifting the drive further south.

This design, illustrated on this page, would be the most expensive option proposed in this plan, but would also be the safest because it removes potential conflict between vehicular and pedestrian/cyclist traffic. The underpass, as illustrated, would be partially below the existing grade of the trail. The Highway's grades would be adjusted to meet the top of the underpass, splitting the grade difference between the two routes. This improvement would require some construction easements, and potentially some land acquisition to allow for the grade changes.

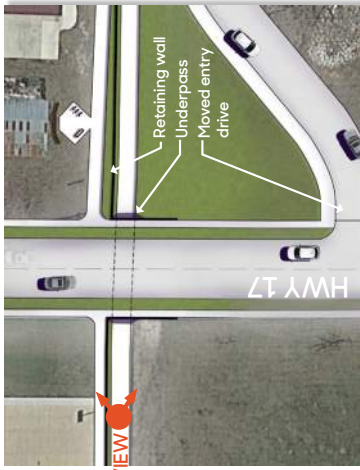
Highway 17 Underpass

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Plan view of proposed underpass under Highway 17



Madrid

Highway 17 Underpass

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation



Highway 17 Underpass

Opinion of Probable Cost

HTT UNDERPASS				
Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	\$60,000.00	\$60,000.00
Temporary Erosion Control	1	LS	\$25,000.00	\$25,000.00
Site Grading	9,500	CY	\$30.00	\$285,000.00
DEMOLITION				
P.C.C Curb and Gutter	202	LF	\$3.00	\$606.00
P.C.C Walk	4,316	SF	\$3.00	\$12,948.00
Asphalt	3,232	SF	\$3.00	\$9,696.00
HARDSCAPE				
Concrete Paving, Sidewalk & Trail	6,356	SF	\$6.00	\$38,136.00
Realigned Park Road, Conc. Apron & Gravel	1	LS	\$24,000.00	\$24,000.00
LANDSCAPE				
Sod	1,345	SF	\$1.50	\$2,017.50
SITE IMPROVEMENTS				
Retaining Wall	380	LF	\$225.00	\$85,500.00
Railing	380	LF	\$125.00	\$47,500.00
Underpass & Road Repair	1	LS	\$1,250,000.00	\$1,250,000.00
Site Utility Allowance	1	LS	\$300,000.00	\$300,000.00
Bench	1	EA	\$2,000.00	\$2,000.00
Bike Rack	3	EA	\$750.00	\$2,250.00
Mural	1	LS	\$3,000.00	\$3,000.00
SUB-TOTAL				\$2,147,653.50
MOBILIZATION/GENERAL CONDITIONS - 5%				\$107,382.68
CONTINGENCY - 15%				\$322,148.03
DESIGN AND ENGINEERING - 10%				\$214,765.35
INFLATION - 3%				\$64,429.61
CONSTRUCTION COST				\$2,856,379.16

Highway 17 Median

This design, illustrated on this page, includes two of the three solutions. The first improvement is a 12-foot-wide refuge island in the middle of Highway 17. This improvement would allow a place of refuge in situations where a driver stops to wave through cyclists or pedestrians. The change in traffic pattern also works as a traffic-calming measure. This concept needs further study to ensure pedestrians and cyclists won't back up into the lanes of traffic from the median.

The second improvement shown is a High-Intensity Activated Crosswalk (HAWK) beacon. This beacon is the same style as the one located at West First Street and the High Trestle Trail in Ankeny. The beacon is pedestrian-activated and first warns traffic on Highway 17 that a "Stop" is coming shortly. Once traffic on the highway is stopped, pedestrians and cyclists will have a timed period to cross. Vehicular traffic is allowed to cross once the crosswalk has been cleared of traffic. The beacon can be programmed to have a specific reset period to ensure traffic along the highway does not become congested. Further study is needed to ensure both pedestrian and vehicular traffic hourly counts require this improvement.

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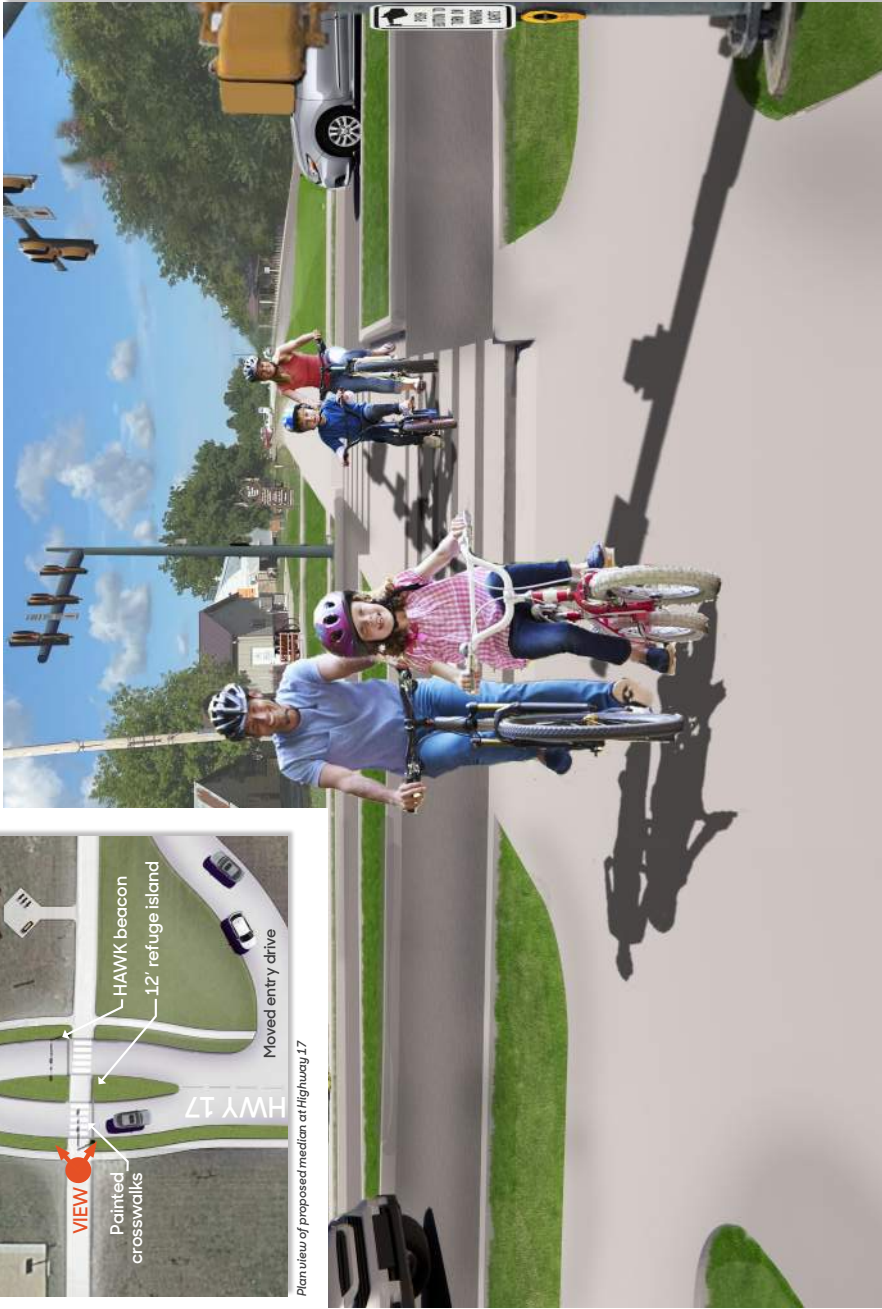
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Existing view of intersection looking east



Plan view of proposed median at Highway 17



Madrid Highway 17 Median

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

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Highway 17 Median

Opinion of Probable Cost

HTT MEDIAN				
Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	\$20,000.00	\$20,000.00
DEMOLITION				
P.C.C Curb and Gutter	202	LF	\$3.00	\$606.00
P.C.C Walk	1,487	SF	\$3.00	\$4,461.00
Asphalt	3,232	SF	\$3.00	\$9,696.00
HARDSCAPE				
Concrete Paving Curb & Gutter	190	LF	\$35.00	\$6,650.00
Concrete Paving - Walks	938	SF	\$6.00	\$5,628.00
Concrete, Roadway	6,756	SF	\$14.00	\$94,584.00
Crosswalk Paint	309	SF	\$2.00	\$618.00
Realigned Park Road, Conc. Apron & Gravel	1	LS	\$15,000.00	\$15,000.00
LANDSCAPE				
Sod	1,692	SF	\$1.50	\$2,538.00
SITE IMPROVEMENTS				
HAWK System	1	LS	\$300,000.00	\$300,000.00
Bench	1	EA	\$2,000.00	\$2,000.00
Bike Rack	3	EA	\$750.00	\$2,250.00
SUB-TOTAL				\$464,031.00
MOBILIZATION/GENERAL CONDITIONS - 5%				\$23,201.55
CONTINGENCY - 15%				\$69,604.65
DESIGN AND ENGINEERING - 10%				\$46,403.10
INFLATION - 3%				\$13,920.93
CONSTRUCTION COST				\$617,161.23

Highway 210

Highway 210 bisects the north and south portions of Madrid and is subject to heavy vehicular traffic. Currently, wide roads and too many access points make the intersection of Highways 201 and 17 welcoming for pedestrians and feel unsafe. This design proposes closing down the Annex Road access along Highway 210 to limit the directions of oncoming and turning traffic. New crosswalk paint and plantings will help pedestrians feel safer and will provide Madrid residents with a more walkable and bikable road system.

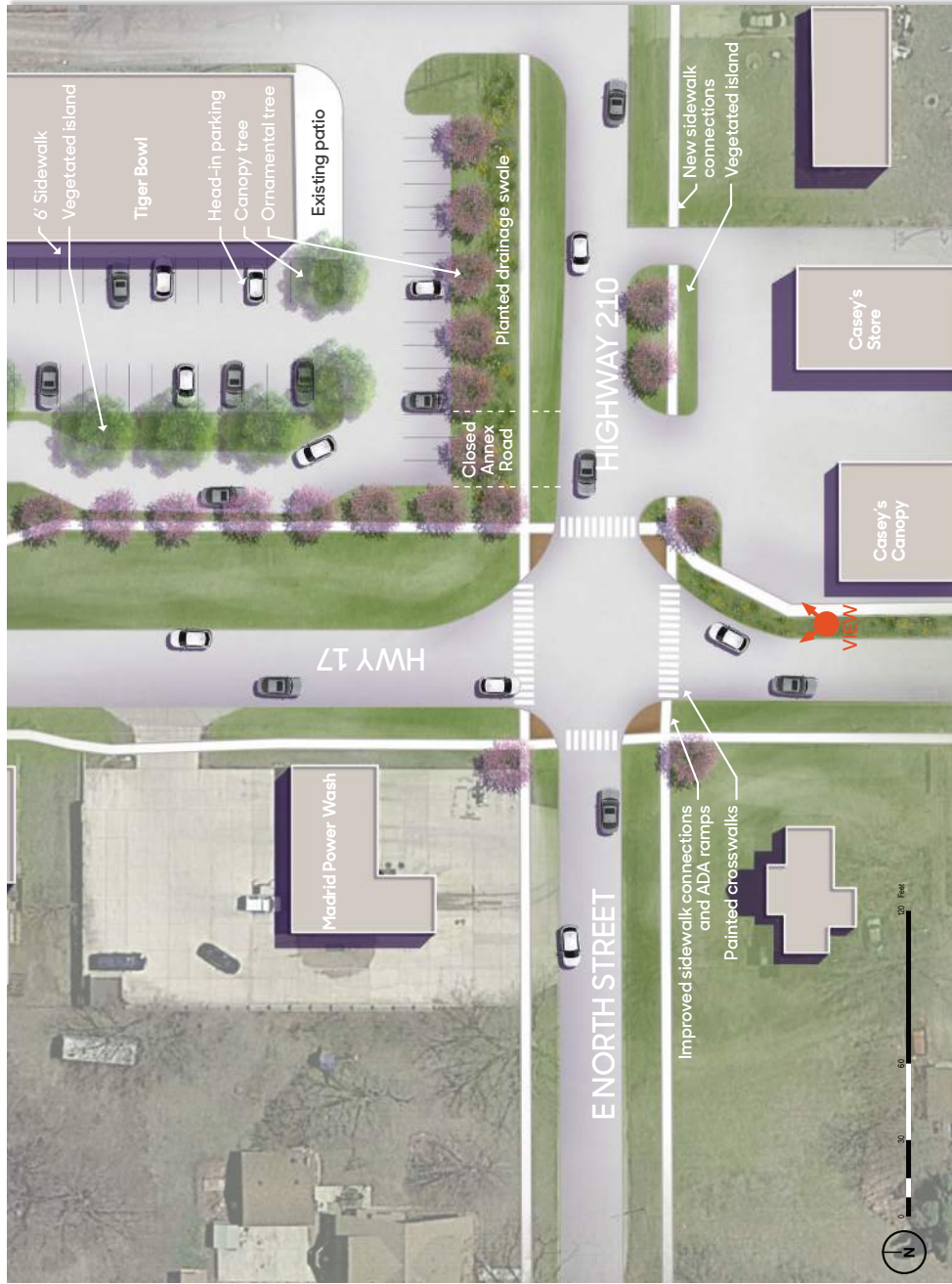
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Additional study would be required to confirm vehicular and semi-truck patterns with the closing of Annex Road.



Existing view of intersection looking north



Madrid

Highway 210

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP
Intern: Dani Hodgson
Iowa State University | Trees Forever | Iowa Department of Transportation



Highway 210

Opinion of Probable Cost

HIGHWAY 210				
Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	\$30,000.00	\$30,000.00
DEMOLITION				
Road Removal	1,447	SF	\$3.00	\$4,341.00
HARDSCAPE				
Concrete Paving Curb & Gutter	1,130	LF	\$35.00	\$39,550.00
Concrete Paving - Walks	5,983	SF	\$6.00	\$35,898.00
Asphalt	4,480	SF	\$4.00	\$17,920.00
Special Paving - Brick	360	SF	\$20.00	\$7,200.00
Crosswalk Paint	1,400	SF	\$2.00	\$2,800.00
LANDSCAPE				
Deciduous Shade Tress - 2" Caliper	6	EA	\$350.00	\$2,100.00
Ornamental Tree	19	EA	\$250.00	\$4,750.00
Native Planting in Roadway Ditch, Seeded	0.50	AC	\$5,000.00	\$2,500.00
Shrubs and Perennials	900	SF	\$30.00	\$27,000.00
Sod	8,474	SF	\$1.50	\$12,711.00
SUB-TOTAL				\$186,770.00
MOBILIZATION/GENERAL CONDITIONS - 5%				\$9,338.50
CONTINGENCY - 15%				\$28,015.50
DESIGN AND ENGINEERING - 10%				\$18,677.00
INFLATION - 3%				\$5,603.10
CONSTRUCTION COST				\$248,404.10

Proposed School Crossing

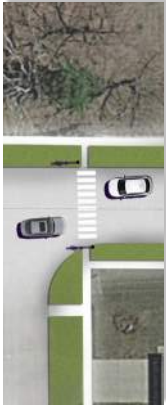
Traffic along Highway 17 interferes with students crossing the road to get to Madrid Junior and Senior High School. Currently, the only designated crossing area is at this intersection, which handles almost all of the pedestrian traffic going to the school. This design proposes a newly painted crosswalk and a Rectangular Rapid Flashing Beacon (RRFB), that is activated by pedestrians. This design also proposes a sidewalk on the west side of Highway 17 extending to the south. This path would emphasize the connection to the residences on that side of the roadway, instead of forcing students to prematurely cross Highway 17 or trek across the existing landscape.

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Existing view of school crossing looking north



Plan view of proposed school crossing

Madrid

Proposed School Crossing

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation



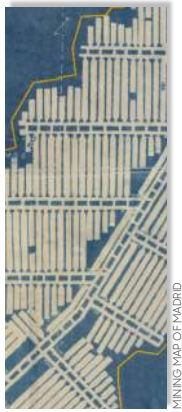
Proposed School Crossing

Opinion of Probable Cost

SCHOOL INTERSECTION				
Description	Quantity	Unit	Unit Cost	Extended Amount
GENERAL REQUIREMENTS				
Traffic Control	1	LS	\$10,000.00	\$10,000.00
HARDSCAPE				
Concrete Paving Curb & Gutter	80	LF	\$35.00	\$2,800.00
Concrete Paving - Walks	130	SF	\$6.00	\$780.00
Crosswalk Paint	242	SF	\$2.00	\$484.00
LANDSCAPE				
Sod	65	SF	\$1.50	\$97.50
SITE IMPROVEMENTS				
Flashing Pedestrian Signs	1	LS	\$110,000.00	\$110,000.00
SUB-TOTAL				\$124,161.50
MOBILIZATION/GENERAL CONDITIONS - 5%				\$6,208.08
CONTINGENCY - 15%				\$18,624.23
DESIGN AND ENGINEERING - 10%				\$12,416.15
INFLATION - 3%				\$3,724.85
CONSTRUCTION COST				\$165,134.80

Signage

Expanding upon Madrid's existing signage structure can help tie the design proposals together and emphasize the identity of the town. This signage family is inspired by the industrial history of Madrid and its relationship with mining and railroads. Steel is a featured material found in each option to match the exiting signage used in town. Pedestrian-level way-finding signage can be simple (seen in the second image) or be more prominent with a truss shaped structure that speaks to the old rail lines. The street labels take on the shape of the mine shafts that existed beneath Madrid historically. Adding banners through Madrid will be a simple way to promote the identity of the town, especially within the downtown corridor. Pedestrian lighting can support the banners, help connectivity within areas of town, and resemble lighting used in mining.



Signage

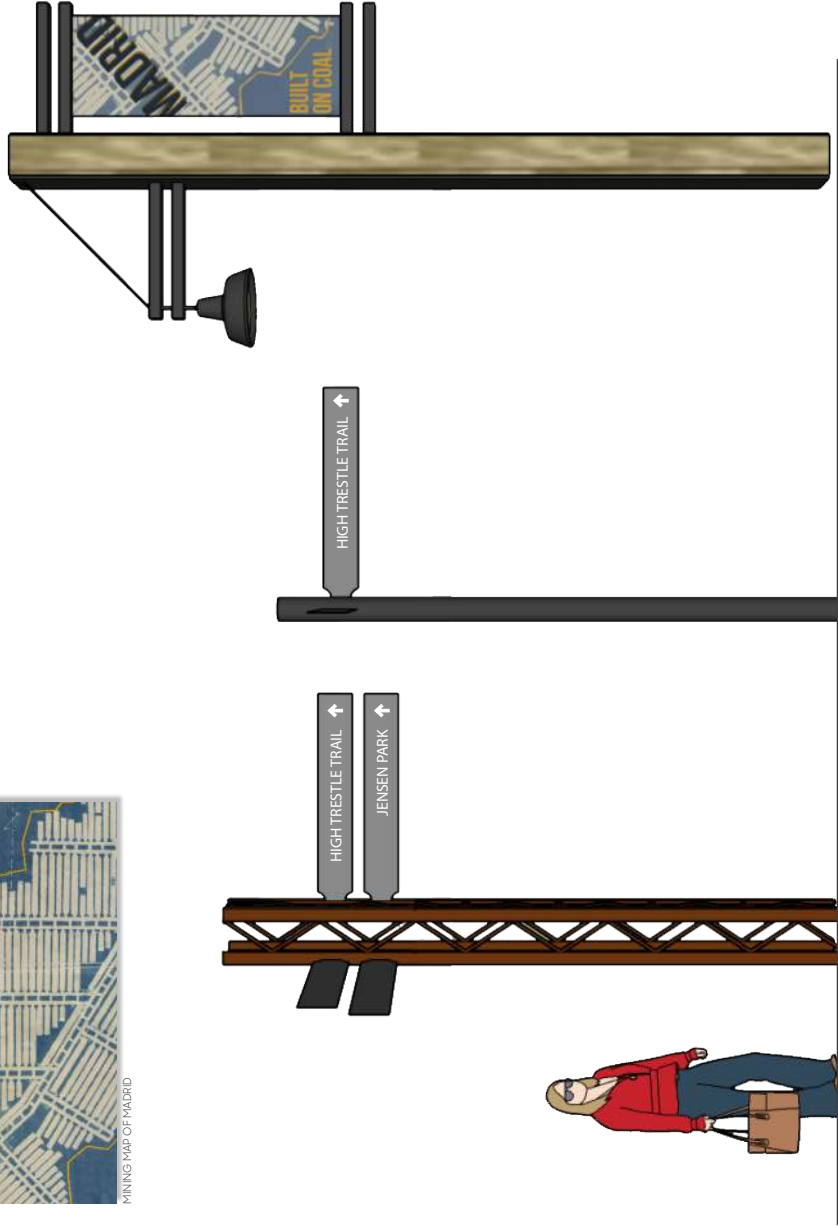
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Existing trail signage



Existing downtown signage



Madrid

Signage

RDG Planning & Design

LAs: Nate Byro, PLA, ASLA; Bruce Niedermeyer, PLA, ASLA, LEED AP

Intern: Dani Hodgson

Iowa State University | Trees Forever | Iowa Department of Transportation



Signage

Opinion of Probable Cost

SIGNAGE				
Description	Quantity	Unit	Unit Cost	Extended Amount
Way-Finding Signage Element #1				
Steel Truss Structure	1	LS	\$2,500.00	\$2,500.00
Destination Panels	1	LS	\$500.00	\$500.00
SUB-TOTAL - Way-Finding Signage Element #1				\$3,000.00
TOTAL PROPOSED	14	EA	\$3,000.00	\$42,000.00
Way-Finding Signage Option #2				
Metal Pole	1	LS	\$1,000.00	\$1,000.00
Destination Panels	1	LS	\$500.00	\$500.00
SUB-TOTAL - Way-Finding Signage Element #2				\$1,500.00
TOTAL PROPOSED	16	EA	\$1,500.00	\$24,000.00
Banner and Street Lighting				
Beam - Structural Pole - See Downtown OPC	1	EA	\$0.00	\$0.00
Banner Fabrication and Production	1	LS	\$500.00	\$500.00
SUB-TOTAL -Banner and Street Lighting				\$500.00
TOTAL PROPOSED	29	EA	\$500.00	\$14,500.00
SUB-TOTAL OF ALL SIGNAGE				\$80,500.00
MOBILIZATION/GENERAL CONDITIONS - 5%				\$4,025.00
CONTINGENCY - 15%				\$12,075.00
DESIGN AND ENGINEERING - 10%				\$8,050.00
INFLATION - 3%				\$2,415.00
CONSTRUCTION COST				\$107,065.00

Implementation Strategies

The Community Visioning Program is just the beginning of the planning process for implementing projects that will enhance Madrid's quality of life. Although there is value in data gathering, analysis, conclusions, and recommendations, the most significant value is providing Madrid's residents the opportunity to look at their community from different perspectives and to motivate future change. The design team intends to provide the community with a framework for significant future development and community resource enhancement.

Key Recommendations – Based on economic return and increased quality of life, proposed projects are recommended to 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 to be separated and completed systematically. This will provide an opportunity to address smaller, more affordable portions of work to build success without substantial fundraising efforts.

Downtown – When looking for funding sources for the system of bumpouts and pedestrian improvements proposed within the downtown, focusing on pedestrian safety will be key. One of the most beneficial aspects of this concept is the fact that the improved pedestrian crossings will create a safe, walkable area, that is accessible to all, and meets ADA standards. Reducing the distance of the pedestrian crossings is beneficial to the walkability of downtown. This benefit is very important for health-based funding sources. Improving the pedestrian crossings with newly painted pavement accompanied by the bumpouts could align with several grant sourcing opportunities, including Iowa DOT's Transportation Alternatives Program, Safe Routes to Parks, or the America Walks Community Change Grants. The pocket park improvements could be paid for through private fundraising or in conjunction with grants that support creative placemaking initiatives. Since the large mural is shown on a privately owned building, a partnership will need to be forged to develop this mural. These improvements would demonstrate an investment from the City and the community into the downtown area, which would be beneficial to both current, and potential future businesses. The City should make it a priority to provide incentives for building owners to make improvements to their properties, such as those through the Iowa's Downtown Revitalization Program. Minor improvements, such as the "Coal Markers" throughout downtown could be completed with a partnership between volunteers and City Public Works employees. These markers, once completed, would be another extension of the High Trestle Trail into the community, encouraging economic investment from the out-of-town cyclist community.

High Trestle Trail Improvements – Madrid is uniquely located along the High Trestle Trail and can benefit economically from its adjacency. Enticing bicyclists to leave the trail and visit the City’s downtown through the trail business loop shown in the concept plan will be beneficial to that economic impact. Creating iconic art installations in the form of illuminated coal sculptures will provide an experience that is unique to Madrid and will help to establish a vibrancy within the connection of the trail and Madrid’s downtown. Funding for this project could come from sources such as the National Endowment for the Arts’ Our Town Creative Placemaking Grants Program, which emphasizes integrated arts, culture, and design in communities, or similar sources. The native prairie planting at the trailhead entrance would improve pollinator habitat. Funding sources for this may be available through the Iowa Department of Natural Resources. Trail lighting along the trail corridor through the City would improve safety along the trail and lengthen the amount of time in day when the trail is usable by walkers and novice bicyclists. This has a health benefit, that should be highlighted when applying for support from health-based funding sources.

Highway 17 & the High Trestle – The trail crossing at Highway 17 is perceived to be a dangerous intersection for cyclists, pedestrians, and vehicular traffic. To date there have been very few recorded accidents at this intersection, but many close calls have been accounted. An accurate count of near-accident situations would prove beneficial to safety grant applications. This could be completed by a private consultant or volunteers, in conjunction with the Iowa DOT. Safety for pedestrian and cyclists should be stressed as the up most priority on all grant applications. The option for a median & HAWK system would require an engineering study to get approved by the DOT. A funding option for the professional services due to the safety aspect of this intersection is available through the DOT Traffic Engineering Assistance Program (TEAP). This program was used in 2014 for this intersection, which should not be ignored in funding applications. Funding for native plantings within the right-of-way near the underpass might be available through the Iowa Living Roadways Integrated Roadway Vegetative Management Program. Implementation funding requests for either option should focus on safety, improved health benefits, and economic benefits. Funding options would be available through various safety grants, Transportation Alternatives Grants, and the DOT Traffic Safety Improvement Program (TSIP).

Highway 210 & Highway 17 – When looking for funding for the proposed improvements at the intersection of Highway 210 & Highway 17, safety and accessibility improvements should be a major focus of grant applications. Funding for the hardscape elements may be available through the DOT Pedestrian Curb Ramp Program, Safe Routes to Schools, or the America Walks Community Change Grants. Planting improvements within the right-of-way could seek funding through the Iowa Living Roadways Integrated Roadway Vegetative Management Program.

Proposed School Crossing – The proposed crossing at Highway 17 should highlight the safety, school access, and accessibility improvements. Grant applications should focus on these elements. Funding may be available through the DOT Traffic Safety Improvement Program (TSIP) & the DOT Pedestrian Curb Ramp Program. Funding may also be available through the Safe Routes to School program.

Signage & Wayfinding – The committee should work with the Madrid Chamber of Commerce on implementation of the signage and wayfinding elements. As discussed during committee meetings, the Chamber is in the process of implementing banners throughout town. The Chamber would be a strong partner in developing the full wayfinding system. The unique design elements included with the signage and wayfinding system, such as the structural truss columns, should be considered important elements in a family of placemaking materials. Specific placemaking-focused grant sources could be received for these items, if the story conveyed is cohesive and intertwined.

Madrid 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 time frame 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 Madrid, as well as develop and enhance a positive identity for the community.

Implementation Road Map

- | | | | |
|-------------------------|---|-------------------------|---|
| MILE
1 | Assemble a steering committee with community members that are willing to become advocates for proposed improvements in Madrid. | MILE
4 | Utilizing the concepts generated from the Community Visioning Process and this Feasibility Report, develop applications for applicable grants or funding. |
| MILE
2 | Identify the committee's top three priority projects, confirm whether the projects should be developed at once or in phases, and evaluate associated costs. | MILE
5 | Develop a project scope and proposed schedule to request services for design consultants, if necessary, or request bids from potential contractors. |
| MILE
3 | Determine the most feasible project based on available grants/funding opportunities. | MILE
6 | Once your project is complete, reevaluate your committee's priority projects and repeat these steps to implement your next community improvement project! |

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)