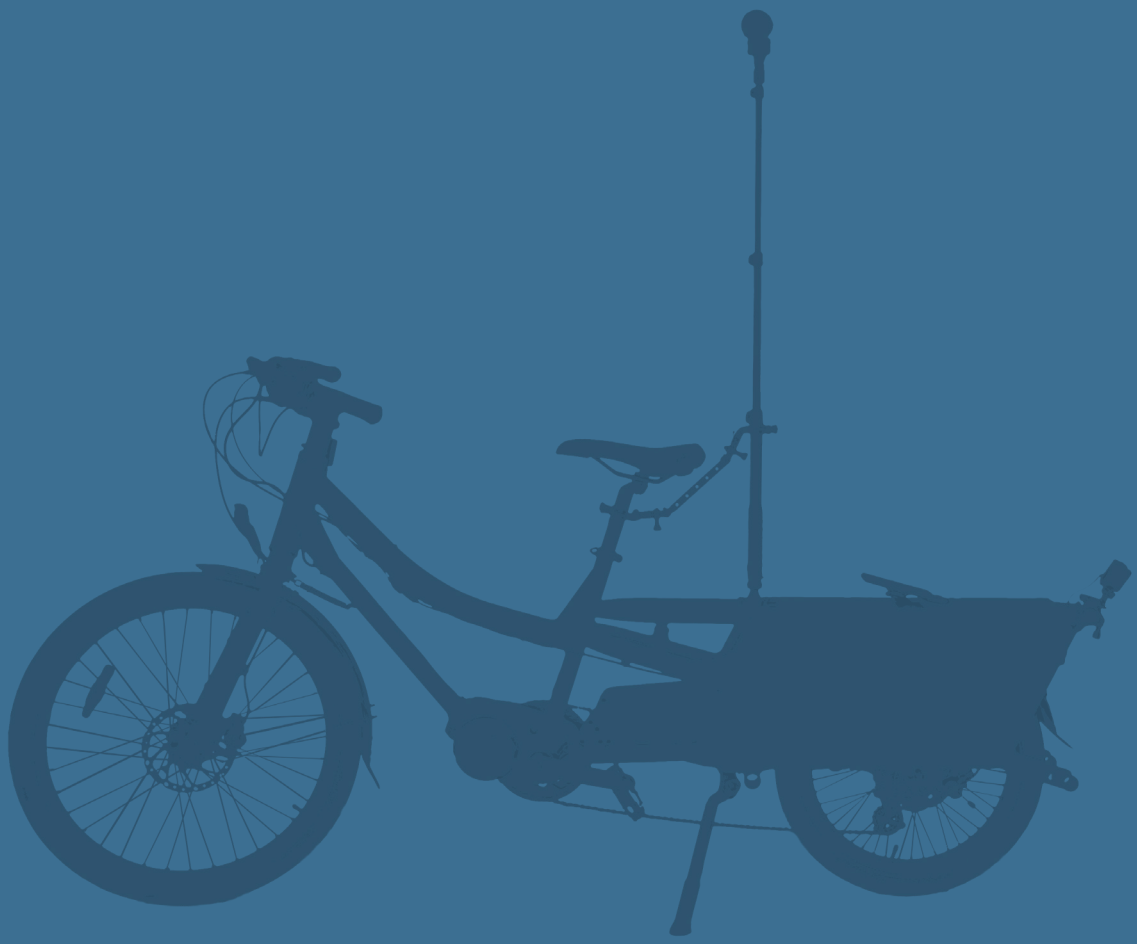
Central Iowa Trail Condition

2018 Report



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Acknowledgements

We would like to thank Iowa Department of Public Health (IDPH) and Iowa Natural Heritage Foundation (INHF) for their assistance in making this project possible.

IDPH

Iowa
Natural Heritage
Foundation

Key Findings

- Of trail segments collected in 2017, 86 percent are in good condition with smooth or very smooth surface conditions.
- Level 1 regional trails have limited poor condition segments. Overall, they are preforming with smooth and very smooth surface conditions.
- Of trail segments collected in 2017, only 3 percent are in rough condition.
- Local connector trails are more likely to be in fair or rough condition.

Introduction

Central Iowa is home to more than 600 miles of shared use trails connecting urban centers with natural rural landscapes that show the beauty of the heart of Iowa. Trails in central Iowa continue to be an important quality of life aspect for thousands of residents every year by providing recreational opportunities accessible to all ages. More recently, the trails have been leveraged as a tool to generate additional tourism through events like the BaCoon Ride along the Racoon River Valley Trail.

This extensive trail system continues to grow and evolve as missing links in the trail system are constructed by local communities, county conservation boards, or collaborations between local partners. Each year the Des Moines Area MPO (MPO) provides trail projects with funding through state and federal programs to fill gaps within the trail system. As more Iowans embrace bicycling for both recreation and daily transportation, the trail system will continue to see use throughout the year.

While the network of trails expands, the existing trail network is starting to mature and soon spending priorities will require a greater focus on the maintenance of existing trails. Currently, when trail maintenance is required, local governments utilize field investigations to determine the condition of trail segments they plan to maintain. The field investigation process can be time-consuming as not all trail segments are readily accessible by road.

Connection to *Mobilizing Tomorrow*

In 2014, the MPO completed the update of the long-range transportation plan for the Greater Des Moines Area called *Mobilizing Tomorrow.* This plan provides the goals for the transportation network to the year 2050. Goal 2 of *Mobilizing Tomorrow* is to "manage and optimize the transportation infrastructure and services" within the region.

Currently, the MPO utilizes pavement condition data collected for the entire street network to provide a regional review of the investment necessary to maintain the current condition of the roadway network.

Photo courtesy of MPO staff.

The MPO seeks to support long-range planning of trail maintenance by providing data to make performance-based decisions on prioritizing trail maintenance.

The *Central Iowa Trail Condition* project was created to fill this information gap within the central Iowa trail system. It intends to:

- Develop a bike-based data collection vehicle to improve the efficiency of collecting data on the extensive trail network.
- Create an inventory of condition data for all paved trails within central Iowa, with a focus on trail roughness and geo-located photos of trail surfaces.
- Provide data to local agencies, consultants, and the public to inform a long-term maintenance strategy for the central Iowa trail network.
- Make the project replicable and promote the project to expand knowledge regarding approaches to collect trail condition data.

Central Iowa Trails

The beginning of the central Iowa trails network started with the Bill Riley Trail, now known as the Neal Smith Trail. Since the late 1970's, local community leaders and organizations have pushed for trails within and connecting their communities. This leadership is still seen today as a majority of trails are managed by local agencies rather than state agencies.

In 2004, the Central Iowa Bicycle-Pedestrian Roundtable was formed to further develop bicycle and pedestrian facilities in central Iowa. The Roundtable encompasses the planning areas of the MPO, the Ames Area MPO, and the Central Iowa Regional Transportation Planning Alliance (CIRTPA). The mission of the Roundtable is "to facilitate the development, maintenance, and promotion of a world-class commuter and recreational trail system in central Iowa."

The Roundtable assisted MPO staff in creating the plan, *CONNECT: Central Iowa Bicycle and Pedestrian Transportation Action Plan 2020*. This plan includes projects, programs, and policies on bicycle and pedestrian transportation in upcoming years. Additionally, it includes the breakdown of four Trail Level of Significance Classifications. They are as follows:

Level 1: State Significance

Must first meet all of the criteria described in Level 2. Must span two or more counties and be recognized by the State of Iowa/Iowa Department of Transportation as a Level 1 Trail. A decisive knowledge of the trail boundaries must exist. Alternatively, must receive approval by the Central Iowa Bicycle-Pedestrian Roundtable.

Level 2: Regional Significance

Must first meet all of the criteria described in Level 3. Must exist in two or more city or county jurisdictions. Must connect places, streets or trails of significance to the central Iowa region. Alternatively, must receive approval by the Central Iowa Bicycle-Pedestrian Roundtable.

Level 3: Jurisdiction Significance

Must first meet all of the criteria described in Level 4. Must be a minimum of 8 feet in width. Must connect places, streets, or trails of jurisdictional significance. Alternatively, must receive approval by the Central Iowa Bicycle-Pedestrian Roundtable.

Level 4: Local/Neighborhood Significance

Must meet the minimum criteria to be designated as a Shared-Use Path, Bicycle Lane, or Bicycle Route, as specified in the Manual on Unified Traffic Control Devices.

Today, Iowans and visitors continue to enjoy trails and what they provide for communities. The demand for trails and better connectivity between individual trails persists. As the Central Iowa trail system continues to grow, it will be important to create a reliable procedure to conduct condition assessments in order to maintain a high quality network and locate gaps in the network.

Iowa Data Bike

A primary objective of the project was to develop a bike-based data collection vehicle to improve the efficiency of collecting data on the extensive trail network.

Using an electric-assist bicycle, an iPhone, an app designed to detect pavement roughness, and a pair of cameras, the MPO created a tool to efficiently collect data to evaluate trail condition. The Data Bike is able to provide a consistent speed for data collection regardless of terrain as the electric-assist bicycle provided the rider additional power while pedaling.

The Data Bike uses three main components to collect data.

1) The rRuf app on the iPhone collected accelerometer data to produce a segmented Class 3 response-based roughness condition rating.

2) A GoPro camera mounted at the rear of the bike provided geo-located photos of the trails.

3) A Samsung Gear 360 mounted above the riders head provided imagery used for Google Street View.

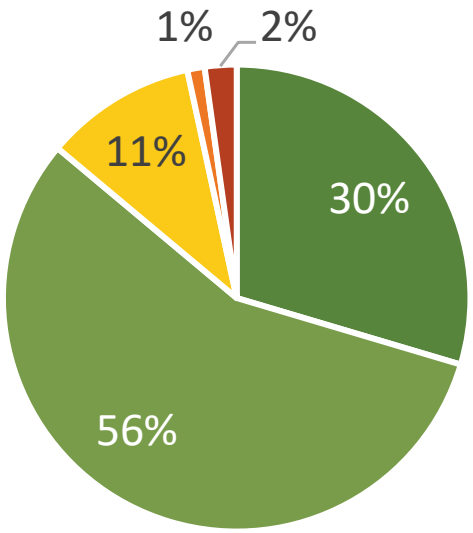
State of the Trails

During the summer and fall of 2017, the Data Bike collected approximately 400 miles of roughness data, over 100,000 photos of the trail surface, and more than 2,700 photos for Google Street View.

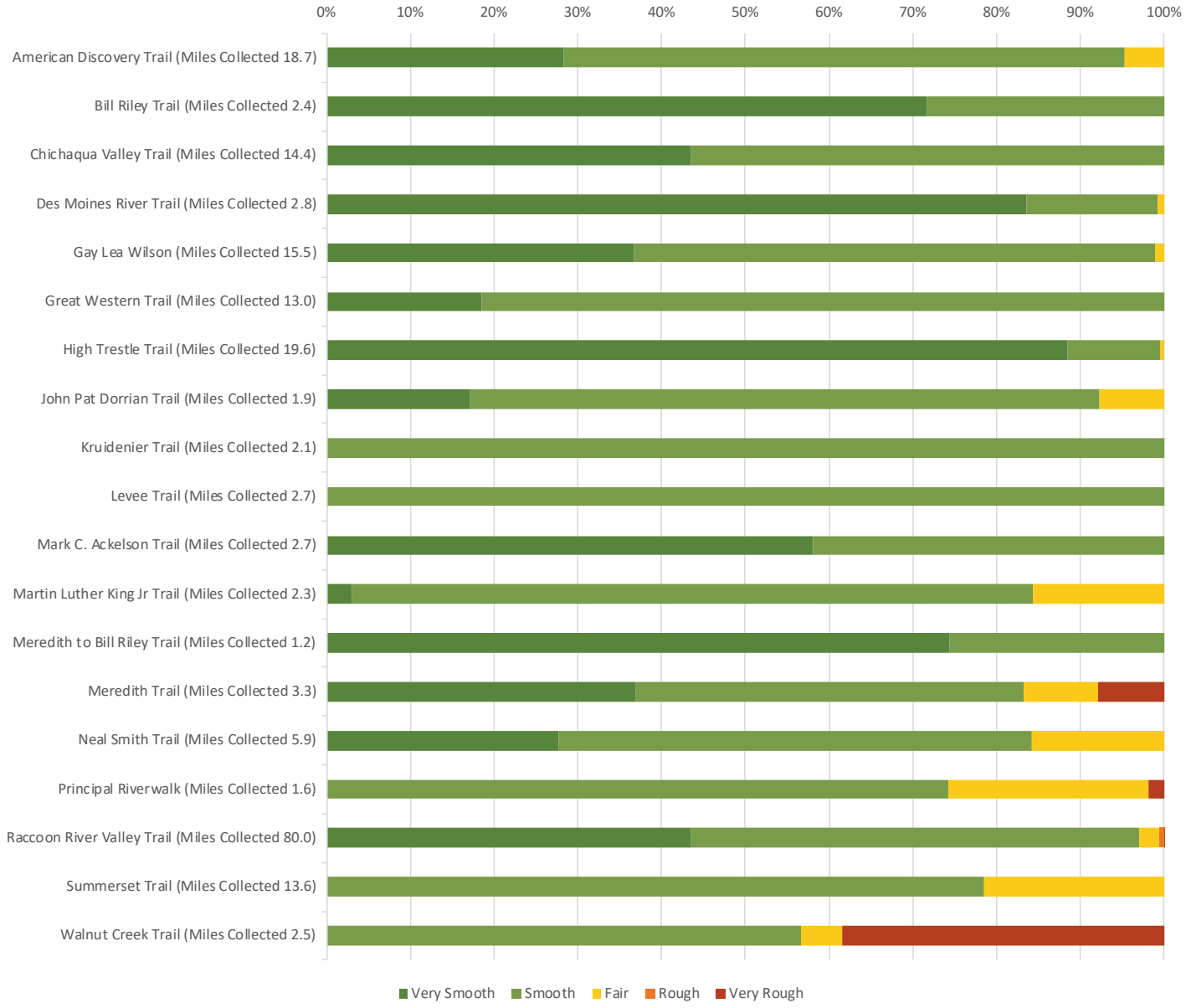
The data collected to date provides evidence that the regional trail network in Central Iowa is in good condition with 86 percent of trail miles in smooth or very smooth condition. While these trails may have intermittent cracking, maintenance has been completed to keep trail users on a smooth surface.

The photos collected on the trails provide a snapshot of the experience available to users. As previously stated, the trails provide a link between the urban cityscapes and the rolling rural landscapes. Trailheads in towns throughout the region highlight the investment in ammenities that make central Iowa a cycling destination.

Trail Mileage by Condition



Trail Condition



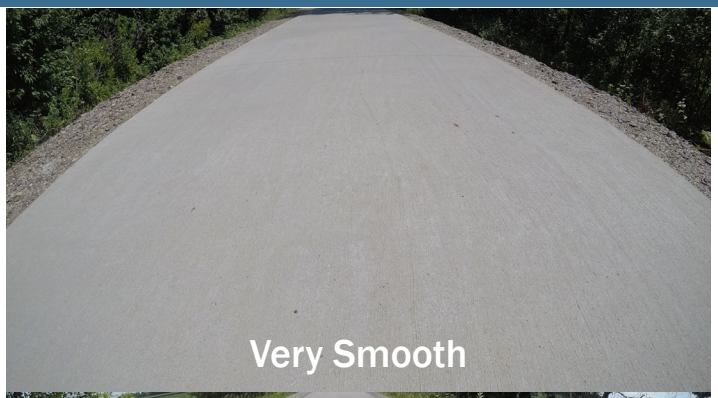
Note: Based on percent of mileage collected in 2017

Trail Roughness

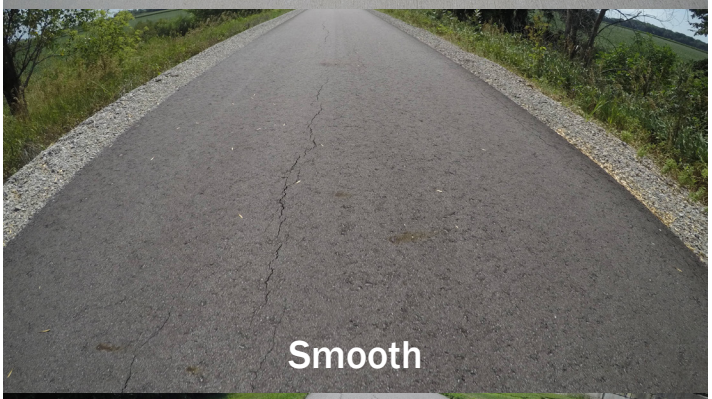
The accelerometer data collected by the Data Bike indicated significant changes in the smoothness of the trail segment. Using the accelerometer data, the trails can be categorized into five roughness categories. The photos on the following page illustrate roughness conditions for each of the five levels.

The rRuf app scores the condition of trails by using the iPhone's accelerometers and gyros to produce a segmented Class 3 response based roughness condition rating. It includes an automated intelligent map matching algorithm that connects collected data to the appropriate trail segment. Through the RUBIX dashboard, the trail network can be monitored to ensure coverage and filling of gaps as needed. This specialized app is also able to produce averages and other statistics if data on sections of trails are collected multiple times.

Very Smooth
Very smooth trails have nearly no cracking or vegetation growing on the trail. Variations in smoothness can be caused at seams between concrete or other material spread across trail.



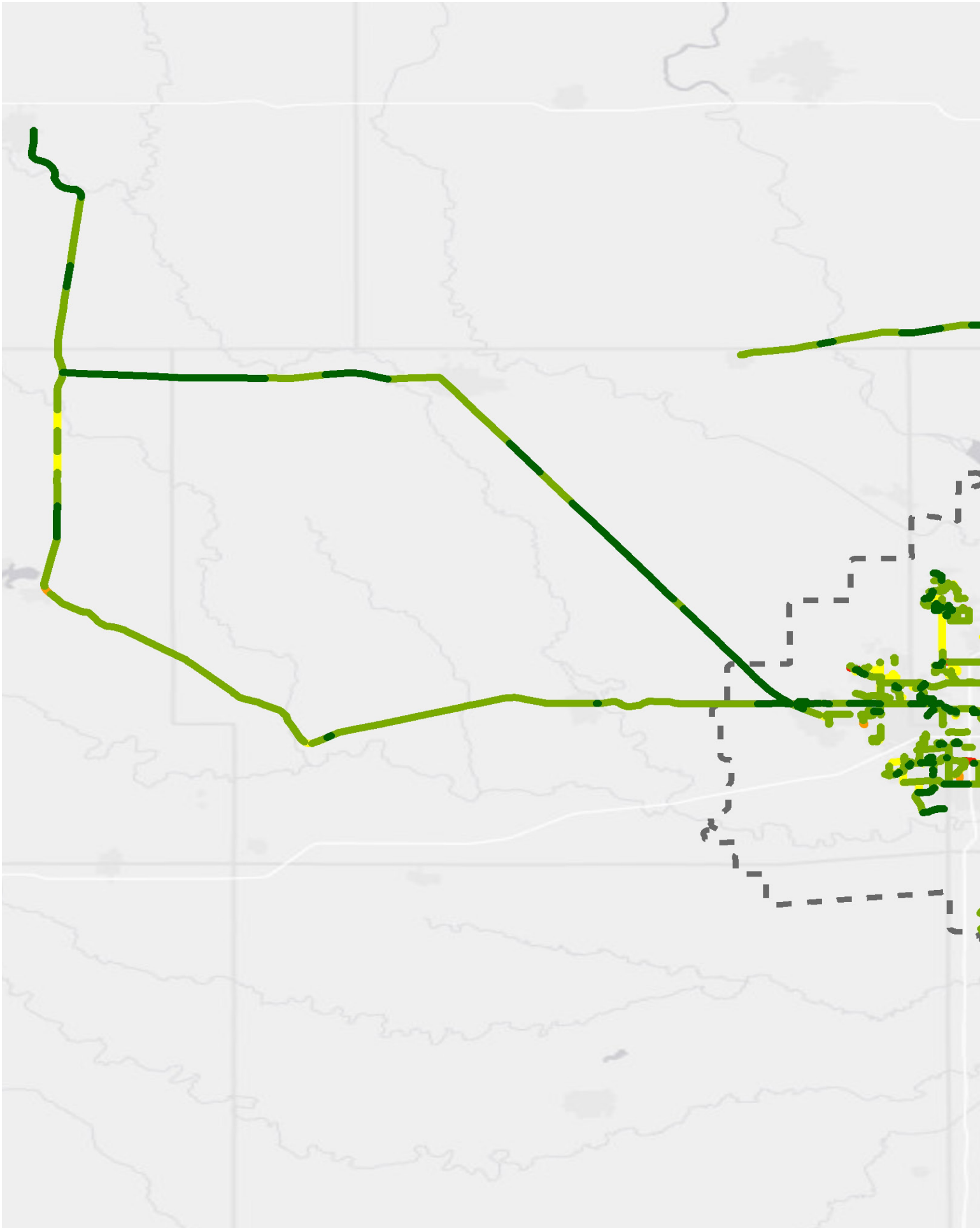
Smooth
Smooth trails are typically in good condition, but are beginning to show signs of cracking. Cracking on smooth trails generally does not create discomfort for the rider.

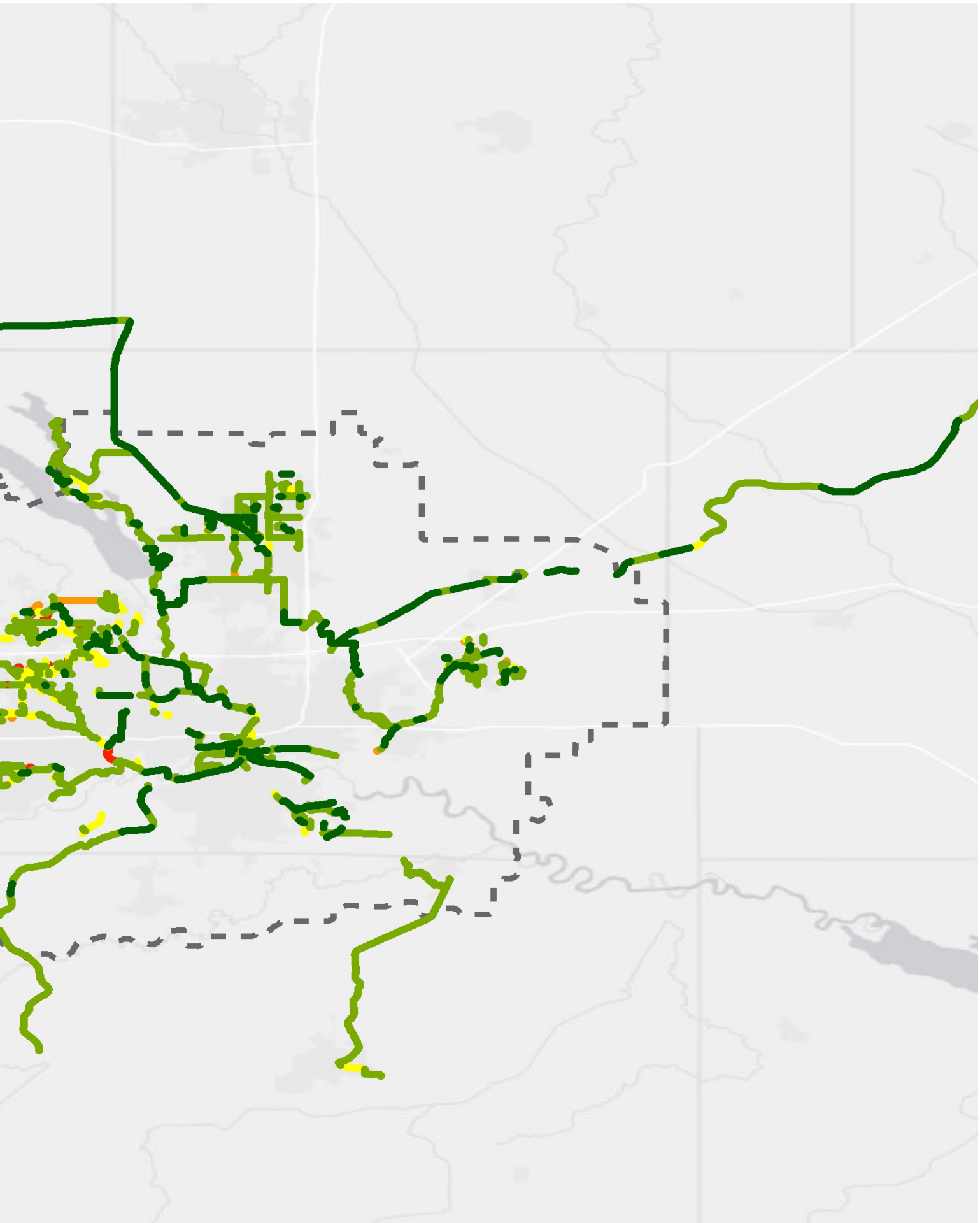


Fair
Fair trails are beginning to show increased wear and typically have more cracking. Cracking on trails in fair condition can cause minor discomfort for riders.

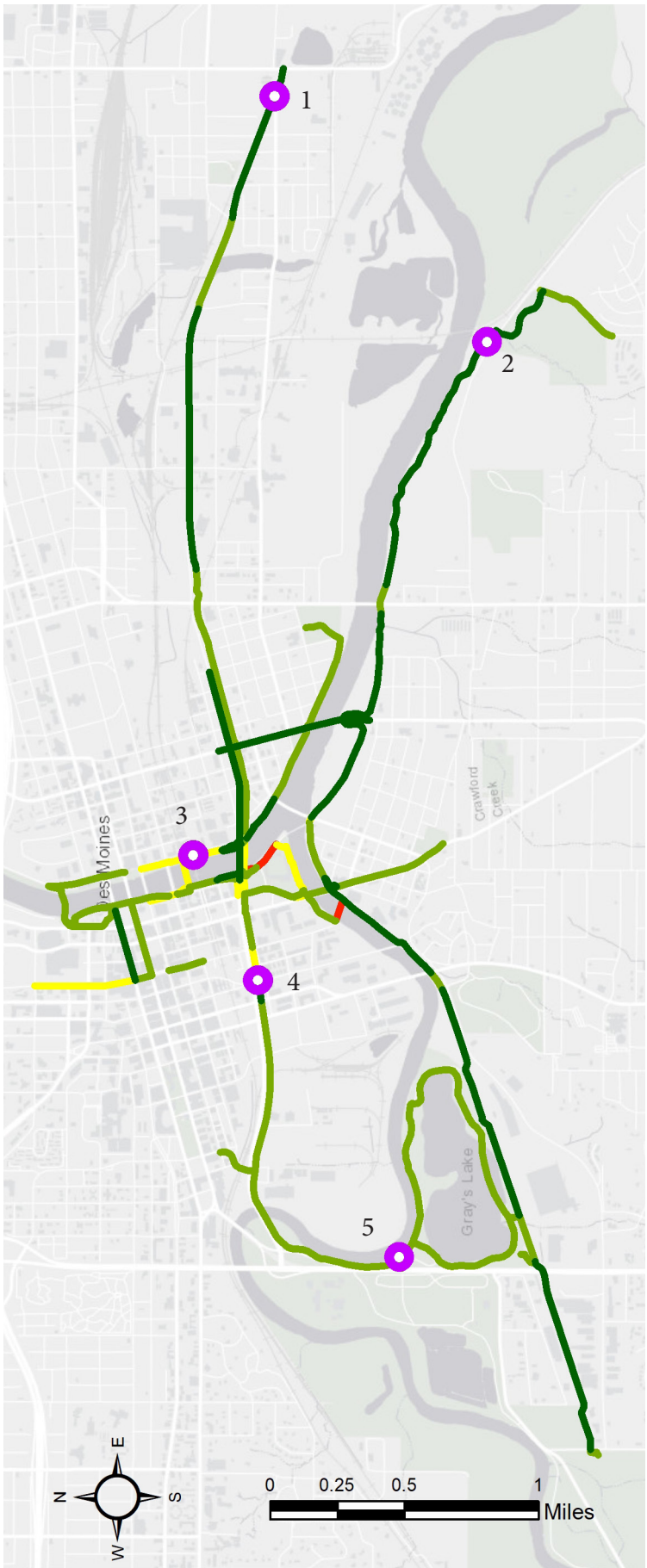
Rough -
Trails in rough condition are showing advanced cracking with vegetation growing through the surface. These cracks are typically wider and deeper than cracks along fair conditioned trails and can cause discomfort for riders.

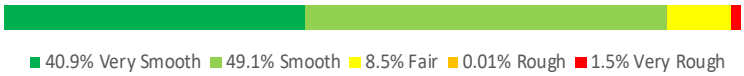
Very Rough
Very rough condition trails have cracking similar to trails in rough condition, but also have vertical displacement of the trail surface. Very rough conditions on trails may be avoided by riders, but if traversed can cause discomfort.



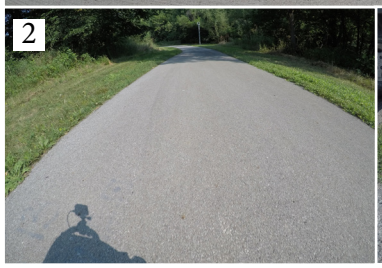


DOWNTOWN TRAILS & CONNECTOR TRAILS

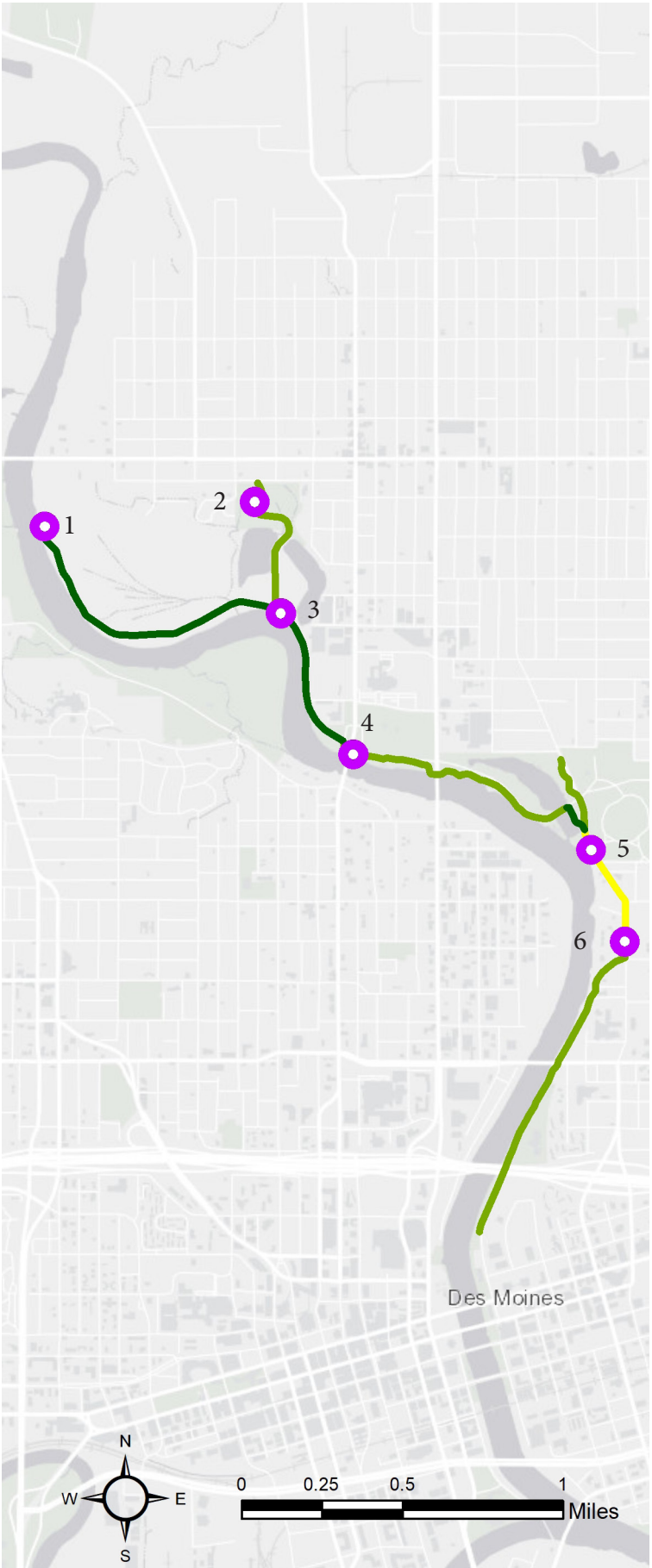


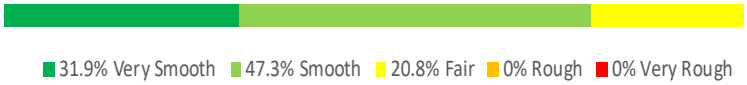


Miles: 26.24
Jurisdiction: Des Moines
Surface Type: Asphalt, Brick and Concrete



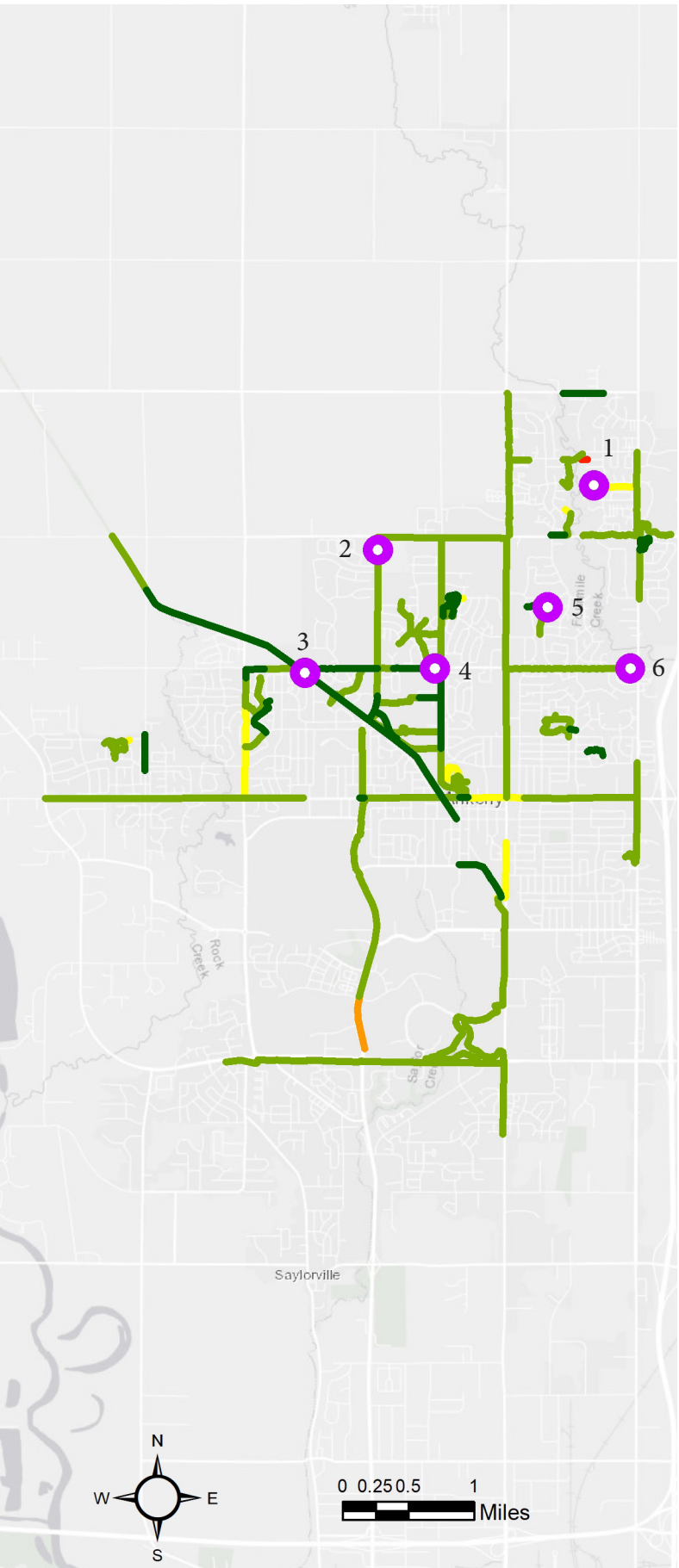
NEAL SMITH & McHENRY PARK TRAILS

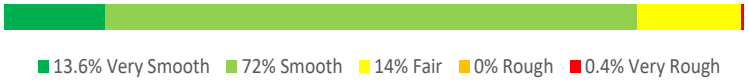




Miles: 4.52
Jurisdiction: Des Moines
Surface Type: Asphalt, Concrete

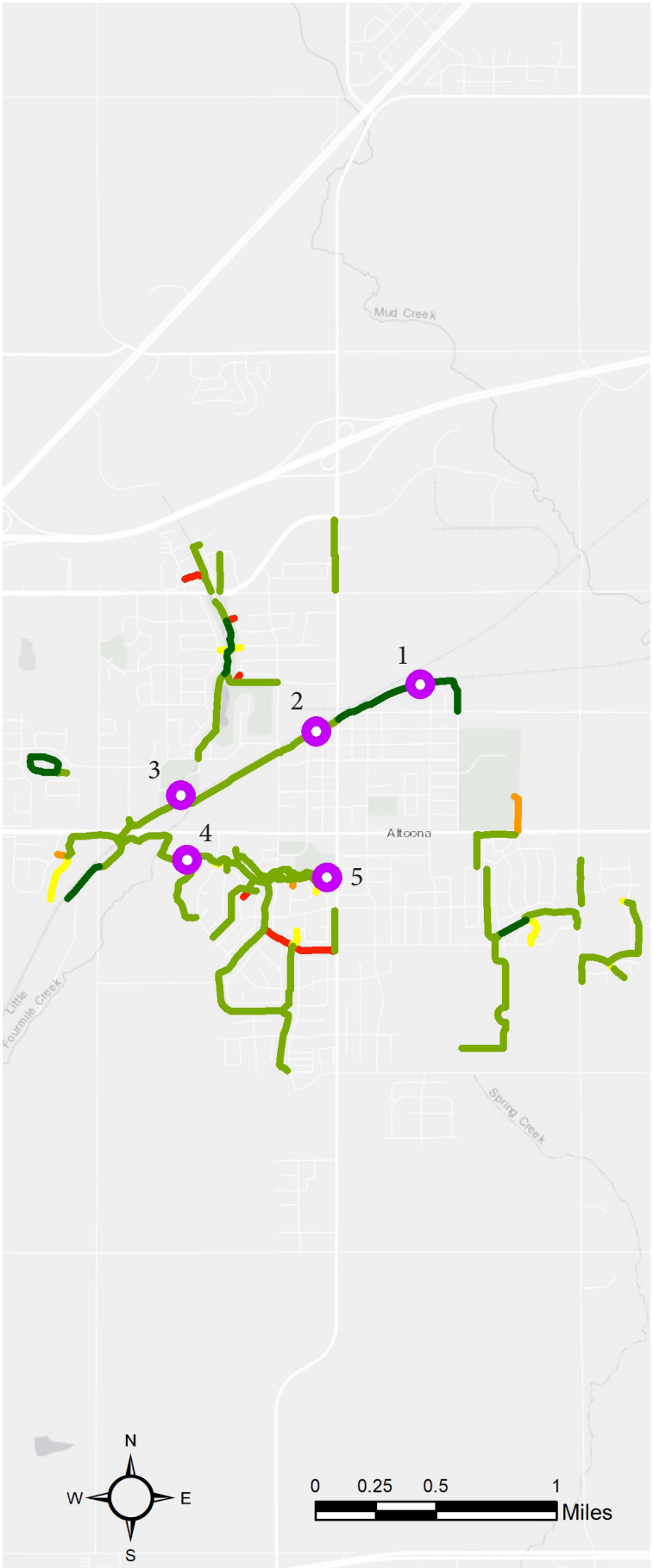
CITY OF ANKENY TRAILS

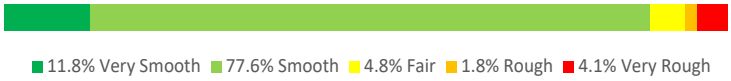




Miles: 40.38
Jurisdiction: Ankeny
Surface Type: Asphalt, Concrete

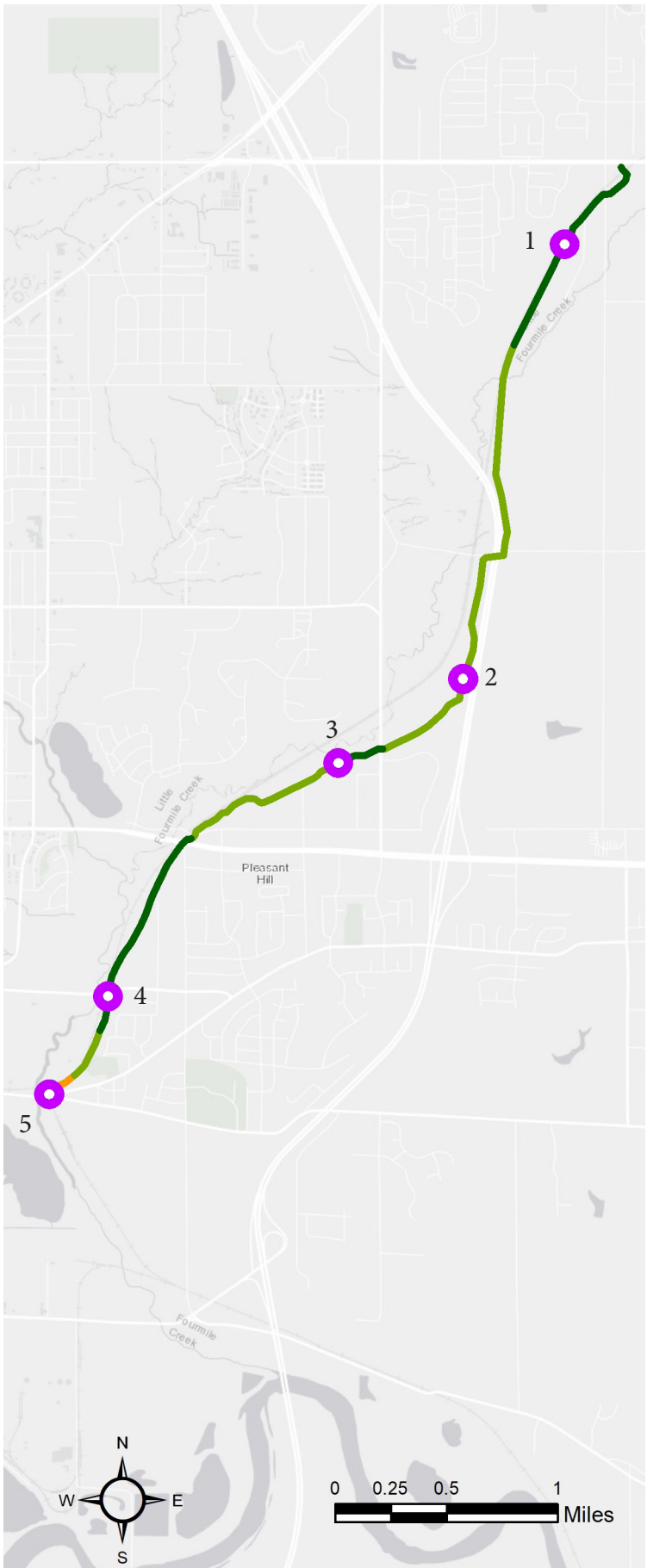
CITY OF ANKENY TRAILS

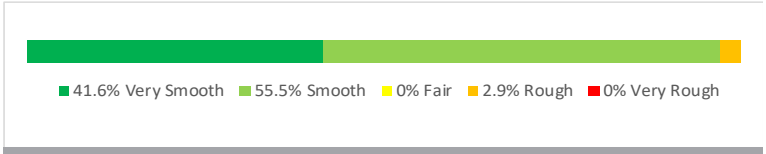




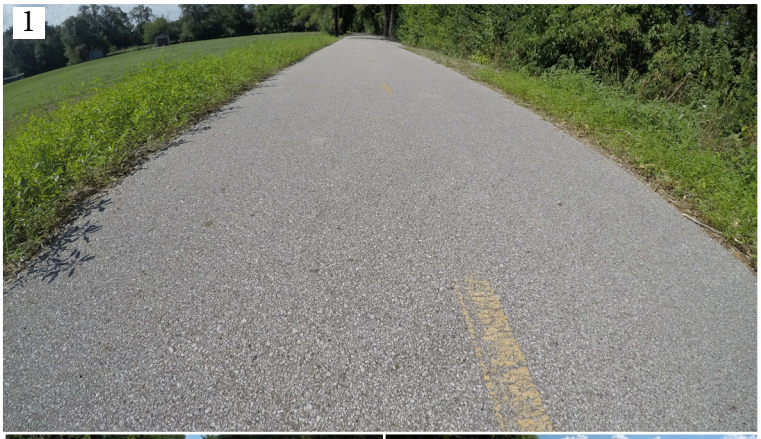
Miles: 13.08
Jurisdiction: Altoona
Surface Type: Asphalt

GAY LEA WILSON TRAIL

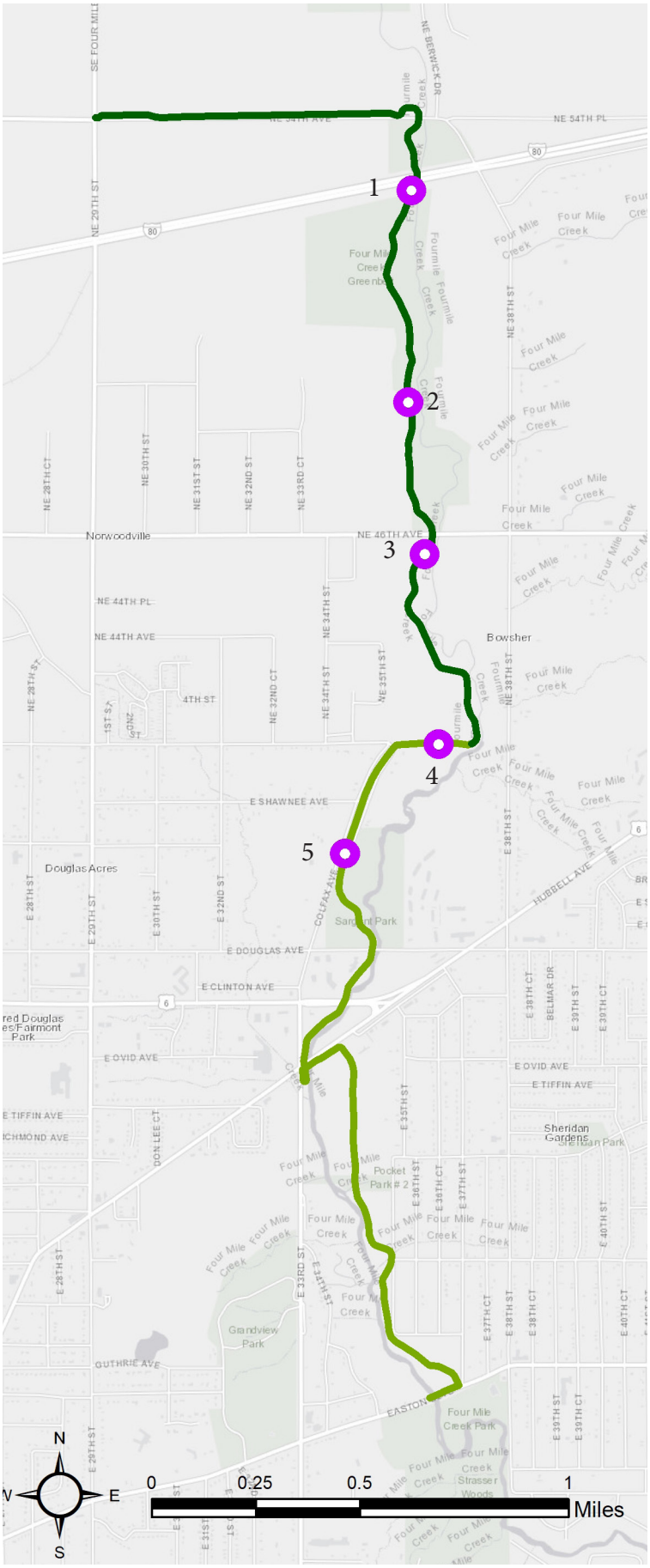


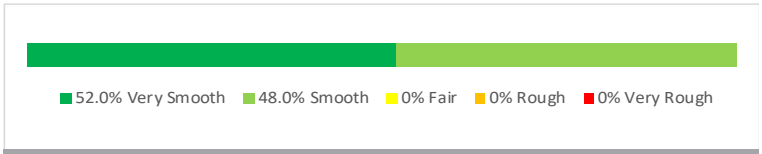


Miles: 5.56
Jurisdiction: Pleasant Hill
Surface Type: Asphalt



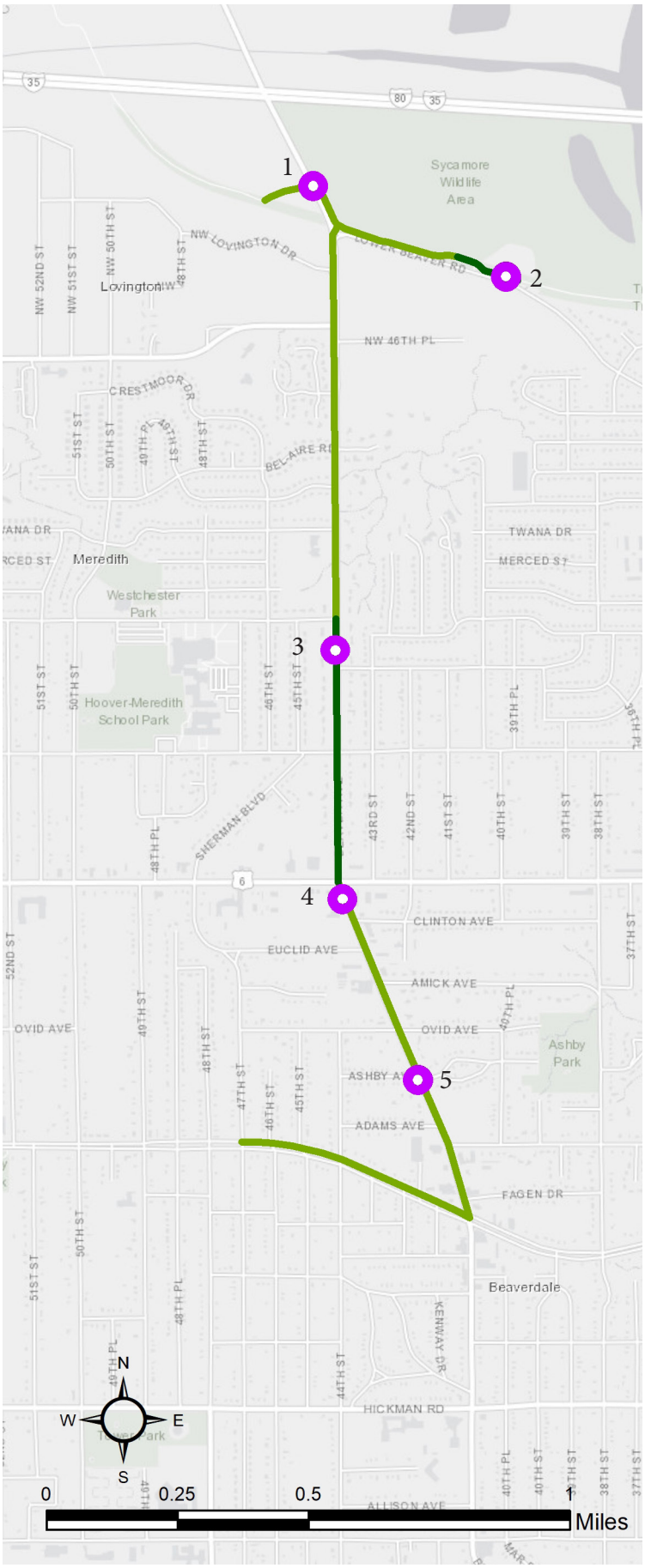
GAY LEA WILSON TRAIL

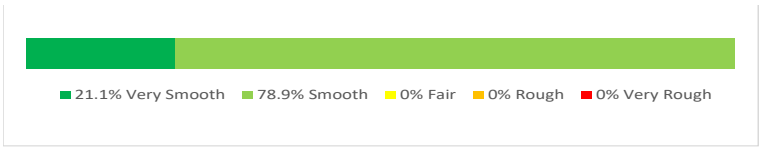




Miles: 4.75
Jurisdiction: Delaware; Des Moines
Surface Type: Asphalt, Concrete

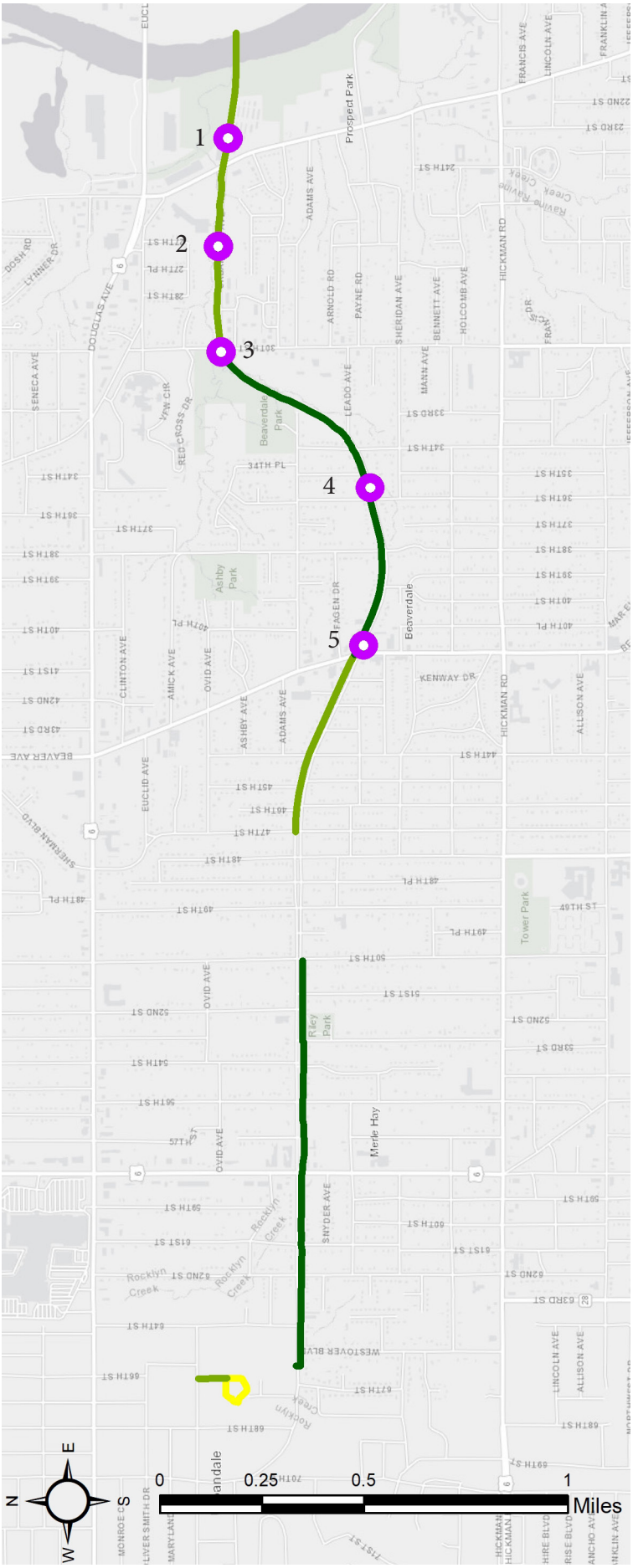
TRESTLE TO TRESTLE TRAIL

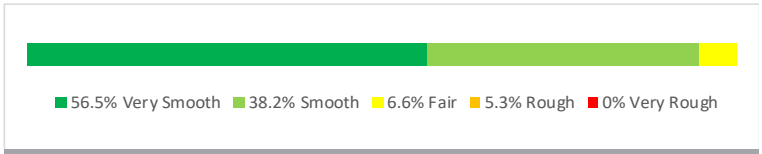




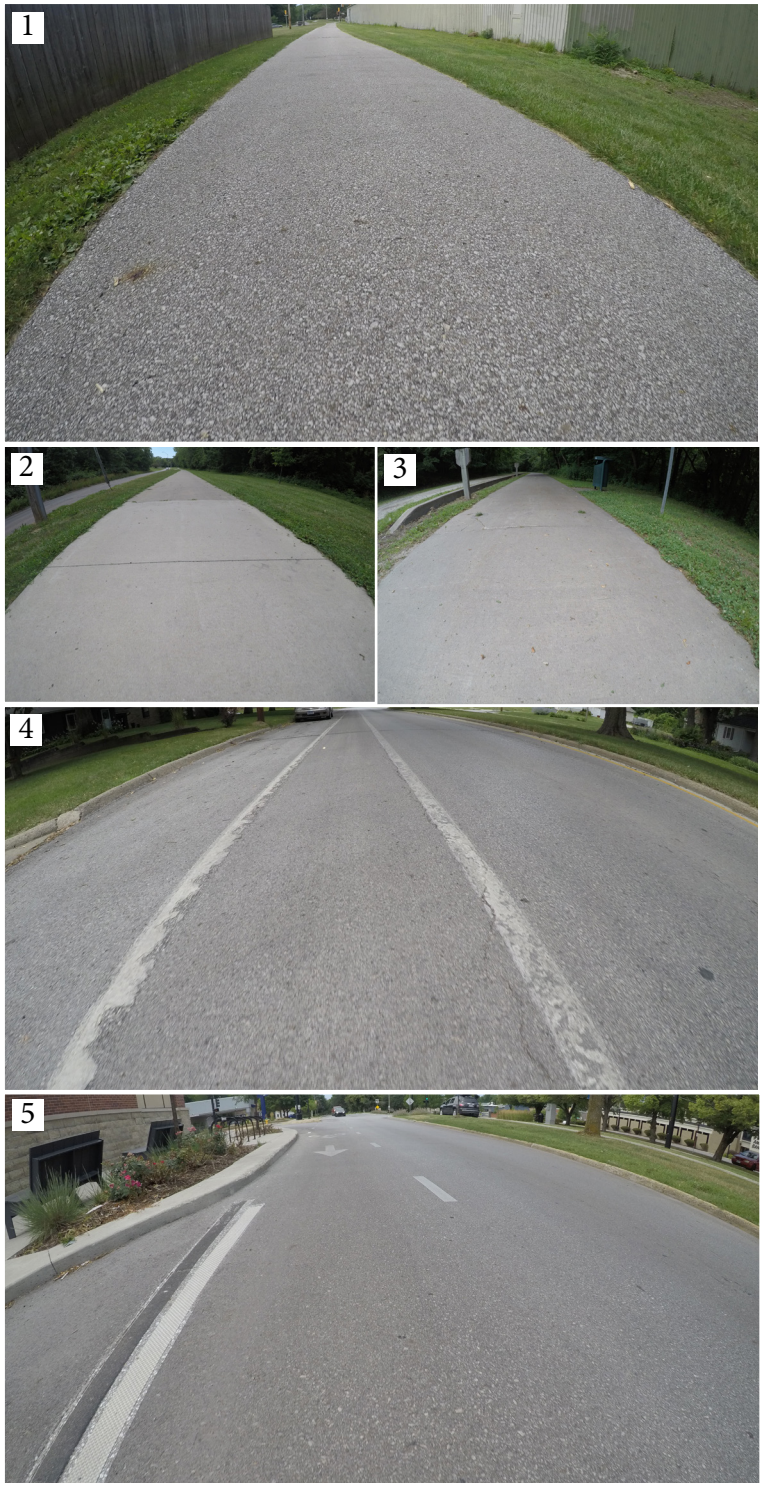
Miles: 2.97
Jurisdiction: Des Moines
Surface Type: Asphalt

INTER-URBAN TRAIL

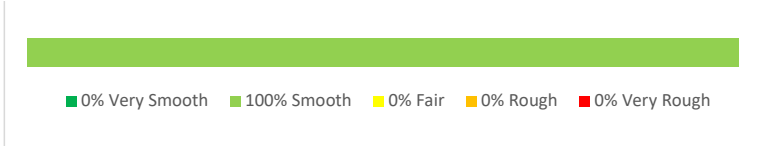




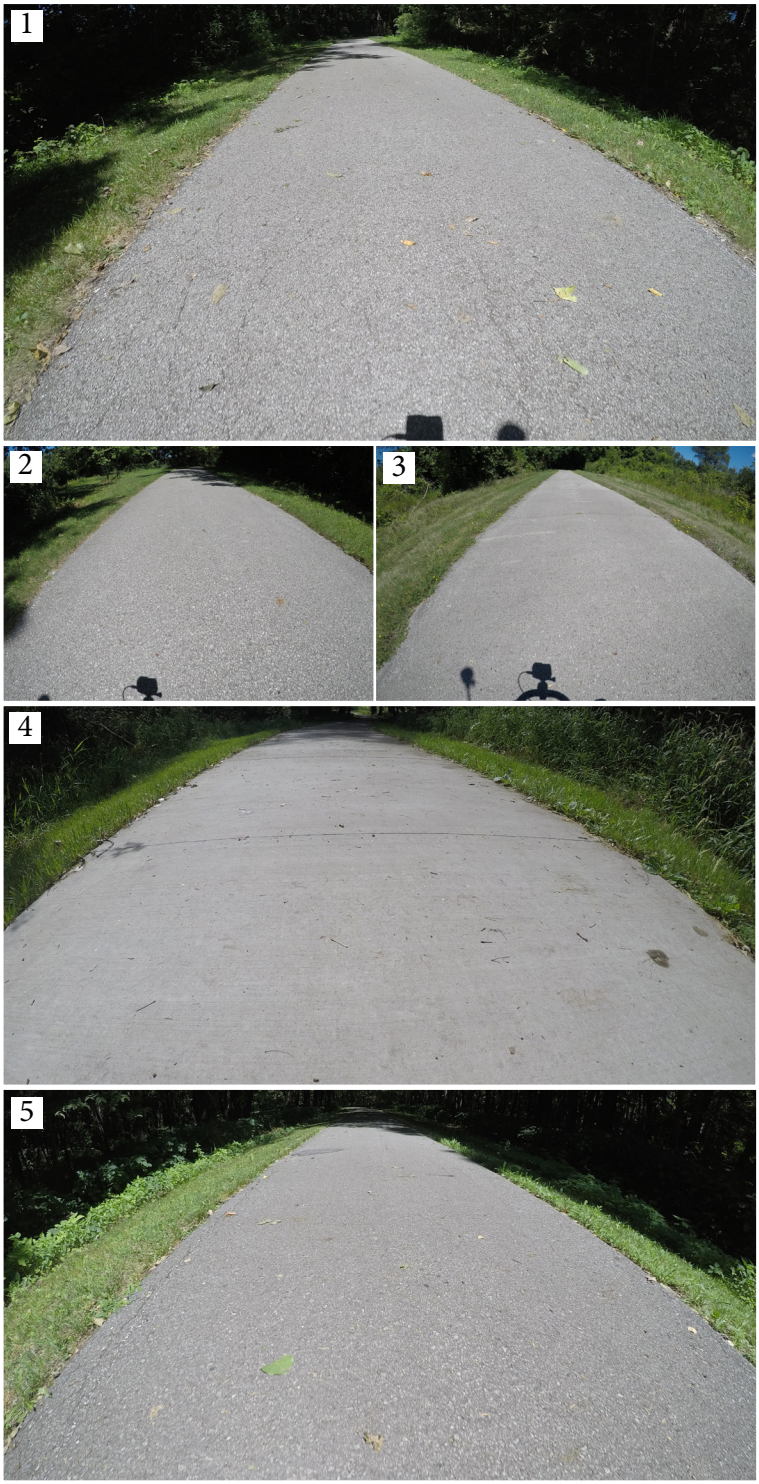
Miles: 3.45
Jurisdiction: Des Moines, Urbandale
Surface Type: Asphalt, Concrete



AMERICAN DISCOVERY TRAIL



Miles: 2.19
Jurisdiction: Des Moines
Surface Type: Asphalt, Concrete



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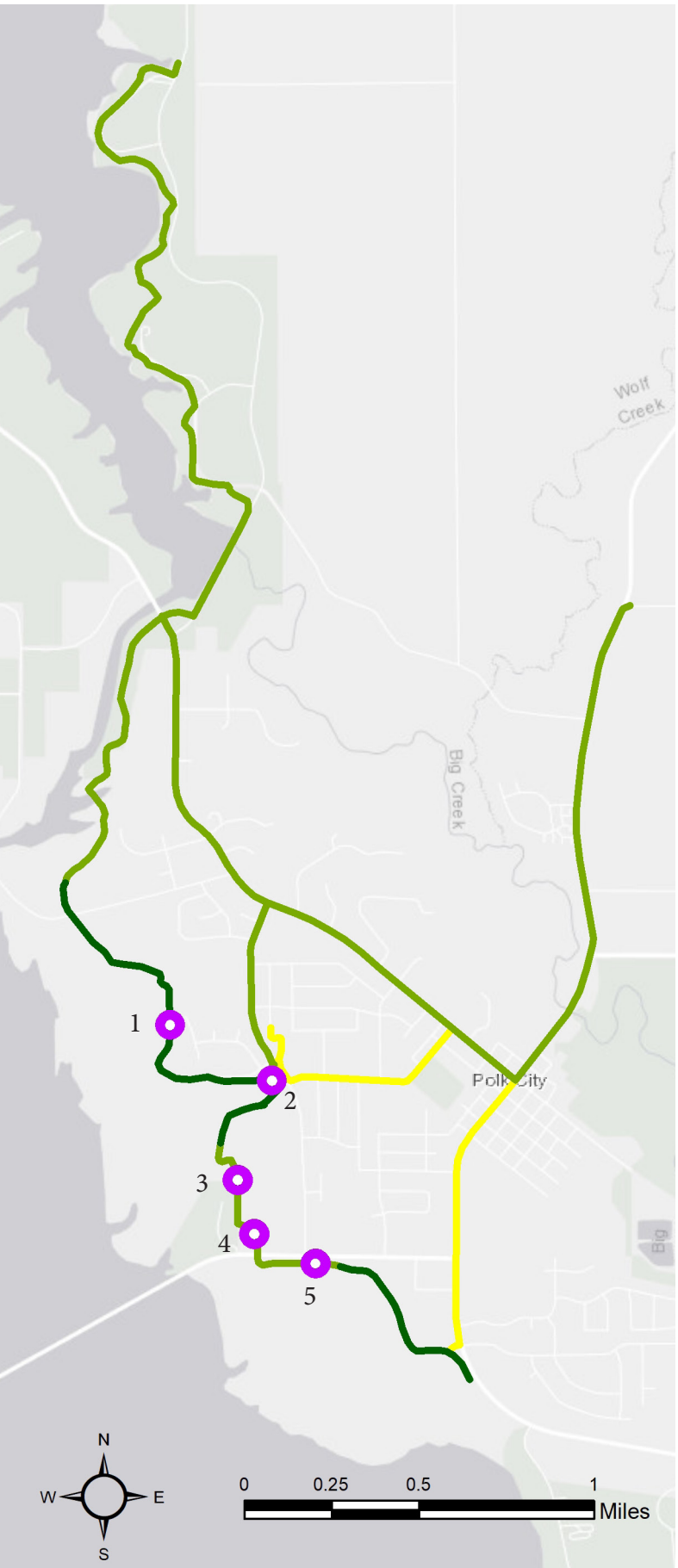
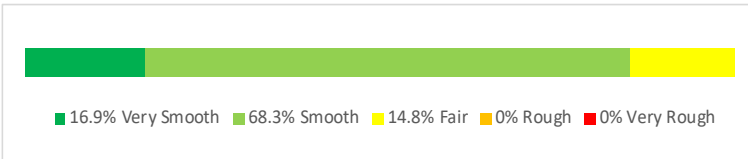
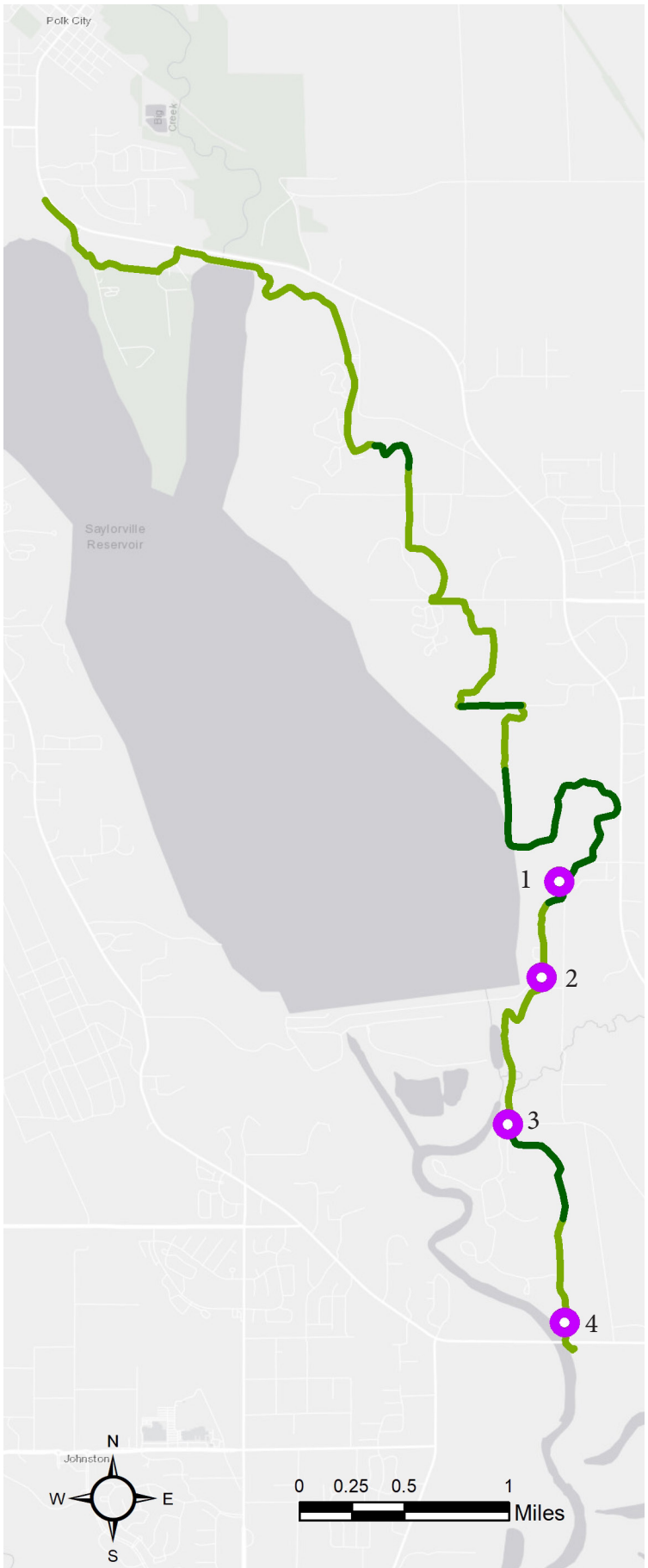
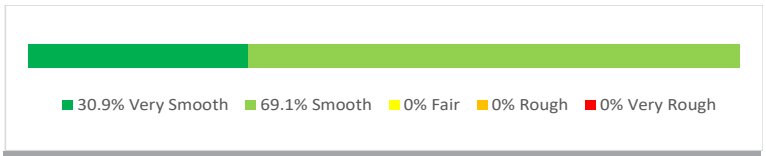




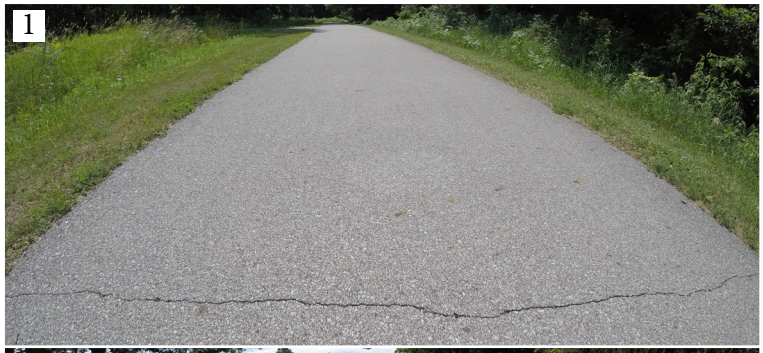
Miles: 11.20
Jurisdiction: Polk City
Surface Type: Asphalt

AMERICAN DISCOVERY TRAIL

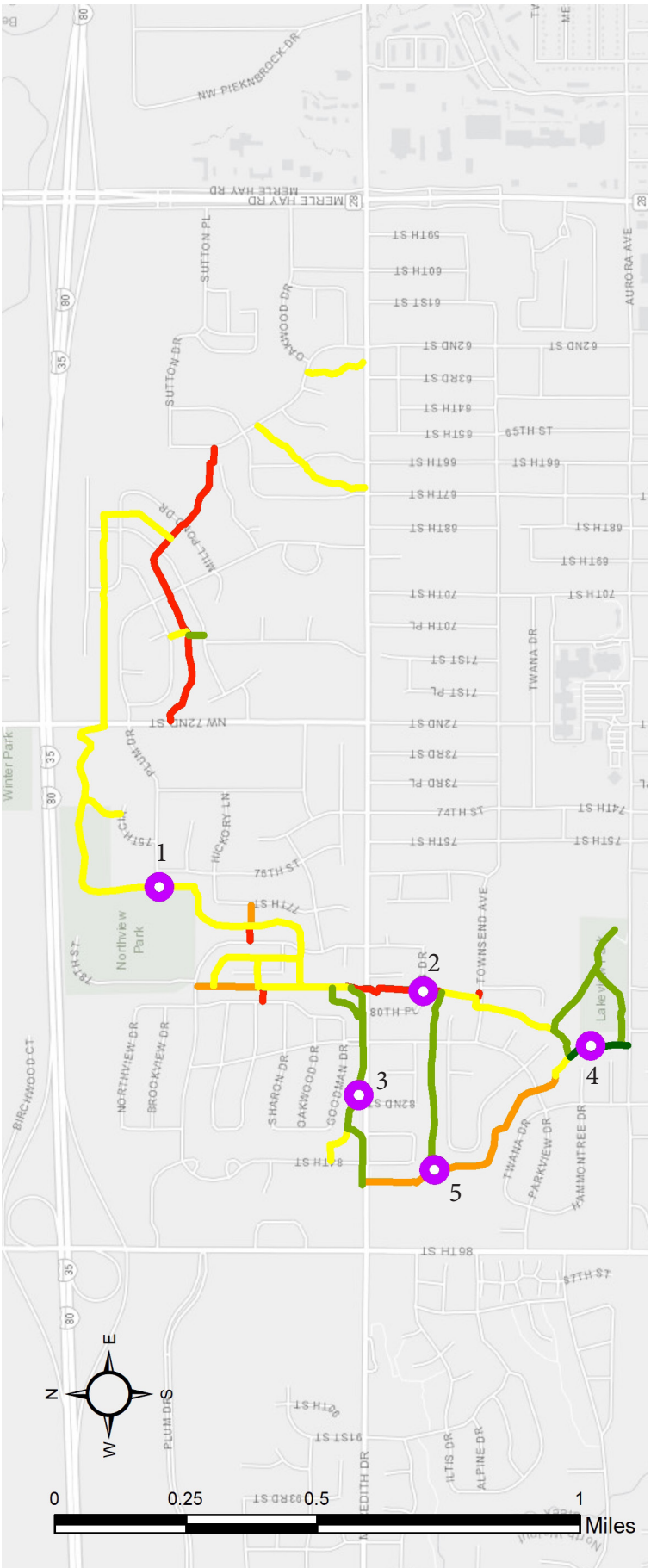


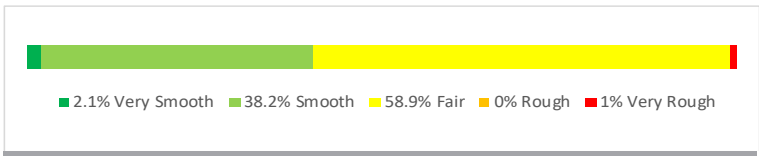


Miles: 9.33
Jurisdiction: Polk City
Surface Type: Asphalt



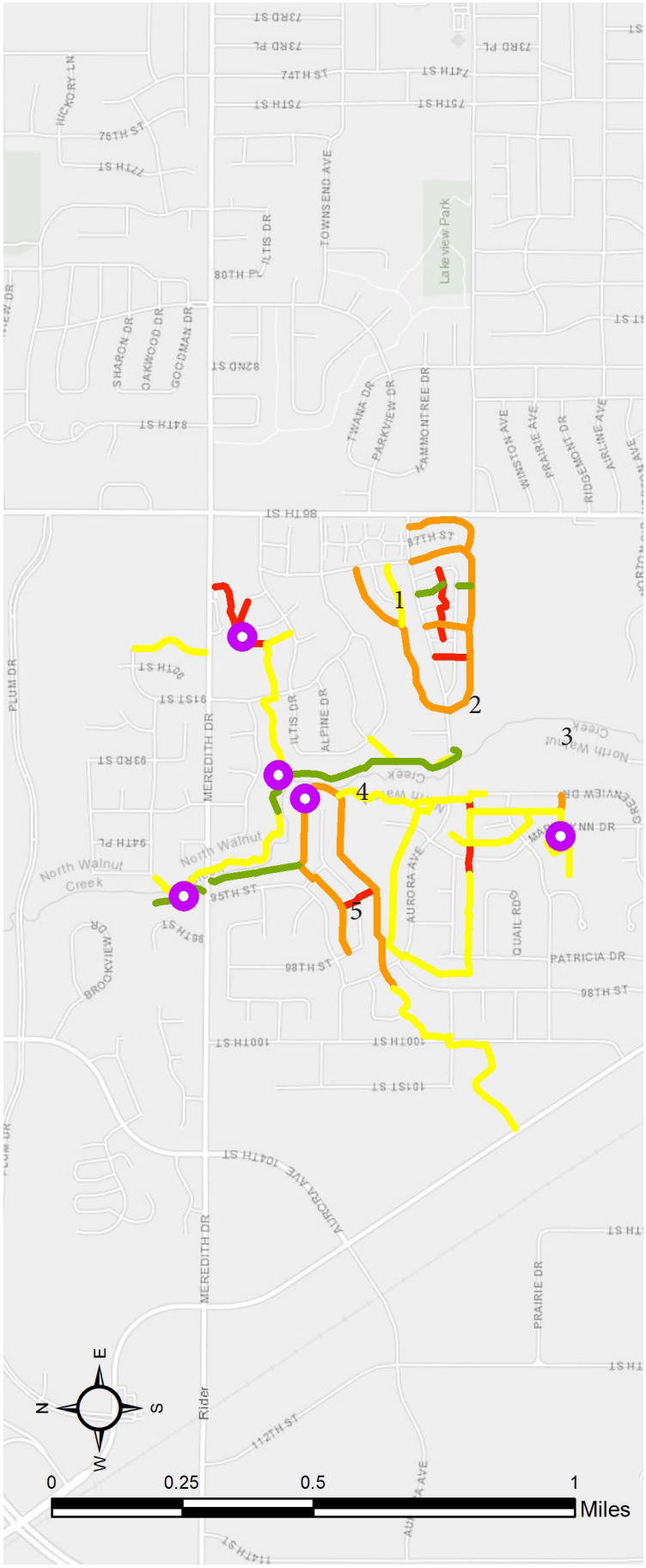
BROOKVIEW PARK; LAKEVIEW PARK; NORTHVIEW PARK

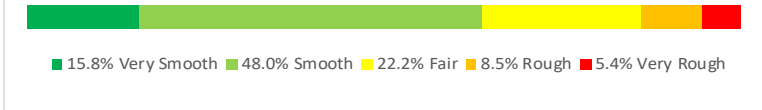




Miles: 5.70
Jurisdiction: Urbandale
Surface Type: Asphalt

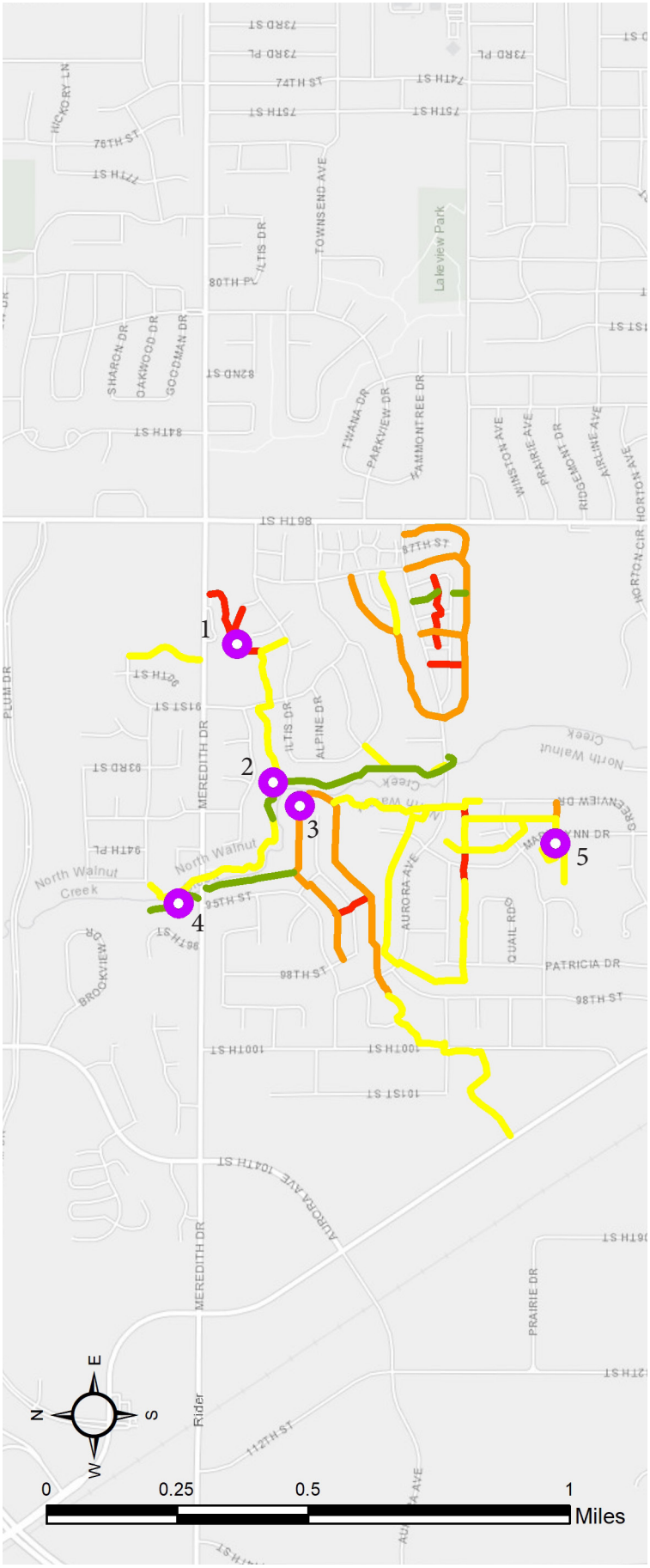
JOHNSTON TRAILS

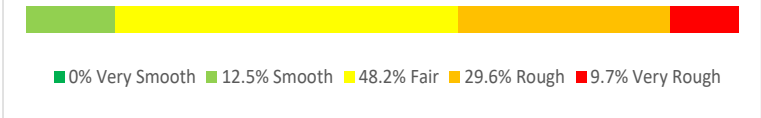




Miles: 27.13
Jurisdiction: Johnston
Surface Type: Asphalt, Concrete

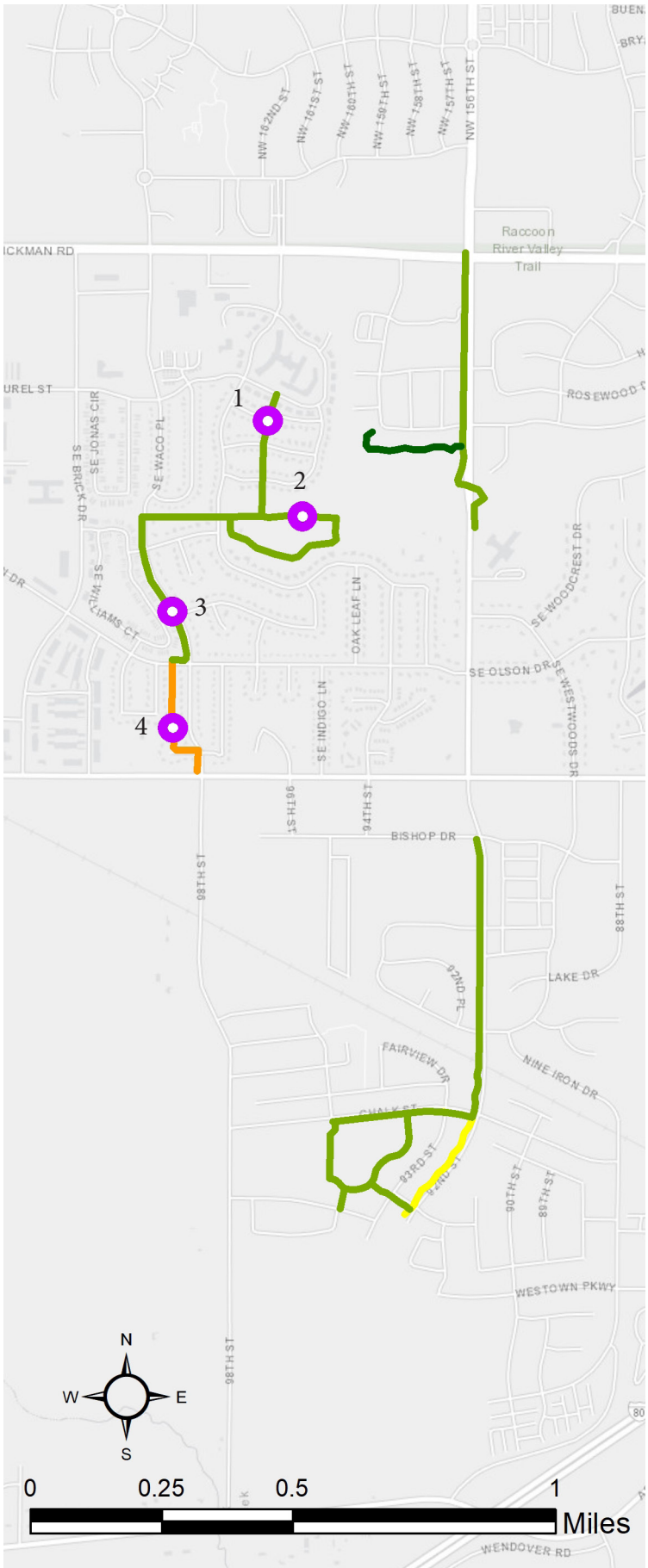
CROSS CREEK PARK; GOLF VIEW PARK TRAILS

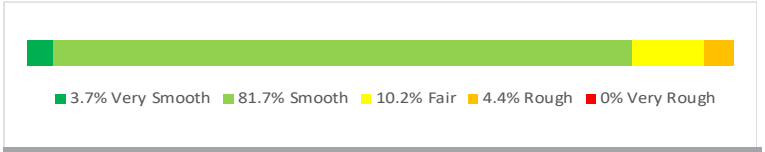




Miles: 7.15
Jurisdiction: Urbandale
Surface Type: Asphalt

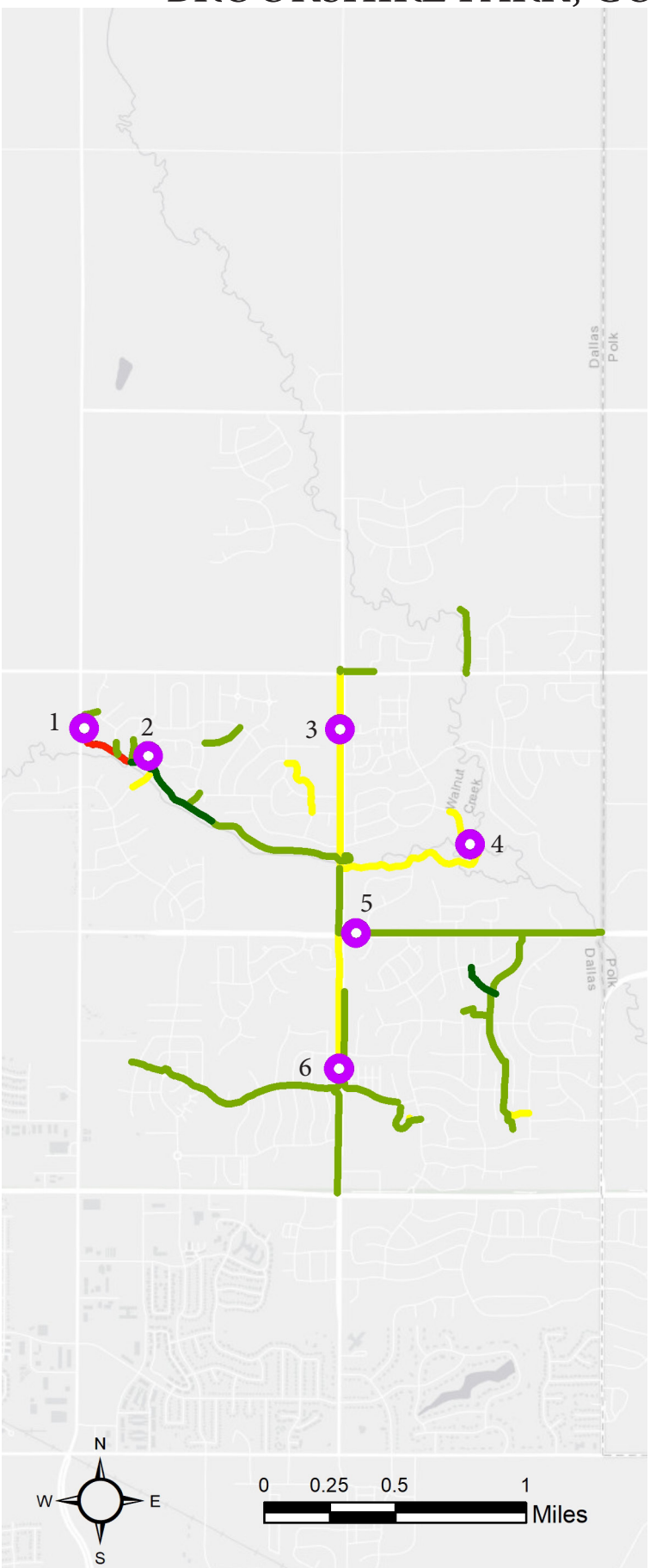
RIDGE POINT PARK TRAIL

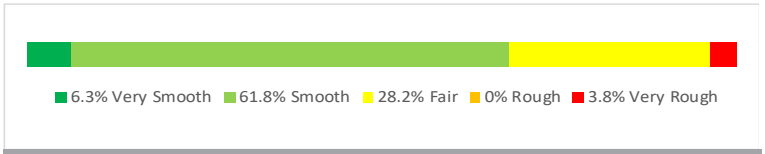




Miles: 5.91
Jurisdiction: Waukee
Surface Type: Concrete

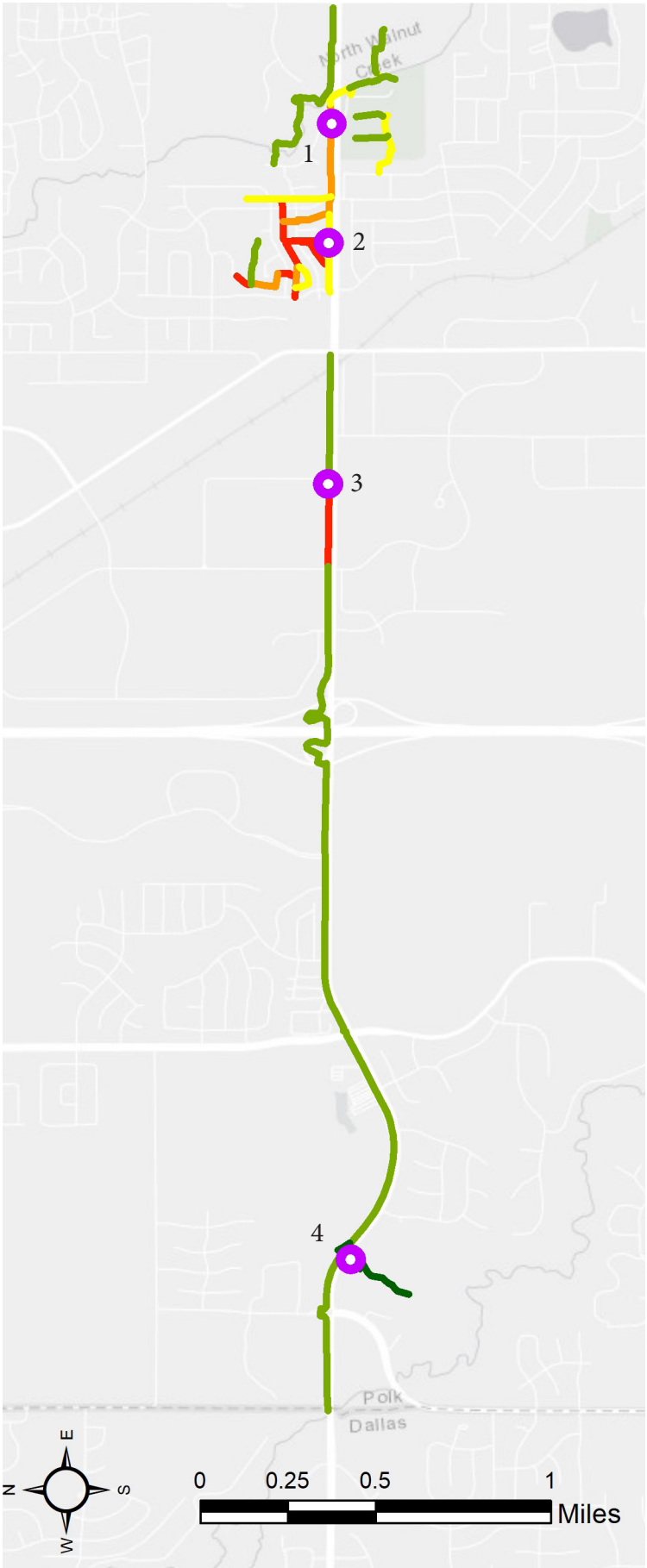
WALNUT CREEK REGIONAL PARK TRAILS; BROOKSHIRE PARK; COUNTRY CLUB GLEN PARK

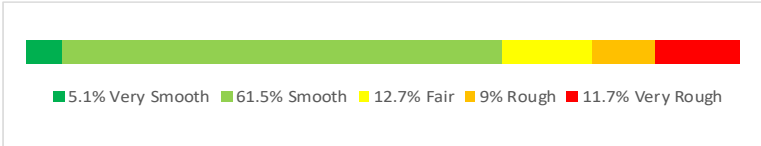




Miles: 9.14
Jurisdiction: Clive, Urbandale
Surface Type: Asphalt, Concrete

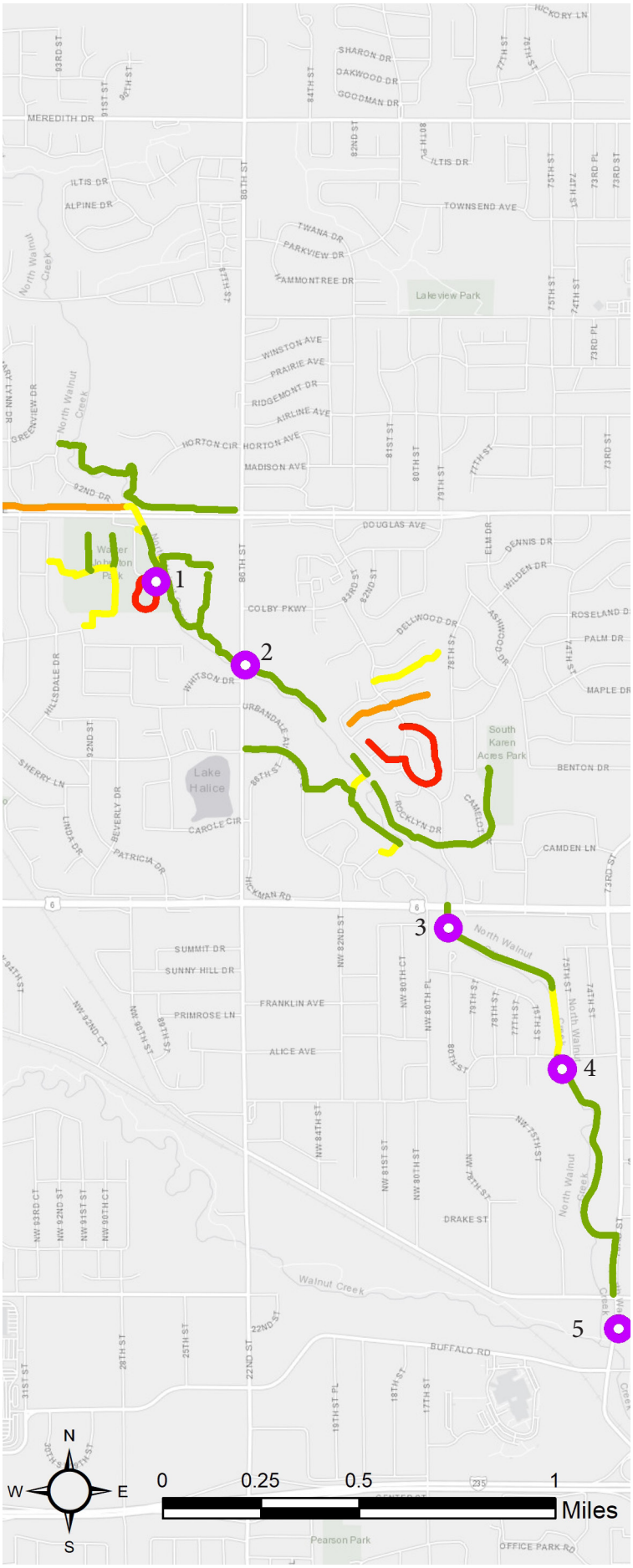
URBANDALE TRAILS

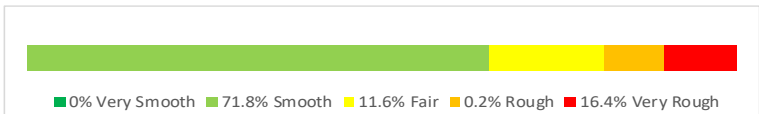




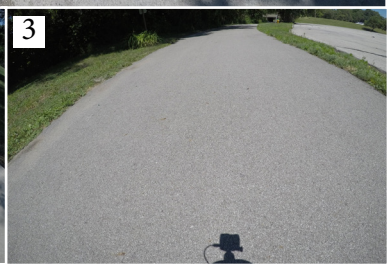
Miles: 7.17
Jurisdiction: Urbandale
Surface Type: Asphalt, Concrete

AMERICAN DISCOVERY TRAIL

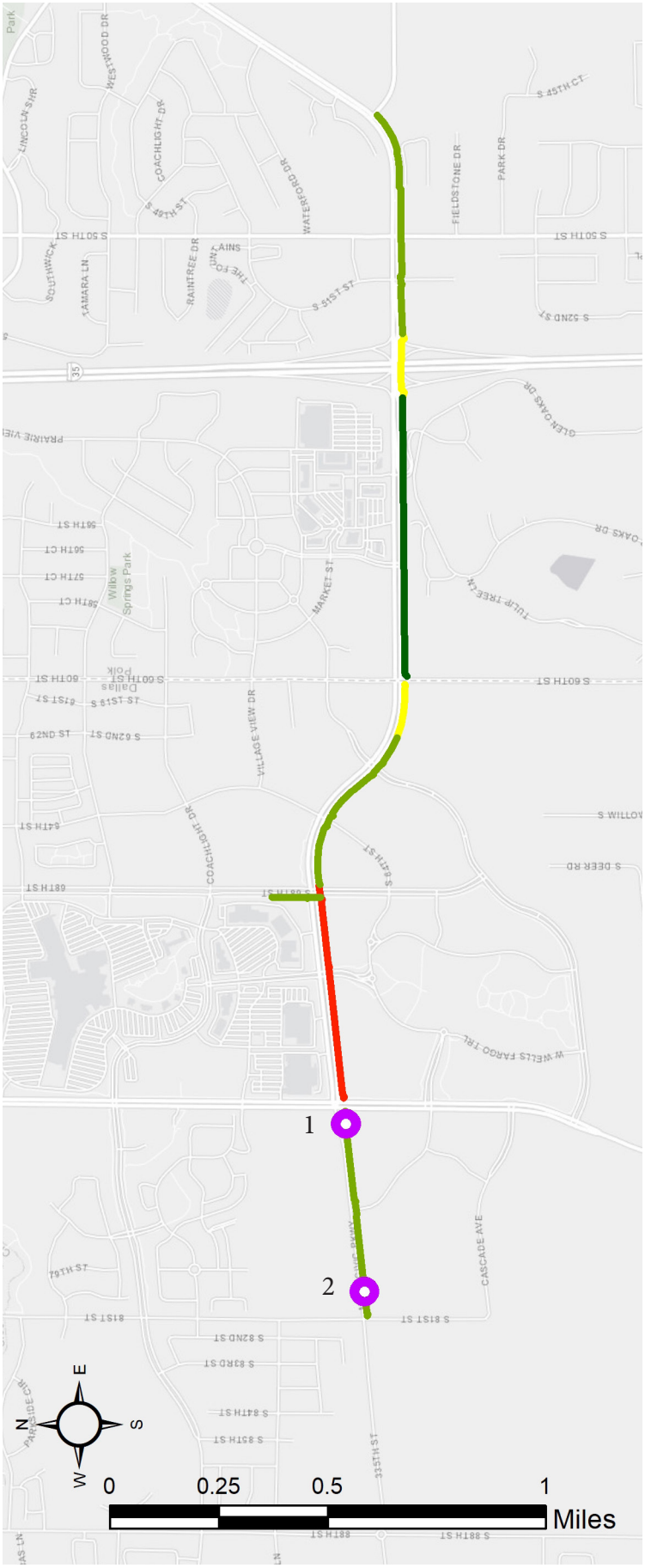


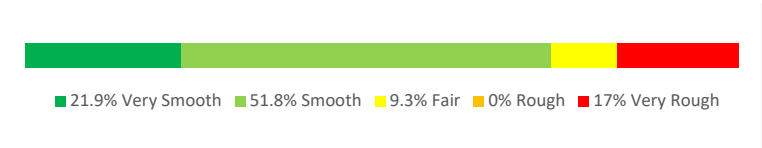


Miles: 6.32
Jurisdiction: Urbandale, Windsor Heights
Surface Type: Asphalt, Concrete



MILLS CIVIC PARKWAY TRAIL



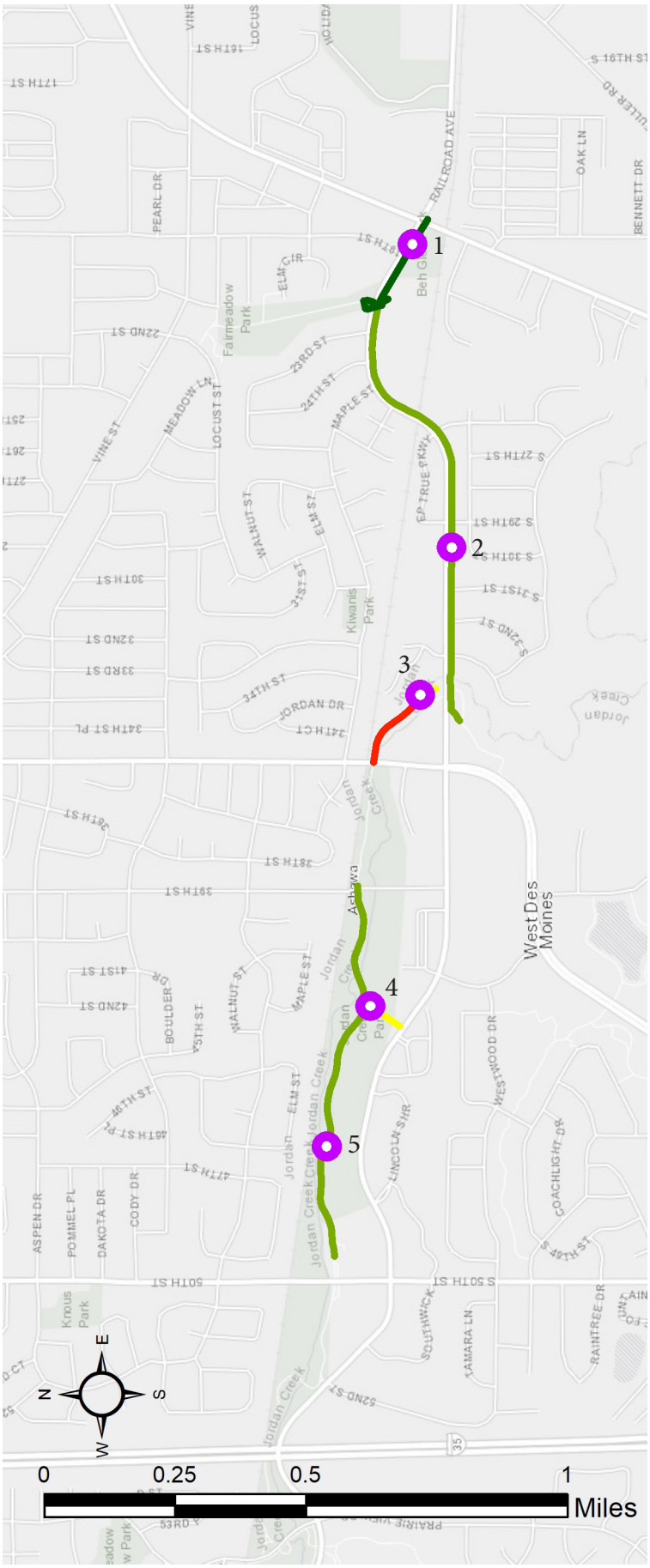


Miles: 2.81
Jurisdiction: West Des Moines
Surface Type: Concrete

1

2

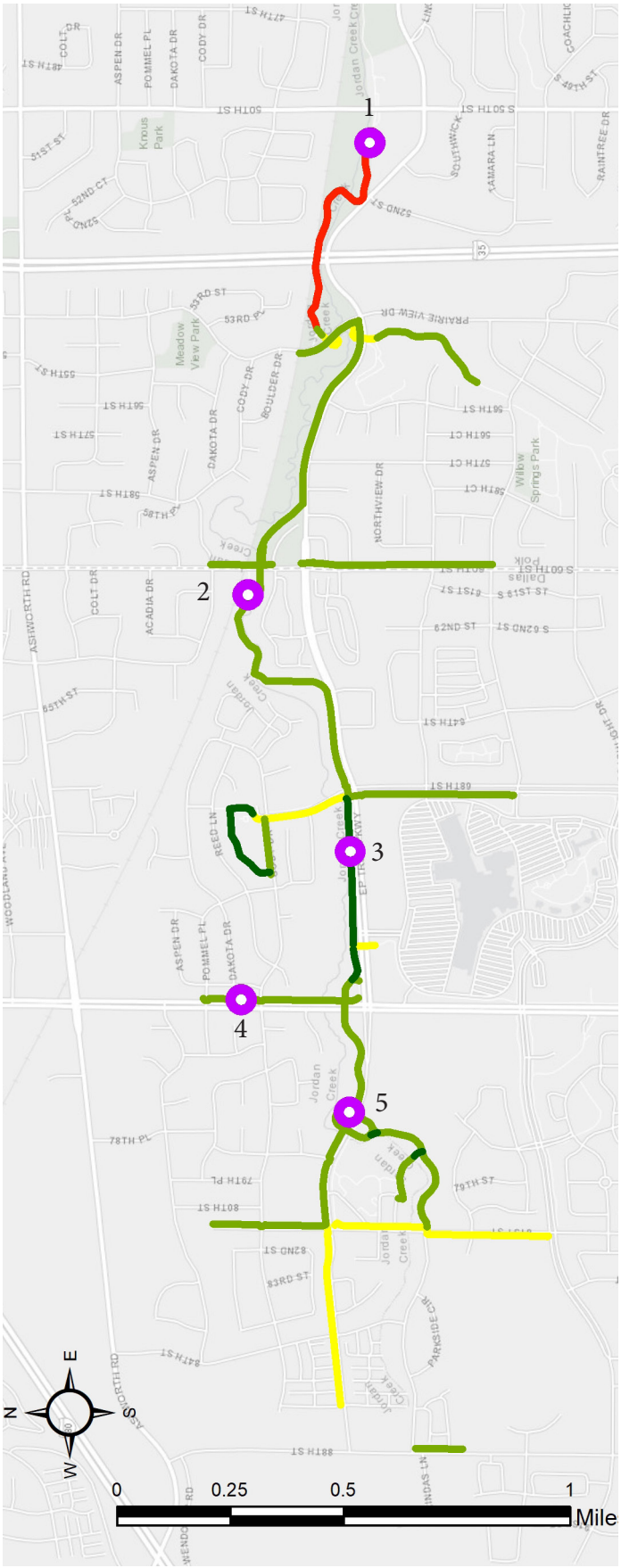
JORDAN CREEK AND JORDAN CREEK GREENWAY TRAILS

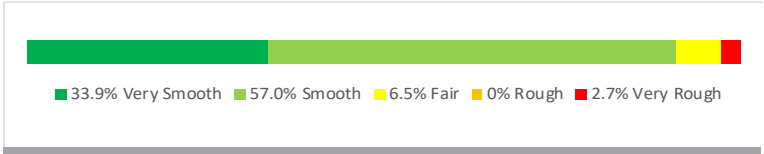


12.3% Very Smooth | 74.4% Smooth | 4.7% Fair | 0% Rough | 8.6% Very Rough

Miles: 2.46
Jurisdiction: West Des Moines
Surface Type: Asphalt

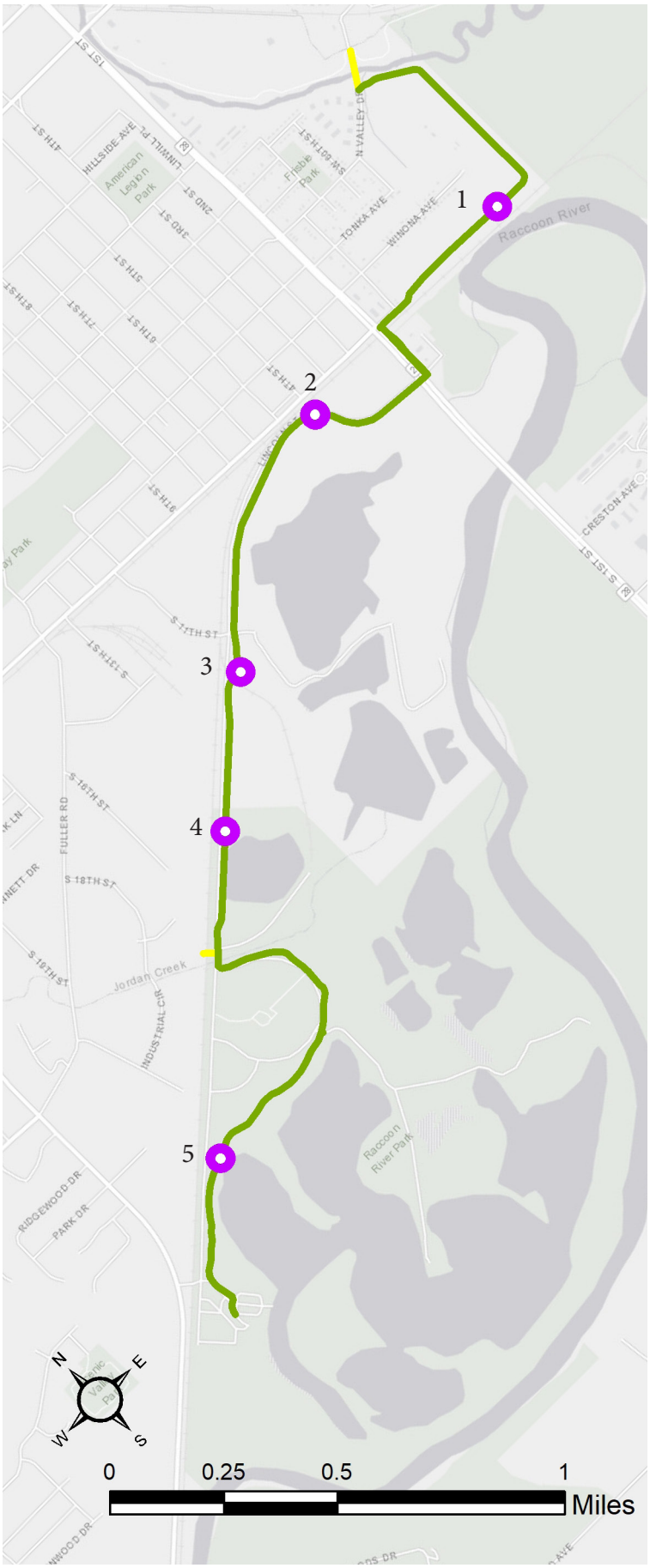
JORDAN CREEK, 60TH ST, 68TH ST, CODY DR, WILD ROSE PARK, JORDAN CREEK PRWY, EP TRUE PKWY ST, BROOKVIEW PARK TRAILS

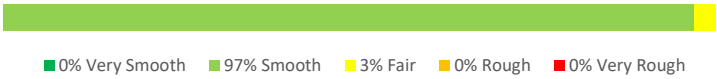




Miles: 20.50
Jurisdiction: West Des Moines
Surface Type: Asphalt, Concrete

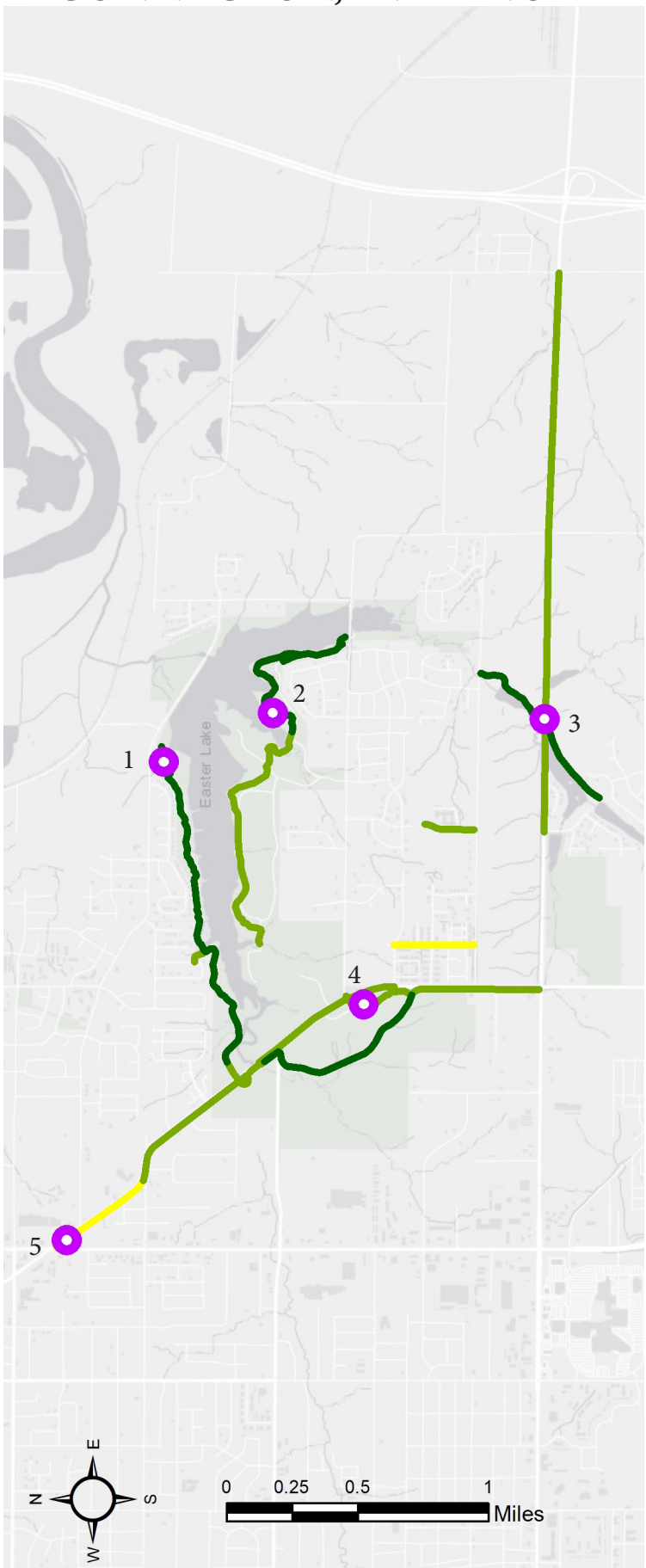
WALNUT CREEK, LEVEE, RACCOON RIVER PARK TRAILS

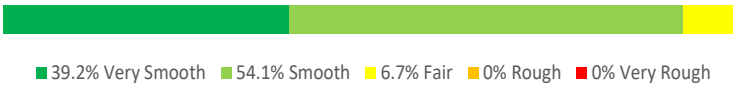




Miles: 3.91
Jurisdiction: West Des Moines
Surface Type: Asphalt

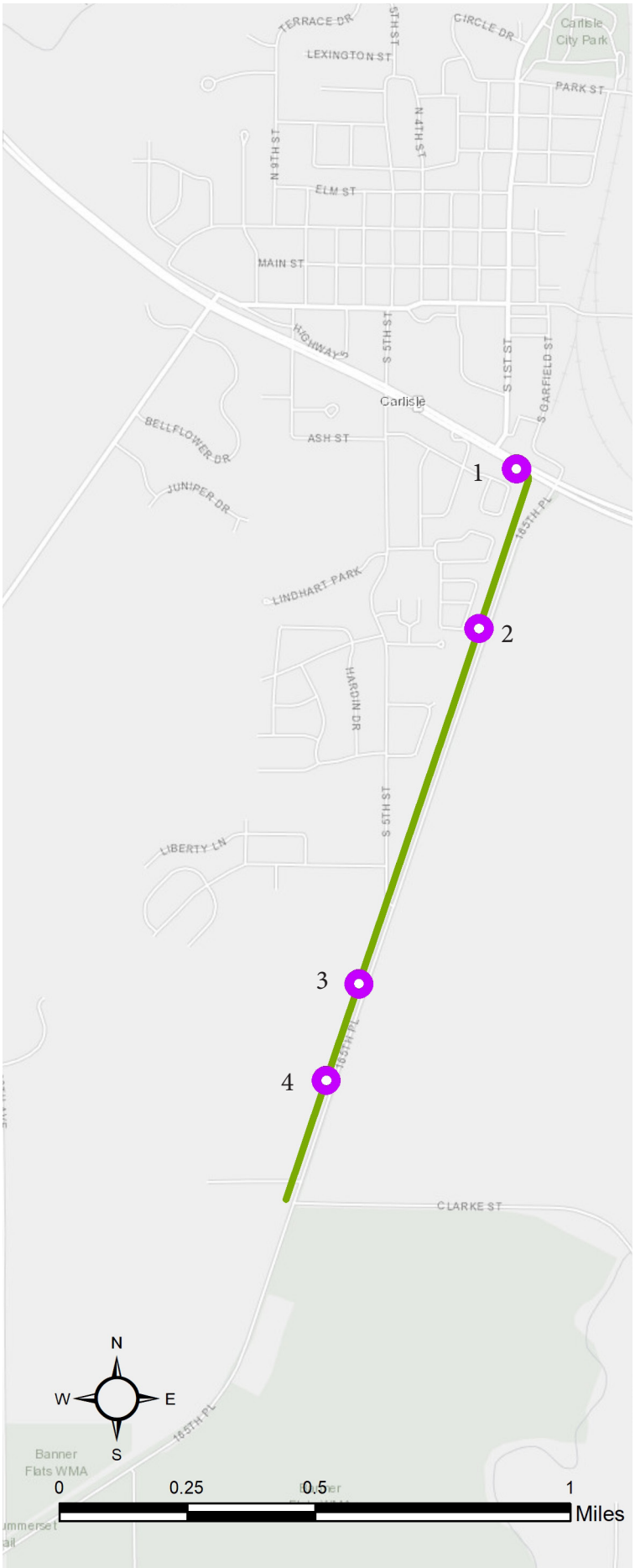
EASTER LAKE SPINE, MARK C. ACKELSON, EASTER LAKE CONNECTOR, INDIANOLA AVENUE, HARRY PIPER PARKWAY

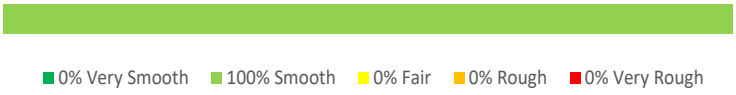




Miles: 10.12
Jurisdiction: Des Moines
Surface Type: Asphalt, Concrete

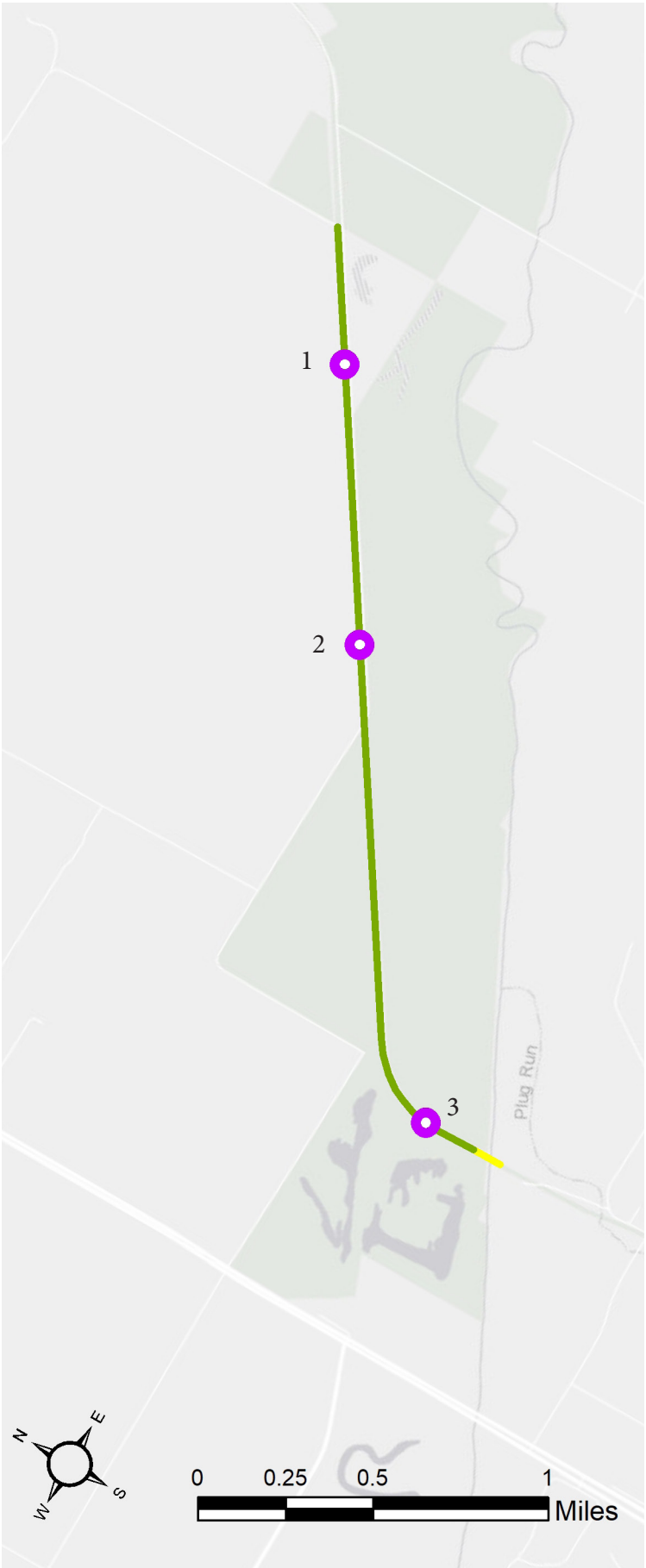
SUMMERSET TRAIL

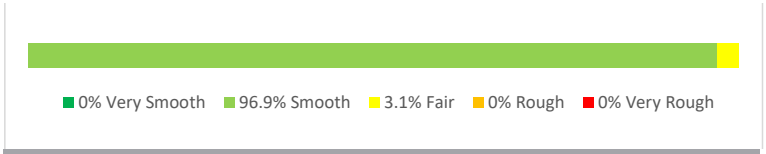




Miles: 1.52
Jurisdiction: Carlisle
Surface Type: Asphalt

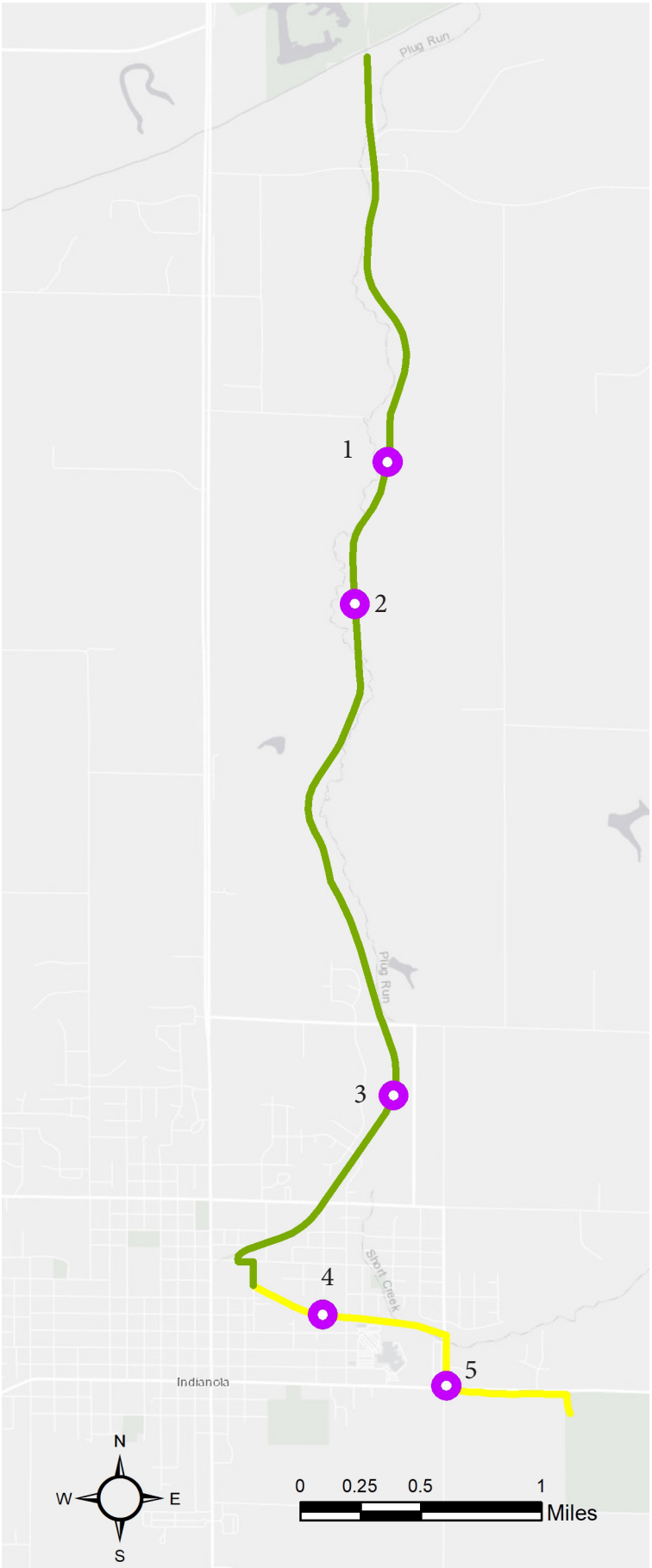
SUMMERSET TRAIL

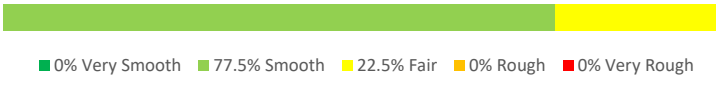




Miles: 3.76
Jurisdiction: Indianola
Surface Type: Asphalt

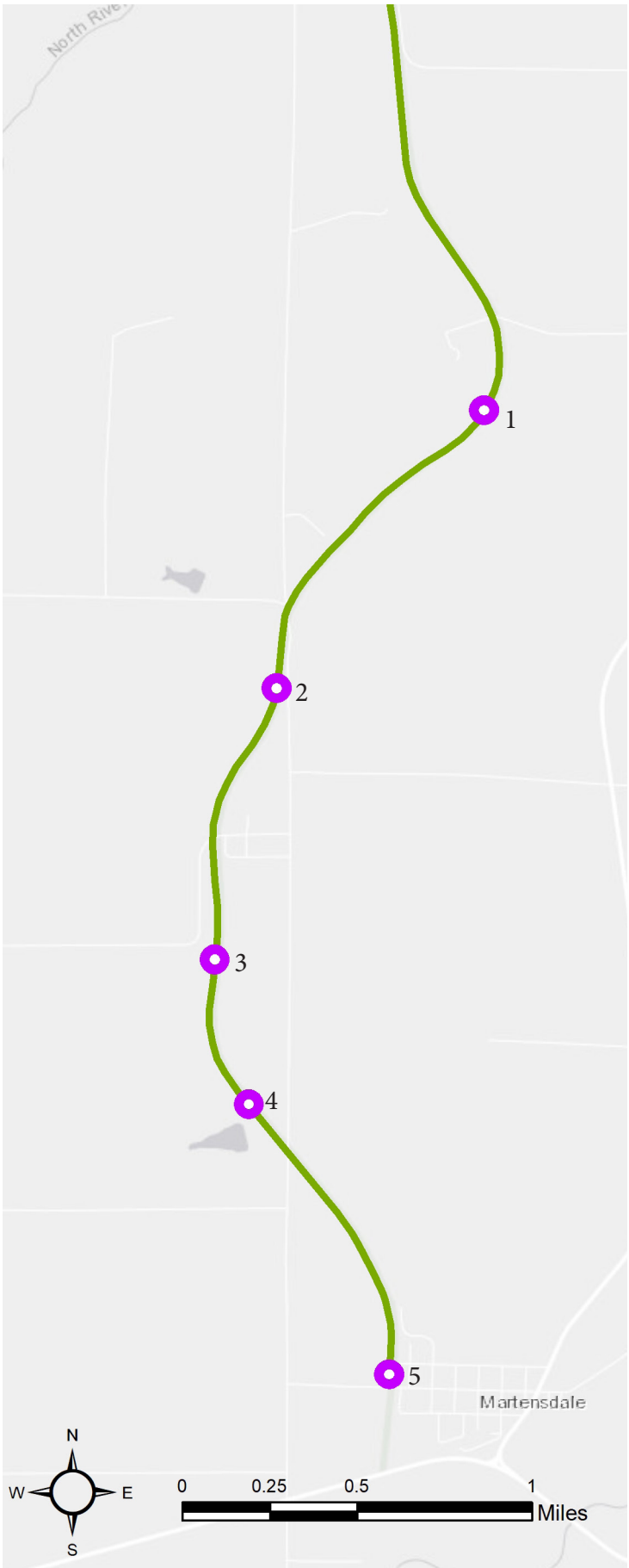
SUMMERSET TRAIL

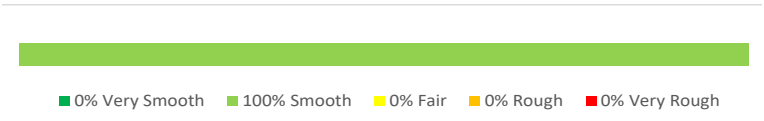




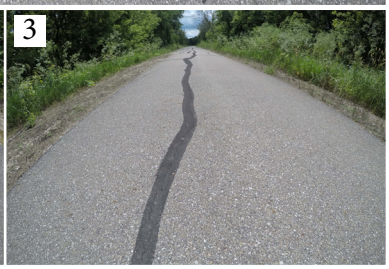
Miles: 7.15
Jurisdiction: Indianola
Surface Type: Asphalt

GREAT WESTERN TRAIL

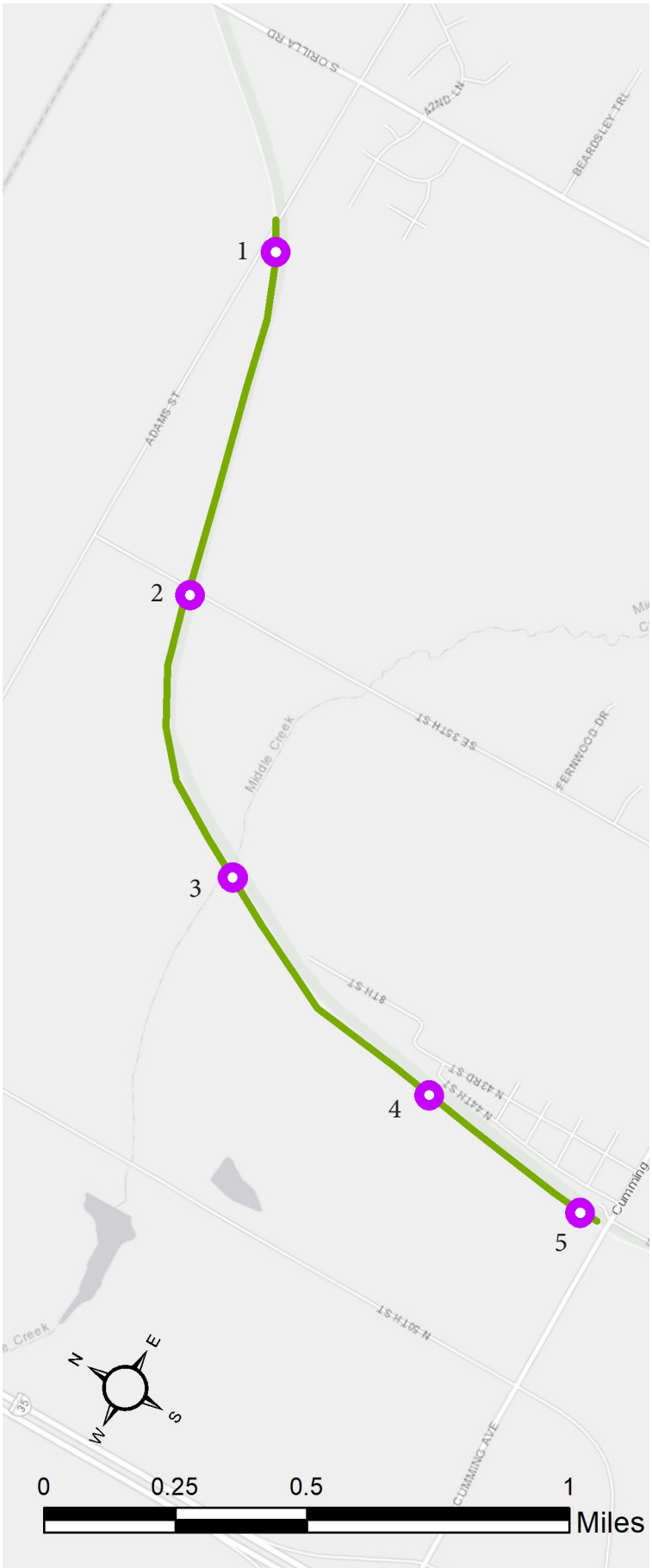


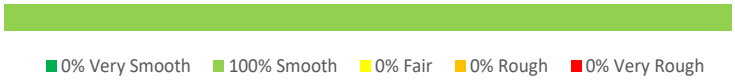


Miles:: 13.17
Jurisdiction: Warren County
Surface Type: Asphalt



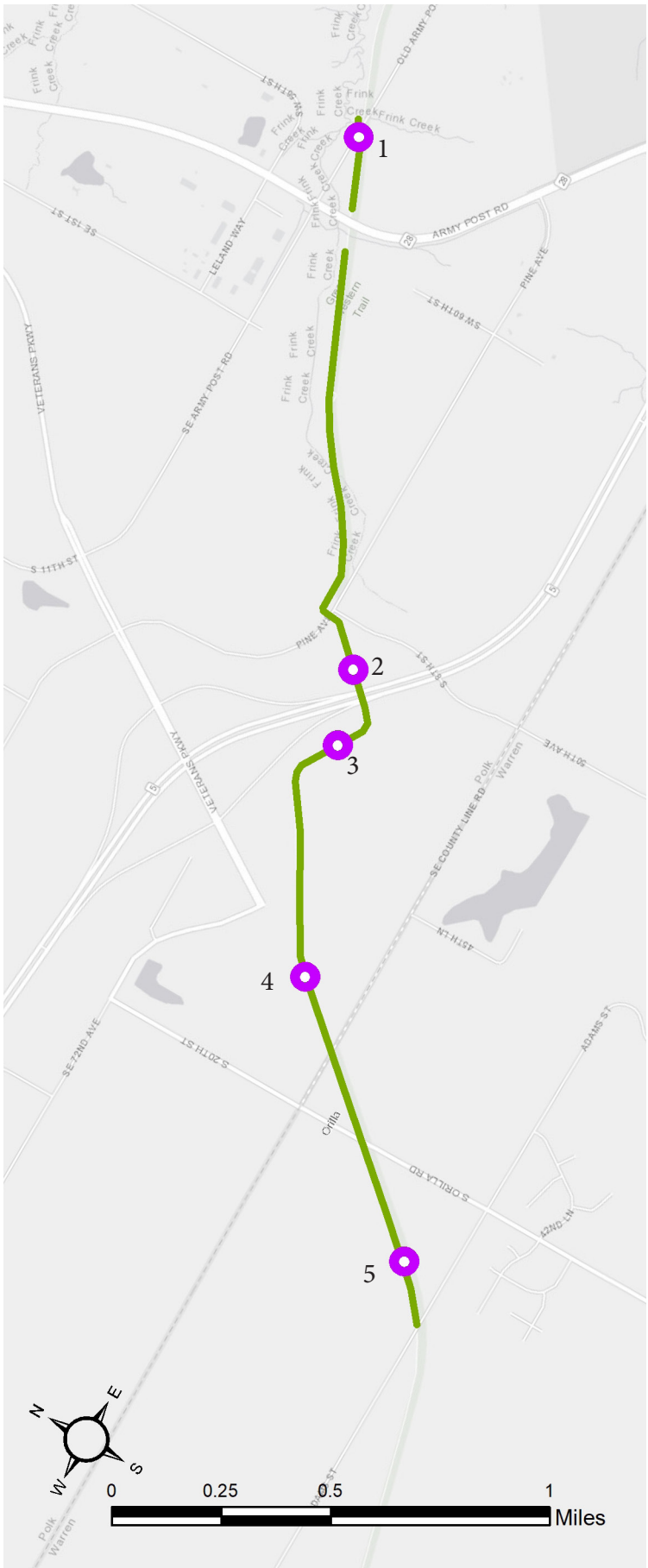
GREAT WESTERN TRAIL

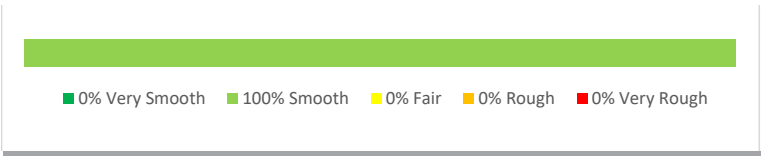




Miles: 2.28
Jurisdiction: Cumming
Surface Type: Asphalt

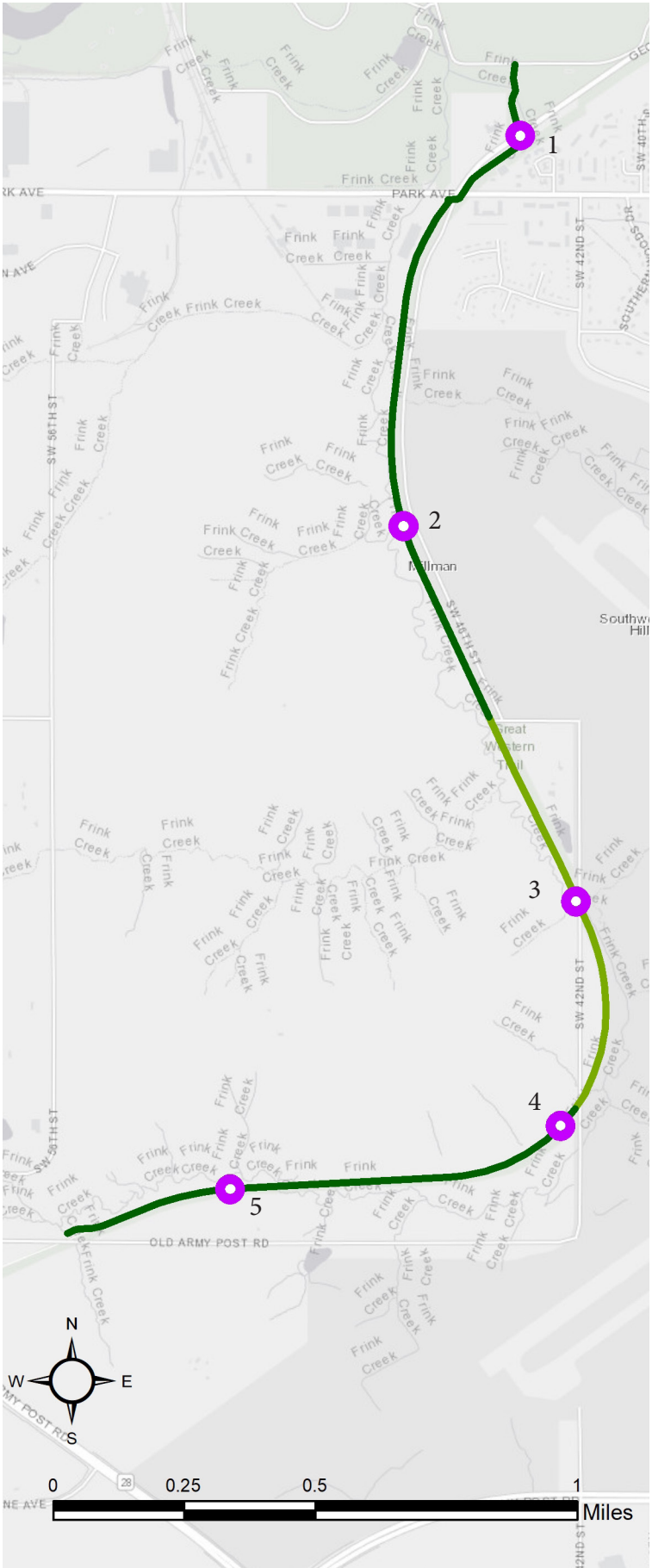
GREAT WESTERN TRAIL

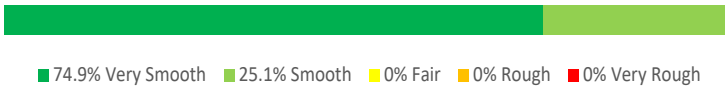




Miles: 2.83
Jurisdiction: Des Moines
Surface Type: Asphalt, Concrete

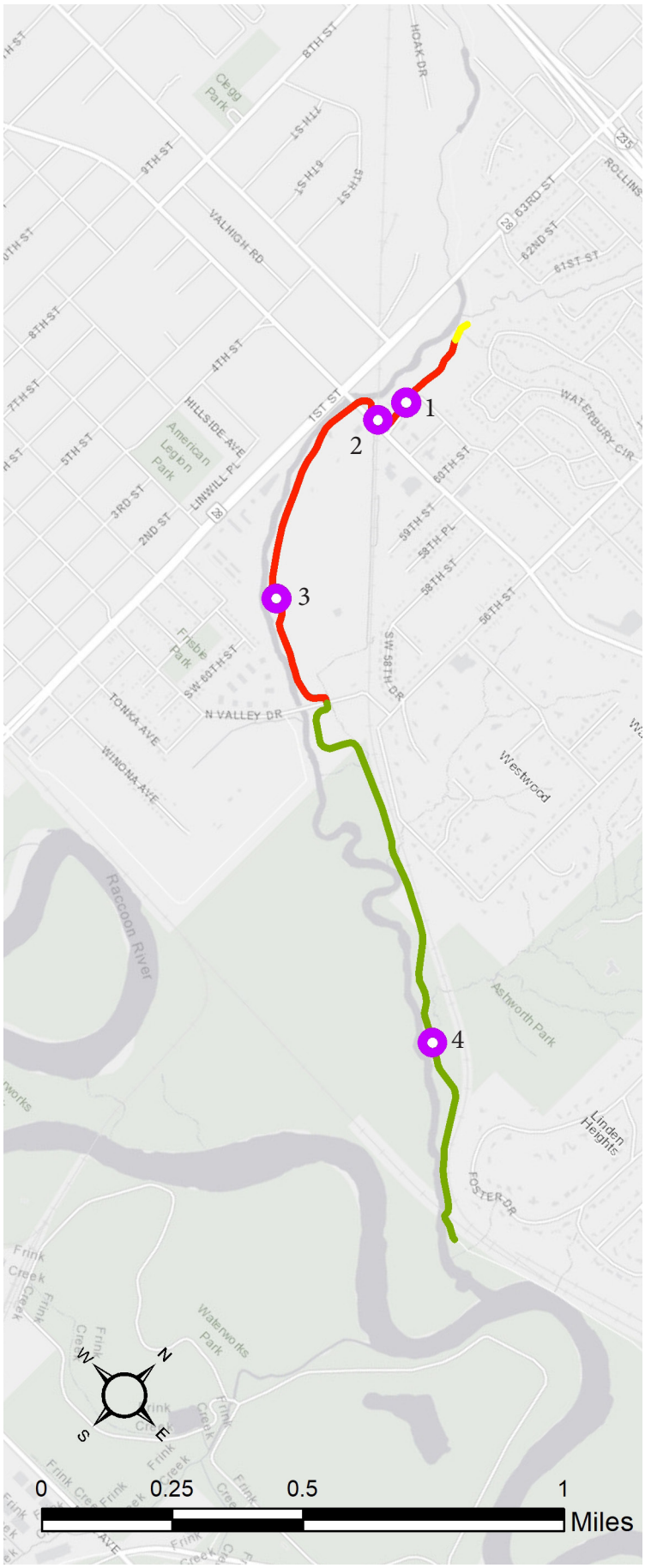
GREAT WESTERN TRAIL

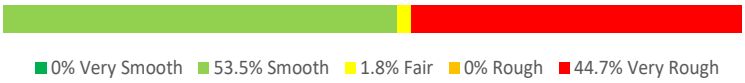




Miles: 3.42
Jurisdiction: : Des Moines
Surface Type: Asphalt

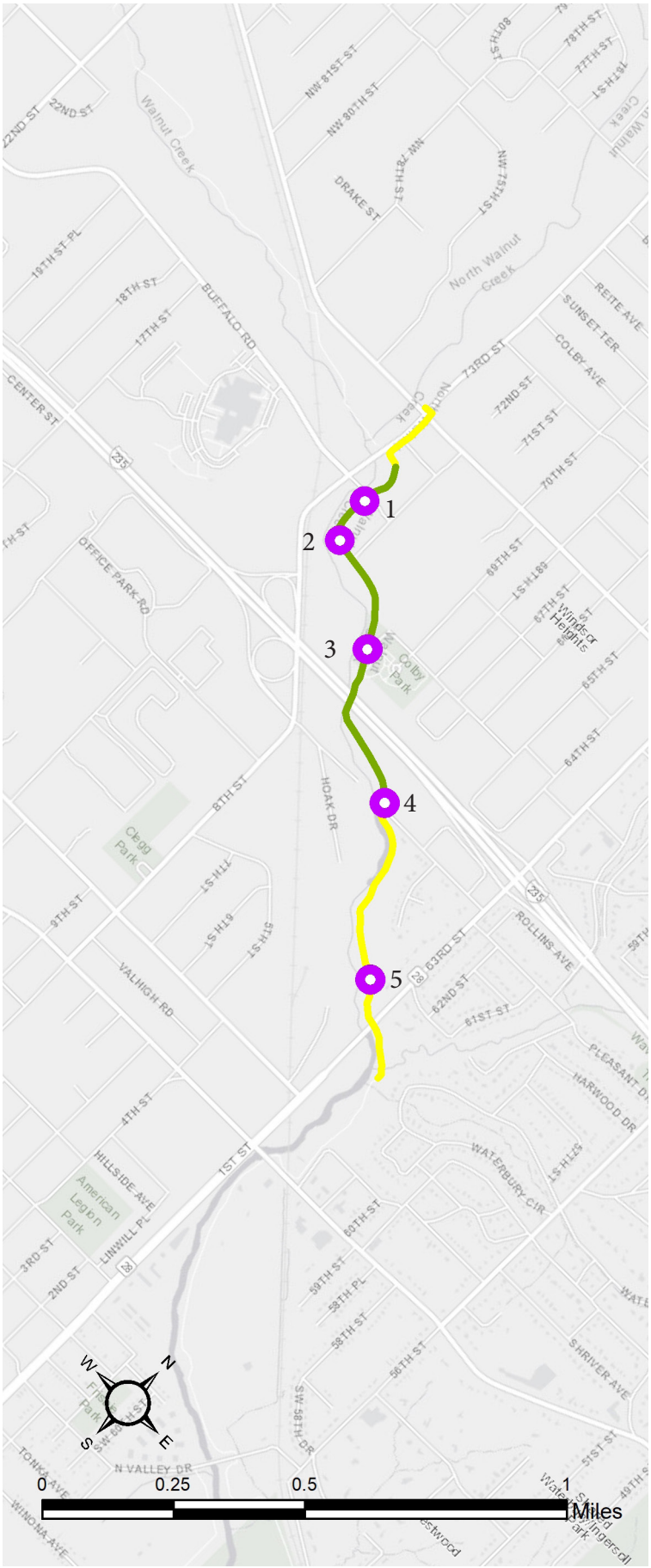
WALNUT CREEK AND BILL RILEY TRAILS

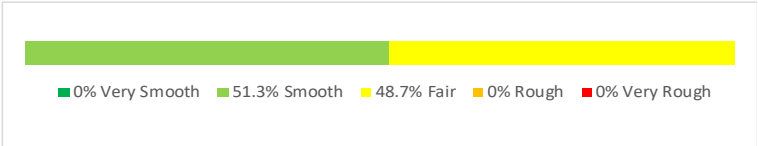




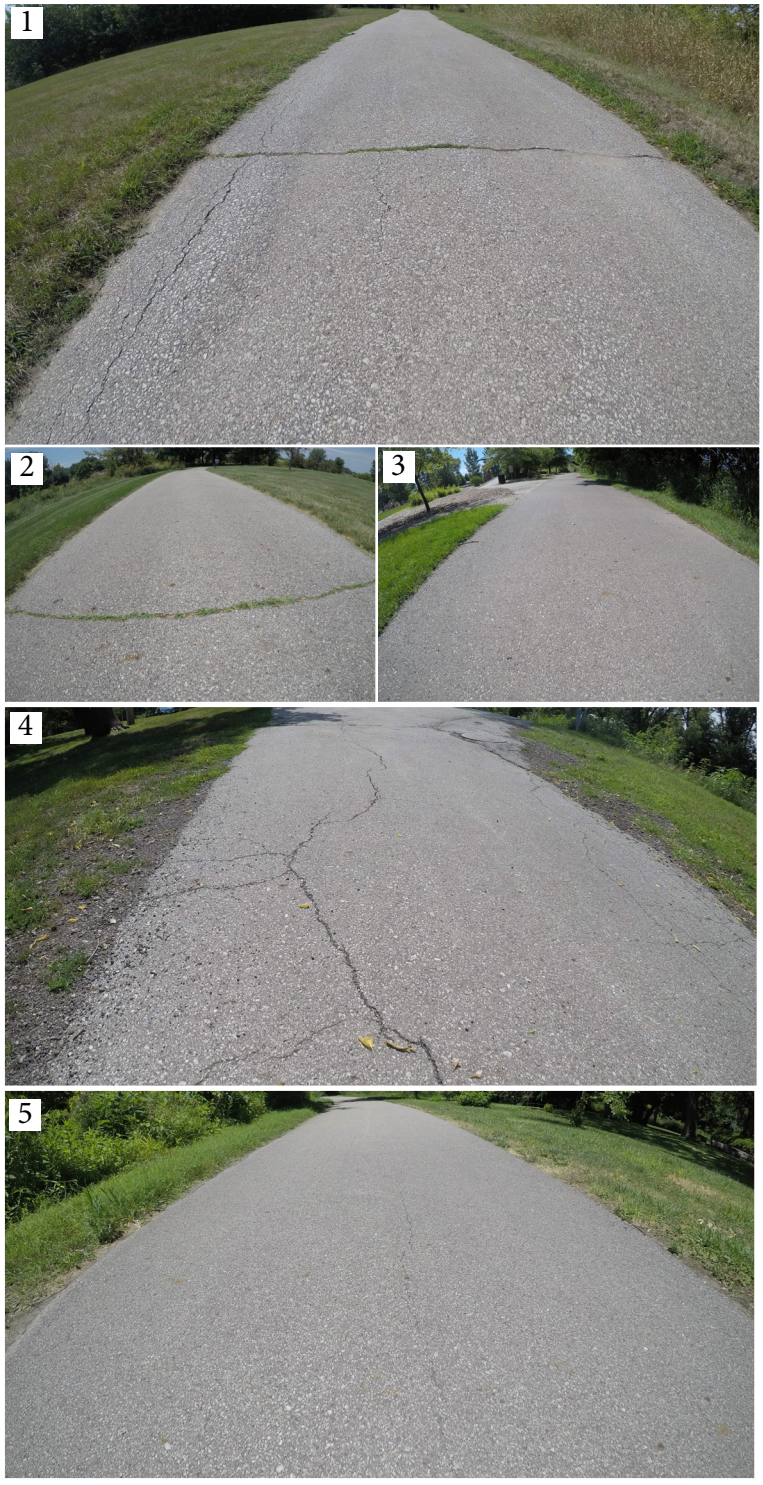
Miles: 2.13
Jurisdiction: Des Moines
Surface Type: Asphalt

AMERICAN DISCOVERY AND WALNUT CREEK TRAILS

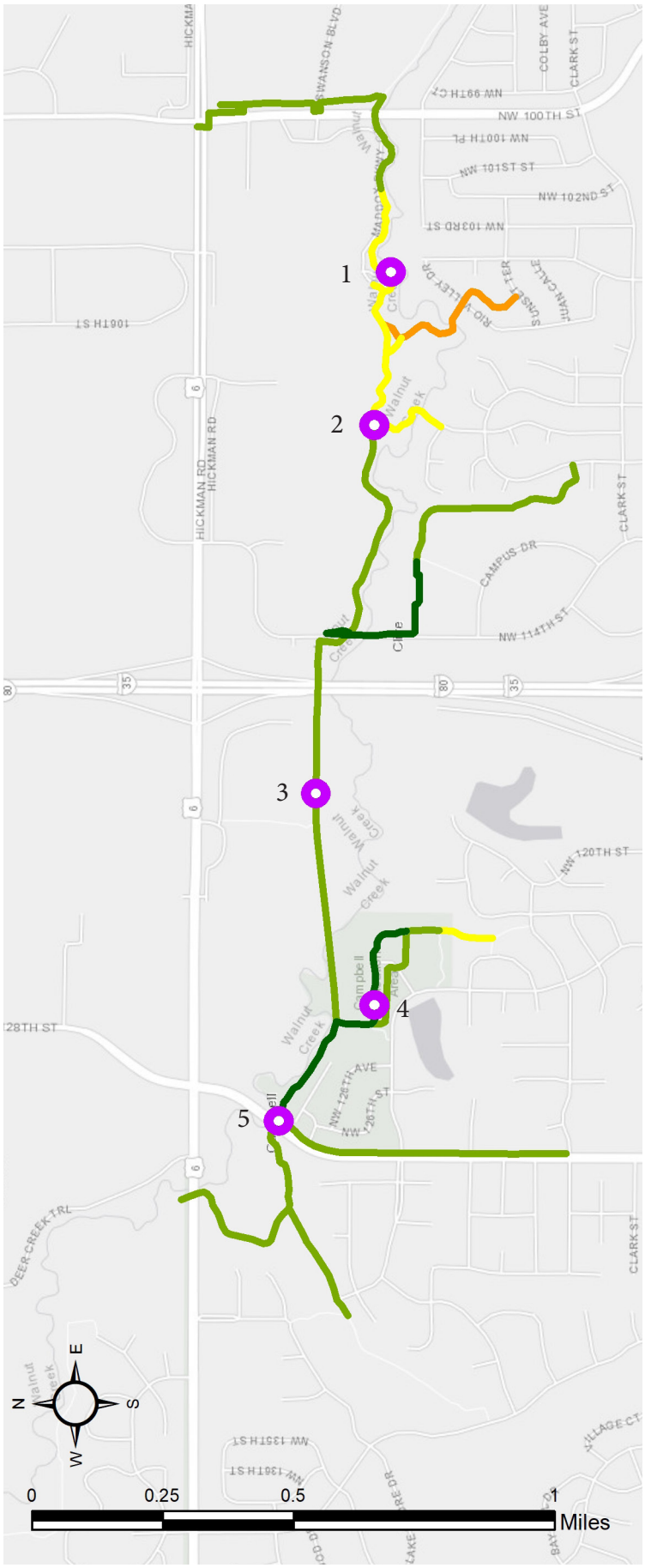


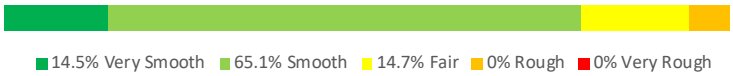


Miles: 1.46
Jurisdiction: Windsor Heights
Surface Type: Asphalt



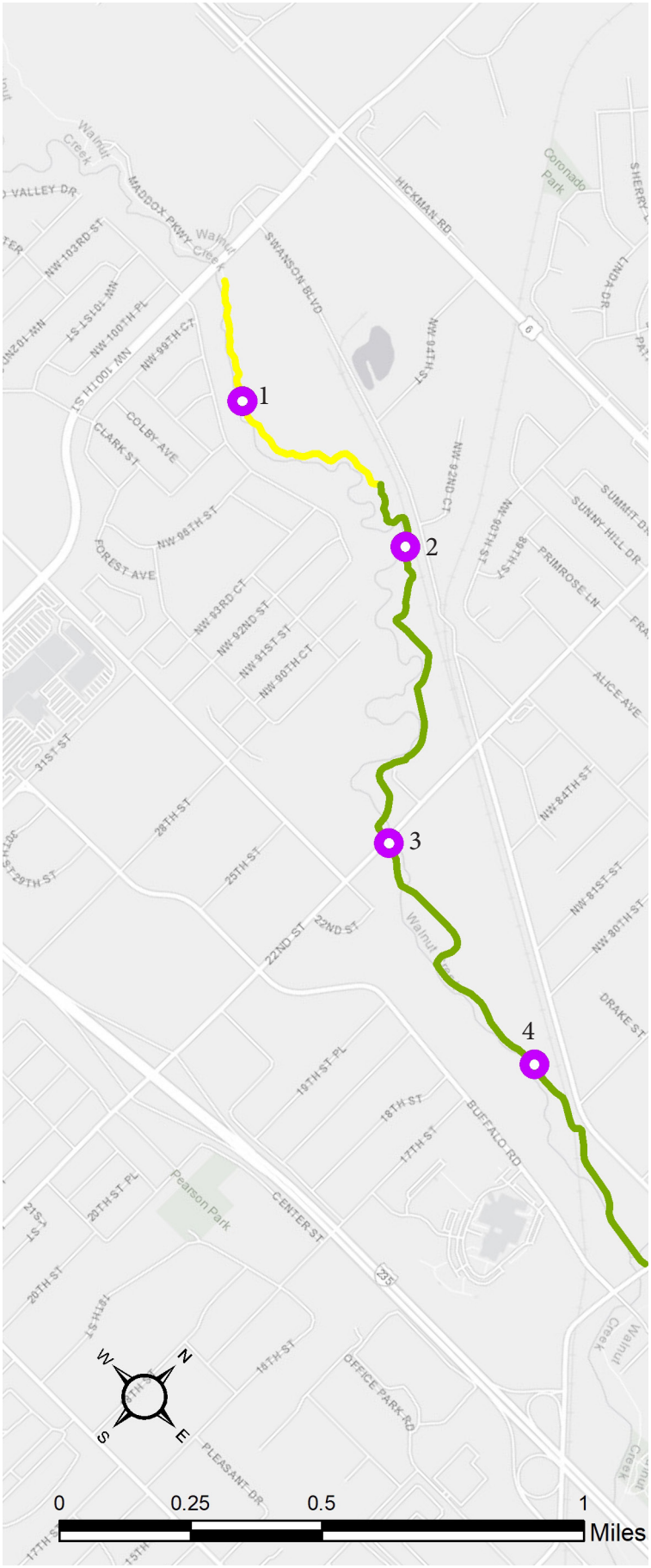
AMERICAN DISCOVERY TRAIL

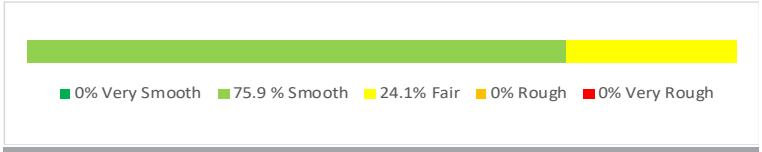




Miles: 6.02
Jurisdiction: Clive
Surface Type: Asphalt

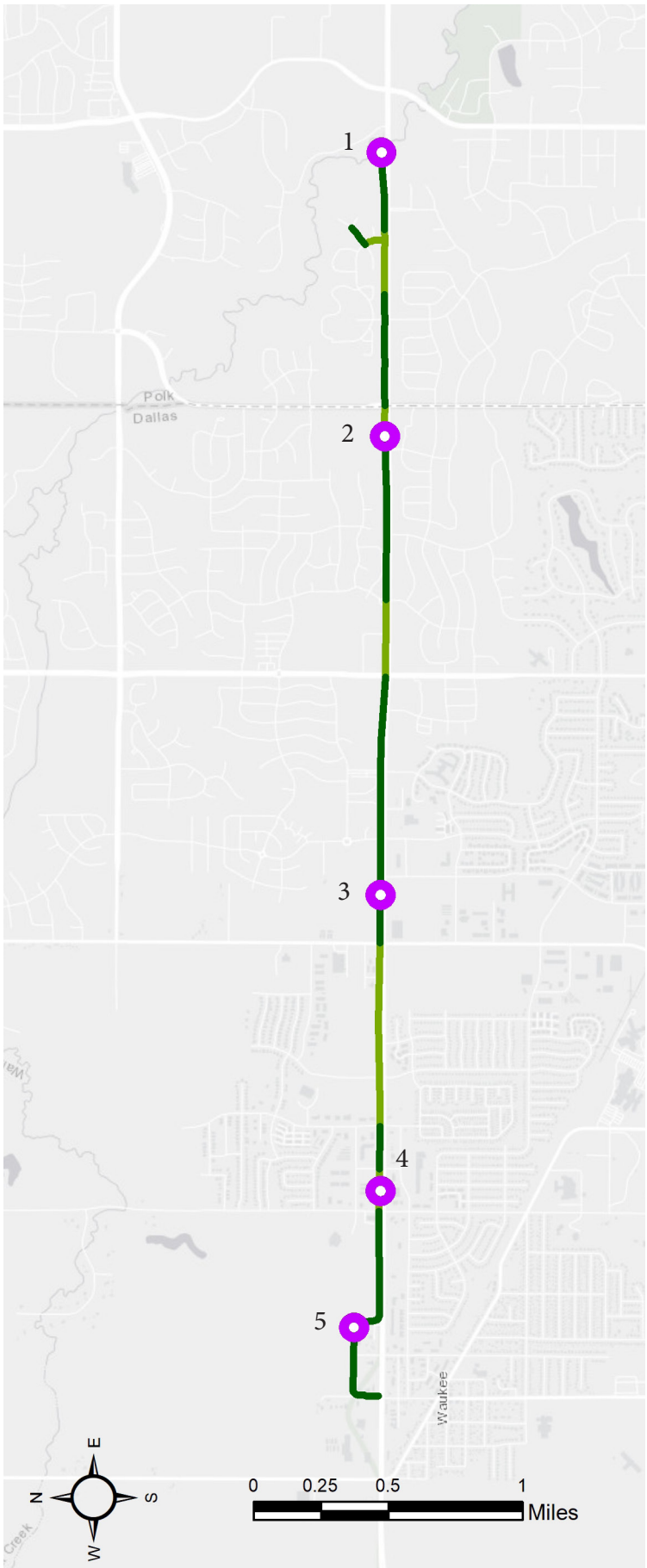
AMERICAN DISCOVERY TRAIL

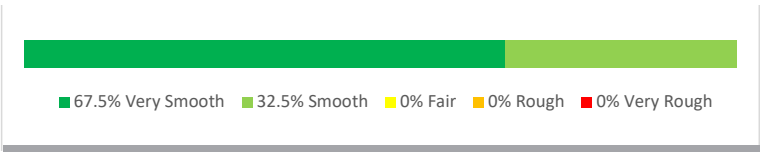




Miles: 2.48
Jurisdiction: West Des Moines
Surface Type: Asphalt

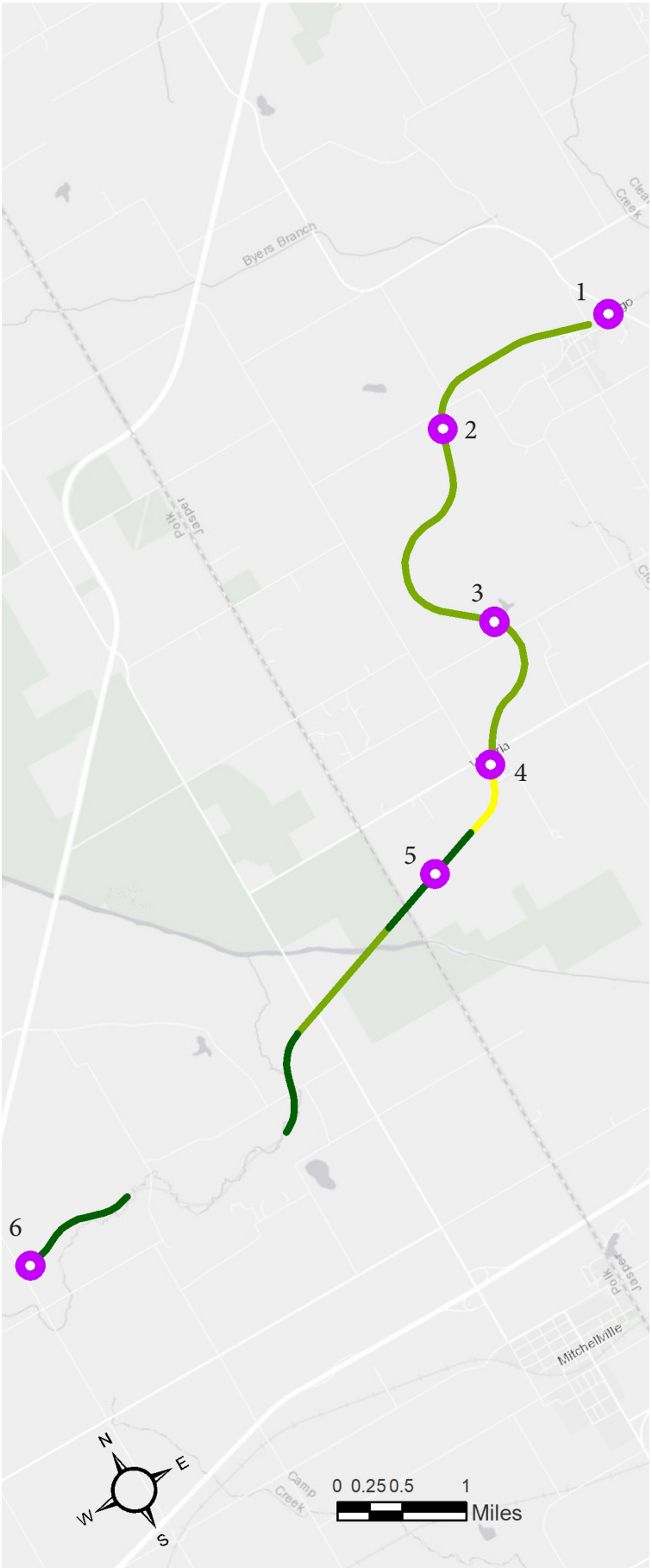
AMERICAN DISCOVERY AND RACCOON RIVER VALLEY TRAILS

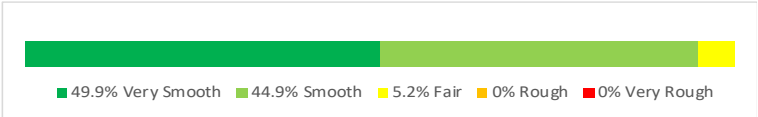




Miles: 5.02
Jurisdiction: Waukee
Surface Type: Asphalt

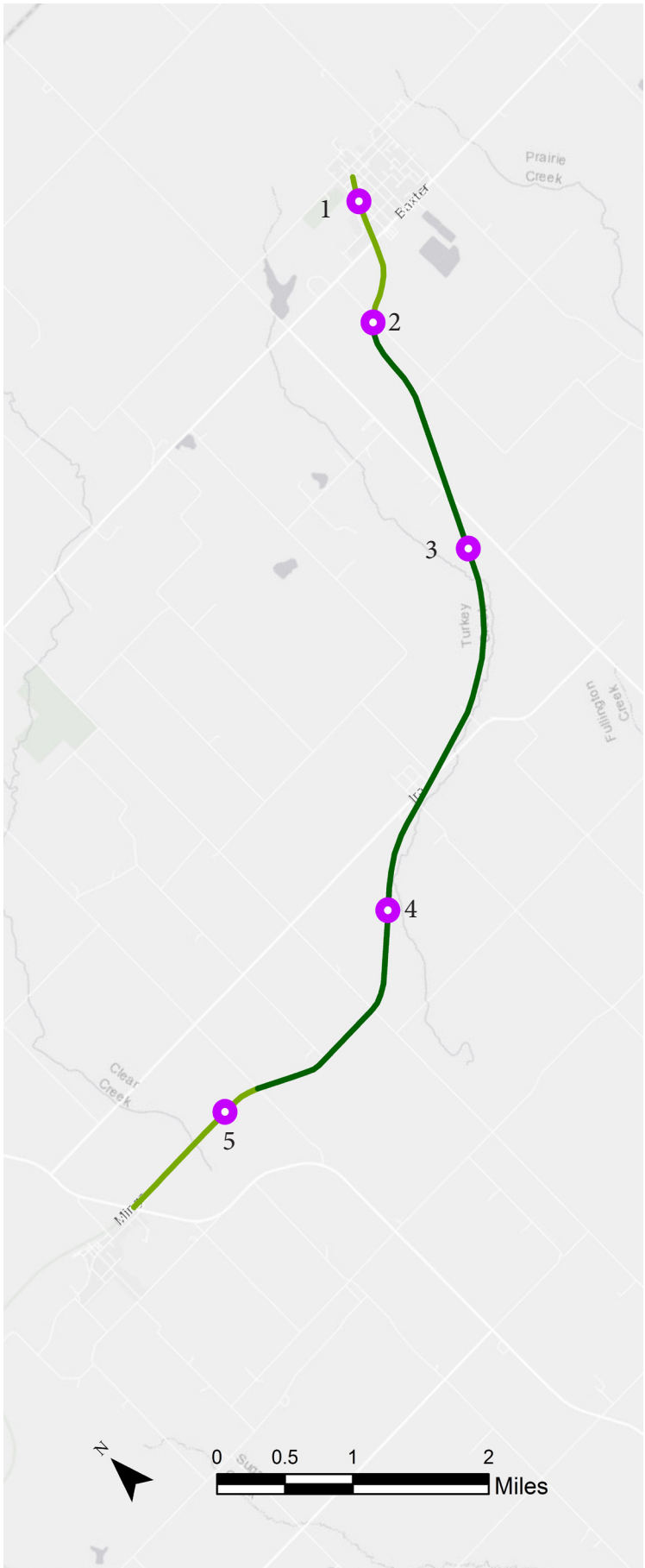
CHICHAQUA VALLEY TRAIL

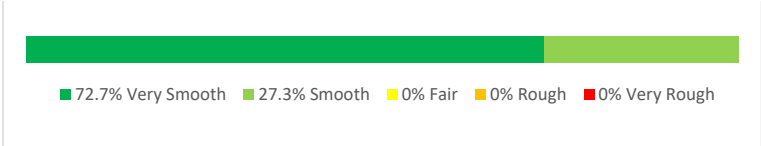




Miles: 9.38
Jurisdiction: Valeria
Surface Type: Asphalt

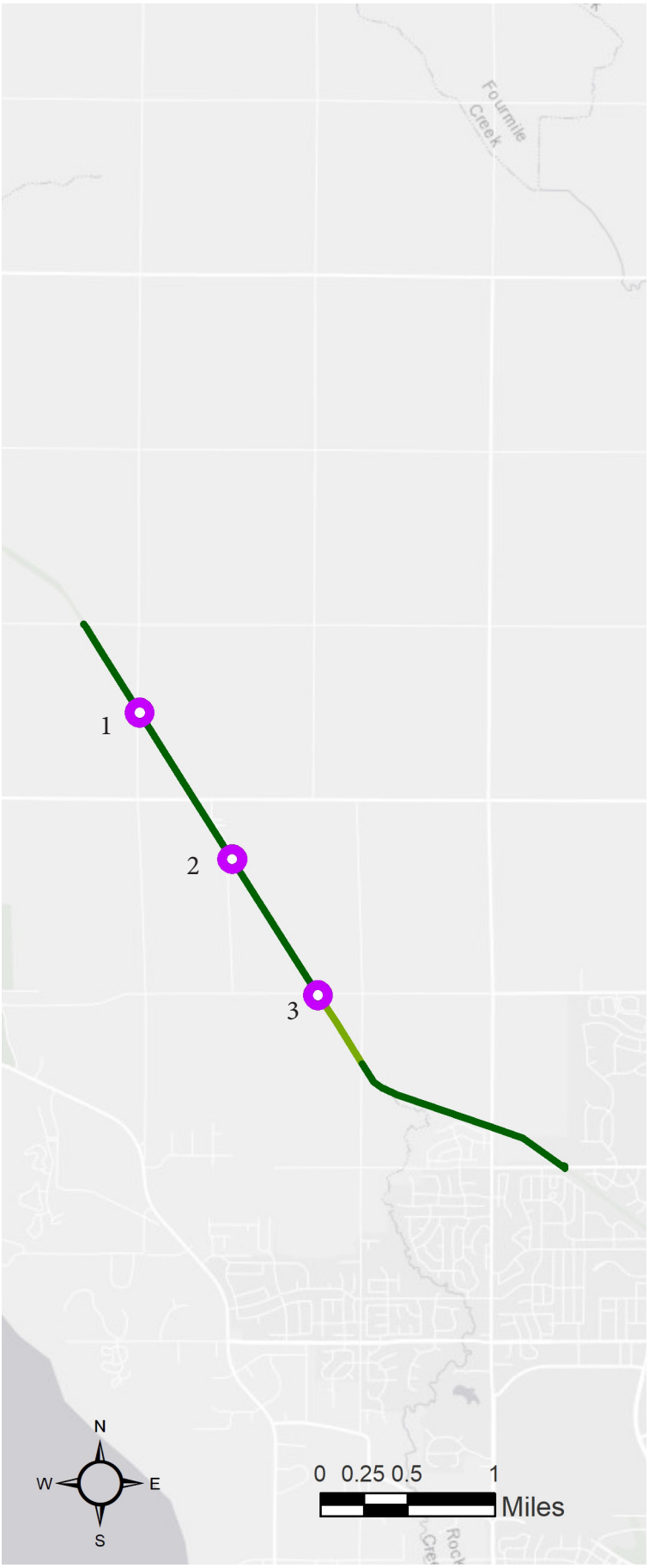
CHICHAQUA VALLEY TRAIL

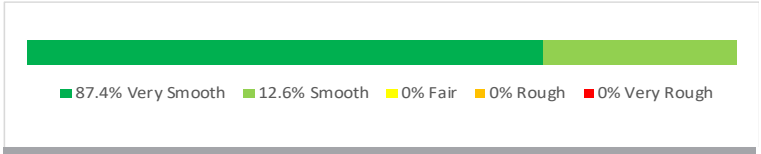




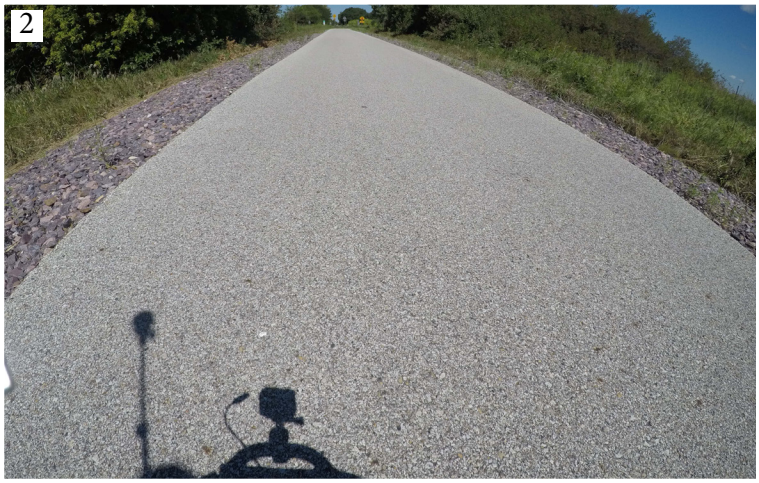
Miles: 8.62
Jurisdiction: Jasper County
Surface Type: Asphalt

HIGH TRESTLE TRAIL

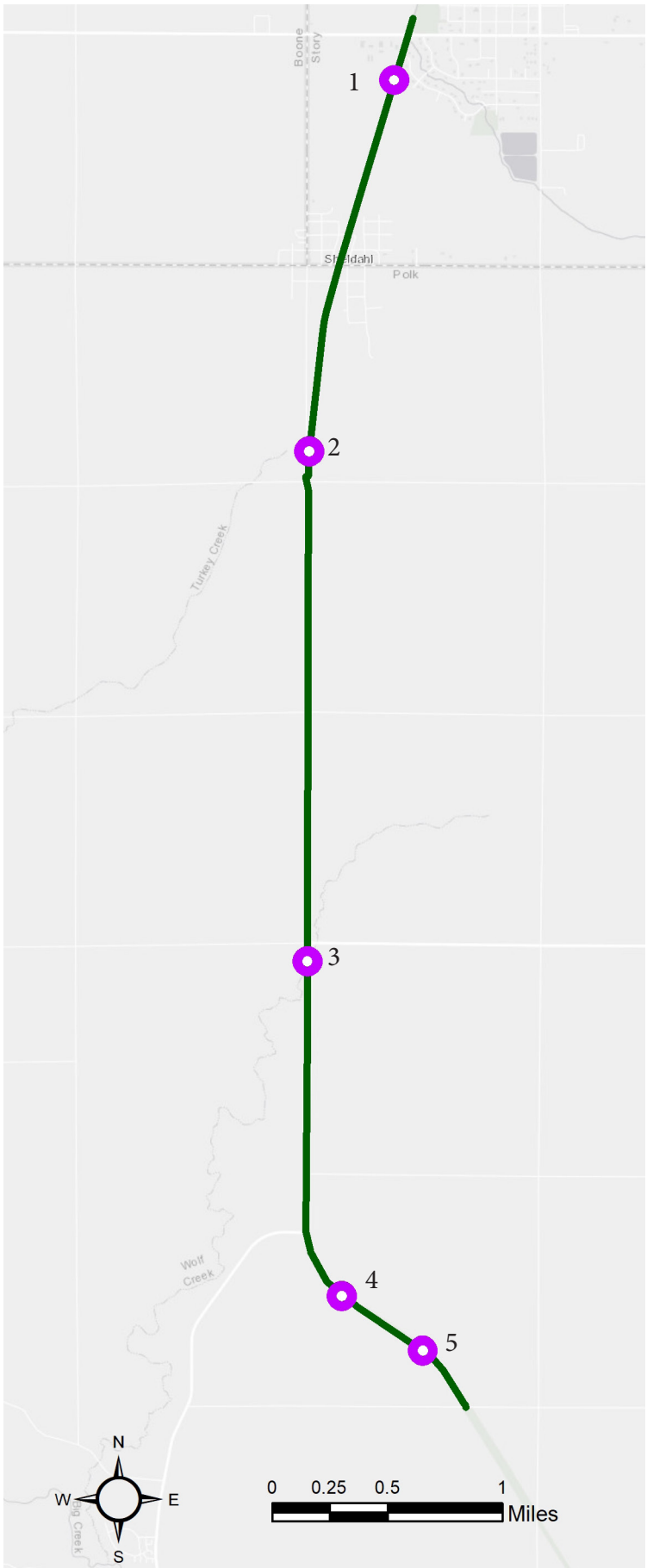


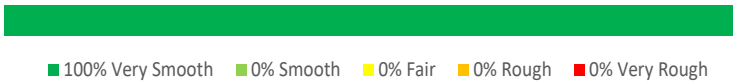


Miles: 4.33
Jurisdiction: Polk County
Surface Type: Asphalt

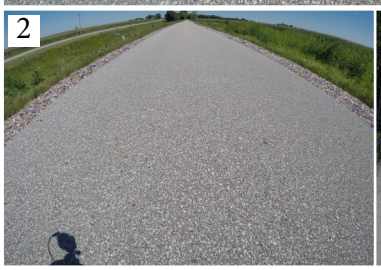


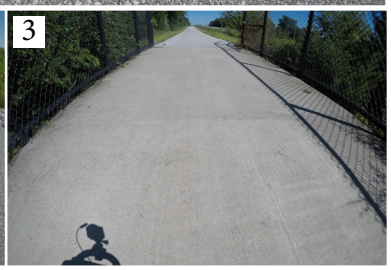
HIGH TRESTLE TRAIL



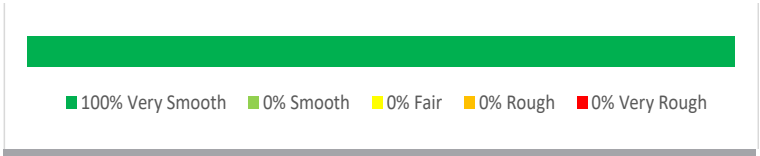


Miles: 6.40
Jurisdiction: Polk County
Surface Type: Asphalt



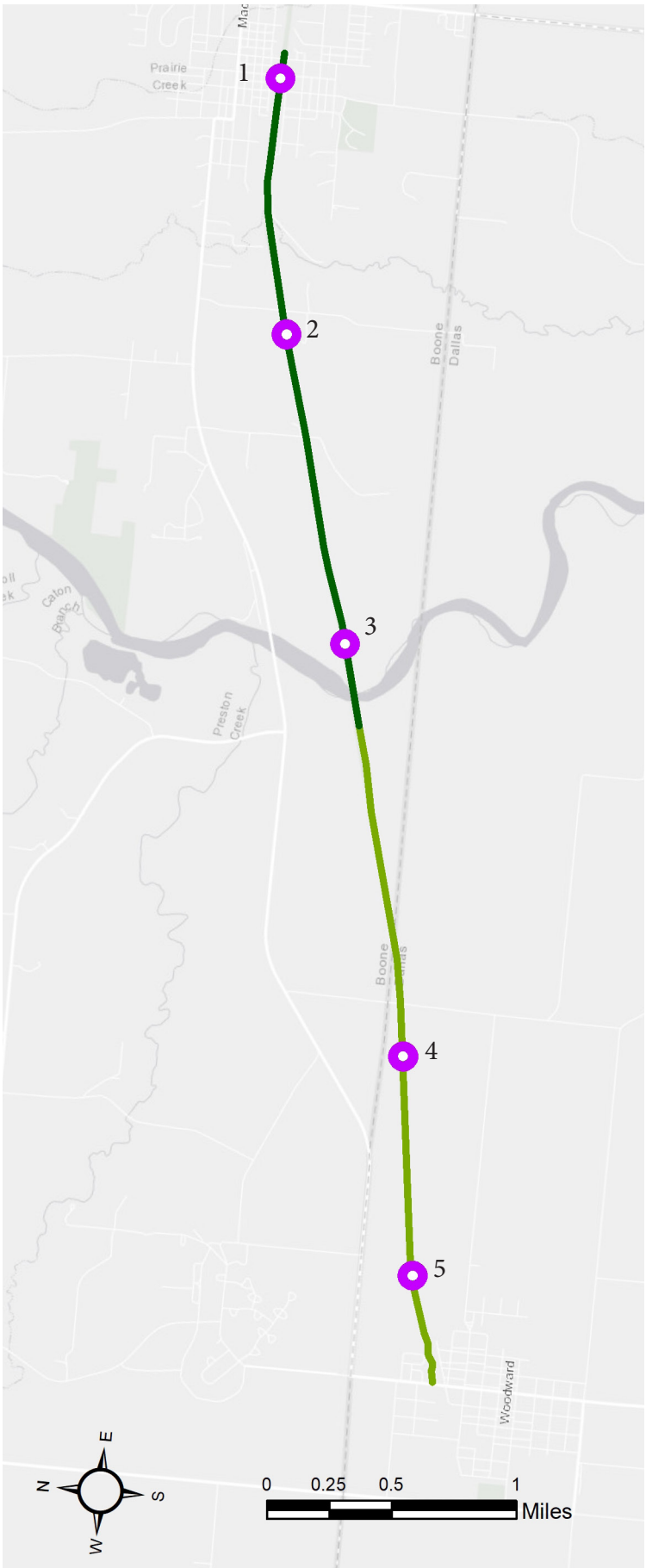


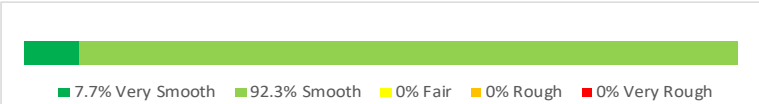
HIGH TRESTLE TRAIL



Miles : 6.81
Jurisdiction: Boone County
Surface Type: Concrete

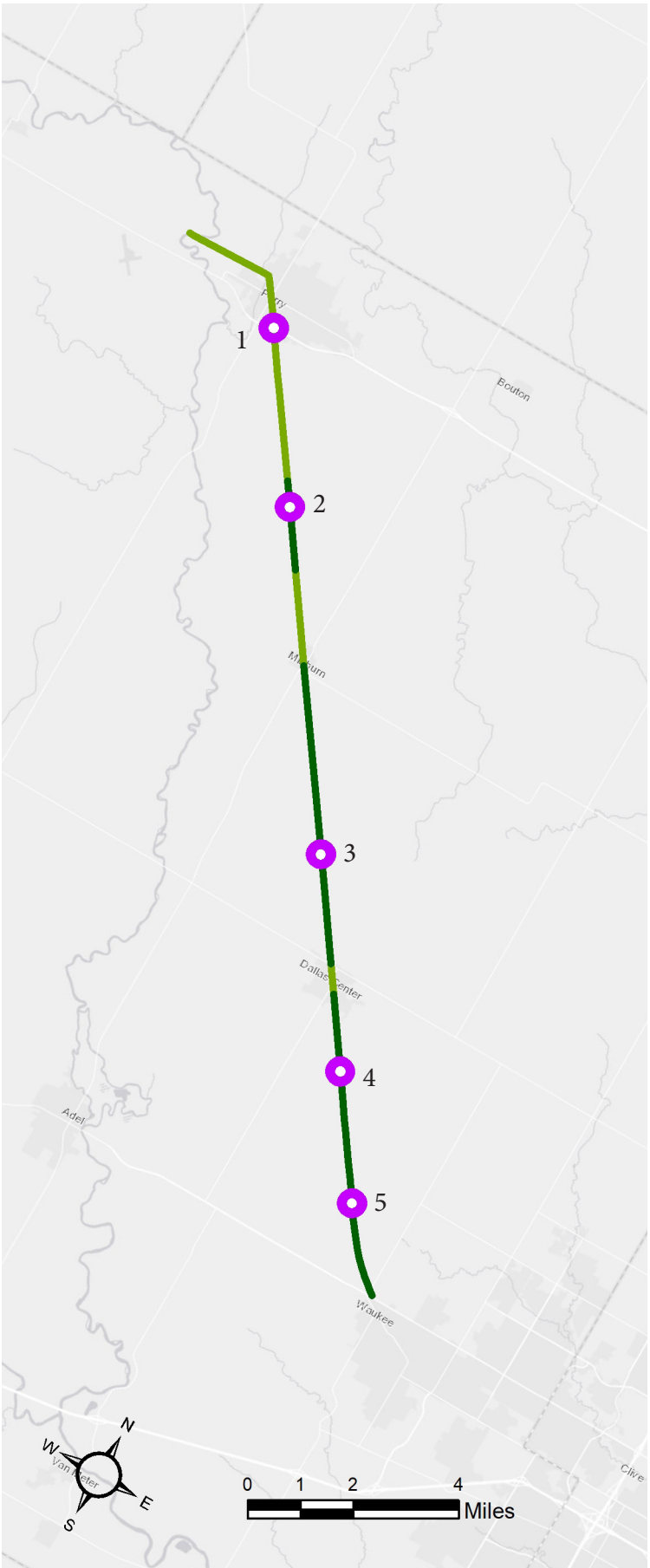
HIGH TRESTLE TRAIL

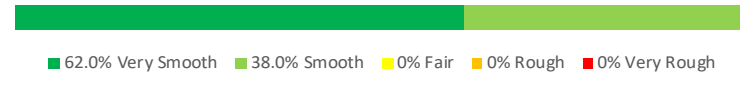




Miles: 5.39
Jurisdiction: Polk County
Surface Type: Concrete

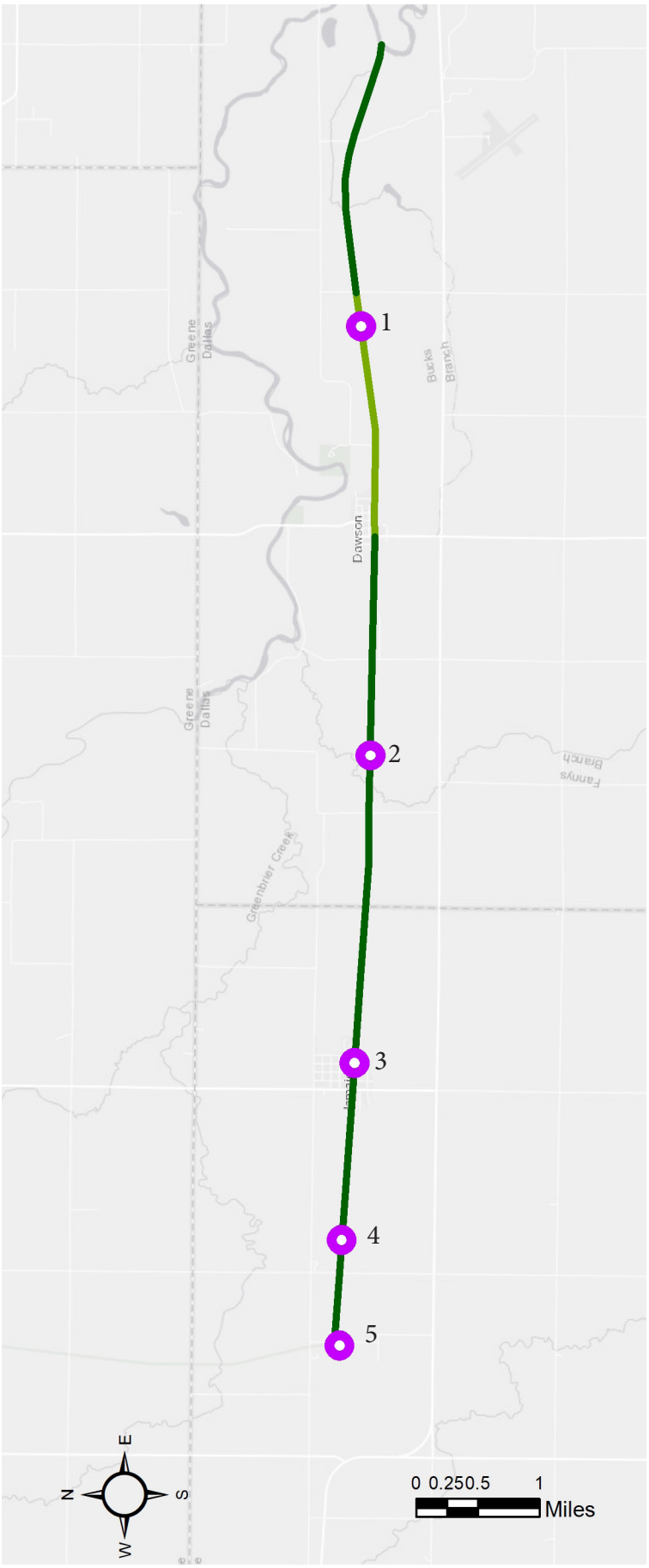
RACCOON RIVER VALLEY TRAIL

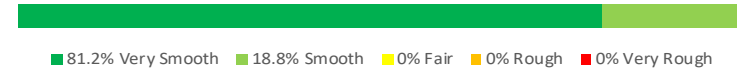




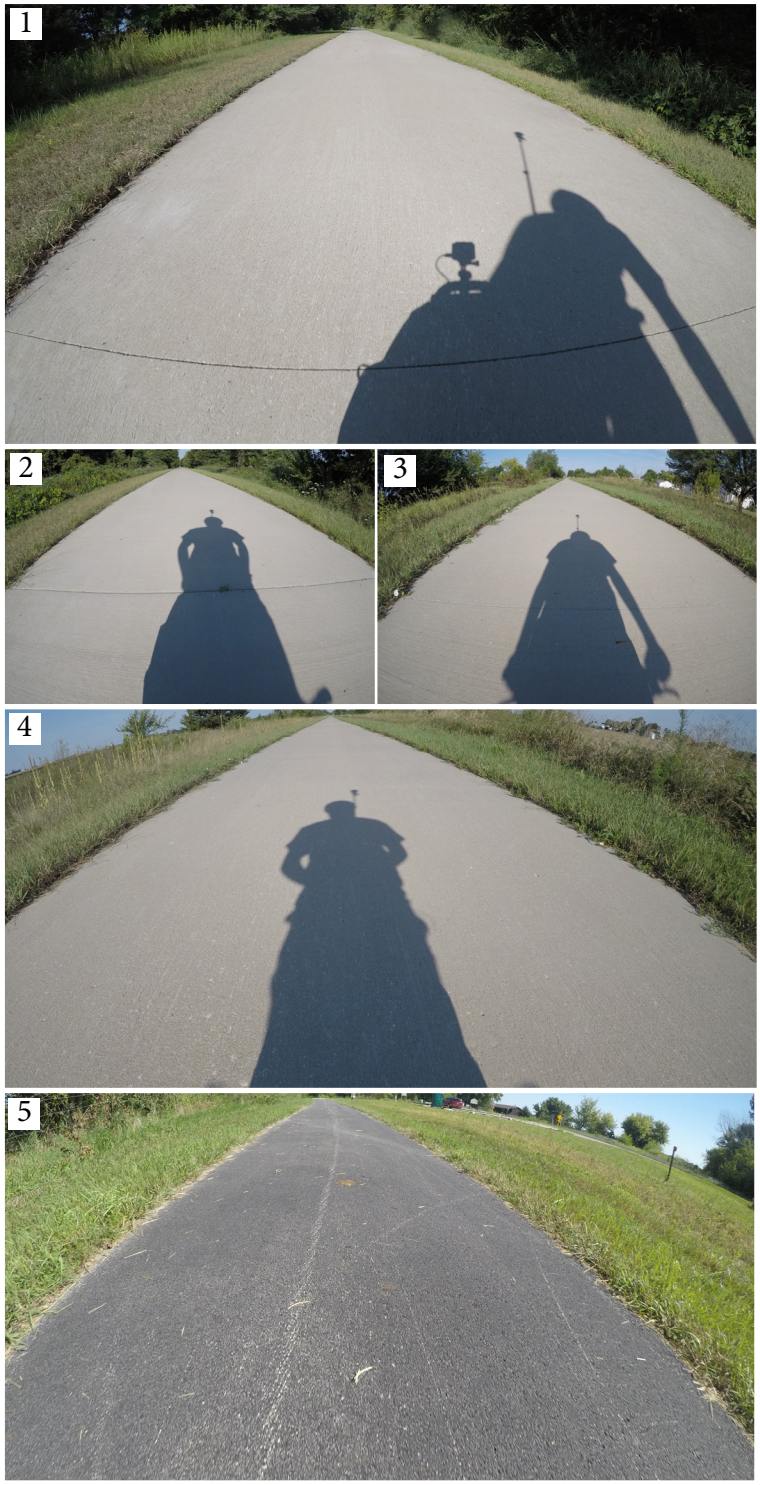
Miles: 21.17
Jurisdiction: Dallas County
Surface Type: Concrete

RACCOON RIVER VALLEY TRAIL

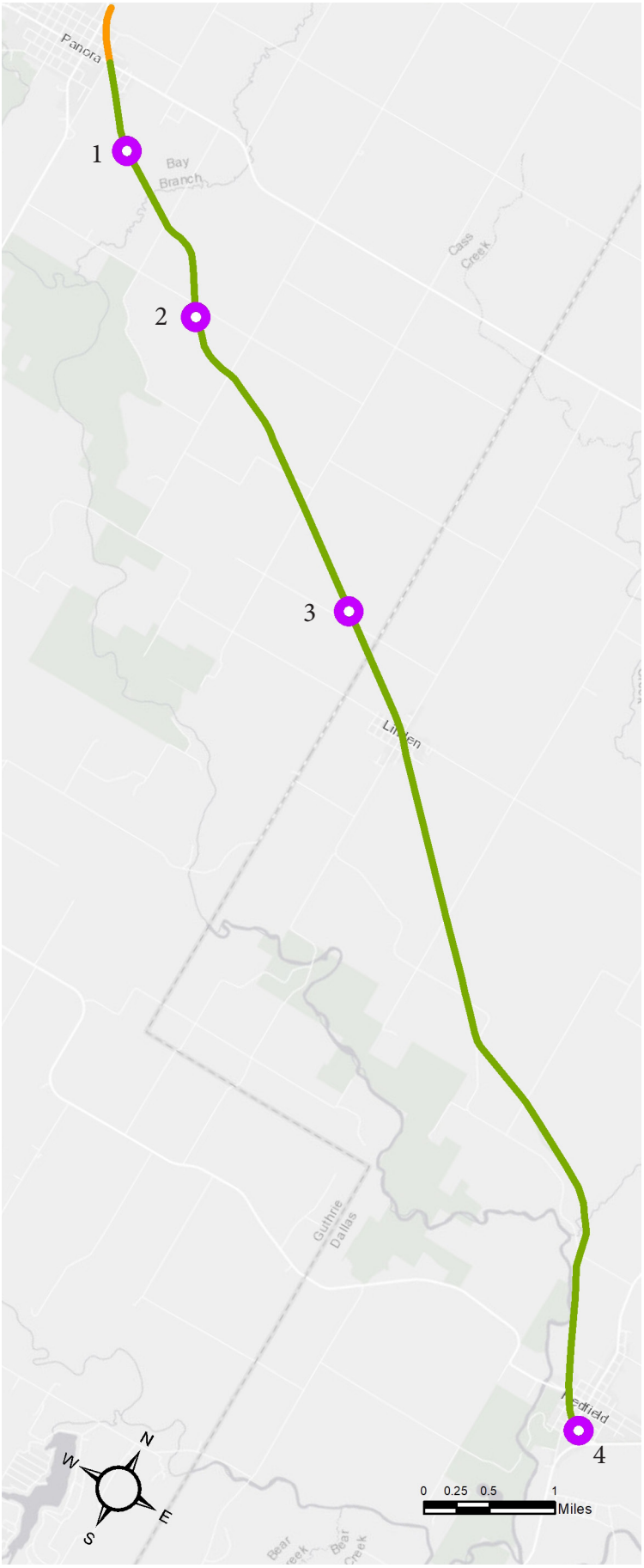


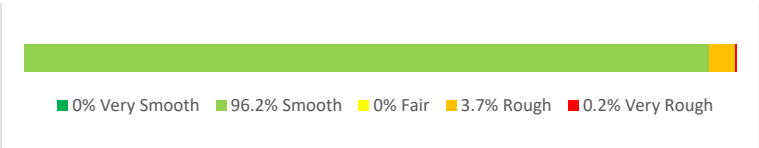


Miles: 10.65
Jurisdiction: Dallas County
Surface Type: Asphalt, Concrete



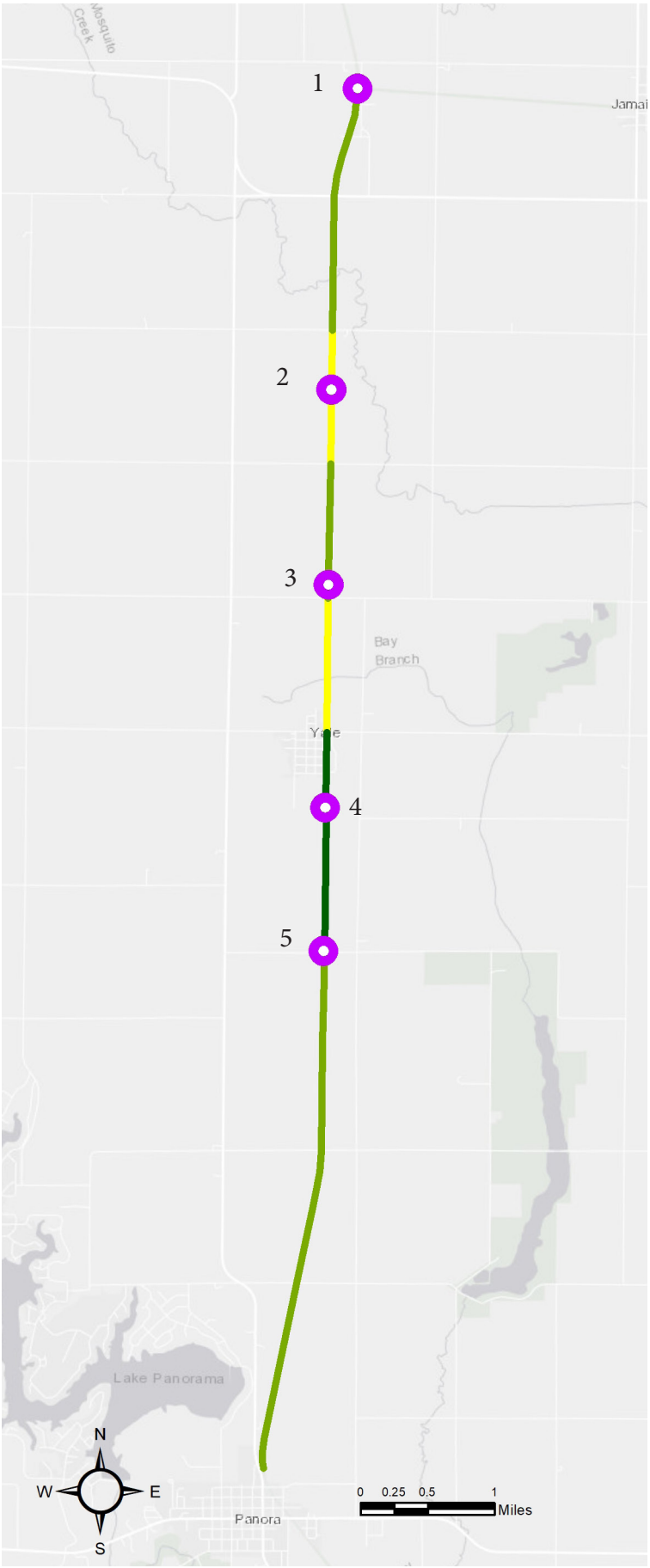
RACCOON RIVER VALLEY TRAIL

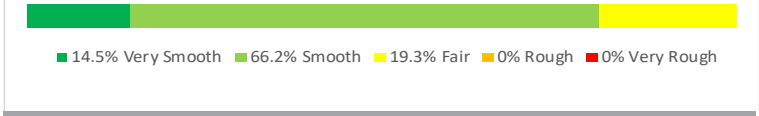




Miles: 11.66
Jurisdiction: Guthrie County
Surface Type: Asphalt, Concrete

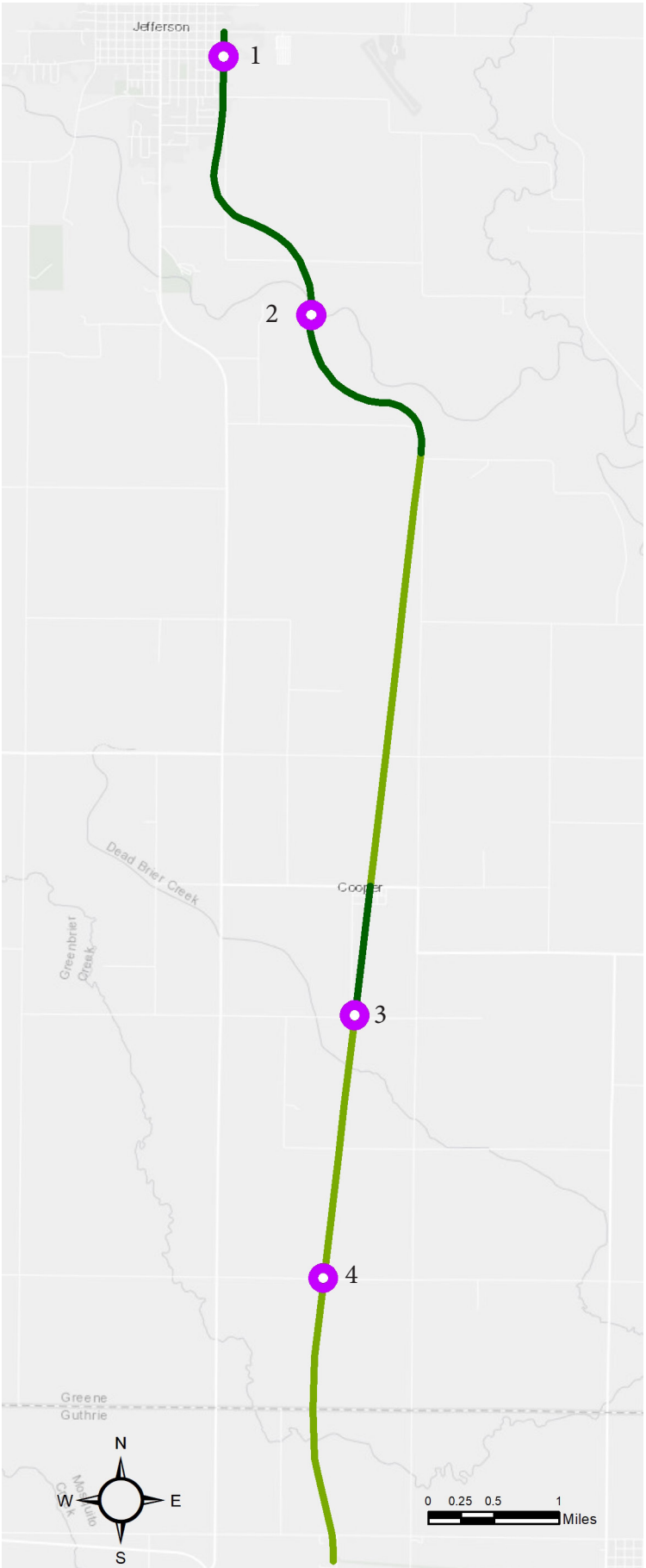
RACCOON RIVER VALLEY TRAIL

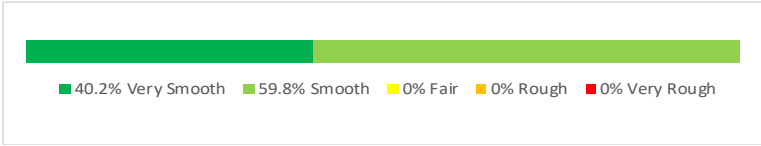




Miles: 10.35
Jurisdiction: Guthrie County
Surface Type: Asphalt, Concrete

RACCON RIVER VALLEY TRAIL





Miles: 12.55
Jurisdiction: Green County
Surface Type: Asphalt, Concrete