



SEPTEMBER 2021

BICYCLE FACILITIES INVENTORY REPORT



ACHD Bicycle Facilities Inventory Report

INTRODUCTION

Executive Summary

Ada County Highway District (ACHD) contracted J-U-B Engineers, Inc. (J-U-B) to perform a full evaluation and comprehensive inventory of all existing bicycle facilities within the Highway District. A methodology was established for data collection which included collecting and reviewing existing data provided by ACHD and collecting new data to input and verify facility types and specifications. A test pilot was performed to verify the effectiveness of the established methodology. Once the methodology was deemed successful, data collection continued until completion. All data was published in a GIS database to be maintained by ACHD and various maps were developed to display data findings.

MAIN FINDINGS

- Calculated GIS data based on segment lengths does not always accurately reflect the lengths of constructed bicycle facilities. Field verification is required to capture accurate inventory for both sides of roadways.
- Pavement markings regarding mixed traffic facilities could be improved.
- Variations in pavement facility widths occur regularly at intersections, railroad crossings, and bridges confining users to either a narrower facility or lack of facility entirely.

Existing Facilities & Inventory

The existing facilities inventoried included bike lanes, cycle tracks, buffered bike lanes, multi-use paths, raised bike lanes, protected bikes, as well as mixed traffic facilities such as shared bike routes, signed shared roadways, and bicycle boulevards. The inventory did not include state roads/facilities, the Greenbelt, sidewalks, or canal paths. Each facility type is outlined and defined in **Appendix A**.



Methodology

ACHD's existing bicycle facility network data was reviewed to determine the necessary information to collect during the inventory process so that ACHD could perform accurate analysis of the constructed bike network for future planning efforts.

DATA CONSIDERATIONS

The existing line segments in the network (which mainly occurred at intersections) were unchanged in order to maintain the existing linework and assigned unique identifiers (Location IDs). Maintaining these IDs also reduces the chance of unintentionally impacting ACHD's current planning process. In cases where duplicate lines were drawn on top of others, the duplicate segments were removed, and the



deleted Location IDs were noted on the line that remained.

Instead of relying on a specific frequency to perform field measurement points, lines were split at points where the bike facility or roadway conditions change. In these cases, a data point was placed on each side of the split point to document the facility information.

DATA ATTRIBUTES

No existing data fields were edited in the bicycle network attribute table provided by ACHD. Data fields were created to collect details about the road in its

entirety to include speed, total number of lanes, total width of pavement, and total right-of-way (ROW). Fields and domains were also created to capture details about the bike facilities for each direction to include facility direction, facility type, facility width, adjacent lane width, lane count, pavement edge, right turn designation, parking, parking width, pavement markings and location, and buffer type and width. See **Appendix B** for a complete list and explanation of each data field.

FACILITY MEASUREMENTS

On-screen measurements were performed using high-resolution aerial imagery (flown in 2019) provided by ACHD. A list of capital improvement projects (CIP) was also provided by ACHD to alert where differences were known to exist between the aerial imagery and what was currently existing in the field. Field measurements were then collected where bike facilities were found, including those not originally documented by ACHD or the CIP list.

The total ROW was then measured on-screen using the Ada County Assessor's office current parcel boundaries layer. Lane width and total pavement width were measured on-screen for highly trafficked roads and were spot-checked in the field to measure margin of error to increase accuracy (field measurements were found to be almost identical to on-screen measurements). All bike facilities were measured in the field. The following measurement standards were used:

- Bike lane width measured from center of lane line to gutter lip; or to edge of pavement, including when there is a vertical curb but no gutter; or from center of lane line to center of lane line for "floating" bike lanes
- General travel lanes measured from center of lane line to center of lane line, or from center of lane line to edge of pavement/gutter lip for turn lanes outside of floating bike lanes (RTL to the right of bike lane, LTL to the left of (left side) bike lane)
- For double yellow markings, the center of lane line is the center of the gap between the two yellow lines

- Total pavement width measured to the gutter lip where gutters exist, otherwise to the edge of pavement, including locations where there is vertical curb but no gutter.
- Pavement markings, such as sharrows (Shared Lane Markings), are measured from the center of the symbol to the edge of asphalt or concrete pavement.
- If no parking stall pavement markings are present, width is recorded as 8 feet.

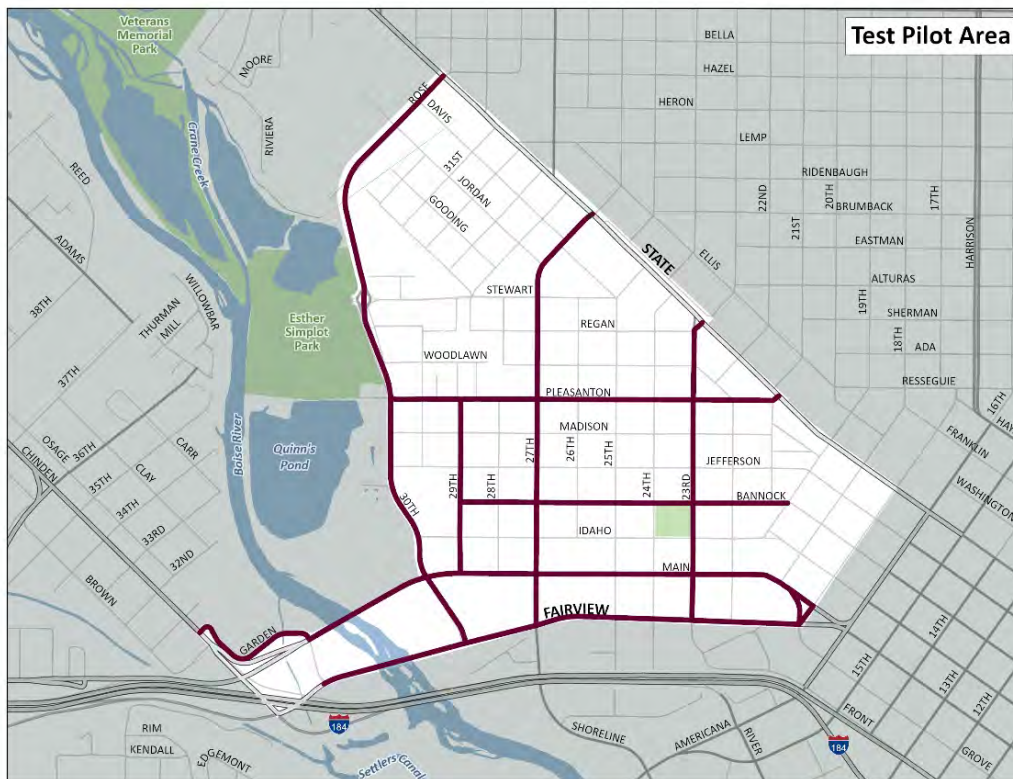
In cases where a measurement was slightly off of the nearest interval, measurements were rounded down. This conservative approach ensures a better indication if something is on the margin of needing improvements (i.e. a lane measurement of 10.3 feet would be entered as 10 instead of 10.5).

Field photos of each side of the road were taken and attached to the digital measurement points in GIS.

INVENTORY AND ANALYSIS

Test Pilot

The test pilot consisted of testing initial methodology to collect data on existing bicycle facilities within an area identified as the ‘Whitewater + VMP Neighborhood’ planning area. The Whitewater + VMP planning area was previously created by ACHD for the development of a neighborhood bicycle and pedestrian plan. The pilot area follows Rose Street for the north boundary, State Street for the east boundary, Fairview Avenue for the south boundary and borders the 30th Street for the entirety of the west boundary. After testing and refining the data collection methodology within the test pilot area, final measurement standards and data collection techniques were established for the inventory process.



Existing Bicycle Facilities Inventory

The existing bicycle facilities inventoried are summarized in **Table 1** and **Table 2**. Due to the size of the District, the bicycle facility data is represented in two ways, by the five incorporated cities and the greater unincorporated Ada County areas, as well as by ACHD neighborhood planning areas. It should be noted that the mileage presented in **Table 1** and **Table 2** reflects both sides of the roadways inventoried. **Figures 1 & 2** show an overview of the bicycle facilities within ACHD in which **Figure 1** depicts the Eastbound/Northbound sides of roadways and **Figure 2** depicts the Westbound/Southbound sides. **Figures 3-8** reflect the data summarized in **Table 1** below.

Table 1 – Existing Bicycle Facilities by City and County

Location	Number of Miles Inventoried	Facility Type							Total Bike Facility Miles
		Bike Lane	Buffered Bike Lane	Protected Bike Lane	Cycle Track	Mixed Traffic	Multi-use Path	Raised Bike Lane	
Kuna (Figure 3)	39.2	7.4	0	0	0	26.9	0.3	0	34.6
Boise (Figure 4)	482	196.5	7.6	0.9	0.9	240.5	10.5	1.2	458.1
Meridian (Figure 5)	211.4	84.6	0	0	0	107.6	10.6	0	202.8
Eagle (Figure 6)	54.2	25.9	0	0	0	24.4	1.7	0	52
Star (Figure 7)	15.6	6.6	0.8	0	0	8.2	0	0	15.6
Garden City (Figure 8)	25.2	6.6	0	0	0	18.4	0	0	25
Unincorporated Ada County	74.6	16.1	0	2.6	0	47.4	0	0	66.1
TOTAL	902.2	343	8.4	3.5	0.9	474.1	23.1	1.2	854.2

Table 2 – Existing Bicycle Facilities by Neighborhood Planning Area

Location	Number of Miles Inventoried	Facility Type							Total Bike Facility Miles
		Bike Lane	Buffered Bike Lane	Protected Bike Lane	Cycle Track	Mixed Traffic	Multi-use Path	Raised Bike Lane	
Ada County	25	7.3	0.8	0	0	14	0	0	22.1
Barber Valley	17.6	11	0	0	0	2	2.3	0	15.3
Boise Central Bench	70.4	18.7	0.5	0	0	47.9	1.3	0	68.4
Boise Downtown	14.6	7.8	1.3	0.3	0	3.3		0	12.7
Boise East End	16	4.5	0	0	0.7	8.6	0.2	0	14
Boise North	72.8	21.4	1.5	0.5	0.2	45.5	0.1	0	69.2
Boise Northwest	34.8	16	1	0	0	17	0	0	34
Boise Southeast	76.6	38.9	0.8	0	0	23.8	5.3	0	68.8
Boise Southwest	73.4	19.6	0	2.6	0	47.3	0.4	0.4	70.3
Boise West Bench	142.4	64.1	1.7	0	0	72.4	0.7	1	139.9
Eagle	57.6	27.6	0	0	0	26.3	1.7	0	55.6
Garden City	26.2	7.2	0	0	0	18.8	0	0	26
Kuna	41.8	7.4	0.1	0	0	26.6	0.5	0	34.6
Meridian Downtown	19	8	0	0	0	9.6	0.4	0	18
Meridian North	143	60.4	0	0	0	70.4	6.3	0	137.1
Meridian South	56.6	17.4	0	0	0	32.6	3.9	0	53.9
Star	16.6	6.6	0.8	0	0	9.2	0	0	16.6
TOTAL	904.4	343.9	8.5	3.4	0.9	475.3	23.1	1.4	856.5

Figure 1 – Overview of Inventoried Areas: Eastbound/Northbound

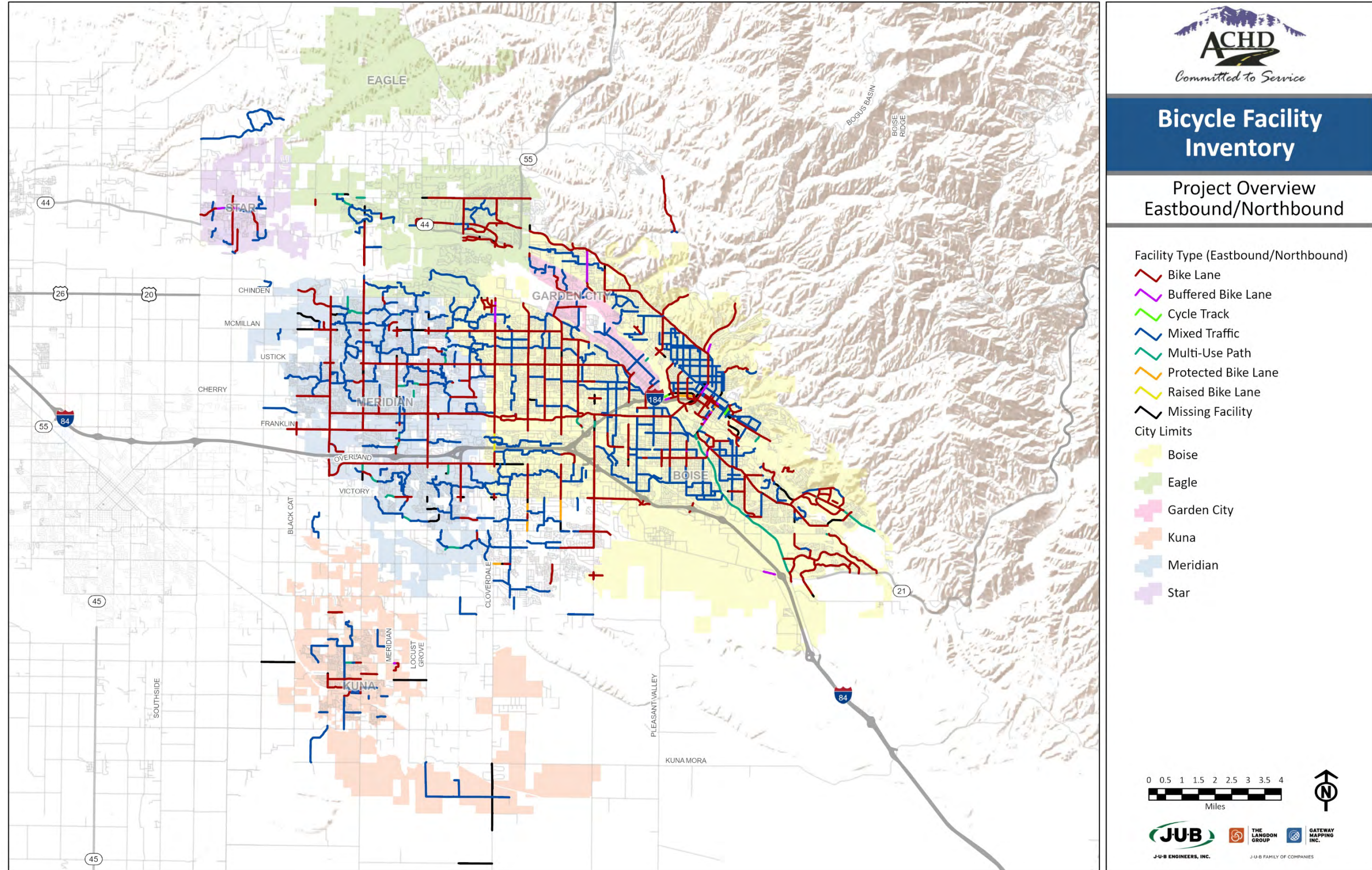


Figure 2 – Overview of Inventoried Areas: Westbound/Southbound

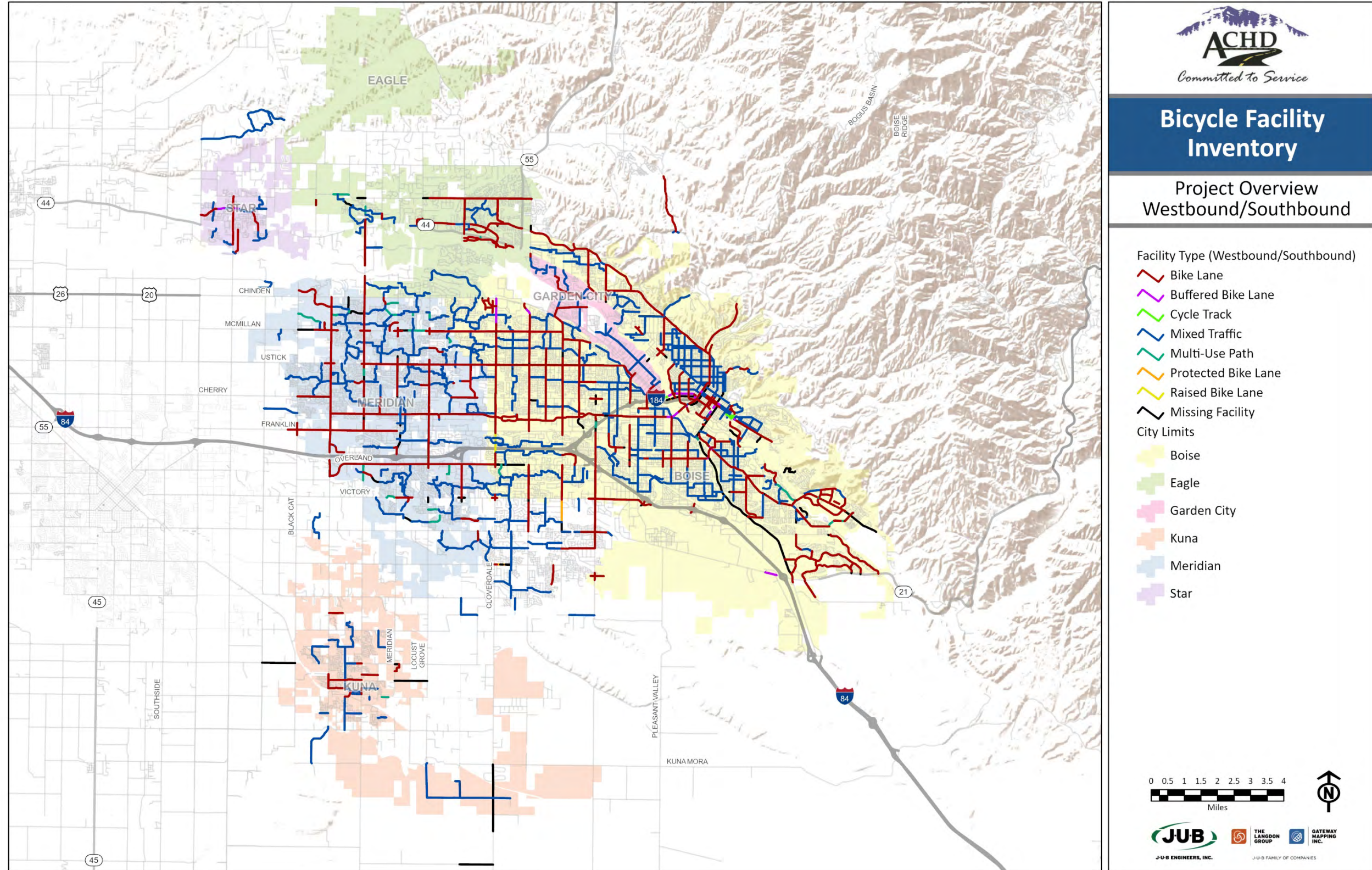


Figure 3 – City of Kuna Existing Bicycle Facilities

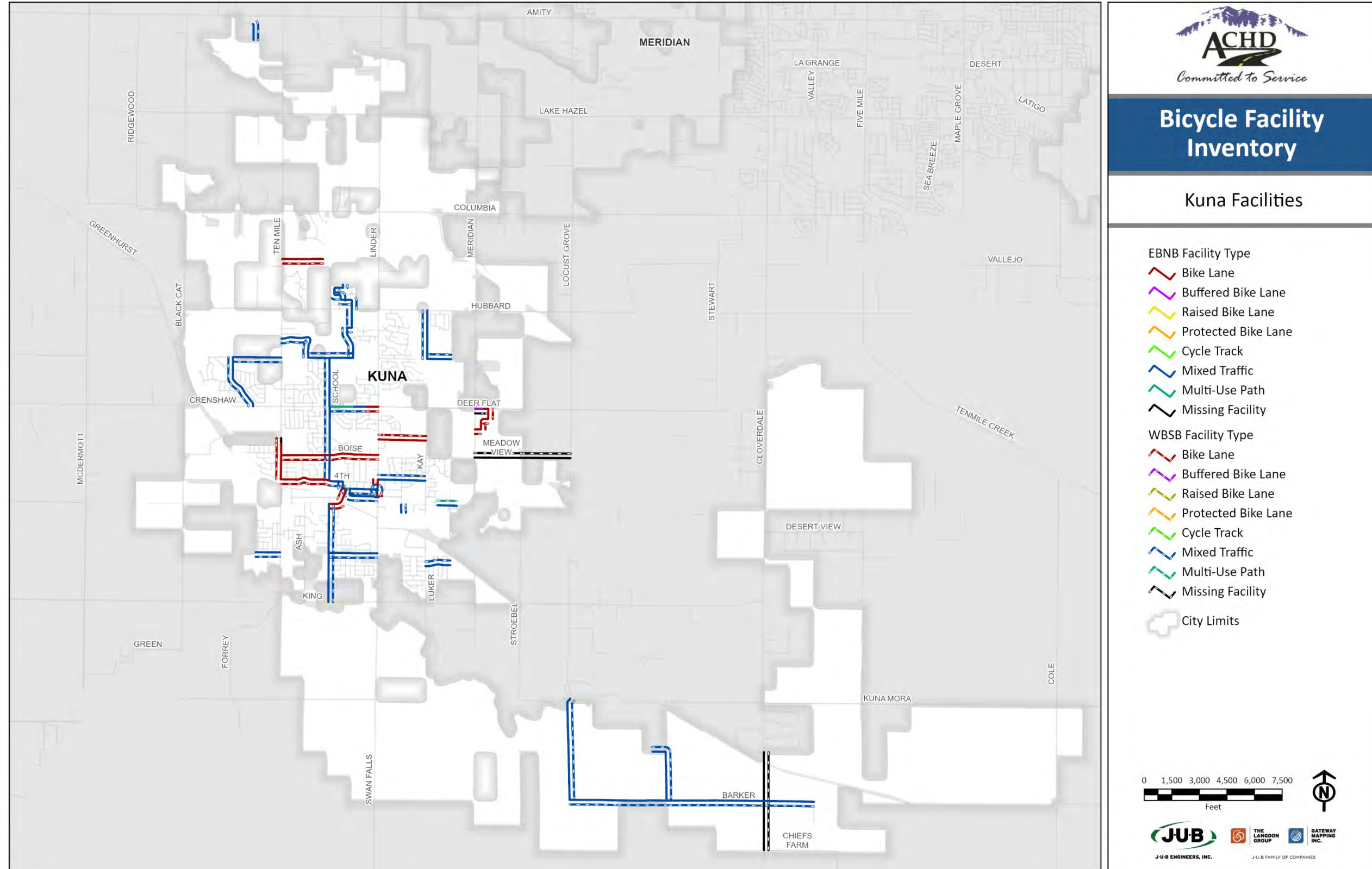


Figure 4 – City of Boise Existing Bicycle Facilities

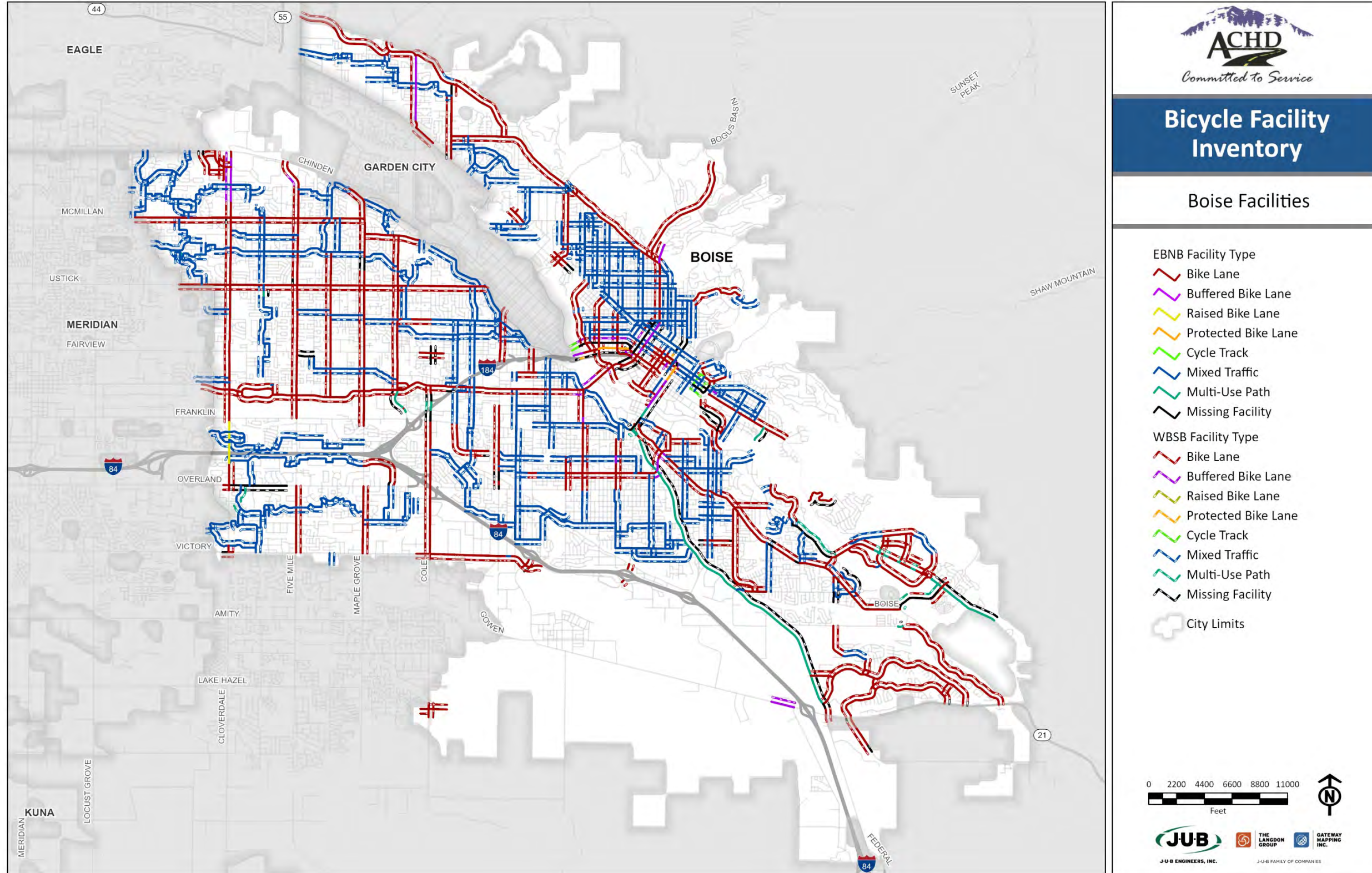


Figure 5 – City of Meridian Existing Bicycle Facilities

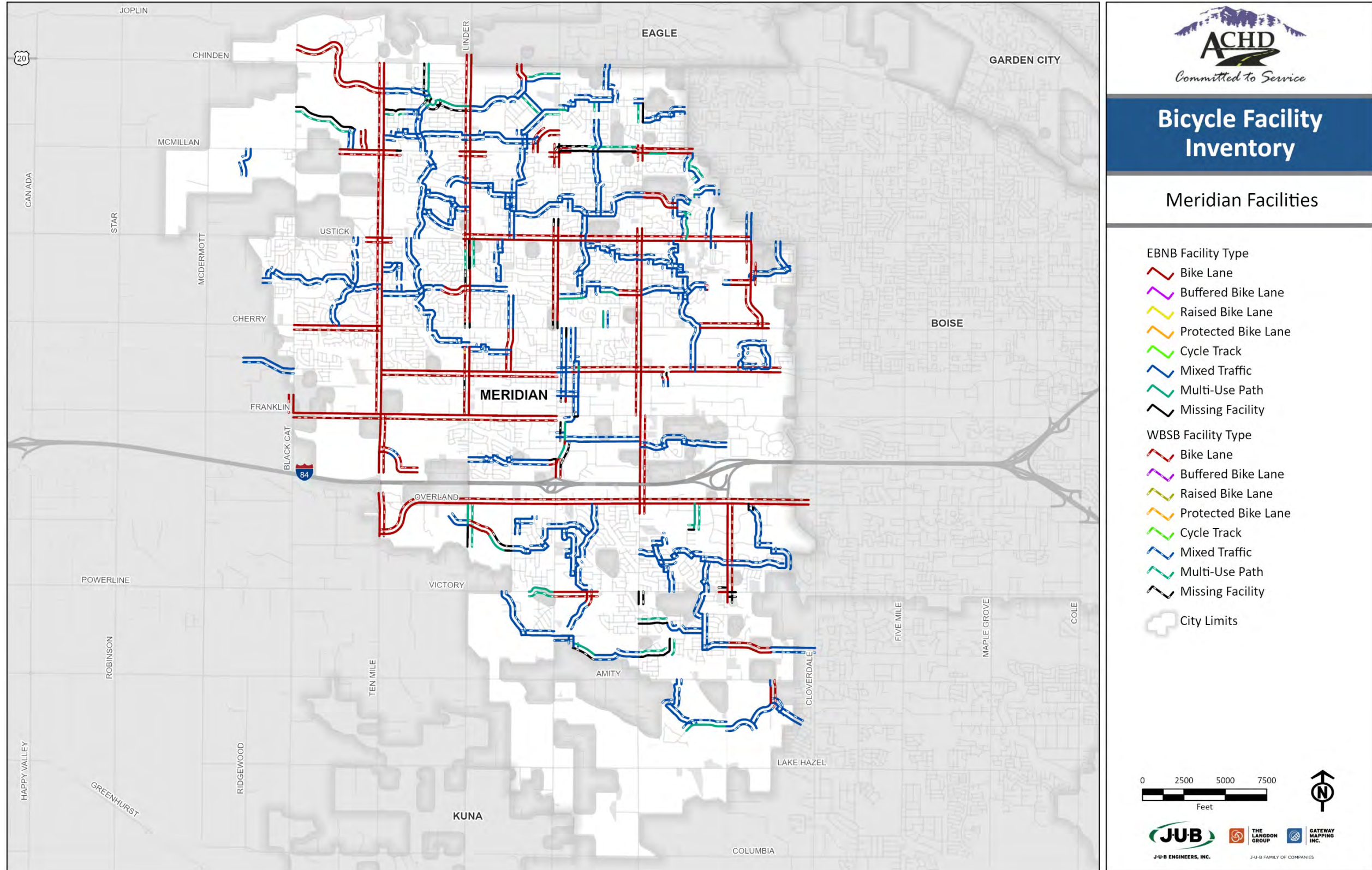


Figure 6 – City of Eagle Existing Bicycle Facilities

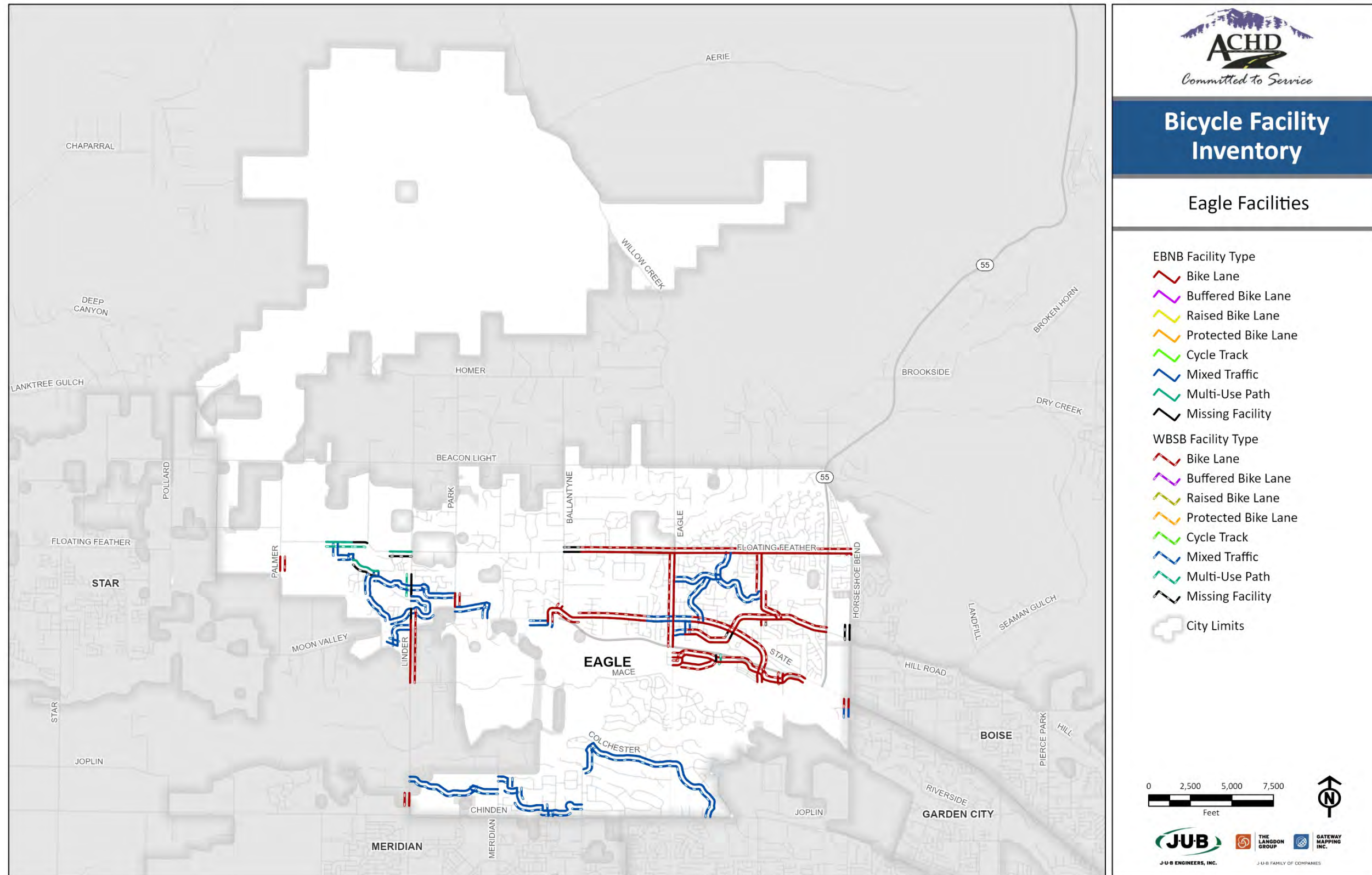


Figure 7 – City of Star Existing Bicycle Facilities

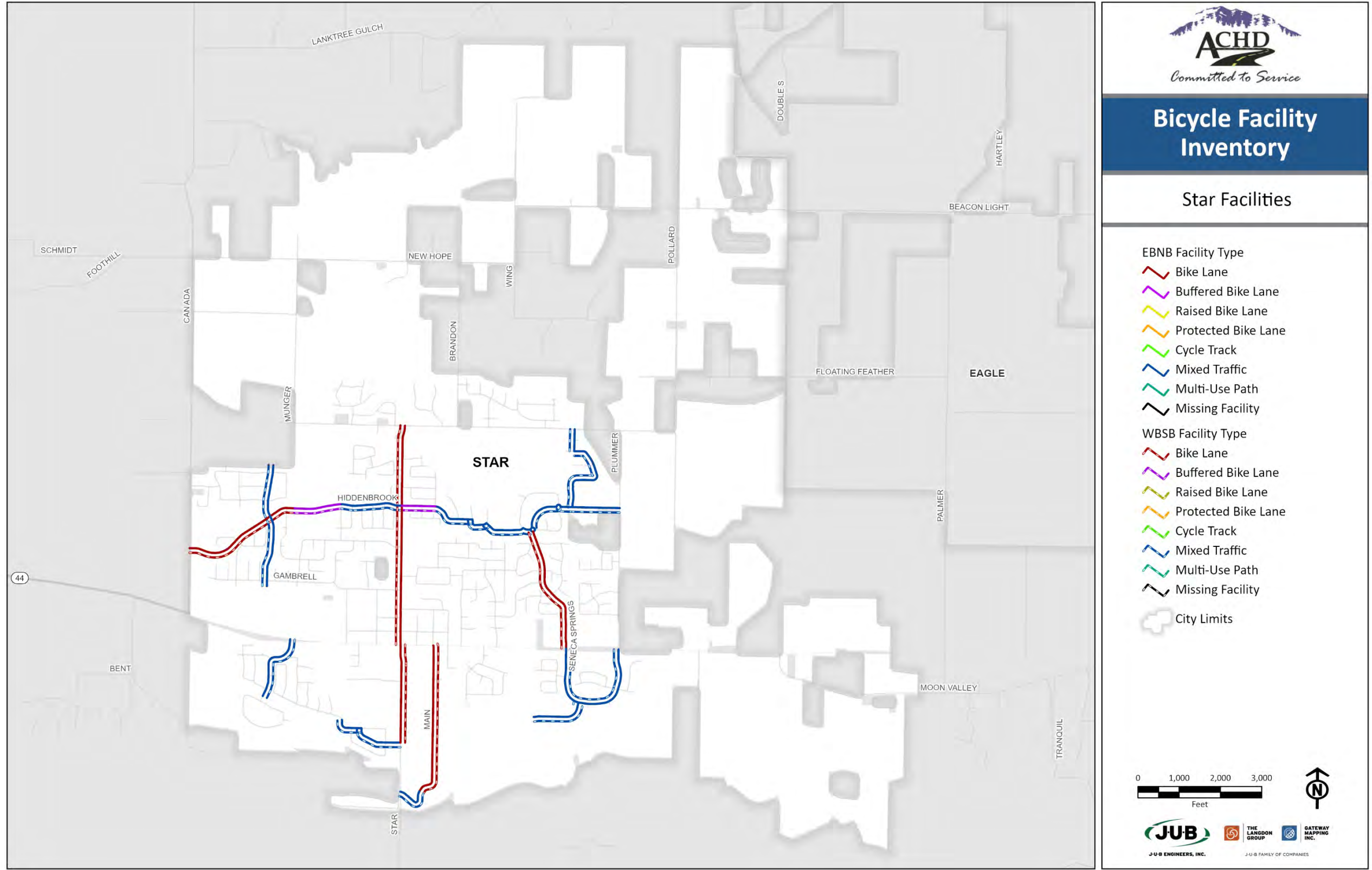
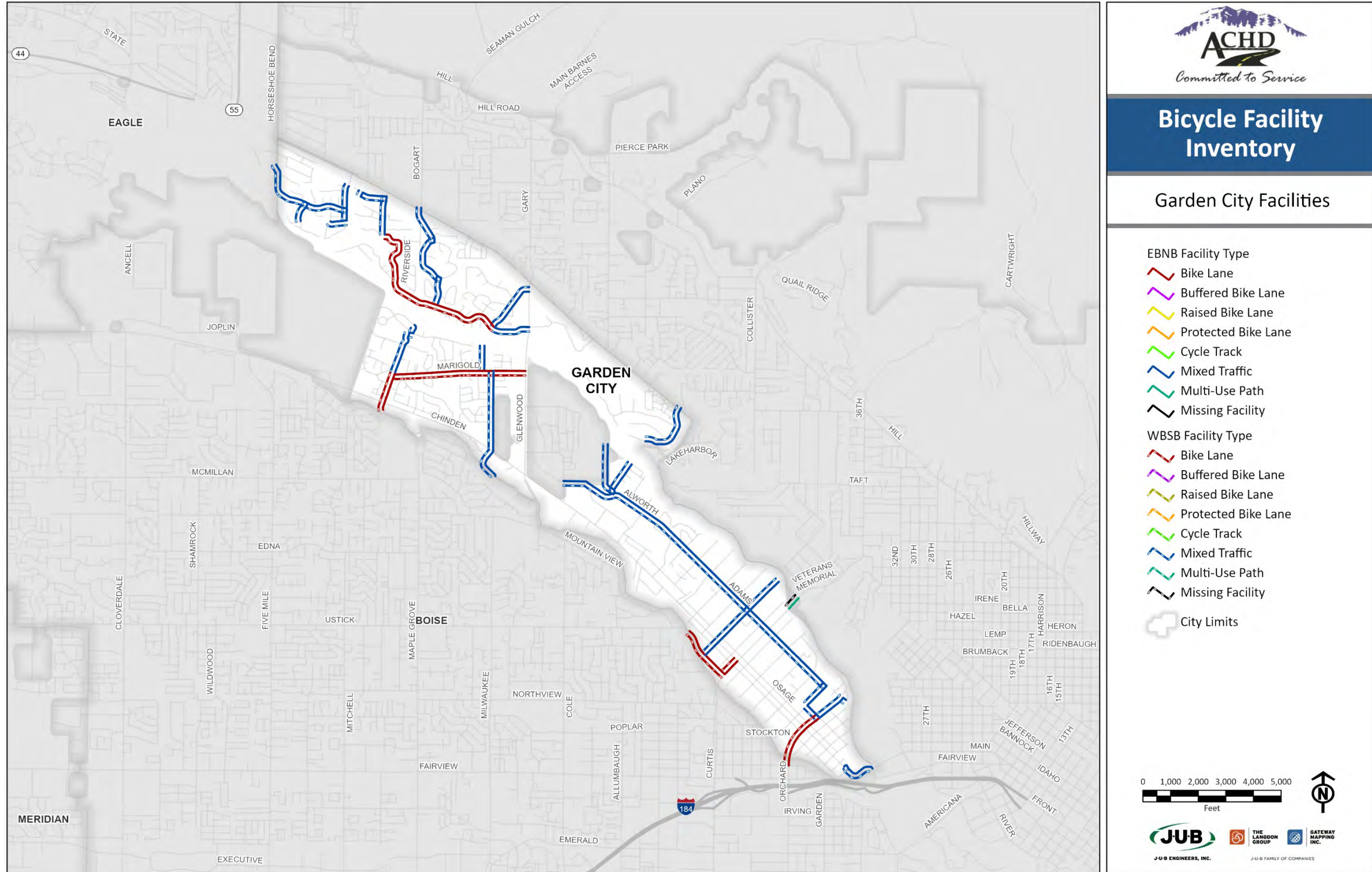


Figure 8 – City of Garden City Existing Bicycle Facilities



Bicycle Facilities Analysis

FACILITY GAPS

Within the Ada County Highway District, 903 miles of bicycle facilities were inventoried, which includes both Eastbound/Northbound (EBNB) and Westbound/Southbound (WBSB) lanes of traffic. After analyzing these facilities, the following gaps in both segments and connectivity are identified below:

- Approximately 476 miles (includes both directions of traffic) within the district are designated as “Mixed Traffic”, however only 39 miles have sharrows to identify the road as a shared route. Out of these 39 miles, 31 miles are located within the Boise city limits.
- Bike facilities are most lacking in rural areas. The gaps occur primarily south of Interstate 84 (South Meridian, SW Boise, and Kuna) and north of Chinden Boulevard (Star and Eagle).
- The existence of bike facilities on both the EBNB and WBSB sides of traffic is relatively balanced. However, EBNB road lanes contain slightly more facilities than WBSB (50.4% vs 49.5%).
- Bike Lanes and Mixed Traffic make up 95.7% of bike facilities within the district. Buffered Bike Lanes, Protected Bike Lanes, Raised Bike Lanes, and Cycle Tracks only make up 1.6% of facilities combined. Multi-Use Paths are only 2.7% of bike facilities within the District (only multi-use paths along right-of-ways (ROW) were inventoried, so this number does not include most of the Boise Greenbelt).
- The majority of the multi-use paths inventoried are located within the city of Boise (45%) or Meridian (46%). The span of the multi-use paths throughout the District are limited and disconnected. They usually span small portions of subdivisions or road sections and range in length from .1 to 1 mile (one exception is a 5-mile path along Federal Way in Boise). In the city of Boise, the gaps in multi-use paths are usually bridged with bike lanes. However, the multi-use path gaps within the cities of Meridian and Eagle are bridged with Mixed Traffic facilities. This pushes cyclists back and forth between the multi-use path and traffic.

FIELD OBSERVATIONS

General observations made during field data collection include identified patterns regarding varying bicycle widths, pavement markings, and external factors such as noxious weeds and debris. Such observations include the following:

- Pavement markings to distinguish bike lanes are scarce.
- Bike lane widths vary around intersections and various curves or bends in the road.
- Facilities often have obstructions including debris and/or noxious weeds.
- Facilities vary when crossing bridges and railroad tracks (i.e. Linder, south of Pine).
- Some bike lane facilities do not meet standard 4’ (i.e. Linden & Gekeler).
- Facility widths vary in areas with shoulder pavement edges.



DATA MAINTENANCE & COLLECTION RECOMMENDATIONS

To ensure that updating and maintaining the bicycle facilities inventory is as simple and straightforward as possible, recommendations for data collection and maintenance are as follows:

- Collect data using Esri's ArcGIS Field Maps app with a live connection to the database. This mobile application is easy to use and submitting data as it is collected ensures no data is lost if the tablet is compromised. Use a MiFi device to provide a hotspot for the tablet.
- Plan routes to eliminate back tracking and make sure they can be inventoried within the time allotted. The average battery life of a tablet and MiFi device is approximately 3-4 hours, so plan a route that can be finished in that timeframe.
- If the Esri Field Maps app is used to collect measurements, it is most efficient to first view the roadway and bicycle facility data on a web map in the office; add Field Measurement points where it looks like there are changes in the roadway or bicycle facilities. This helps lay out the route/area to be verified and it streamlines the process to edit the measurement points once you are in the field.
- Take photos at each measurement point. When beginning an edit to a measurement point in the field app, it is most efficient to take the photo as the first step before any data fields are filled out to make sure the photo is not forgotten. Remember to take photos on each side of the road if bike facilities are present.
- The best time for field verifications is in the morning after rush hour, around 8:30 a.m.
- Verification of longer road segments, or busy roadways (i.e. Ten Mile Road), can be accomplished more efficiently as a team with one person on each side of the road collecting data for each direction of traffic.
- Collecting data is more efficient by bicycle rather than by vehicle because of the frequent stops required as facilities change. However, if it is a shared facility, driving is more efficient because fewer stops are necessary.

Appendix A

Bicycle Facility Types

ACHD Bicycle Facility Types

Bike Lane

“Designated exclusively for bicycle travel, bicycle lanes are separated from vehicle travel lanes with striping and also include pavement stencils.” (ACHD, Roadways to Bikeways, 22)



Cycle Track

“The treatment provides a physical barrier between bikes and cars.” (ACHD, Roadways to Bikeways, 217). In order to be considered a cycle track, it must also be two directional bicycle travel on the track as shown below.



ACHD Bicycle Facility Types

Buffered Bike Lane

A bike lane that is separated from the travel lane by paint only



Multi-Use Path

“[Multi-use paths] are used by various non-motorized users, including pedestrians, cyclists, in-line skaters and runners. [Multi-use paths] are typically paved (asphalt or concrete) but may also consist of an unpaved smooth surface as long as it meets ADA standards.” (ACHD, Roadways to Bikeways, 24)



ACHD Bicycle Facility Types

Raised Bike Lane

Designated exclusively for bicycle travel, raised bicycle lanes are raised lanes separated from vehicle travel lanes with a curb and also include pavement stencils.



Protected Bike Lane

One way bike lane with vertical separation



ACHD Bicycle Facility Types

Mixed Traffic

1. Shared Bike Route

“Wide outside lanes, which may not have enough width to provide bike lanes but do have space to provide a wider (14’-16’) outside travel lane” (ACHD, Roadways to Bikeways, 22) A shared bike route should include stencils. Stencils shall be 4’ from the face of curb if no parking is present. Stencils to be 11’ from the curb face if parking is present.



2. Signed Shared Roadways

“Bike routes may also be desirable on certain commute routes where installing bike lanes is not possible, provided that appropriate signage is installed to alert motorists to the presence of bicycles on the roadway. Bike route signing may also include “Share the Road” signs at regular intervals along the route.” (ACHD, Roadways to Bikeways, 23)



ACHD Bicycle Facility Types

3. Bicycle Boulevards

“On streets with low traffic volumes of 3,000 average daily traffic or less and low speeds of 25 mph or less, striped bike lanes may not be needed at all. This is based on the potential for serious conflicts being so low that the cost of installing bike lanes may not be warranted. On these types of low-traffic neighborhood streets, called ‘bicycle boulevards,’ designated and signed bike routes can serve as important connectors to schools and recreational areas such as parks. Bicycle Boulevards are a specific sub-category of signed shared roadways, where different levels of traffic calming, signage and other accommodations are made for bicyclists.” (ACHD, Roadways to Bikeways, 23)



Appendix B

Attribute Table

Field	Description	Field Type	Domain
SpeedField	Speed limit noted in field	Long Int	15-55 (5 interval)
TotalLanes	Total number of roadway lanes	Long Int	1-10
TotalPavement	Width of all pavement present in feet (on-screen measurement & field spot checks)	Double	.5 ft intervals
TotalROW	Width of entire right-of-way based on parcel boundaries in feet (on-screen measurement)	Double	
ManagementZone	Pavement management zone (Select by location - "Center In" to capture majority)	Text - 50	
NeighborhoodPlanning	Neighborhood planning zone (Select by location - "Center In" to capture majority)	Text - 100	
FieldNotes	Comments on facility	Text - 500	
FacilityDirectionEBNB	Specifies direction of bike facility on one side of street (N/A used when one-way street)	Text - 20	Eastbound, Northbound, N/A
FacilityTypeEBNB	Specifies type of bike facility	Text - 100	FacilityType (see list below)
FacilityWidthEBNB	Measured width of bike facility	Text - 10	2.5-15 (half foot intervals), N/A
AdjLaneWidthEBNB	Width of adjacent travel lane	Text - 10	8.5-22 (half foot intervals), N/A
LaneCtEBNB	Number of lanes going EBNB	Text - 10	1-8, N/A
PavementEdgeEBNB	Describes the edge of pavement	Text - 100	Curb No Gutter, Curb & Gutter, Rural Edge, N/A
RightTurnEBNB	Designates if there is a right only or right through lane and where the bike lane is in relation	Text - 100	Rt Turn (Floating Bike Lane), Thru Rt Turn (Outside Bike Lane), Thru Rt Turn (Shared Bike Route), N/A
ParkingEBNB	Presence/Type of on-street parking	Text - 25	Parallel, Angled, None
ParkingWidthEBNB	Designates width of parking	Text - 10	5-25 (foot intervals), N/A
PavementMarkingsEBNB	Designates if pavement markings present	Text - 20	Yes, No, Needs Corrected, N/A
MarkingLocationEBNB	Distance from curb or edge of pavement to pavement marking	Text - 10	1-20 (foot intervals), N/A
BufferTypeEBNB	Type of buffer	Text - 100	None, Painted, Extruded Curb, Delineator, Landscaping, Parking, Jersey Barrier, Other, N/A
BufferWidthEBNB	Width of buffer	Text - 10	.5, 1, 1.5, 2-20, N/A, Varies
FacilityDirectionWBSB	Specifies direction of bike facility on one side of street (N/A used when one-way street)	Text - 20	Westbound, Southbound, N/A
FacilityTypeWBSB	Specifies type of bike facility	Text - 100	FacilityType (see list below)
FacilityWidthWBSB	Measured width of bike facility	Text - 10	2.5-15 (half foot intervals), N/A
AdjLaneWidthWBSB	Width of adjacent travel lane	Text - 10	8.5-22 (half foot intervals), N/A
LaneCtWBSB	Number of lanes going WBSB	Text - 10	1-8, N/A
PavementEdgeWBSB	Describes the edge of pavement	Text - 100	Curb No Gutter, Curb & Gutter, Rural Edge, N/A
RightTurnWBSB	Designates if there is a right only or right through lane and where the bike lane is in relation	Text - 100	Rt Turn (Floating Bike Lane), Thru Rt Turn (Outside Bike Lane), Thru Rt Turn (Shared Bike Route), N/A
ParkingWBSB	Presence/Type of on-street parking	Text - 25	Parallel, Angled, None
ParkingWidthWBSB	Designates width of parking	Text - 10	5-25 (foot intervals), N/A
PavementMarkingsWBSB	Designates if pavement markings present	Text - 20	Yes, No, Needs Corrected, N/A
MarkingLocationWBSB	Distance from curb or edge of pavement to pavement marking	Text - 10	1-20 (foot intervals), N/A
BufferTypeWBSB	Type of buffer	Text - 100	None, Painted, Extruded Curb, Delineator, Landscaping, Parking, Jersey Barrier, Other, N/A
BufferWidthWBSB	Width of buffer	Text - 10	.5, 1, 1.5, 2-20, N/A, Varies

Facility Type:

- Bike Lane
- Mixed Traffic (encompasses Shared Bike Route)
- Multi-Use Path
- Buffered Bike Lane (only paint)
- Protected Bike Lane (anything with vertical element)
- Raised Bike Lane
- Cycle Track (two way bicycle traffic and separate from sidewalk)
- No Facility
- N/A