APPENDIX D3: EASTERN WEBER COUNTY & MORGAN COUNTY

Safety Summary

Tech Memo #1 Safety Analysis

Case Study Project Information Sheets

Case Study Project Location Map

Equity Index Map

EASTERN WEBER COUNTY & MORGAN COUNTY SAFETY SUMMARY

East Weber County & Morgan County Geographic Focus Area

CSAP OVERVIEW

"A plan to provide local governments the means to make strategic roadway safety improvements"

Wasatch Front Regional Council (WFRC) is preparing a regional Comprehensive Safety Action Plan (CSAP). The CSAP will present a **holistic, well-defined strategy** to **reduce roadway fatalities and serious injuries** in the Wasatch Front region.

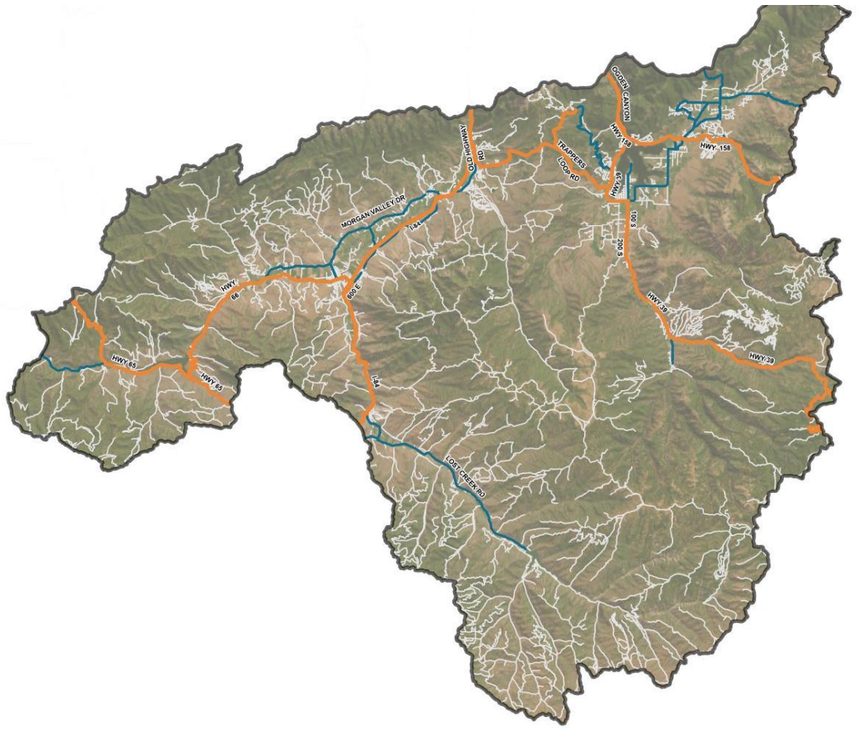
The CSAP will ***analyze*** safety needs, ***identify*** high-risk locations and factors contributing to crashes, and ***prioritize*** strategies to address them.

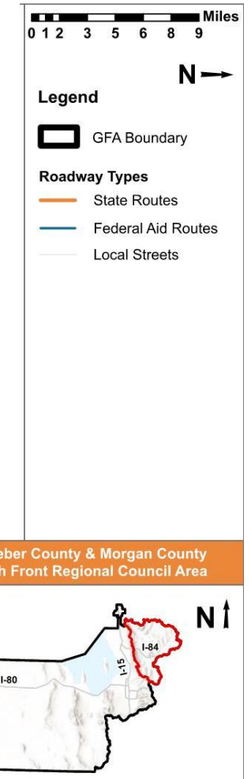
The CSAP will meet eligibility requirements that allow local jurisdictions to apply for **Implementation Grants** from the United States Department of Transportation (USDOT) Safe Streets and Roads for All (SS4A) discretionary grant program. The grant program was established by the Bipartisan Infrastructure Law (BIL) with $5 billion in appropriated funds, 2022-2026. A Safety Action Plan must include the following elements, as specified by FHWA to satisfy eligibility requirements to apply for an implementation grant:

State Route: Roadways owned, operated, and maintained by UDOT

Federal-Aid Route: Non-UDOT roadways eligible for federal funding – typically minor arterials and collectors

Local Streets: Other non-UDOT / non-Federal Aid roadways, primarily collectors, and residential streets





Self-Certification Checklist

Plan must include the following:

- ❑ Safety Analysis
  - ❑ Existing conditions and historical trends
  - ❑ Crashes by location, severity, and contributing factor
  - ❑ Systemic and specific safety needs
  - ❑ Geospatial identification of higher risk locations
- ❑ Identification of comprehensive set of projects and strategies

...And must complete 4 of the 6 elements to the right:

1. Leadership Commitment
   - ❑ Governing body publicly commit to a zero fatalities and serious injury goal
2. Plan Development
   - ❑ Committee charged with plan development, implementation, and monitoring
3. Development Activities
   - ❑ Engagement with public and relevant stakeholders
4. Equity
   - ❑ Data-driven, inclusive, and representative processes
5. Policies, Plans, Guidelines, and/or Standards
   - ❑ Assessment policies, plans, guidelines, and/or standards
6. Progress
   - ❑ Description on how progress will be measured over time

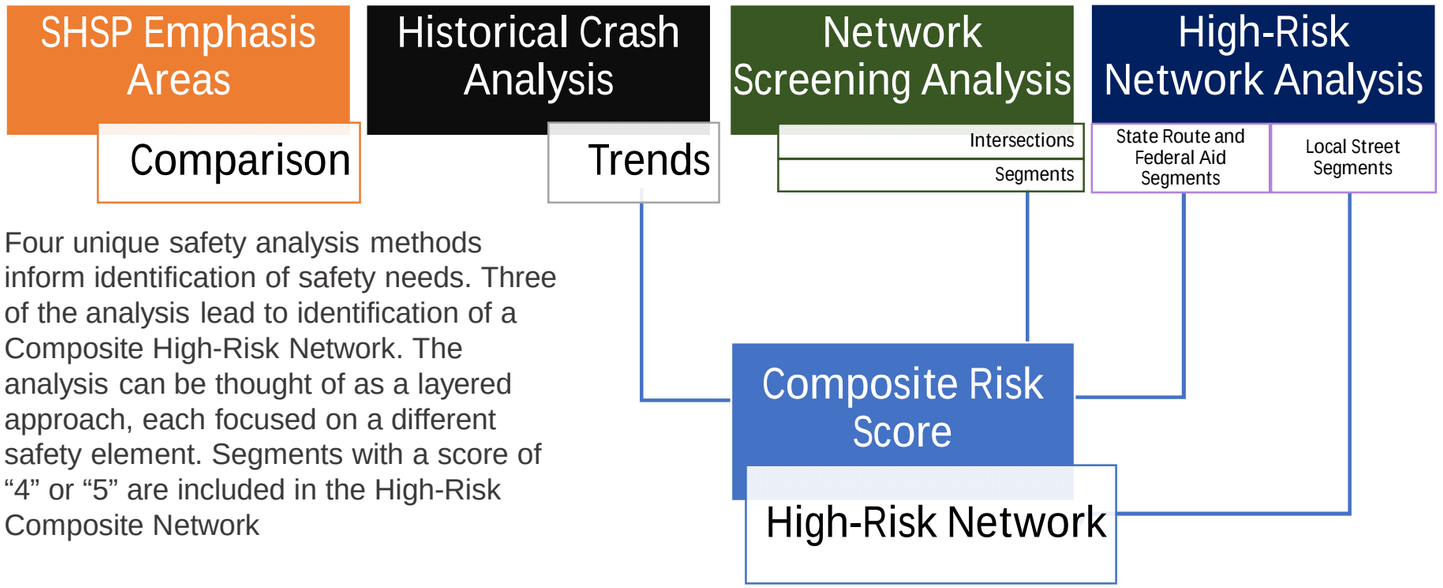
Safe System Approach

Implementing a Safe System Approach requires moving away from traditional safety paradigms.

- ❑ The Safe System approach seeks to prevent death and serious injuries.
- ❑ The Safe System approach designs for human mistakes and limitations.
- ❑ The Safe System approach focuses on speed management and strategies to reduce system kinetic energy.
- ❑ The Safe System approach aims to share responsibility among system users, managers, and others.
- ❑ The Safe System approach proactively identifies and addresses risks

Traditional Approach to Safety	Safe System Approach Paradigm
Prevent crashes	Prevent death and serious injury
Improve human behavior	Design for human mistakes/limitations
Control speeding	Reduce system kinetic energy
Individuals are responsible	Share responsibility
React based on crash history	Proactively identify and address risks

Safety Analysis Methodology



Four unique safety analysis methods inform identification of safety needs. Three of the analysis lead to identification of a Composite High-Risk Network. The analysis can be thought of as a layered approach, each focused on a different safety element. Segments with a score of "4" or "5" are included in the High-Risk Composite Network

Analysis	Composite High Risk Score Element	Value
Historical Crash Analysis	Segment 5-Year Crash Totals ≥ 3 Crashes	1
Network Screening Analysis	Positive CCR Differential	1
High-Risk Network Analysis	Crash Profile Risk Score ≥ 20	1
	usRAP Vehicle Star Rating = 1-2 Stars	1
	usRAP Pedestrian Star Rating = 1-2 Stars	0.5
	usRAP Bicycle Star Rating = 1-2 Stars	0.5
Total Possible Composite Risk Score		**5**

Strategic Highway Safety Plan (SHSP) Emphasis Area Comparison

Based on a comparison of fatal and serious injuries for each Utah SHSP Emphasis area, the following emphasis areas should be considered when developing safety improvement projects specific to the **East Weber County & Morgan County** GFA.

- Roadway Departure
- Motorcycle
- Speed-Related
- No Safety Restraints
- Teen Driver

Note that while Intersection and Roadway Departure emphasis areas rank highest in terms of number of fatal and serous injuries at the Statewide and Regional Levels, Roadway Departure and Motorcycles rank highest in the **East Weber County & Morgan County** GFA.

Motorcycles ranks 7th as a Statewide and 5th Regional emphasis area, and 2nd in the **East Weber County & Morgan County** GFA.

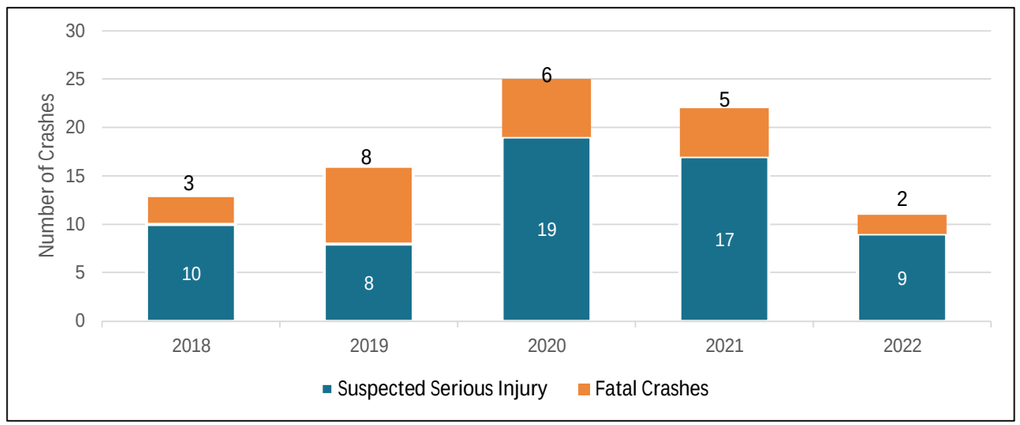
Strategic Highway Safety Plan Emphasis Area Comparison

Category	Utah SHSP Safety Emphasis Area	Statewide Totals		WFRC Totals		East Weber County & Morgan County Totals		
		Fatal and Serious Injury	Rank	Fatal and Serious Injury	Rank	Fatal and Serious Injury	Rank	Change in Rank From WFRC
Driver	Teen Driver	1,640	**4**	751	4	15	5	-1
	Older Driver	1,508	6	700	6	8	8	-2
	Speed-Related	2,133	**3**	936	3	34	3	0
	Aggressive Driving	555	11	297	10	12	6	4
	Distracted Driving	718	10	286	11	5	10	1
	Impaired Driving	1,184	8	623	8	10	7	1
	No Safety Restraints	1,542	**5**	599	9	23	4	5
Roadway	Intersection	3,567	**1**	2,163	1	8	8	-7
	Roadway Departure	2,931	**2**	1,014	2	65	1	1
Special Users	Motorcycle	1,457	7	750	5	42	2	3
	Pedestrian	912	9	636	7	0	12	-5
	Bicycle*	280	12	167	12	1	11	1

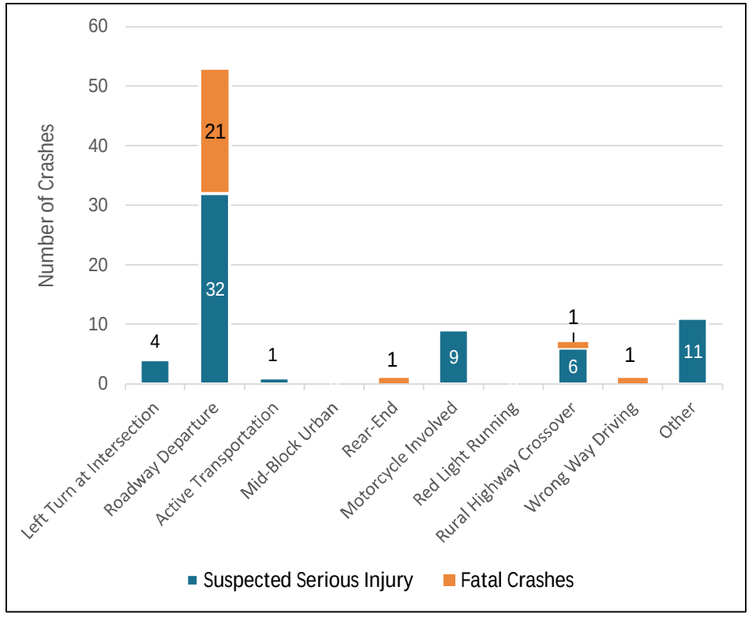
*While Bicycles are not one of the eleven Utah SHSP emphasis areas, they are included as part of the CSAP safety analysis.

5-Year Historical Crash Trends in East Weber County and Morgan County GFA

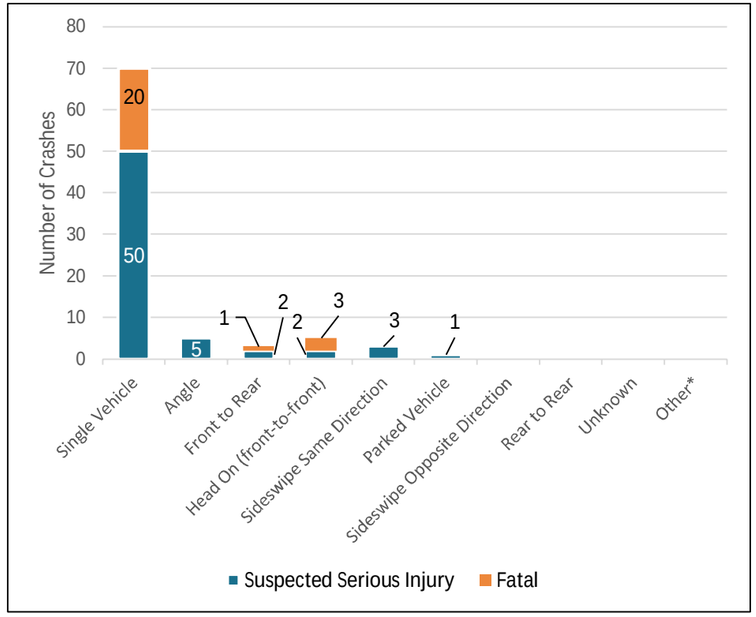
Route Type	State Route		Federal Aid Route		Local Street		Overall Total		% of WFRC
Crash Severity	Crashes		Crashes		Crashes		Crashes		%
	#	%	#	%	#	%	#	%	
Fatal	21	1%	1	0%	2	2%	**24**	**1.2%**	**0.0%**
Suspected Serious Injury	45	3%	12	4%	6	5%	**63**	**3.2%**	**0.0%**
Suspected Minor Injury	183	12%	36	13%	14	12%	**233**	**12.0%**	**0.1%**
Possible Injury	171	11%	42	15%	9	8%	**222**	**11.4%**	**0.1%**
No Injury / Property Damage Only	1,125	73%	183	67%	89	74%	**1,397**	**72.0%**	**0.8%**
Route Total	**1,545**	**100%**	**274**	**100%**	**120**	**100%**	**1,939**	**100%**	**1.1%**



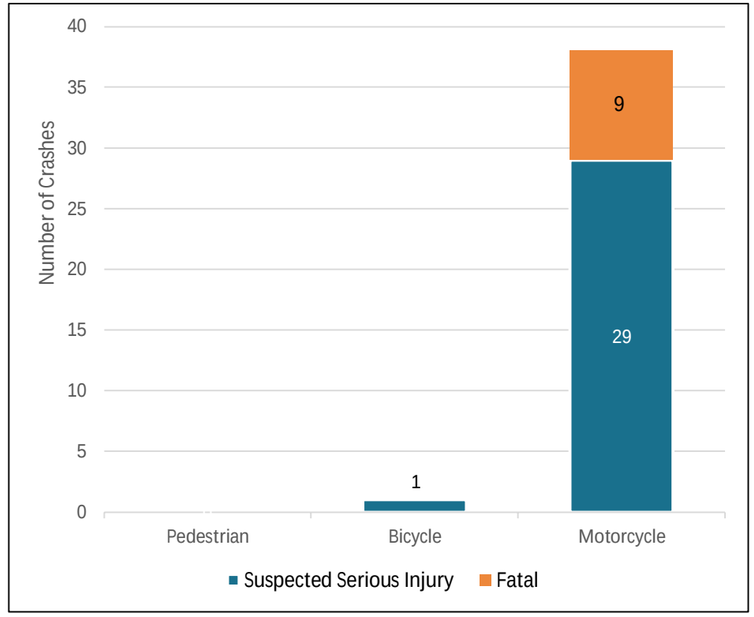
Annual Fatal and Serious Injury Crashes (2018-2022)



Crash Type



Manner of Collision



Active Transportation

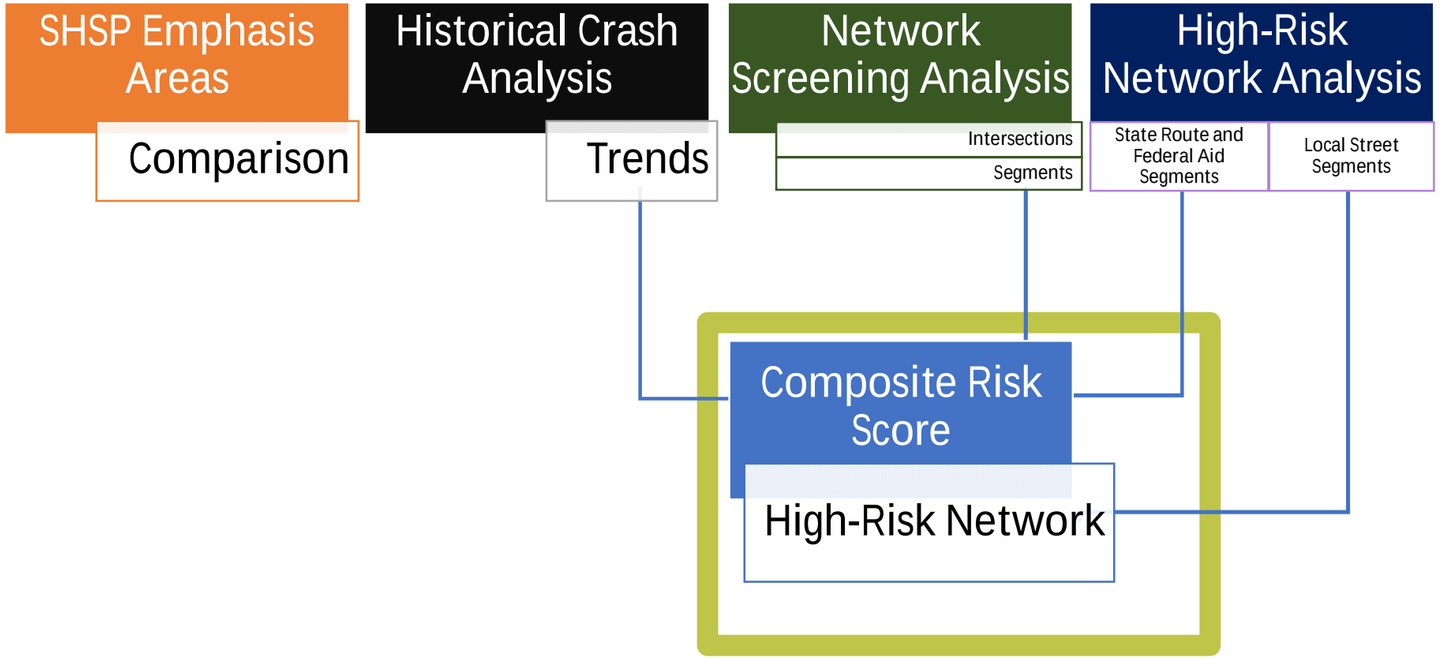
Composite High-Risk Roadway Network

Each of the completed safety analysis methodologies identified segments or intersections that are **candidates for safety improvements** to reduce fatalities and serious injury crashes.

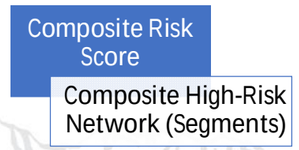
To provide focused information for jurisdictional decisions regarding **prioritization of safety improvements**, an analysis was performed to identify overlapping segments from each of the analysis methodologies. A **composite risk score**, from zero to five, was assigned to each State Highway or Federal Aid Route segment in the region. State Route or Federal Aid Route segments with a score of "4" or higher are included in the Composite High-Risk Network. These represent the top 10% of State Route and Federal Aid Route segments for the entire WFRC area.

The Composite High Risk Network map on page 8 includes State Route and Federal Aid Route segments with a score of "4" or higher.

A list of locally-owned and maintained Federal Aid Route segments in the **East Weber County & Morgan County** GFA Composite High-Risk Network is included on the next page. Streets operated and maintained by local agencies are an emphasis of the SS4A program.



Analysis	Composite High Risk Score Element	Value
Historical Crash Analysis	Segment 5-Year Crash Totals ≥ 3 Crashes	1
Network Screening Analysis	Positive Local CCR Differential	1
High Risk Network Analysis	Crash Profile Risk Score ≥ 20	1
	usRAP Vehicle Star Rating = 1-2 Stars	1
	usRAP Pedestrian Star Rating = 1-2 Stars	0.5
	usRAP Bicycle Star Rating = 1-2 Stars	0.5
Total Possible Composite Risk Score		**5**



Composite High-Risk Network (State Route/Federal Aid) and Local Street Risk Network

Facility	Limits	Functional Classification	City	Length (miles)	RISK TYPE: *usRAP- Pedestrian Star Rating*	*usRAP - Bicycle Star Rating*	*usRAP- Vehicle Star Rating*	Crash Profile Risk Score	CCR Differential Analysis	Significant Crashes	Local Street Risk Assessment
State Route											
Ogden Canyon	West GFA Extent to Highway 158/H	Minor Arterial	Unincorporated	4.5	X	X	X	X		X	
Highway 158	Ogden Canyon to North GFA Extent	Major Collector	Unincorporated	11.0	X	X	X	X		X	
Highway 39	Ogden Canyon to Cobble Creek Spe	Major Collector	Huntsville	12.0	X	X	X		X	X	
Highway 39	Beaver Creek to Ant Flat Road	Major Collector	Unincorporated	3.5	X	X	X		X	X	
Highway 39	Dry Bread Loop to Blue Bell Flat	Major Collector	Unincorporated	1.5	X	X	X		X	X	
Old Highway Road	I-84 to Trappers Loopp Road	Major Collector	Unincorporated	1.5	X	X	X	X		X	
Highway 66	Along East Canyon Creek	Major Collector	Unincorporated	0.7	X	X	X		X	X	
Highway 65	West GFA Extent to Access Road	Major Collector	Unincorporated	4.3	X	X	X		X	X	
Federal Aid Routes											
Old Highway Rd	Morgan Valley Dr to Bohman Ln	Major Collector	Unincorporated	0.1	X	X		X	X	X	
Local Streets					Local Street Risk Assessment						
Richville Lane	Morgan Valley Drive to SR-66	Local	Richville	0.8	The Local Street Risk Assessment considered factors such as locations of crashes, proximity to schools, and hard-braking.						X
North Fork Road	Middle Gate Drive to North Fork Pa	Local	Morgan County	0.6							X
Lost Creek Road	Entire Corridor	Major Collector	Croydon	11.6							X
Old Highway Road	2000 North to 2700 North	Major Collector	Morgan County	1.7							X
100 North	200 East to 300 West	Local	Morgan	0.5							X
100 South	100 West to 400 East	Local	Morgan	0.6							X
525 North	Entire Corridor	Local	Morgan	0.4							X
5900 East	2100 North to 1800 North	Local	Eden	0.4							X
River Drive	Hwy-162 to 4100 North	Minor Collector	Liberty	1.7							X
Round Valley Road	Entire Corridor	Local	Morgan	1.7							X

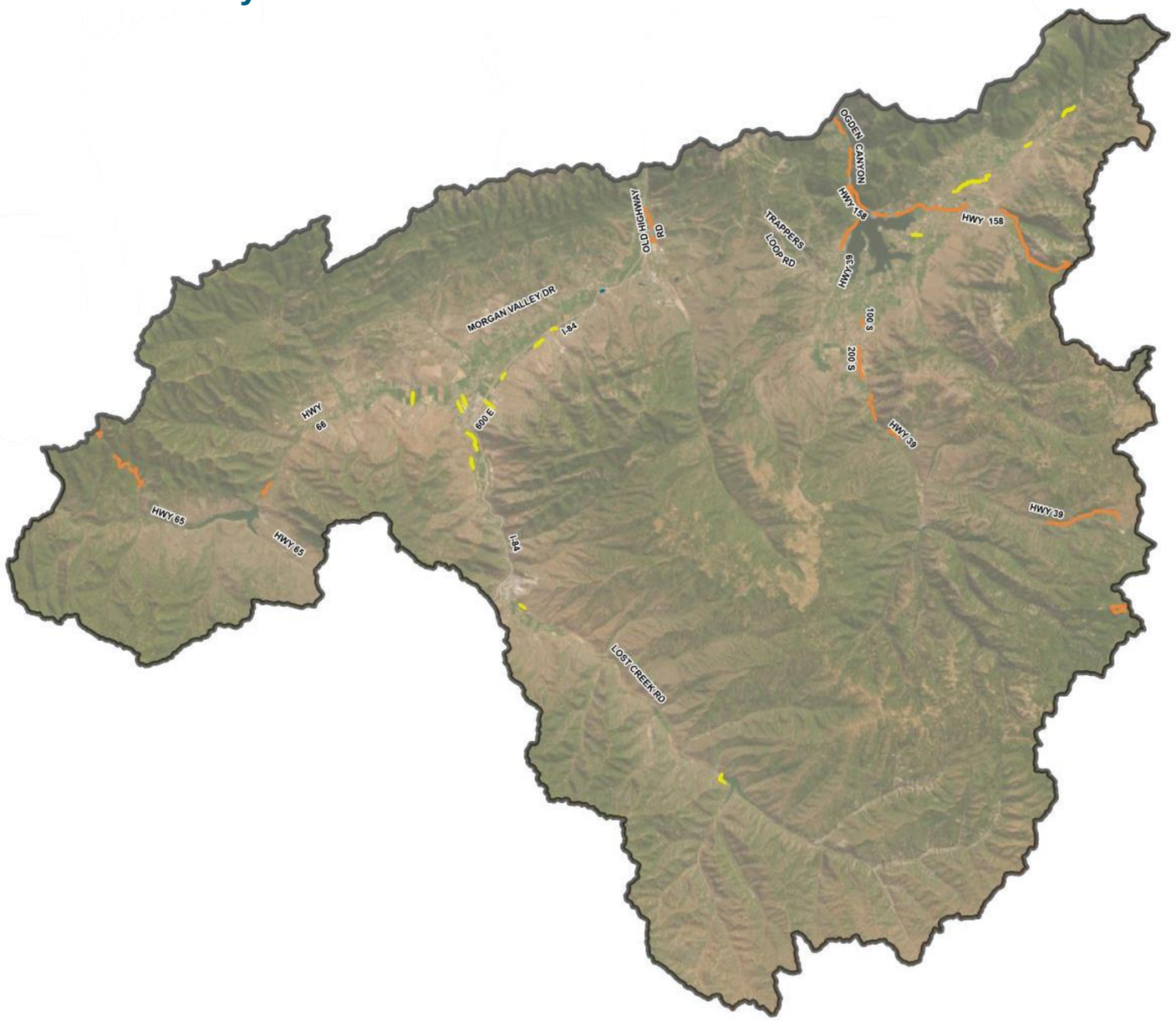
State Route and Federal Aid segments in the **East Weber County & Morgan County GFA** Composite High-Risk Network are listed at left. Each of these segments received a composite risk score of "4" or higher. These segments provide a focus for local jurisdictions or for coordination with UDOT. Each of these segments are shown on the map on page 7.

Local Streets are also listed at left. These segments were identified through a separate analysis that considered factors such as crash location, proximity to schools, and hard braking.

Composite Risk Score

Composite High-Risk Network (Segments)

Composite High-Risk Roadway Network



Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

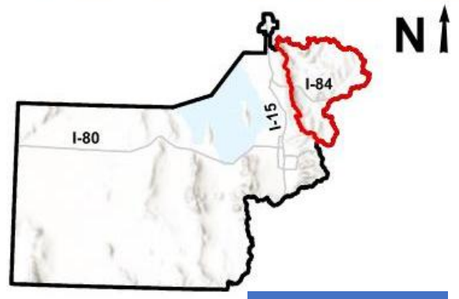
Composite High-Risk Network

State Routes

Federal Aid Routes

Local Streets

East Weber County & Morgan County
Wasatch Front Regional Council Area



Composite Risk Score

Composite High-Risk Network (Segments)

Network Screening - Intersections

Network Screening is one of the inputs to the Composite High-Risk Network. Network screening is based on Critical Crash Rate Differential analysis as documented in the Highway Safety Manual. This analysis identified intersections where historical crash rates exceed those which can be expected for similar facilities**.**

A list of the top-10 intersections on State Routes, Federal Aid Routes, and Local (Non-Federal Aid) Streets in the **East Weber County and Morgan County** GFA are listed at right, along with their associated number of crashes.

For each intersection, the Critical Crash Rate (CCR) Differential and Equivalent Property Damage Only (EDPO) value is listed. These intersections represent those with the highest potential for safety improvements and can be considered as project candidate locations.

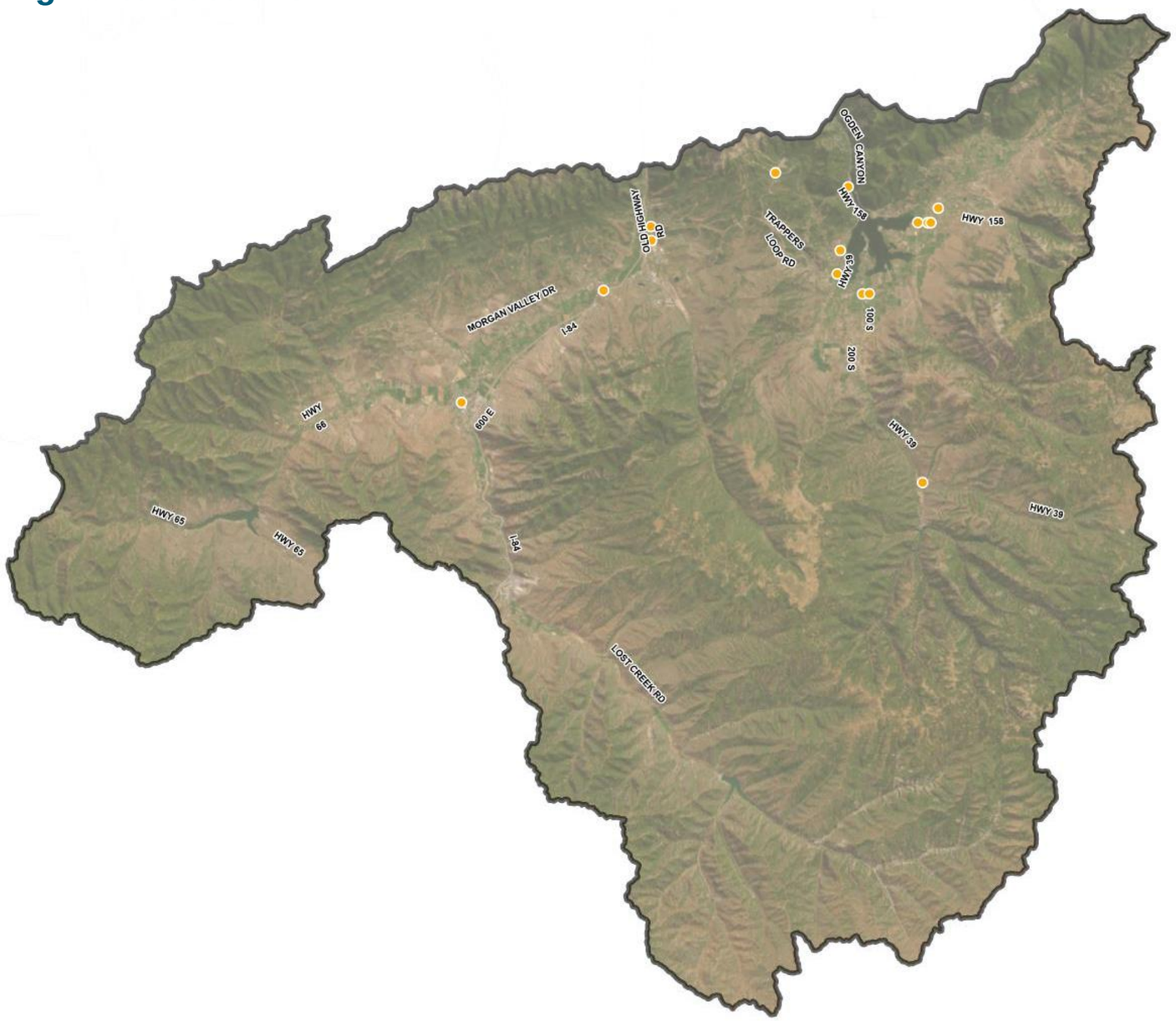
Signalized and unsignalized intersections in the **East Weber County and Morgan County** GFA with a positive Critical Crash Rate Differential (rate exceeds expected rate) are mapped on page 9.

Intersection	City	Crashes	Critical Crash Rate Differential	EPDO[1]	*Fatal*	*Suspected Serious Injury*	*Suspected Minor Injury*	*Possible Injury*	*No Injury/PDO*	Angle	Front to Rear	Head On	Parked Vehicle	Single Vehicle	Rear to Rear	Rear to Side	Sideswipe (Same Direction)	Sideswipe (opposite Direction)	Other/Unknown	Pedestrian	Bicycle	Motorcycle
Unsignalized Intersections																						
Wcsb19 Rd & Wc226 Rd	Unincorp.	3	1.2	3	0	0	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0
Hwy 39 & Causey Dr	Unincorp.	3	1.0	13	0	0	0	1	2	2	0	0	0	0	1	0	0	0	0	0	0	0
5500 E & 2200 N	Unincorp.	10	1.0	63	0	0	2	1	7	7	0	0	3	0	0	0	0	0	0	0	0	0
Trappers Loop Rd & Old Highway Rd	Unincorp.	16	0.7	57	0	0	0	4	12	2	12	0	1	0	0	0	0	1	0	0	1	1
7800 E & 100 S	Unincorp.	11	0.7	43	0	0	1	1	9	5	2	0	2	0	0	0	0	2	0	0	0	0
Trappers Loop Rd & Hwy 39	Unincorp.	11	0.6	310	0	3	1	0	7	1	4	0	4	0	0	0	0	2	0	0	0	2
5500 E & 2300 N	Unincorp.	5	0.5	47	0	0	1	2	2	0	1	0	4	0	0	0	0	0	0	0	0	1
Wheeler Creek Rd & Hwy 39	Unincorp.	11	0.4	167	0	1	2	2	6	4	3	1	2	0	0	0	0	1	0	0	0	0
State St & Young St	Morgan	7	0.3	48	0	0	0	4	3	6	1	0	0	0	0	0	0	0	0	0	0	0
5500 E & 1900 N	Unincorp.	4	0.3	14	0	0	0	1	3	1	0	0	3	0	0	0	0	0	0	0	0	0

1. Equivalent Property Damage Only Crashes

= 90 - 100% probability that crash type is over-represented
= 80 - 90% probability that crash type is over-represented
= 70 - 80% probability that crash type is over-represented

Network Screening - Intersections



Miles
0 1 2 3 5 6 8 9

N

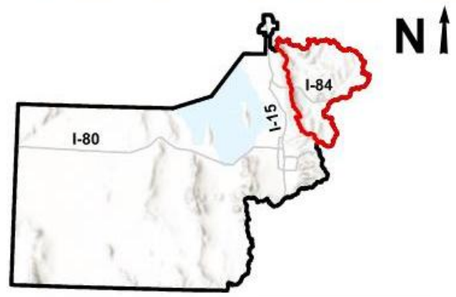
Legend

GFA Boundary

Critical Crash Rate Differential (> 1.0)

- Signalized
- Unsignalized

East Weber County & Morgan County
Wasatch Front Regional Council Area



Network Screening Analysis
- Intersections
- Segments

Supporting Information

High-Risk Roadway Segments (Federal Aid Routes)

Facility	Limits	City	RISK TYPE: *usRAP- Pedestrian Star Rating*	*usRAP - Bicycle Star Rating*	*usRAP- Vehicle Star Rating*	*Crash Profile Risk Score*	CCR Differential Analysis	Significant Crashes	Local Streets Risk Assessment
Federal Aid Routes									
Ant Flat Road	Ogden River Scenic Byway to North GFA Extents	Unincorporated	X	X	X				
2300 North	SR-158 to 5500 East	Unincorporated	X	X	X				
2200 North	5300 East to Sierra Drive	Unincorporated	X	X	X				
5500 East	2200 North to 2300 North	Unincorporated	X						
3500 East	Highway 162 to 4100 North	Unincorporated	X	X					
Old Highway Road	SR-167 to Sego Lily Road	Morgan	X	X					
Lost Creek Road	1900 North to Lost Creek Road	Morgan	X						
Lost Creek Road	North of 700 East	Morgan	X						
Morgan Valley Drive	SR-66 to Young Street	Morgan	X						
3500 East	3600 North to 4100 North	Eden				X			
5500 East	2200 North to 2300 North	Eden				X			
Old Highway Road	600 West to SR-167	Morgan				X			
2200 North	SR-158 to 5500 East	Eden				X			
2300 North	SR-158 to 5500 East	Eden				X			
North Ogden Canyon Rd	2900 E to 3300 E	North Ogden					X	X	
Old Highway Rd	4300 North to Morgan Valley Dr	Morgan					X	X	
7100 E	700 N to 1000 N	Huntsville					X	X	
500 N	7800 E to 7100 E	Huntsville					X	X	

A list of Federal Aid segments in the **East Weber County & Morgan County GFA** identified from each of the safety analysis methods is listed in the table at left. An “x” is placed to identify the analysis that flagged the segment:

- **usRAP** Star Ratings (Vehicle, Bicycle, Pedestrian)
- **Crash Profile** Risk Score
- **Network Screening,** applying Critical Crash Rate (CCR) and Significant Crashes (three or more crashes over 5-year period)

The maps on page 13 through 17 depict each of these segments identified by the respective analysis.

Composite Risk Score

High-Risk Network

High-Risk Roadway Segments (Federal Aid Routes), Cont'd. & Network Screening – Segments (Local Streets)

Facility	Limits	City	RISK TYPE: *usRAP- Pedestrian Star Rating*	*usRAP - Bicycle Star Rating*	*usRAP- Vehicle Star Rating*	*Crash Profile Risk Score*	CCR Differential Analysis	Significant Crashes	Local Streets Risk Assessment
Federal Aid Routes									
7100 E	1000 N to 1275 N	Huntsville					X	X	
1900 N	5700 E to Stingtown Rd	Eden					X	X	
River Dr	4100 N to Leonard Dr	Eden					X	X	
Hwy 162	Nordic Valley Dr to North Fork Ogden River	Unincorporated					X	X	
4100 N	3775 E to 3500 E	Eden					X	X	
Hwy 162	3300 N to Nordic Valley Dr	Unincorporated					X	X	
Local Streets									
Port Boat Ramp	UT-158 to Pineview Reservoir	Weber County					X	X	
7900 E	Stoker Ln to 1900 N	Weber County					X	X	
North Fork Rd	5900 N to 3100 E	Weber County					X	X	

A list of Federal Aid segments in the **East Weber County & Morgan County GFA** identified from each of the safety analysis methods is listed in the table at left. An "x" is placed to identify the analysis that flagged the segment:

- **usRAP** Star Ratings (Vehicle, Bicycle, Pedestrian)
- **Crash Profile** Risk Score
- **Network Screening,** applying Critical Crash Rate (CCR) and Significant Crashes (three or more crashes over 5-year period)

The maps on page 13 through 17 depict each of these segments identified by the respective analysis.

Composite Risk Score

High-Risk Network

usRAP Pedestrian Star Rating - Segments

Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

Pedestrian Star Rating (1-2)

State Routes

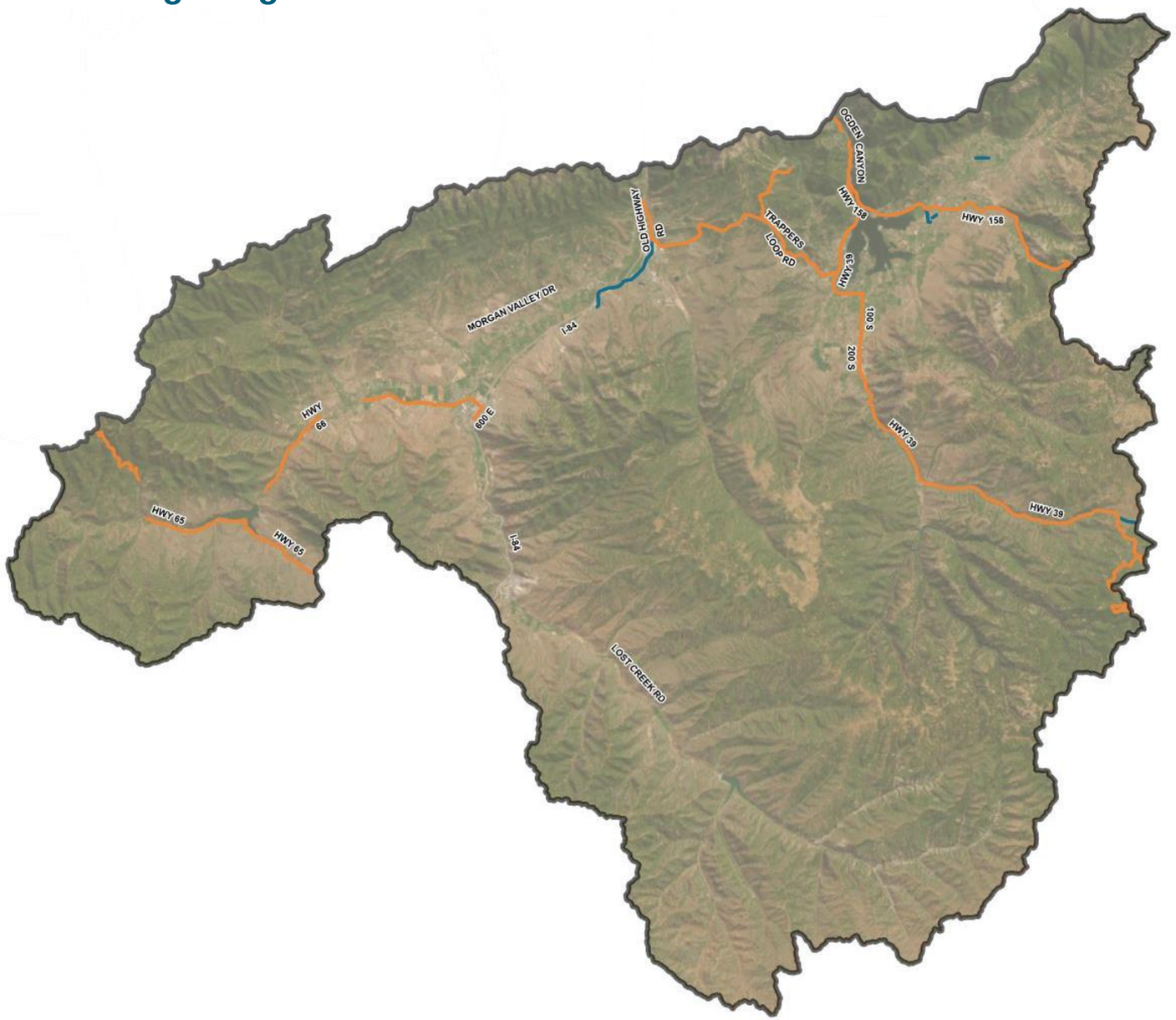
Federal Aid Routes

East Weber County & Morgan County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

usRAP Bicycle Star Rating - Segments



Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

Bicycle Star Rating (1-2)

State Routes

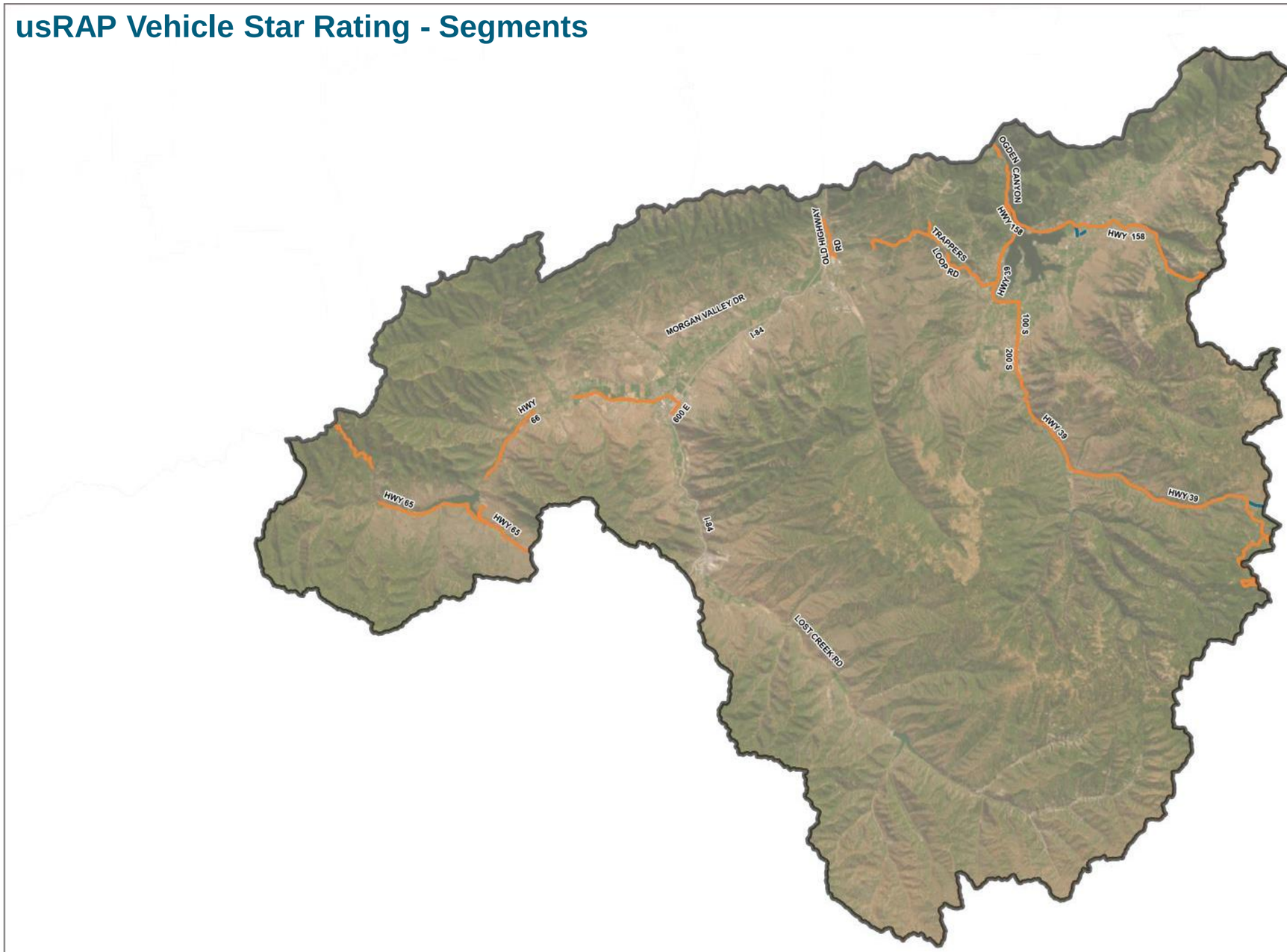
Federal Aid Routes

East Weber County & Morgan County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

usRAP Vehicle Star Rating - Segments



Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

Vehicle Star Rating (1-2)

State Routes

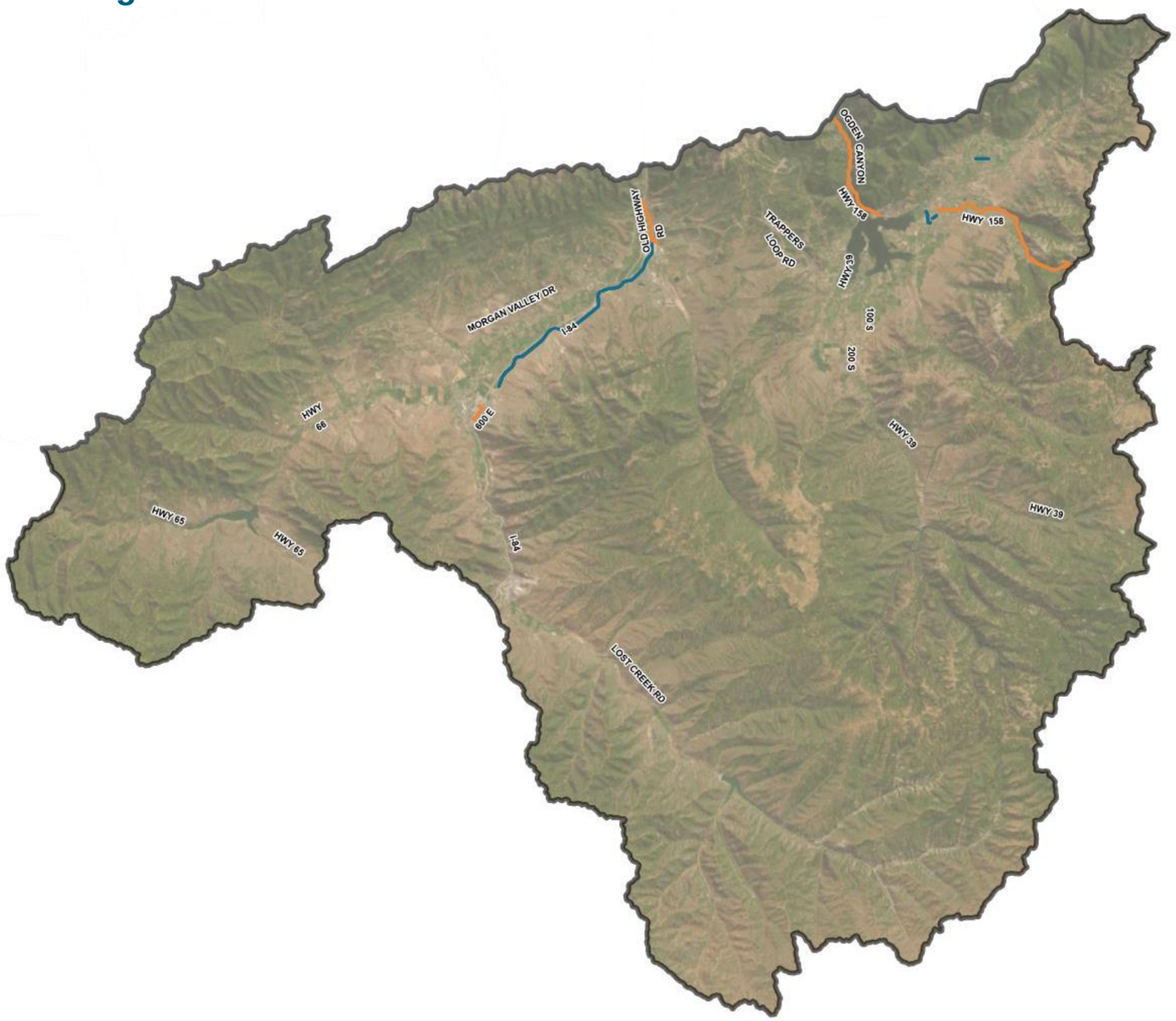
Federal Aid Routes

East Weber County & Morgan County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

Crash Profile Risk - Segments



Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

Crash Profile Risk (> 20)

State Routes

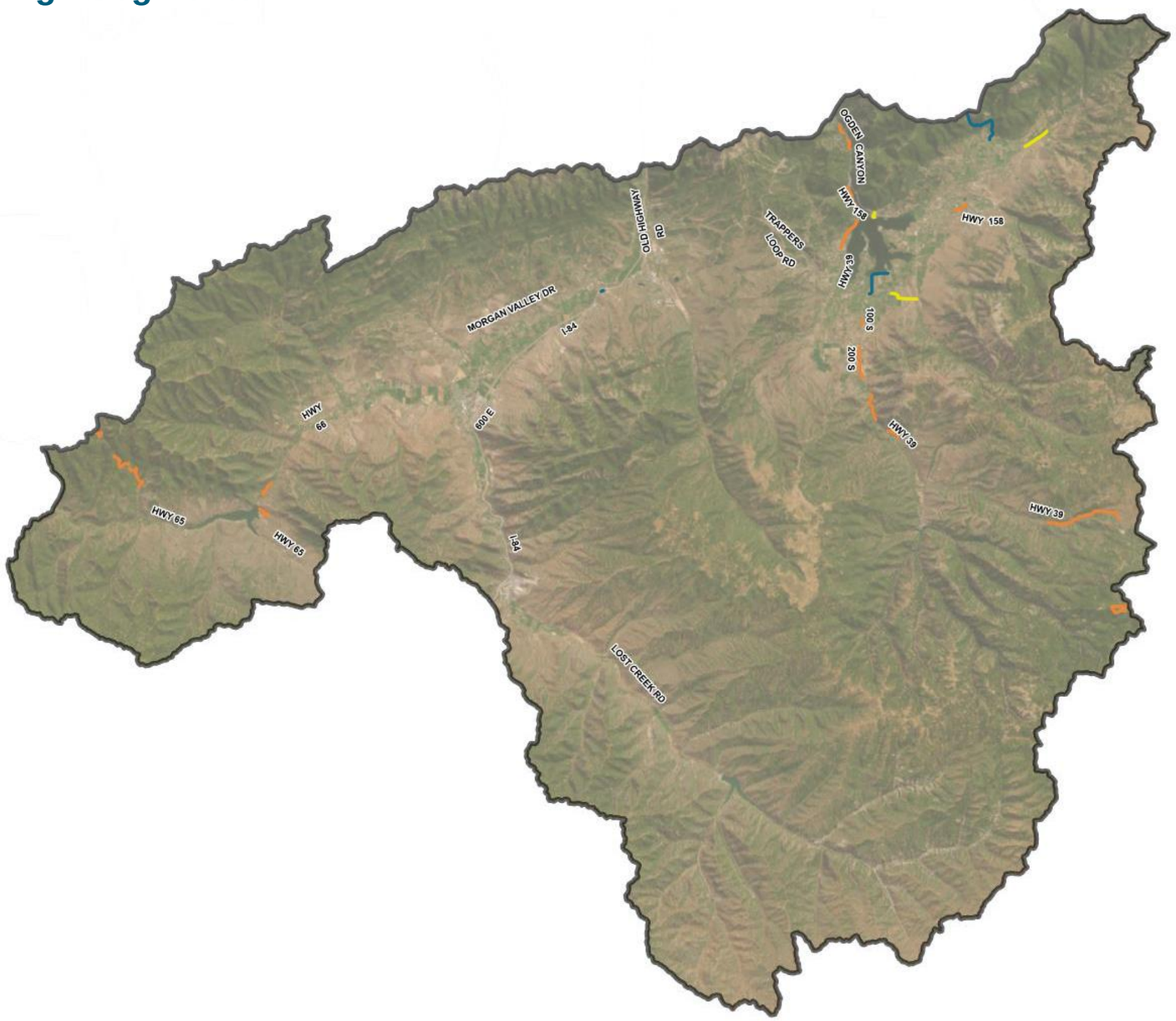
Federal Aid Routes

East Weber County & Morgan County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

Network Screening - Segments



Miles
0 1 2 3 5 6 8 9

N

Legend

GFA Boundary

Critical Crash Rate Differential (> 0.0)

State Routes

Federal Aid Routes

Local Streets

East Weber County & Morgan County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

EASTERN WEBER COUNTY & MORGAN COUNTY TECH MEMO #1 SAFETY ANALYSIS

TECHNICAL MEMORANDUM #1

APPENDIX A4 - EAST WEBER COUNTY & MORGAN COUNTY GEOGRAPHIC FOCUS AREA ANALYSIS

September 2023

Statutory Notice

23 U.S.C. § 409: US Code - Section 409: Discovery and admission as evidence of certain reports and surveys

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway- highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

File name: Appendix A4 - East Weber County & Morgan County - Safety Analysis.docx

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1. Introduction

Appendix A4 summarizes the safety analysis performed for the East Weber County & Morgan County Geographic Focus Area (GFA) for the Wasatch Front Area Comprehensive Safety Action Plan (CSAP).

The analysis of available safety related data informs identification of a potential project locations that may be further considered in the development of safety related projects and project types.

1.1. Safety Analysis

The following safety analysis methodologies were completed for the East Weber County & Morgan County GFA:

- Strategic Highway Safety Plan (SHSP) Emphasis Area Analysis
- Historical Crash Analysis
- Crash and Network Screening Analysis
- Roadway Characteristic Risk Analysis
  - Crash Profile Risk Assessment
  - usRAP Risk Factors Analysis
  - Local Street Risk Assessment

An overview on the methodologies used to perform these safety analyses are described in Technical Memorandum #1: Safety Analysis Results Summary. **Appendix A4** summarizes the results of the analyses for the East Weber County & Morgan County GFA.

1.2. Appendix Organization

This Appendix is organized into the following sections:

- **Section 1** - Introduction
- **Section 2** - East Weber County & Morgan County GFA Study Area and Roadway Network.
- **Section 3** - Strategic Highway Safety Plan (SHSP) Emphasis Area Analysis.
- **Section 4** - Historical Crash Analysis
- **Section 5** - Crash and Network Screening Analysis based on Highway Safety Manual (HSM).
- **Section 6** - Roadway Characteristic Risk Analysis
- **Section 7** - Common Risk Characteristics and Composite High-Risk Roadway Network

2. Study Area

The CSAP study area includes each jurisdiction within the WFRC area. To organize the large number of jurisdictions within the WFRC area into manageable analysis areas, jurisdictions are organized into Geographic Focus Areas (GFA). The East Weber County & Morgan County GFA (**Figure 2.1**) is located within Weber and Morgan Counties and includes the following agencies and jurisdictions:

- Morgan
- Huntsville

The safety analyses presented in this Technical Memorandum are specific to the East Weber County & Morgan County GFA.

Figure 2.2 highlights the roadway network within the South Box Elder & North Weber Counties GFA study area. Roadways within the study area are divided into the following three categories:

- State Routes: UDOT-maintained roads.
- Federal Aid Routes: Jurisdiction-maintained roads eligible for federal funding.
- Local Streets: Local Jurisdiction-maintained roads that are not Federal Aid routes.

NOTE ON CRASH DATA ANALYSIS: All crash data presented in this Technical Memorandum are specific to the East Weber County & Morgan County GFA, for the years 2018-2022. Crash data was obtained from the Utah Department of Transportation.

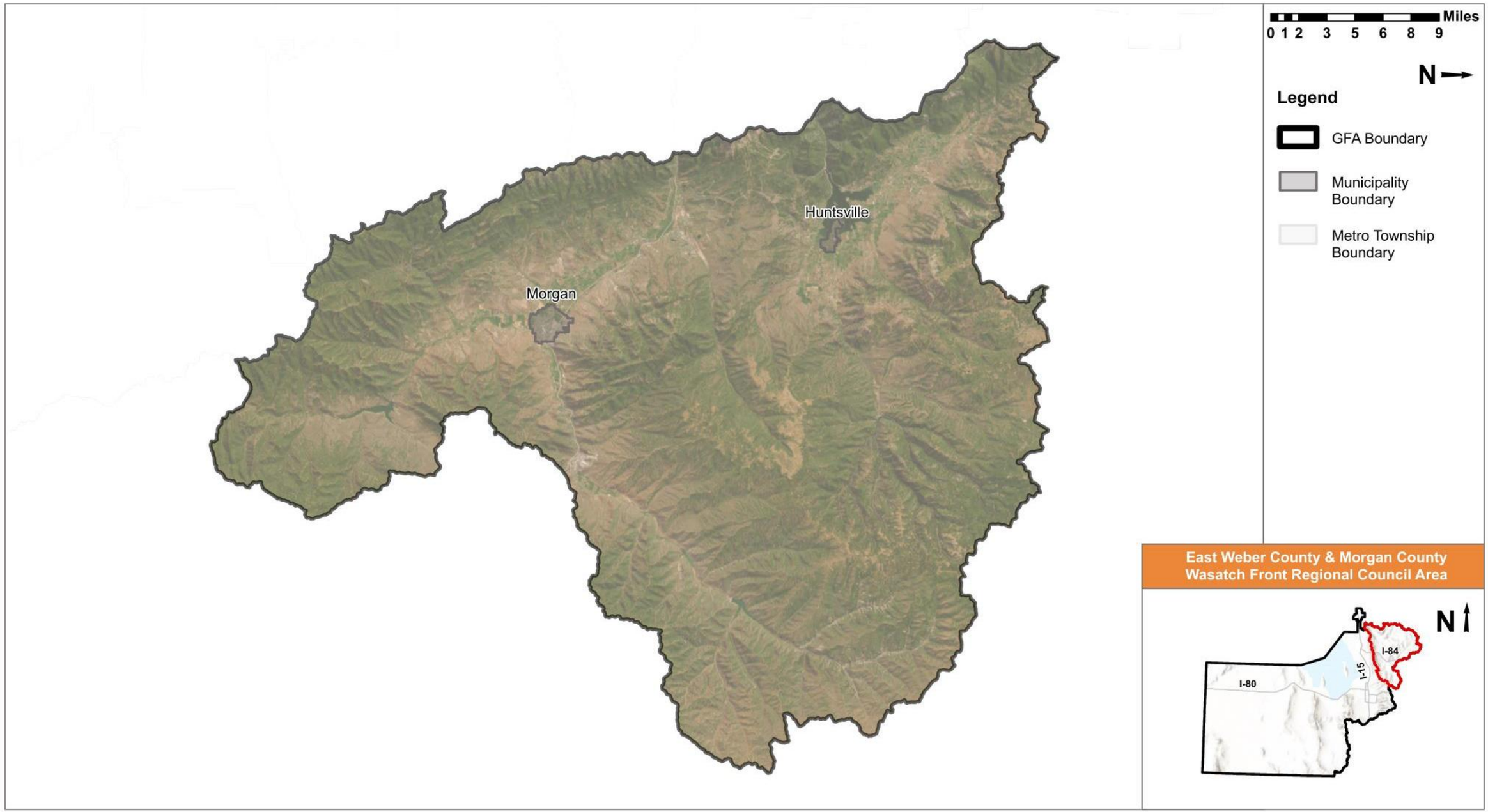


Figure 2.1 – East Weber County & Morgan County GFA Study Area

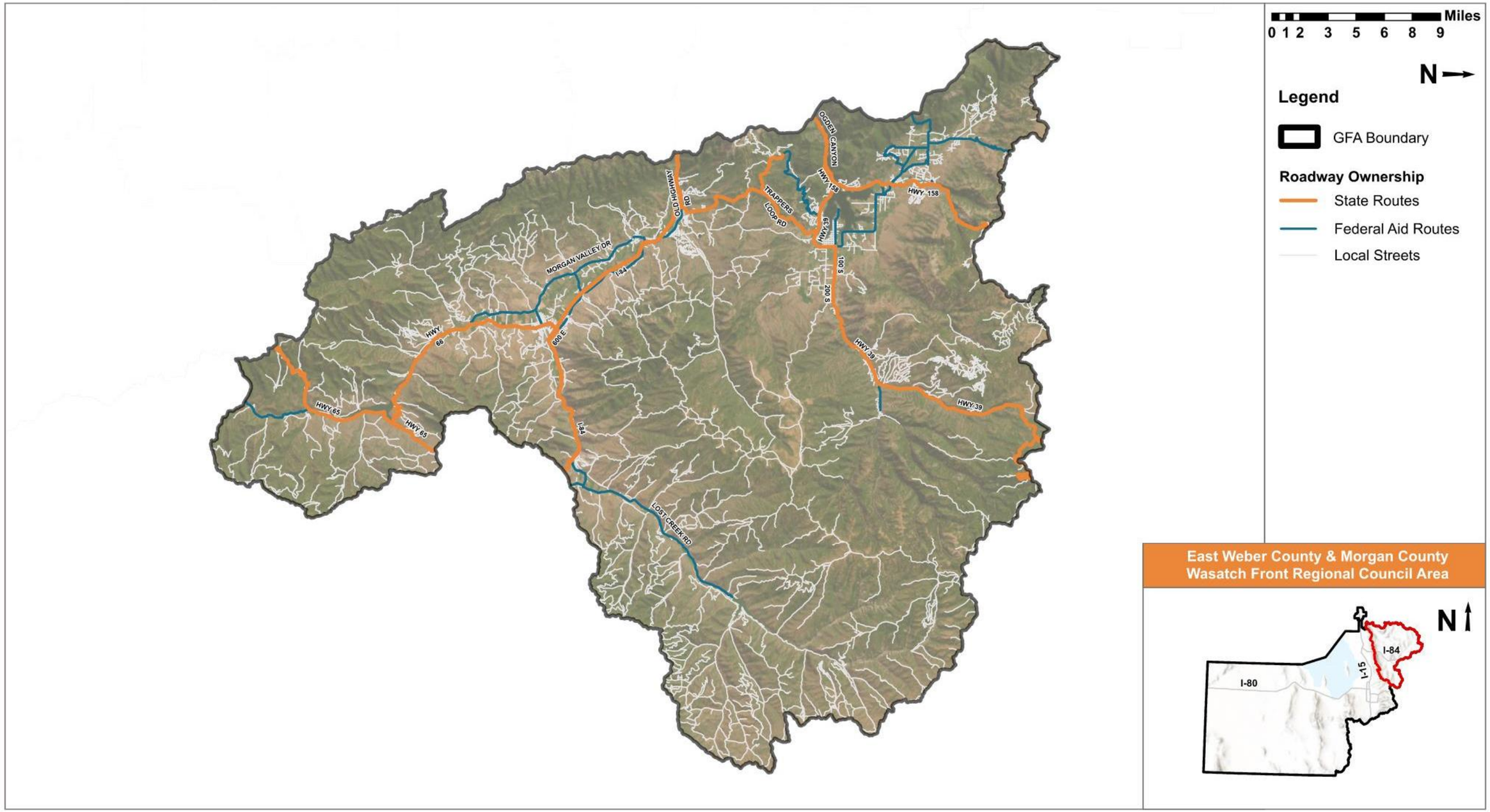


Figure 2.2 – East Weber County & Morgan County GFA Roadway Network

3. SHSP Emphasis Area Analysis

The SHSP emphasis area analysis ranks the frequency of fatal and serious injury crashes in the East Weber County & Morgan County GFA for each of the eleven Utah SHSP emphasis areas. The rankings of the emphasis areas are compared for the East Weber County & Morgan County GFA, statewide (all public roads statewide), and the WFRC study area totals. Each reported crash can have more than one emphasis area identified. The results of the SHSP emphasis area analysis are displayed in **Table 3.1**. The top five ranked emphasis areas are highlighted in the table with the top five for the East Weber County & Morgan County GFA are listed below:

- Roadway Departure
- Motorcycle
- Speed Related
- No Safety Restraints
- Teen Driver

Table 3.1 – SHSP Emphasis Areas Analysis

Category	Utah SHSP Safety Emphasis Area	Statewide Totals		WFRC Totals		East Weber County & Morgan County Totals		
		Fatal and Serious Injury	Rank	Fatal and Serious Injury	Rank	Fatal and Serious Injury	Rank	Change in Rank From WFRC
Driver	Teen Driver	1,640	**4**	751	4	15	5	-1
	Older Driver	1,508	6	700	6	8	8	-2
	Speed-Related	2,133	**3**	936	3	34	3	0
	Aggressive Driving	555	11	297	10	12	6	4
	Distracted Driving	718	10	286	11	5	10	1
	Impaired Driving	1,184	8	623	8	10	7	1
	No Safety Restraints	1,542	**5**	599	9	23	4	5
Roadway	Intersection	3,567	**1**	2,163	1	8	8	-7
	Roadway Departure	2,931	**2**	1,014	2	65	1	1
Special Users	Motorcycle	1,457	7	750	5	42	2	3
	Pedestrian	912	9	636	7	0	12	-5
	Bicycle*	280	12	167	12	1	11	1

**While Bicycles are not one of the eleven Utah SHSP emphasis areas, they are included as part of the CSAP safety analysis.*

4. Historical Crash Analysis

A historical crash data analysis was conducted for the most recent complete 5-year period from 2018 to 2022. This historical crash analysis is primarily focused on fatal and serious injury crashes.

4.1. Overall Crashes

Table 4.1 provides an overview of overall crashes by severity and roadway ownership within the East Weber County & Morgan County GFA. The data shows the following:

- State Routes recorded 80% of the total crashes in this GFA
- Federal Aid routes recorded 14% of fatal and serious injury crashes in this GFA
- Local Streets (non-Federal Aid) recorded 6% of fatal and serious injury crashes in this GFA

Table 4.1 – Crashes by Severity by Roadway Ownership

Route Type	State Route		Federal Aid Route		Local Street		Overall Total		% of WFRC
Crash Severity	Crashes		Crashes		Crashes		Crashes		%
	#	%	#	%	#	%	#	%	
Fatal	21	1%	1	0%	2	2%	**24**	**1.2%**	**0.0%**
Suspected Serious Injury	45	3%	12	4%	6	5%	**63**	**3.2%**	**0.0%**
Suspected Minor Injury	183	12%	36	13%	14	12%	**233**	**12.0%**	**0.1%**
Possible Injury	171	11%	42	15%	9	8%	**222**	**11.4%**	**0.1%**
No Injury / Property Damage Only	1,125	73%	183	67%	89	74%	**1,397**	**72.0%**	**0.8%**
Route Total	**1,545**	**100%**	**274**	**100%**	**120**	**100%**	**1,939**	**100%**	**1.1%**

4.2. Fatal and Serious Injury Crashes by Year

Figure 4.1 through **Figure 4.5** provide an overview of fatal and serious injury crashes by year and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- Fatal and serious injury crashes significantly increased in 2020 and 2021; in 2022, they decreased to similar numbers as occurred in 2018
- Year 2020 recorded highest number of serious crashes during the 5-year period (2018 – 2022); year 2021 was similar
- Serious injury crashes followed a similar pattern as fatal crashes
- Most (21 of 24) of the fatal crashes occurred on state routes

4.3. Fatal and Serious Injury Crashes by Location

Error! Reference source not found. shows the locations of the fatal and serious injury crashes within the East Weber County & Morgan County GFA. Crashes are largely focused on State Routes.

Error! Reference source not found. is a density map of fatal and serious injury crashes within the East Weber County & Morgan County GFA.

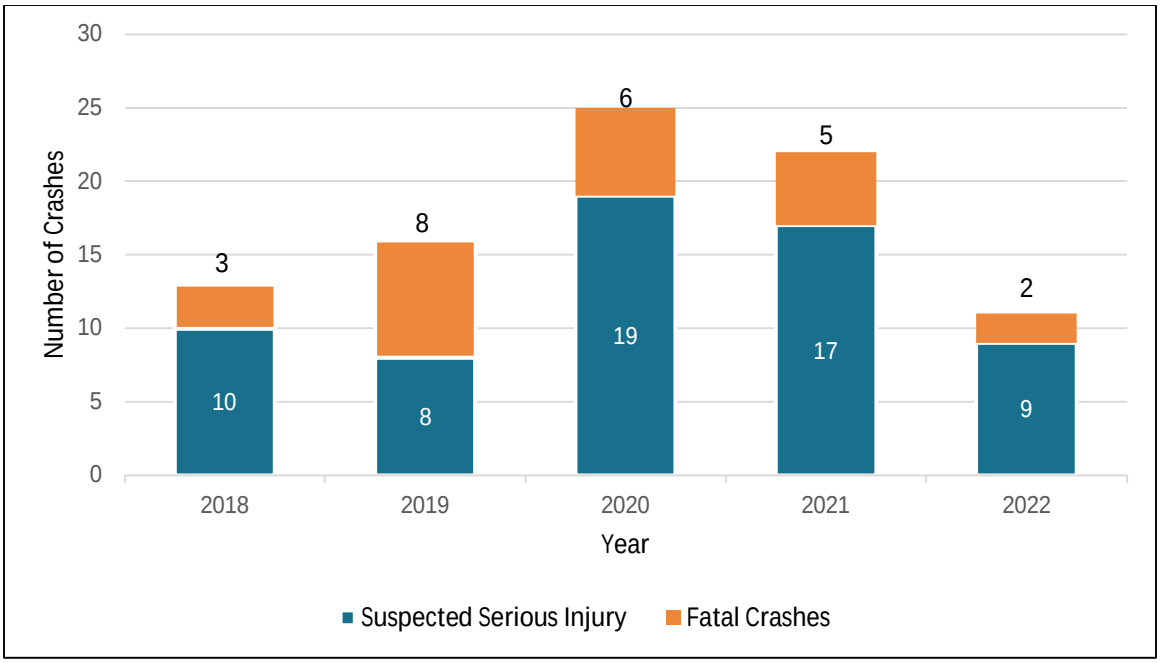


Figure 4.1 – Fatal and Serious Injury Crashes by Year

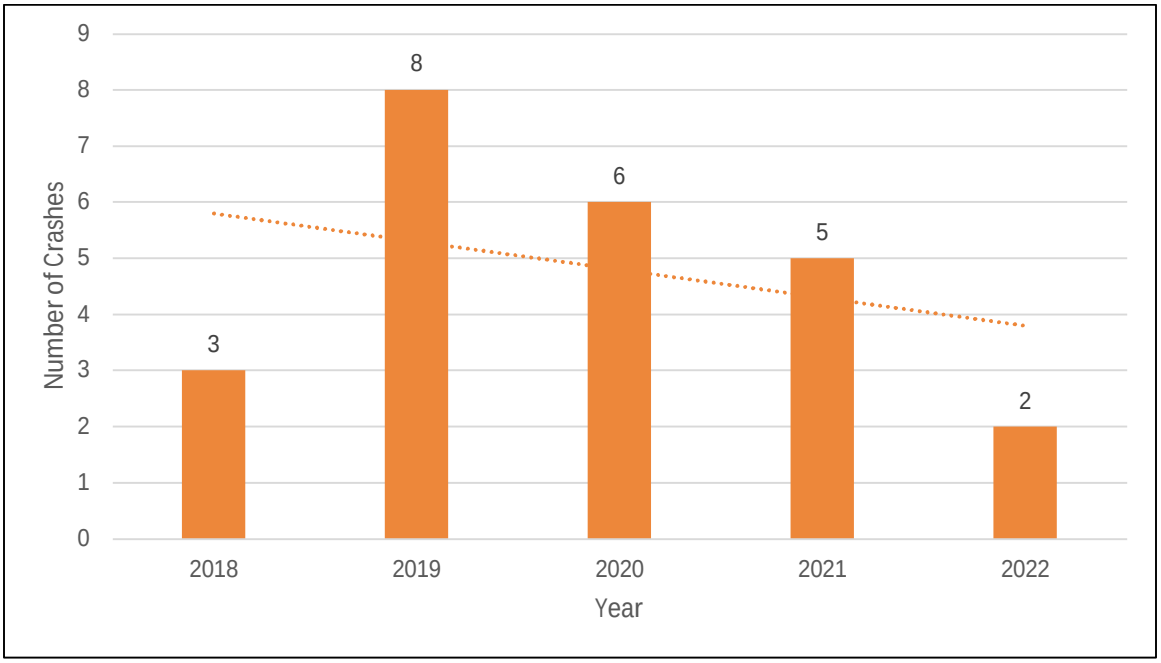


Figure 4.2 – Fatal Crashes by Year

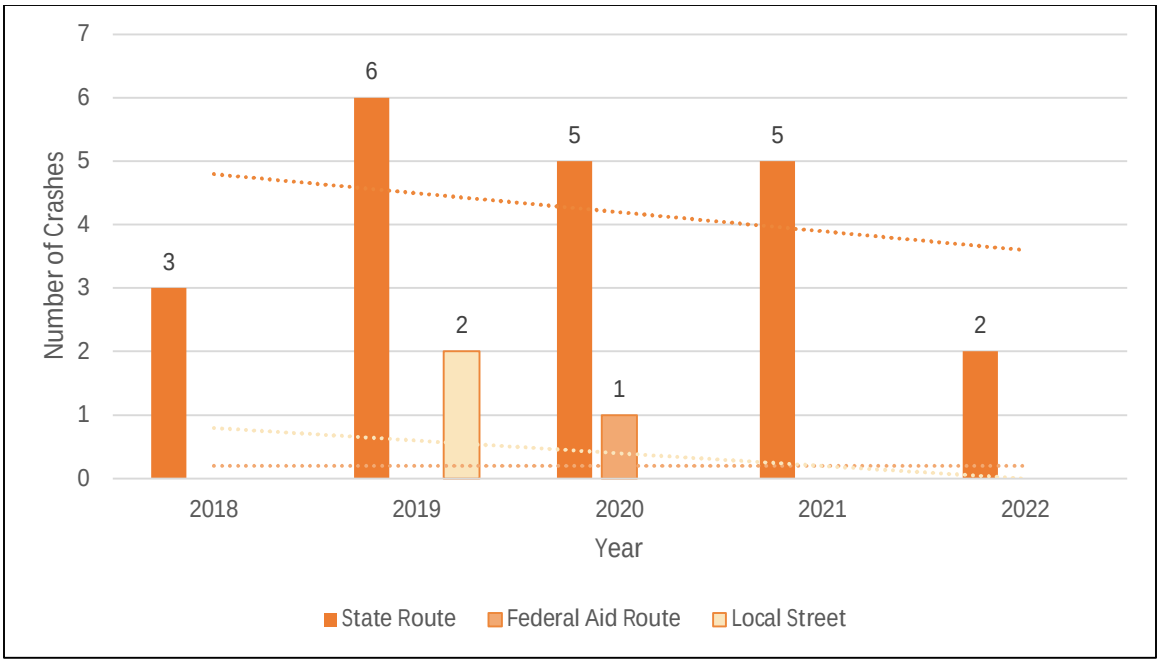


Figure 4.3 – Annual Fatal Crashes by Roadway Ownership

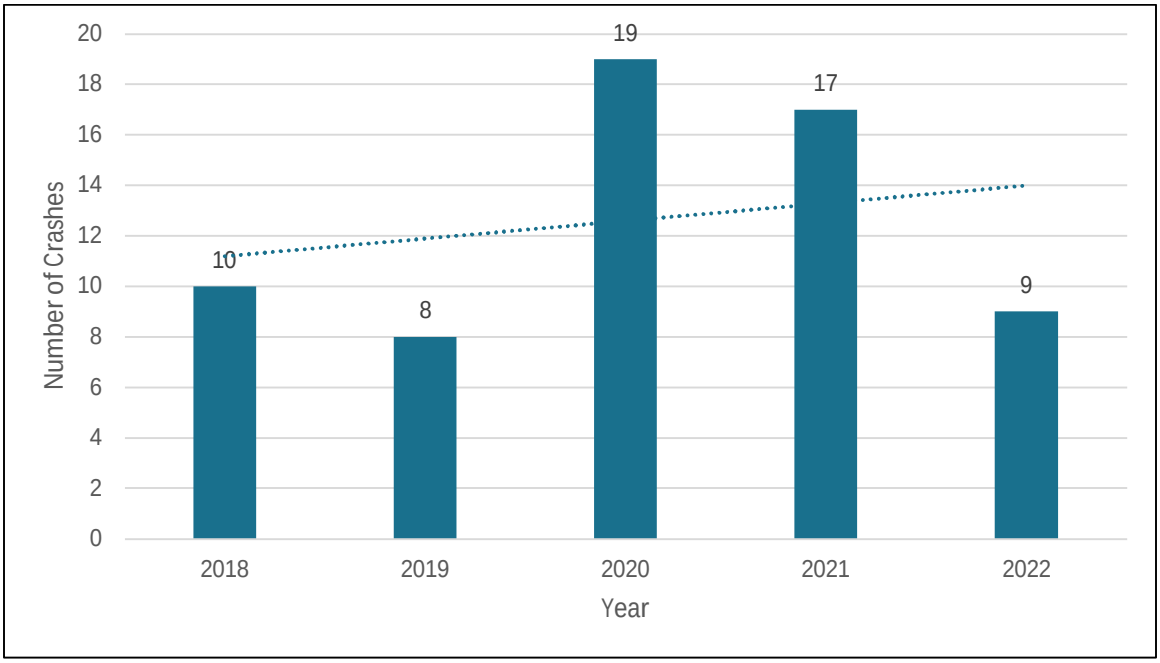


Figure 4.4 – Serious Injury Crashes by Year

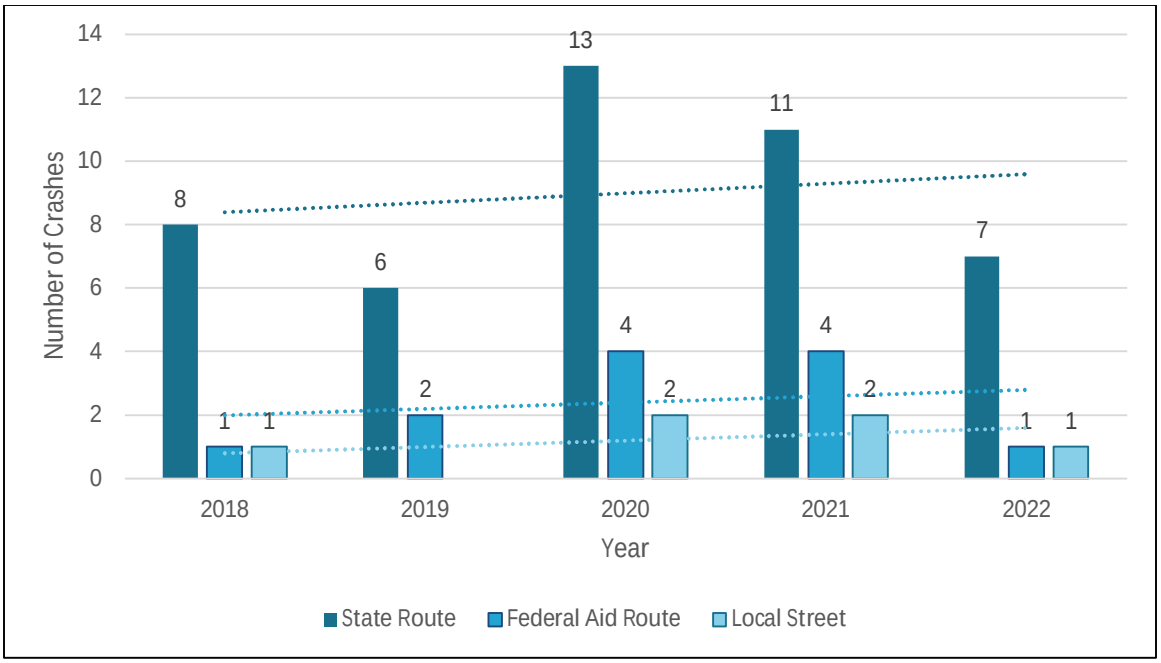


Figure 4.5 – Annual Serious Injury Crashes by Roadway Ownership

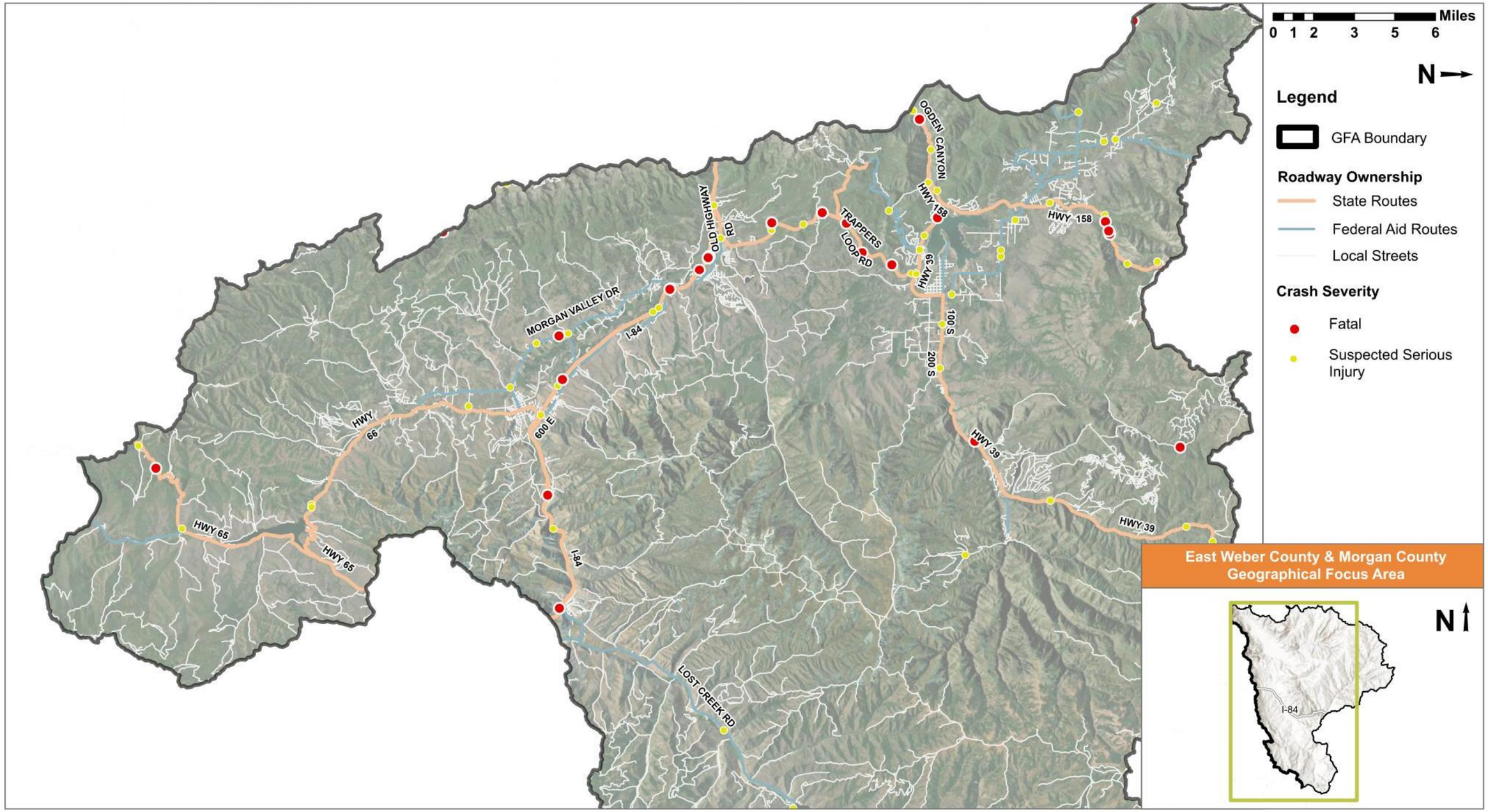


Figure 4.6 – Fatal and Serious Injury Crashes

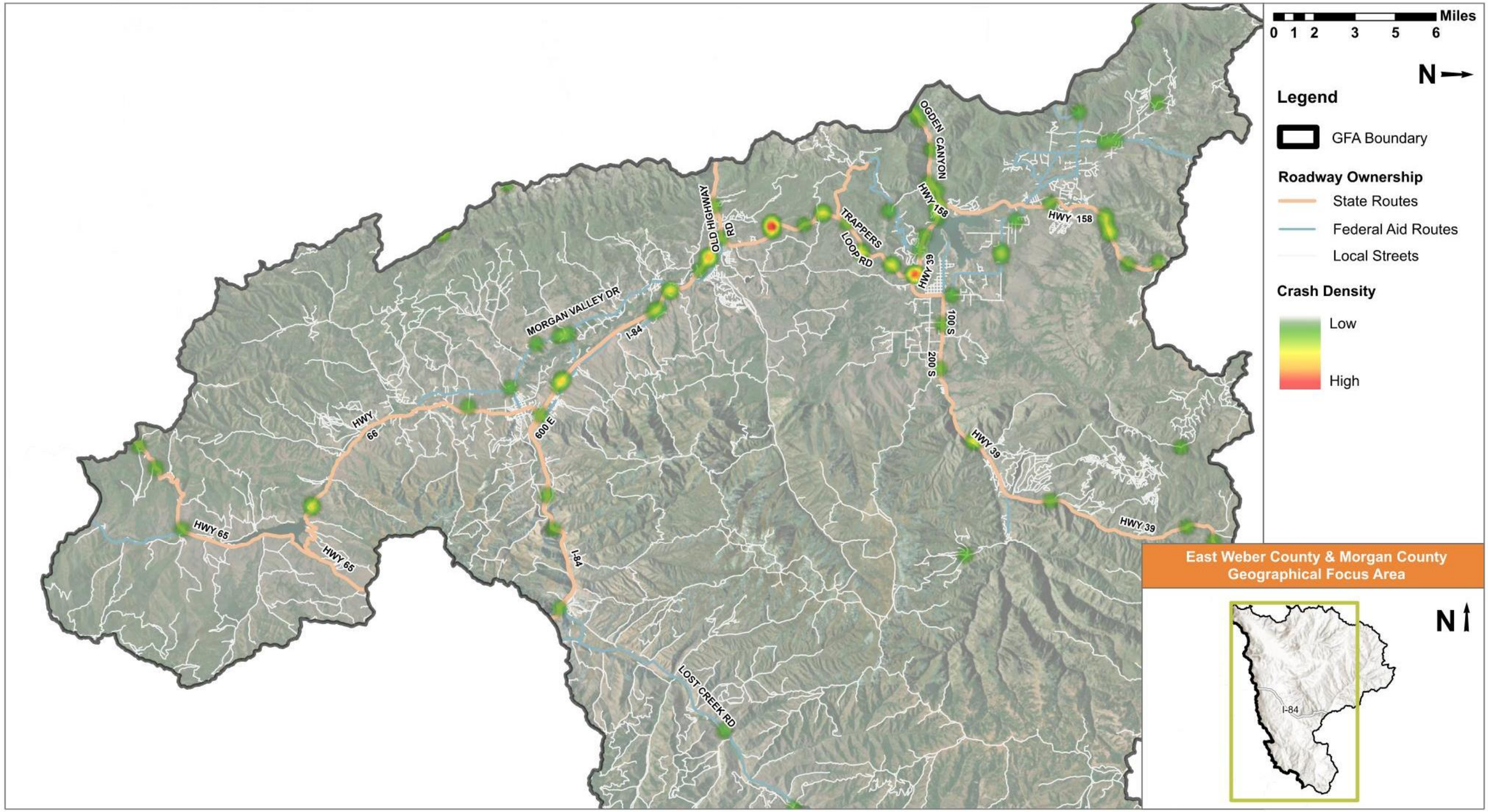


Figure 4.7 – Fatal and Serious Injury Crash Density

4.4. Fatal and Serious Injury Crashes by Crash Type

Figure 4.8 through **Figure 4.10** provide an overview of fatal and serious injury crashes by crash type and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- Roadway departure crash type has the highest number of total fatal and serious injuries with 53 crashes
- Most (50 of 53) Roadway Departure crashes are on State Routes
- Motorcycle-involved and rural highway cross-over are other occurring crash types

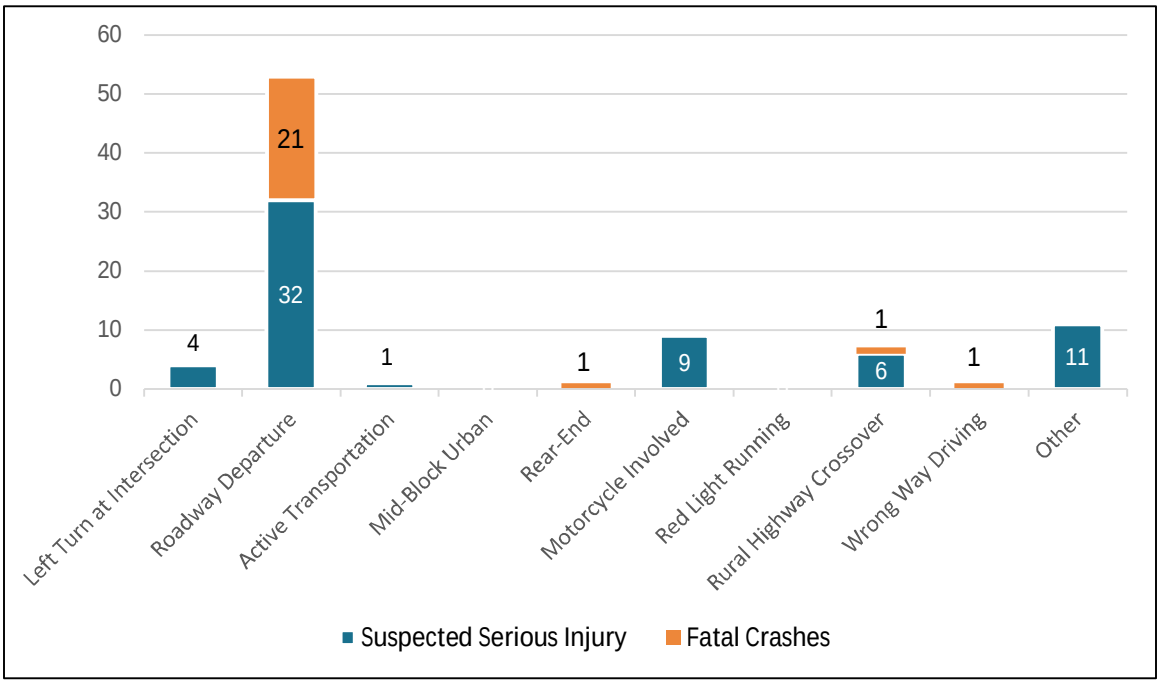


Figure 4.8 – Fatal and Serious Injury Crashes by Crash Type

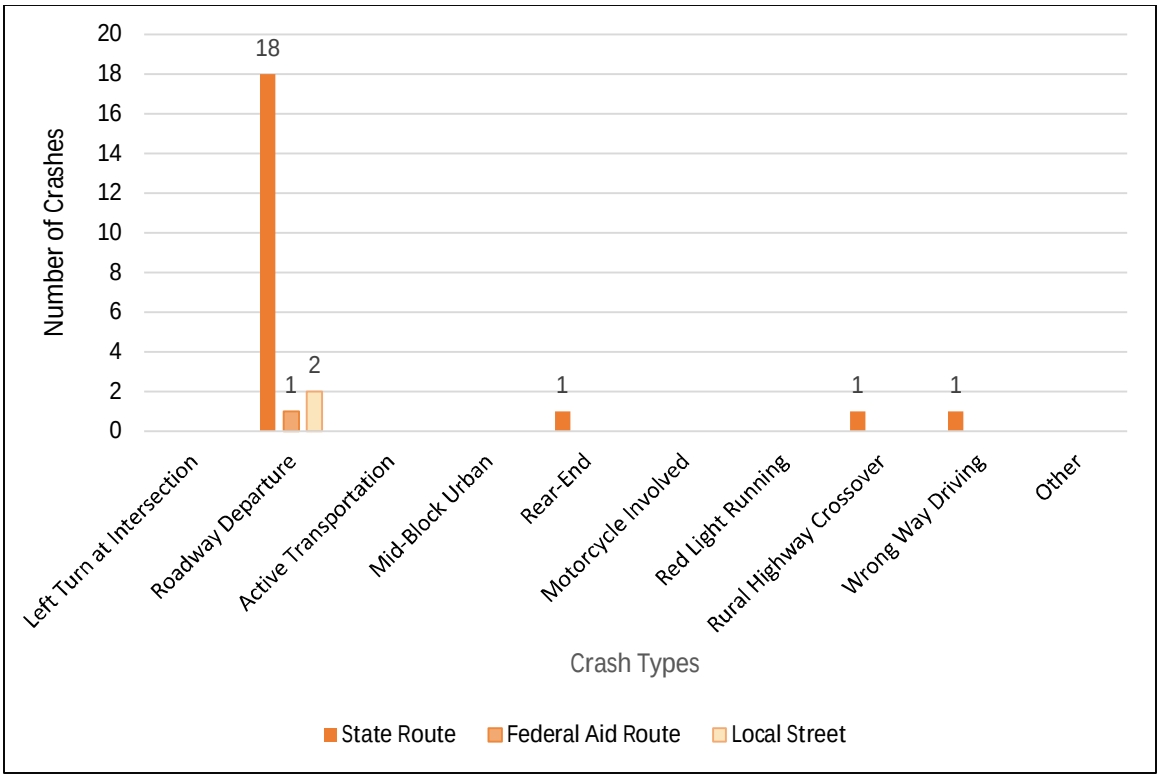


Figure 4.9 – Fatal Crashes by Crash Type and Roadway Ownership

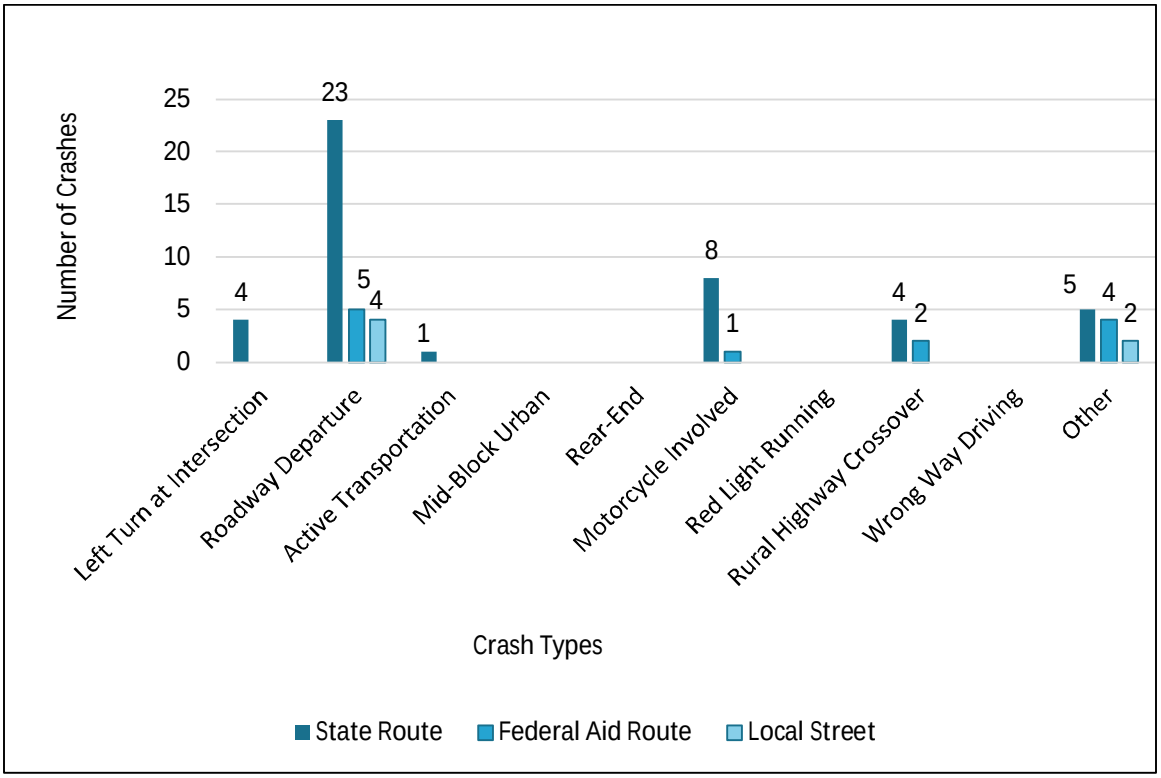


Figure 4.10 – Serious Injury Crashes by Crash Type and Roadway Ownership

4.5. Fatal and Serious Injury Vulnerable User Crashes

Figure 4.11 through **Figure 4.13** provide an overview of fatal and serious injury crashes by vulnerable road user and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- There were no pedestrian crashes in this GFA.
- There was only one bicycle crash in this GFA (serious injury)
- There were 38 motorcycle-involved crashes, 9 of which were fatal

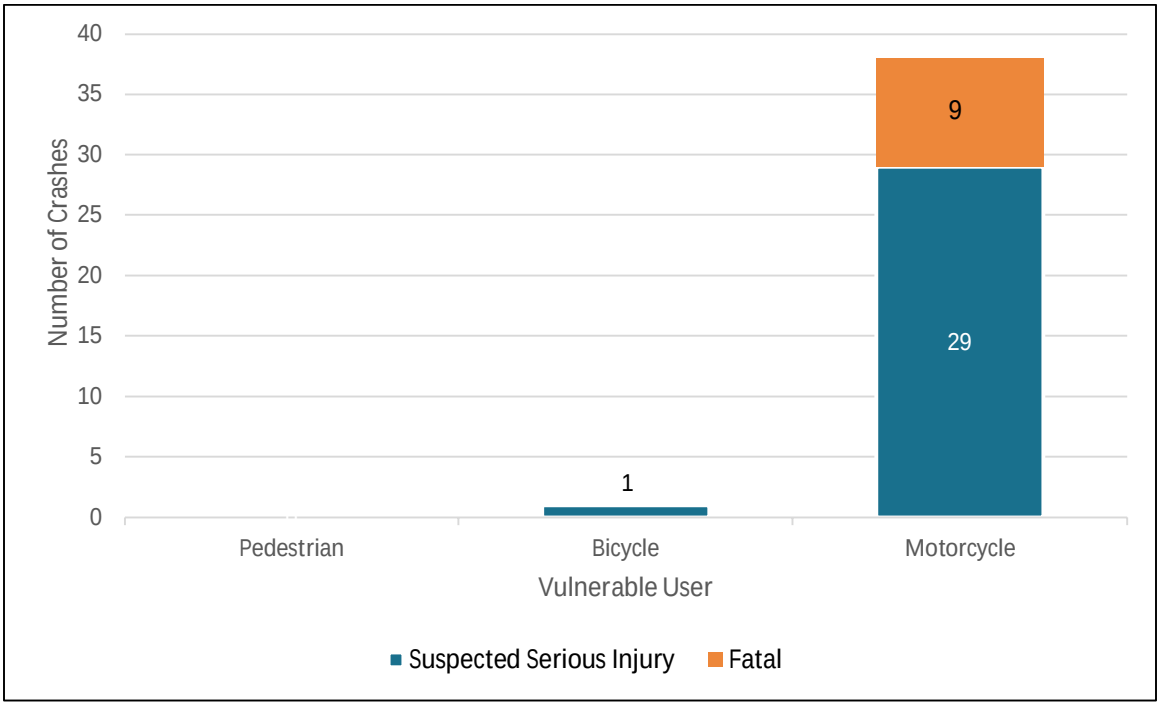


Figure 4.11 – Fatal and Serious Injury Crashes by Vulnerable User

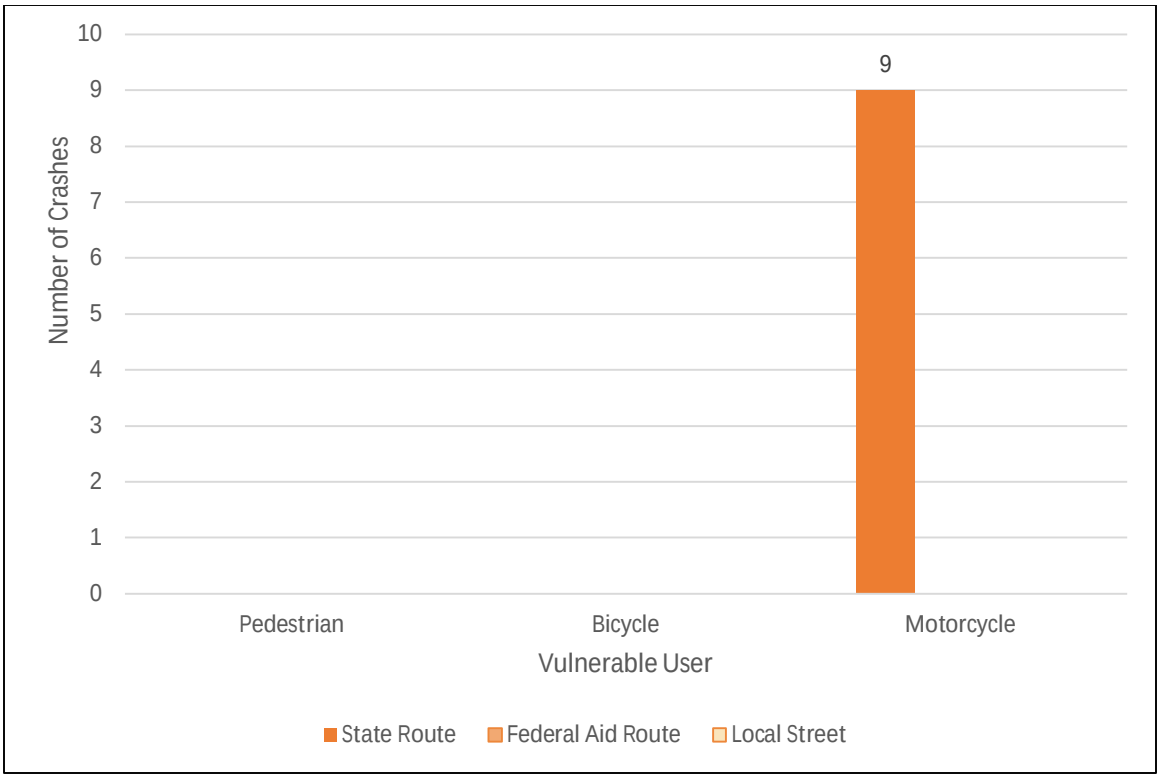


Figure 4.12 – Fatal Crashes by Vulnerable User and Roadway Ownership

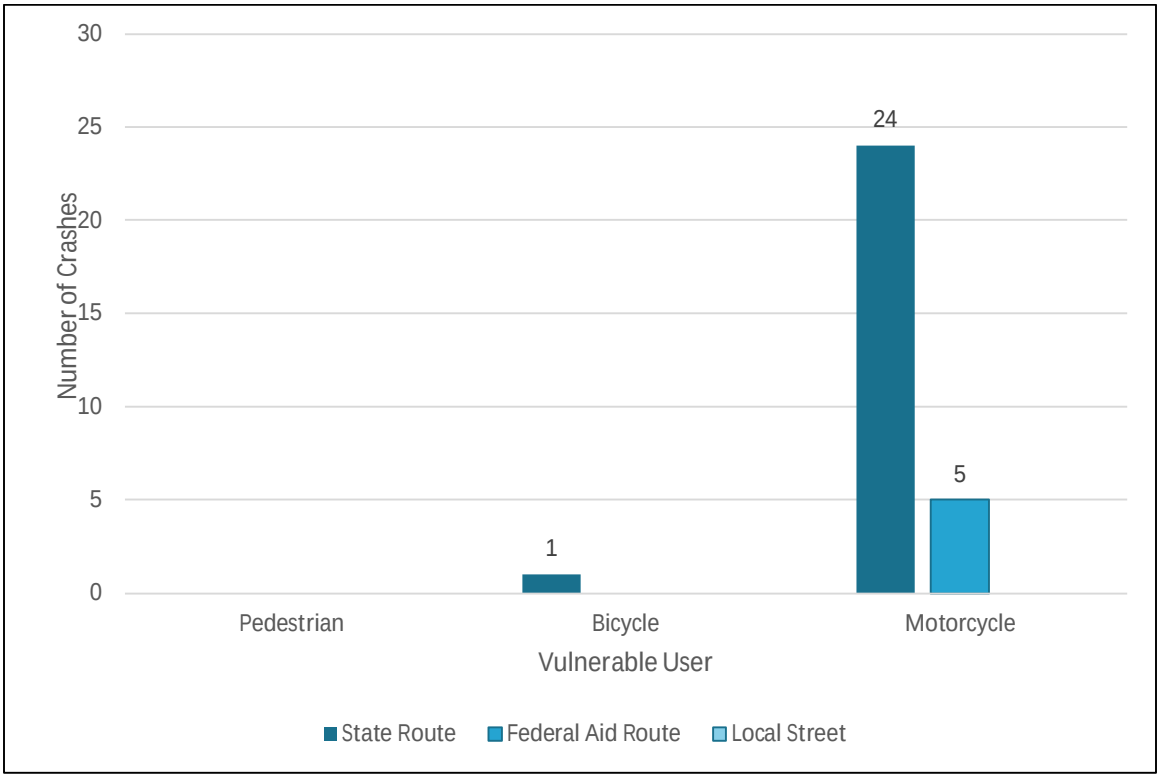


Figure 4.13 – Serious Injury Crashes by Vulnerable User and Roadway Ownership

4.6. Fatal and Serious Injury Crashes by Manner of Collision

Figure 4.14 through **Figure 4.16** provide an overview of fatal and serious injury crashes by manner of collision and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- Single vehicle and angle crash types resulted in the largest number of fatal and serious injury crashes in this GFA
- No other crash types exceeded five fatal crashes

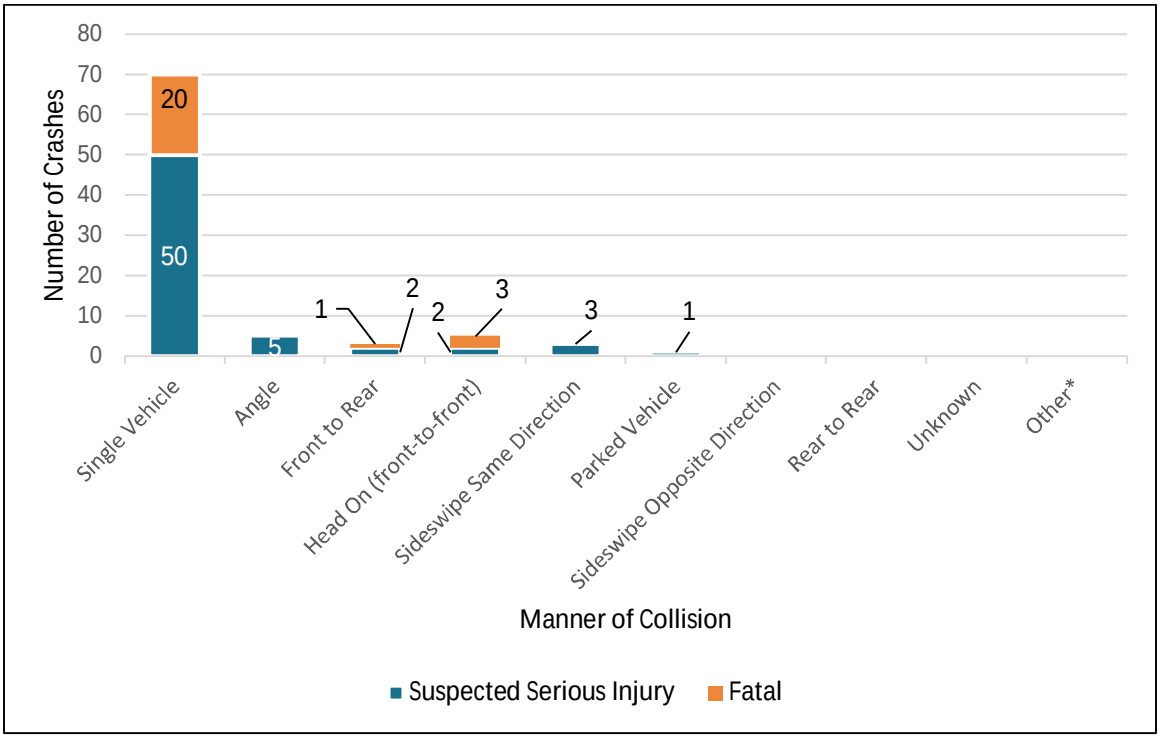


Figure 4.14 – Fatal and Serious Injury Crashes by Manner of Collision

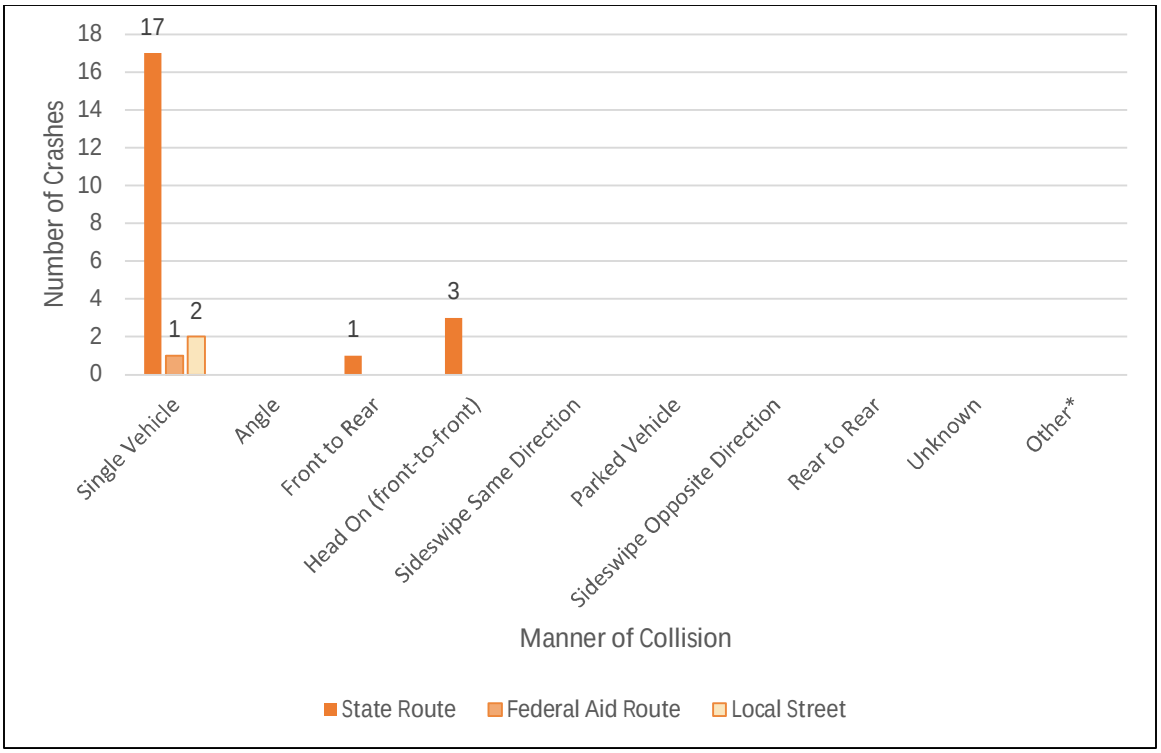


Figure 4.15 – Fatal Crashes by Manner of Collision and Roadway Ownership

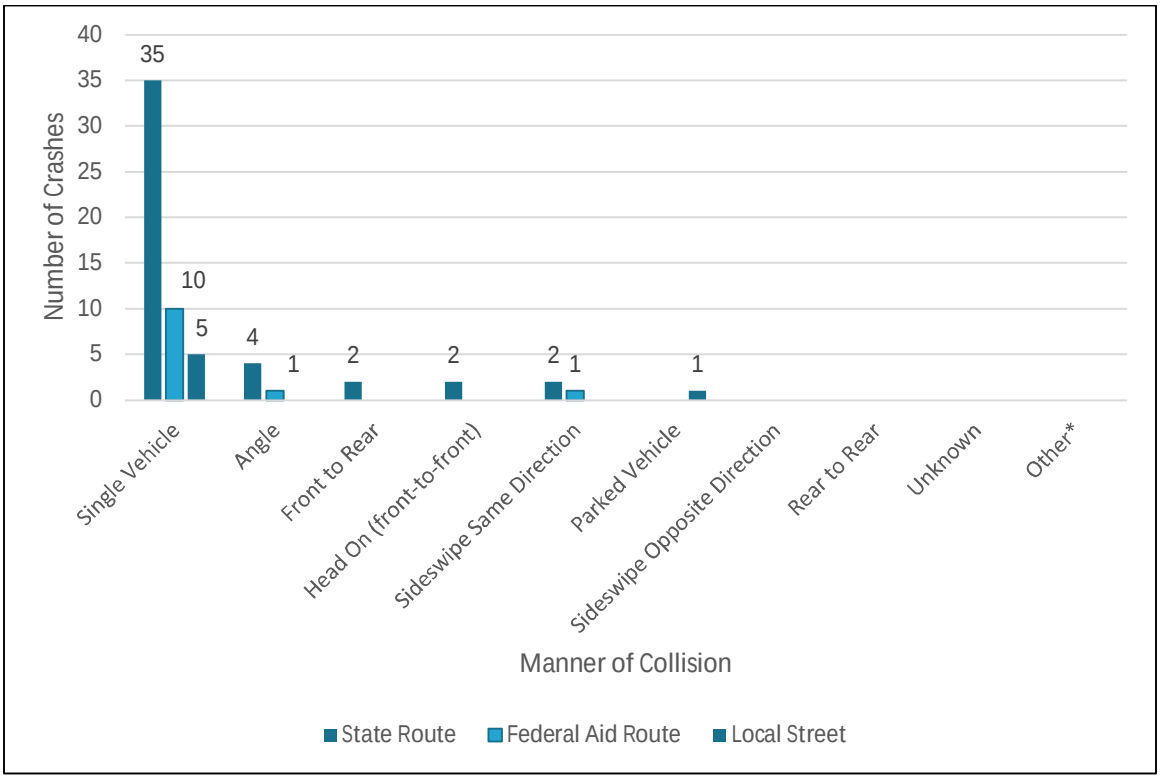


Figure 4.16 – Serious Injury Crashes by Manner of Collision and Roadway Ownership

4.7. Fatal and Serious Injury Intersection Crashes

Figure 4.17 through **Figure 4.19** provide an overview of fatal and serious injury crashes by intersection and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- Most fatal and serious injury crashes were not intersection related
- There were 8 intersection-related crashes

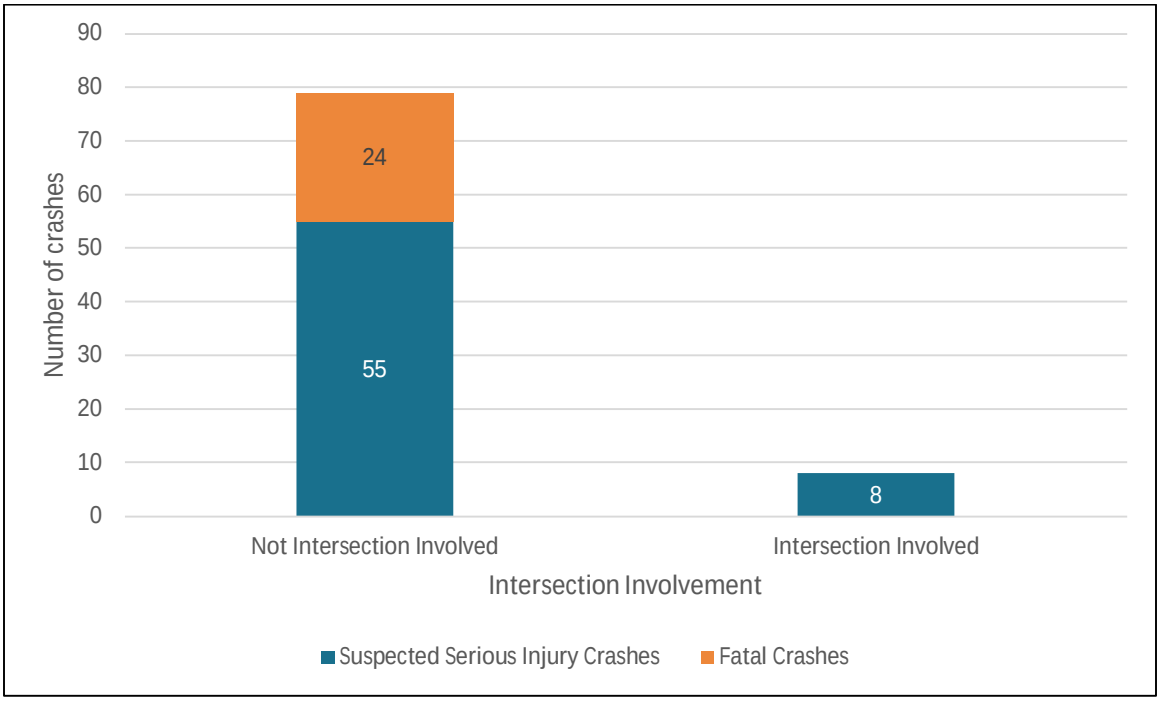


Figure 4.17 – Fatal and Serious Injury Crashes by Intersection

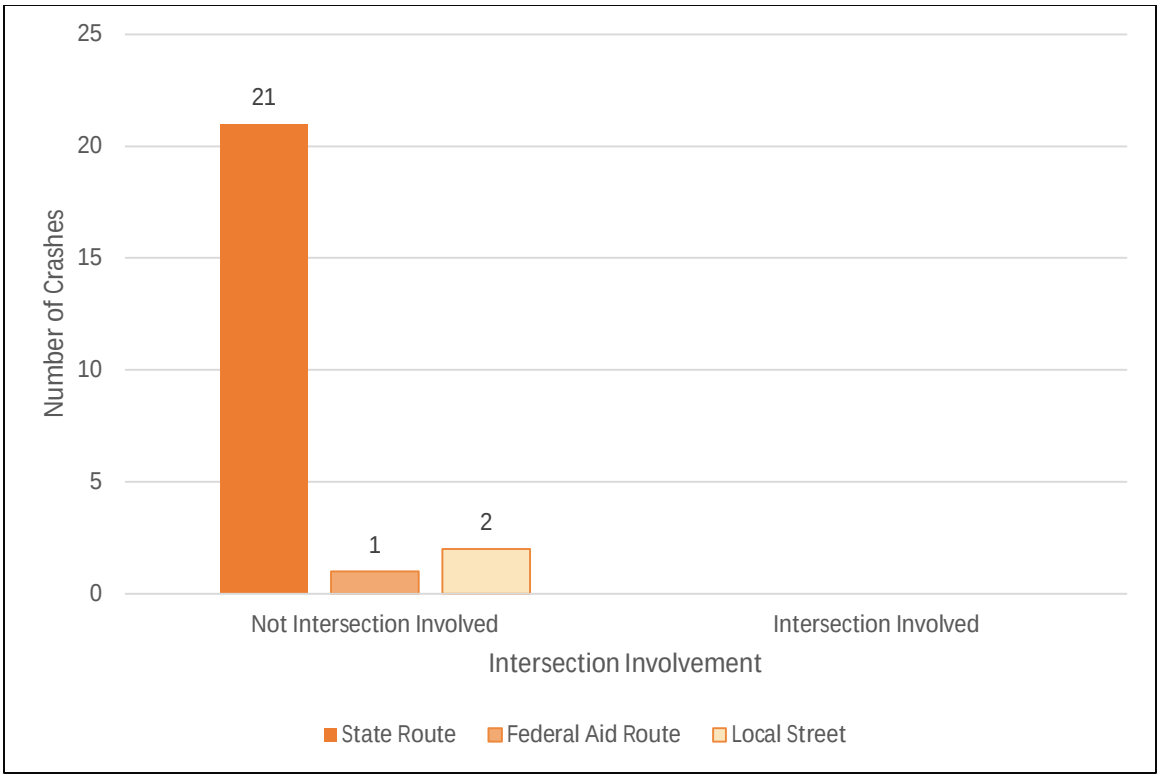


Figure 4.18 – Fatal Crashes by Intersection and Roadway Ownership

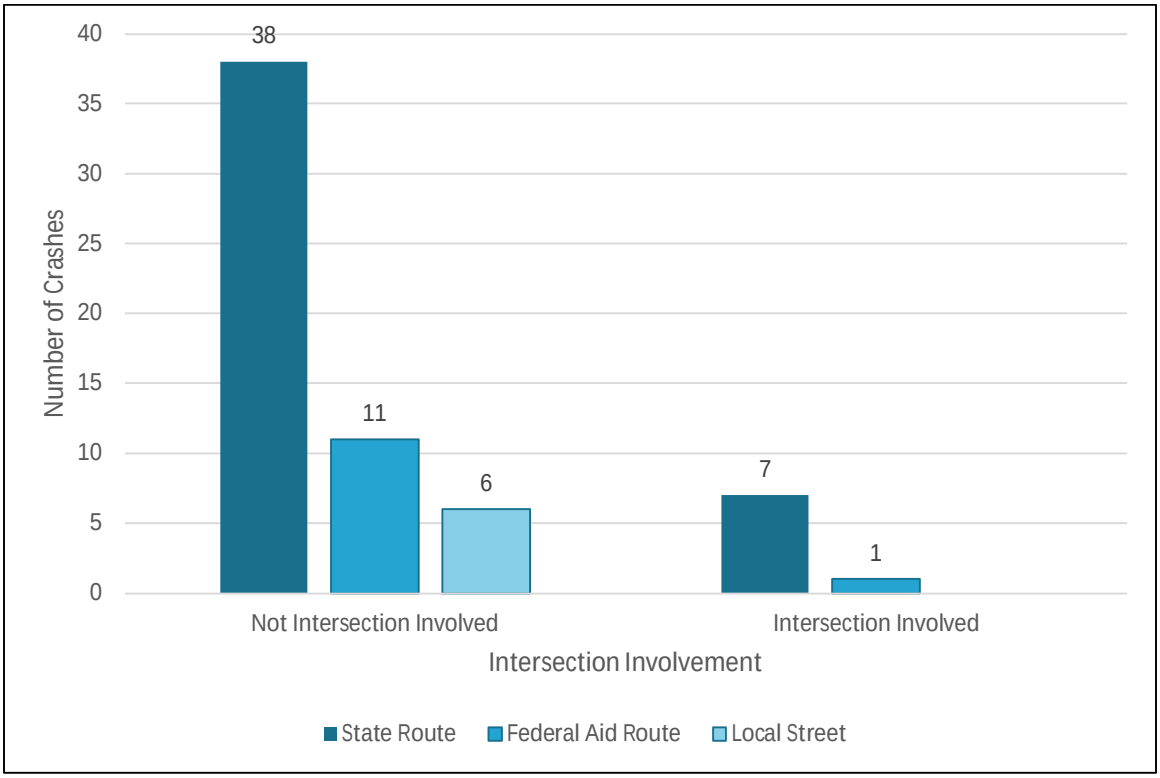


Figure 4.19 – Serious Injury Crashes by Intersection and Roadway Ownership

4.8. Fatal and Serious Injury Crashes by Functional Class

Figure 4.20 through **Figure 4.22** provide an overview of fatal and serious injury crashes by functional class and roadway ownership for the East Weber County & Morgan County GFA. The data shows the following:

- Most fatal and serious injury crashes occurred on minor arterials and collectors; eight fatal and serious injury crashes occurred on Local Streets

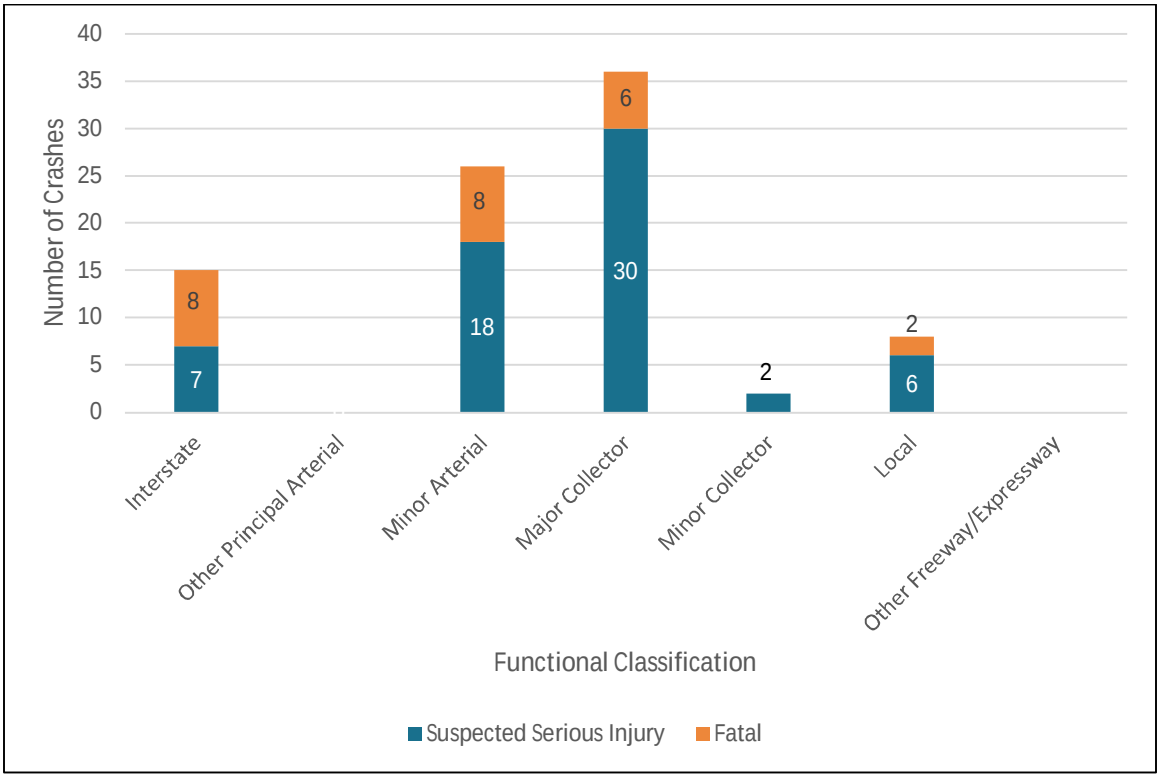


Figure 4.20 – Fatal and Serious Injury Crashes by Functional Class

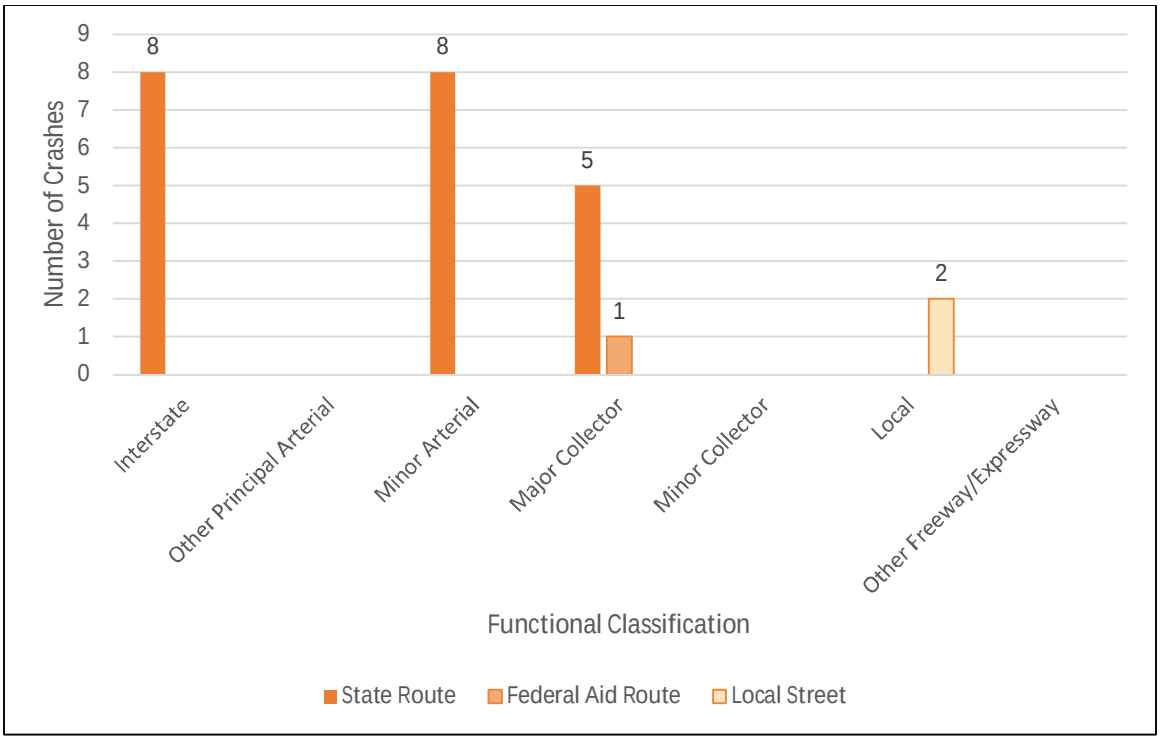


Figure 4.21 – Fatal Injury Crashes by Functional Class and Roadway Ownership

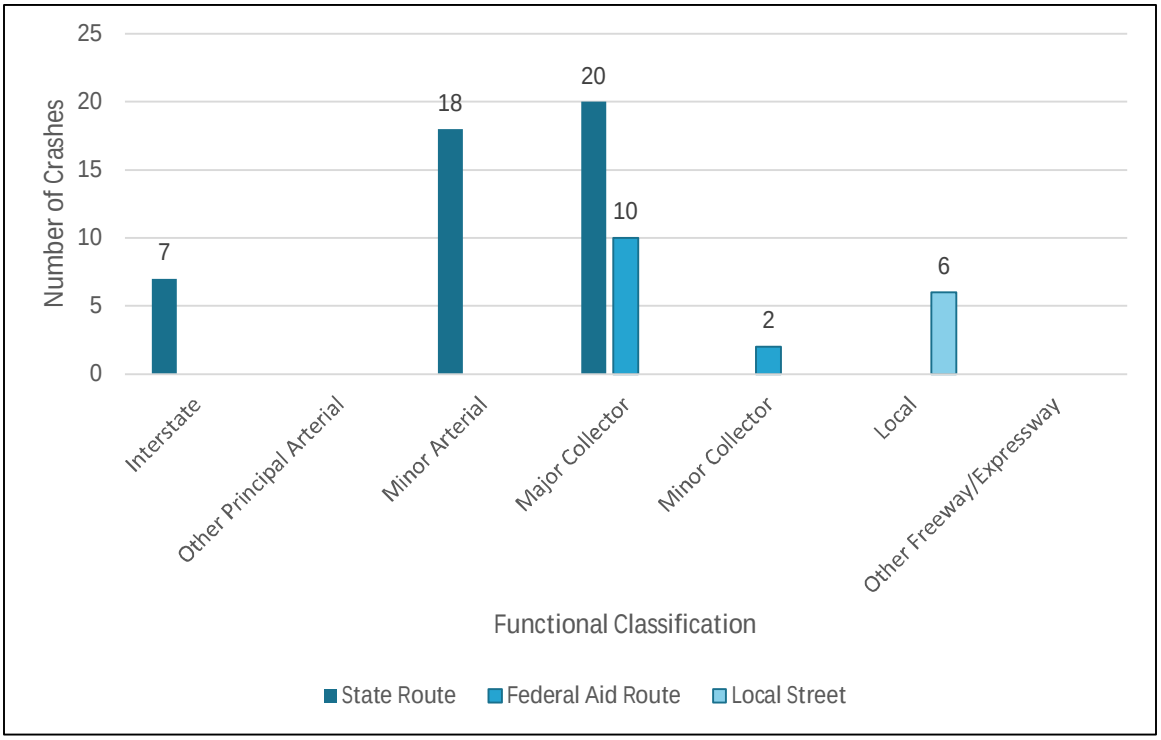


Figure 4.22 – Serious Injury Crashes by Functional Class and Roadway Ownership

4.9. Fatal and Serious Injury Crash Trees Diagrams

Fatal and serious injury crash tree diagrams were generated for the East Weber County & Morgan County GFA. These crash tree diagrams are presented in **Figure 4.23** and **Figure 4.24**.

The crash trees are limited to the top 3 categories for crash type and manner of collision. Each crash tree diagram displays the total fatal and serious injury crashes (T), fatal crashes (K), and serious injury crashes (A). The data shows the following:

- State Routes recorded the highest number of crashes
- Most crashes are in rural areas in this GFA
- Urban areas recorded a higher number of crashes than rural area
- Roadway Department represents the most prominent crash type

CRASH TYPE

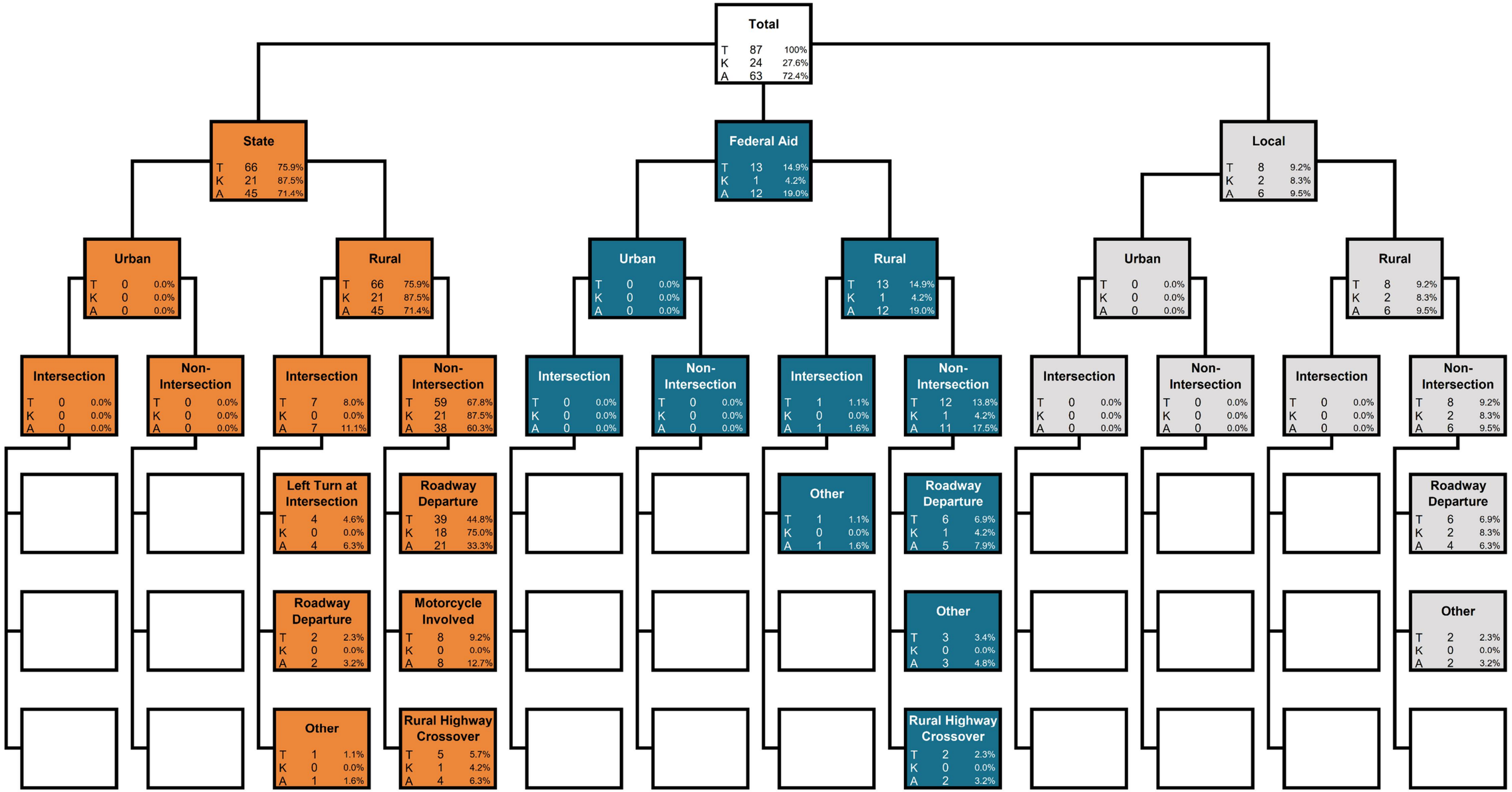


Figure 4.23 – Fatal and Serious Injury Crash Tree Diagram (Crash Type)

MANNER OF COLLISION

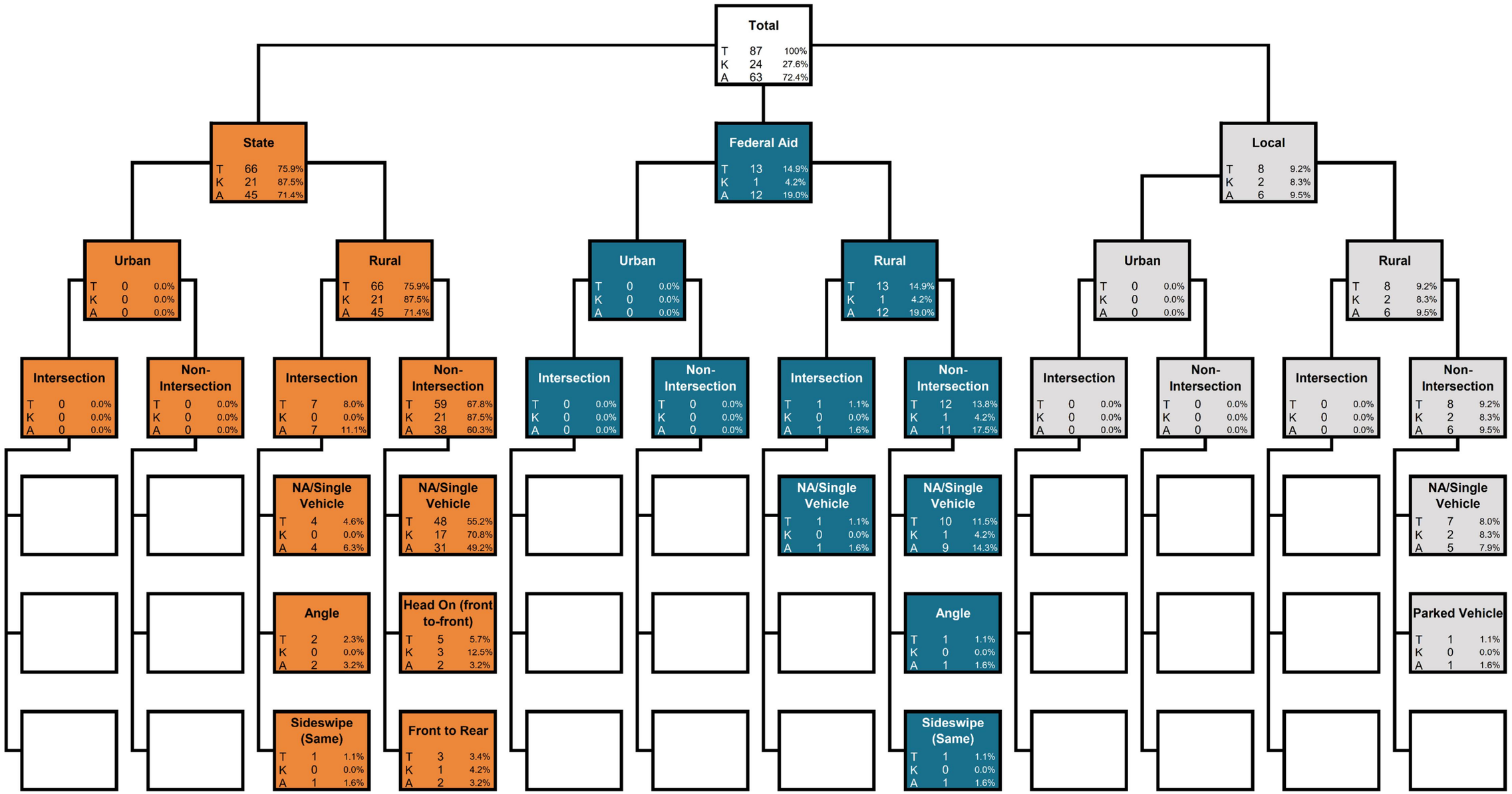


Figure 4.24 – Fatal and Serious Injury Crash Tree Diagram (Manner of Collision)

5. Crash and Network Screening Analysis

A crash and network screening analysis was prepared for the East Weber County & Morgan County GFA informed by four sub-analyses:

- Number of Crashes
- Critical Crash Rate (CCR)
- Probability of a Specific Crash Type Exceeding Threshold Proportion
- Equivalent Property Damage Only (EPDO)

CCR Differential by roadway ownership are mapped in the following figures:

- **Figure 5.1** – CCR Differential – Segments (State Routes)
- **Figure 5.2** – CCR Differential – Segments (Federal Aid Routes)
- **Figure 5.3** – CCR Differential – Segments (Local Routes)
- **Figure 5.4** – CCR Differential – Intersections (Signalized)
- **Figure 5.5** – CCR Differential – Intersections (Unsignalized)

A positive Local CCR Differential is an indication of a location with a potential for safety improvement (PSI).

A list of the top 10 CCR Differential segments and intersections for the East Weber County & Morgan County GFA are located in **Table 5.1** and **Table 5.2** along with their associated number of crashes, probability of a specific crash type exceeding threshold proportion, and EPDO analysis results.

These locations represent those with the highest potential for safety improvements and can be considered as project candidate locations.

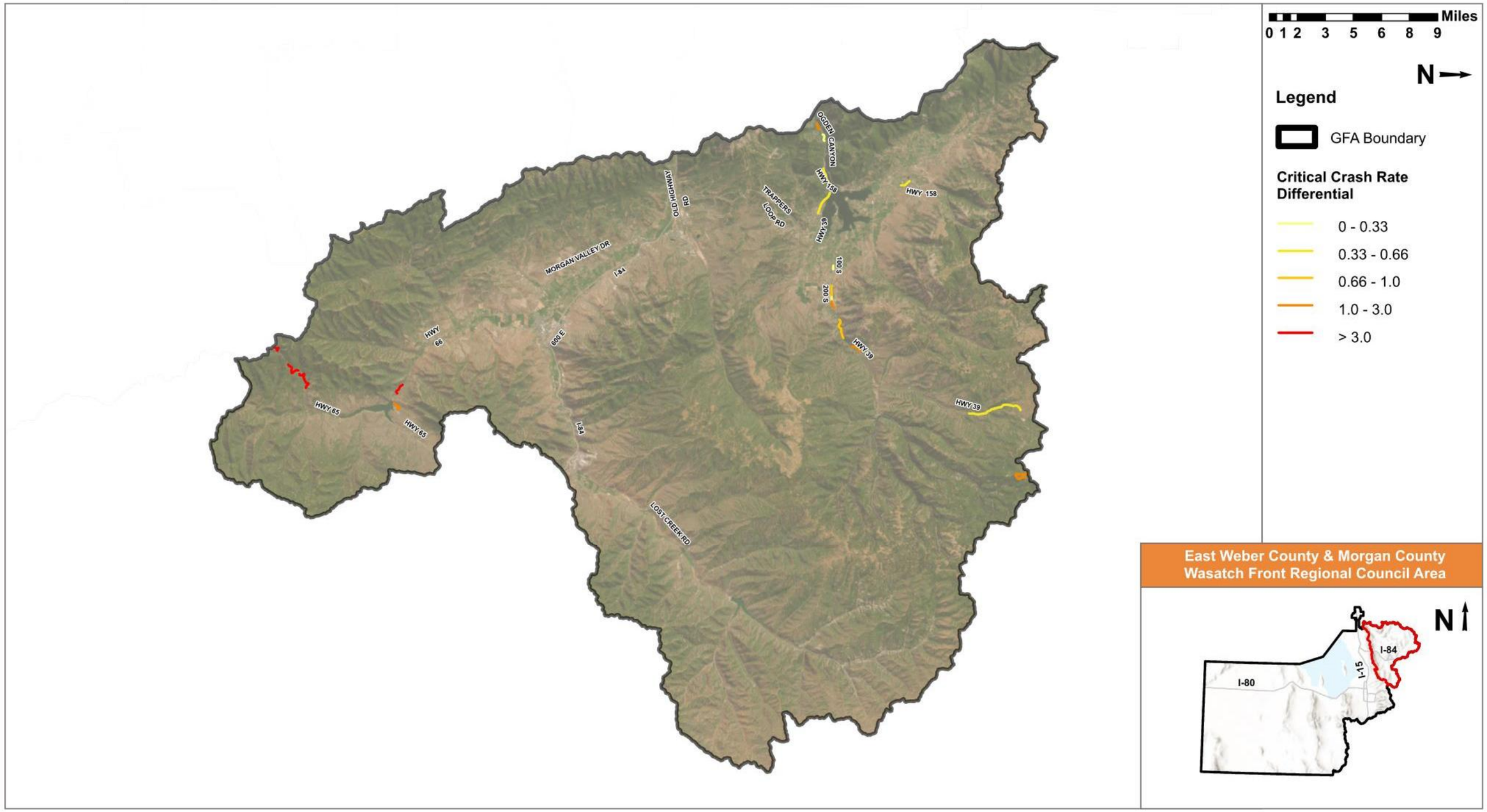


Figure 5.1 – CCR Differential – Segments (State Routes)

Figure 5.2 – CCR Differential – Segments (Federal Aid Routes)

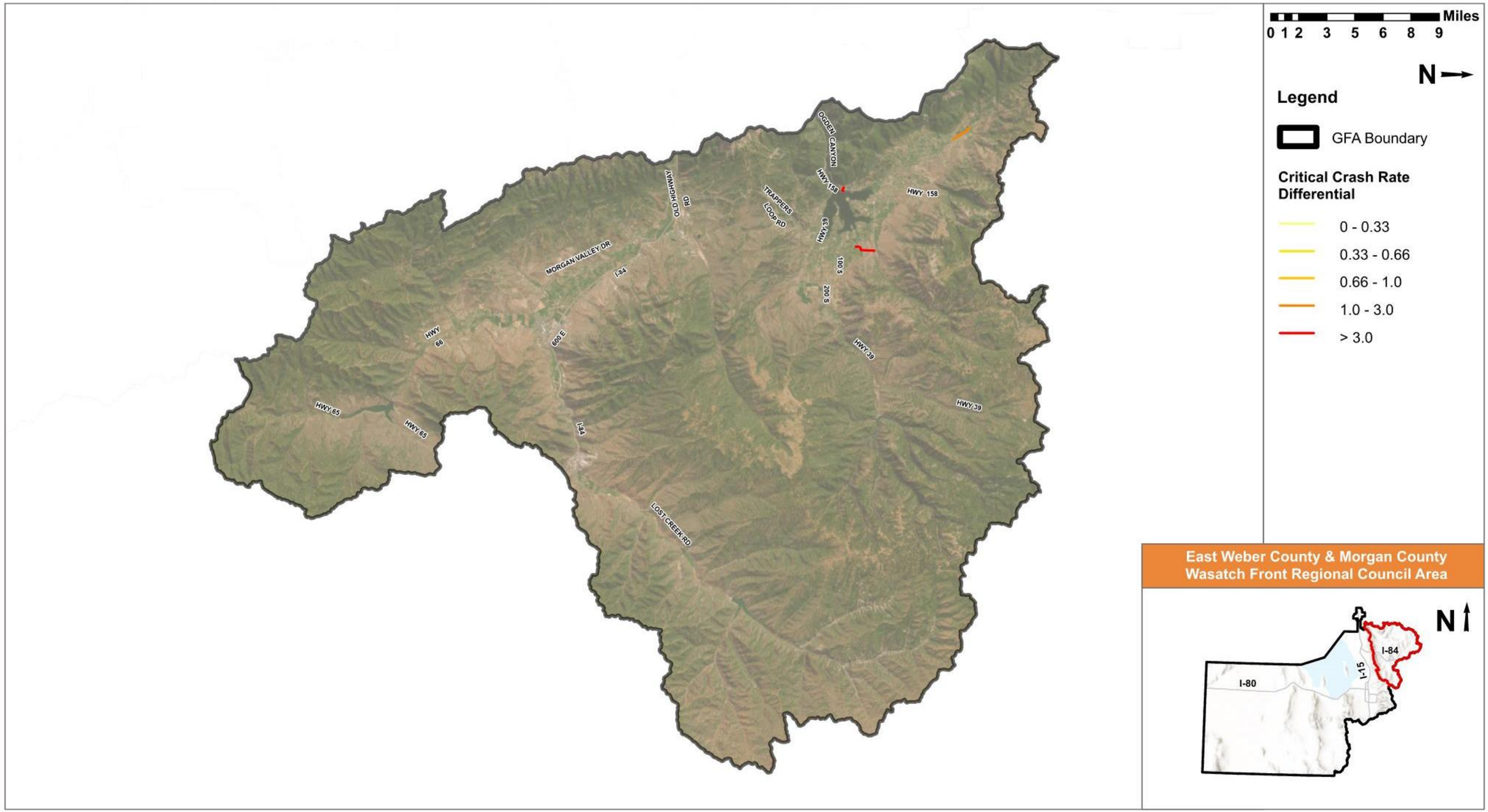


Figure 5.3 – CCR Differential – Segments (Local Routes)

Table 5.1 – Crash and Network Screening Analysis Results - Segments

Facility	Limits	Functional Classification	City	Crashes	Critical Crash Rate Differential	EPDO[1]	*Fatal*	*Suspected Serious Injury*	*Suspected Minor Injury*	*Possible Injury*	*No Injury/PDO*	Angle	Front to Rear	Head On	Single Vehicle	Parked Vehicle	Rear to Rear	Rear to Side	Sideswipe (Same Direction)	Sideswipe (opposite Direction)	Other/Unknown	Pedestrian	Bicycle	Motorcycle
State Routes																								
SR-65	Big Mountain Summit	Major Collector		15	30.2	320	0	1	9	2	3	0	0	0	14	0	0	0	1	0	0	0	0	9
SR-65	Left Fork Little Dutch Hollow	Major Collector		10	5.5	95	0	0	3	2	5	0	0	1	9	0	0	0	0	0	0	0	0	6
SR-66	East Canyon Creek	Major Collector		5	5.0	212	0	2	1	0	2	0	0	0	5	0	0	0	0	0	0	0	0	4
SR-65	Quaking Asp Creek	Major Collector		7	4.7	979	1	0	4	0	2	0	0	0	7	0	0	0	0	0	0	0	0	5
SR-39	Blue Bell Flat to Power Line Spur	Major Collector		5	2.9	129	0	1	1	1	2	0	0	0	5	0	0	0	0	0	0	0	0	3
SR-66	UT-306	Major Collector		4	2.9	67	0	0	2	2	0	0	0	0	3	0	0	0	1	0	0	0	0	3
200 S (SR-39)	10450 E to Private Rd	Major Collector		6	1.9	80	0	0	3	1	2	0	0	0	6	0	0	0	0	0	0	0	0	1
SR-39	Dry Bread Loop	Major Collector		5	1.7	68	0	0	2	2	1	0	0	0	5	0	0	0	0	0	0	0	0	1
SR-39	Botts Flat CG to Fork CG	Major Collector		7	1.6	1030	1	1	2	0	3	0	0	0	7	0	0	0	0	0	0	0	0	3
Ogden Canyon (SR-39)	Ogden Canyon Rd	Minor Arterial		27	1.3	1115	1	0	7	5	14	0	2	3	19	0	0	0	2	1	0	0	0	8
Federal Aid Routes																								
North Ogden Canyon Rd	2900 E to 3300 E	Major Collector	North Ogden	70	2.5	926	0	4	15	16	35	0	3	2	54	0	1	0	4	2	4	0	1	10
Old Highway Rd	Bohman Ln to Morgan Valley Ln	Major Collector		3	2.1	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
7100 E	700 N to 1000 N	Major Collector		7	1.2	17	0	0	0	1	6	1	0	0	4	0	0	1	0	1	0	0	0	0
500 N	7800 E to 7100 E	Major Collector		12	0.4	179	0	1	3	1	7	0	0	0	10	0	1	0	0	0	1	0	0	1
7100 E	1000 N to 1275 N	Major Collector		4	-0.4	14	0	0	0	1	3	0	3	0	0	0	0	0	0	1	0	0	0	0
1900 N	5700 E to Stingtown Rd	Major Collector		3	-0.5	35	0	0	1	1	1	0	1	0	2	0	0	0	0	0	0	0	1	0
River Dr	4100 N to Leonard Dr	Minor Collector		7	-0.5	48	0	0	0	4	3	0	2	0	5	0	0	0	0	0	0	0	0	0
Hwy 162	Nordic Valley Dr to North Fork Ogden Riv	Major Collector		4	-0.6	14	0	0	0	1	3	1	0	0	3	0	0	0	0	0	0	0	0	0
4100 N	3775 E to 3500 E	Major Collector		3	-0.8	13	0	0	0	1	2	0	0	0	2	1	0	0	0	0	0	0	0	0
Hwy 162	3300 N to Nordic Valley Dr	Major Collector		6	-0.8	6	0	0	0	0	6	1	0	0	5	0	0	0	0	0	0	0	0	0
Local Streets																								
Port Boat Ramp	UT-158 to Pineview Reservoir	Local		6	95.4	6	0	0	0	0	6	1	0	0	1	3	0	1	0	0	0	0	0	0
7900 E	Stoker Ln to 1900 N	Local		3	5.5	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
North Fork Rd	5900 N to 3100 E	Local		3	2.8	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0

1. Equivalent Property Damage Only Crashes

= Local CCR Differential > 3.0
= Local CCR Differential 1.0 - 3.0
= Local CCR Differential 0.66 - 1.0
= Local CCR Differential 0.33 - 0.66
= Local CCR Differential 0.0 - 0.33

= 90 - 100% probability that crash type is over-represented
= 80 - 90% probability that crash type is over-represented
= 70 - 80% probability that crash type is over-represented

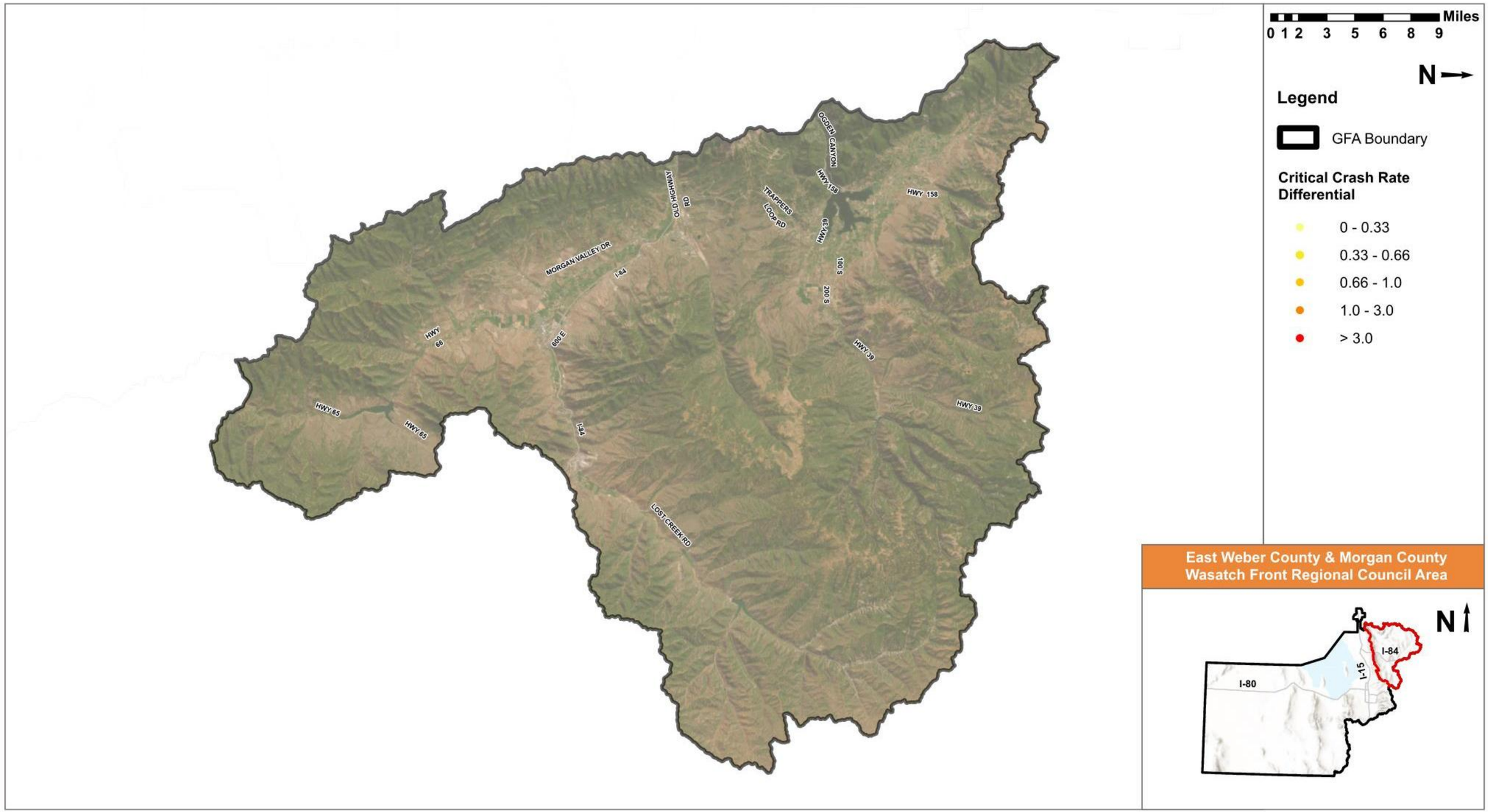


Figure 5.4 – CCR Differential – Intersections (Signalized)

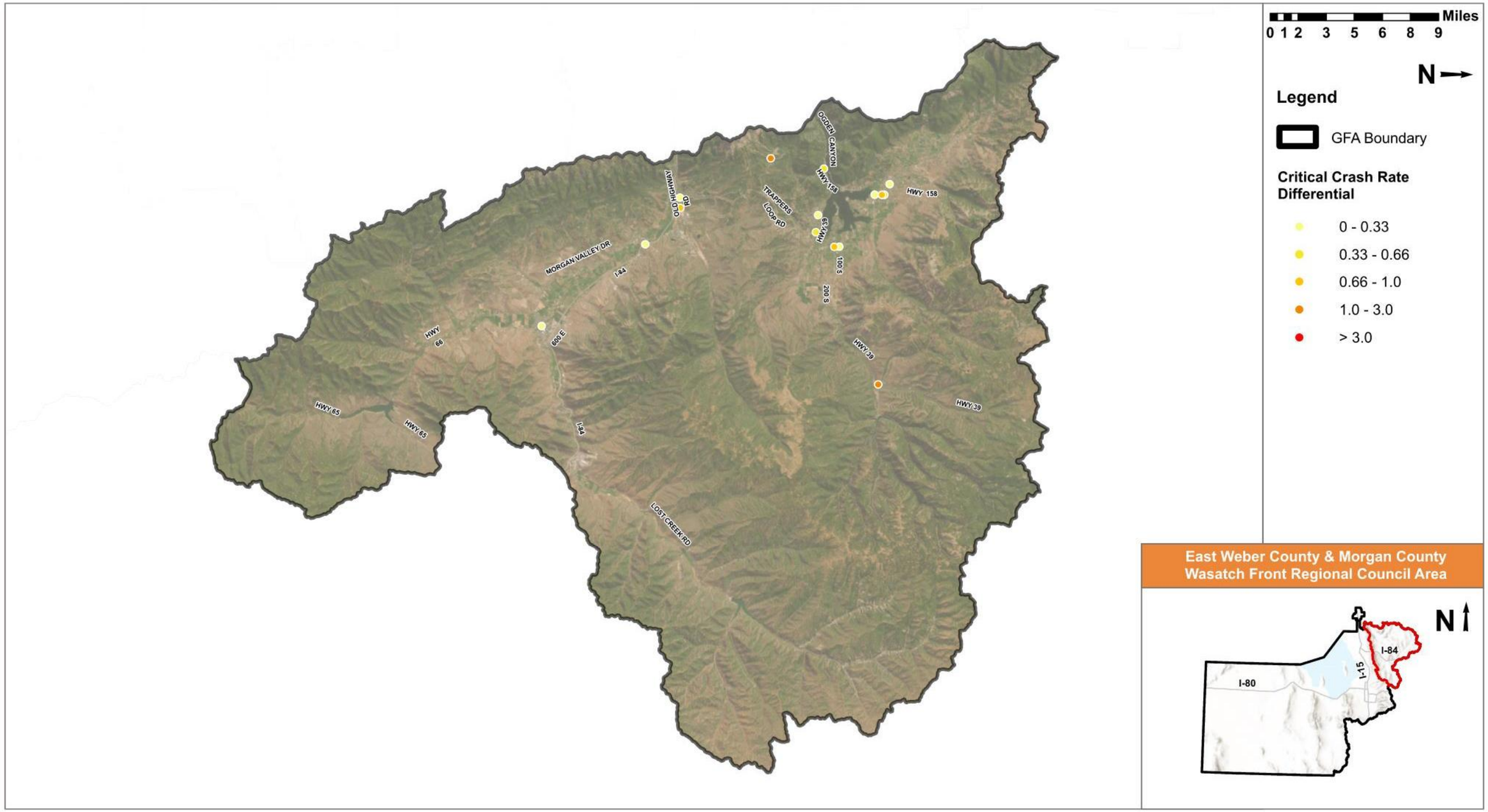


Figure 5.5 – CCR Differential – Intersections (Unsignalized)

Table 5.2 – Crash and Network Screening Analysis Results - Intersections

Intersection	City	Crashes	Critical Crash Rate Differential	EPDO[1]	*Fatal*	*Suspected Serious Injury*	*Suspected Minor Injury*	*Possible Injury*	*No Injury/PDO*	Angle	Front to Rear	Head On	Parked Vehicle	Single Vehicle	Rear to Rear	Rear to Side	Sideswipe (Same Direction)	Sideswipe (opposite Direction)	Other/Unknown	Pedestrian	Bicycle	Motorcycle
Unsignalized Intersections																						
Wcsb19 Rd & Wc226 Rd		3	1.2	3	0	0	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0
Hwy 39 & Causey Dr		3	1.0	13	0	0	0	1	2	2	0	0	0	0	1	0	0	0	0	0	0	0
5500 E & 2200 N		10	1.0	63	0	0	2	1	7	7	0	0	3	0	0	0	0	0	0	0	0	0
Trappers Loop Rd & Old Highway Rd		16	0.7	57	0	0	0	4	12	2	12	0	1	0	0	0	0	1	0	0	1	1
7800 E & 100 S		11	0.7	43	0	0	1	1	9	5	2	0	2	0	0	0	0	2	0	0	0	0
Trappers Loop Rd & Hwy 39		11	0.6	310	0	3	1	0	7	1	4	0	4	0	0	0	0	2	0	0	0	2
5500 E & 2300 N		5	0.5	47	0	0	1	2	2	0	1	0	4	0	0	0	0	0	0	0	0	1
Wheeler Creek Rd & Hwy 39		11	0.4	167	0	1	2	2	6	4	3	1	2	0	0	0	0	1	0	0	0	0
State St & Young St	Morgan	7	0.3	48	0	0	0	4	3	6	1	0	0	0	0	0	0	0	0	0	0	0
5500 E & 1900 N		4	0.3	14	0	0	0	1	3	1	0	0	3	0	0	0	0	0	0	0	0	0

1. Equivalent Property Damage Only Crashes

= Local CCR Differential > 3.0	= 90 - 100% probability that crash type is over-represented
= Local CCR Differential 1.0 - 3.0	= 80 - 90% probability that crash type is over-represented
= Local CCR Differential 0.66 - 1.0	= 70 - 80% probability that crash type is over-represented
= Local CCR Differential 0.33 - 0.66	
= Local CCR Differential 0.0 - 0.33	

6. Roadway Characteristic Risk Analysis

A roadway characteristic risk analysis was performed using the following three sub-analysis:

- Crash Profile Risk Assessment
- usRAP Risk Assessment
- Local Street Risk Assessment

6.1. Crash Profile Risk Assessment

This risk assessment sub-analysis identifies common roadway characteristics for fatal and serious injury crashes that occurred within the WFRC study area. Based on the scoring of the various roadway characteristic risks identified from analysis of crash reports, a risk score was assigned to all state and federal aid routes within the East Weber County & Morgan County GFA consistent with the methodology described in Tech Memo #1 Section 3.4. The results of the Crash Profile Risk Assessment are mapped in the following figures:

- **Figure 6.1** – Crash Profile Risk Assessment Results (State Routes)
- **Figure 6.2** – Crash Profile Risk Assessment Results (Federal Aid Routes)

Table 6.1 provides an overview of urban and rural segments with the highest risk scoring. Up to ten urban and rural segments are listed if the segment received at least 67% of the overall total risk score.

Table 6.1 – WFRC Risk Segments (Federal Aid Routes)

Area Type	Road Segment	Extents	Risk Score
Urban	3500 East	3600 North to 4100 North	22.5
Urban	5500 East	2200 North to 2300 North	21
Rural	Old Highway Road	600 West to SR-167	20.1 to 22.5
Rural	2200 North	SR-158 to 5500 East	21
Rural	2300 North	SR-158 to 5500 East	21

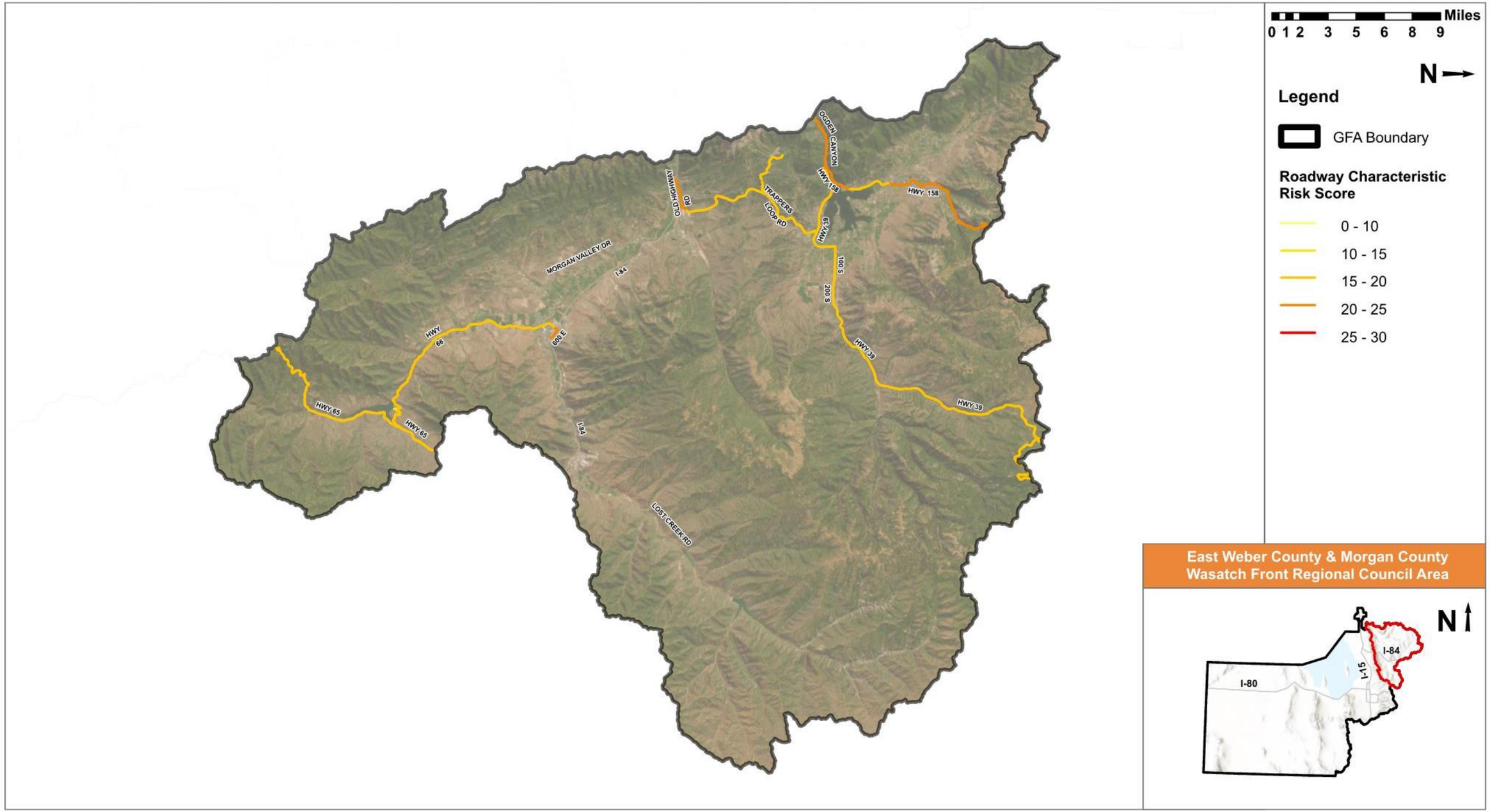


Figure 6.1 – Crash Profile Risk Assessment Results (State Routes)

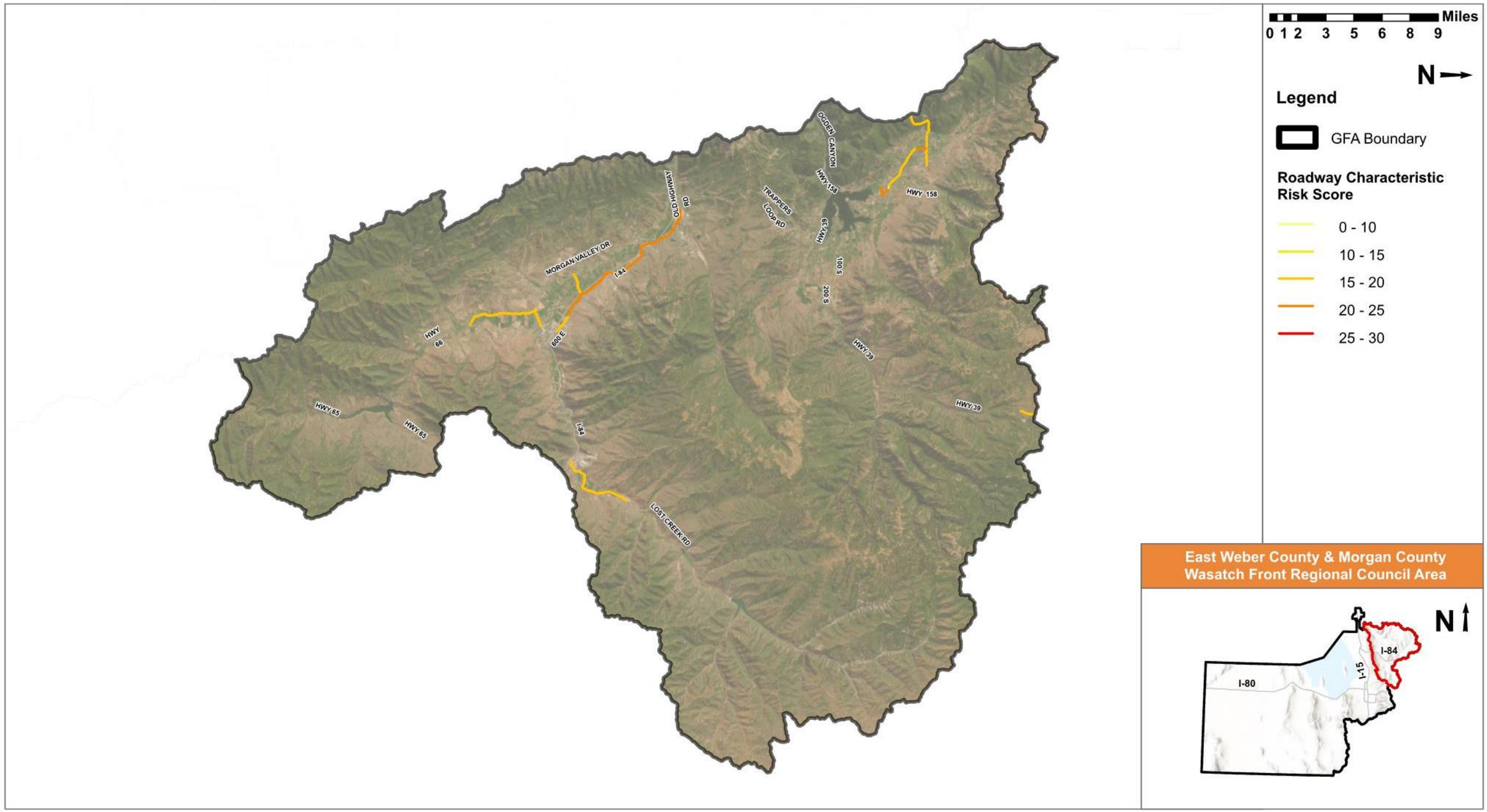


Figure 6.2 – Crash Profile Risk Assessment Results (Federal Aid Routes)

6.2. usRAP Risk Assessment

A roadway characteristic risk assessment was performed using roadway feature data collected for Utah state and federal aid routes. The risk assessment was performed using the usRAP tool. The output of the usRAP tool is a star rating or risk rating for vehicle, pedestrian, and bicyclist features. The results of the usRAP risk assessment by star rating are mapped in the following figures:

- **Figure 6.3** – Vehicle Star Rating (State Routes)
- **Figure 6.4** – Vehicle Star Rating (Federal Aid Routes)
- **Figure 6.5** – Pedestrian Star Rating (State Routes)
- **Figure 6.6** – Pedestrian Star Rating (Federal Aid Routes)
- **Figure 6.7** – Bicycle Star Rating (State Routes)
- **Figure 6.8** – Bicycle Star Rating (Federal Aid Routes)

A summary of the highest risk segments (1-2 Stars) for federal aid routes in the East Weber County & Morgan County GFA are located in **Table 6.2**.

Table 6.2 – usRAP Risk Segments (Federal Aid Route)

Road Segment	Extents	Vehicle Risk	Pedestrian Risk	Bicycle Risk
Ant Flat Road	Ogden River Scenic Byway to North GFA Extents	X	X	X
2300 North	SR-158 to 5500 East	X	X	X
2200 North	5300 East to Sierra Drive	X	X	X
5500 East	2200 North to 2300 North		X	
3500 East	Highway 162 to 4100 North		X	X
Old Highway Road	SR-167 to Sego Lily Road		X	X
700 East	1900 North to Lost Creek Road		X	
Lost Creek Road	North of 700 East		X	
Morgan Valley Drive	SR-66 to Young Street		X	

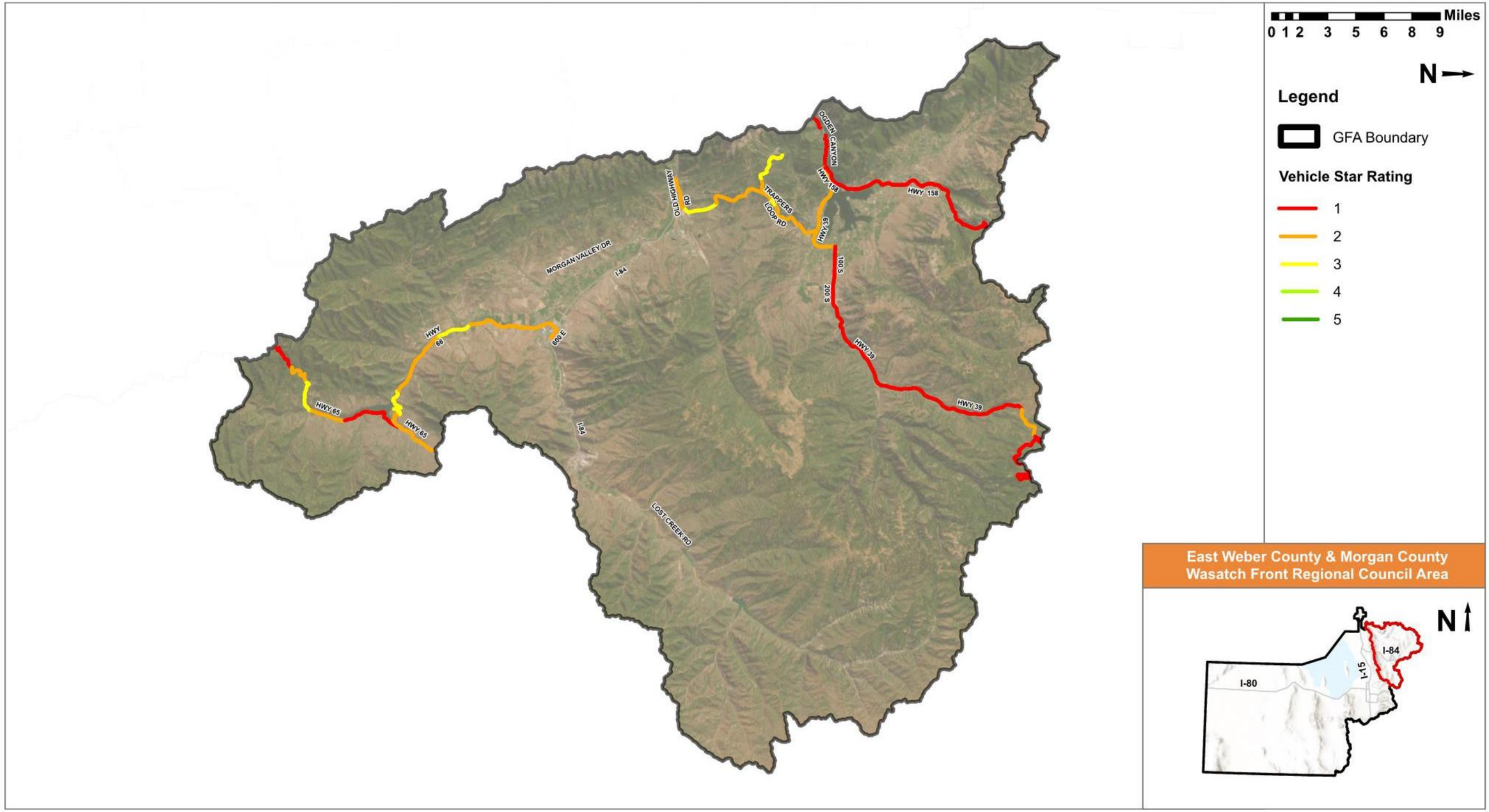


Figure 6.3 – Vehicle Star Rating (State Routes)

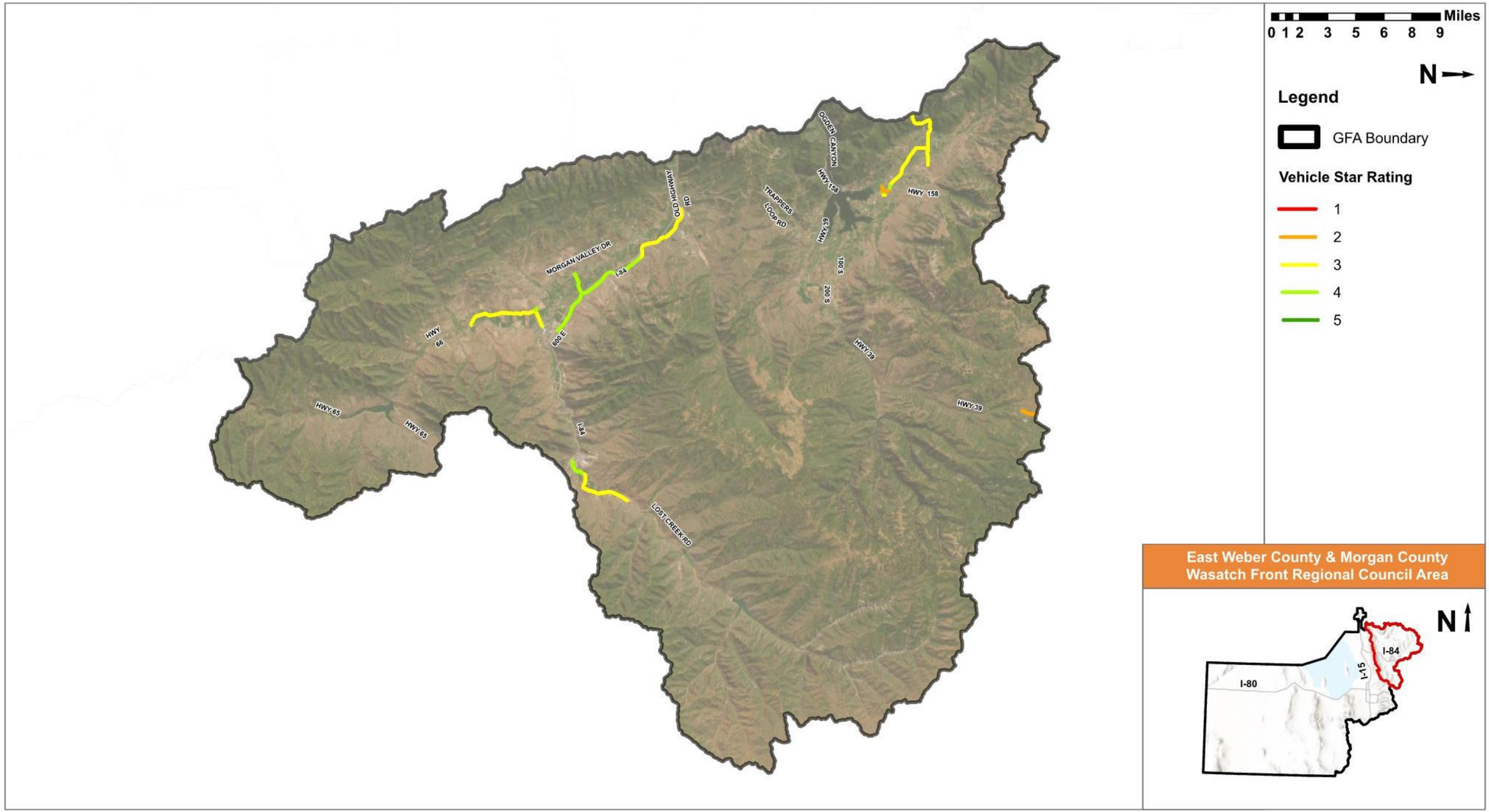


Figure 6.4 – Vehicle Star Rating (Federal Aid Routes)

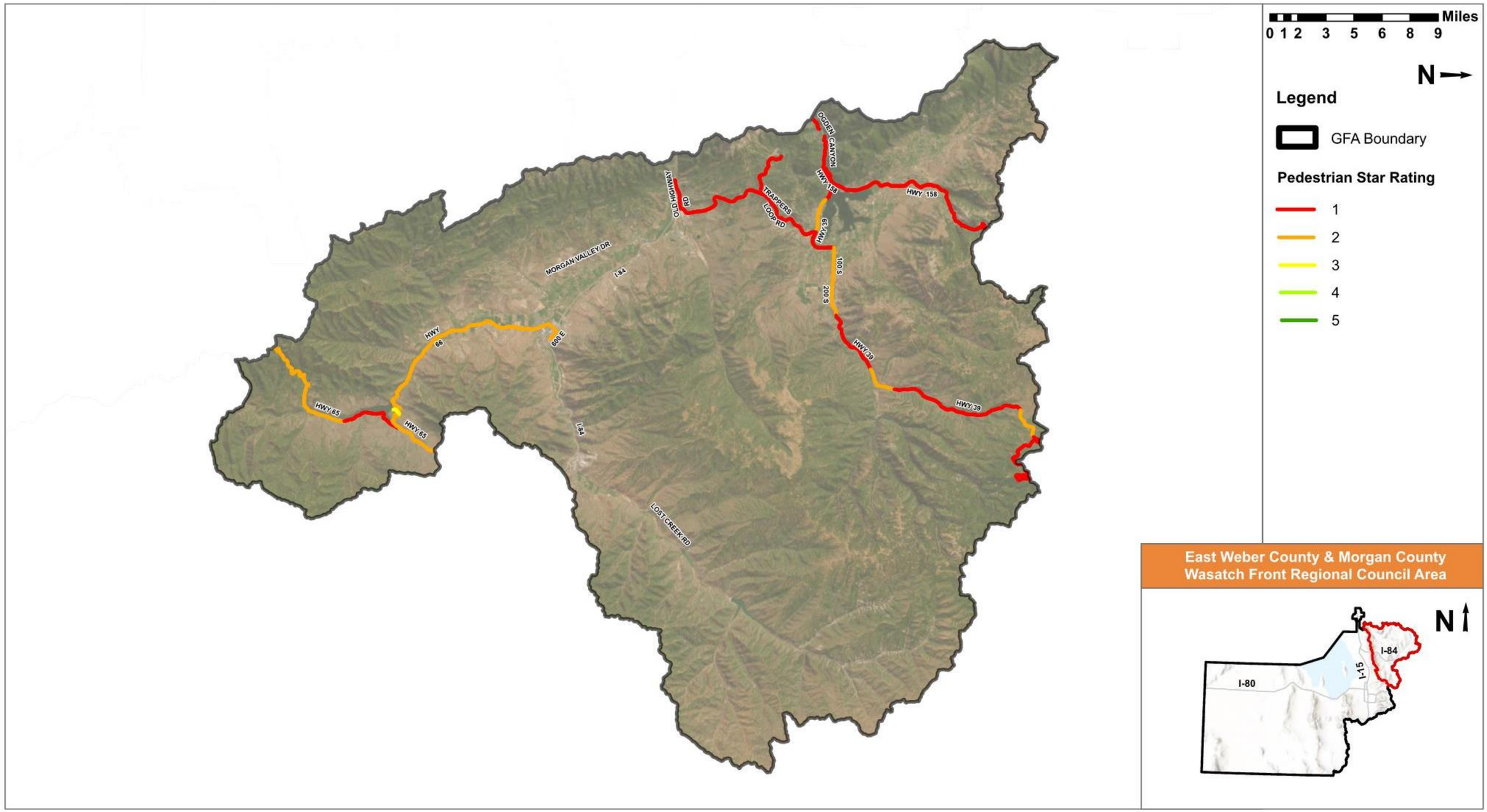


Figure 6.5 – Pedestrian Star Rating (State Routes)

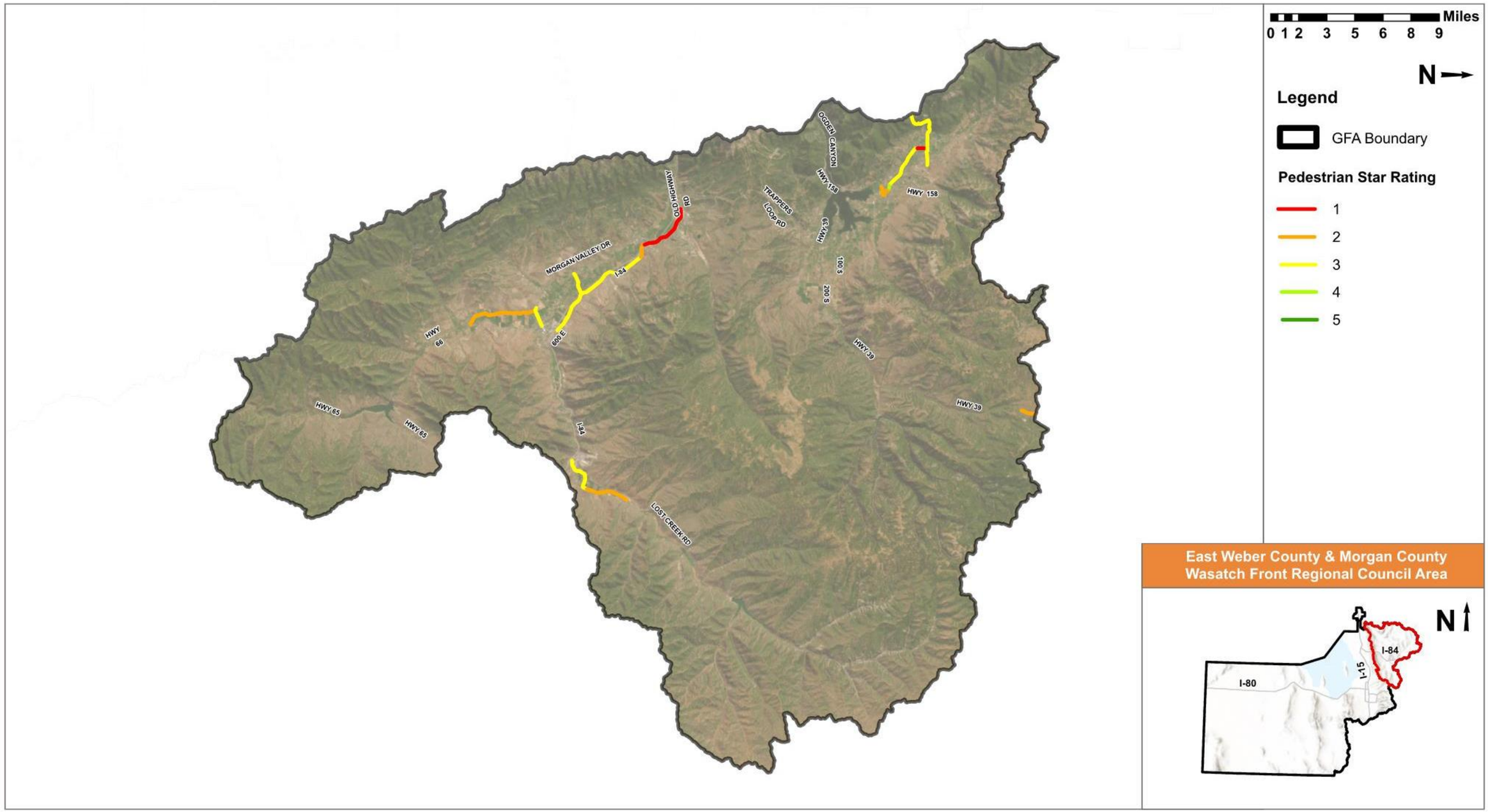


Figure 6.6 – Pedestrian Star Rating (Federal Aid Routes)

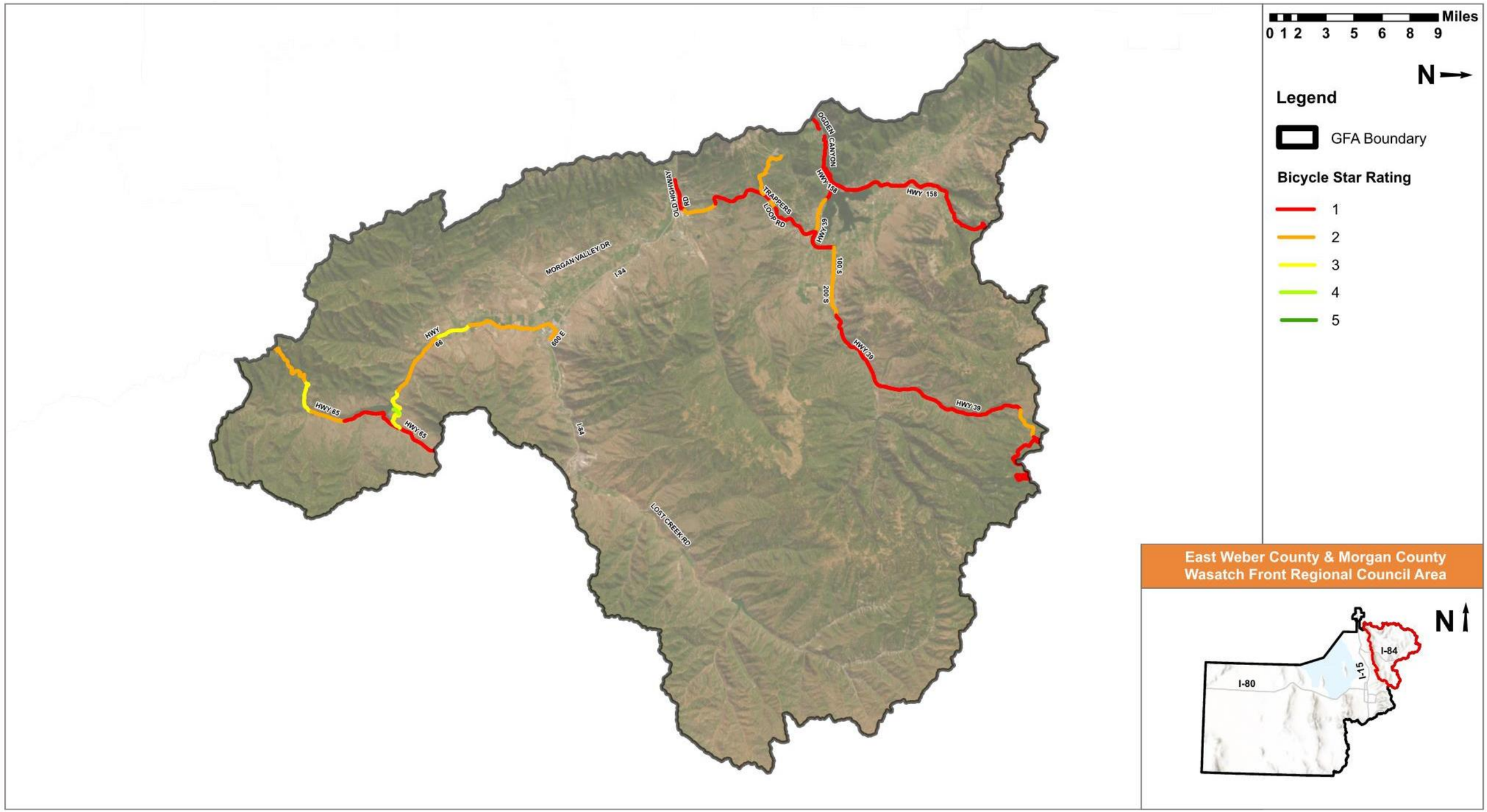


Figure 6.7 – Bicycle Star Rating (State Routes)

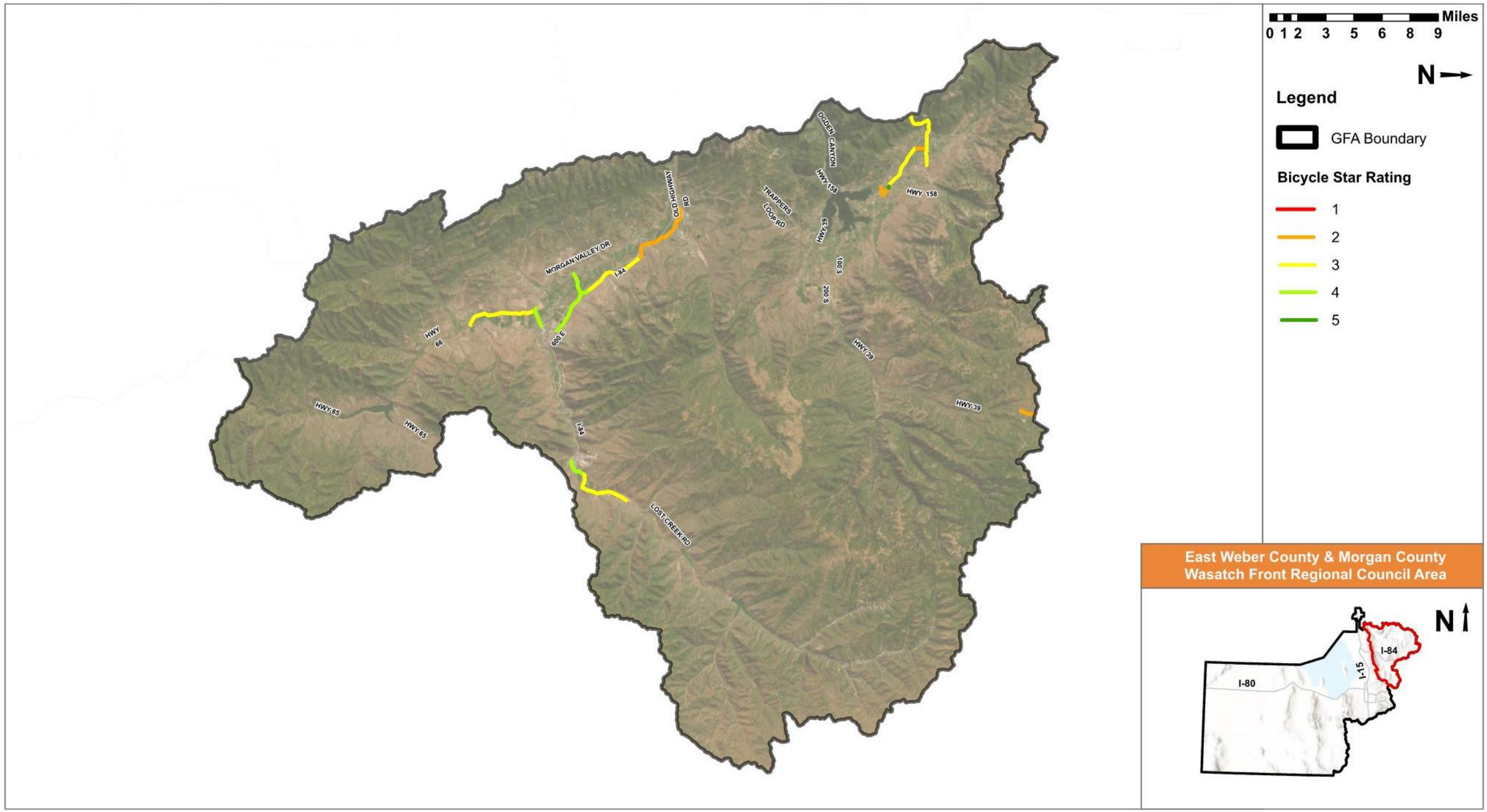


Figure 6.8 – Bicycle Star Rating (Federal Aid Routes)

6.3. Local Street Risk Assessment

A local street risk assessment was performed for all local roads within WFRC that are not included in the usRAP network. The results of the local street risk assessment are summarized in **Table 6.3** and **Figure 6.9**. Mapped segments include the top 5% risk segments within the WFRC study area and the top 10 segments or high priority segments within the East Weber County & Morgan County GFA.

Table 6.3 – Local Street High Priority Segments

Road Segment	Extents
Richville Lane	Morgan Valley Drive – SR-66
North Fork Road	Middle Gate Drive – North Fork Park Road
Lost Creek Road	-
Old Highway Road	2000 North – 2700 North
100 North	200 East – 300 West
100 South	100 West – 400 East
525 North	-
5900 East	2100 North – 1800 North
River Drive	Hwy-162 – 4100 North
Round Valley Road	-

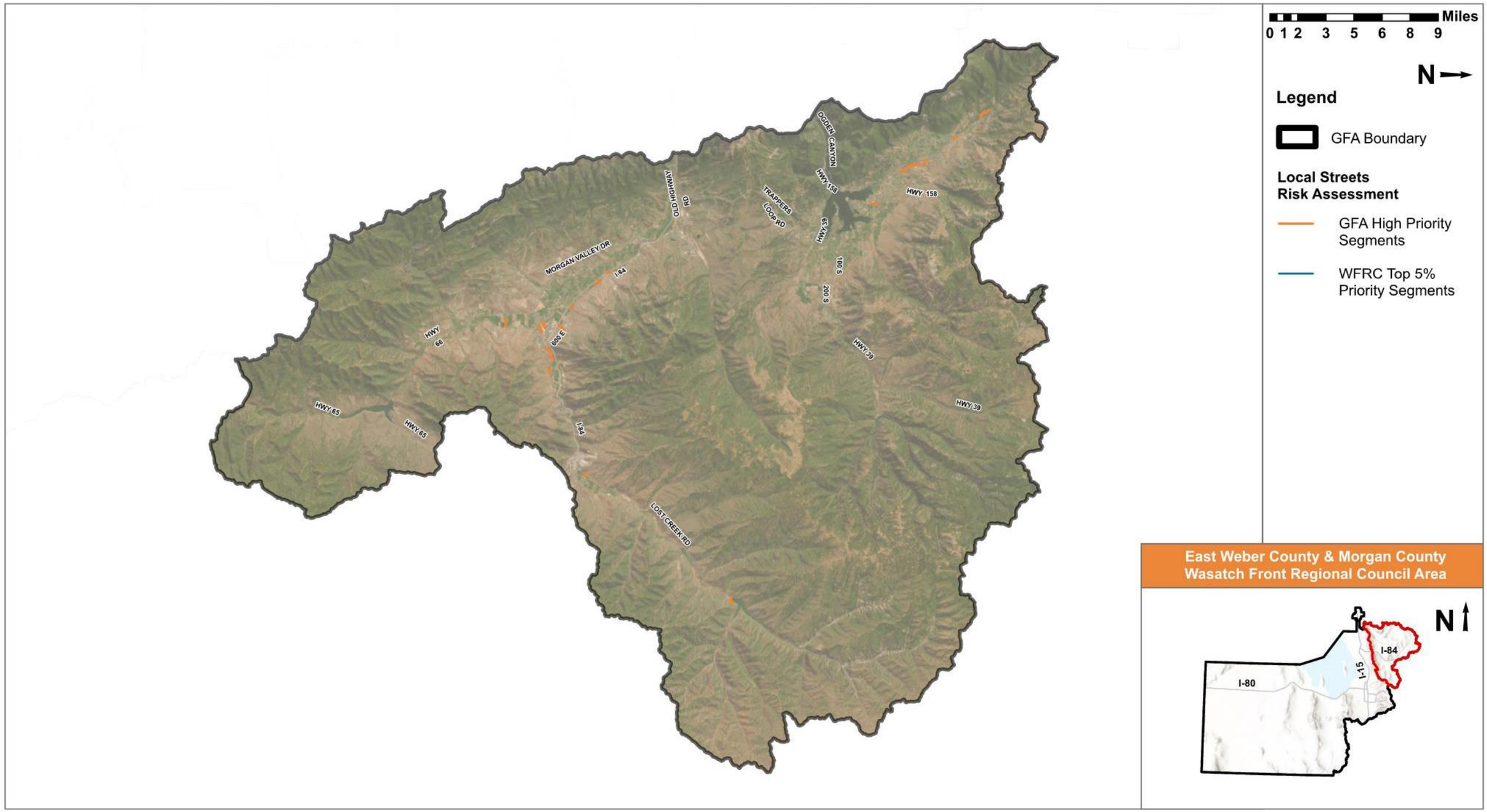


Figure 6.9 – Local Street Risk Assessment Results

7. Safety Analysis Summary

This section summarizes the safety analysis performed for the East Weber County & Morgan County GFA by identifying common risk characteristics and a composite high-risk roadway network.

7.1. Common Risk Characteristics

Based on the SHSP Emphasis Area Analysis and the Historical Crash Analysis summarized above, the following are common risk characteristics that should be considered when developing safety improvement projects specific to the East Weber County & Morgan County GFA:

- Roadway Departure
  - 63.7% of all fatal and serious injuries
  - 60.9% of all fatal and serious injury crashes
- Motorcycle
  - 41.2% of all fatal and serious injuries
- Speed-Related
  - 33.3% of all fatal and serious injuries
- No Safety Restraints
  - 22.5% of all fatal and serious injuries
- Teen Driver
  - 14.7% of all fatal and serious injuries
- Active Transportation
  - 1.1% of all fatal and serious injuries
- Left Turn at Intersection
  - 4.6% of all fatal and serious injury crashes

7.2. Composite High-Risk Roadway Network

Each of the safety analysis methodologies completed identified segments that can be improved to reduce fatalities and serious injuries.

To identify an overall high-risk roadway network and provide focused information for jurisdictional decisions regarding prioritization of safety improvements, an analysis was performed to identify overlapping segments from each of the analysis methodologies. A composite score, from zero to five, was determined using the approach in **Table 7.1**. The high-risk roadway network is a composite of the various risks as presented in **Section 4** through **Section 6** of Tech Memo #1. The top 10% of roadway segments for the entire WFRC area are included in the Composite High-Risk Network. These segments have a composite risk value of four or higher.

The East Weber County & Morgan County GFA Composite High-Risk Network for Federal Aid routes is summarized in **Table 7.2**.

The results are also mapped in **Figure 7.1** (State Routes) and **Figure 7.2** (Federal Aid Routes).

Table 7.1 – Composite High-Risk Roadway

Analysis	Risk Type	Approach	Value
Historical Crash Analysis	Historical Crash Risk	5-Year Crash Totals ≥ 3 Crashes	1
Crash and Network Screening Analysis	Systemic Crash Risk	Positive Local CCR Differential	1
WFRC Risk Assessment	Roadway Risk	Risk Score ≥ 20	1
usRAP Risk Assessment	Vehicle Risk	Vehicle Star Rating = 1-2 Stars	1
usRAP Risk Assessment	Pedestrian Risk	Pedestrian Star Rating = 1-2 Stars	0.5
usRAP Risk Assessment	Bicycle Risk	Bicycle Star Rating = 1-2 Stars	0.5
		Total Possible Composite Risk Score	**5**

The greater the overlap the higher the likelihood that the segment has risk factors that should be addressed to reduce and/or eliminate fatal and serious injury crashes at that location. The top 10% of roadway segments for the entire WFRC area are considered high-risk segments. These segments have a composite risk value of four or higher. A summary of the composite high-risk roadway network for federal aid routes is summarized in **Table 7.2**. The results are also mapped in **Figure 7.1** and **Figure 7.2**.

Table 7.2 – East Weber County & Morgan County High-Risk Roadway Network (Federal Aid Routes)

Facility	Limits	Functional Classification	City	Composite Risk Score	Length (miles)	*usRAP- Pedestrian Star Rating*	*usRAP - Bicycle Star Rating*	*usRAP- Vehicle Star Rating*	Crash Profile Risk Score	CCR Differential Analysis	Significant Crashes
Federal Aid Routes											
Old Highway Rd	Morgan Valley Dr to Bohman Ln	Major Collector		4	0.1	X	X		X	X	X

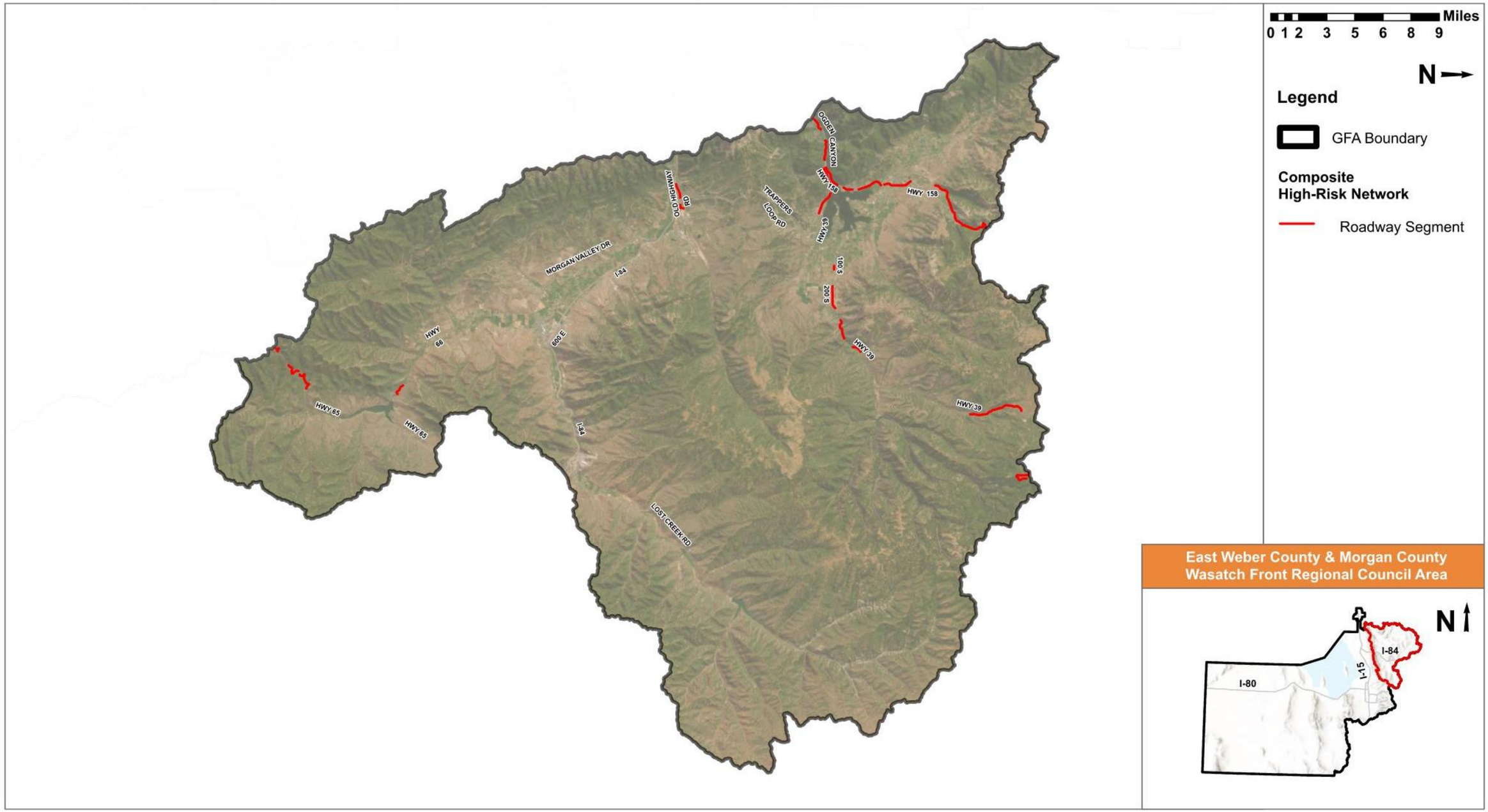


Figure 7.1 – East Weber County & Morgan County High-Risk Roadway Network (State Routes)

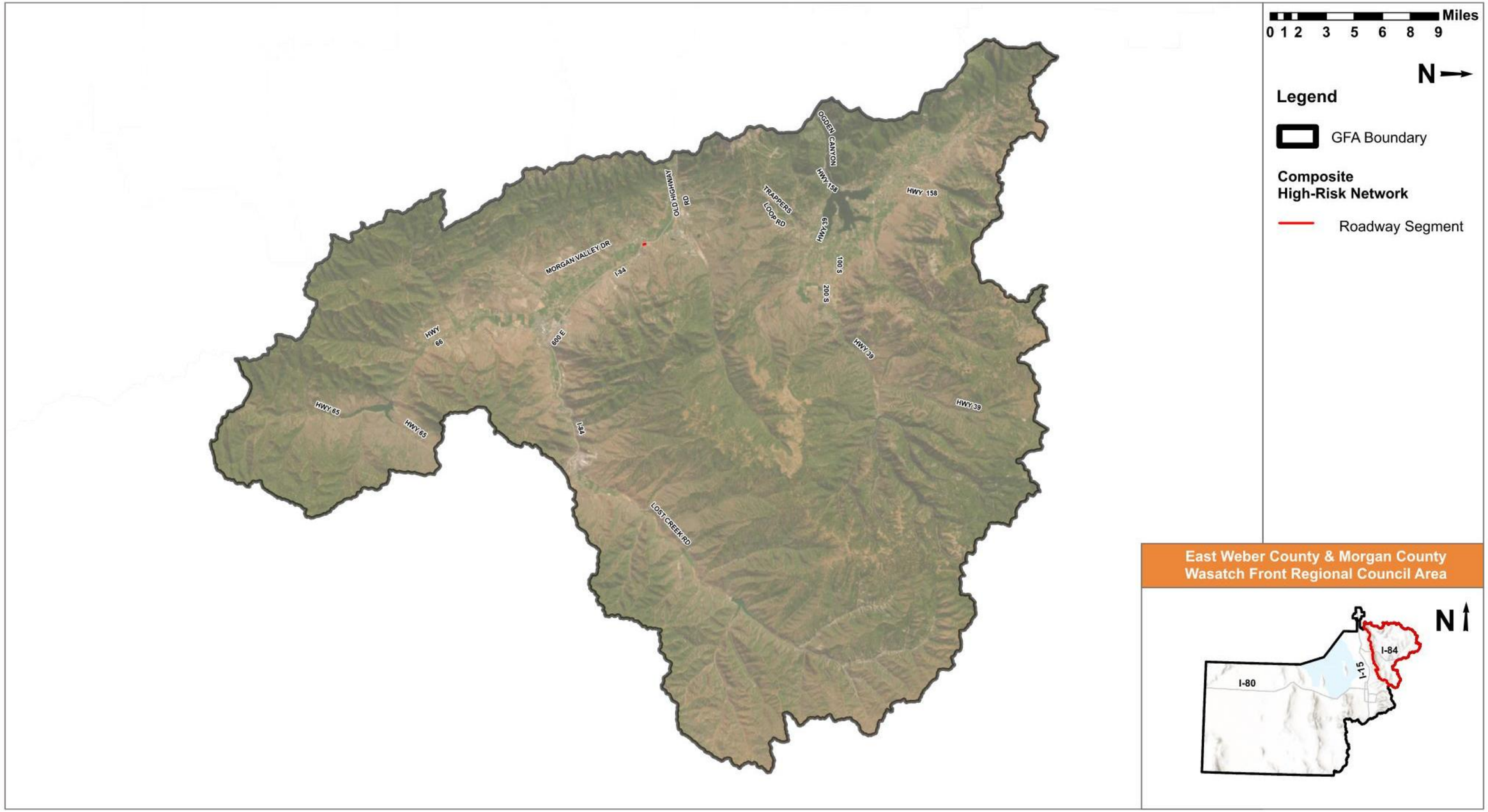


Figure 7.2 – East Weber County & Morgan County High-Risk Roadway Network (Federal Aid Routes)

APPENDIX

EASTERN WEBER COUNTY & MORGAN COUNTY CASE STUDY PROJECT INFORMATION SHEETS

East Weber County & Morgan County

Project ID	Jurisdictions	Project Name
3.13.1.1	Weber County	Ogden Canyon (SR 39) from Valley Drive to SR 226
3.13.2	Weber County	SR 158 from SR 39 to Powder Ridge Road
3.13.3	Huntsville, Weber County	SR 39 from 7800 East to Ant Flat Road
3.14.1	Morgan, Morgan County	Old Highway Road (SR 167) from Monte Verde Drive to 300 North (SR 66)
3.14.2	Morgan, Morgan County	SR 66 from 700 East (I-84) to Morgan Valley Road

Project Information Sheet

GFA(s):	**East Weber County & Morgan County, Central Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**Ogden Canyon (SR 39) from Valley Drive to SR 226**	**Prepared By:**	**JSF**
Jurisdiction(s):	**Weber County**	**Checked By:**	**EJS**
Emphasis Areas:	**Intersections, Teen Drivers, Roadway Departures**		
Equity Priority:	**Low**		

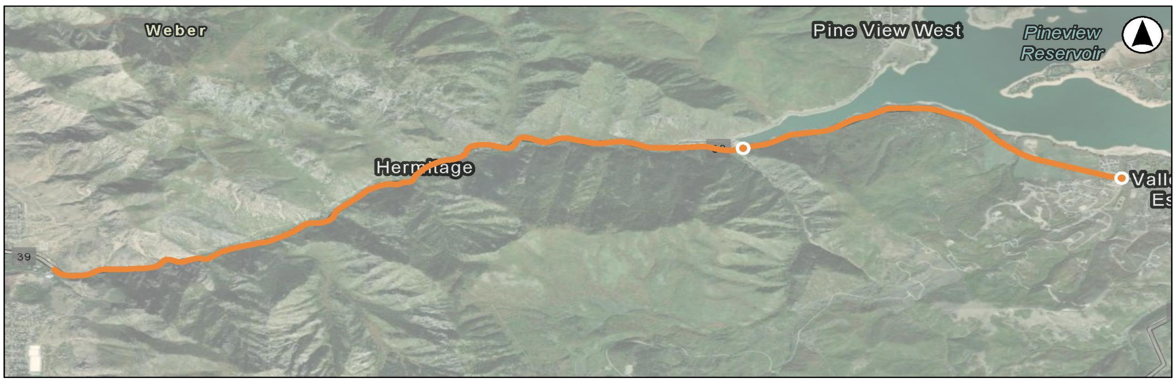
Location Description

Roadway: Ogden Canyon (SR 39)
From: Valley Drive
To: SR 226
Length: 7.89 miles

Key Intersection Locations:
SR 158
Old Snowbasin Road (SR 226)

Project Location Map

Map ID: 3.13.1.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**7.89**
Average Daily Traffic (vehicles per day)	**7,342**
Functional Classification	**Minor Arterial**
Roadway Ownership	**State**
Urban/Rural Designation	**Rural**
Number of Key Intersections	**2**

Why Was This Location Identified?	
Composite Safety Score	✓
Historic Crashes	✓
Critical Crash Rate Differential	✓
Crash Profile Risk Score	✓
usRAP - Star Rating (Veh, Ped, Bike)	✓
Local Street Assessment	

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	**2**
Suspected Serious Injury Crashes (A)	**10**
Suspected Minor Injury Crashes (B)	**50**
Possible Injury Crashes (C)	**34**
No Injury/PDO Crashes (O)	**183**
Total Crashes	**279**
Total EPDO Crashes	**4,397**

What Crash Types are Over-Represented?			
Fatal	✓	Head On (HO)	✓
Serious Injury	✓	Parked Vehicle (PV)	✓
Pedestrian (Ped)		Single Vehicle	✓
Bicycle (Bike)		Rear to Rear (RR)	
Motorcycle		Rear to Side (RS)	
Angle	✓	Sideswipe (SS)	✓
Front to Rear (FR)	✓	Other/Unknown	

Intersection Crash History

									What Crash Types are Over-Represented?							
Intersections	**Signal**	**K**	**A**	**B**	**C**	**O**	**Total**	**EPDO**	K/A	Ped/Bike	Angle	FR	HO	PV	RR/RS	SS
SR 158 & SR 39		0	1	2	6	4	13	210	✓				✓			
Old Snowbasin Road (SR 226) &		0	1	0	2	2	5	118	✓		✓			✓		

Project Description/How is safety improved?

This project is focused on systemic corridor safety improvement in an effort to reduce run-off-road and head-on crashes. Countermeasures include shoulder installation and widening, edge and centerline rumble strips, wider edge lines, Safety Edge installation, and enhanced curve warning signs. Due to the difficult nature of construction in Ogden Canyon, additional quantity was added to shoulder widen to account for anticipated increased costs.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

Proposed Proven Safety Countermeasures


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Enhanced Delineation for Horizontal Curves


Wider Edge Lines


SafetyEdge™

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	11.84	MILE	$ 298,000	$ 3,526,830
Shoulder Widening on Rural Roads	0.771	All Crashes	11.84	MILE	$ 32,000	$ 378,720
Install Edge line Rumble Strips	0.49 - 0.87	Fatal & Injury	7.89	MILE	$ 9,000	$ 71,010
Install Centerline Rumble Strips	0.36 - 0.56	Head-on Fatal & Injur	3.95	MILE	$ 5,000	$ 19,725
Install 6" Edge line (Both Sides of Road)	0.64 - 0.88	All Crashes	7.89	MILE	$ 7,000	$ 55,230
Install and/or Upgrade Curve Signage to Enhanced Delineations	0.4 - 0.852	All Crashes	14.00	CURVE	$ 2,000	$ 28,000
Install Safety Edge with Repaving Projects	0.79 - 0.892	All Crashes	7.89	MILE	$ 121,000	$ 954,690
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 5,034,205
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 251,710
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 1,510,262
Estimated Construction Cost:		$ 6,871,177

Local Match†: 20% $ 1,745,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 824,541
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 1,030,677
Estimated Project Total:		$ 8,727,000

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000
**To be evaluated during feasibility study/design

Additional Potential Improvements

Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: Set Appropriate Speed Limits for All Road Users
Additional Improvements #2: Improve Roadside Design on Curves
Additional Improvements #3:
Additional Improvements #4:
Additional Improvements #5:

Disclaimer:

Disclaimer: The cost estimates provided in this document are for comparison purposes only. Actual project costs will vary. The recommended safety improvement strategies were based on available data and reasonable engineering judgment and a more detailed assessment may suggest additional safety strategies that could be considered.

Project Information Sheet

GFA(s):	**East Weber County & Morgan County, Central Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**SR 158 from SR 39 to Powder Ridge Road**	**Prepared By:**	**JSF**
Jurisdiction(s):	**Weber County**	**Checked By:**	**EJS**
Emphasis Areas:	**Intersections, Teen Drivers, Roadway Departures**		
Equity Priority:	**Low**		

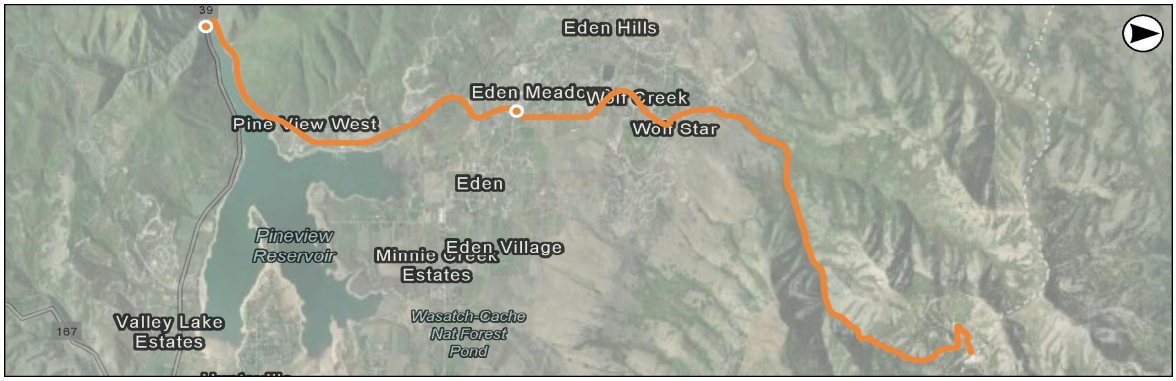
Location Description

Roadway:	SR 158
From:	SR 39
To:	Powder Ridge Road
Length:	11.57 miles

Key Intersection Locations:
SR 39
SR 166

Project Location Map

Map ID: 3.13.2



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**11.57**
Average Daily Traffic (vehicles per day)	**4,716**
Functional Classification	**Major Collector**
Roadway Ownership	**State**
Urban/Rural Designation	**Rural**
Number of Key Intersections	**2**

Why Was This Location Identified?	
Composite Safety Score	✓
Historic Crashes	✓
Critical Crash Rate Differential	✓
Crash Profile Risk Score	✓
usRAP - Star Rating (Veh, Ped, Bike)	✓
Local Street Assessment	

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	**3**
Suspected Serious Injury Crashes (A)	**5**
Suspected Minor Injury Crashes (B)	**11**
Possible Injury Crashes (C)	**13**
No Injury/PDO Crashes (O)	**86**
Total Crashes	**118**
Total EPDO Crashes	**3,612**

What Crash Types are Over-Represented?			
Fatal	✓	Head On (HO)	✓
Serious Injury	✓	Parked Vehicle (PV)	✓
Pedestrian (Ped)		Single Vehicle	
Bicycle (Bike)		Rear to Rear (RR)	✓
Motorcycle		Rear to Side (RS)	
Angle		Sideswipe (SS)	✓
Front to Rear (FR)	✓	Other/Unknown	

Intersection Crash History

									What Crash Types are Over-Represented?							
Intersections	**Signal**	**K**	**A**	**B**	**C**	**O**	**Total**	**EPDO**	K/A	Ped/Bike	Angle	FR	HO	PV	RR/RS	SS
SR 39 & SR 158		0	1	2	6	4	13	210	✓				✓			
SR 166 & SR 158		0	0	2	5	3	10	104	✓		✓	✓	✓			

Project Description/How is safety improved?

This project is focused on systemic corridor safety improvement in an effort to reduce run-off-road, head-on, and rural roadway crashes. Countermeasures include shoulder installation and widening, edge and centerline rumble strips, wider edge lines, Safety Edge installation, and enhanced curve warning signs. Due to the difficult nature of construction on the northern end of the project, additional quantity was added to shoulder widening to account for anticipated increased costs. Additional evaluation of the SR 162 and SR 158 stop-controlled intersection is included.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

Proposed Proven Safety Countermeasures


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Enhanced Delineation for Horizontal Curves


Wider Edge Lines


SafetyEdge™

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	8.68	MILE	$ 298,000	$ 2,585,895
Shoulder Widening on Rural Roads	0.771	All Crashes	8.68	MILE	$ 32,000	$ 277,680
Install Safety Edge with Repaving Projects	0.79 - 0.892	All Crashes	11.57	MILE	$ 121,000	$ 1,399,970
Install 6" Edge line (Both Sides of Road)	0.64 - 0.88	All Crashes	11.57	MILE	$ 7,000	$ 80,990
Install and/or Upgrade Curve Signage to Enhanced Delineations	0.4 - 0.852	All Crashes	7.00	CURVE	$ 2,000	$ 14,000
Install Edge line Rumble Strips	0.49 - 0.87	Fatal & Injury	11.57	MILE	$ 9,000	$ 104,130
Install Centerline Rumble Strips	0.36 - 0.56	Head-on Fatal & Injur	5.79	MILE	$ 5,000	$ 28,925
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Perform an Intersection Control Evaluation and Implement	NA	All Crashes	1.00	INT	$ 225,000	$ 225,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 4,716,590
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 235,830
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 1,414,977
Estimated Construction Cost:		$ 6,442,397

Local Match†: 20% $ 1,636,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 773,088
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 966,359
Estimated Project Total:		$ 8,182,000

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000
**To be evaluated during feasibility study/design

Additional Potential Improvements

Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: Set Appropriate Speed Limits for All Road Users
Additional Improvements #2: Evaluate signalization at warranted intersections
Additional Improvements #3: Improve Roadside Design on Curves
Additional Improvements #4:
Additional Improvements #5:

Disclaimer:

Disclaimer: The cost estimates provided in this document are for comparison purposes only. Actual project costs will vary. The recommended safety improvement strategies were based on available data and reasonable engineering judgment and a more detailed assessment may suggest additional safety strategies that could be considered.

Project Information Sheet

GFA(s): East Weber County & Morgan County
Project Name: SR 39 from 7800 East to Ant Flat Road
Jurisdiction(s): Huntsville, Weber County
Emphasis Areas: Intersections, Teen Drivers, Roadway Departures
Equity Priority: Low

Date Prepared: 3/13/2024
Prepared By: JSF
Checked By: EJS

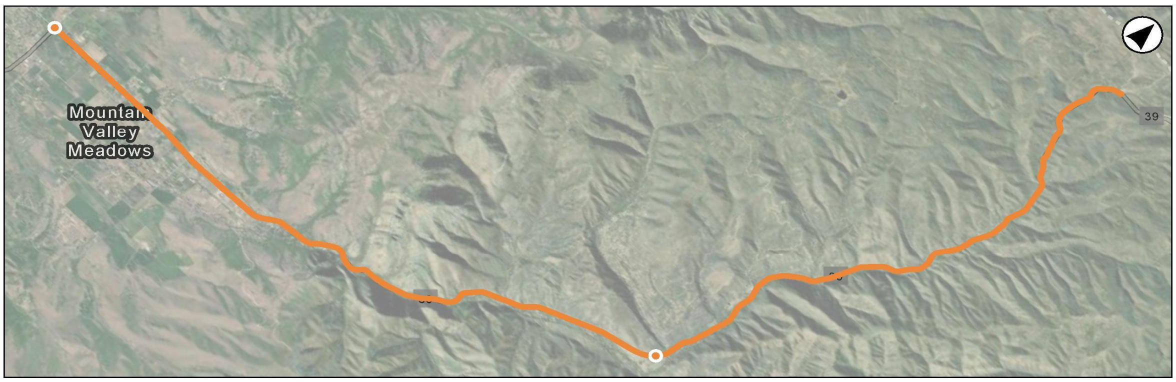
Location Description

Roadway: SR 39
From: 7800 East
To: Ant Flat Road
Length: 16.82 miles

Key Intersection Locations:
7800 East
Causey Drive

Project Location Map

Map ID: 3.13.3



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	16.82
Average Daily Traffic (vehicles per day)	1,068
Functional Classification	Major Collector
Roadway Ownership	State
Urban/Rural Designation	Rural
Number of Key Intersections	2

Why Was This Location Identified?	
Composite Safety Score	✓
Historic Crashes	✓
Critical Crash Rate Differential	✓
Crash Profile Risk Score	
usRAP - Star Rating (Veh, Ped, Bike)	✓
Local Street Assessment	

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	1
Suspected Serious Injury Crashes (A)	4
Suspected Minor Injury Crashes (B)	14
Possible Injury Crashes (C)	8
No Injury/PDO Crashes (O)	57
Total Crashes	**84**
Total EPDO Crashes	**1,723**

What Crash Types are Over-Represented?			
Fatal	✓	Head On (HO)	
Serious Injury	✓	Parked Vehicle (PV)	
Pedestrian (Ped)		Single Vehicle	✓
Bicycle (Bike)		Rear to Rear (RR)	
Motorcycle		Rear to Side (RS)	
Angle		Sideswipe (SS)	✓
Front to Rear (FR)		Other/Unknown	

Intersection Crash History

									What Crash Types are Over-Represented?							
Intersections	Signal	K	A	B	C	O	Total	EPDO	K/A	Ped/Bike	Angle	FR	HO	PV	RR/RS	SS
7800 East & SR 39		0	0	1	9	5	15	130			✓					✓
Causey Drive & SR 39		0	0	1	2	2	5	47			✓				✓	

Project Description/How is safety improved?

This project is focused on systemic corridor safety improvement in an effort to reduce run-off-road, head-on, and rural roadway crashes. Countermeasures include shoulder installation and widening, edge and centerline rumble strips, wider edge lines, Safety Edge installation, and enhanced curve warning signs.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

Proposed Proven Safety Countermeasures


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Enhanced Delineation for Horizontal Curves


Wider Edge Lines


SafetyEdge™

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	16.82	MILE	$ 298,000	$ 5,012,360
Install Safety Edge with Repaving Projects	0.79 - 0.892	All Crashes	16.82	MILE	$ 121,000	$ 2,035,220
Install and/or Upgrade Curve Signage to Enhanced Delineations	0.4 - 0.852	All Crashes	21.00	CURVE	$ 2,000	$ 42,000
Install Edge line Rumble Strips	0.49 - 0.87	Fatal & Injury	16.82	MILE	$ 9,000	$ 151,380
Install 6" Edge line (Both Sides of Road)	0.64 - 0.88	All Crashes	16.82	MILE	$ 7,000	$ 117,740
Install Centerline Rumble Strips	0.36 - 0.56	Head-on Fatal & Injury	12.69	MILE	$ 5,000	$ 63,450
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 7,422,150
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 371,108
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 2,226,645
Estimated Construction Cost:		$ 10,094,903

Local Match†: 20% $ 2,564,200

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 1,211,388
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 1,514,235
Estimated Project Total:		$ 12,821,000

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000
**To be evaluated during feasibility study/design

Additional Potential Improvements

Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: Set Appropriate Speed Limits for All Road Users
Additional Improvements #2: Improve Roadside Design on Curves
Additional Improvements #3:
Additional Improvements #4:
Additional Improvements #5:

Disclaimer:

Disclaimer: The cost estimates provided in this document are for comparison purposes only. Actual project costs will vary. The recommended safety improvement strategies were based on available data and reasonable engineering judgment and a more detailed assessment may suggest additional safety strategies that could be considered.

Project Information Sheet

GFA(s):	**East Weber County & Morgan County**	**Date Prepared:**	**5/20/2024**
Project Name:	**Old Highway Road (SR 167) from Monte Verde Drive to 300 North (SR 66)**	**Prepared By:**	**MA**
Jurisdiction(s):	**Morgan, Morgan County**	**Checked By:**	**EMF**
Emphasis Areas:	**Intersections, Roadway Departures, Impaired Driving**		
Equity Priority:	**Low**		

Location Description

Roadway:	Old Highway Road (SR 167)
From:	Monte Verde Drive
To:	300 North (SR 66)
Length:	11.48 miles

Key Intersection Locations:
Highland Drive
Trappers Loop R
4300 North

Project Location Map

Map ID: 3.14.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**11.48**
Average Daily Traffic (vehicles per day)	**3,967**
Functional Classification	**Major Collector**
Roadway Ownership	**Federal Aid - Local**
Urban/Rural Designation	**Rural**
Number of Key Intersections	**3**

Why Was This Location Identified?	
Composite Safety Score	✓
Historic Crashes	✓
Critical Crash Rate Differential	
Crash Profile Risk Score	✓
usRAP - Star Rating (Veh, Ped, Bike)	✓
Local Street Assessment	✓

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	**0**
Suspected Serious Injury Crashes (A)	**1**
Suspected Minor Injury Crashes (B)	**7**
Possible Injury Crashes (C)	**9**
No Injury/PDO Crashes (O)	**30**
Total Crashes	**47**
Total EPDO Crashes	**382**

What Crash Types are Over-Represented?			
Fatal		Head On (HO)	
Serious Injury		Parked Vehicle (PV)	
Pedestrian (Ped)		Single Vehicle	✓
Bicycle (Bike)		Rear to Rear (RR)	
Motorcycle		Rear to Side (RS)	
Angle		Sideswipe (SS)	✓
Front to Rear (FR)		Other/Unknown	

Intersection Crash History

									What Crash Types are Over-Represented?							
Intersections	**Signal**	**K**	**A**	**B**	**C**	**O**	**Total**	**EPDO**	K/A	Ped/Bike	Angle	FR	HO	PV	RR/RS	SS
Highland Drive & Old Highway Ro		0	0	1	1	6	8	40		✓		✓				
Trappers Loop Road & Old Highw		0	0	0	4	12	16	57		✓		✓				
4300 North & Old Highway Road (		0	0	0	1	3	4	14			✓					✓

Project Description/How is safety improved?

This project includes the following improvements along Old Highway Road to address an overrepresentation of single-vehicle and sideswipe collisions: Provide 2-ft paved shoulders from Great View Drive to Silver Leaf Drive, including 6" edge line with rumble strips and visible striping; Horizontal curvature improvements at pertinent curves, including installation/improvement of curve signage as well as high friction surface treatments along the curves.This project also recommends intersection improvements at Trappers Loop Rd, Highland Drive, and 4300 N to address an overrepresentation of ped/bike, angle and rear-end collisions: Perform intersection control evaluations for a potential roundabout and add lighting at each of these intersections. At Trappers Loop Rd, also add sidewalks, intersection lighting, and high visibility crossing improvements on all legs of this intersection.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

Proposed Proven Safety Countermeasures


Crosswalk Visibility Enhancements


Enhanced Delineation for Horizontal Curves


Lighting


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Roundabouts

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	9.30	MILE	$ 298,000	$ 2,771,400
Install Edge line Rumble Strips	0.49 - 0.87	Fatal & Injury	9.30	MILE	$ 9,000	$ 83,700
Install Centerline Rumble Strips	0.36 - 0.56	Head-on (FI)	9.30	MILE	$ 5,000	$ 46,500
Install 6" Edge line (Both Sides of Road)	0.64 - 0.88	All Crashes	11.41	MILE	$ 7,000	$ 79,870
Install and/or Upgrade Curve Signage to Enhanced Delineations	0.4 - 0.852	All Crashes	10.00	CURVE	$ 2,000	$ 20,000
Shoulder Widening on Rural Roads	0.771	All Crashes	9.30	MILE	$ 32,000	$ 297,600
Install a Separated Bicycle Lane (Cycle Track or Multi-Use Path)	NA	Bicycle	11.48	MILE	$ 553,000	$ 6,348,440
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Add Sidewalk	0.2	Pedestrian	1.00	INT	$ 4,500	$ 4,500
Install Intersection Lighting	0.62 - 0.67	Nighttime	3.00	INT	$ 31,000	$ 93,000
Perform an Intersection Control Evaluation and Implement	NA	All Crashes	3.00	INT	$ 225,000	$ 675,000
Convert Existing Intersection to Modern Roundabout	0.18 - 0.59	All Crashes	3.00	INT	$ 2,500,000	$ 7,500,000
Install High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	1.00	XING	$ 36,000	$ 36,000
Systemic Low-Cost Countermeasures at Stop-Control Intersection	0.73 - 0.9	All Crashes	2.00	INT	$ 19,000	$ 38,000
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 17,994,010
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 899,701
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 5,398,203
Estimated Construction Cost:		$ 24,366,914

Local Match†: 20% $ 6,189,200

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 2,924,030
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 3,655,037
Estimated Project Total:		$ 30,946,000

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000
**To be evaluated during feasibility study/design

Additional Potential Improvements

Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: Set Appropriate Speed Limits for All Road Users
Additional Improvements #2: Co-Locate Bus Stops and Pedestrian Crossings
Additional Improvements #3: Fixed object markers and reflective roadside delineators.
Additional Improvements #4:
Additional Improvements #5:

Disclaimer:

Disclaimer: The cost estimates provided in this document are for comparison purposes only. Actual project costs will vary. The recommended safety improvement strategies were based on available data and reasonable engineering judgment and a more detailed assessment may suggest additional safety strategies that could be considered.

ADDITIONAL INFORMATION

This project includes the following improvements along Old Highway Road to address an overrepresentation of single-vehicle collisions (often road departure or fixed object collisions) as well as sideswipe collisions related to passing vehicles:

-Provide a 2-ft paved shoulder on both sides from Great View Drive to Silver Leaf Drive; this includes egde line rumble strips, clearly striping the travelled way and shoulders, and providing a 6" edge line.

-Provide horizontal curvature improvements at pertinent curves, including installation and improvement of curve signage as well as high friction surface treatments along the curves.

This project also recommends improvements at the following intersections to address overrepresentation of ped/bike, angle and rear-end collisions:

-Trappers Loop Rd/Old Highway Road: Add sidewalks, intersection lighting, and high visibility crossing improvements on all legs of this intersection, connecting to the transit stop. Perform an intersection control evaluation to evaluate a potential roundabout.

-Highland Drive/Old Highway Road: Add intersection lighting and high visibility crossing improvements on the north leg of this intersection. Perform an intersection control evaluation to evaluate a potential roundabout.

-4300 N/Old Highway Road: Add intersection lighting, proper striping and visibility improvements, and perform an intersection control evaluation to consider a potential roundabout at this intersection.

Project Information Sheet

GFA(s):	**East Weber County & Morgan County**	**Date Prepared:**	**3/13/2024**
Project Name:	**SR 66 from 700 East (I-84) to Canyon Road (SR-65)**	**Prepared By:**	**JSF**
Jurisdiction(s):	**Morgan, Morgan County**	**Checked By:**	**EJS**
Emphasis Areas:	**Intersections, Teen Drivers, Roadway Departures**		
Equity Priority:	**Low**		

Location Description

Roadway: SR 66
From: 700 East (I-84)
To: Canyon Road (SR-65)
Length: 13.78 miles

Key Intersection Locations:
Young Street

Project Location Map

Map ID: 3.14.2

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**13.78**
Average Daily Traffic (vehicles per day)	**2,834**
Functional Classification	**Major Collector**
Roadway Ownership	**State**
Urban/Rural Designation	**Rural**
Number of Key Intersections	**1**

Why Was This Location Identified?	
Composite Safety Score	✓
Historic Crashes	✓
Critical Crash Rate Differential	
Crash Profile Risk Score	✓
usRAP - Star Rating (Veh, Ped, Bike)	✓
Local Street Assessment	

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	**0**
Suspected Serious Injury Crashes (A)	**2**
Suspected Minor Injury Crashes (B)	**12**
Possible Injury Crashes (C)	**12**
No Injury/PDO Crashes (O)	**27**
Total Crashes	**53**
Total EPDO Crashes	**618**

What Crash Types are Over-Represented?			
Fatal		Head On (HO)	
Serious Injury		Parked Vehicle (PV)	✓
Pedestrian (Ped)		Single Vehicle	
Bicycle (Bike)		Rear to Rear (RR)	
Motorcycle		Rear to Side (RS)	
Angle	✓	Sideswipe (SS)	
Front to Rear (FR)	✓	Other/Unknown	

Intersection Crash History

									What Crash Types are Over-Represented?							
Intersections	**Signal**	**K**	**A**	**B**	**C**	**O**	**Total**	**EPDO**	K/A	Ped/Bike	Angle	FR	HO	PV	RR/RS	SS
Young Street & SR 66		0	0	4	3	6	13	129			✓					✓

Project Description/How is safety improved?

This project is focused on systemic corridor safety improvement to reduce run-off-road, head-on, and rural roadway crashes. Countermeasures include shoulder installation and widening, edge and centerline rumble strips, wider edge lines, and Safety Edge installation for the SR 66 corridor, south of 350 South.

This project description represents potential safety improvement strategies that could be implemented at this location, as well as other locations with similar conditions. Additional improvement strategies could be considered subject to engineering analysis.

Proposed Proven Safety Countermeasures


Longitudinal Rumble Strips and Stripes on Two-Lane Roads


Wider Edge Lines


SafetyEdge℠

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	13.78	MILE	$ 298,000	$ 4,106,440
Install Safety Edge with Repaving Projects	0.79 - 0.892	All Crashes	13.78	MILE	$ 121,000	$ 1,667,380
Install Edge line Rumble Strips	0.49 - 0.87	Fatal & Injury	13.78	MILE	$ 9,000	$ 124,020
Install Centerline Rumble Strips	0.36 - 0.56	Head-on Fatal & Injur	13.78	MILE	$ 5,000	$ 68,900
Install 6" Edge line (Both Sides of Road)	0.64 - 0.88	All Crashes	13.78	MILE	$ 7,000	$ 96,460
Shoulder Widening on Rural Roads	0.771	All Crashes	13.78	MILE	$ 32,000	$ 440,960
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 6,504,160
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 325,208
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 1,951,248
Estimated Construction Cost:		$ 8,855,616

Local Match†: 20% $ 2,249,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 1,062,674
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 1,328,342
Estimated Project Total:		$ 11,247,000

*Mobilization is 10% +/- of the subtotal with a minimum of $2,500 and a maximum of $75,000
**To be evaluated during feasibility study/design

Additional Potential Improvements

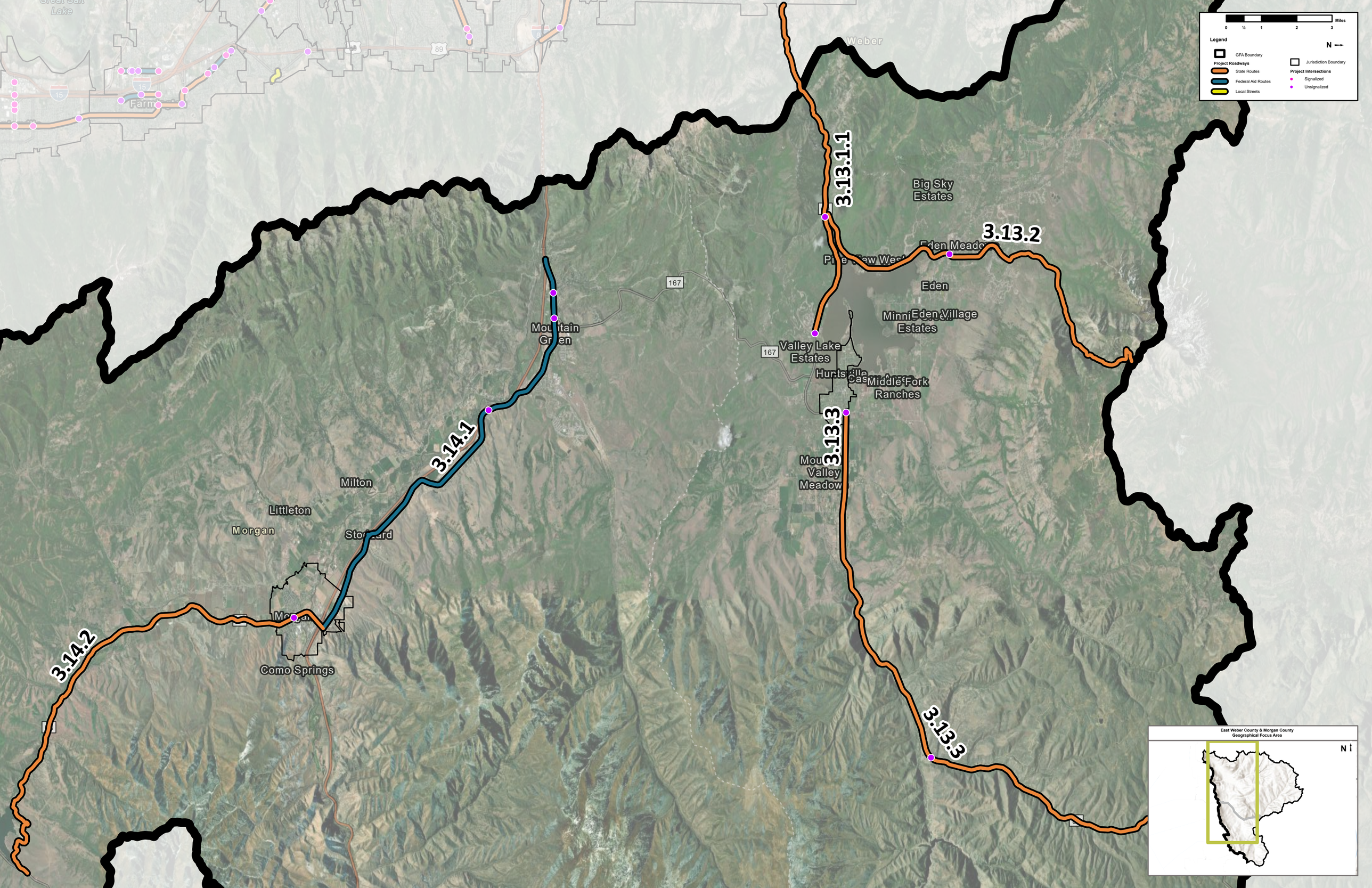
Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: _____
Additional Improvements #2: _____
Additional Improvements #3: _____
Additional Improvements #4: _____
Additional Improvements #5: _____

Disclaimer:

Disclaimer: The cost estimates provided in this document are for comparison purposes only. Actual project costs will vary. The recommended safety improvement strategies were based on available data and reasonable engineering judgment and a more detailed assessment may suggest additional safety strategies that could be considered.

EASTERN WEBER COUNTY & MORGAN COUNTY CASE STUDY PROJECT LOCATION MAP


Great Salt Lake
Farmington
15
89
Weber
3.13.1.1
Big Sky Estates
3.13.2
Eden Meadows
Pineview West
Eden
Eden Village Estates
Valley Lake Estates
Middle Fork Ranches
167
Mountain Green
3.14.1
Milton
Littleton
Morgan
Stoddard
Morgan
Como Springs
3.14.2
3.13.3
Mountain Valley Meadows
Miles
0
⅛
1
2
3
Legend
N
GFA Boundary
Project Roadways
State Routes
Federal Aid Routes
Local Streets
Jurisdiction Boundary
Project Intersections
Signalized
Unsignalized
East Weber County & Morgan County
Geographical Focus Area
N

EASTERN WEBER COUNTY & MORGAN COUNTY EQUITY INDEX MAP

East Weber County & Morgan County

Equity Need Areas

- High
- Medium
- Low