APPENDIX D1: SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY

Safety Summary

Tech Memo #1 Safety Analysis

Case Study Project Information Sheets

Case Study Project Location Map

Equity Index Map

SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY SAFETY SUMMARY

South Box Elder & North Weber 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.

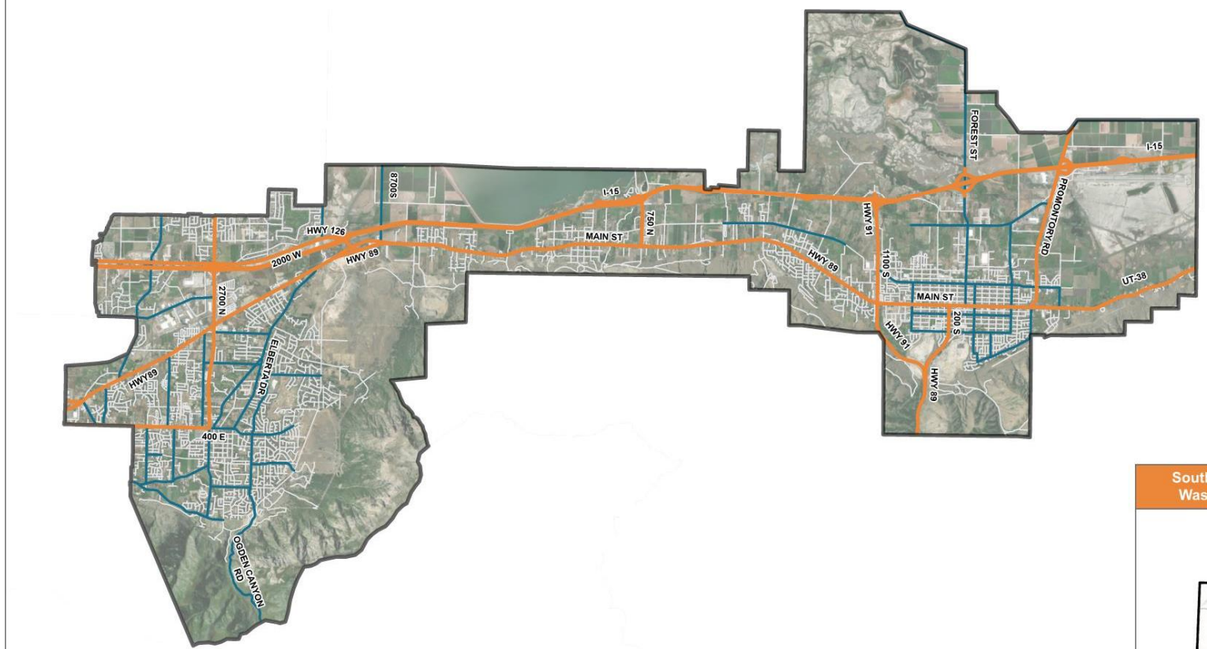
The CSAP will ***analyze*** safety needs, ***identify*** high-risk locations and factors contributing to crashes, and ***prioritize*** strategies to address them.

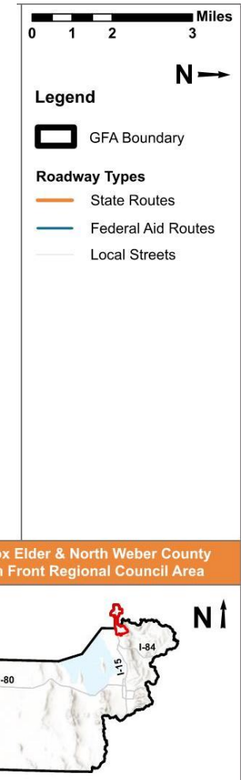
The CSAP will meet eligibility requirements that allow local jurisdictions to apply for **Implementation Grants** from the United States Department of Transportation (USDOT) Safe Streets and Roads for All (SS4A) discretionary grant program. The grant program was established by the Bipartisan Infrastructure 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

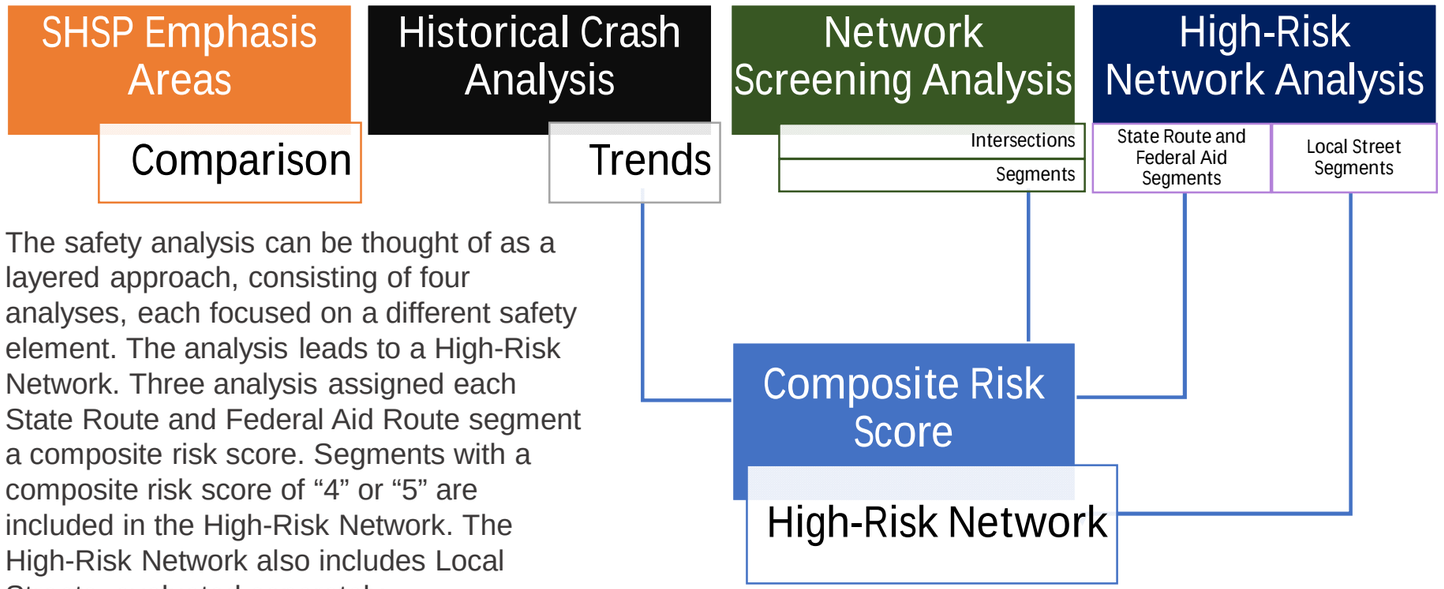
Safe System Approach

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



The safety analysis can be thought of as a layered approach, consisting of four analyses, each focused on a different safety element. The analysis leads to a High-Risk Network. Three analysis assigned each State Route and Federal Aid Route segment a composite risk score. Segments with a composite risk score of “4” or “5” are included in the High-Risk Network. The High-Risk Network also includes Local Streets, evaluated separately.

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**

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 **South Box Elder & North Weber** GFA.

- Roadway Departure
- Speed-Related
- Intersections
- No Safety Restraints
- Older Driver

Intersection, Roadway Departure, and Speed-Related emphasis areas rank highest in terms of number of fatal and serious injuries at the Statewide and WFRC Levels.

In addition to Intersection, Roadway Departure, and Speed-Related emphasis areas within the **South Box Elder & North Weber** GFA, Teen Driver and Motorcycle are also identified as top emphasis areas.

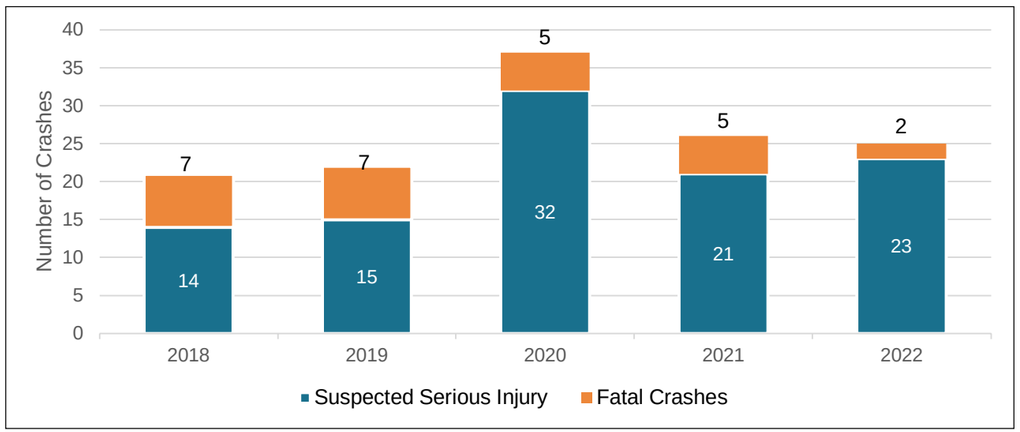
Strategic Highway Safety Plan Emphasis Area Comparison

Category	Utah SHSP Safety Emphasis Area	Statewide Totals		WFRC Totals		South Box Elder & North Weber Counties 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	26	7	-3
	Older Driver	1,508	6	700	6	36	5	1
	Speed-Related	2,133	**3**	936	3	56	2	1
	Aggressive Driving	555	11	297	10	22	9	1
	Distracted Driving	718	10	286	11	16	10	1
	Impaired Driving	1,184	8	623	8	33	6	2
	No Safety Restraints	1,542	**5**	599	9	37	4	5
Roadway	Intersection	3,567	**1**	2,163	1	53	3	-2
	Roadway Departure	2,931	**2**	1,014	2	62	1	1
Special Users	Motorcycle	1,457	7	750	5	23	8	-3
	Pedestrian	912	9	636	7	16	10	-3
	Bicycle*	280	12	167	12	6	12	0

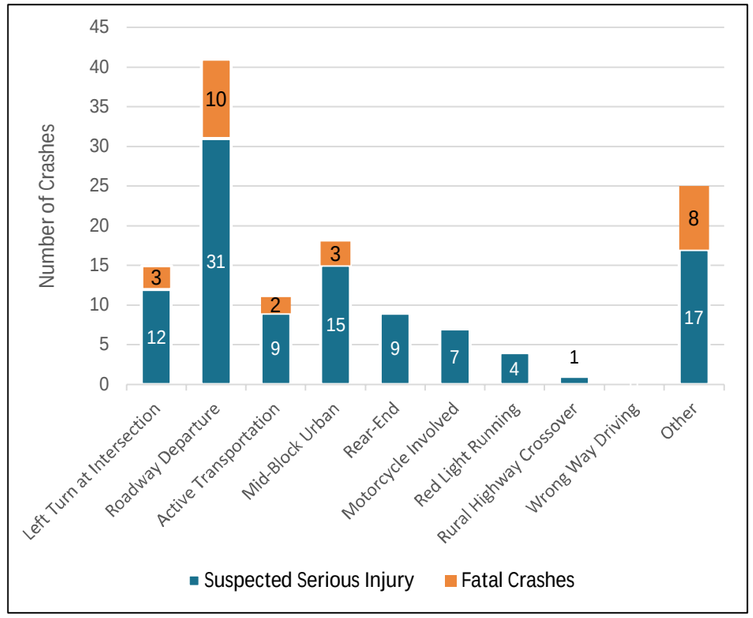
*While Bicycles are not one of the eleven Utah SHSP emphasis areas, they are included as part of the CSAP safety analysis.

5-Year Historical Crash Trends in South Box Elder and North Weber GFA

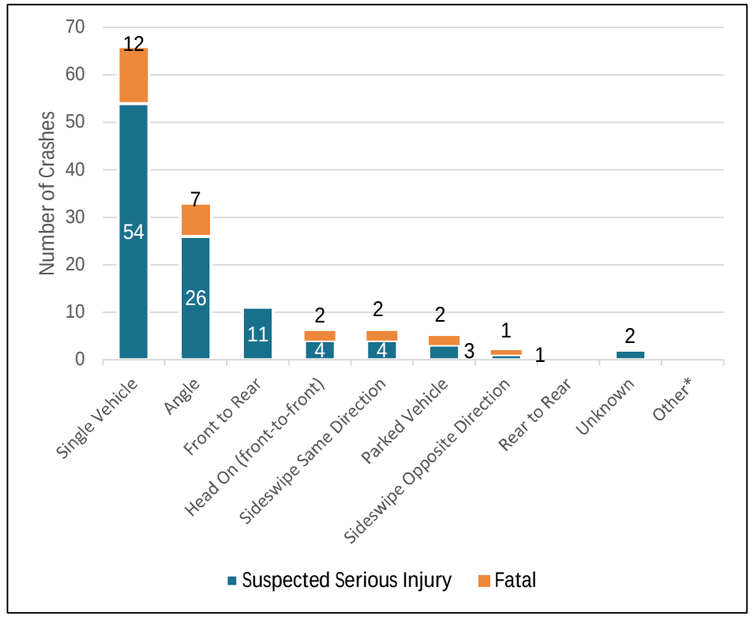
Route Type	State Route		Federal Aid Route		Local Street		Overall Total		% of WFRC
Crash Severity	Crashes		Crashes		Crashes		Crashes		%
	#	%	#	%	#	%	#	%	
Fatal	23	1%	3	0%	0	0%	**26**	**0.5%**	**< 0.1%**
Suspected Serious Injury	68	2%	20	2%	17	3%	**105**	**2.2%**	**0.1%**
Suspected Minor Injury	356	11%	111	13%	57	11%	**524**	**11.0%**	**0.3%**
Possible Injury	529	16%	163	18%	65	12%	**757**	**15.8%**	**0.4%**
No Injury / Property Damage Only	2,389	71%	589	66%	387	74%	**3,365**	**70.4%**	**1.9%**
Route Total	**3,365**	**100%**	**886**	**100%**	**526**	**100%**	**4,777**	**100%**	**2.6%**



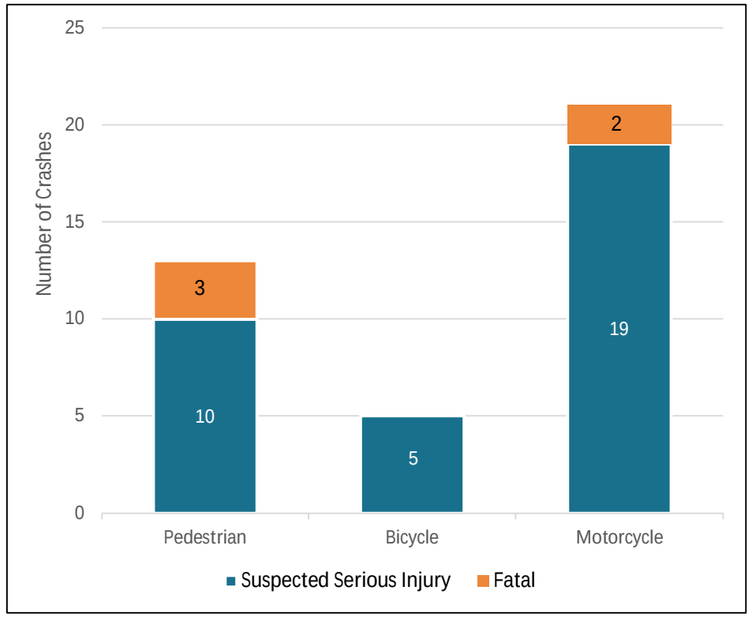
Annual Fatal and Serious Injury Crashes (2018-2022)



Crash Type



Manner of Collision



Active Transportation

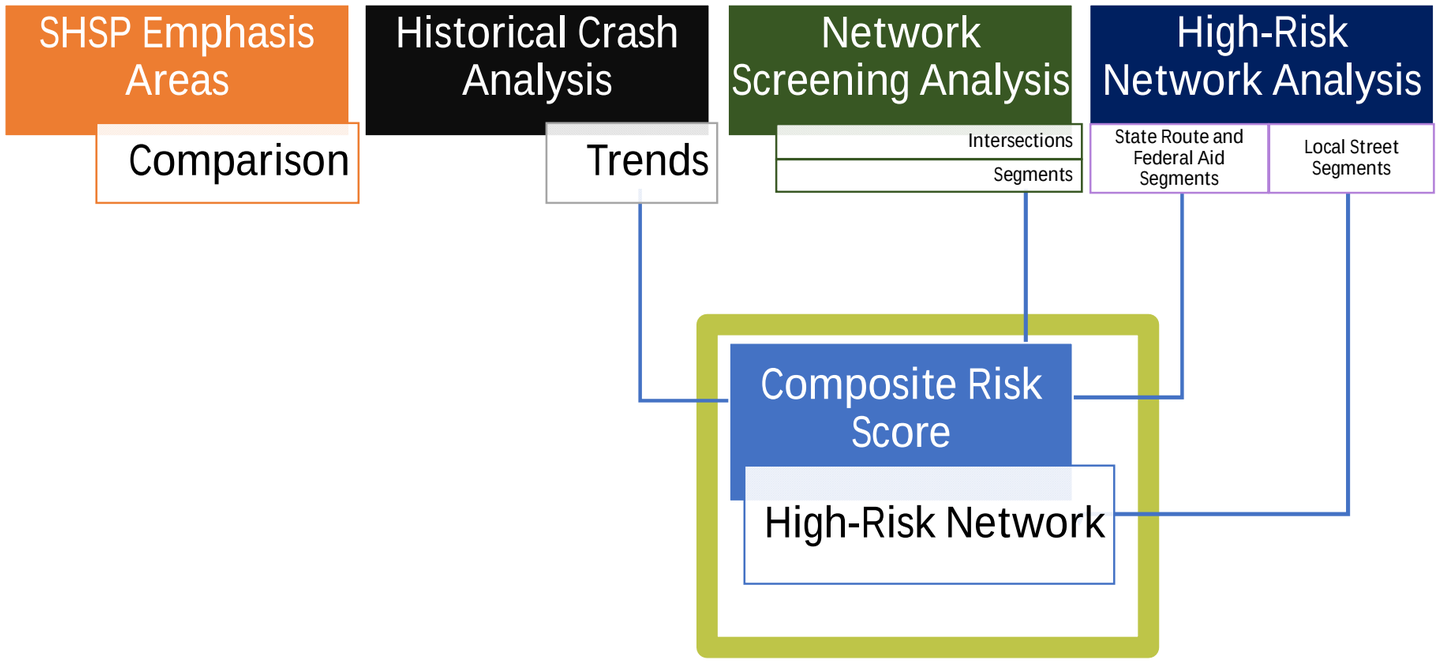
Composite High-Risk Roadway Network

Each of the completed safety analysis methodologies identified segments or intersections that may be **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 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 High-Risk Network. These represent the top 10% of State Route and Federal Aid Route segments for the entire WFRC area.

State Route and Federal Aid segments in the **South Box Elder & North Weber GFA** that scored "4" or higher, and included in the Composite High-Risk Network, are listed in the table on page 6. The table also lists streets identified through a separate Local Street Risk Assessment.

The Composite High Risk Network map on page 7 includes State Route and Federal Aid Route segments with a score of "4" or higher. The map also shows local streets identified through a separate Local Street Risk Assessment.



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 Risk Score
High-Risk Network (Segments)

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											
2000 W (SR-126)	I-15 to Higley Rd	Other Principal Arterial	Farr West	0.5	X	X	X	X		X	
Washington Blvd (SR-235)	2600 N to 1525 N	Minor Arterial	North Ogden	1.5	X	X	X	X		X	
US-89	2700 N to 700 N	Other Principal Arterial	Harrisiville	3.5	X	X	X	X		X	
2700 N (SR-134)	I15 to US-89	Other Principal Arterial	Farr West	1.1	X	X	X	X	X	X	
Federal Aid Routes											
2600 N	Washington Blvd to 950 E	Major Collector	North Ogden	1.0	X	X	X	X		X	
1500 W, 1200 W	2150 N to 1350 N	Minor Arterial	Farr West	1.2	X	X	X	X		X	
Harrisville Rd	1800 N to Harrisville Rd	Major Collector	Farr West, Harrisville	2.5	X	X	X	X		X	
Larsen Ln	Wahlen Way to 375 E	Minor Arterial	Harrisville	0.2	X	X	X	X		X	
Local Streets											**Local Street Risk Assessment**
North Street	400 West to Monroe Street	Major Collector	Harrisville	1.0							X
600 South	400 West to 400 East	Local	Brigham City	0.7							X
Forest Street	800 West to Main Street	Minor Arterial	Brigham City	0.7							X
500 West/Medical	Forest to 1150 South	Minor Arterial	Brigham City	1.8							X
700 South	1000 West to 700 East	Local	Brigham City	1.4							X
Rulon White/1500 West	UT-134 to 2100 North	Minor Arterial	Farr West	0.9							X
Fishburn Drive	200 East to 900 South	Local	Brigham City	0.6							X
100 North	300 West to 600 East	Major Collector	Brigham City	0.8							X
3100 North	Mt Lomond Drive to 800 East	Major Collector	North Ogden	1.1							X
3100 North /Weber High Drive	600 West to 250 West	Major Collector	North Ogden	0.6							X

The Local Street Risk Assessment considered factors such as locations of crashes, proximity to schools, and hard-braking.

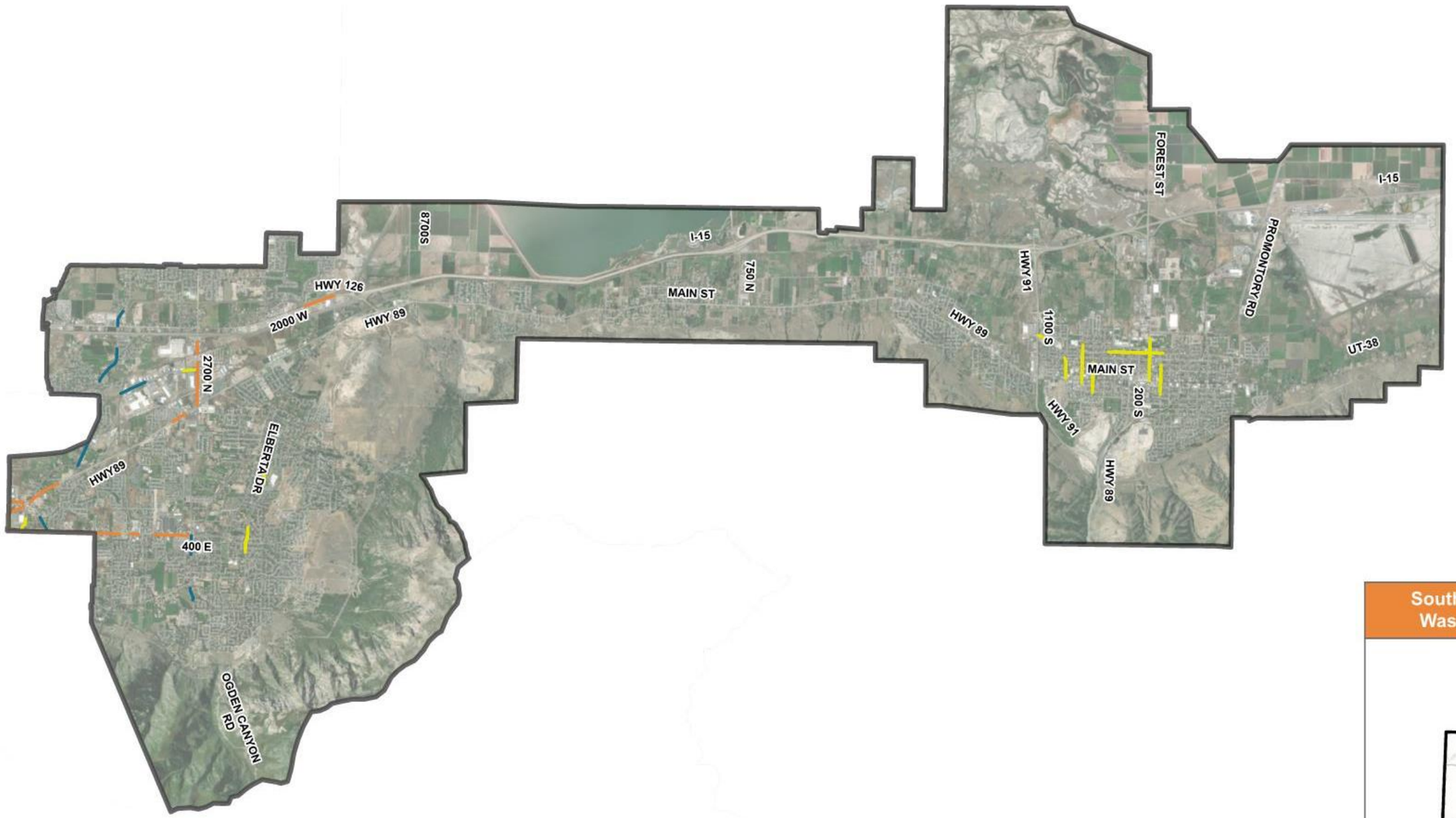
State Route and Federal Aid segments in the **South Box Elder & North Weber GFA** Composite High-Risk Network are listed at left. Each of these segments received a composite risk score of "4" or higher. These segments provide a focus for local jurisdictions or for coordination with UDOT. Each of these 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

High-Risk Network (Segments)

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



Miles
0 1 2 3

N

Legend

GFA Boundary

Composite High-Risk Network

State Routes

Federal Aid Routes

Local Streets

South Box Elder & North Weber County Wasatch Front Regional Council Area

Composite Risk Score

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 **South Box Elder County & North Weber 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.

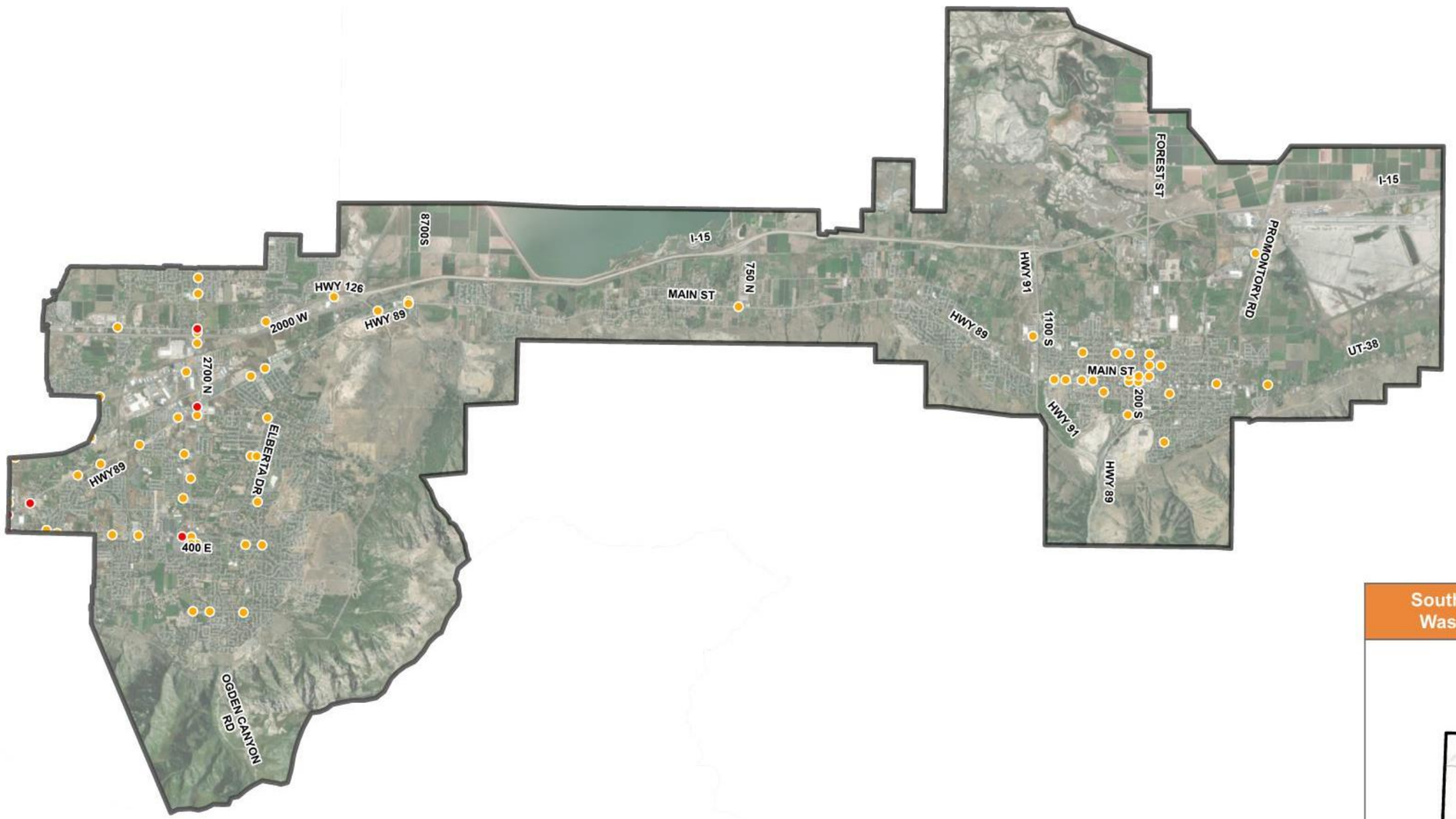
Signalized and unsignalized intersections in the **South Box Elder County & North Weber County** GFA with a positive Critical Crash Rate Differential (rate exceeds expected rate) are mapped on page 9.

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
Signalized Intersections																						
Hwy 89 & 2700 N	Pleasant Vie	97	0.5	675	0	1	16	14	66	38	43	4	2	1	0	1	1	6	1	0	1	0
Wall Ave & Harrisville Rd	Harrisville	72	0.4	524	0	1	12	10	49	35	26	1	4	0	0	0	1	4	1	0	0	0
2000 W & 2700 N	Farr West	35	0.2	232	0	1	1	8	25	18	12	2	2	0	0	0	0	1	0	0	1	0
400 E & 2550 N	North Ogden	62	0.1	262	0	0	5	9	48	39	18	0	0	0	0	0	0	4	1	0	0	0
Unsignalized Intersections																						
Michell St & First St	Pleasant Vie	7	34.4	39	0	0	1	1	5	3	0	0	3	0	0	0	0	0	1	0	0	0
100 W & Michelle St	Pleasant Vie	3	7.3	13	0	0	0	1	2	2	0	0	1	0	0	0	0	0	0	0	0	0
100 W & 100 S	Brigham City	7	5.3	50	0	0	2	0	5	6	0	0	1	0	0	0	0	0	0	0	0	0
200 E & 500 S	Brigham City	3	3.5	24	0	0	1	0	2	2	0	0	0	1	0	0	0	0	0	0	0	0
200 E & 200 N	Brigham City	3	1.9	46	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0
100 W & 200 S	Brigham City	3	1.6	3	0	0	0	0	3	1	1	0	1	0	0	0	0	0	0	0	0	0
575 W & 2550 N	Pleasant Vie	5	1.1	36	0	0	0	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0
Charleston Ave & 2550 N	Harrisville	4	0.9	47	0	0	2	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
450 E & 2650 N	North Ogden	3	0.9	13	0	0	0	1	2	2	0	0	0	1	0	0	0	0	0	0	0	0
300 W & 100 N	Brigham City	3	0.8	13	0	0	0	1	2	3	0	0	0	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

N

Legend

GFA Boundary

Critical Crash Rate Differential (> 0.0)

- Signalized
- Unsignalized

South Box Elder & North Weber 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									
2800 West	SR-13 to Study Extents North	Brigham City	X	X	X				
1200 West	1100 South to 800 North	Brigham City	X						
8700 South	West GFA Extents to 1500 W		X						
2600 North	Washington Blvd to Mountain Road	Ogden	X	X	X				
800 East	3100 North to Fox Lane	North Ogden	X		X				
1050 East	2600 North to 3100 North	North Ogden	X	X	X				
2100 North	Washington Blvd to Fruitland Drive	North Ogden	X		X				
1700 North	Washington Blvd to Fruitland Drive	North Ogden	X		X				
Mountain Road	South GFA Boundary to Fruitland Drive	Ogden	X						
Mountain Road	Fruitland Drive to 2750 North	North Ogden	X	X					
1200 West	Bill Bailey St to Harrisville Road	Farr West	X	X	X				
Harrisville Road / 1800 North	I-15 to US-89	Farr West	X	X	X				
1500 West	Harrisville Road to 2700 North	Ogden	X	X	X				
4000 North	West GFA Boundary to 2530 West	Farr West	X	X	X				
3300 North	West GFA Boundary to Higley Road	Farr West	X		X				
1900 North	2300 West to I-15	Farr West	X	X	X				
1900 North	West GFA Boundary to 2300 West	Farr West	X	X					
Larsen Road	US-89 to Washington Blvd	Harrisville	X	X	X				

A list of Federal Aid and Local Street segments in the **South Box Elder & North Weber 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 14 through 18 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.

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									
1900 North / 1800 North	West GFA Extents to SR-89	Harrisville				X			
Mountain Road	South GFA Extents to 2750 North	North Ogden				X			
2600 North	Washington Boulevard to Mountain Road	North Ogden				X			
1050 East	2600 North to 3100 North	North Ogden				X			
3100 North	300 West to Mountain Road	North Ogden				X			
2100 North	Washington Boulevard to Fruitland Drive	North Ogden				X			
1500 West	Bill Bailey Street to 2700 North	Farr West				X			
Larsen Lane	US-89 to Washington Boulevard	Harrisville				X			
2600 North	Washington Boulevard to 475 East	North Ogden				X			
1900 North / 1800 North	West GFA Extents to SR-89	Harrisville				X			
Fruitland Dr	Private Driveway to 1700 N	North Ogden					X	X	
2550 N	300 E to Washington Blvd	North Ogden					X	X	
2550 N	Charleston Ave to 200 E	North Ogden					X	X	
1700 N	Washington Blvd to 425 E	North Ogden					X	X	
3100 N	1150 E to 1225 E	North Ogden					X	X	
Mountain Rd	1700 N to 1925 N	North Ogden					X	X	
700 S	200 W to 100 W	Brigham City					X	X	
North Ogden Canyon Rd	Mountain Rd to Private Driveway	North Ogden					X	X	
700 S	200 E to 300 E	Brigham City					X	X	
500 W	700 S to 600 S	Brigham City					X	X	

Composite Risk Score

High-Risk Network

Network Screening – Segments (Local Streets)

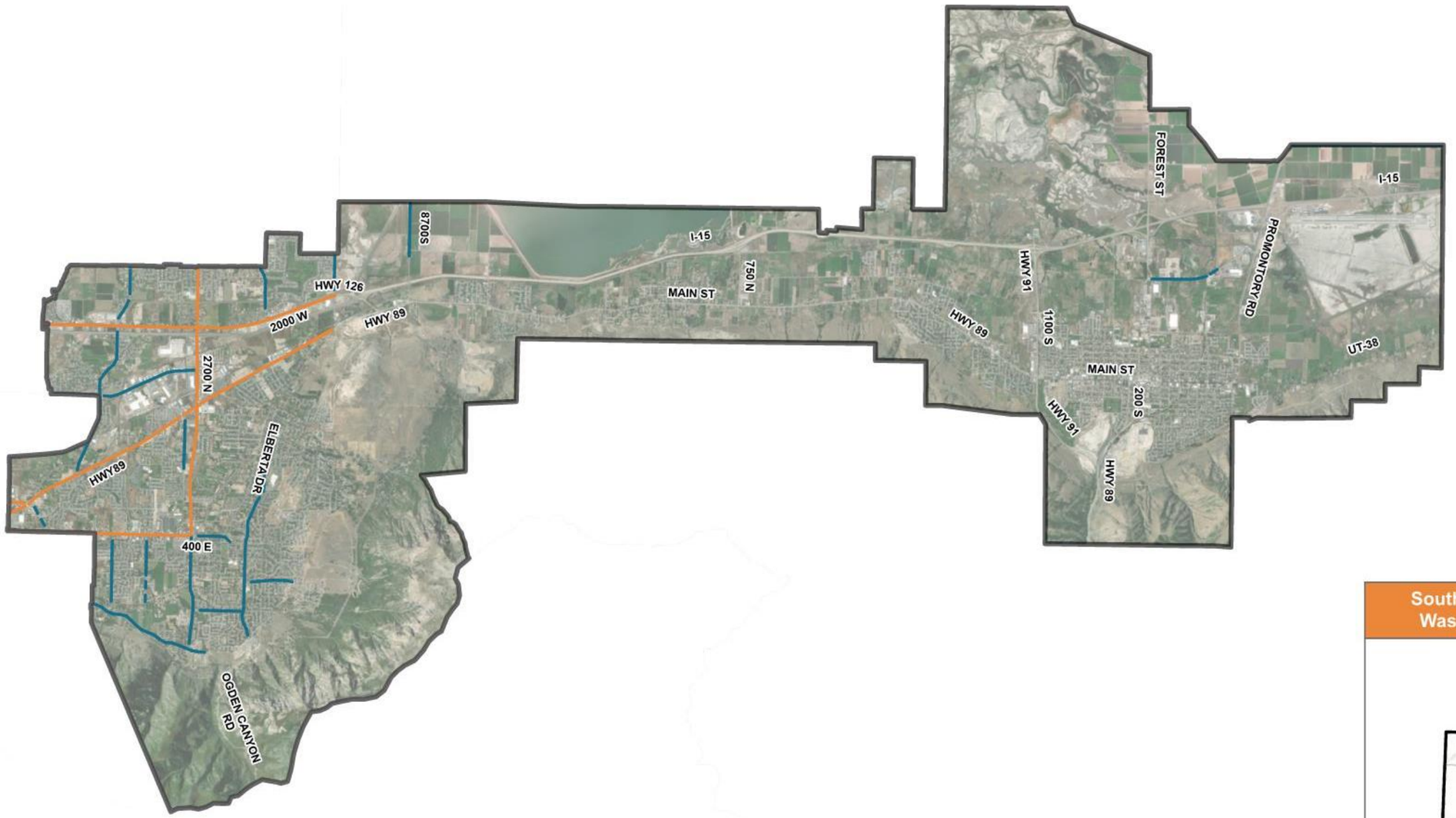
Facility	Limits	City	RISK TYPE						
			usRAP- Pedestrian Star Rating	*usRAP - Bicycle Star Rating*	*usRAP- Vehicle Star Rating*	*Crash Profile Risk Score*	CCR Differential Analysis	Significant Crashes	Local Streets Risk Assessment
Local Streets									
600 W	400 S to 300 S	Brigham City					X	X	
1150 S	Commerce Way to Dollar Tree	Brigham City					X	X	
3000 S	1080 W to US-89	Perry					X	X	
400 S	Private Driveway to 800 W	Brigham City					X	X	
1000 W	SR-13 to 900 W	Unincorporated					X	X	
200 S	200 W to 100 W	Brigham City					X	X	
1850 W	Eccles St to 2700 N	Farr West					X	X	
700 N	Main St to 100 E	Brigham City					X	X	
2600 W	Forest St to 800 N	Brigham City					X	X	
Perry St	Maddox Ln to 1200 S	Brigham City					X	X	

A list of Local Street segments in the **South Box Elder & North Weber GFA** identified from Network Screening, applying Critical Crash Rate (CCR) and Significant Crashes (three or more crashes over 5-year period), is shown at left.

Composite Risk Score

High-Risk Network

usRAP Pedestrian Star Rating - Segments



Miles
0 1 2 3

N

Legend

GFA Boundary

Pedestrian Star Rating (1-2)

State Routes

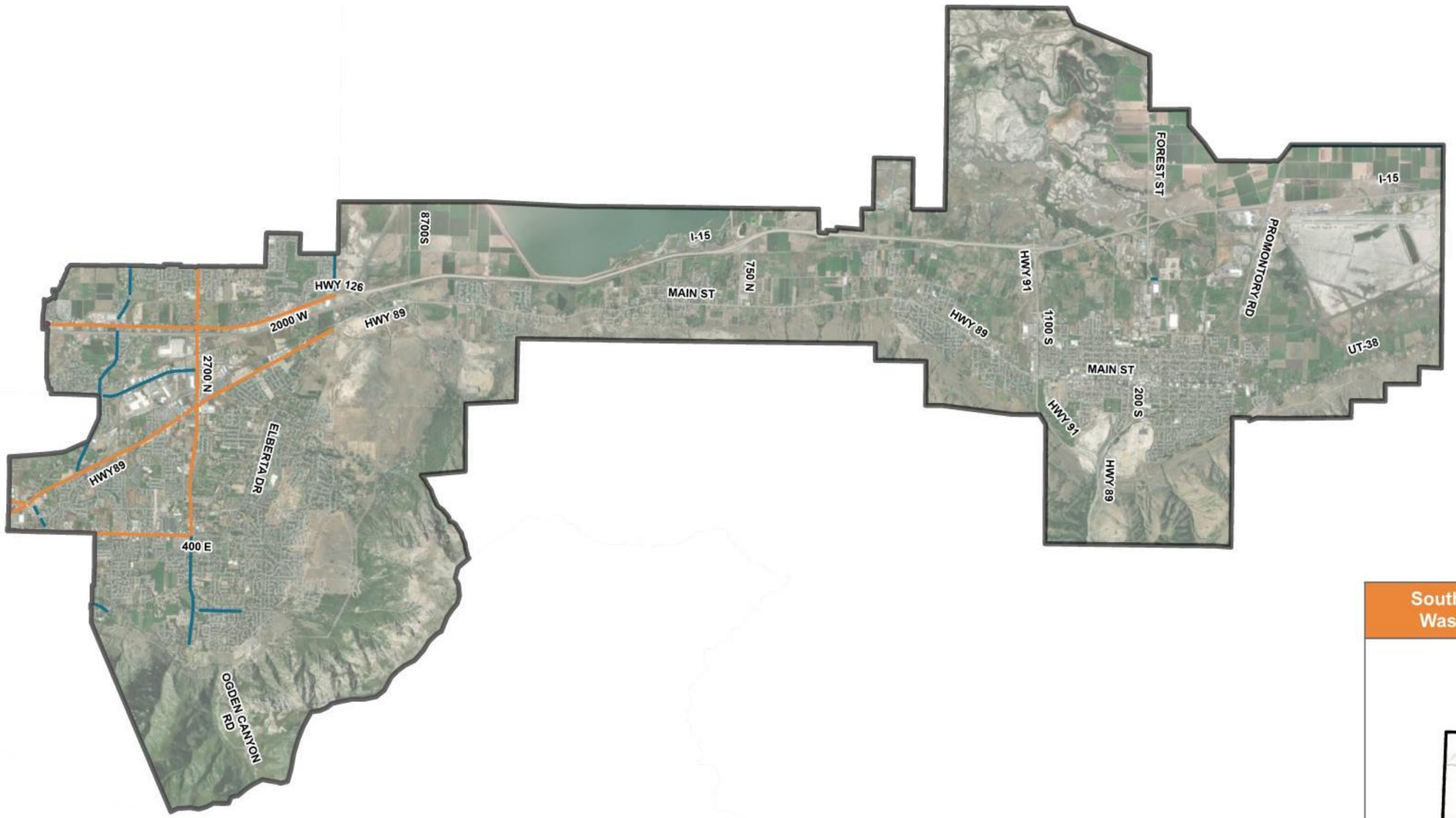
Federal Aid Routes

South Box Elder & North Weber 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

N

Legend

GFA Boundary

Bicycle Star Rating (1-2)

State Routes

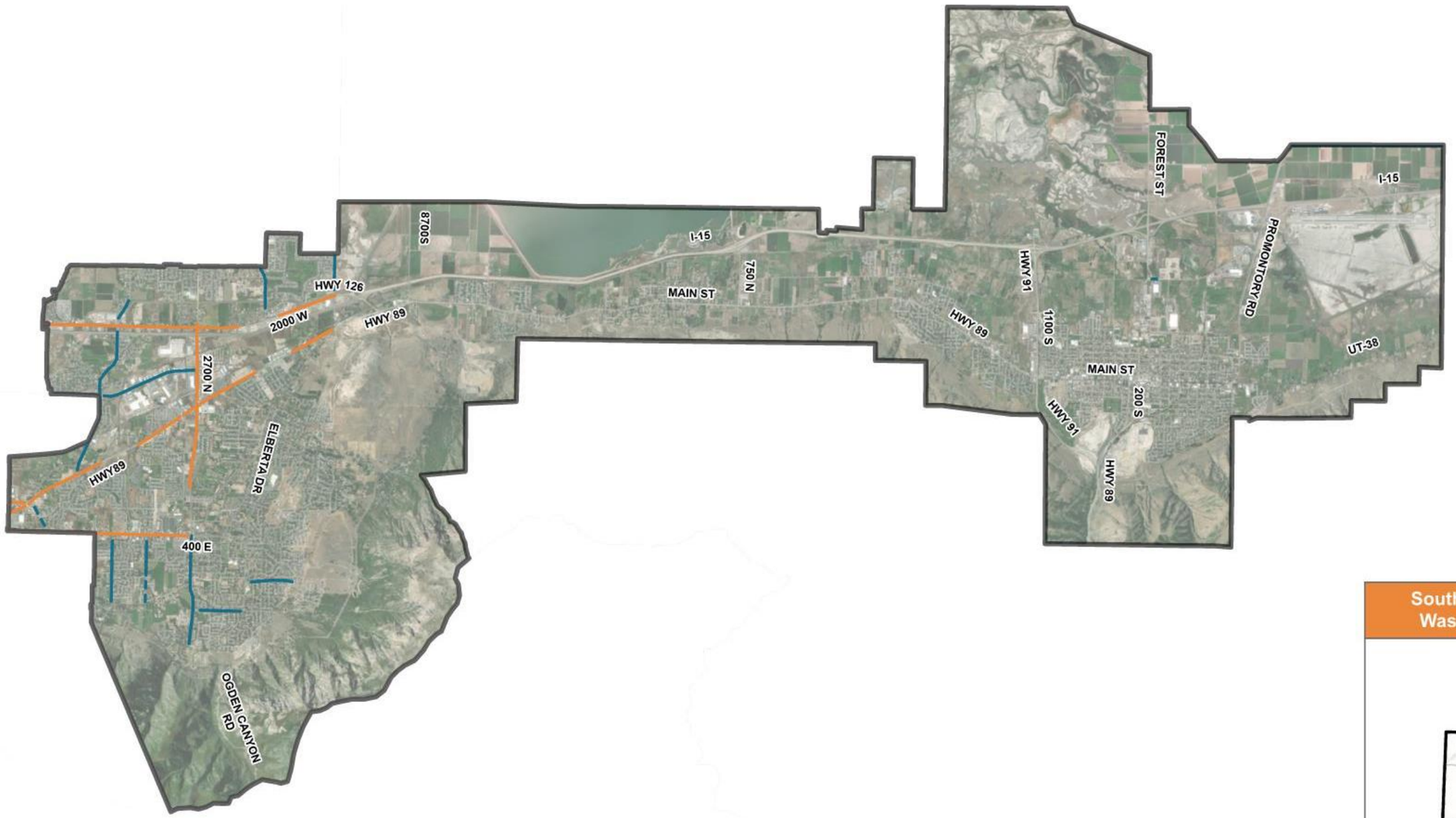
Federal Aid Routes

South Box Elder & North Weber 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

N

Legend

GFA Boundary

Vehicle Star Rating (1-2)

State Routes

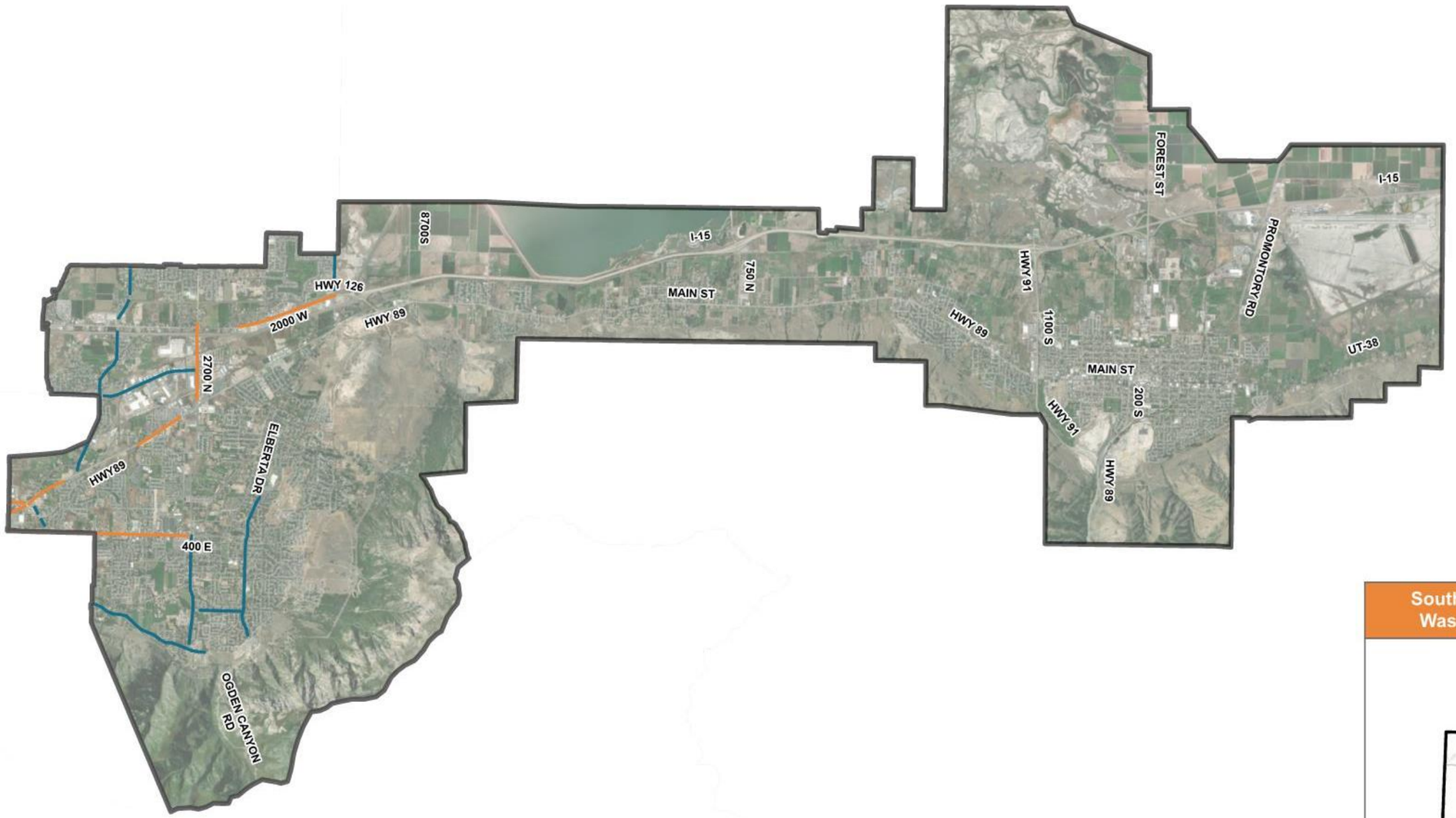
Federal Aid Routes

South Box Elder & North Weber 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

N

Legend

GFA Boundary

Crash Profile Risk (> 20)

State Routes

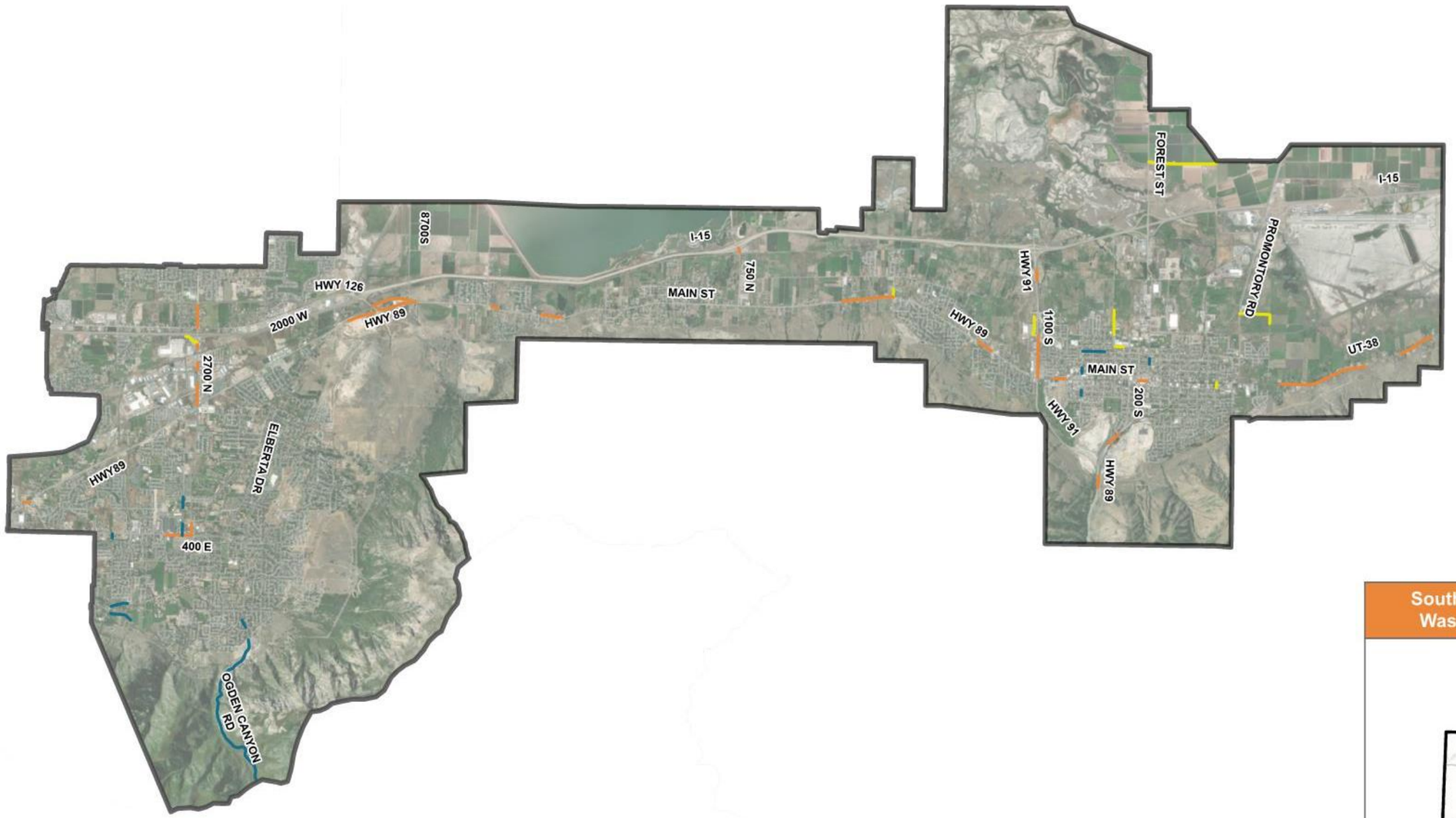
Federal Aid Routes

South Box Elder & North Weber 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

N

Legend

GFA Boundary

Critical Crash Rate Differential (> 0.0)

State Routes

Federal Aid Routes

Local Streets

South Box Elder & North Weber County
Wasatch Front Regional Council Area

High-Risk Network Analysis

State Route and Federal Aid Segments	Local Street Segments

SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY TECH MEMO #1 SAFETY ANALYSIS

TECHNICAL MEMORANDUM #1

APPENDIX A1 - SOUTH BOX ELDER & NORTH WEBER COUNTIES 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 A1 - South Box Elder-North Weber Counties GFA - Safety Analysis.docx

Table of Contents

List of Figures

List of Tables

1. Introduction

Appendix A1 summarizes the safety analysis performed for the South Box Elder & North Weber Counties 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 South Box Elder & North Weber Counties 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 A1** summarizes the results of the analyses for the South Box Elder & North Weber Counties GFA.

1.2. Appendix Organization

This Appendix is organized into the following sections:

- **Section 1** - Introduction
- **Section 2** - South Box Elder & North Weber Counties 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 South Box Elder & North Weber Counties Geographic Focus Areas (GFA) (**Figure 2.1**) is located on the southern portion of Box Elder County and norther portion of Weber County and includes the following agencies and jurisdictions:

- Brigham City
- Perry
- Willard
- Farr West
- Harrisville
- North Ogden
- Pleasant View

The safety analyses presented in this Technical Memorandum are specific to the South Box Elder & North Weber Counties 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 South Box Elder & North Weber Counties, for the years 2018-2022. Crash data was obtained from the Utah Department of Transportation.

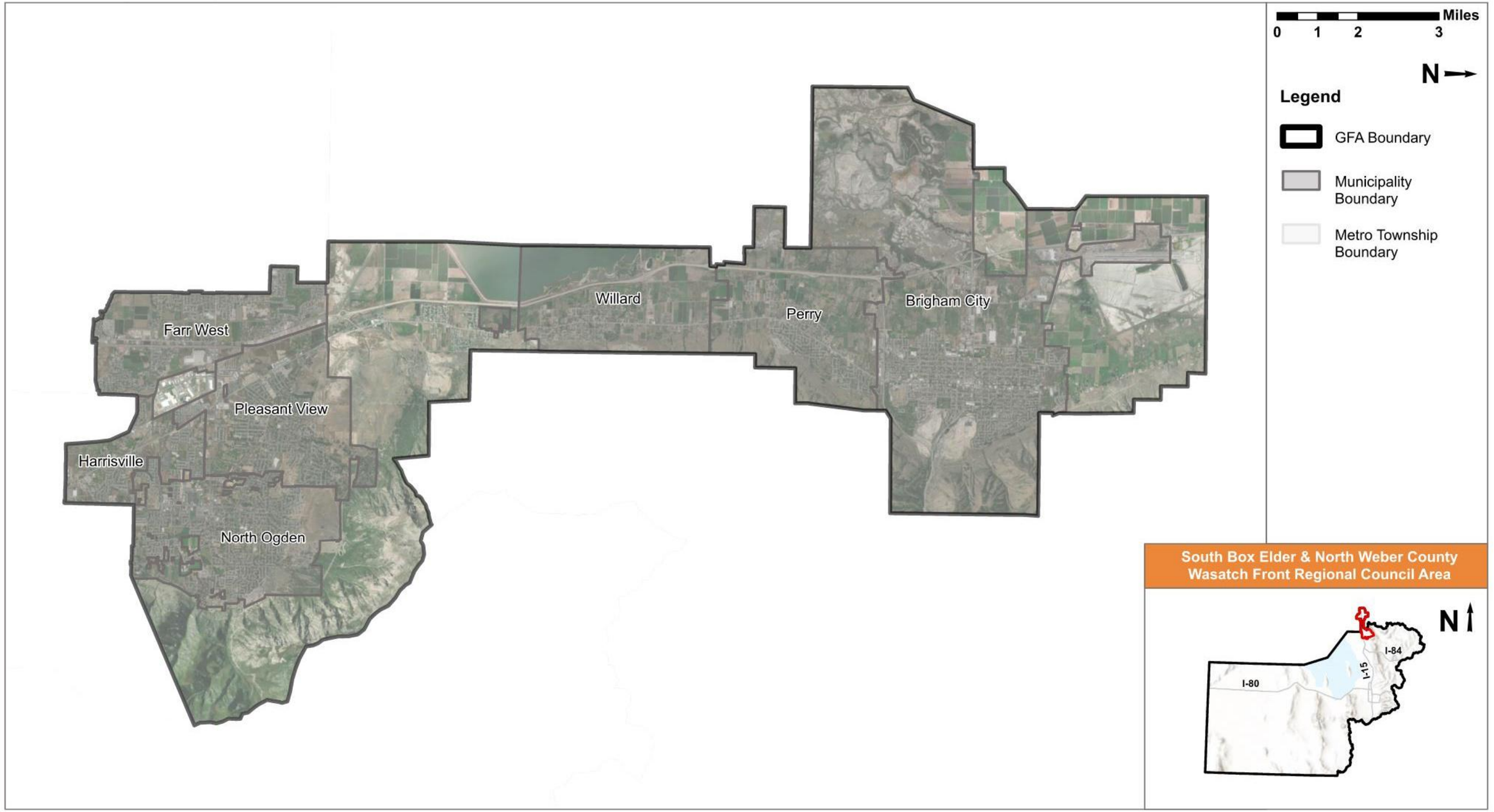


Figure 2.1 – South Box Elder & North Weber Counties GFA Study Area

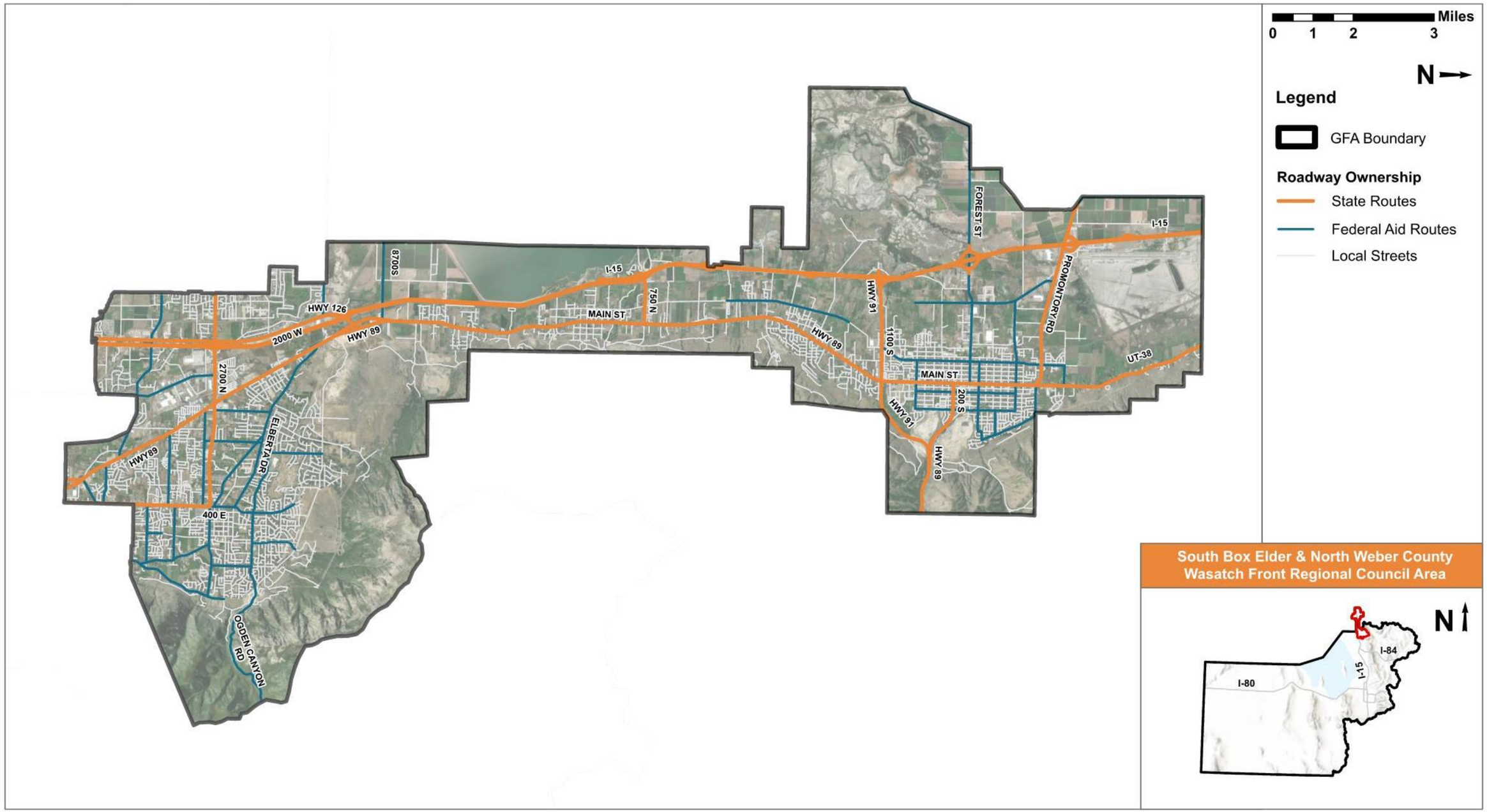


Figure 2.2 – South Box Elder & North Weber Counties GFA Roadway Network

3. SHSP Emphasis Area Analysis

The SHSP emphasis area analysis ranks the frequency of fatal and serious injury crashes in the South Box Elder & North Weber Counties GFA for each of the eleven Utah SHSP emphasis areas. The rankings of the emphasis areas are compared for the South Box Elder & North Weber Counties 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 South Box Elder & North Weber Counties GFA listed below:

- Roadway Departure
- Speed-Related
- Intersections
- No Safety Restraints
- Older Driver

Table 3.1 – SHSP Emphasis Areas Analysis

Category	Utah SHSP Safety Emphasis Area	Statewide Totals		WFRC Totals		South Box Elder & North Weber Counties 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	26	7	-3
	Older Driver	1,508	6	700	6	36	5	1
	Speed-Related	2,133	**3**	936	3	56	2	1
	Aggressive Driving	555	11	297	10	22	9	1
	Distracted Driving	718	10	286	11	16	10	1
	Impaired Driving	1,184	8	623	8	33	6	2
	No Safety Restraints	1,542	**5**	599	9	37	4	5
Roadway	Intersection	3,567	**1**	2,163	1	53	3	-2
	Roadway Departure	2,931	**2**	1,014	2	62	1	1
Special Users	Motorcycle	1,457	7	750	5	23	8	-3
	Pedestrian	912	9	636	7	16	10	-3
	Bicycle*	280	12	167	12	6	12	0

**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 South Box Elder & North Weber Counties GFA. The data shows the following:

- State Routes recorded 71% of the total crashes in this GFA
- Federal Aid routes recorded 18% of fatal and serious injury crashes in this GFA
- Local Streets (non-Federal Aid) recorded 11% 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	23	1%	3	0%	0	0%	**26**	**0.5%**	**< 0.1%**
Suspected Serious Injury	68	2%	20	2%	17	3%	**105**	**2.2%**	**0.1%**
Suspected Minor Injury	356	11%	111	13%	57	11%	**524**	**11.0%**	**0.3%**
Possible Injury	529	16%	163	18%	65	12%	**757**	**15.8%**	**0.4%**
No Injury / Property Damage Only	2,389	71%	589	66%	387	74%	**3,365**	**70.4%**	**1.9%**
Route Total	**3,365**	**100%**	**886**	**100%**	**526**	**100%**	**4,777**	**100%**	**2.6%**

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 South Box Elder & North Weber Counties GFA. The data shows the following:

- Fatal crashes have slightly decreased during the 5-year period (2018-2022), with two fatal crashes occurring in 2022, down from 7 in 2018
- Serious injury crashes have increased during the 5-year period (2018-2022)
- Year 2020 recorded highest number of serious crashes during the 5-year period (2018 – 2022)
- Most (23 of 26) of the fatal and serious injury crashes occurred on state routes

4.3. Fatal and Serious Injury Crashes by Location

Figure 4.6 shows the locations of the fatal and serious injury crashes within the South Box Elder & North Weber Counties GFA. Crashes are largely focused on State Routes.

Figure 4.7 is a density map of fatal and serious injury crashes within the South Box Elder & North Weber Counties GFA.

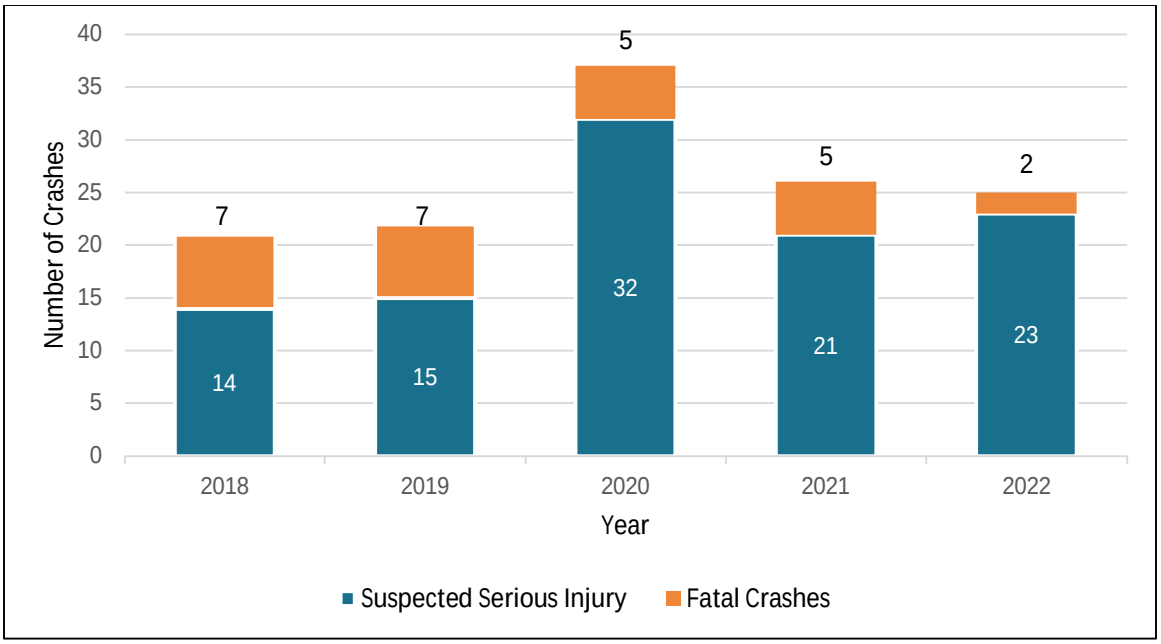


Figure 4.1 – Fatal and Serious Injury Crashes by Year

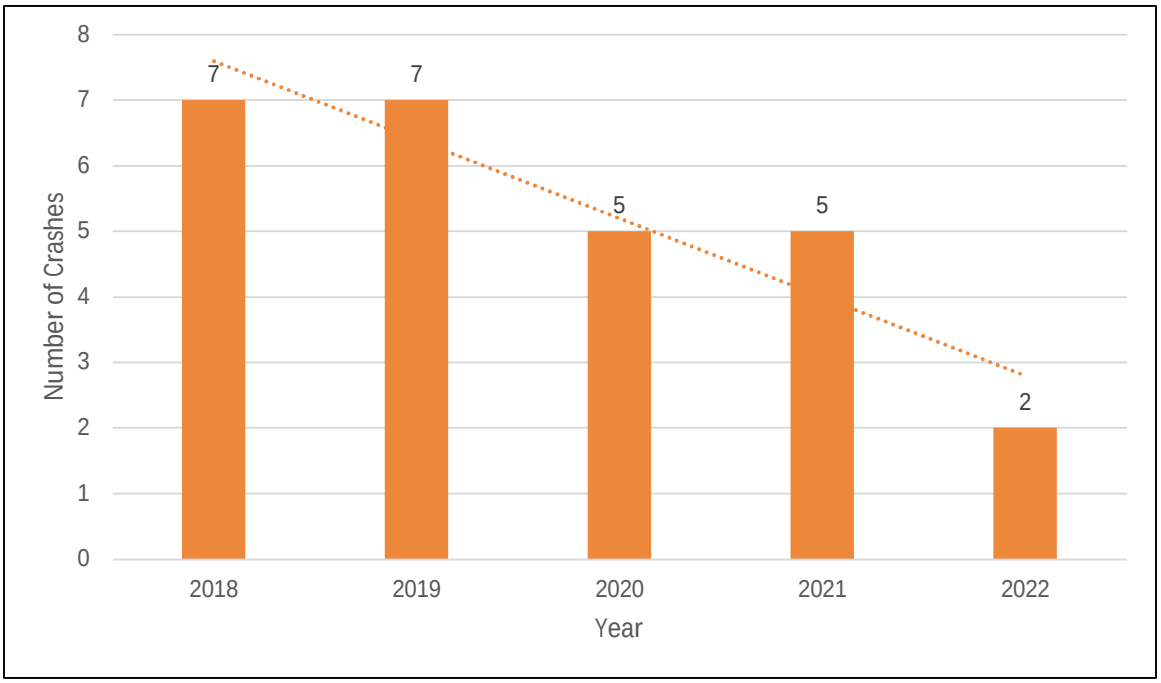


Figure 4.2 – Fatal Crashes by Year

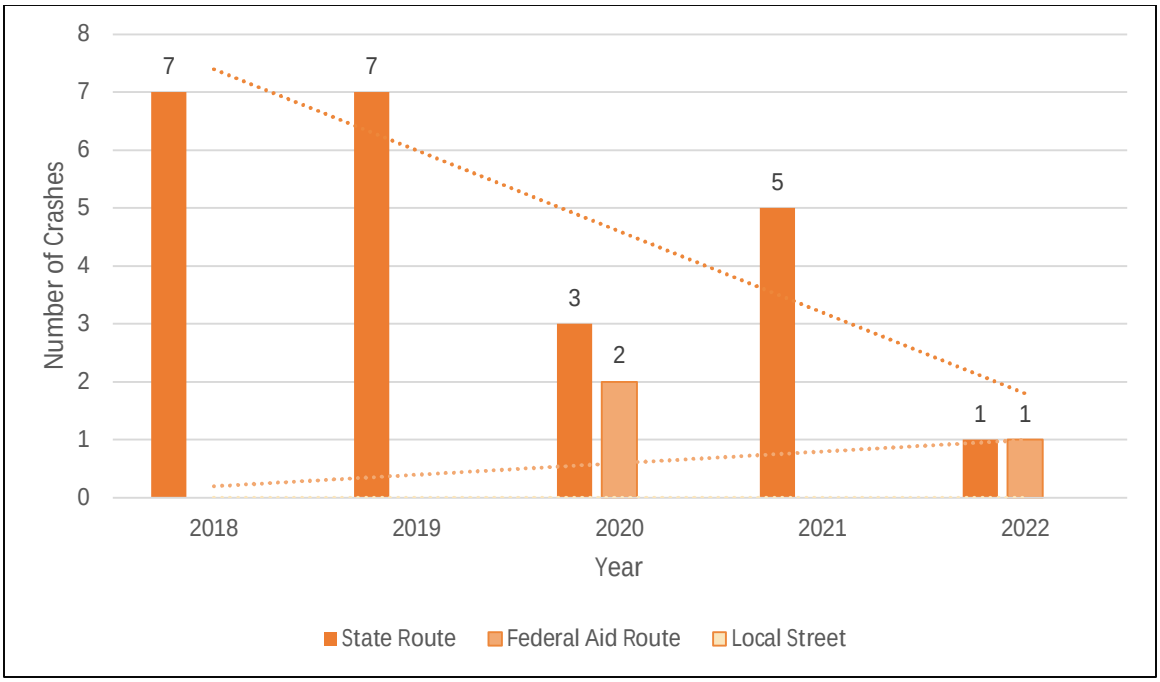


Figure 4.3 – Annual Fatal Crashes by Roadway Ownership

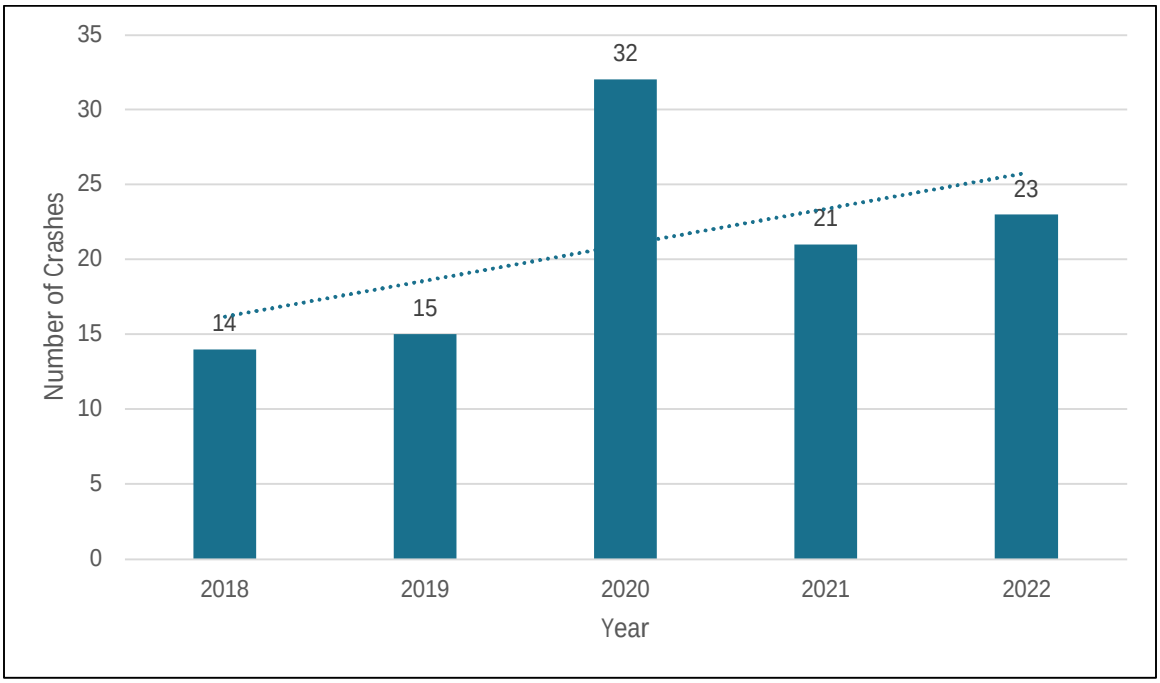


Figure 4.4 – Serious Injury Crashes by Year

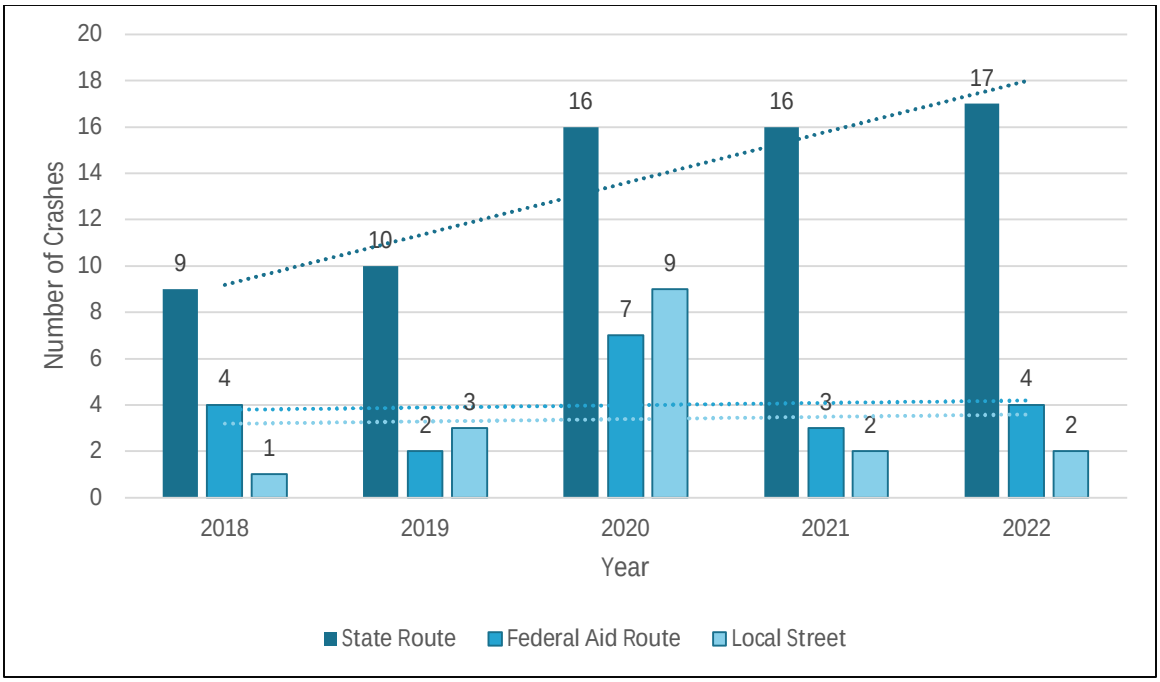


Figure 4.5 – Annual Serious Injury Crashes by Roadway Ownership

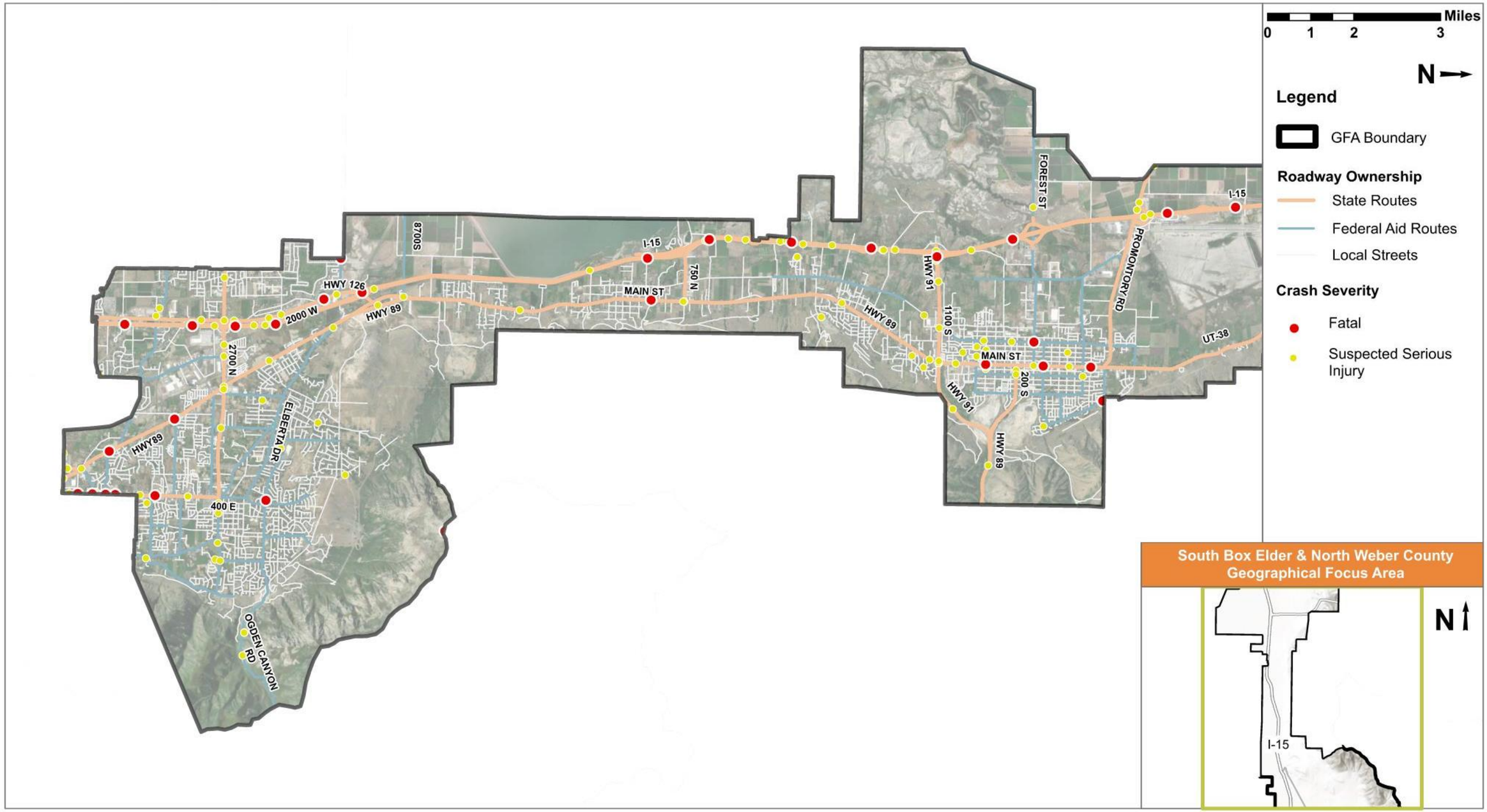


Figure 4.6 – Fatal and Serious Injury Crashes

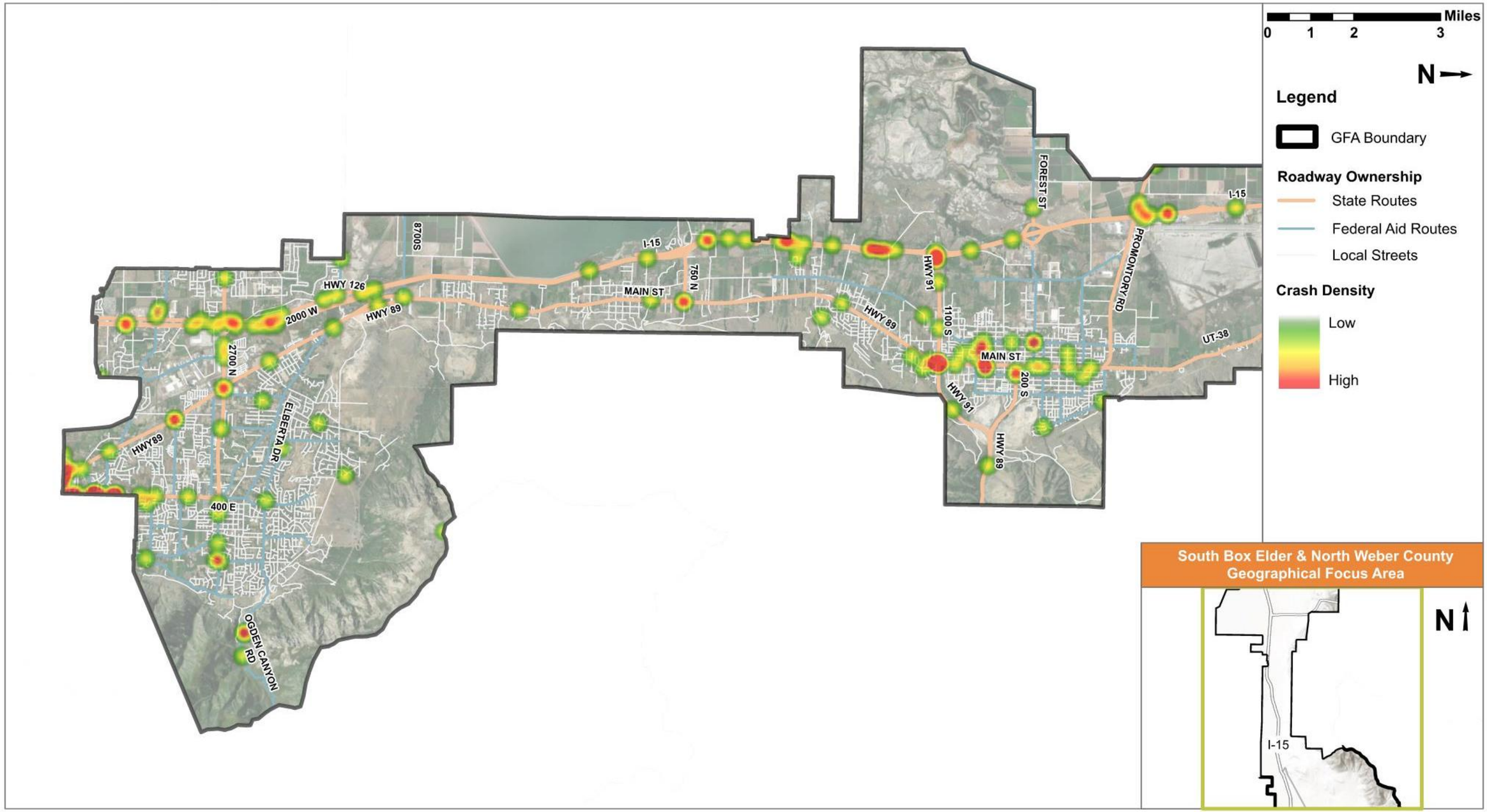


Figure 4.7 – Fatal and Serious Injury Crash Density

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 South Box Elder & North Weber Counties GFA. The data shows the following:

- The Roadway Departure crash type has the highest number of total fatal and serious injuries with 41 crashes
- Most Roadway Departure crashes are on State Routes. However, of the crash types, Roadway Departure was also highest on Federal Aid Routes

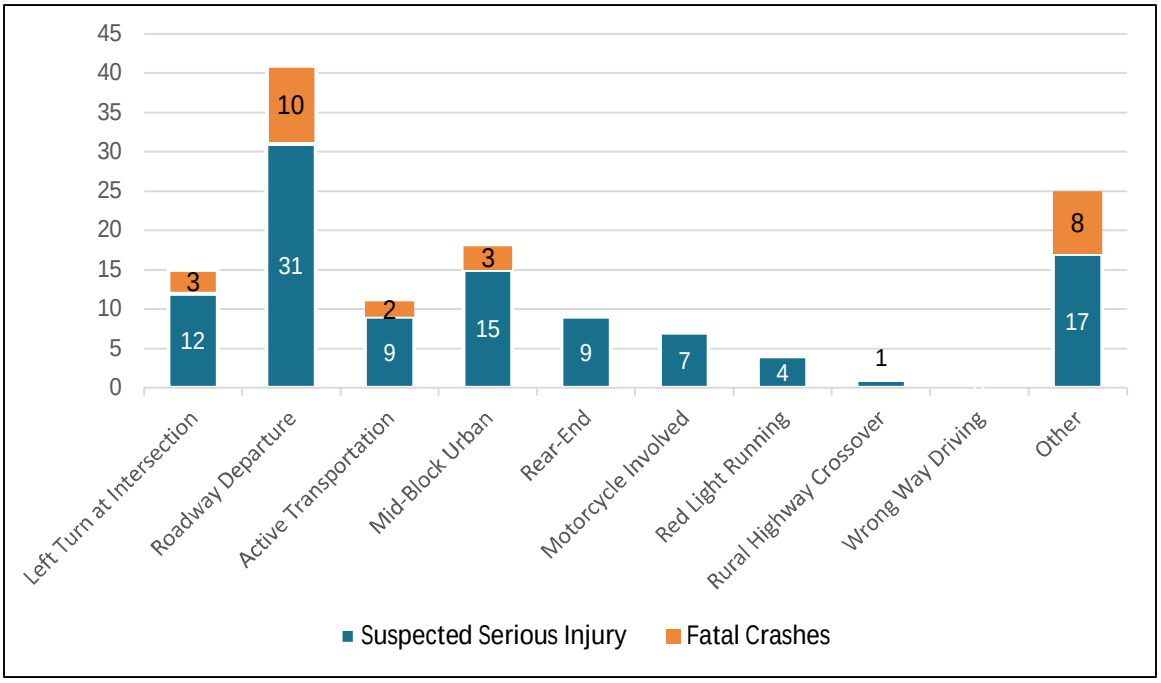


Figure 4.8 – Fatal and Serious Injury Crashes by Crash Type

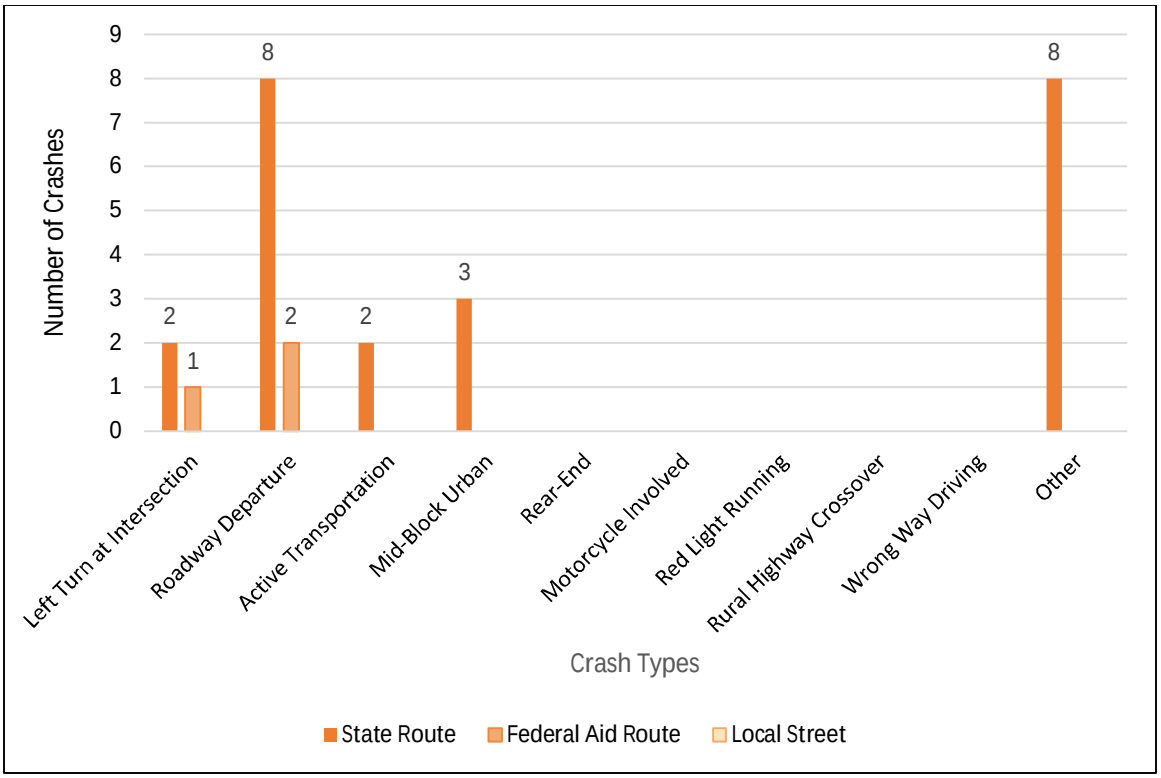


Figure 4.9 – Fatal Crashes by Crash Type and Roadway Ownership

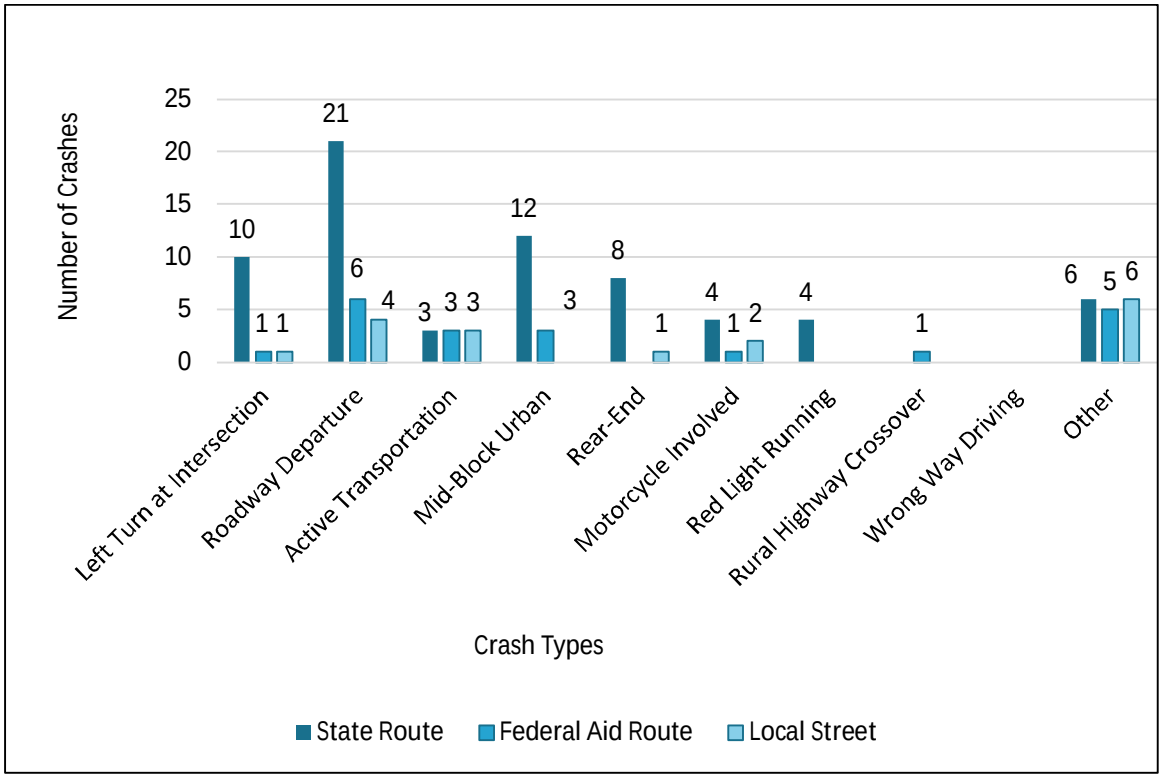


Figure 4.10 – Serious Injury Crashes by Crash Type and Roadway Ownership

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 South Box Elder & North Weber Counties GFA. The data shows the following:

- Motorcycle-related fatal and serious injury crashes are double the number of pedestrian or bicycle related crashes.
- The highest number of motorcycle crashes occurred on State Routes.
- No bicycle related fatal crashes were recorded between (2018 and 2022)

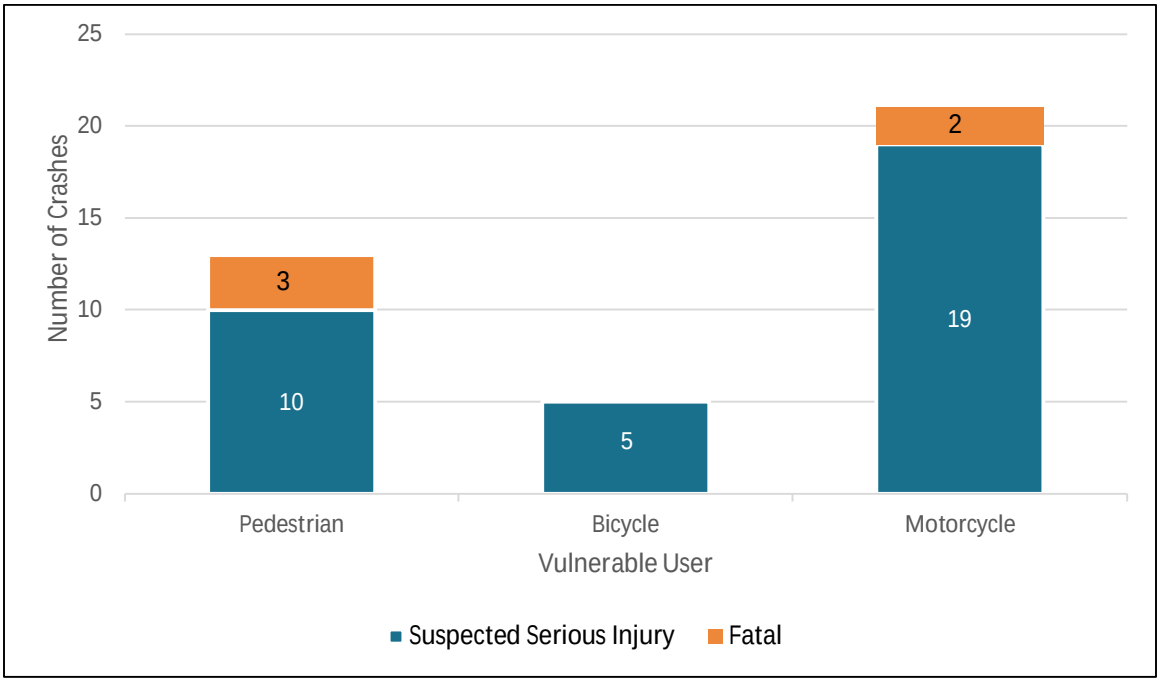


Figure 4.11 – Fatal and Serious Injury Crashes by Vulnerable User

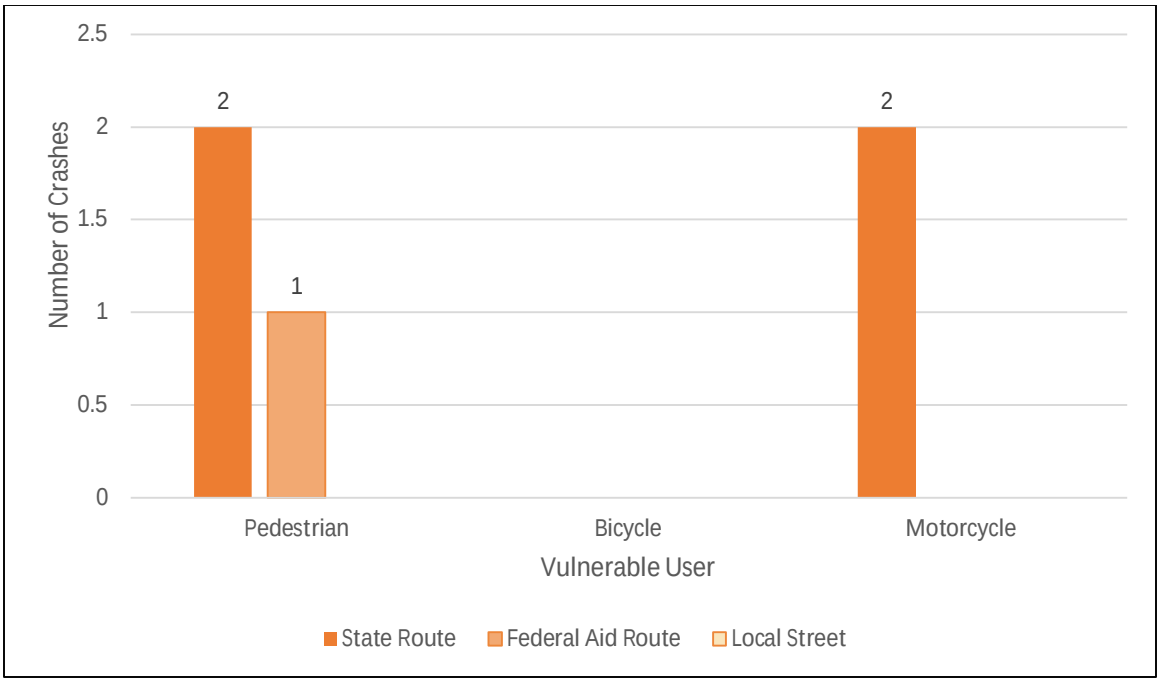


Figure 4.12 – Fatal Crashes by Vulnerable User and Roadway Ownership

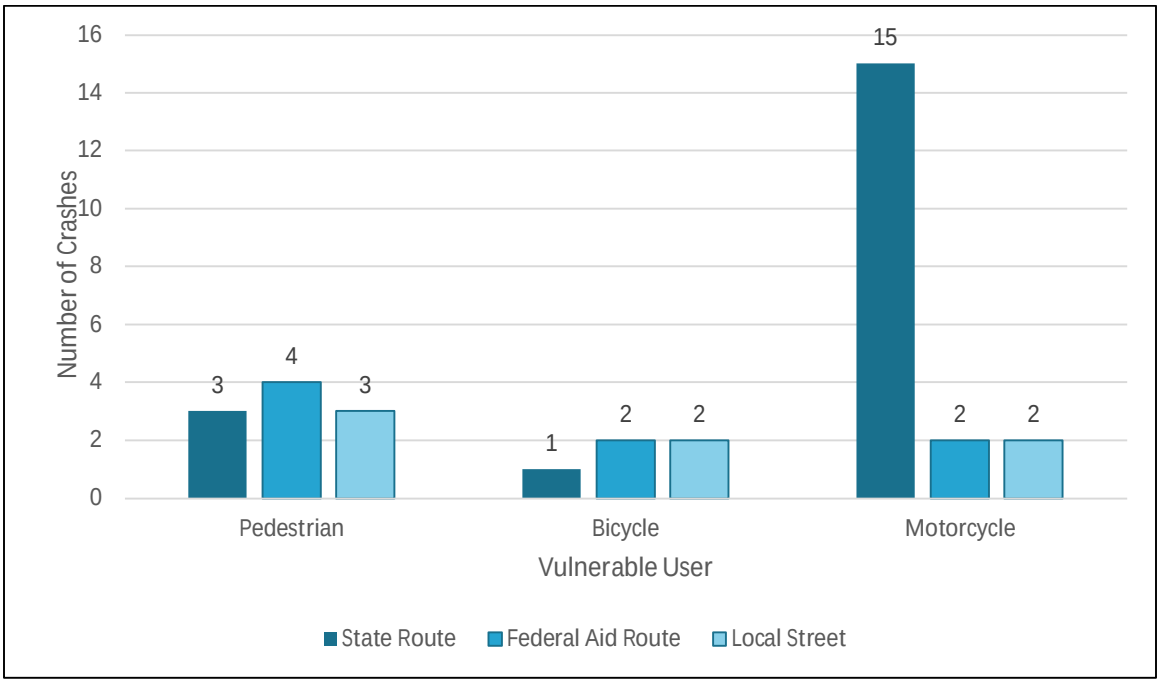


Figure 4.13 – Serious Injury Crashes by Vulnerable User and Roadway Ownership

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 South Box Elder & North Weber Counties 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 two fatal crashes
- Two single vehicle fatal crashes occurred on Federal Aid Routes

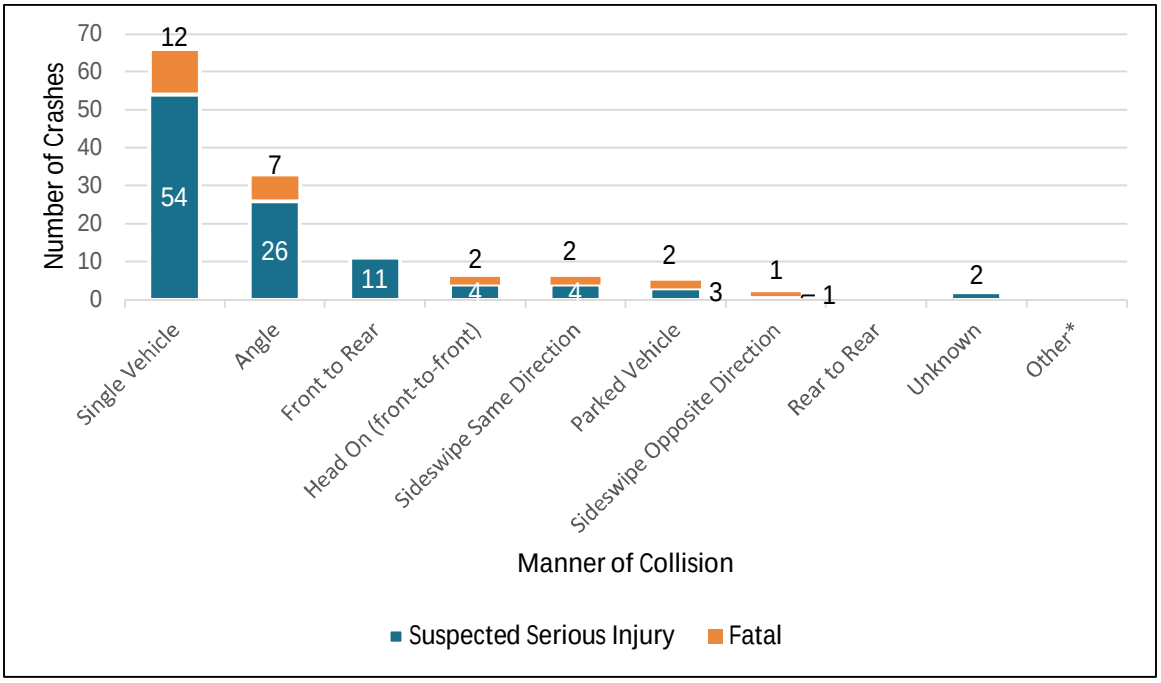


Figure 4.14 – Fatal and Serious Injury Crashes by Manner of Collision

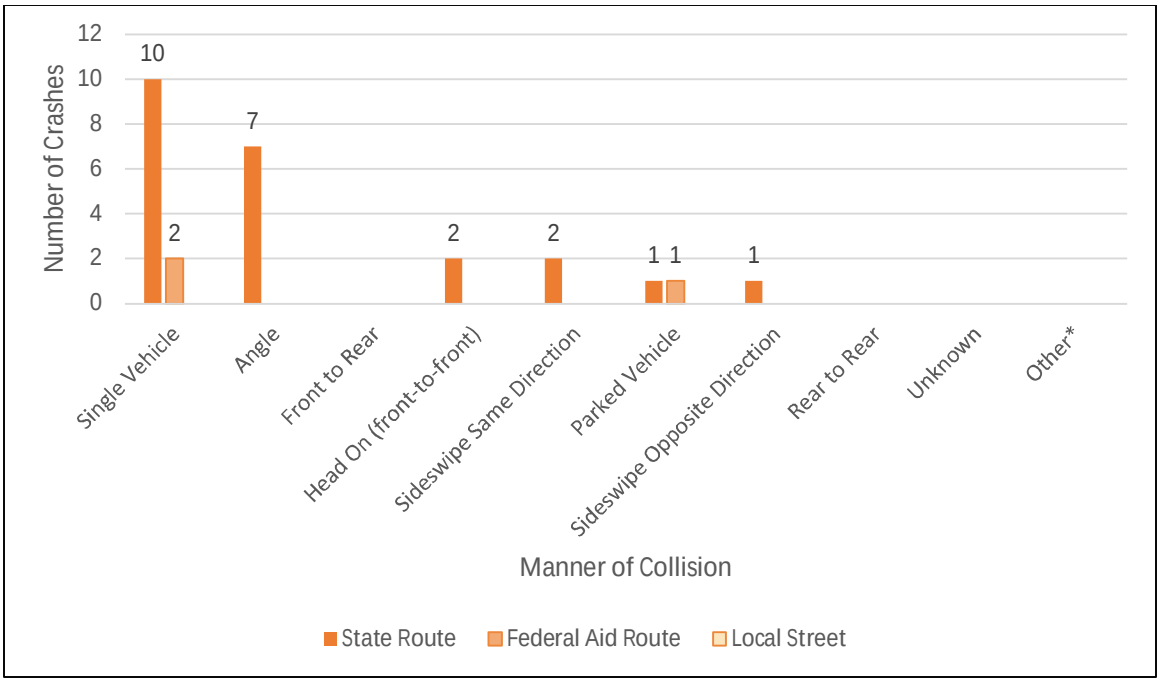


Figure 4.15 – Fatal Crashes by Manner of Collision and Roadway Ownership

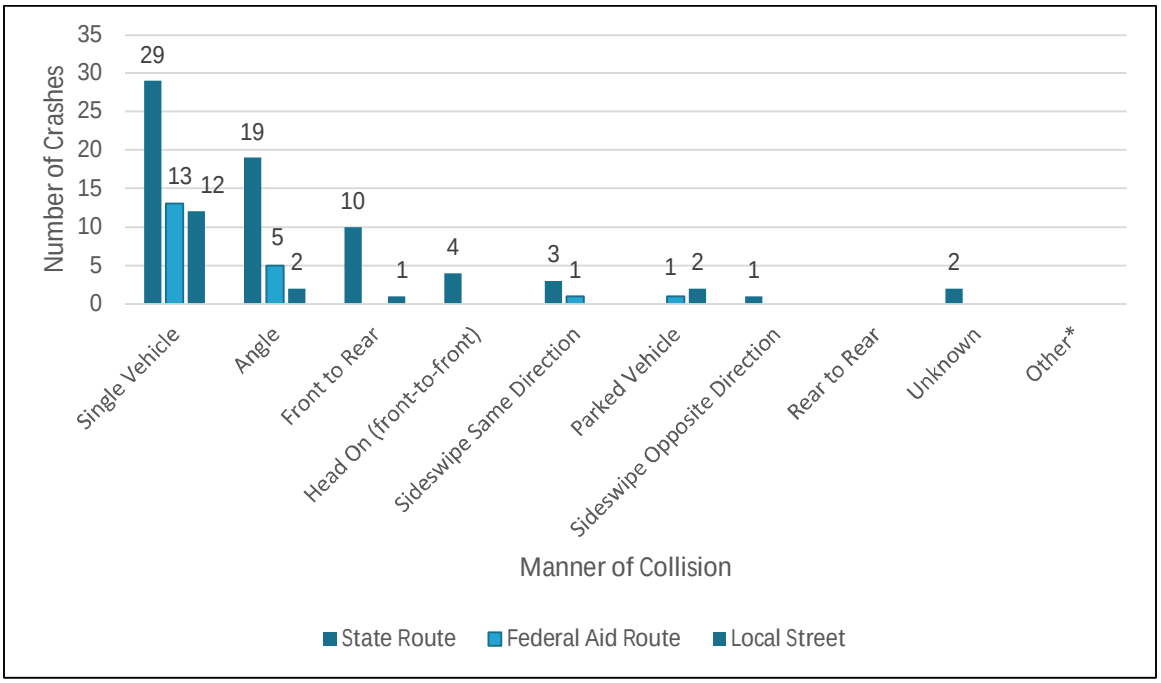


Figure 4.16 – Serious Injury Crashes by Manner of Collision and Roadway Ownership

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 South Box Elder & North Weber Counties GFA. The data shows the following:

- Not intersection involved fatal and serious injury crashes are double the number intersection involved crashes.
- State Routes recorded higher number of both intersection and non-intersection related crashes

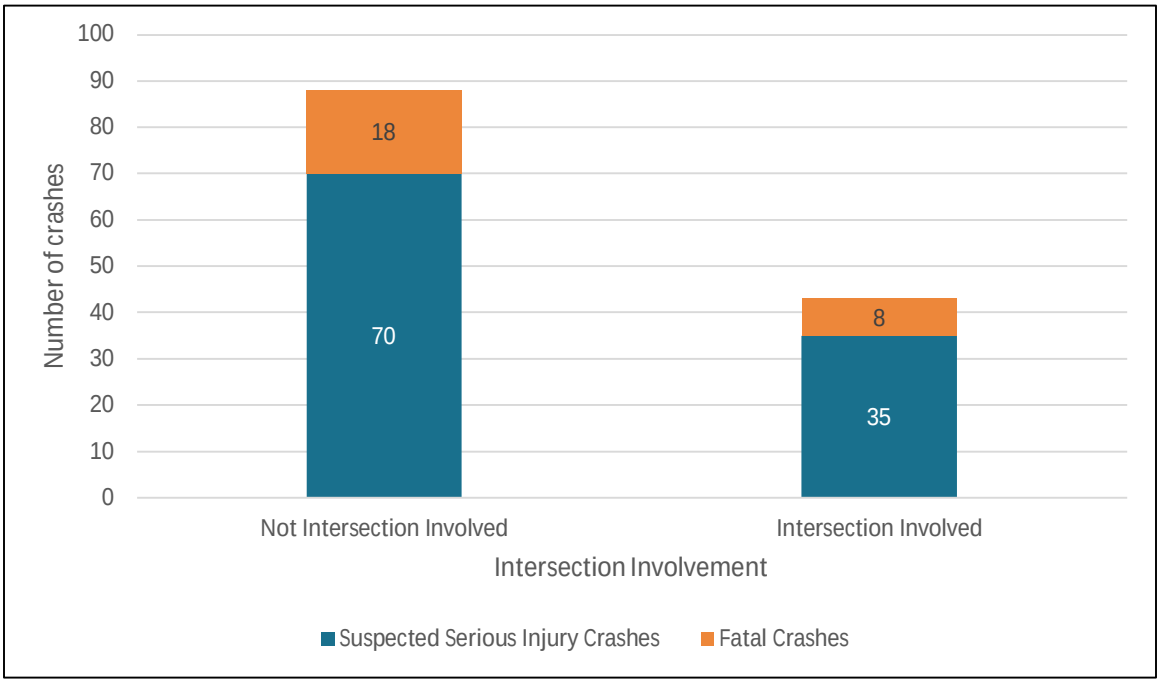


Figure 4.17 – Fatal and Serious Injury Crashes by Intersection

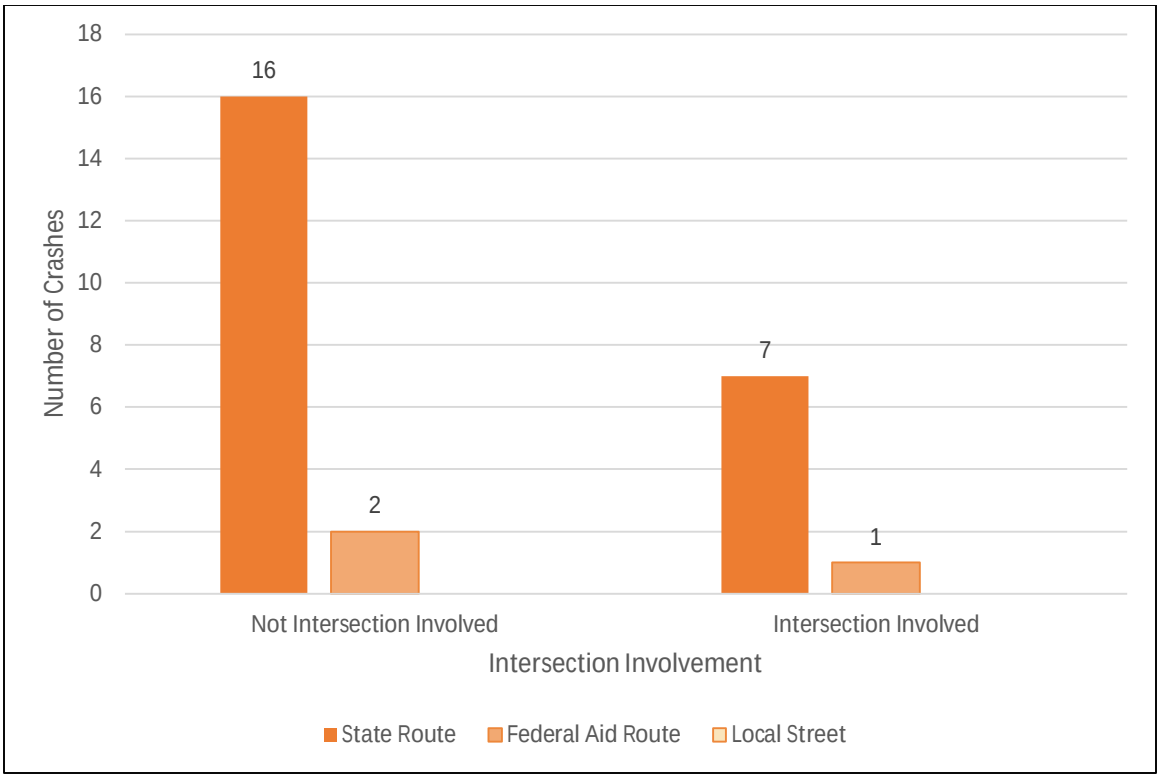


Figure 4.18 – Fatal Crashes by Intersection and Roadway Ownership

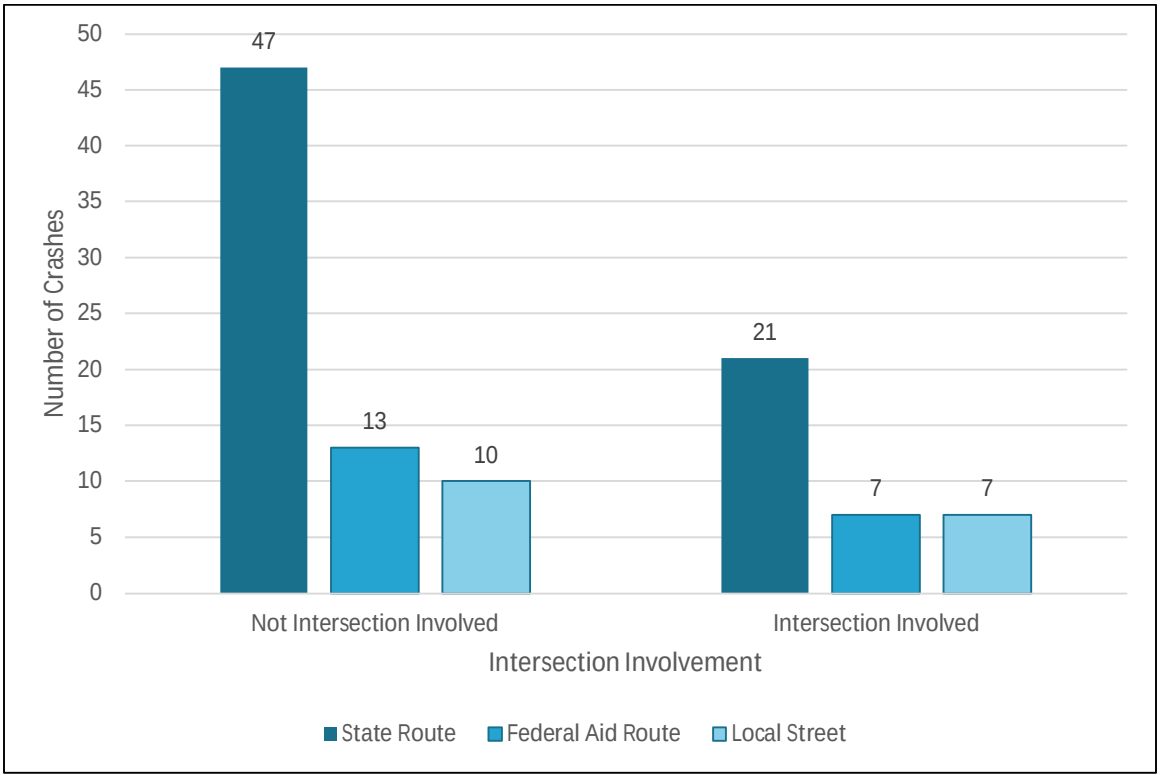


Figure 4.19 – Serious Injury Crashes by Intersection and Roadway Ownership

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 South Box Elder & North Weber Counties GFA. The data shows the following:

- Principal Arterial recorded the highest total number of fatal and serious injury crashes
- Interstate recorded the highest number of fatal crashes (12 crashes)

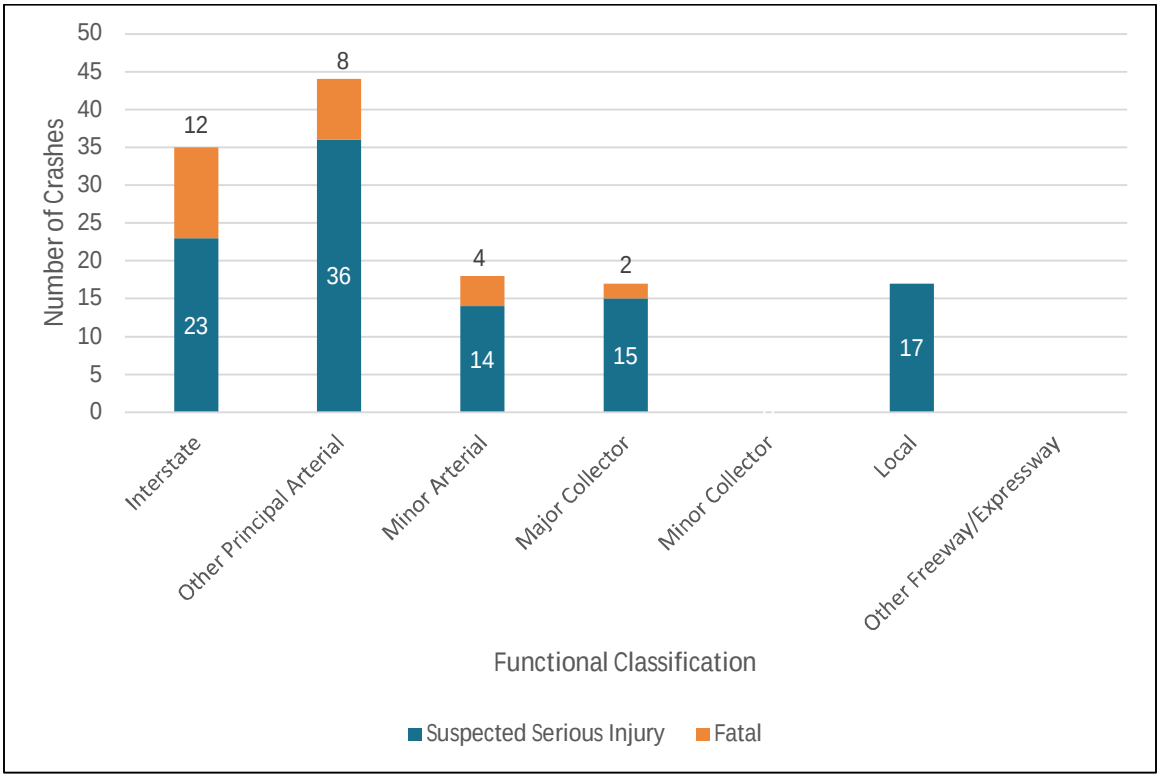


Figure 4.20 – Fatal and Serious Injury Crashes by Functional Class

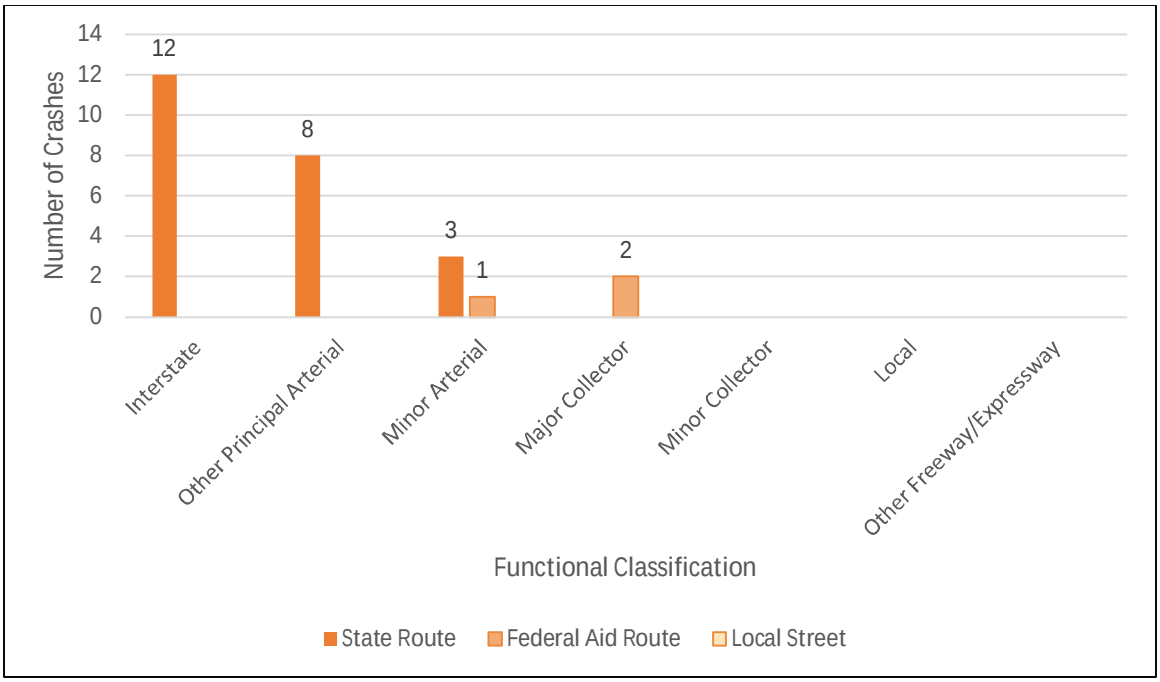


Figure 4.21 – Fatal Injury Crashes by Functional Class and Roadway Ownership

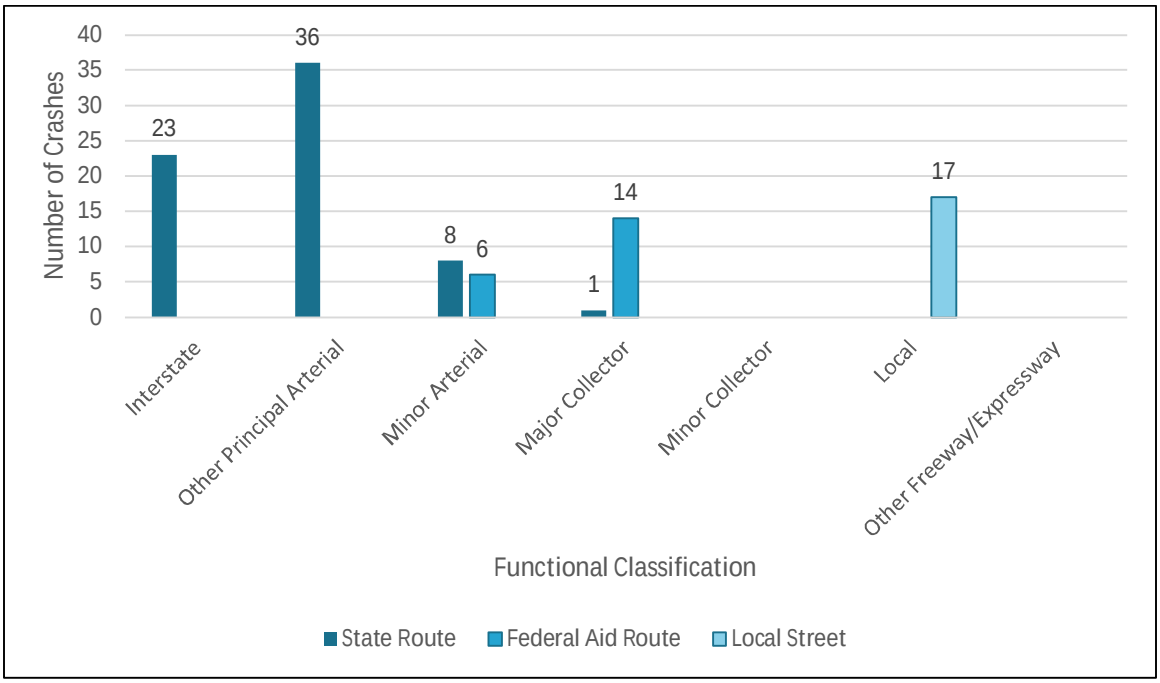


Figure 4.22 – Serious Injury Crashes by Functional Class and Roadway Ownership

4.9. Fatal and Serious Injury Crash Trees Diagrams

Fatal and serious injury crash tree diagrams were generated for the South Box Elder & North Weber Counties GFA. These crash tree diagrams are presented in **Figure 4.25** through **Figure 4.24**.

The crash trees are limited to the top 3 categories for crash type and manner of collision. A crash tree for Active Transportation is also provided.

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
- The urban area had more crashes recorded than the rural areas
- Urban areas recorded a higher number of crashes than rural area
- Higher number of non-intersection related crashes were recorded on all three roadway types (State Route, Federal Aid, Local)
- Of the non-intersection involved crashes, roadway departure crashes, followed by midblock crashes were the most prominent crash types
- Of the intersection involved crashes, in urban areas, left-turn crash types was the most prominent
- Of the intersection involved crashes, in urban areas, angle crash types was the most prominent

CRASH TYPE

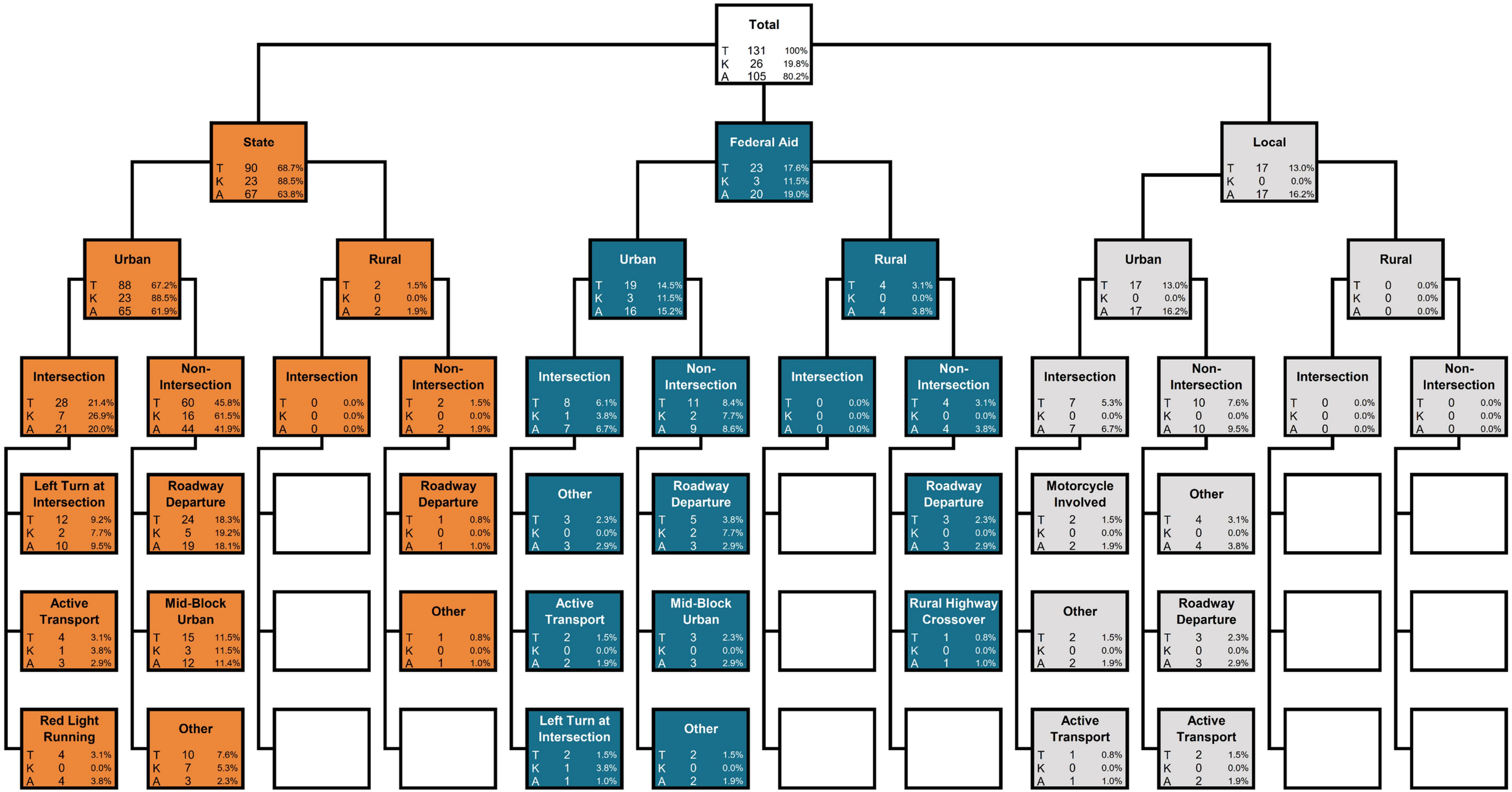


Figure 4.23 – Fatal and Serious Injury Crash Tree Diagram (Crash Type)

MANNER OF COLLISION

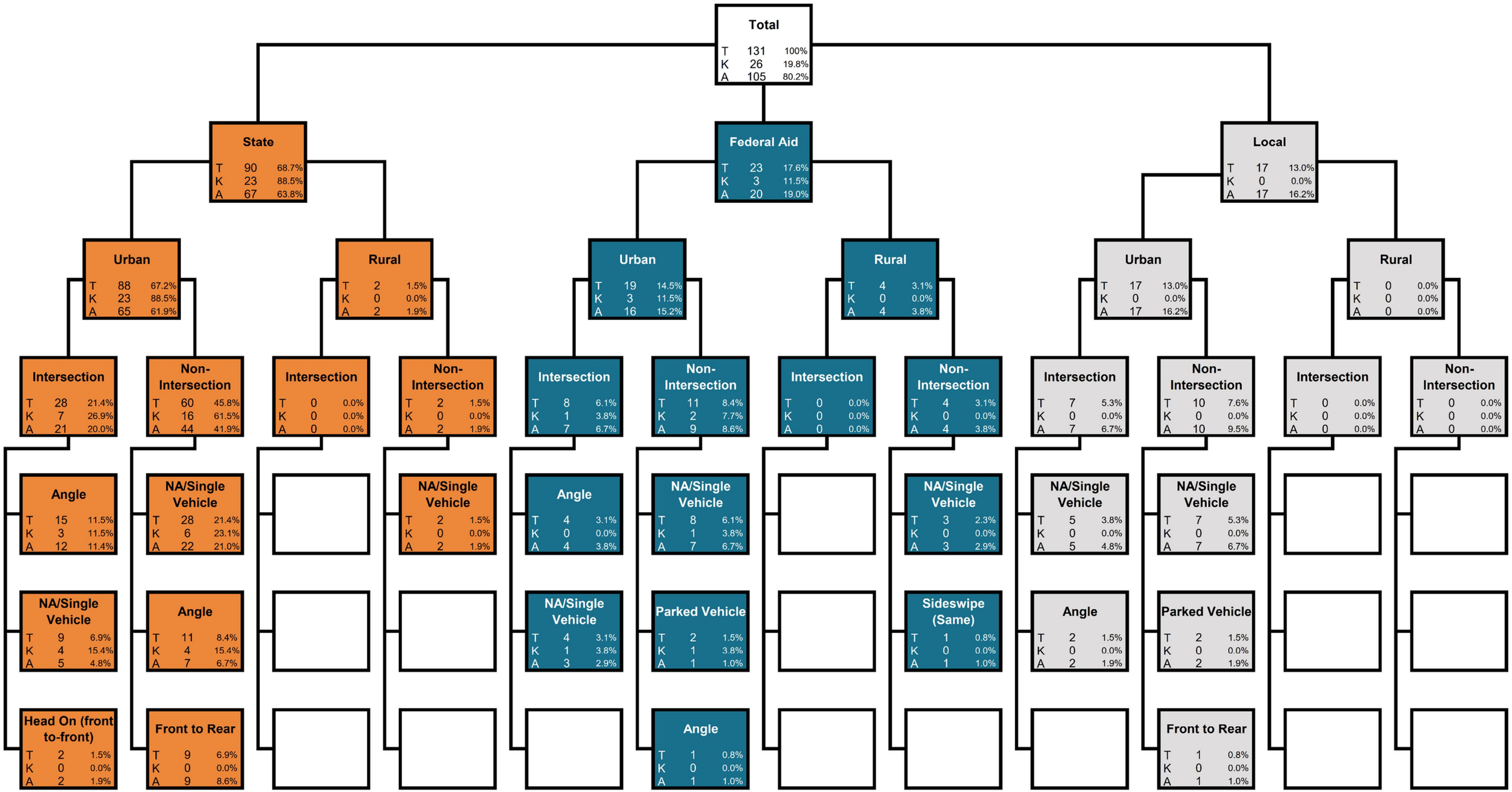


Figure 4.24 – Fatal and Serious Injury Crash Tree Diagram (Manner of Collision)

ACTIVE TRANSPORTATION

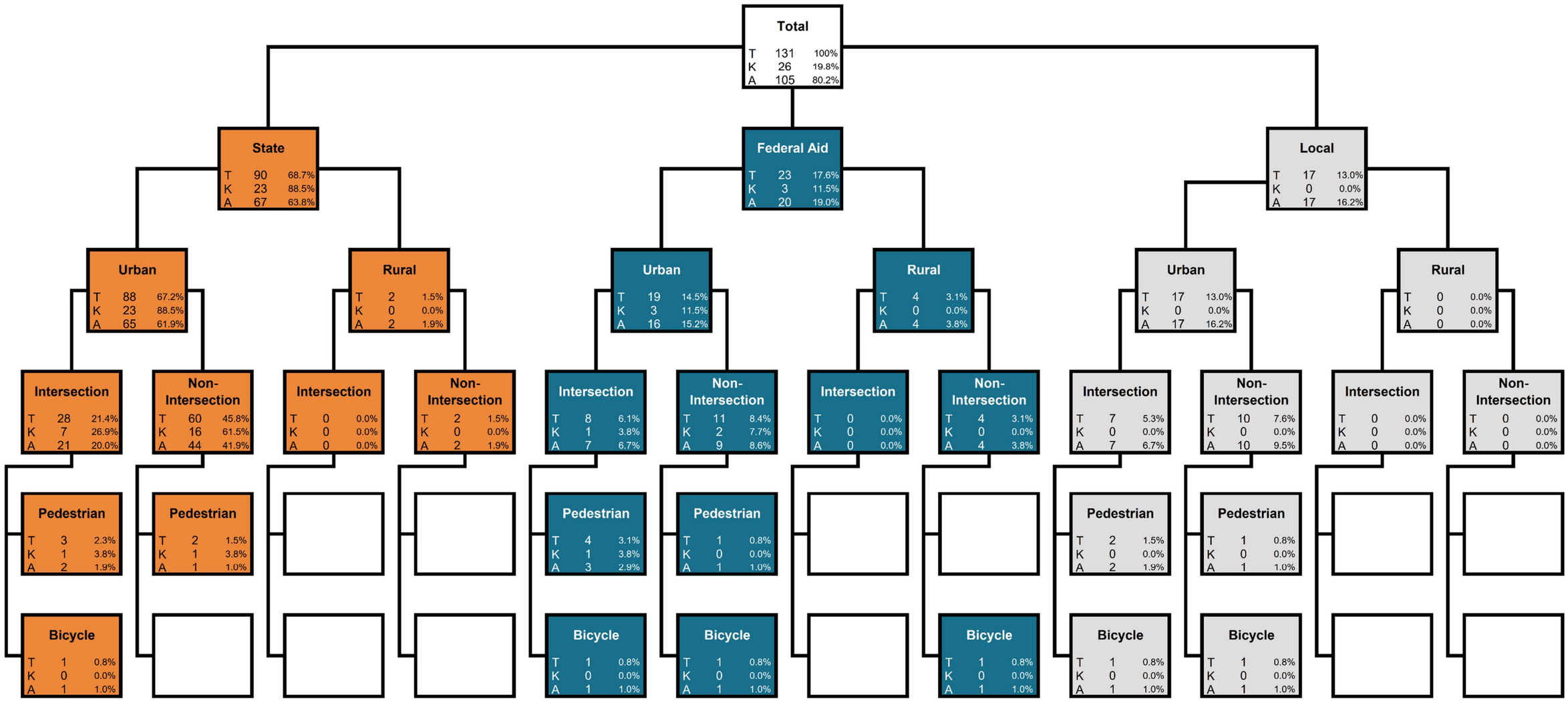


Figure 4.25 – Fatal and Serious Injury Crash Tree Diagram (Active Transportation)

5. Crash and Network Screening Analysis

A crash and network screening analysis was prepared for the South Box Elder & North Weber Counties 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 ten CCR Differential segments and intersections for the South Box Elder & North Weber Counties 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.

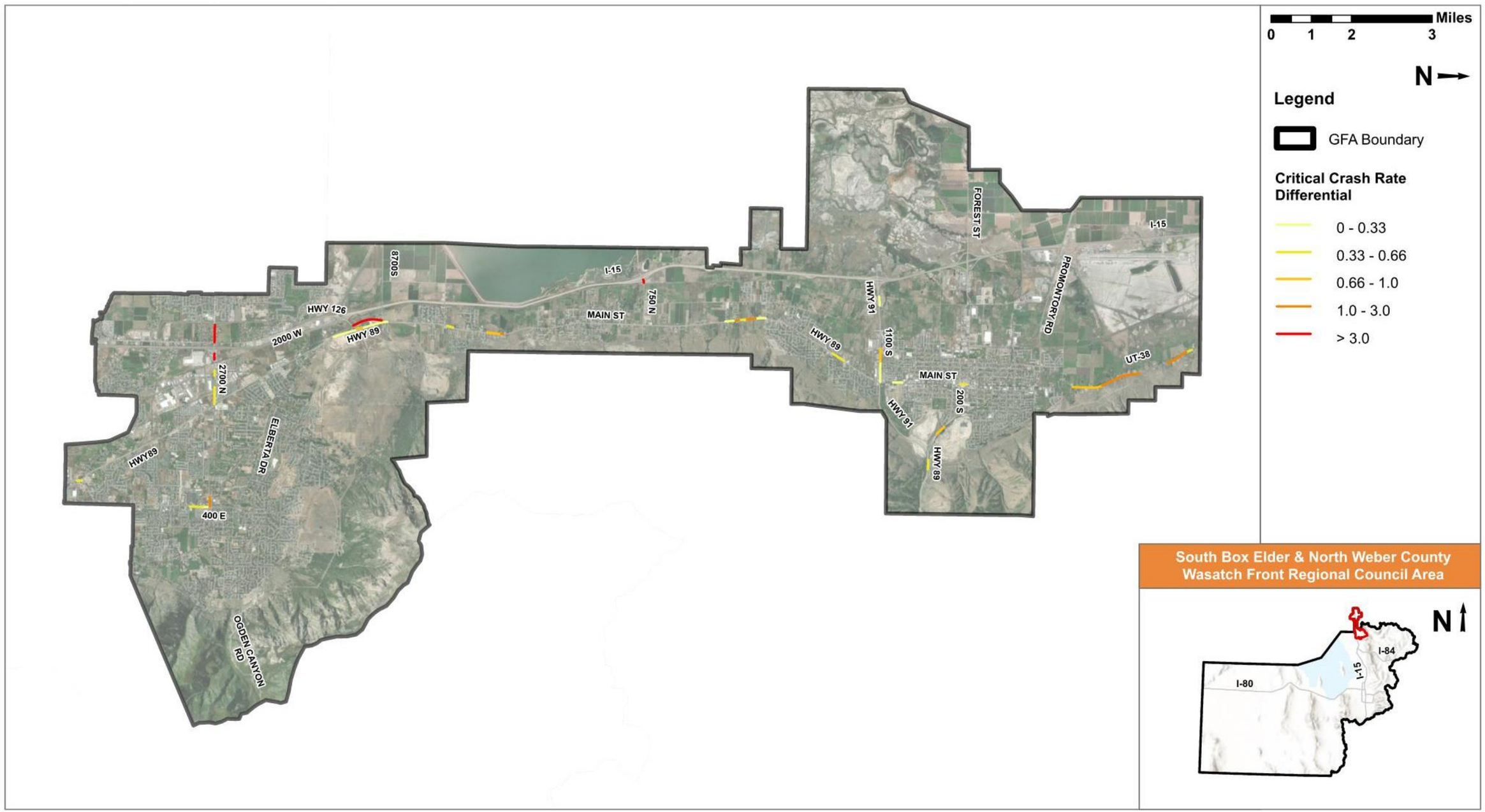


Figure 5.1 – CCR Differential – Segments (State Routes)

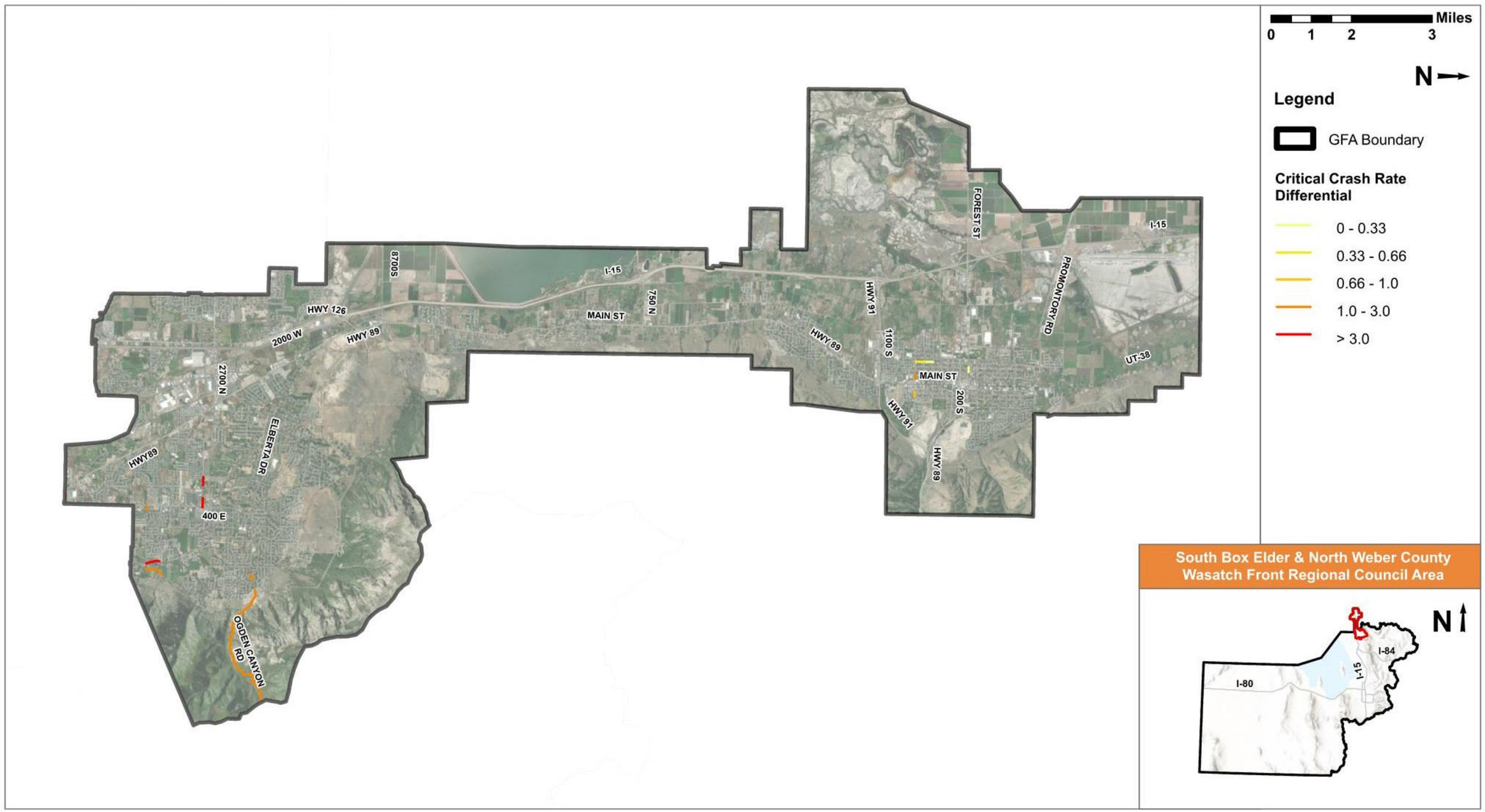


Figure 5.2 – CCR Differential – Segments (Federal Aid Routes)

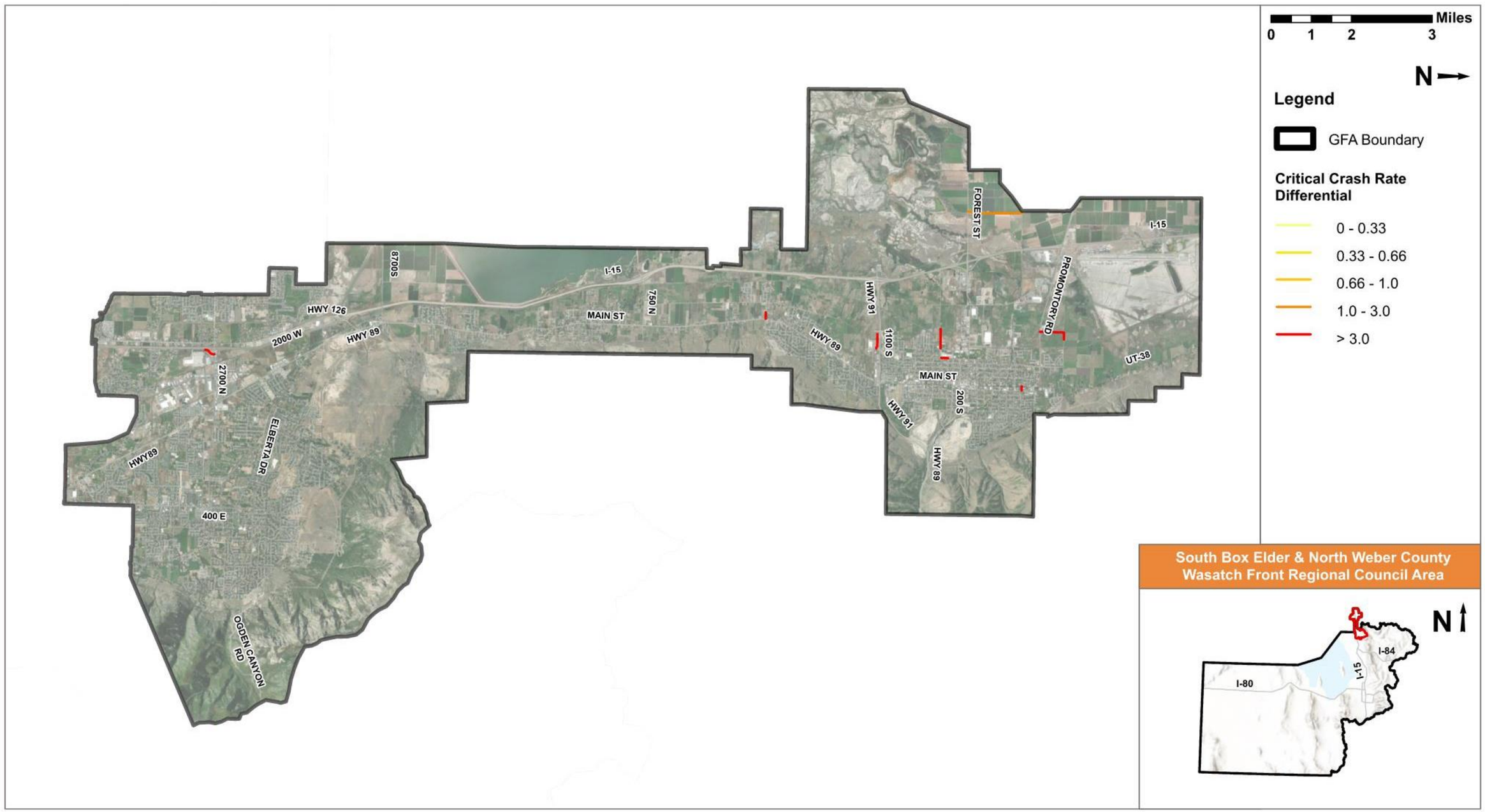


Figure 5.3 – CCR Differential – Segments (Local Routes)

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																								
US-89	SR-126 to 8700 S	Other Principal Arterial		9	22.7	83	0	0	2	3	4	0	0	0	6	0	0	0	0	2	1	0	0	1
2700 N (SR-134)	1850 W to 1775 W	Other Principal Arterial	Farr West	32	5.2	127	0	0	4	1	27	13	9	1	2	0	0	0	1	6	0	1	0	0
750 N (SR-315)	I-15 Ramp to 600 W	Major Collector	Willard	3	3.2	24	0	0	1	0	2	0	2	1	0	0	0	0	0	0	0	0	0	0
2700 N (SR-134)	2250 W to 2000 W	Minor Arterial	Farr West	14	3.1	99	0	0	3	2	9	6	4	1	1	0	0	0	0	1	1	0	0	1
SR-38	Private Driveway to Private Driveway	Minor Arterial		12	2.3	136	0	1	1	1	9	1	0	0	11	0	0	0	0	0	0	0	0	1
US-89	Private Driveway to Private Driveway	Other Principal Arterial		4	2.3	4	0	0	0	0	4	0	1	0	2	0	0	0	0	0	1	0	0	0
2600 N (SR-134)	300 E to Washington Blvd	Minor Arterial	North Ogden	21	1.7	158	0	0	4	5	12	15	4	0	1	0	0	0	0	1	0	0	0	1
US-89	Threemile Creek to Private Driveway	Other Principal Arterial	Perry	11	1.5	11	0	0	0	0	11	0	0	0	11	0	0	0	0	0	0	0	0	0
SR-38	North Irrigation Ditch to Private Drivew	Minor Arterial		16	1.4	69	0	0	2	1	13	0	2	1	13	0	0	0	0	0	0	0	0	0
US-89	Private Driveway to 3450 S	Other Principal Arterial	Perry	5	1.2	15	0	0	0	1	4	0	0	0	5	0	0	0	0	0	0	0	0	0
Federal Aid Routes																								
Fruitland Dr	Private Driveway to 1700 N	Minor Collector	North Ogden	5	13.7	15	0	0	0	1	4	1	0	0	3	1	0	0	0	0	0	0	0	0
2550 N	300 E to Washington Blvd	Major Collector	North Ogden	5	10.3	5	0	0	0	0	5	2	1	0	2	0	0	0	0	0	0	0	0	0
2550 N	Charleston Ave to 200 E	Major Collector	North Ogden	3	4.9	3	0	0	0	0	3	0	1	0	1	0	0	0	0	0	1	0	0	0
1700 N	Washington Blvd to 425 E	Major Collector	North Ogden	3	2.7	3	0	0	0	0	3	0	2	0	1	0	0	0	0	0	0	0	0	0
3100 N	1150 E to 1225 E	Major Collector	North Ogden	3	2.6	24	0	0	0	2	1	0	0	0	2	0	0	1	0	0	0	0	1	0
Mountain Rd	1700 N to 1925 N	Major Collector	North Ogden	6	2.6	16	0	0	0	1	5	0	1	0	4	0	0	0	0	0	1	0	0	0
700 S	200 W to 100 W	Minor Arterial	Brigham City	4	1.5	107	0	1	0	1	2	0	0	0	2	1	0	0	1	0	0	0	0	0
North Ogden Canyon Rd	Mountain Rd to Private Driveway	Major Collector	North Ogden	4	1.0	36	0	0	1	1	2	0	0	0	4	0	0	0	0	0	0	0	0	1
700 S	200 E to 300 E	Major Collector	Brigham City	3	0.9	24	0	0	0	2	1	1	0	0	0	2	0	0	0	0	0	0	0	0
500 W	700 S to 600 S	Minor Arterial	Brigham City	5	0.5	129	0	1	1	1	2	0	2	0	1	1	0	0	0	0	1	0	0	0
Local Streets																								
600 W	400 S to 300 S	Local	Brigham City	3	819.1	24	0	0	1	0	2	1	0	0	1	1	0	0	0	0	0	1	0	0
1150 S	Commerce Way to Dollar Tree	Local	Brigham City	6	110.3	16	0	0	0	1	5	3	0	0	2	0	0	0	0	1	0	0	0	0
3000 S	1080 W to US-89	Local	Perry	3	104.7	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
400 S	Private Driveway to 800 W	Local	Brigham City	3	69.3	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
1000 W	SR-13 to 900 W	Local		3	18.5	3	0	0	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0
200 S	200 W to 100 W	Local	Brigham City	3	10.9	13	0	0	0	1	2	0	0	0	1	1	0	0	0	1	0	0	0	0
1850 W	Eccles St to 2700 N	Local	Farr West	3	10.1	56	0	0	2	1	0	2	0	0	1	0	0	0	0	0	0	0	0	1
700 N	Main St to 100 E	Local	Brigham City	3	9.4	35	0	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1
2600 W	Forest St to 800 N	Local	Brigham City	4	2.1	46	0	0	1	2	1	0	0	0	4	0	0	0	0	0	0	0	0	1
Perry St	Maddox Ln to 1200 S	Local	Brigham City	5	-0.3	98	0	1	0	0	4	1	0	0	4	0	0	0	0	0	0	1	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

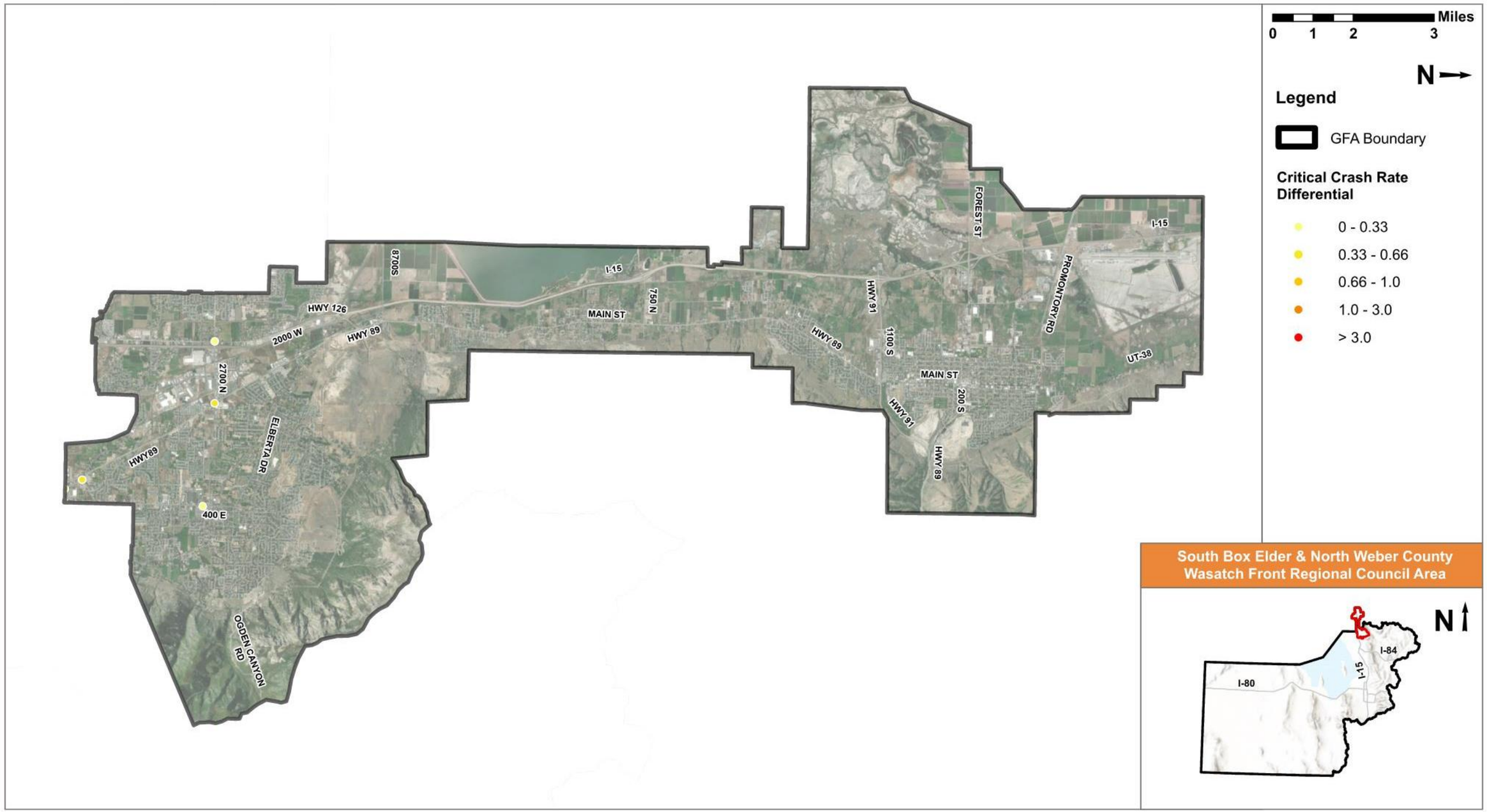


Figure 5.4 – CCR Differential – Intersections (Signalized)

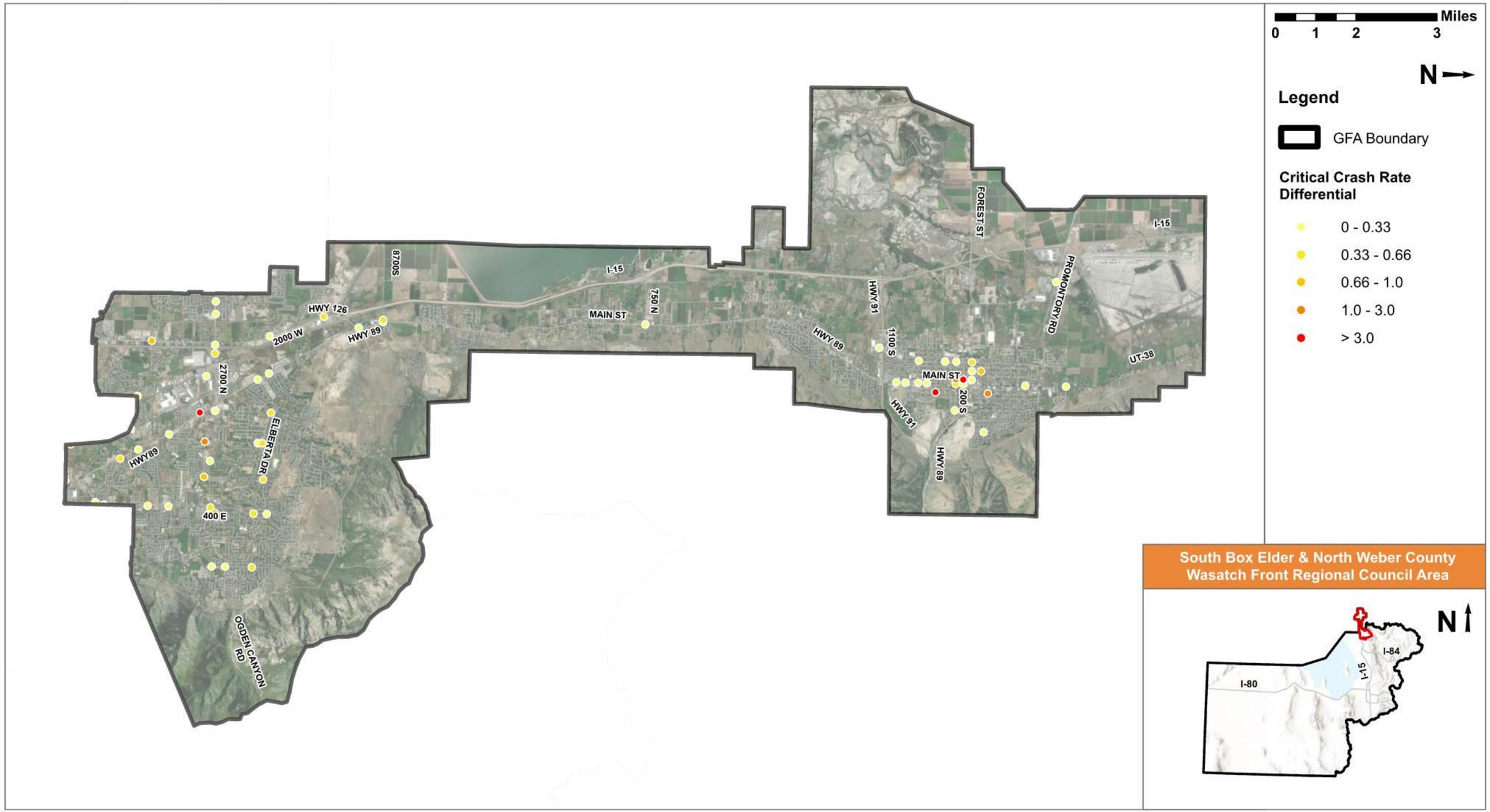


Figure 5.5 – CCR Differential – Intersections (Unsignalized)

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
Signalized Intersections																						
Hwy 89 & 2700 N	Pleasant Vie	97	0.5	675	0	1	16	14	66	38	43	4	2	1	0	1	1	6	1	0	1	0
Wall Ave & Harrisville Rd	Harrisville	72	0.4	524	0	1	12	10	49	35	26	1	4	0	0	0	1	4	1	0	0	0
2000 W & 2700 N	Farr West	35	0.2	232	0	1	1	8	25	18	12	2	2	0	0	0	0	1	0	0	1	0
400 E & 2550 N	North Ogden	62	0.1	262	0	0	5	9	48	39	18	0	0	0	0	0	0	4	1	0	0	0
Rulon White Blvd & 2700 N	Pleasant Vie	39	-0.3	320	0	1	3	12	23	12	21	1	3	1	0	0	0	1	0	1	0	1
600 W & 2700 N	Pleasant Vie	25	-0.4	307	0	1	5	8	11	13	5	3	3	0	0	0	0	0	1	0	0	0
Main St & 1100 S	Brigham City	50	-0.4	798	0	5	9	9	27	21	23	1	3	0	0	0	0	1	1	0	0	3
Commerce Way & 1100 S	Brigham City	44	-0.4	317	0	0	7	12	25	15	25	0	1	0	0	0	2	1	0	0	1	0
Washington Blvd & Larsen Ln	Harrisville	29	-0.6	259	0	1	4	5	19	9	13	3	1	0	1	0	0	2	0	0	0	0
Main St & 100 N	Brigham City	14	-0.7	997	1	0	4	1	8	8	1	2	2	0	0	0	0	1	0	1	0	0
Unsignalized Intersections																						
&	Pleasant Vie	7	34.4	39	0	0	1	1	5	3	0	0	3	0	0	0	0	0	1	0	0	0
100 W & Michelle St	Pleasant Vie	3	7.3	13	0	0	0	1	2	2	0	0	1	0	0	0	0	0	0	0	0	0
100 W & 100 S	Brigham City	7	5.3	50	0	0	2	0	5	6	0	0	1	0	0	0	0	0	0	0	0	0
200 E & 500 S	Brigham City	3	3.5	24	0	0	1	0	2	2	0	0	0	1	0	0	0	0	0	0	0	0
200 E & 200 N	Brigham City	3	1.9	46	0	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0
100 W & 200 S	Brigham City	3	1.6	3	0	0	0	0	3	1	1	0	1	0	0	0	0	0	0	0	0	0
575 W & 2550 N	Pleasant Vie	5	1.1	36	0	0	0	3	2	3	2	0	0	0	0	0	0	0	0	0	0	0
Charleston Ave & 2550 N	North Ogden	4	0.9	47	0	0	2	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
450 E & 2650 N	North Ogden	3	0.9	13	0	0	0	1	2	2	0	0	0	1	0	0	0	0	0	0	0	0
300 W & 100 N	Brigham City	3	0.8	13	0	0	0	1	2	3	0	0	0	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

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 South Box Elder & North Weber Counties 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 – Crash Profile Risk Segments (Federal Aid Routes)

Area Type	Road Segment	Extents	Risk Score
Urban	1900 North / 1800 North	West GFA Extents to SR-89	21.8 to 24
Urban	Mountain Road	South GFA Extents to 2750 North	21.6 to 24
Urban	2600 North	Washington Boulevard to Mountain Road	22.8
Urban	1050 East	2600 North to 3100 North	22
Urban	3100 North	300 West to Mountain Road	21 to 21.4
Urban	2100 North	Washington Boulevard to Fruitland Drive	20
Rural	1500 West	Bill Bailey Street to 2700 North	23.5
Rural	Larsen Lane	US-89 to Washington Boulevard	23
Rural	2600 North	Washington Boulevard to 475 East	23
Rural	1900 North / 1800 North	West GFA Extents to SR-89	21.8 to 24

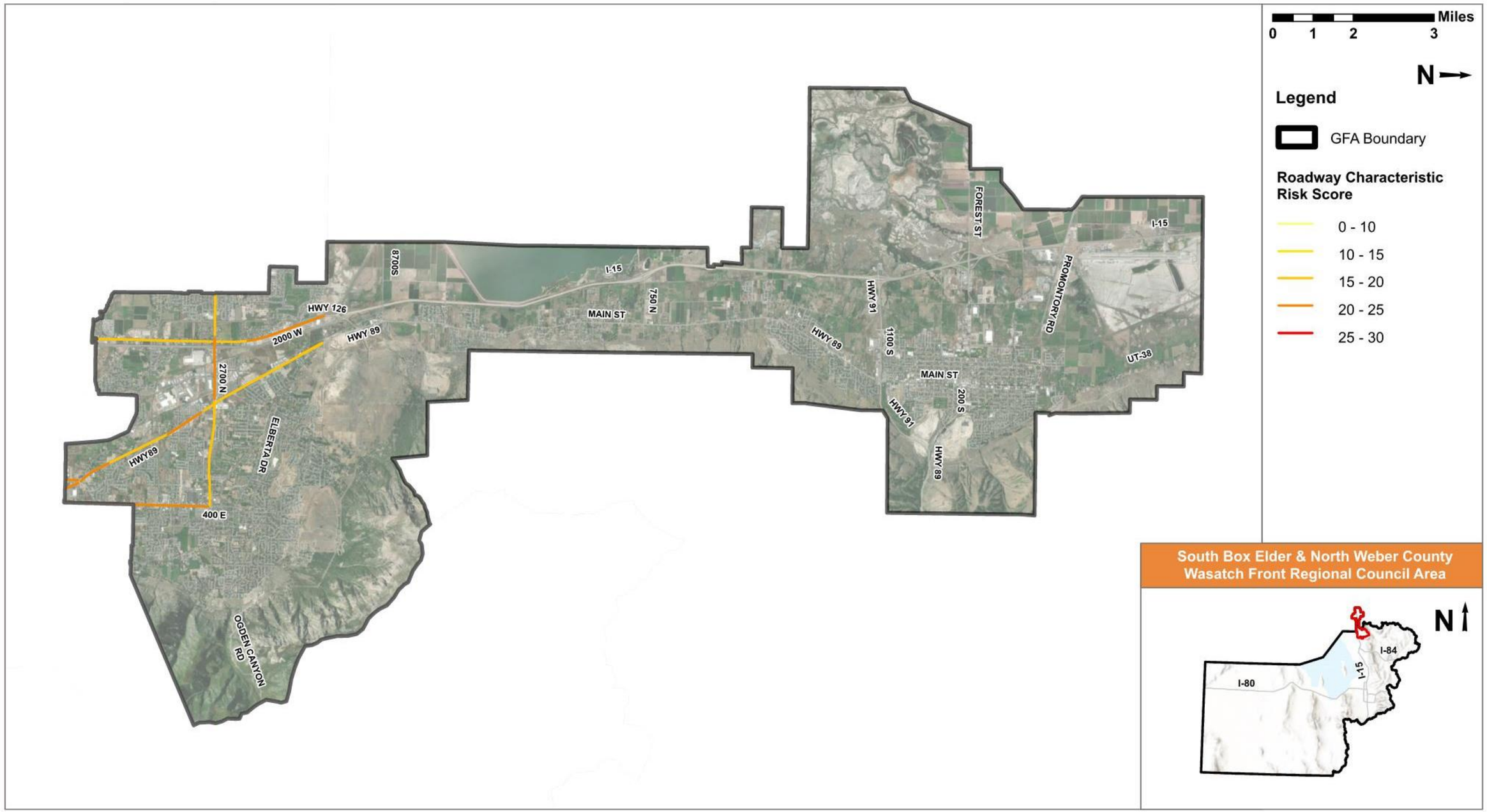


Figure 6.1 – Crash Profile Risk Assessment Results (State Routes)

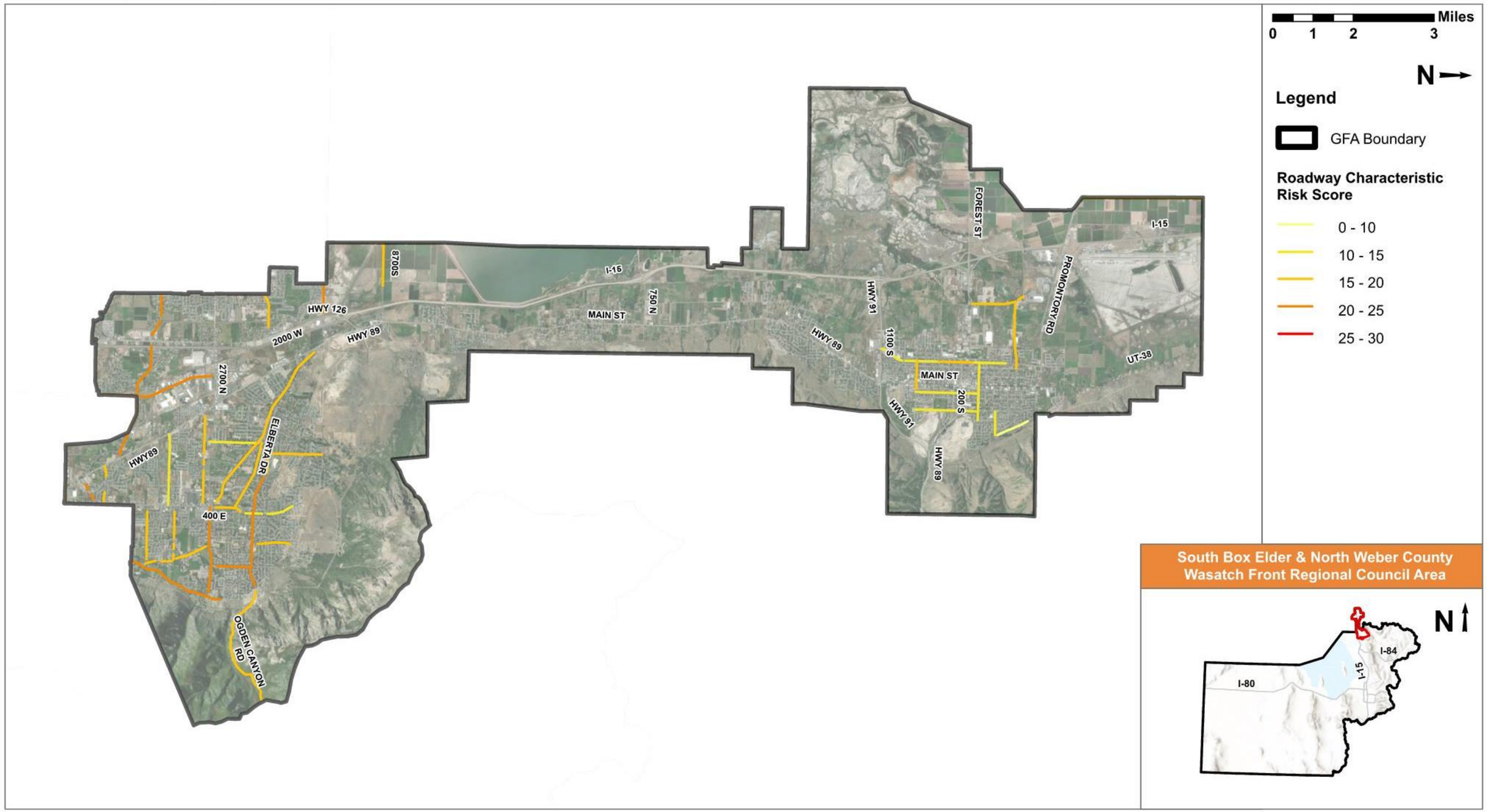


Figure 6.2 – Crash Profile Risk Assessment Results (Federal Aid Routes)

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 South Box Elder & North Weber Counties 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
2800 West	SR-13 to Study Extents North	X	X	X
1200 West	Forest Street to 800 North		X	
8700 South	West GFA Extents to 1500 W		X	
2600 North	Washington Blvd to Mountain Road	X	X	X
800 East	3100 North to Fox Lane	X	X	
1050 East	2600 North to 3100 North	X	X	X
2100 North	Washington Blvd to Fruitland Drive	X	X	
1700 North	Washington Blvd to Fruitland Drive	X	X	
Mountain Road	South GFA Boundary to Fruitland Drive		X	
Mountain Road	Fruitland Drive to 2750 North		X	X
1200 West	Bill Bailey St to Harrisville Road	X	X	X
Harrisville Road / 1800 North	I-15 to US-89	X	X	X
1500 West	Harrisville Road to 2700 North	X	X	X
4000 North	West GFA Boundary to 2530 West	X	X	X
3300 North	West GFA Boundary to Higley Road	X	X	
1900 North	2300 West to I-15	X	X	X
1900 North	West GFA Boundary to 2300 West		X	X
Larsen Road	US-89 to Washington Blvd	X	X	X

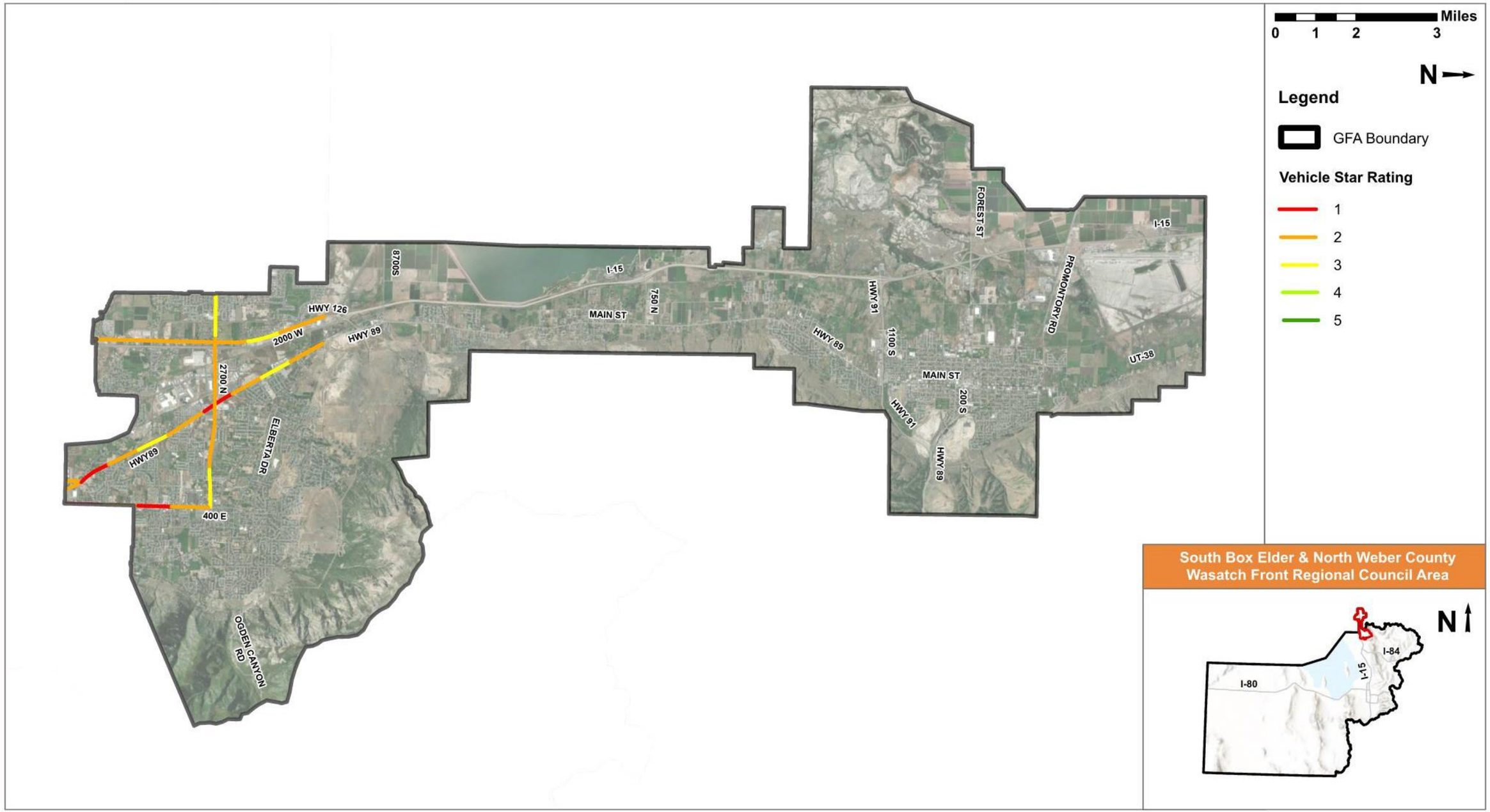


Figure 6.3 – Vehicle Star Rating (State Routes)

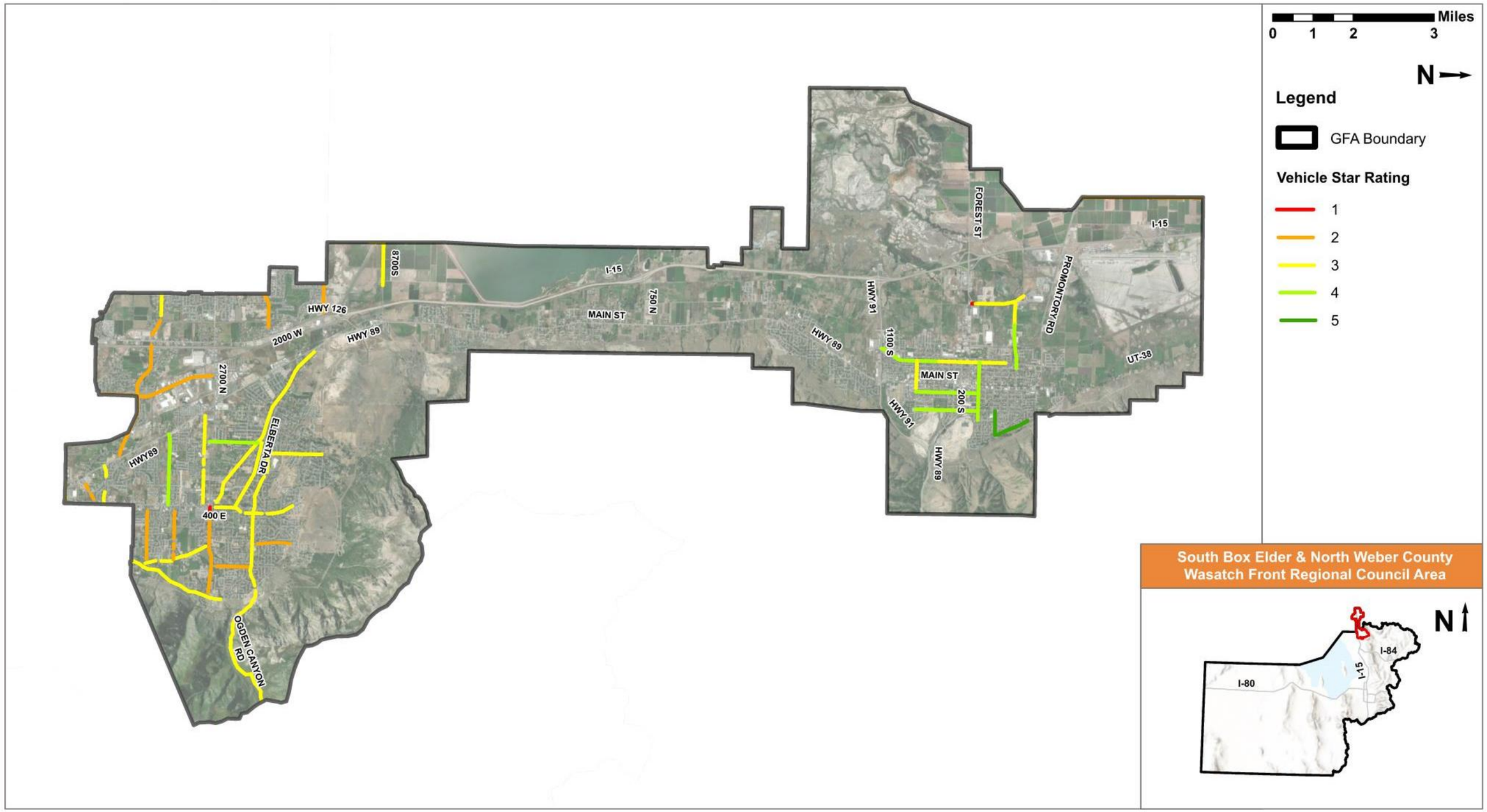


Figure 6.4 – Vehicle Star Rating (Federal Aid Routes)

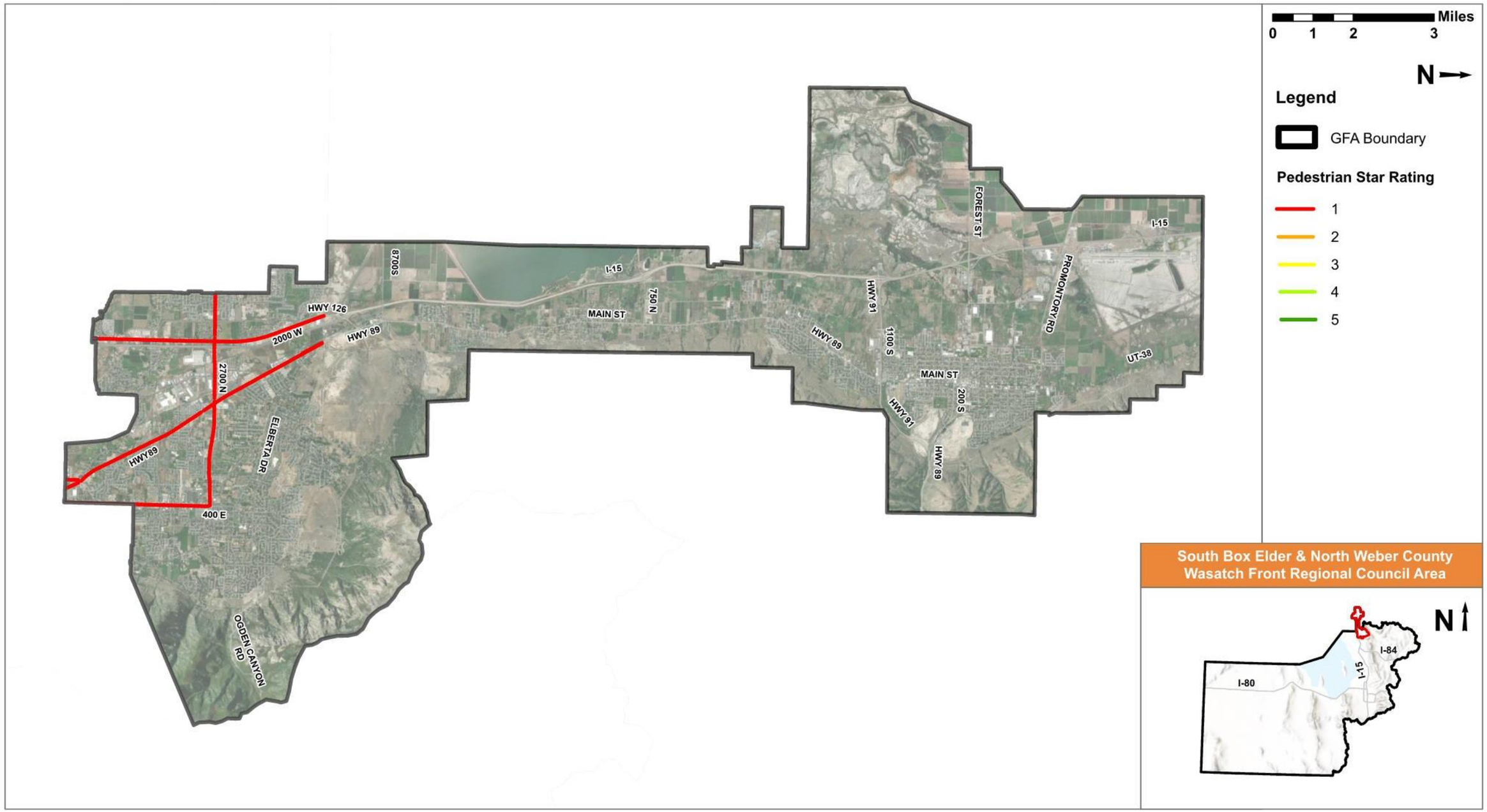


Figure 6.5 – Pedestrian Star Rating (State Routes)

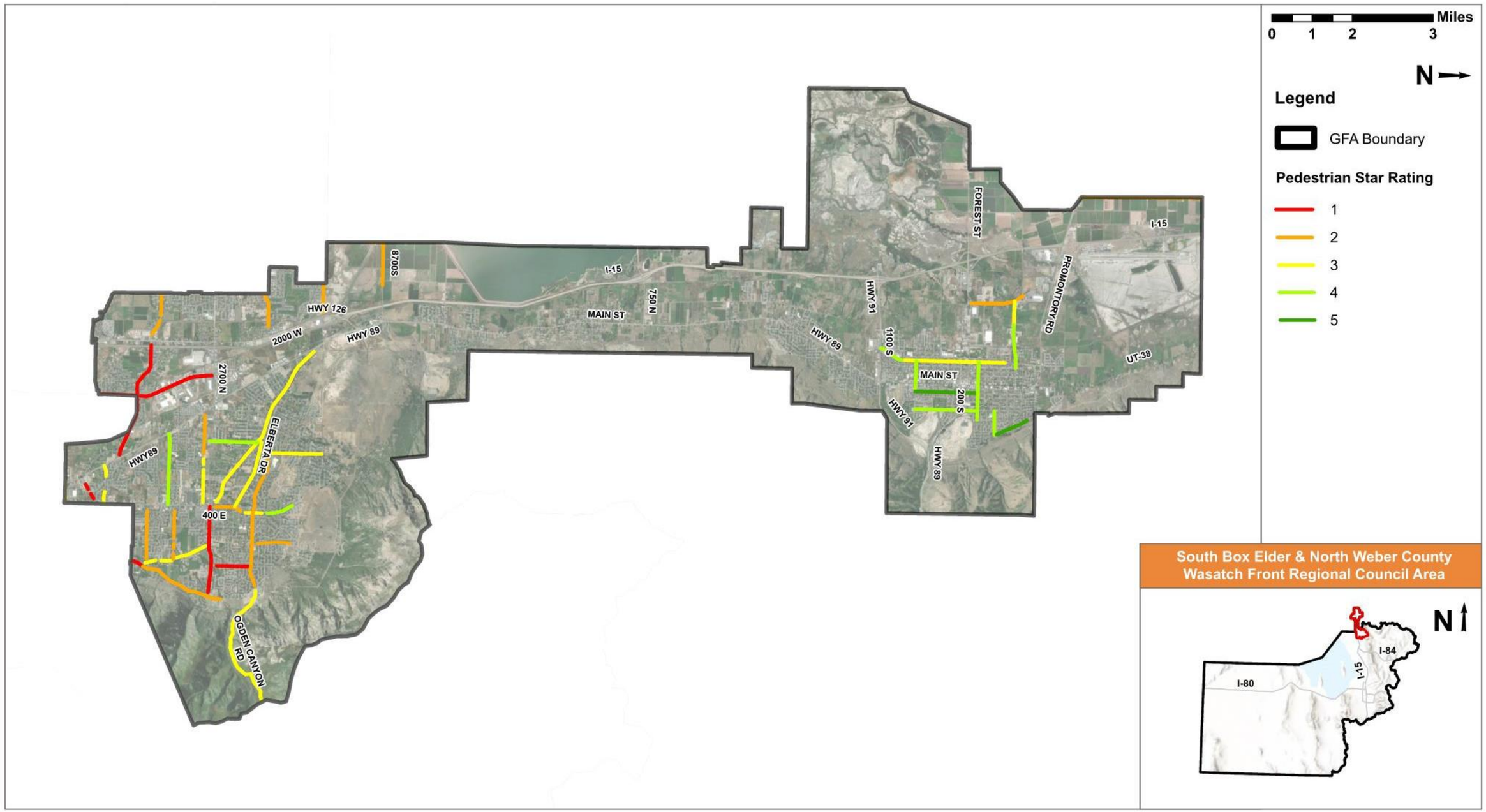


Figure 6.6 – Pedestrian Star Rating (Federal Aid Routes)

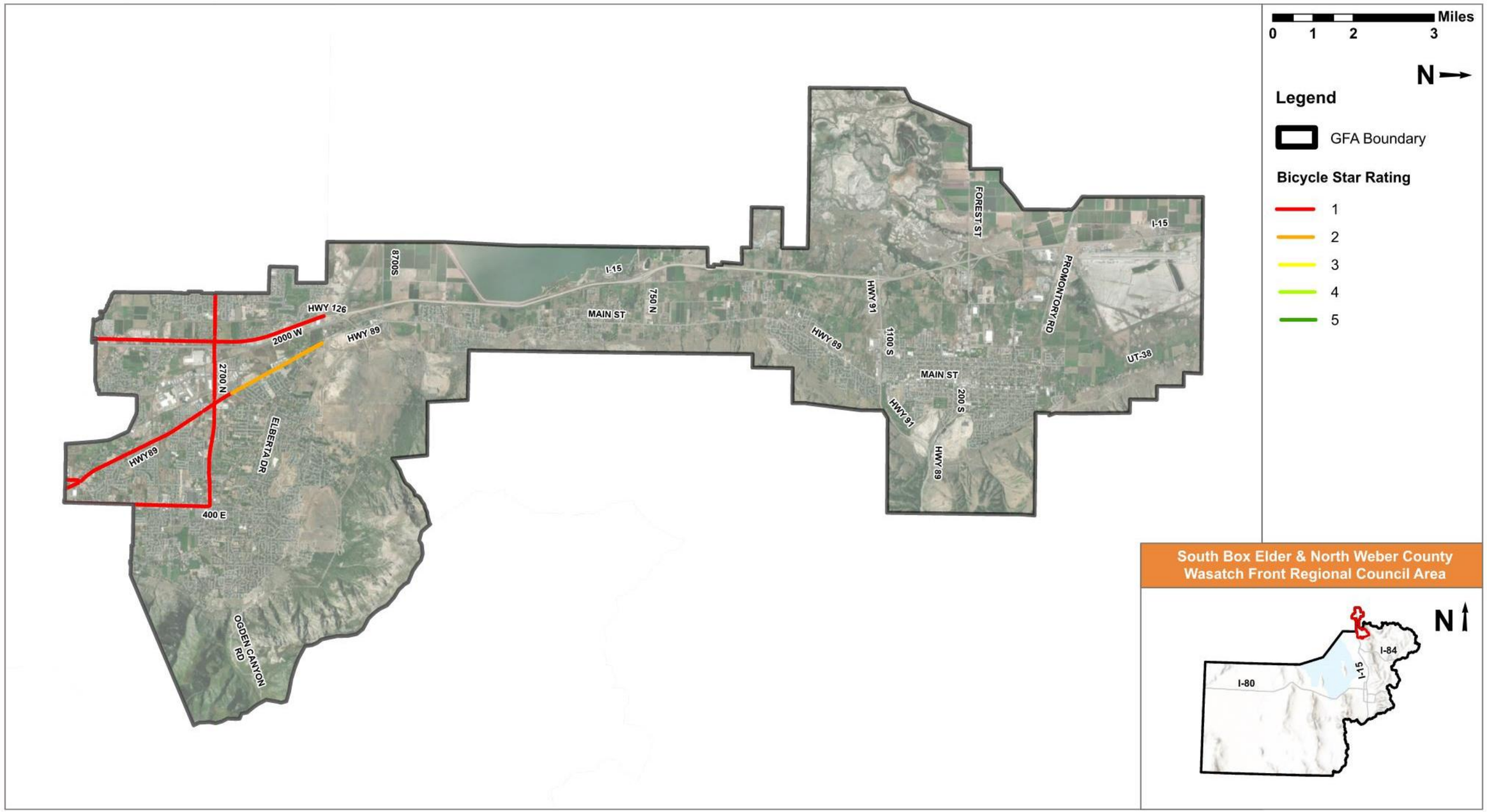


Figure 6.7 – Bicycle Star Rating (State Routes)

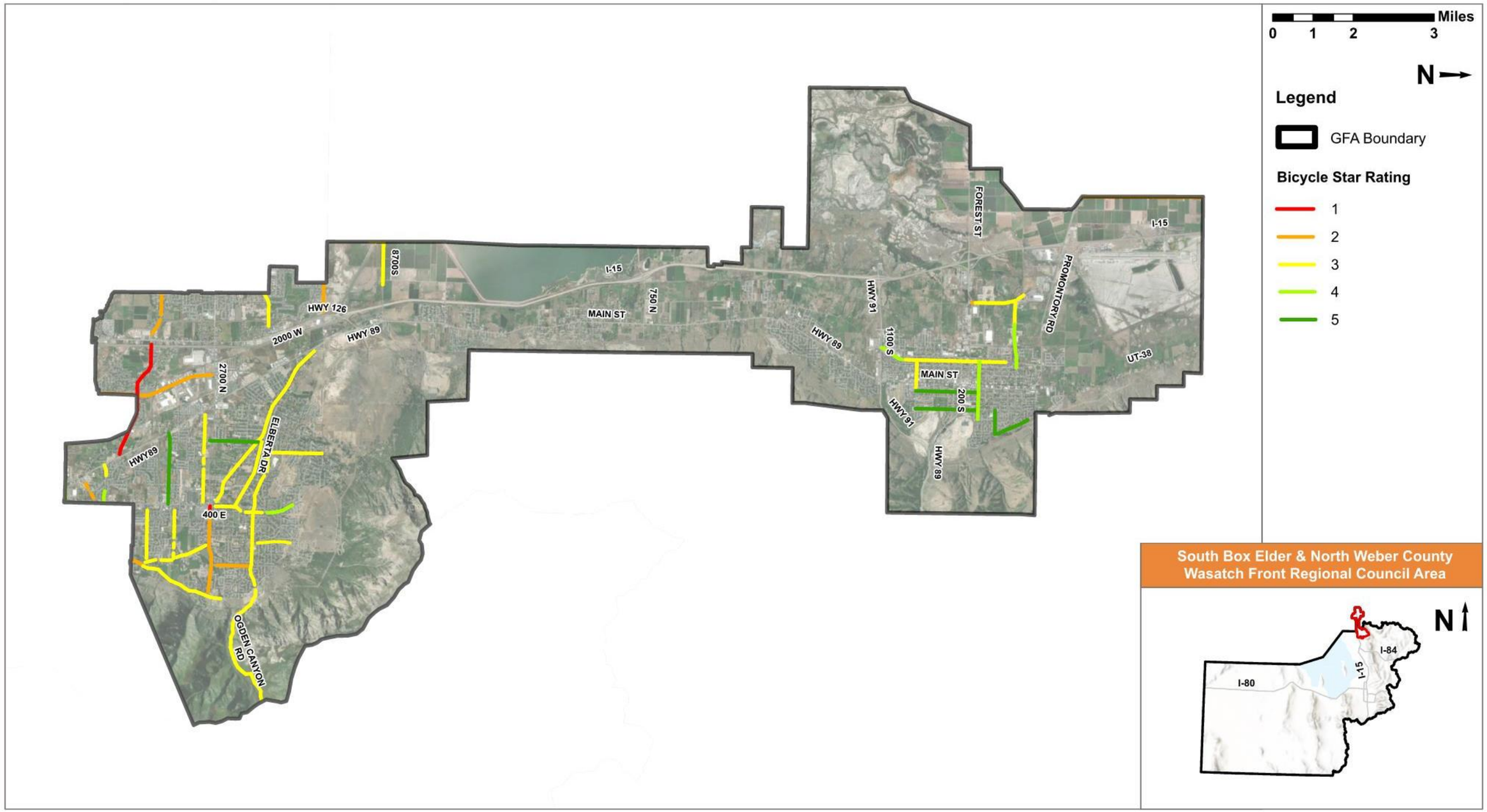


Figure 6.8 – Bicycle Star Rating (Federal Aid Routes)

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 shown in **Figure 6.9**. Mapped segments include the top 5% local road risk segments within the WFRC study area and the top 10 local road segments within the South Box Elder & North Weber Counties GFA.

Table 6.3 – Local Street High Priority Segments

Road Segment	Extents
North Street	400 West – Monroe Street
600 South	400 West – 400 East
Forest Street	800 West – Main Street
500 West/Medical	Forest – 1150 South
700 South	1000 West – 700 East
Rulon White/1500 West	UT-134 – 2100 North
Fishburn Drive	200 East – 900 South
100 North	300 West – 600 East
3100 North	Mt Lomond Drive – 800 East
3500 North /Weber High Drive	600 West – 250 West

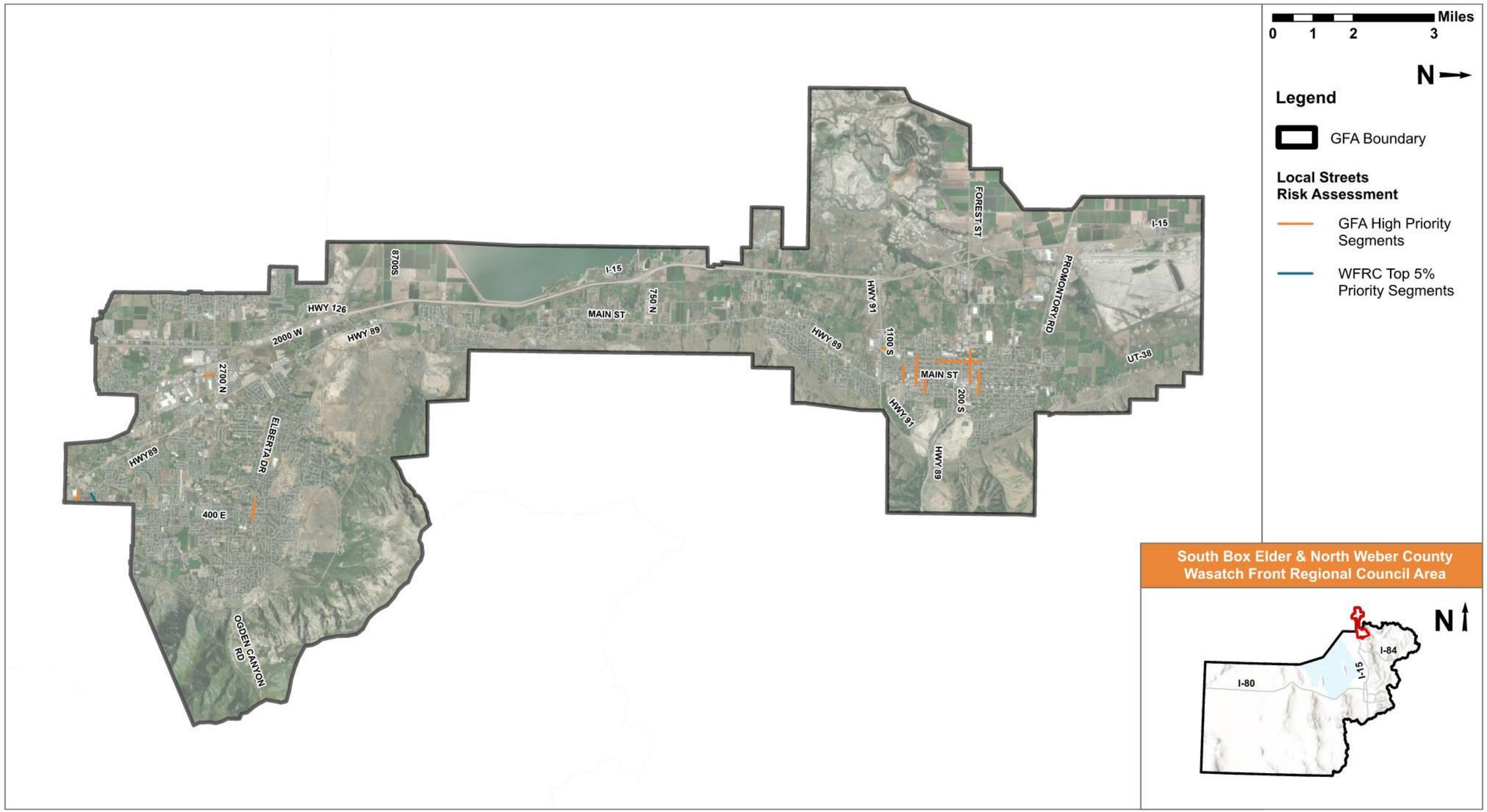


Figure 6.9 – Local Street Risk Assessment Results

7. Safety Analysis Summary

This section summarizes the safety analysis performed for the South Box Elder & North Weber Counties 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 South Box Elder & North Weber Counties GFA:

- Roadway Departure
  - 37.3% of all fatal and serious injuries
  - 31.3% of all fatal and serious injury crashes
- Speed Related
  - 33.7% of all fatal and serious injuries
- Intersections
  - 31.9% of all fatal and serious injuries
- No Safety Restraints
  - 22.3% of all fatal and serious injuries
- Older Driver
  - 21.7% of all fatal and serious injuries
- Active Transportation
  - 8.41% of all fatal and serious injury crashes
- Left Turn at Intersection
  - 11.5% 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 South Box Elder & North Weber Counties 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 Network

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

Table 7.2 – South Box Elder & North Weber Counties 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											
2600 N	Washington Blvd to 950 E	Major Collector	North Ogden	4	1.0	X	X	X	X		X
1500 W, 1200 W	2150 N to 1350 N	Minor Arterial	Farr West	4	1.2	X	X	X	X		X
Harrisville Rd	1800 N to Harrisville Rd	Major Collector	Farr West, Harrisville	4	2.5	X	X	X	X		X
Larsen Ln	Wahlen Way to 375 E	Minor Arterial	Harrisville	4	0.2	X	X	X	X		X

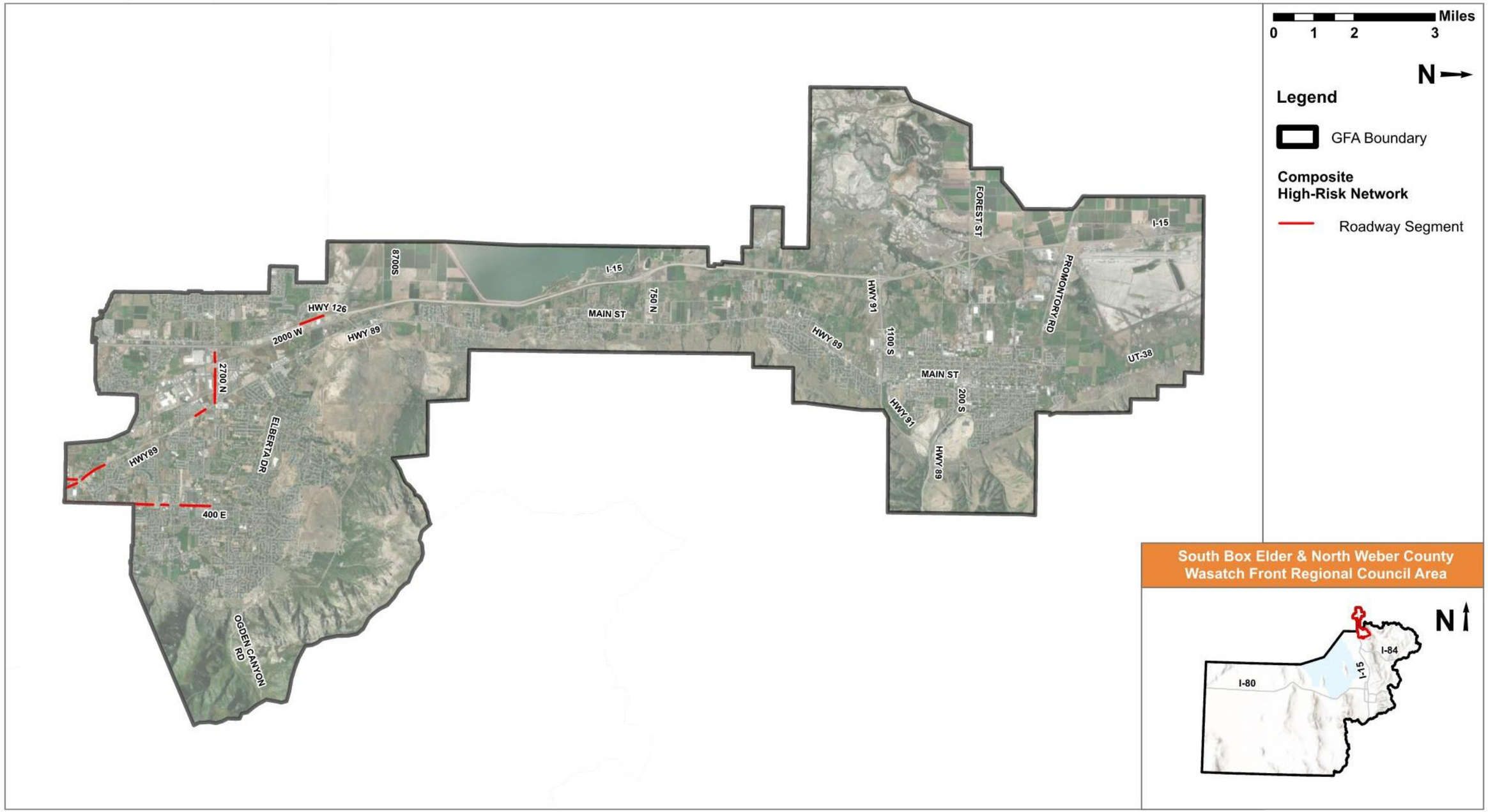


Figure 7.1 – South Box Elder & North Weber Counties High-Risk Roadway Network (State Routes)

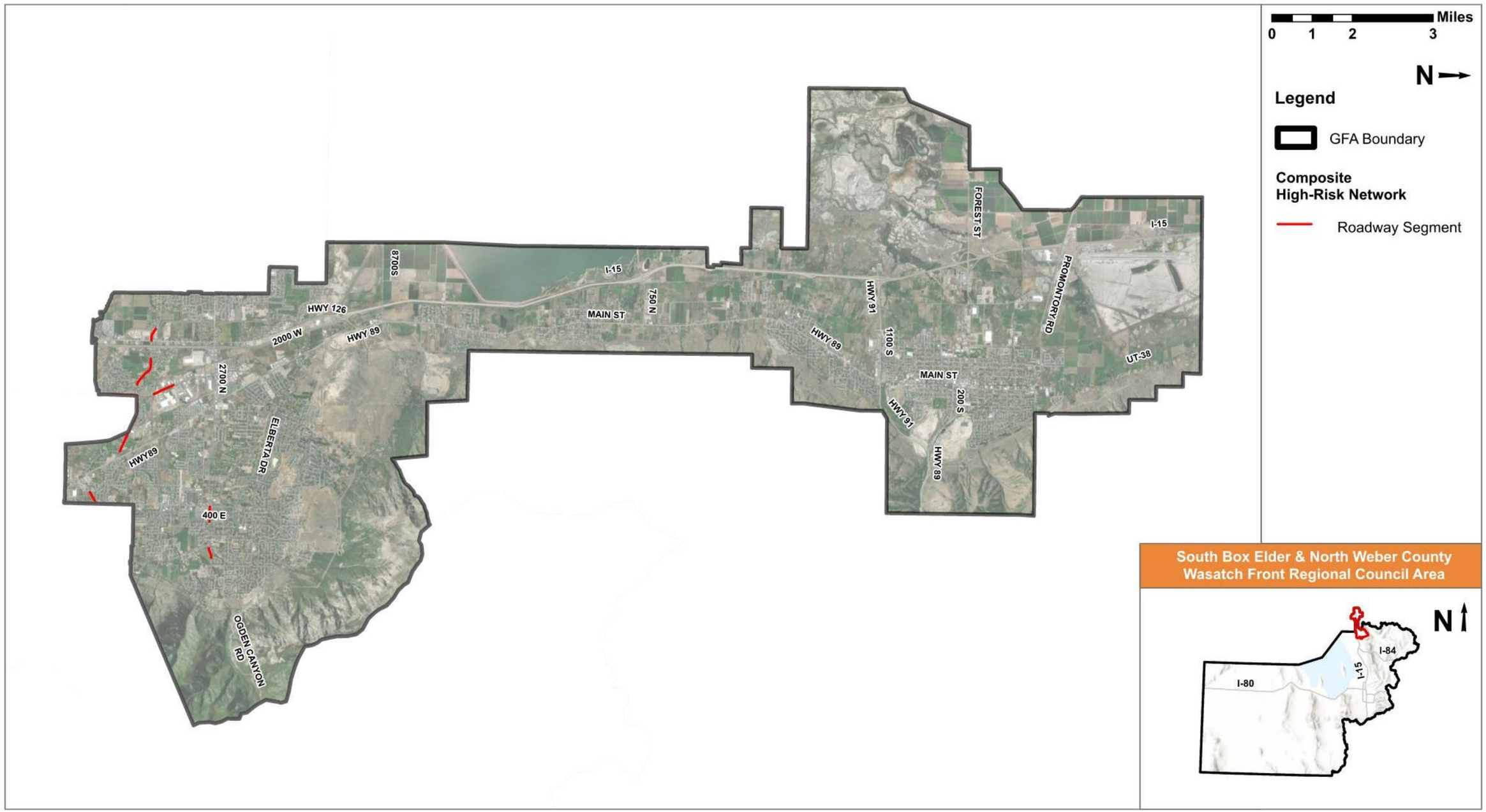


Figure 7.2 – South Box Elder & North Weber Counties High-Risk Roadway Network (Federal Aid Routes)

APPENDIX

SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY CASE STUDY PROJECT INFORMATION SHEETS

South Box Elder & North Weber County

Project ID	Jurisdictions	Project Name
1.1.1	Brigham City	500 West from Forest Street to 1150 South
1.1.2	Brigham City	Systemic Unsignalized Intersection Improvements
1.1.3	Brigham City	Main Street Signalized Intersection Improvements: 990 South, 700 South, 200 South, and 100 South
1.2.1	Perry	US 89 from 1100 South to 3600 South
1.3.1	Willard	US 89 from North Willard Limits to South Willard Limits
1.4.1	Farr West	1800/Harrisville Road from 2750 West to 1200 West
1.4.2.1	Farr West, Pleasant View	2700 North (SR-134) from 2575 West to US 89
1.4.3.1	Farr West, Marriott-Slaterville	1200 West from 2700 North to 17th Street
1.5.1	Harrisville	Harrisville Road from 1200 West to US 89
1.5.2	Harrisville	Larsen Lane from Harrisville Road to Washington Boulevard
1.5.3.1	Harrisville, Pleasant View, Uintah, Ogden, South Ogden	US 89 from SR 134 to I-84
1.6.1	North Ogden	2600 North from Washington Boulevard to Mountain Road
1.6.2	North Ogden	Washington Boulevard Intersection Improvements: 2600 North, 2650 North, 3100 North, and 2300 North
1.6.3	North Ogden	2600 North, 2650 North from Washington Boulevard to 550 East
1.7.1.1	Pleasant View, Farr West	2700 North (SR-134) from 2575 West to US 89

Project Information Sheet

GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**500 West from Forest Street to 1150 South**	**Prepared By:**	**JSF/MA**
Jurisdiction(s):	**Brigham City**	**Checked By:**	**ES**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium**		

Location Description

Roadway:	500 West	**Key Intersection Locations:**	
From:	Forest Street	700 South	Forest Street
To:	1150 South	400 South	
Length:	1.79 miles	200 South	

Project Location Map

Map ID: 1.1.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**1.79**
Average Daily Traffic (vehicles per day)	**8,522**
Functional Classification	**Minor Arterial**
Roadway Ownership	**Federal Aid - Local**
Urban/Rural Designation	**Urban**
Number of Key Intersections	**4**

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)	**5**
Possible Injury Crashes (C)	**4**
No Injury/PDO Crashes (O)	**21**
Total Crashes	**31**
Total EPDO Crashes	**272**

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
700 South & 500 West	✓	0	0	0	2	4	6	27					✓			✓
400 South & 500 West		0	0	2	2	1	5	68		✓	✓					
200 South & 500 West		0	0	1	0	4	5	26				✓				
Forest Street & 500 West	✓	1	1	3	8	11	24	1,151	✓	✓	✓					

Project Description/How is safety improved?

This project includes striping improvements from W 1100 S to Forest St to delineate the parking area/shoulder, which by default will narrow the travelled lane; bulbouts at major residential collector intersections to encourage lower travel speeds; striped bike lane integrated into the delineated shoulder from W 1100 S to Forest St to mitigate overrepresentation of parking-related and rear end collisions along S 500 W; enhanced pedestrian crossing at the intersections of W 400 S/S 500 W and Camaren Dr/S 500 W to improve access to the schools west of S 500 W and to address overrepresentation of pedestrian and bicycle collisions; and intersection control evaluations for the intersections of 400 S/500 W and Forest St/500 W to evaluate the potential implementation of roundabouts, consistent with

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

Appropriate Speed Limits for All Road Users


Bicycle Lanes


Crosswalk Visibility Enhancements


Rectangular Rapid Flashing Beacons (RRFB)


Roundabouts


Wider Edge Lines

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Traffic Calming - Bulbouts	0.68	All Crashes	8.00	EACH	$ 36,000	$ 288,000
Traffic Calming - Lane Narrowing	0.68	All Crashes	1.60	MILE	$ 39,000	$ 62,400
Traffic Calming - Wider Lane Lines	0.68	All Crashes	1.60	MILE	$ 21,000	$ 33,600
Install Bicycle Lane	0.51 - 0.69	Bicycle	1.60	MILE	$ 21,000	$ 33,600
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install a Rectangular Rapid Flashing Beacons (RRFB)	0.526	Pedestrian	2.00	XING (2)	$ 15,000	$ 30,000
Install High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	2.00	XING	$ 36,000	$ 72,000
Convert Existing Intersection to Modern Roundabout	0.18 - 0.59	All Crashes	2.00	INT	$ 2,500,000	$ 5,000,000
Perform an Intersection Control Evaluation and Implement	NA	All Crashes	2.00	INT	$ 225,000	$ 450,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 5,969,600
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 298,480
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 1,790,880
Estimated Construction Cost:		$ 8,133,960

Local Match†: 20% $ 2,066,200

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 976,075
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 1,220,094
Estimated Project Total:		$ 10,331,000

*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: Safe Routes to School
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

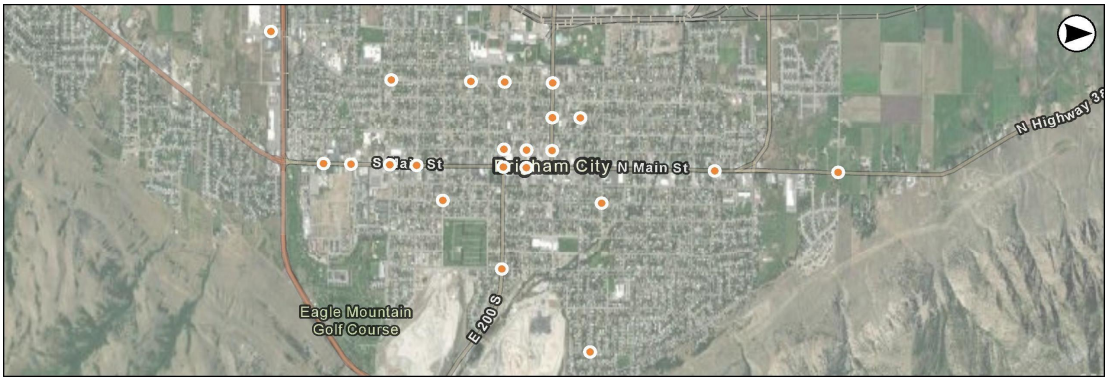
GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**Systemic Unsignalized Intersection Improvements**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Brigham City**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium**		

Location Description

		Key Intersection Locations:		
Roadway:	NA	Commerce Way & 1150 South	Main Street & 600 South	Main Street & 100 South
From:	NA	Main Street & 990 South	200 East & 500 South	100 West & 100 South
To:	NA	Main Street & Aggie Boulevard	600 East & 200 South	300 West & Forest Street
Length:	NA	Main Street & 700 South	100 West & 200 South	500 West & Forest Street
		500 West & 700 South	500 West & 200 South	100 West & Forest Street

Project Location Map

Map ID: 1.1.2



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	NA
Average Daily Traffic (vehicles per day)	NA
Functional Classification	NA
Roadway Ownership	NA
Urban/Rural Designation	NA
Number of Key Intersections	NA

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

Segment Crash History

Crash History (2018 - 2022)	# of crashes
Fatal Crashes (K)	NA
Suspected Serious Injury Crashes (A)	NA
Suspected Minor Injury Crashes (B)	NA
Possible Injury Crashes (C)	NA
No Injury/PDO Crashes (O)	NA
Total Crashes	NA
Total EPDO Crashes	NA

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

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
Commerce Way & 1150 South		0	0	1	7	7	15	109			✓					✓
Main Street & 990 South		0	0	6	11	8	25	267				✓				
Main Street & Aggie Boulevard		0	0	2	4	7	13	97			✓					
Main Street & 700 South		0	0	3	12	12	27	215			✓		✓			✓
500 West & 700 South		0	0	2	4	3	9	93		✓			✓			✓
Main Street & 600 South		1	1	0	4	5	11	1,033	✓							
200 East & 500 South		0	0	0	2	2	4	25		✓	✓					
600 East & 200 South		0	0	1	5	4	10	83		✓	✓					✓
100 West & 200 South		0	0	0	3	1	4	35		✓				✓		
500 West & 200 South		0	0	0	4	2	6	47				✓				
Main Street & 100 South		0	0	5	7	6	18	197		✓						
100 West & 100 South		0	0	0	3	3	6	37								
300 West & Forest Street		0	0	3	0	3	6	70						✓		
500 West & Forest Street		1	1	3	8	11	24	1,151	✓	✓	✓					
100 West & Forest Street		0	0	0	4	3	7	48		✓	✓					
Main Street & 700 North		1	0	1	5	3	10	970	✓	✓				✓		✓

Project Description/How is safety improved?

This project is focused on improving safety at unsignalized intersections by applying systemic countermeasures that mitigate pedestrian-involved and angle crashes at unsignalized intersections throughout the City. Countermeasures include installing high-visibility crosswalks, upgrading existing crosswalks to high-visibility style, installing bulbouts, and installing RRFBs. Similar countermeasures may be installed at unsignalized intersections throughout the City or along a corridor for consistency. Additional intersections not listed on the project sheet include, Forest Street and 900 North with Main Street and the intersections of 200 West, 400 East, and 200 South with 4th Street.

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


Rectangular Rapid Flashing Beacons (RRFB)


Stop-Controlled Intersection Systemic Countermeasures

Opinion of Probable Construction Cost

Segment Improvements

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

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Systemic Low-Cost Countermeasures at Stop-Control Intersection	0.73 - 0.9	All Crashes	16.00	INT	$ 19,000	$ 304,000
Install High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	25.00	XING	$ 36,000	$ 900,000
Upgrade Existing Crosswalk to High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	12.00	XING	$ 37,000	$ 444,000
Traffic Calming - Bulbouts	0.68	All Crashes	22.00	EACH	$ 36,000	$ 792,000
Install a Rectangular Rapid Flashing Beacon (RRFB)	0.526	Pedestrian	2.00	XING (2)	$ 15,000	$ 30,000
Convert Existing Intersection to Modern Roundabout	0.18 - 0.59	All Crashes	3.00	INT	$ 2,500,000	$ 7,500,000
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 9,970,000
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 498,500
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 2,991,000
Estimated Construction Cost:		$ 13,534,500

Local Match†: 20% $ 3,437,800

† Toward SS4A Implementation Grants

Preconstruction Engineering/Design	*12%*	$ 1,624,140
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 2,030,175
Estimated Project Total:		$ 17,189,000

*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:	Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #3:	Targeted Enforcement and Deterrence
Additional Improvements #4:	Education Campaigns for Vulnerable Groups
Additional Improvements #5:	Neighborhood Slow Zones

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):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**Main Street Signalized Intersection Improvements**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Brigham City**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium**		

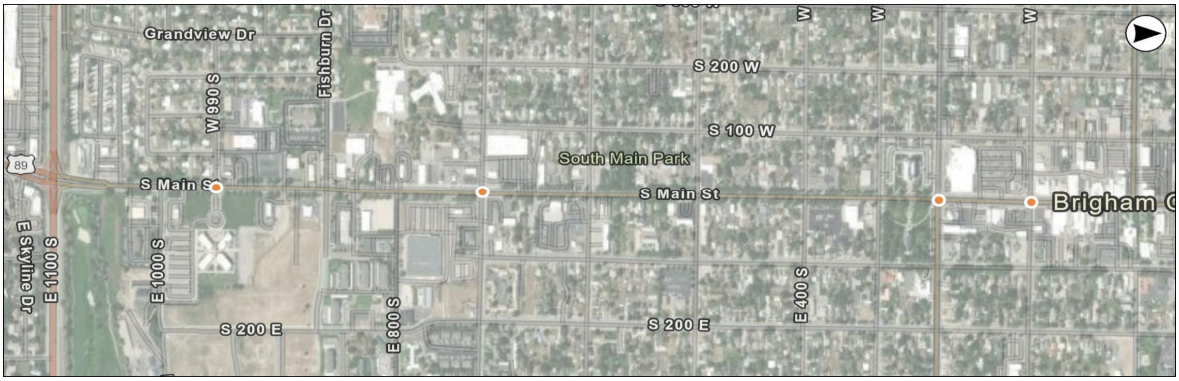
Location Description

Roadway:	NA
From:	NA
To:	NA
Length:	NA

Key Intersection Locations:
990 South & Main Street
700 South & Main Street
200 South & Main Street
100 South & Main Street

Project Location Map

Map ID: **1.1.3**



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**NA**
Average Daily Traffic (vehicles per day)	**NA**
Functional Classification	**NA**
Roadway Ownership	**NA**
Urban/Rural Designation	**NA**
Number of Key Intersections	**NA**

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

Segment Crash History

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

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

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
990 South & Main Street	✓	0	0	6	11	8	25	267				✓				
700 South & Main Street	✓	0	0	3	12	12	27	215		✓	✓		✓			✓
200 South & Main Street	✓	0	0	4	17	16	37	298		✓	✓					
100 South & Main Street	✓	0	0	2	5	7	14	108			✓					

Project Description/How is safety improved?

This project improves safety at signalized intersections on Main Street by implementing countermeasures that mitigate pedestrian-involved crashes and speed issues. Countermeasures include signal timing (for left-turns and pedestrians), and traffic calming to manage speed including bulbouts at the downtown intersections of 100 South and 200 South. To mitigate angled crashes each intersection is upgraded to include left-turn lane signal heads. Pedestrian activated signals (RRFB) are propsed at aoll unsignalized midblock crossings (South of 100 North & South of 100 South). Forest St. & 100 N. signals are included for consistency on Main St.

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

Appropriate Speed Limits for All Road Users


Leading Pedestrian Interval


Yellow Change Intervals


Rectangular Rapid Flashing Beacons (RRFB)

Opinion of Probable Construction Cost

Segment Improvements

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

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Include a Leading Pedestrian Interval (LPI)	0.87	Pedestrian	2.00	INT	$ 3,000	$ 6,000
Change Permissive Left-Turn to Protected or Protected/Permissive	0.79 - 0.95	Left-Turn	6.00	INT	$ 8,000	$ 48,000
Traffic Calming - Bulbouts	0.68	All Crashes	8.00	EACH	$ 36,000	$ 288,000
Install a Rectangular Rapid Flashing Beacon (RRFB)	0.526	Pedestrian	2.00	XING (2)	$ 15,000	$ 30,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 372,000
*Mobilization: (% +/-)**	*10%*	$ 37,200
Traffic Control: (% +/-)	*5%*	$ 18,600
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 111,600
Estimated Construction Cost:		$ 539,400

Local Match*: **20%** **$ 137,200**

*

Preconstruction Engineering/Design	*12%*	$ 64,728
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 80,910
Estimated Project Total:		$ 686,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**US 89 from 1100 South to 3600 South**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Perry**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Low**		

Location Description

Roadway: US 89
From: 1100 South
To: 3600 South
Length: 3.20 miles

Key Intersection Locations:

Project Location Map

Map ID: 1.2.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	3.20
Average Daily Traffic (vehicles per day)	16,485
Functional Classification	Other Principal Arteria
Roadway Ownership	State
Urban/Rural Designation	Urban
Number of Key Intersections	0

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)	7
Possible Injury Crashes (C)	14
No Injury/PDO Crashes (O)	75
Total Crashes	**98**
Total EPDO Crashes	**577**

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

Project Description/How is safety improved?

This project improves safety by enhancing unsignalized intersections, managing driveway access, and managing speed. This includes speed feedback signs (Maddox area, and Tagge's Fruit Stand), unsignalized intersection improvements (at 3000 South, 2700 South, and 1550 South), raised medians to limit access and movements on US 89 (throughout entire corridor), and turn lanes to separate vehicles on US 89 (at 3000 South, 2700 South, and 1550 South). Additional pedestrian and bicycle improvements should be considered pending recommendaitons from the in-process Perry City US 89 Corridor Master Plan.

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


Corridor Access Management

Appropriate Speed Limits for All Road Users


Stop-Controlled Intersection Systemic Countermeasures


Dedicated Left and Right-Turn Lanes at Intersections


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Driver Feedback Speed Limit Signs	NA	All Crashes	6.00	EACH	$ 10,000	$ 60,000
Corridor Access Management-Driveway Consolidation (Urban)	0.69 - 0.75	Fatal & Injury	10.00	DRIVEW	$ 7,000	$ 70,000
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	2.45	MILE	$ 928,000	$ 2,273,600
Traffic Calming - Wider Lane Lines	0.68	All Crashes	2.45	MILE	$ 21,000	$ 51,450
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Systemic Low-Cost Countermeasures at Stop-Control Intersection	0.73 - 0.9	All Crashes	3.00	INT	$ 19,000	$ 57,000
Provide Right-Turn Lanes	0.74 - 0.86	All Crashes	6.00	LANE	$ 150,000	$ 900,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 3,412,050
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 170,603
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 1,023,615
Estimated Construction Cost:		$ 4,681,268

Local Match†: 20% $ 1,189,200

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 561,752
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 702,190
Estimated Project Total:		$ 5,946,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Set Appropriate Speed Limits for All Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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): South Box Elder & North Weber County
Project Name: US 89 from North Willard Limits to South Willard Limits
Jurisdiction(s): Willard
Emphasis Areas: Roadway Departures, Intersections, Impaired Driving
Equity Priority: Low

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

Location Description

Roadway: US 89
From: North Willard Limits
To: South Willard Limits
Length: 3.82 miles

Key Intersection Locations:
750 North

Project Location Map

Map ID: 1.3.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	3.82
Average Daily Traffic (vehicles per day)	12,059
Functional Classification	Other Principal Arteria
Roadway Ownership	State
Urban/Rural Designation	Urban
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)	1
Suspected Minor Injury Crashes (B)	8
Possible Injury Crashes (C)	8
No Injury/PDO Crashes (O)	39
Total Crashes	56
Total EPDO Crashes	402

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
750 North & Main Street	✓	0	1	1	7	7	16	203	✓		✓					

Project Description/How is safety improved?

This project improves safety through systemic speed management and driveway access management, and mitigates angle crashes at the 750 North intersection with US 89. This includes speed feedback signs, corridor access management through raised medians to managee access and movements on US 89, and widened shoulders to reduce roadway departure crashes throughout. Paved shoulder improvements to accomodate bicycles are recommended.

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


Corridor Access Management

Appropriate Speed Limits for All Road Users


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Driver Feedback Speed Limit Signs	NA	All Crashes	6.00	EACH	$ 10,000	$ 60,000
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	3.32	MILE	$ 928,000	$ 3,080,960
Shoulder Widening on Rural Roads	0.771	All Crashes	2.92	MILE	$ 32,000	$ 93,440
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Change a permissive only to Flashing Yellow Arrow	0.5 - 0.6	Left-Turn	1.00	INT	$ 8,000	$ 8,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 3,242,400
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 162,120
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 972,720
Estimated Construction Cost:		$ 4,452,240

Local Match†: 20% $ 1,131,000

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 534,269
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 667,836
Estimated Project Total:		$ 5,655,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Set Appropriate Speed Limits for All Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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

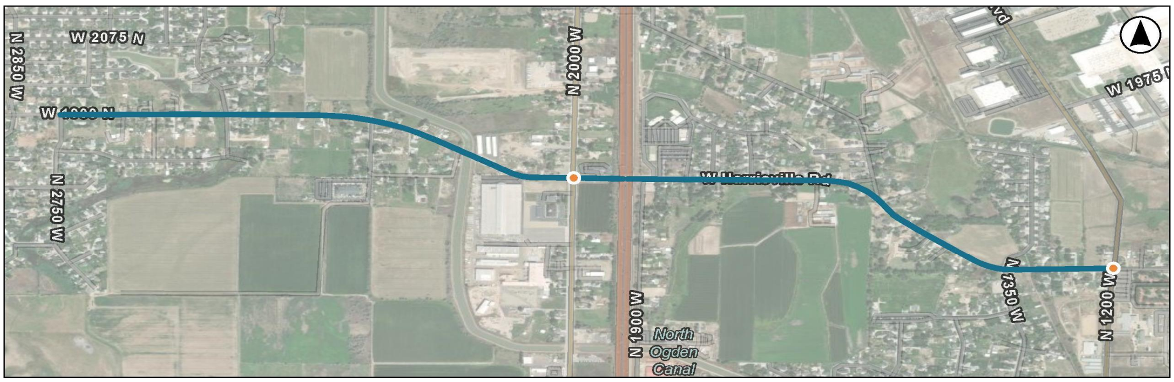
GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**1800/Harrisville Road from 2750 West to 1200 West**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Farr West**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Low**		

Location Description

Roadway:	1800/Harrisville Road	**Key Intersection Locations:**
From:	2750 West	2000 West
To:	1200 West	1200 West
Length:	2.13 miles	

Project Location Map

Map ID: 1.4.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	2.13
Average Daily Traffic (vehicles per day)	7,165
Functional Classification	Major Collector
Roadway Ownership	Federal Aid - Local
Urban/Rural Designation	Urban
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)	0
Suspected Serious Injury Crashes (A)	2
Suspected Minor Injury Crashes (B)	6
Possible Injury Crashes (C)	4
No Injury/PDO Crashes (O)	13
Total Crashes	**25**
Total EPDO Crashes	**380**

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
2000 West & Harrisville Road	✓	0	0	7	17	12	36	361				✓	✓			
1200 West & Harrisville Road		0	0	2	12	11	25	192			✓					

Project Description/How is safety improved?

This project improves safety through systemic countermeasures along the corridor and key improvement at intersections (2000 West and 1200 West). These include installing bicycle lanes, widening narrow shoulders, upgrading signal head equipment (at 2000 West), installing sidewalk and a new high visibility crosswalk at 2175 West, and performing additional specific studies for the area.

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


Road Safety Audit


Walkways


Crosswalk Visibility Enhancements


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Driver Feedback Speed Limit Signs	NA	All Crashes	2.00	EACH	$ 10,000	$ 20,000
Install Bicycle Lane	0.51 - 0.694	Bicycle	2.13	MILE	$ 21,000	$ 44,730
Install Sidewalk or Walkways	NA	Pedestrian	0.65	MILE	$ 634,000	$ 413,661
Install High-Visibility Crosswalk at Midblock Locations	0.6 - 0.75	Pedestrian	1.00	XING	$ 36,000	$ 36,000
Shoulder Widening on Rural Roads	0.771	All Crashes	0.64	MILE	$ 32,000	$ 20,394
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	0.08	MILE	$ 298,000	$ 24,833
						$ -
						$ -
						$ -
						$ -
						$ -

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
Change a 5-section "Doghouse" to Flashing Yellow Arrow	0.75 - 0.93	Left-Turn	1.00	INT	$ 8,000	$ 8,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 792,618
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 39,631
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 237,785
Estimated Construction Cost:		$ 1,145,035

Local Match†: **20%** **$ 291,000**

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 137,404
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 171,755
Estimated Project Total:		$ 1,455,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Targeted Enforcement and Deterrence
Additional Improvements #3: Set Appropriate Speed Limits for All Road Users
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

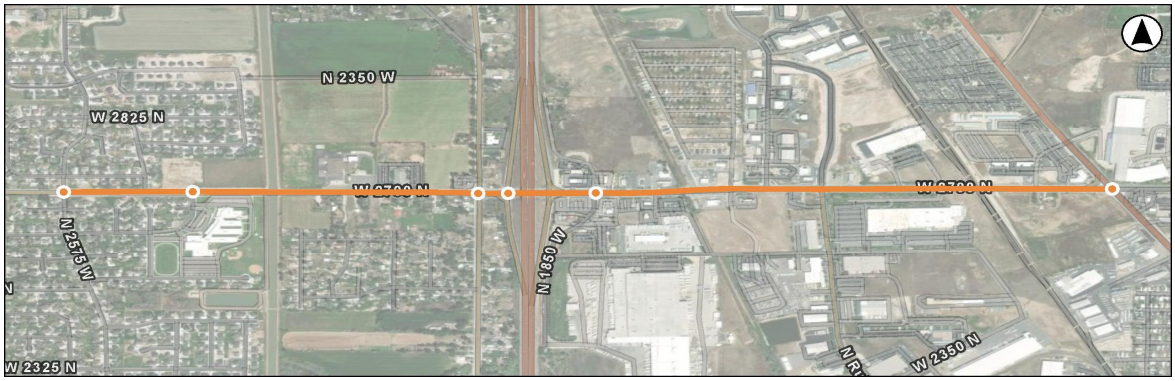
GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**2700 North (SR-134) from 2575 West to US 89**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Farr West, Pleasant View**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Low**		

Location Description

Roadway:	2700 North (SR-134)	**Key Intersection Locations:**	
From:	2575 West	2575 West	I-15 SB Ramp
To:	US 89	2400 West	1850 West
Length:	1.90 miles	2000 West	US 89

Project Location Map

Map ID: 1.4.2.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**1.90**
Average Daily Traffic (vehicles per day)	**16,078**
Functional Classification	**Other Principal Arterial**
Roadway Ownership	**State**
Urban/Rural Designation	**Urban**
Number of Key Intersections	**6**

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)	**10**
Possible Injury Crashes (C)	**16**
No Injury/PDO Crashes (O)	**81**
Total Crashes	**108**
Total EPDO Crashes	**579**

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
2575 West & 2700 North		0	1	0	3	6	10	134	✓	✓	✓					
2400 West & 2700 North		0	0	1	3	1	5	57				✓				
2000 West & 2700 North	✓	0	1	8	25	18	52	574		✓	✓					
I-15 SB Ramp & 2700 North		0	0	2	2	0	4	67				✓				✓
1850 West & 2700 North		0	0	5	16	8	29	301				✓				✓
US 89 & 2700 North	✓	0	1	14	66	38	119	1,194				✓			✓	✓

Project Description/How is safety improved?

This project improves safety through systemic countermeasures that mitigate speeding, manages driveway access, and enhances pedestrian crosings. This includes speed feedback signs, raised medians in place of the existing two-way left-turn lane for a portion of the corridor, enhanced pedestrian crossing locations (RRFB at 2400 West and enhanced crossings at 2575 West), and improved bicycle facilities west of I-15.

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

Appropriate Speed Limits for All Road Users


Corridor Access Management


Rectangular Rapid Flashing Beacons (RRFB)

Crosswalk Visibility Enhancements


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	1.15	MILE	$ 928,000	$ 1,067,200
Install Driver Feedback Speed Limit Signs	NA	All Crashes	4.00	EACH	$ 10,000	$ 40,000
Install a Rectangular Rapid Flashing Beacon (RRFB)	0.526	Pedestrian	1.00	XING (2)	$ 15,000	$ 15,000
Install Bicycle Lane	0.51 - 0.694	Bicycle	0.75	MILE	$ 21,000	$ 15,750
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Upgrade Existing Crosswalk to High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	3.00	XING	$ 37,000	$ 111,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 1,248,950
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 62,448
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 374,685
Estimated Construction Cost:		$ 1,761,083

Local Match†: 20% $ 447,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 211,330
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 264,162
Estimated Project Total:		$ 2,237,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Set Appropriate Speed Limits for All Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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):	**South Box Elder & North Weber County, West Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**1200 West from 2700 North to 17th Street**	**Prepared By:**	**JSF**
Jurisdiction(s):	**Farr West, Marriott-Slaterville**	**Checked By:**	**EJS**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**High, Low**		

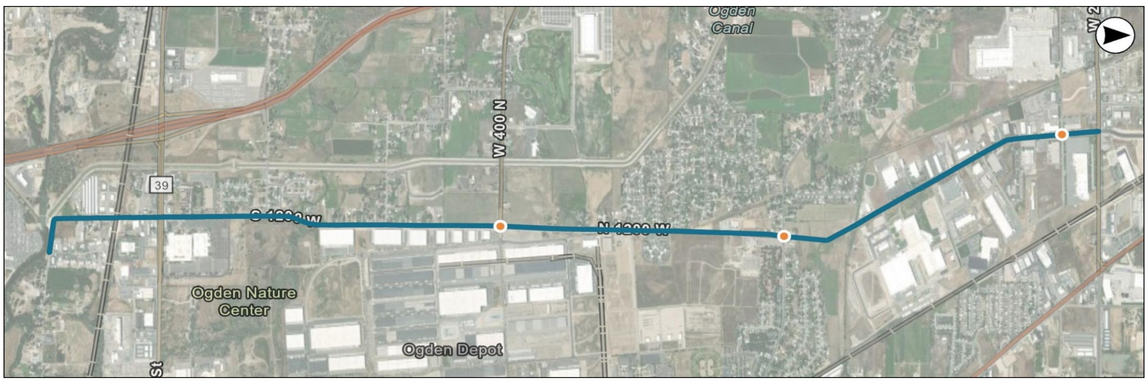
Location Description

Roadway:	1200 West	
From:	2700 North	
To:	17th Street	
Length:	4.99	miles

Key Intersection Locations:
Eccles Street
Harrisville Road
400 North

Project Location Map

Map ID: 1.4.3.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**4.99**
Average Daily Traffic (vehicles per day)	**5,784**
Functional Classification	**Minor Arterial**
Roadway Ownership	**Federal Aid - Local**
Urban/Rural Designation	**Urban**
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)	**1**
Possible Injury Crashes (C)	**8**
No Injury/PDO Crashes (O)	**26**
Total Crashes	**36**
Total EPDO Crashes	**233**

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
Eccles Street & 1250 West		0	0	1	5	2	8	81				✓				✓
Harrisville Road & 1200 West		0	0	2	12	11	25	192			✓					
400 North & 1200 West	✓	0	0	2	3	9	14	88				✓				

Project Description/How is safety improved?

This projects improves safety through systemic countermeasures to include shoulder widening/installation, adding bicycle lanes, speed management through the installation of speed feedback signs, improving stop-controlled intersection (Eccles St. & Harrisville Rd.), and upgrading existing "doghouse" signals to Flashing Yellow Arrow (FYA) signal heads (1200 S.), and installing additional FYA signal heads (400 N.).

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

Appropriate Speed Limits for All Road Users


Bicycle Lanes


Stop-Controlled Intersection Systemic Countermeasures


Yellow Change Intervals

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Bicycle Lane	0.51 - 0.694	Bicycle	4.38	MILE	$ 21,000	$ 91,980
Shoulder Widening on Rural Roads	0.771	All Crashes	2.00	MILE	$ 32,000	$ 64,000
Provide 2-Ft Paved Shoulder on Rural 2-Lane Roadways	0.66 - 0.89	All Crashes	0.86	MILE	$ 298,000	$ 256,280
Install Driver Feedback Speed Limit Signs	NA	All Crashes	8.00	EACH	$ 10,000	$ 80,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Systemic Low-Cost Countermeasures at Stop-Control Intersection	0.73 - 0.9	All Crashes	2.00	INT	$ 19,000	$ 38,000
Change a permissive only to Flashing Yellow Arrow	0.5 - 0.6	Left-Turn	0.50	INT	$ 8,000	$ 4,000
Change a 5-section "Doghouse" to Flashing Yellow Arrow	0.75 - 0.93	Left-Turn	0.50	INT	$ 8,000	$ 4,000
Perform an Intersection Control Evaluation and Implement	NA	All Crashes	1.00	INT	$ 225,000	$ 225,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 763,260
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 38,163
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 228,978
Estimated Construction Cost:		$ 1,105,401

Local Match†: 20% $ 280,800

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 132,648
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 165,810
Estimated Project Total:		$ 1,404,000

*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:
Additional Improvements #3: Conduct Speed Study
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):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**Harrisville Road from 1200 West to US 89**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Harrisville**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**High, Medium**		

Location Description

Roadway:	Harrisville Road	**Key Intersection Locations:**	
From:	1200 West	1200 West	
To:	US 89	750 West	
Length:	1.23 miles	US 89	

Project Location Map

Map ID: 1.5.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**1.23**
Average Daily Traffic (vehicles per day)	**11,201**
Functional Classification	**Major Collector**
Roadway Ownership	**Federal Aid - Local**
Urban/Rural Designation	**Urban**
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)	**0**
Suspected Minor Injury Crashes (B)	**3**
Possible Injury Crashes (C)	**5**
No Injury/PDO Crashes (O)	**11**
Total Crashes	**19**
Total EPDO Crashes	**135**

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
1200 West & Harrisville Road		0	0	2	12	11	25	192			✓					
750 West & Harrisville Road		0	0	1	4	1	6	69				✓		✓		✓
US 89 & Harrisville Road	✓	0	0	4	15	11	30	271				✓			✓	

Project Description/How is safety improved?

This project improves safety through systemic countermeasures that manage speed, and improves mobility for all users. This includes sidewalks in existing gaps (south side of Harrisville Road), driver feedback signs, high-visibility crosswalks (at Fairgrounds Drive and Harrisville Road), bicycle lanes, widening narrow shoulders and performing additional specific studies for the area and specifically an evaluation at 1200 West to determine appropriate intersection control improvements.

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


Walkways


Road Safety Audit


Crosswalk Visibility Enhancements


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Sidewalk or Walkways	NA	Pedestrian	0.30	MILE	$ 634,000	$ 189,420
Perform Road Safety Audits	0.4-0.9	All Crashes	1.00	LOC	$ 25,000	$ 25,000
Install Driver Feedback Speed Limit Signs	NA	All Crashes	4.00	EACH	$ 10,000	$ 40,000
Install Bicycle Lane	0.51 - 0.694	Bicycle	1.23	MILE	$ 21,000	$ 25,830
Shoulder Widening on Rural Roads	0.771	All Crashes	0.28	MILE	$ 32,000	$ 9,076
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

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
Install High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	3.00	XING	$ 36,000	$ 108,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 622,325
*Mobilization: (% +/-)**	*10%*	$ 62,240
Traffic Control: (% +/-)	*5%*	$ 31,116
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 186,698
Estimated Construction Cost:		$ 902,379

Local Match†: **20%** **$ 229,400**

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 108,285
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 135,357
Estimated Project Total:		$ 1,147,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Targeted Enforcement and Deterrence
Additional Improvements #3: Set Appropriate Speed Limits for All Road Users
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): South Box Elder & North Weber County
Project Name: Larsen Lane from Harrisville Road to Washington Boulevard
Jurisdiction(s): Harrisville
Emphasis Areas: Roadway Departures, Intersections, Impaired Driving
Equity Priority: Medium

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

Location Description

Roadway: Larsen Lane
From: Harrisville Road
To: Washington Boulevard
Length: 0.51 miles

Key Intersection Locations:
US 89
375 East

Project Location Map

Map ID: 1.5.2

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	0.51
Average Daily Traffic (vehicles per day)	10,764
Functional Classification	Minor Arterial
Roadway Ownership	Federal Aid - Local
Urban/Rural Designation	Urban
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)	0
Suspected Serious Injury Crashes (A)	0
Suspected Minor Injury Crashes (B)	0
Possible Injury Crashes (C)	1
No Injury/PDO Crashes (O)	9
Total Crashes	10
Total EPDO Crashes	20

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
US 89 & Larsen Lane	✓	0	1	10	49	35	95	908			✓					
375 East & Larsen Lane		0	1	1	4	3	9	164	✓	✓						

Project Description/How is safety improved?

This project improves safety through systemic countermeasures that manage speed, evaluates the need for the addition of protected left turn phasing at signalized intersections, and improves bicyclist safety at intersections. This includes installing driver feedback signs and medians along the corridor.

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

Appropriate Speed Limits for All Road Users

Corridor Access Management

Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Driver Feedback Speed Limit Signs	NA	All Crashes	4.00	EACH	$ 10,000	$ 40,000
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	0.51	MILE	$ 928,000	$ 473,280
Perform Road Safety Audits	0.4-0.9	All Crashes	1.00	LOC	$ 25,000	$ 25,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Add Bicycle Treatments at Intersections	NA	All Crashes	2.00	INT	$ 9,000	$ 18,000
Change Permissive Left-Turn to Protected or Protected/Permissive	0.79 - 0.95	Left-Turn	2.00	INT	$ 8,000	$ 16,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 572,280
*Mobilization: (% +/-)**	*10%*	$ 57,230
Traffic Control: (% +/-)	*5%*	$ 28,614
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 171,684
Estimated Construction Cost:		$ 829,808

Local Match†: **20%** **$ 210,800**

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 99,577
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 124,471
Estimated Project Total:		$ 1,054,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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):	**South Box Elder & North Weber County, Central Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**US 89 from SR 134 to I-84**	**Prepared By:**	**JSF**
Jurisdiction(s):	**Harrisville, Pleasant View, Ogden, South Ogden**	**Checked By:**	**EJS**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**High, Medium**		

Location Description

			Key Intersection Locations:			
Roadway:	US 89		Skyline Drive	5000 South	31st Street	20th Street
From:	SR 134		1475 East	4700 South	30th Street	12th Street
To:	I-84		Sunset Drive	40th Street	24th Street	Independence Boulevard
Length:	13.84	miles	Adams Avenue	Riverdale Road	22nd Street	2700 North

Project Location Map

Map ID: 1.5.3.1

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**13.84**
Average Daily Traffic (vehicles per day)	**27,959**
Functional Classification	**Other Principal Arterial**
Roadway Ownership	**State**
Urban/Rural Designation	**Urban**
Number of Key Intersections	**25**

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)	**8**
Suspected Serious Injury Crashes (A)	**25**
Suspected Minor Injury Crashes (B)	**86**
Possible Injury Crashes (C)	**108**
No Injury/PDO Crashes (O)	**454**
Total Crashes	**681**
Total EPDO Crashes	**13,047**

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
Skyline Drive & US 89	✓	0	1	9	40	19	69	768				✓				✓
1475 East & US 89	✓	0	0	8	9	8	25	288				✓				
Sunset Drive & US 89	✓	0	0	2	16	8	26	234				✓				
Adams Avenue & US 89	✓	0	1	11	30	25	67	705					✓			
5000 South & US 89	✓	0	2	2	8	6	18	329	✓					✓		✓
4700 South & US 89	✓	0	0	1	12	8	21	167						✓		
40th Street & US 89	✓	1	1	21	51	62	136	2,091			✓					✓
Riverdale Road & US 89	✓	0	0	2	13	3	18	195				✓				✓
31st Street & US 89	✓	0	0	5	18	10	33	326		✓		✓				
30th Street & US 89	✓	1	3	13	26	34	77	1,789	✓	✓	✓					
24th Street & US 89	✓	0	0	18	33	24	75	800		✓			✓	✓	✓	✓
22nd Street & US 89	✓	0	0	6	19	8	33	358				✓			✓	
20th Street & US 89	✓	0	2	13	20	31	66	735		✓	✓		✓	✓		
12th Street & US 89	✓	0	1	25	61	36	123	1,380		✓		✓		✓		
Independence Boulevard & US 89	✓	0	0	4	15	11	30	271				✓			✓	
2700 North & US 89	✓	0	1	14	66	38	119	1,194				✓			✓	✓

Project Description/How is safety improved?

This project improves safety through installation of raised medians along the entire length of the corridor. Other improvements include lane narrowing through Ogden to allow for the installation of a bicycle lane from 22nd St. to 2nd St. An evaluation should be performed to see if lane reduction along this segment is feasible to allow for a buffered bicycle lane and other pedestrian improvements like bulbouts or mid-block crossings. Re-timing for existing signals along the corridor to implement leading pedestrian intervals due to the high pedestrian and bicycle crash representation is also 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


Median Barriers


Corridor Access Management


Bicycle Lanes


Leading Pedestrian Interval

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	13.84	MILE	$ 928,000	$ 12,843,520
Traffic Calming - Lane Narrowing	0.68	All Crashes	2.23	MILE	$ 39,000	$ 86,970
Install Bicycle Lane	0.51 - 0.694	Bicycle	2.23	MILE	$ 21,000	$ 46,830
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Systemic Low-Cost Countermeasures at Stop-Control Intersection	0.73 - 0.9	All Crashes	3.00	INT	$ 19,000	$ 57,000
Install Pedestrian Hybrid Beacons (PHB) or HAWK	0.453	Pedestrian	1.00	EACH	$ 200,000	$ 200,000
Include a Leading Pedestrian Interval (LPI)	0.87	Pedestrian	5.00	INT	$ 3,000	$ 15,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 13,249,320
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 662,466
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 3,974,796
Estimated Construction Cost:		$ 17,961,582

Local Match†: 20% $ 4,562,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 2,155,390
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 2,694,237
Estimated Project Total:		$ 22,812,000

*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 if traffic volumes warrant lane reductions from 22nd St to 2nd St instead of lane narrowing
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

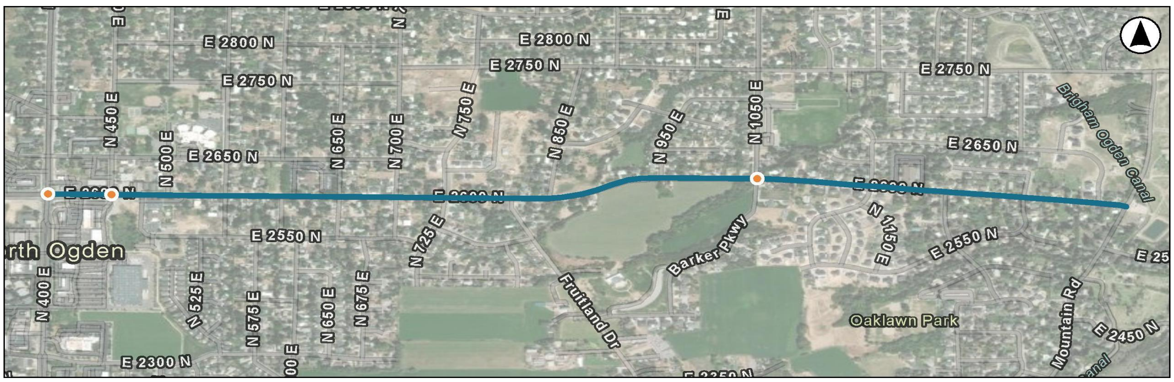
GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**2600 North from Washington Boulevard to Mountain Road**	**Prepared By:**	**EJS**
Jurisdiction(s):	**North Ogden**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium, Low**		

Location Description

Roadway:	2600 North	**Key Intersection Locations:**
From:	Washington Boulevard	Washington Boulevard
To:	Mountain Road	450 East
Length:	1.69 miles	1050 East

Project Location Map

Map ID: 1.6.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**1.69**
Average Daily Traffic (vehicles per day)	**10,005**
Functional Classification	**Major Collector**
Roadway Ownership	**Federal Aid - Local**
Urban/Rural Designation	**Urban**
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)	**2**
Possible Injury Crashes (C)	**3**
No Injury/PDO Crashes (O)	**17**
Total Crashes	**23**
Total EPDO Crashes	**189**

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
Washington Boulevard & 2600 No	✓	0	0	3	6	33	42	168				✓			✓	
450 East & 2600 North		0	1	0	0	5	6	99	✓	✓		✓				
1050 East & 2600 North		0	1	0	3	4	8	132	✓		✓					

Project Description/How is safety improved?

This project improves safety on 2600 South through systemic countermeasures that mitigate pedestrian-involved crashes and manage speed along the corridor. This includes installing bulbouts and crosswalk visibility improvements at key crossings (500 East, 550 East, 650 East, & 1050 East), installing sidewalk where missing, providing driver feedback signs near key crossings, narrowing lane widths to manage travel speeds and ensure adequate width for bicycle lanes. A bicycle lane would require the removal of on-street parking along the corridor.

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

Appropriate Speed Limits for All Road Users


Crosswalk Visibility Enhancements


Walkways


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Driver Feedback Speed Limit Signs	NA	All Crashes	6.00	EACH	$ 10,000	$ 60,000
Install Bicycle Lane	0.51 - 0.694	Bicycle	1.69	MILE	$ 21,000	$ 35,490
Install Sidewalk or Walkways	NA	Pedestrian	0.68	MILE	$ 634,000	$ 431,120
Traffic Calming - Lane Narrowing	0.68	All Crashes	1.69	MILE	$ 39,000	$ 65,910
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Add Bicycle Treatments at Intersections	NA	All Crashes	1.00	INT	$ 9,000	$ 9,000
Traffic Calming - Bulbouts	0.68	All Crashes	8.00	EACH	$ 36,000	$ 288,000
Upgrade Existing Crosswalk to High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	4.00	XING	$ 37,000	$ 148,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 1,037,520
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 51,876
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 311,256
Estimated Construction Cost:		$ 1,475,652

Local Match†: 20% $ 375,000

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 177,078
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 221,348
Estimated Project Total:		$ 1,875,000

*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: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #3: Perform a signal warrant study for 1050 East.
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):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**Washington Boulevard Intersection Improvements**	**Prepared By:**	**EJS**
Jurisdiction(s):	**North Ogden**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium, Low**		

Location Description

Roadway:	NA	**Key Intersection Locations:**	
From:	NA	3100 North & Washington Boulevard	2300 North & Washington Boulevard
To:	NA	2650 North & Washington Boulevard	
Length:	NA	2600 North & Washington Boulevard	

Project Location Map

Map ID: **1.6.2**

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**NA**
Average Daily Traffic (vehicles per day)	**NA**
Functional Classification	**NA**
Roadway Ownership	**NA**
Urban/Rural Designation	**NA**
Number of Key Intersections	**NA**

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

Segment Crash History

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

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

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
3100 North & Washington Boulevard	✓	0	0	2	11	10	23	180		✓	✓					
2650 North & Washington Boulevard		0	0	2	1	0	3	56		✓		✓				✓
2600 North & Washington Boulevard	✓	0	0	6	33	22	61	531				✓			✓	
2300 North & Washington Boulevard		0	0	1	14	9	24	190		✓						✓

Project Description/How is safety improved?

https://highw

This project systemically improves safety at existing signalized and unsignalized intersections through application of proven safety countermeasures that mitigate pedestrian-involved crashes and manage speed at the intersections. This includes improving existing signals (left-turn phasing and leading pedestrian intervals at 3100 North), and installing high-visibility crosswalks and/or pedestrian refuge islands at 2300 North.

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


Leading Pedestrian Interval


Medians and Pedestrian Refuge Islands in Urban & Suburban Areas


Road Safety Audit

Opinion of Probable Construction Cost

Segment Improvements

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

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Change a 5-section "Doghouse" to Flashing Yellow Arrow	0.75 - 0.93	Left-Turn	1.00	INT	$ 8,000	$ 8,000
Include a Leading Pedestrian Interval (LPI)	0.87	Pedestrian	2.00	INT	$ 3,000	$ 6,000
Install High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	2.00	XING	$ 36,000	$ 72,000
Install Pedestrian Refuge Island	0.54	Pedestrian	2.00	EACH	$ 30,000	$ 60,000
Perform Road Safety Audits	0.4-0.9	All Crashes	4.00	INT	$ 5,000	$ 20,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 166,000
*Mobilization: (% +/-)**	*10%*	$ 16,600
Traffic Control: (% +/-)	*5%*	$ 8,300
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 49,800
Estimated Construction Cost:		$ 240,700

Local Match†: 20% $ 61,200

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 28,884
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 36,105
Estimated Project Total:		$ 306,000

*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:	Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #3:	Education Campaigns for Vulnerable Groups
Additional Improvements #4:	Targeted Enforcement and Deterrence
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):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**2600 North, 2650 North from Washington Boulevard to 550 East**	**Prepared By:**	**JSF/MA**
Jurisdiction(s):	**North Ogden**	**Checked By:**	**ES**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Medium, Low**		

Location Description

Roadway: 2600 North, 2650 North
From: Washington Boulevard
To: 550 East
Length: 0.28 miles

Key Intersection Locations:
450 East & 2650 North
450 East & 2600 North
Washington Boulevard & 2600 North

Project Location Map

Map ID: **1.6.3**

Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**0.28**
Average Daily Traffic (vehicles per day)	**13,327**
Functional Classification	**Local Street**
Roadway Ownership	**Local**
Urban/Rural Designation	**Urban**
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)	**0**
Suspected Minor Injury Crashes (B)	**1**
Possible Injury Crashes (C)	**3**
No Injury/PDO Crashes (O)	**6**
Total Crashes	**10**
Total EPDO Crashes	**62**

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
450 East & 2650 North		0	0	0	1	2	3	13			✓					
450 East & 2600 North		0	1	0	0	5	6	99	✓	✓		✓				
Washington Boulevard & 2600 No	✓	0	0	3	6	33	42	168				✓			✓	

Project Description/How is safety improved?

This project includes restricting the intersection of 450 E/2600 N to right-in/right-out for the north and south approaches, and recommends a lane reduction between 450 E and 475 E along 2600 N to remove the right-turn only lane and calm traffic. These improvements address fatal and serious injury as well as angle crash trends at the intersection of 450 E/2600 N. This project also recommends providing high-visibility crossings and traffic calming curb extensions along E 2650 N, including improving crossings at 450 E, 500 E and 550 E, to address ped-bike collision overrepresentation along E 2650 N and improve safe routes to school.

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

Appropriate Speed Limits for All Road Users

Corridor Access Management

Crosswalk Visibility Enhancements

Road Diets (Roadway Configuration)

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
4-Lane to 3-Lane Road Diet Conversion	0.53 - 0.81	All Crashes	0.10	MILE	$ 22,000	$ 2,200
Traffic Calming - Bulbouts	0.68	All Crashes	3.00	EACH	$ 36,000	$ 108,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Right-in-Right-out Access Treatment	0.55	All Crashes	2.00	DRIVEW	$ 50,000	$ 100,000
Upgrade Existing Crosswalk to High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	3.00	XING	$ 37,000	$ 111,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 321,200
*Mobilization: (% +/-)**	*10%*	$ 32,120
Traffic Control: (% +/-)	*5%*	$ 16,060
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 96,360
Estimated Construction Cost:		$ 465,740

Local Match†: 20% $ 118,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 55,889
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 69,861
Estimated Project Total:		$ 592,000

*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: Safe Routes to School
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

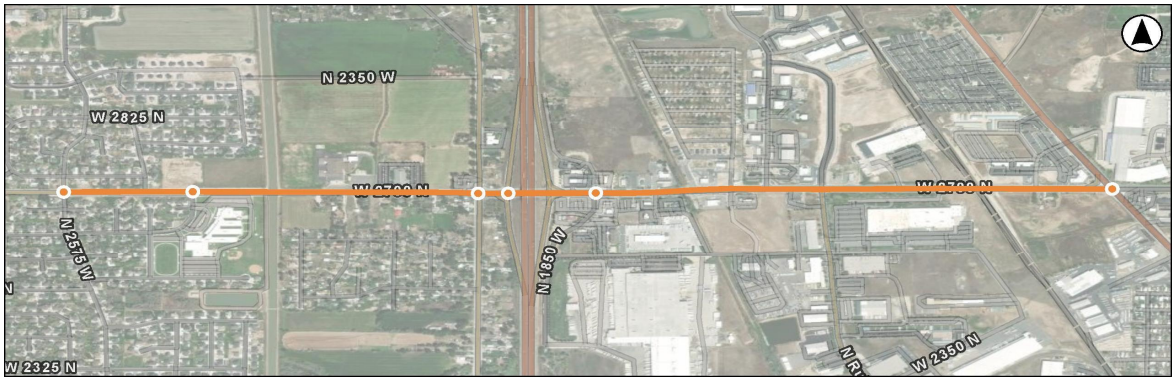
GFA(s):	**South Box Elder & North Weber County**	**Date Prepared:**	**3/13/2024**
Project Name:	**2700 North (SR-134) from 2575 West to US 89**	**Prepared By:**	**EJS**
Jurisdiction(s):	**Pleasant View, Farr West**	**Checked By:**	**JSF**
Emphasis Areas:	**Roadway Departures, Intersections, Impaired Driving**		
Equity Priority:	**Low**		

Location Description

Roadway:	2700 North (SR-134)	**Key Intersection Locations:**	
From:	2575 West	2575 West	I-15 SB Ramp
To:	US 89	2400 West	1850 West
Length:	1.90 miles	2000 West	US 89

Project Location Map

Map ID: 1.7.1.1



Segment Information and Safety Analysis Areas Summary

Roadway Characteristics	Value
Length (miles)	**1.90**
Average Daily Traffic (vehicles per day)	**16,078**
Functional Classification	**Other Principal Arteria**
Roadway Ownership	**State**
Urban/Rural Designation	**Urban**
Number of Key Intersections	**6**

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)	**10**
Possible Injury Crashes (C)	**16**
No Injury/PDO Crashes (O)	**81**
Total Crashes	**108**
Total EPDO Crashes	**579**

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
2575 West & 2700 North		0	1	0	3	6	10	134	✓	✓	✓					
2400 West & 2700 North		0	0	1	3	1	5	57				✓				
2000 West & 2700 North	✓	0	1	8	25	18	52	574		✓	✓					
I-15 SB Ramp & 2700 North		0	0	2	2	0	4	67				✓				✓
1850 West & 2700 North		0	0	5	16	8	29	301				✓				✓
US 89 & 2700 North	✓	0	1	14	66	38	119	1,194				✓			✓	✓

Project Description/How is safety improved?

This project is focused on improving safety through applying systemic countermeasures that mitigate speeding, manage driveway access, and enhance crossings. This includes speed feedback signs, raised medians replacing segments of existing two-way left-turn lane, enhanced pedestrian crossing locations (2400 West & 2575 West), and improved bicycle facilities west of I-15.

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

Appropriate Speed Limits for All Road Users


Corridor Access Management


Rectangular Rapid Flashing Beacons (RRFB)


Crosswalk Visibility Enhancements


Bicycle Lanes

Opinion of Probable Construction Cost

Segment Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Install Raised Medians on Roadways with Existing TWLTL	0.29	All Crashes	1.15	MILE	$ 928,000	$ 1,067,200
Install Driver Feedback Speed Limit Signs	NA	All Crashes	4.00	EACH	$ 10,000	$ 40,000
Install a Rectangular Rapid Flashing Beacon (RRFB)	0.526	Pedestrian	1.00	XING (2)	$ 15,000	$ 15,000
Install Bicycle Lane	0.51 - 0.694	Bicycle	0.75	MILE	$ 21,000	$ 15,750
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Intersection Improvements

Item Description	CMF	Applicable Crashes	Quantity	Unit	Unit Price	Item Cost
Upgrade Existing Crosswalk to High-Visibility Crosswalk	0.6 - 0.75	Pedestrian	3.00	XING	$ 37,000	$ 111,000
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -
						$ -

Improvements Subtotal:		$ 1,248,950
*Mobilization: (% +/-)**	*10%*	$ 75,000
Traffic Control: (% +/-)	*5%*	$ 62,448
Items Not Estimated / Contingency: (% +/-)	*30%*	$ 374,685
Estimated Construction Cost:		$ 1,761,083

Local Match†: 20% $ 447,400

† *Toward SS4A Implementation Grants*

Preconstruction Engineering/Design	*12%*	$ 211,330
*Utilities***		$ -
*ROW***		$ -
Construction Engineering/Management	*15%*	$ 264,162
Estimated Project Total:		$ 2,237,000

*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

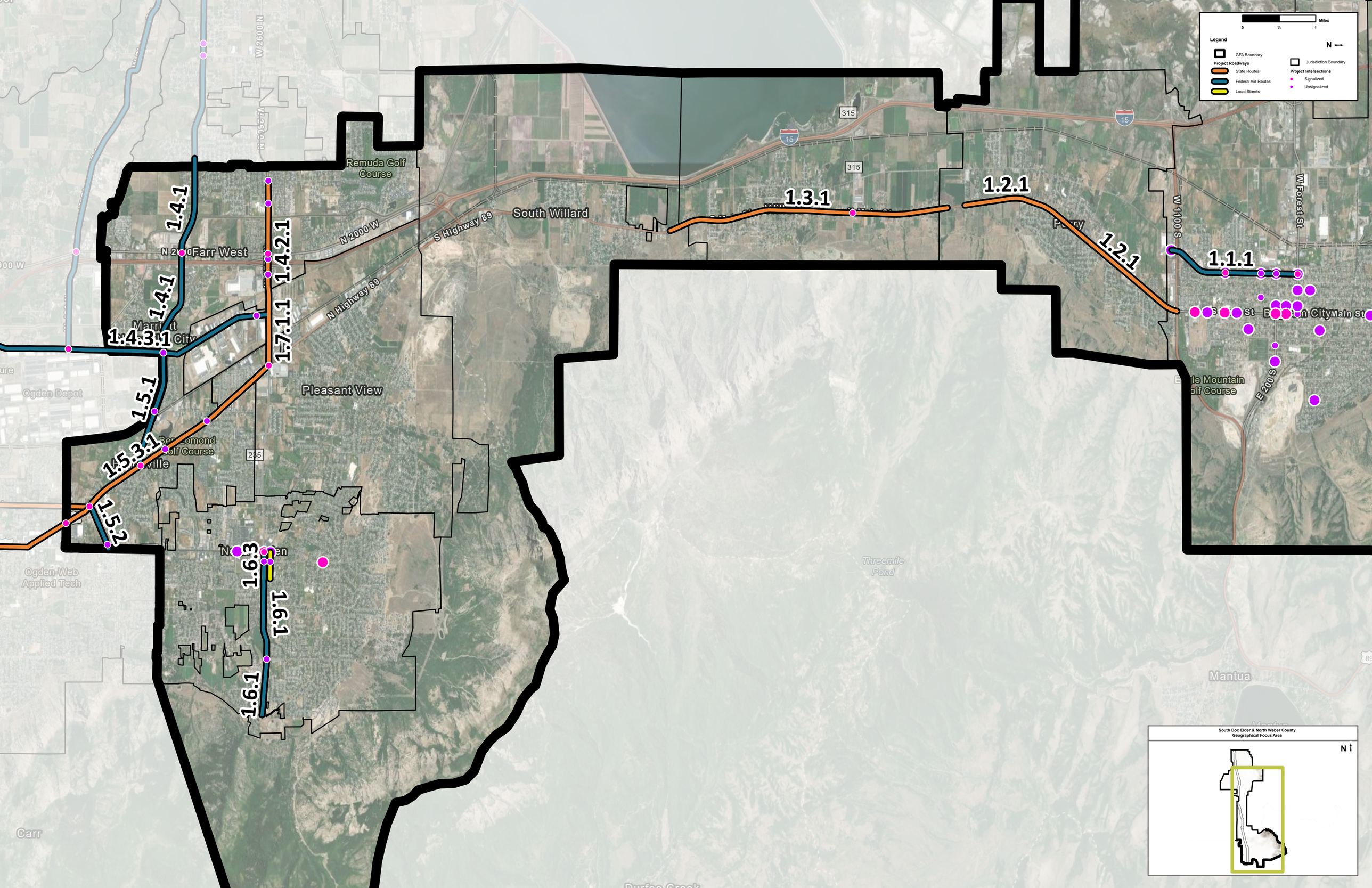
Additional safety improvements could be considered that were not included due to availability of data, need for site-specific information, and/or agency/jurisdiction input. Potential additional countermeasures are listed below. Refer to the ***Countermeasure Toolbox*** for a complete list of safety countermeasures.

Additional Improvements #1: Re-Evaluate Speed Based on Roadway Context, Built Environment, and Existing Road Users
Additional Improvements #2: Set Appropriate Speed Limits for All Road Users
Additional Improvements #3: Targeted Enforcement and Deterrence
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.

SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY CASE STUDY PROJECT LOCATION MAP


Legend
GFA Boundary
Project Roadways
State Routes
Federal Aid Routes
Local Streets
Jurisdiction Boundary
Project Intersections
Signalized
Unsignalized
Miles
0
½
1
N
1.1.1
1.2.1
1.2.1
1.3.1
1.4.1
1.4.1
1.4.2.1
1.4.3.1
1.5.1
1.5.2
1.5.3.1
1.6.1
1.6.1
1.6.3
1.7.1.1
Remuda Golf Course
South Willard
Farr West
Pleasant View
Ogden Depot
Ogden-Web Applied Tech
Carr
Mantua
Threemile Pond
Durfee Creek
N 2000 W
S Highway 89
N Highway 89
W 1100 S
W Forest St
E 200 S
315
15
235
South Box Elder & North Weber County
Geographical Focus Area

SOUTH BOX ELDER COUNTY & NORTH WEBER COUNTY EQUITY INDEX MAP

South Box Elder & North Weber County

Equity Need Areas

- High
- Medium
- Low