IV. U.S. HIGHWAY 50, STATE ROUTE 278, AND INTERSTATE HIGHWAY 80

A. INTRODUCTION

According to various sources, Nevada is the "most mountainous state" in the lower 48 states. Nevada is also the driest, currently the fastest-growing, and the most urban state, with more than 80% of the population residing in the metropolitan areas centered in Las Vegas and Reno. Nevada roadways are often built through long valleys and winding mountains, creating high-speed corridors and steep roadway passes. Temperature extremes create constant deterioration to roadway surfaces and other infrastructure. This section provides a review of three major state routes through Eureka County, Nevada, to establish correlation between roadway serviceability and weather, geometrics, accidents and traffic conditions.

Purpose

The purpose of this report is to provide an objective view of the historical and existing condition of major transportation routes through Eureka County which could potentially be used to transport nuclear waste to Yucca Mountain. By establishing historical conditions and events along the study corridors, the County can better prepare for accidents that may involve nuclear transport vehicles.

Process

The study process required a data-gathering effort that took advantage of existing data obtained by federal, state, and local agencies. This included mapping, accident, speed, traffic volumes and other data. Additional data was added through interviews with the appropriate agencies. The objective was to obtain data for the past 10 years and to establish a timeline that depicts events associated with weather, accidents, work zones, flooding, maintenance, construction, etc.; however, many of the data sets obtained were not available for a 10-year period. The data obtained from various sources was used to establish route profiles for each of the study roadways.

Information Sources & Methodology

Since the study roadways are all under the jurisdiction of the Nevada Department of Transportation (NDOT) most of the available data was obtained from NDOT. NDOT maintains extensive accident, traffic, mapping, and other databases made available for this project. Data useful to the project was included on various maps and tables throughout this report. Some data was not available digitally and required interviews with NDOT staff.

The data presented here was assumed to be accurate and the completeness of the information was not confirmed. However, some interview information did not match some databases. Specifically, many NDOT and County staff concur that an accident event occurred, but the corresponding database didn't contain information for that event.

NDOT's Jurisdictional Boundaries

NDOT District 3 (Elko) has jurisdiction for the northeast portion of the state, including I-80 through Eureka County and the north half of SR 278. The Ely Sub District (under District 3) manages US 50 through Eureka County and the southern half of SR 278. Both offices were contacted throughout this project process.

B. PROJECT LIMITS

The project team established the following roadway limits for this assessment:

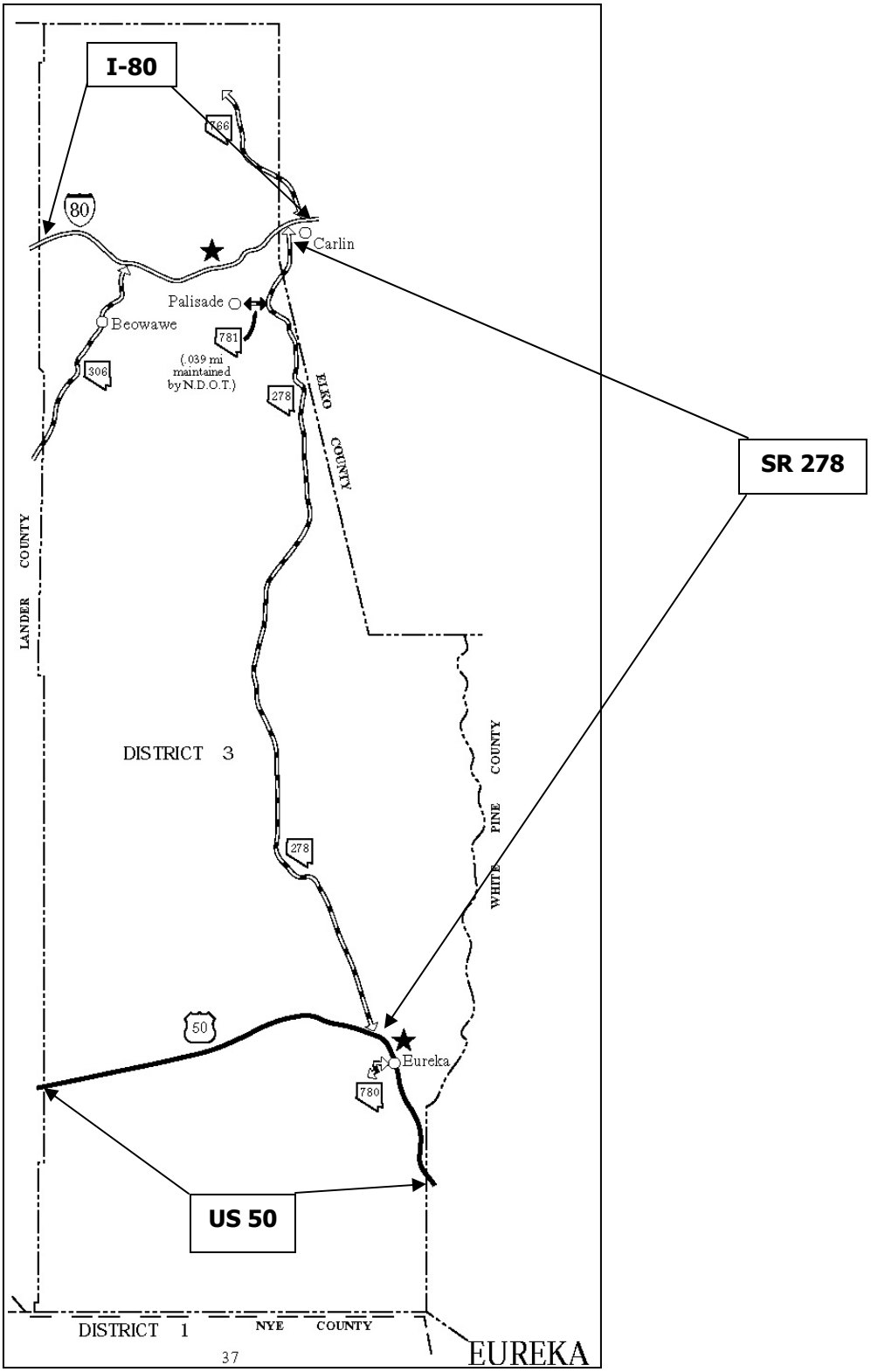
- I-80 – The study limits on Interstate 80 include the western boundary of Eureka County to the Carlin Interchange of I-80 with SR 278 in Elko County.

- US 50 – Study limits for US 50 include the boundaries of Eureka County.

- SR 278 – Project study limits for SR 278 is I-80 and US 50. Though portions of SR 278 are in Elko County the interchange of SR 278 with I-80 was included

Figure IV - a displays the study limits of this project.

Figure IV - a
Study Area – Project Limits



C. ROADWAY TERRAIN & PASSING ZONES

Typical Roadway Terrain

Figure IV – b displays the typical highway terrain through Eureka County (US 50). Low land areas have various small drainage culverts from surface runoff crossing both study highways (see **Figures IV – c & d)**. I-80 is raised with bridges and box culverts allowing farm and ranch under-crossings.

Passing Zones

Passing zones on highways can consist of a separate climbing lane for steep terrain, turnouts, or dashed centerline striping that allows for overtaking a vehicle using the oncoming travel lane. Both US 50 and SR 278 accommodate overtaking by using the oncoming travel lane. The following data was made available from NDOT:

US 50	7.5% No Passing
SR 278	15% No Passing

Three locations in Nevada on I-80 currently have truck climbing lanes. All of these locations are east of Eureka County and out of the study area. The local NDOT district has researched the possibility of adding truck climbing lanes near Emigrant Pass, but NDOT cost-benefit criteria were not met for the project.

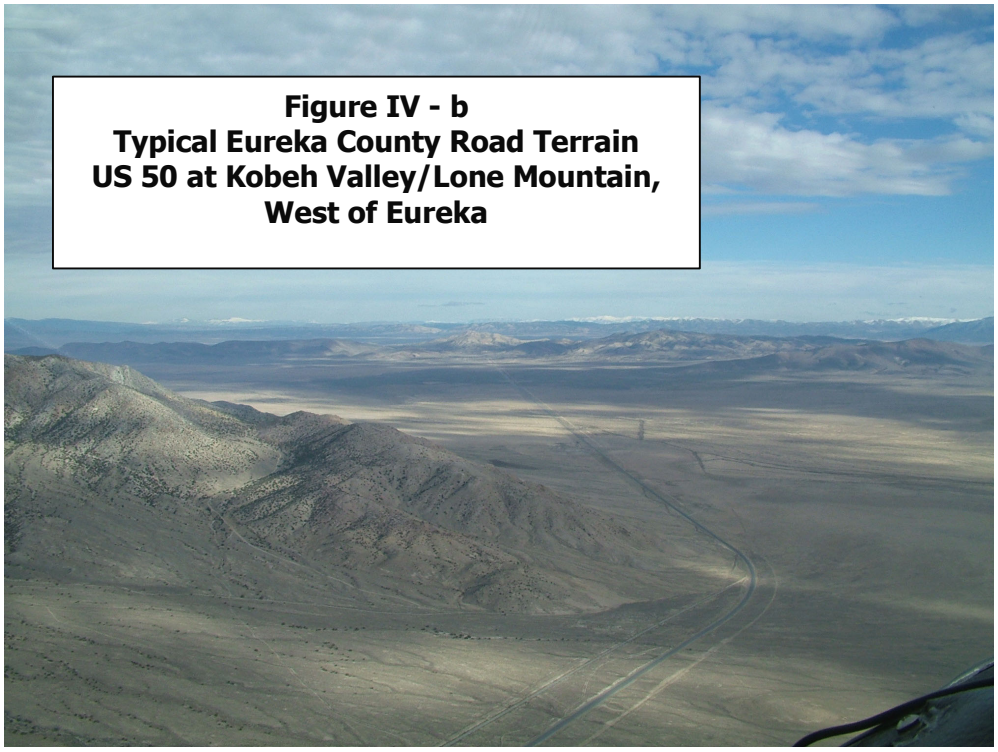


Figure IV - b
Typical Eureka County Road Terrain
US 50 at Kobeh Valley/Lone Mountain,
West of Eureka

Drainage and Bridge Structures

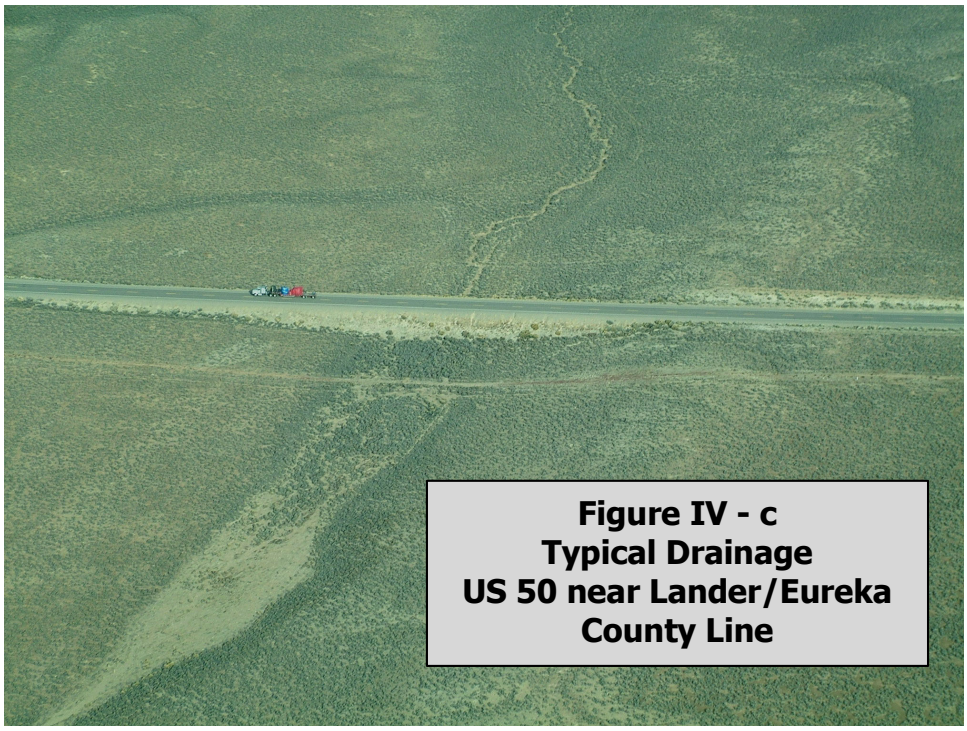


Figure IV - c
Typical Drainage
US 50 near Lander/Eureka County Line

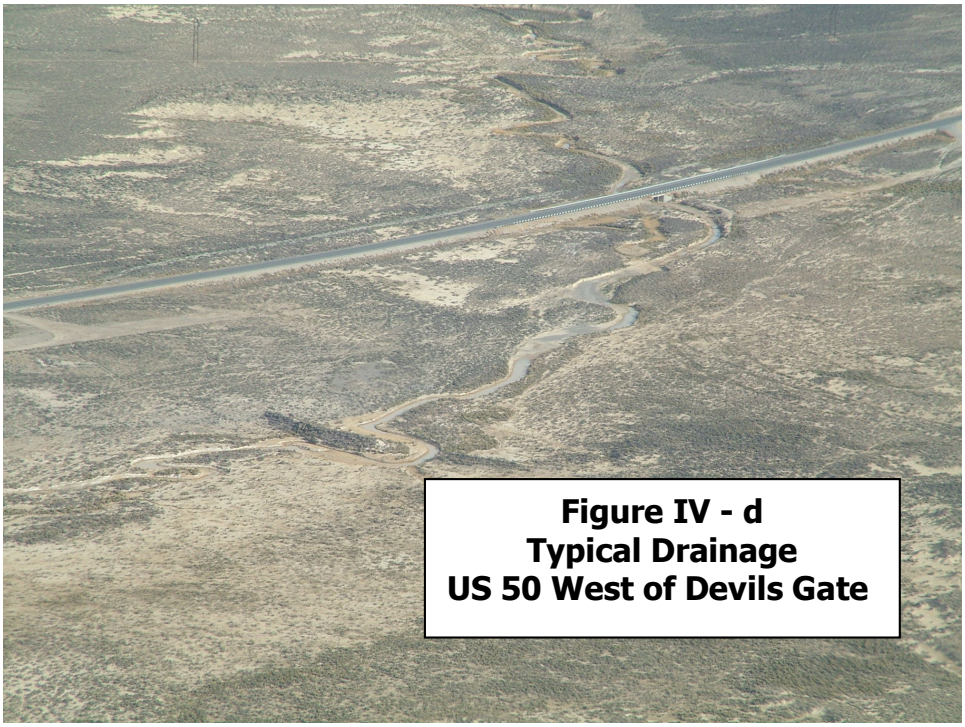


Figure IV - d
Typical Drainage
US 50 West of Devils Gate

D. ROUTE FEATURES

I-80 Route Features (Exhibits 3a and 3b)

Within the study area, I-80 has rest areas in both the eastbound and westbound directions between Dunphy and Beowawe. There is also a major rail, river, and interstate crossing near Dunphy. If an event or accident were to occur in this area it is possible that all three features could be affected.

Emigrant Pass is the area associated with a high number of accidents mainly due to the terrain of the roadway. Chain areas exist both to the east and west of Emigrant Pass. (See **Figure IV – e**). There is also a maintenance station located at Primeaux Springs. Based on NDOT information this station has six maintenance and support personnel who operate out of that facility.

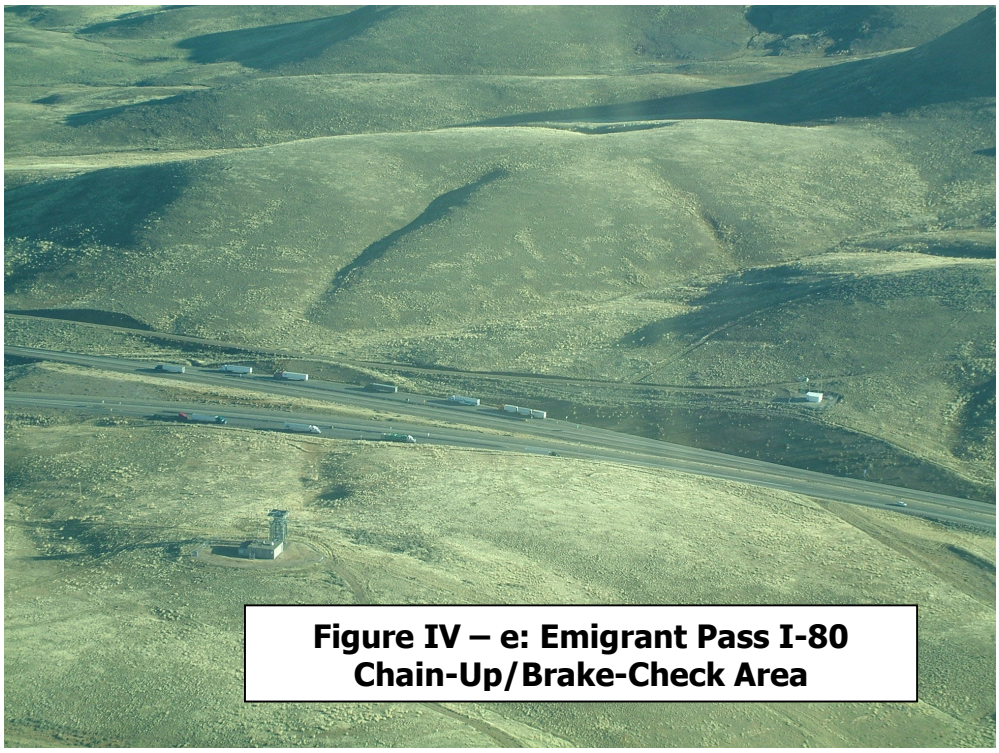


Figure IV – e: Emigrant Pass I-80 Chain-Up/Brake-Check Area

Exhibits 3a and 3b shows various route features provided by NDOT, including chain areas, rest stops, truck parking, major crossings (crossovers), and deficient bridges.

SR 278 Route Features (Exhibits 4, 5, & 6)

SR 278 carries only about 300-600 vehicles per day and has much less infrastructure associated with it. There is one rest area approximately halfway between Carlin and the Town of Eureka. Other features include maintenance staging areas (currently salt and sand piles) and an abandoned maintenance station. According to NDOT reports, Bridge B 478 just north of the Eureka Airport on SR 278 is considered a "deficient bridge."

US 50 Route Features (Exhibit 7)

There is an existing NDOT maintenance station near the Town of Eureka. There are also salt/sand piles approximately four miles into White Pine County on US 50. Just southeast of the town of Eureka is a rest area along with a paved parking area on the side of the highway. A second rest area is located on US 50 approximately five miles east of the Lander County line. Rest area services are limited to a parking area, garbage cans and picnic benches. **Figure IV – f** displays an aerial view of this rest stop taken in 2004.

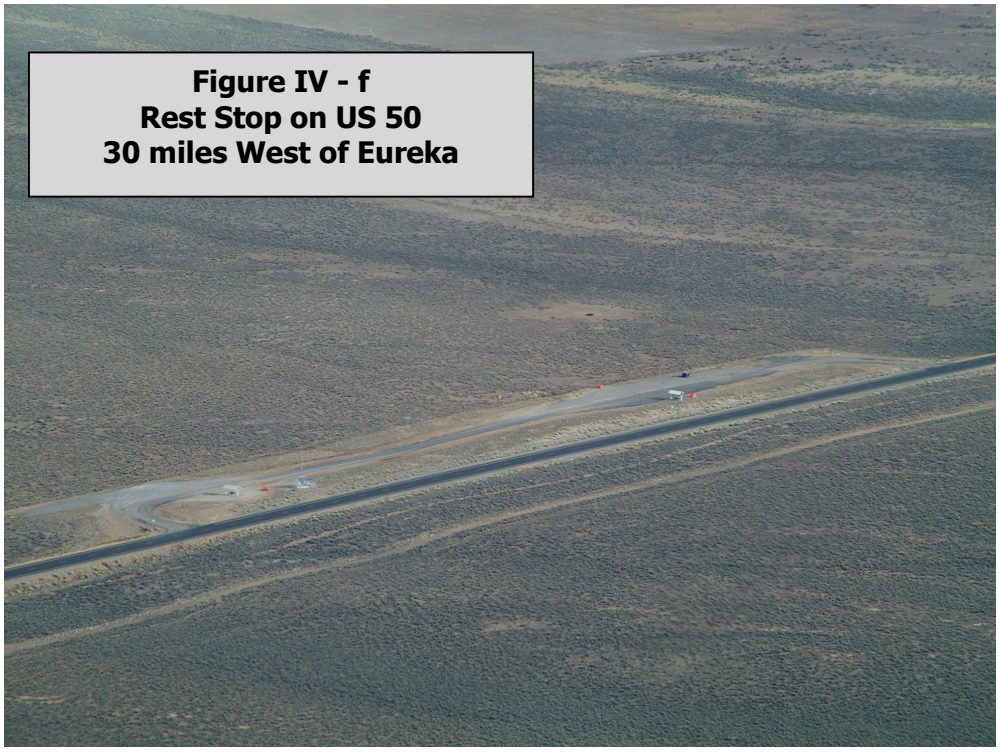


Figure IV - f
Rest Stop on US 50
30 miles West of Eureka

Bridge Deficiencies (Exhibits 3a & 6)

The Structural Design Division of NDOT was contacted regarding bridges listed in the NDOT Roadway Preservation Report as being deficient. NDOT rates bridges using a 1-100 "sufficiency rating" that is used to estimate the remaining structural life of each bridge and help prioritize bridge rehabilitation or replacement. NDOT uses the following rating scale and action:

Bridge Rating	Qualifying Action
100-80	No Action
79-50	Rehabilitation
49-01	Replacement

While bridges may qualify for an action, the actual time of service or replacement depends on priority and funding. **Table IV-a** lists deficient bridges in Eureka County on or near the study road segments.

Table IV - a
Eureka County Bridge Deficiency List

Bridge	Rating	Qualifying Action	NDOT Notes
I-80			
G-884 East	70.6	Rehabilitation	Pier caps need repair
G-884 West	70.6	Rehabilitation	Pier caps need repair
G-885 East	70.6	Rehabilitation	Pier caps need repair
G-885 West	70.6	Rehabilitation	Pier caps need repair
US 40 (Adjacent to I-80 & Rail)			
G-38	83.5	No Action	Recent minor rehab.
B-395	44.5	Replacement	
G-324	54.7	Rehabilitation	Will need replacement soon
SR 278			
B-478	56.0	Rehabilitation	Will need replacement soon
Note: This list represents bridges on or near study road segments only.			

Source: NDOT Structural Safety Division, 2005

Four bridge structures along I-80 near Dunphy are on the state's "structurally deficient" list (see **Figure IV – g**). The Sufficiency Rating of these structures suggests that they can be rehabilitated in order to be brought up to acceptable standards. Three other bridges near Dunphy, not directly on I-80, that are also structurally deficient could disrupt nuclear waste transport by rail or road, or possibly contaminate the Humboldt River, if an incident occurred on these bridges. This area near Dunphy is also a "commodity terminal" used by local mines to transfer chemicals used in the leaching process from rail to truck. These trucks use the three bridges to access mines north of Dunphy.

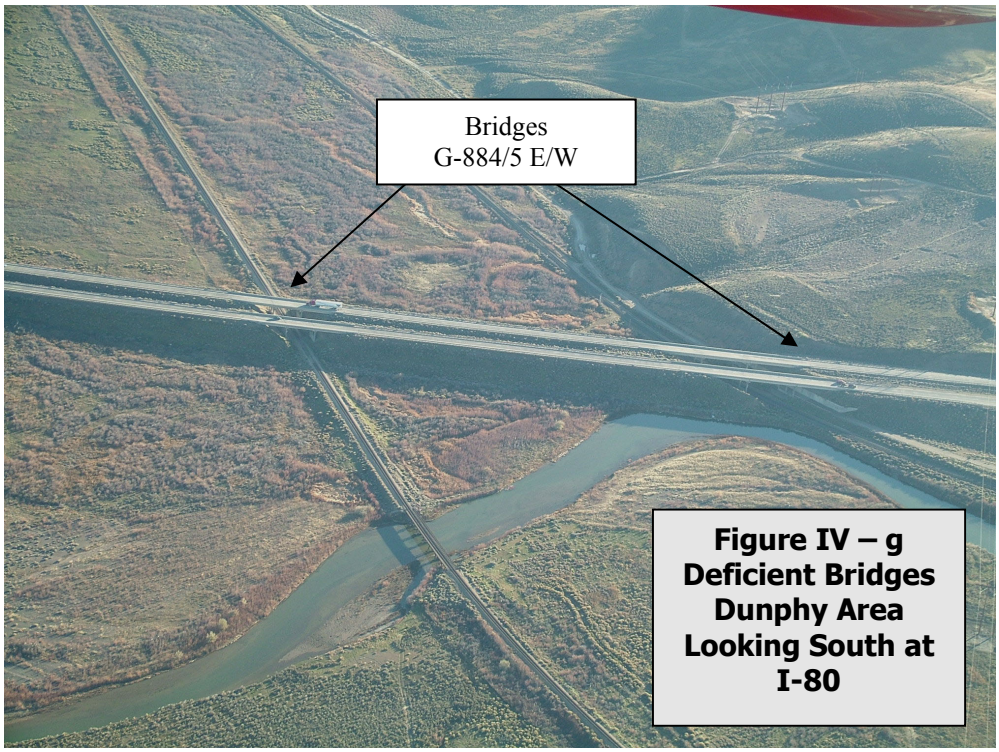


Figure IV – g
Deficient Bridges
Dunphy Area
Looking South at
I-80

One bridge on SR 278 is on the State's structurally deficient list (B-478). This bridge is within the rehabilitation category, but is expected to soon qualify for complete replacement.

See **Exhibit 3a** for the locations of deficient bridges.

E. NDOT ROADWAY CLASS AND TRAFFIC REVIEW

Roadway Functional Classification

NDOT roadway classifications are presented in **Figure IV-h** (Jan. 15, 2003). These roadway classifications help the State group similar roadway data to estimate truck traffic, accidents and daily traffic.

- I-80 is classified as an "Interstate Highway"
- US 50 is classified as an "Other Principal Arterial"
- SR 278 is classified as a "Rural Major Collector"

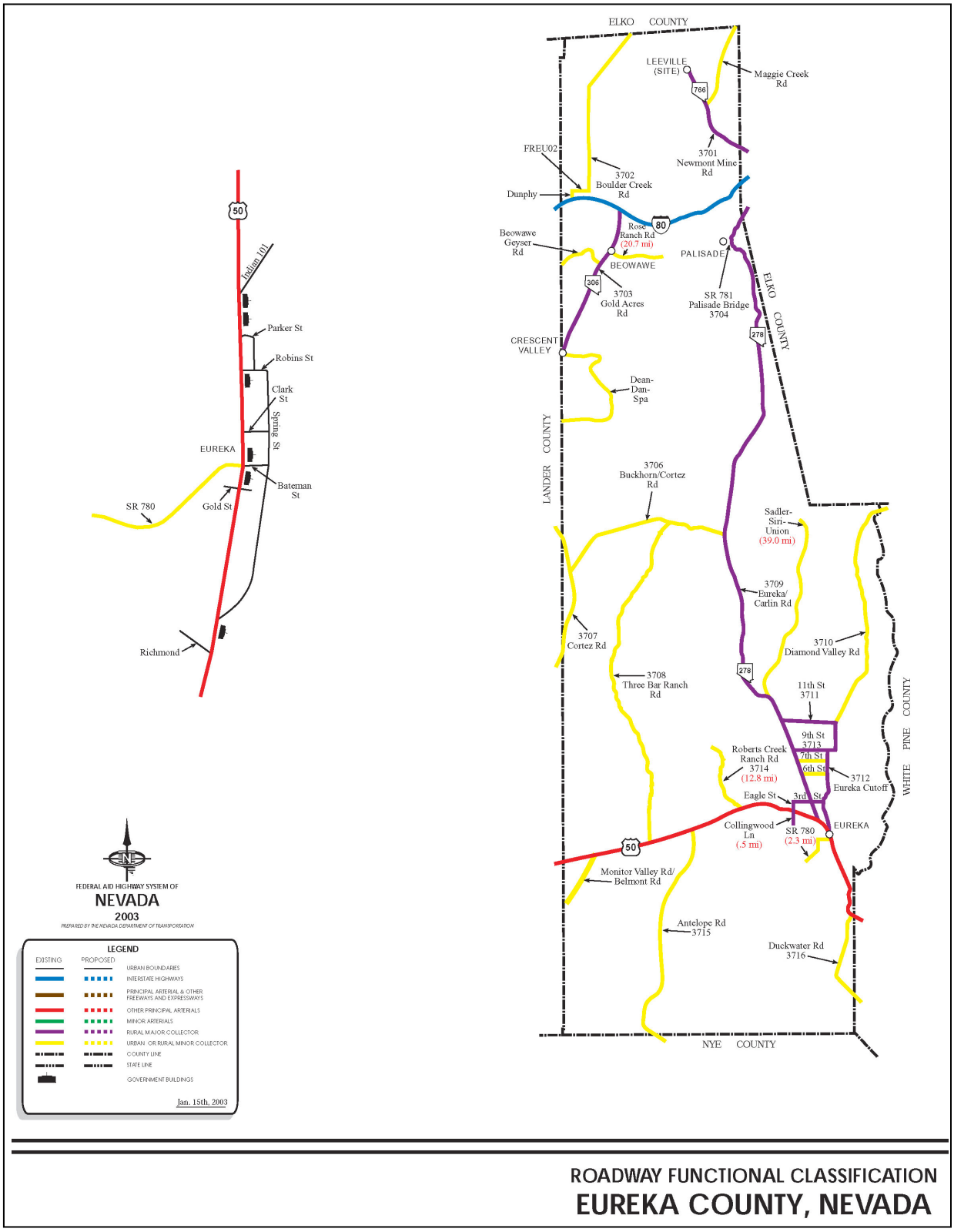
Truck Percentages

NDOT has provided truck percentages based on functional classification as follows:

I-80 – Interstate Highway	32.3% Trucks
US 50 – Other Principal Arterial	19.6% Trucks
SR 278 – Rural Major Collector	12.9% Trucks

Trucks create potentially hazardous conditions in roadways including faster road surface wear and potentially slower moving vehicles in hilly areas. In addition, trucks often are less stable than smaller vehicles on steep downgrades, leading to the potential for crashes.

Figure IV - h
NDOT Functional Classification



Annual Average Daily Traffic

NDOT publishes traffic count data in an *Annual Traffic Report.* The most current traffic report at the start of this project used to establish daily traffic counts was the 2003 report. **Exhibits 3 through 7** display NDOT count locations and traffic volumes.

Traffic counts are usually performed for a five to seven-day period and divided by the number of hours sampled, then multiplied by 24 (24 hours in a day). The count is factored (seasonal, etc.) and annualized over the entire year. This method includes weekend traffic. AADT is not the same as Average Daily Traffic (ADT) which estimates traffic on a typical weekday (Tuesday through Thursday). AADT is used for maintaining large road networks (statewide) while ADT is typically used for localized traffic impacts from development.

Figure IV-i displays traffic count station locations and volumes on I-80 and the on/off ramps within Eureka County. Each of these numbers represents a traffic monitoring station number that is used on look-up tables to obtain historical and recent traffic volumes (see **Appendix J**).

Figure IV - i
NDOT Traffic Count Stations on I-80 (Eureka County)

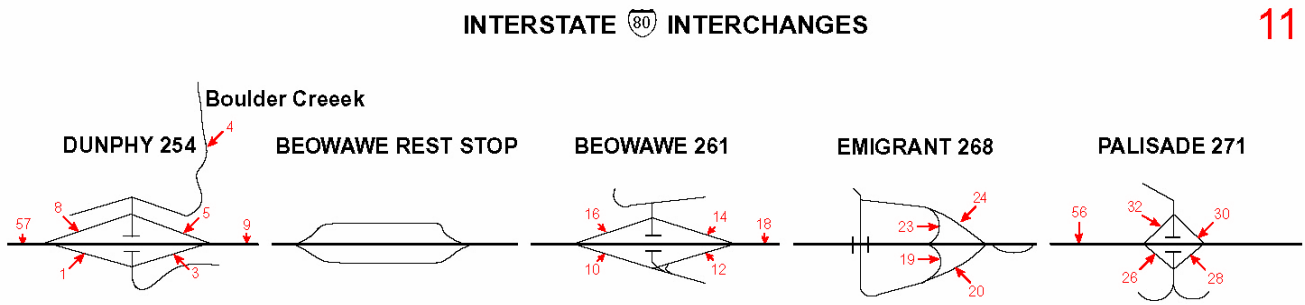
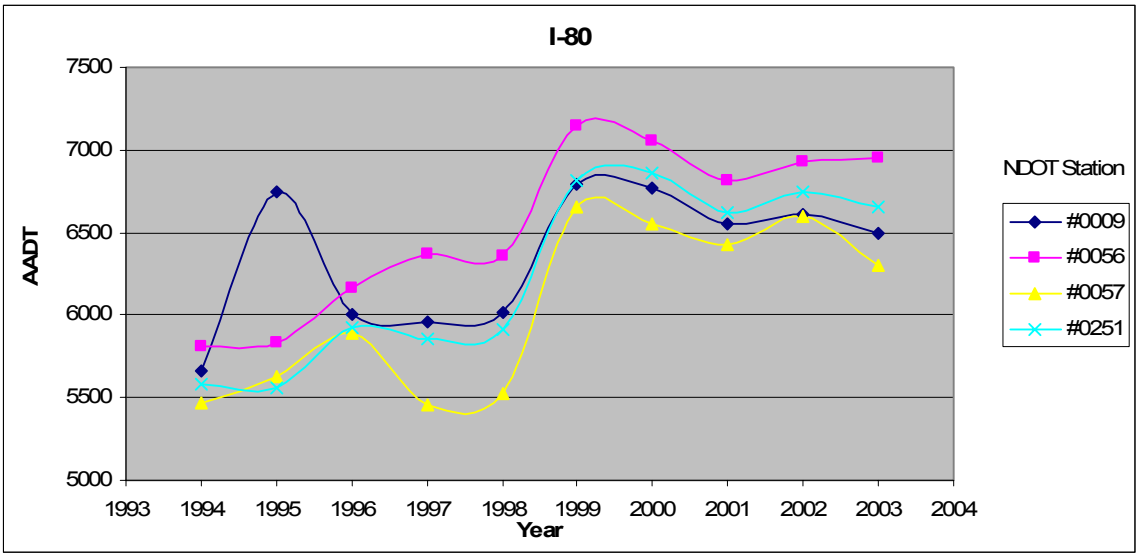


Table IV-b on the next page displays historical and existing AADT at traffic count stations on I-80 within Eureka County. Traffic volumes are shown to be approximately 6,500 vehicle trips per day on I-80, with 10-year annual growth rates of 1.55, 1.59, and 2.01%. **Figure IV – j,** next page**,** shows a graphical representation of historical traffic data along I-80. An annual traffic growth rate of 2% is an accepted growth rate within the traffic engineering practice. If it is then assumed that a two percent (2%) annual growth rate continued into the future, traffic volumes on I-80 would be as shown on page 75.

Table IV - b
Historical Annual Average Daily Traffic on I-80

Count Station # 0009 Eureka County IR-80, .2 mi E of the Dunphy Interchange									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
5660	6745	6005	5955	6020	6790	*6770*	*6550*	*6610*	*6500*
Annual Average Growth between 1994 and 2003 =								1.55%	
Count Station # 0056 Eureka County IR-80, .5 mi E of Emigrant Pass Interchange 'Exit 268'									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
5810	5830	6170	6370	6355	7145	7060	*6820*	*6930*	*6950*
Annual Average Growth between 1994 and 2003 =								2.01%	
Count Station # 0057 Eureka County IR-80, .5 mi W of the Dunphy Interchange 'Exit 254'									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
5465	5625	5885	5455	5520	6650	*6550*	6430	6600	6300
Annual Average Growth between 1994 and 2003 =								1.59%	
Count Station #0251 Elko County IR-80, .4 mi E of the W Carlin Interchange 'Exit 279'									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
5585	5560	5925	5860	5915	6820	*6865*	6620	6750	6650
Annual Average Growth between 1994 and 2003 =								1.96%	
Values italicized are estimated or adjusted data									
Source: NDOT, 2003 Annual Traffic Report									

Figure IV - j
Historical Traffic on I-80



Source: NDOT 2003

Potential Future Traffic on I-80

Percent	# of Years	Year	AADT
n/a	0 yrs	2003	7,000
2%	12 yrs	2015	8,700
2%	17 yrs	2020	9,600
2%	22 yrs	2025	10,600

Other traffic monitoring stations in Eureka County are included in **Figure IV-k**. Traffic monitoring station data is shown on **Table IV-c** and includes data for three locations along SR 278.

Count station #36 is located on SR 278 south of Carlin near the Palisade South Junction. This traffic count shows little growth over the last 10 years (0.72%). Count station #250 is on SR 278 near I-80 and Chestnut Street near downtown Carlin (Elko County). This station shows an increase of 3.25% over the past 10 years. Traffic station #40 is on SR 278 just north of US 50. This station shows a 10-year annual increase of 3.06%. A fourth station that has no historical data prior to 2003 is count station #1111109. This station counted 350 AADT in 2003 and represents "through" traffic along SR 278 between Carlin and Eureka.

Data gathered for SR 278 shows that at the northern and southernmost termini traffic has greater growth rates. The main line of SR 278 shows AADT about half as much as populated areas with minimal historical growth.

Figure IV - k
NDOT Traffic Count Stations (Eureka County)

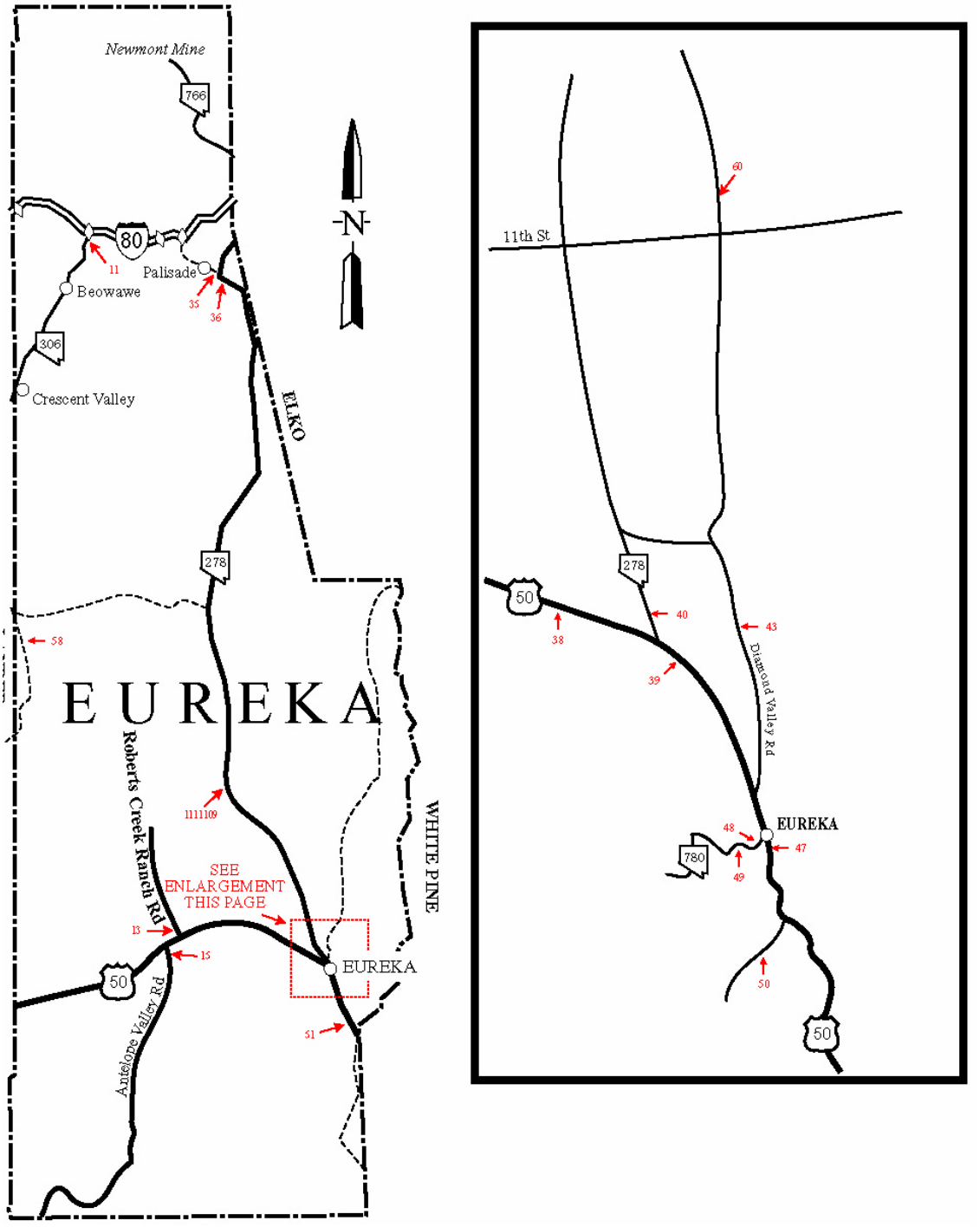
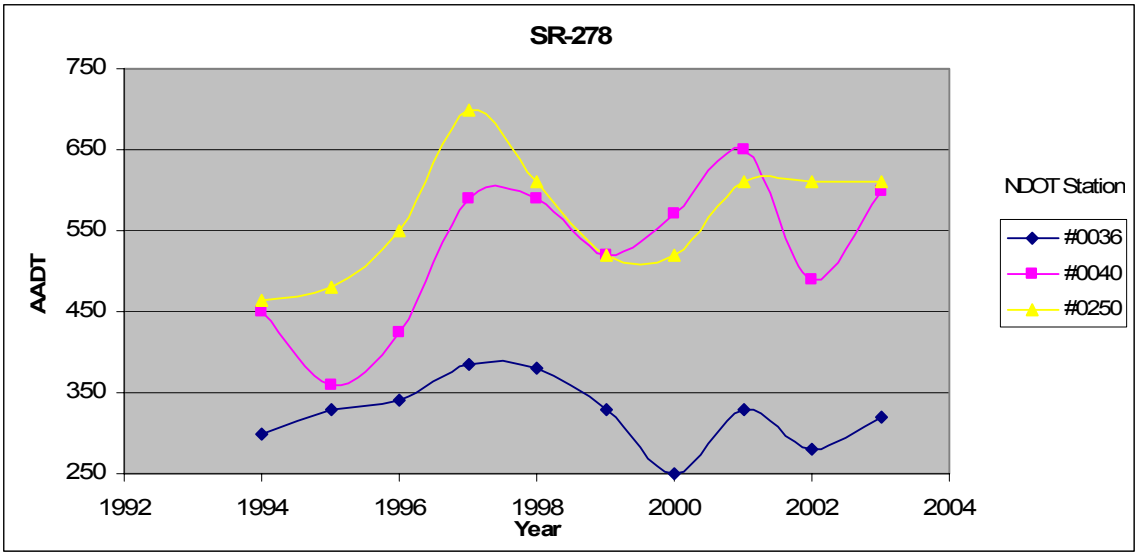


Table IV - c
Historical Annual Average Daily Traffic on SR 278

Count Station # 0036 Eureka County SR-278 (Eureka-Carlin Rd.), .5 mi S of County Road to Palisade South Jct.									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
300	330	340	385	380	330	250	330	280	320
Annual Average Growth between 1994 and 2003 =								0.72%	
Count Station # 0040 Eureka County SR-278 (Eureka-Carlin Rd.), .1 mi North of US-50									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
450	360	425	*590*	590	520	570	650	490	600
Annual Average Growth between 1994 and 2003 =								3.25%	
Count Station # 0250 Elko County SR-278 (Eureka-Carlin Rd.), .3 mi S of SR-221 (Chestnut St.)									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
465	480	550	700	610	520	520	610	610	610
Annual Average Growth between 1994 and 2003 =								3.06%	
Values italicized are estimated or adjusted data									
Source: NDOT, 2003 Annual Traffic Report									

Figure IV - l is a graphical representation of historical traffic growth over the past 10 years.

Figure IV - l
Historical Traffic on SR 278



Source: NDOT 2003

Traffic on US 50 over the past 10 years has remained relatively constant. At many count stations traffic is less than it was 10 years ago, showing a negative growth rate over that period. With relatively small daily traffic volumes, slight variations in counts can cause what is seen on the graph as large changes in traffic volumes. For transportation planning purposes, traffic on US 50 near Eureka has received no change over the last decade.

Table IV-d and **Figure IV-m** show the historical traffic and growth trends on US 50.

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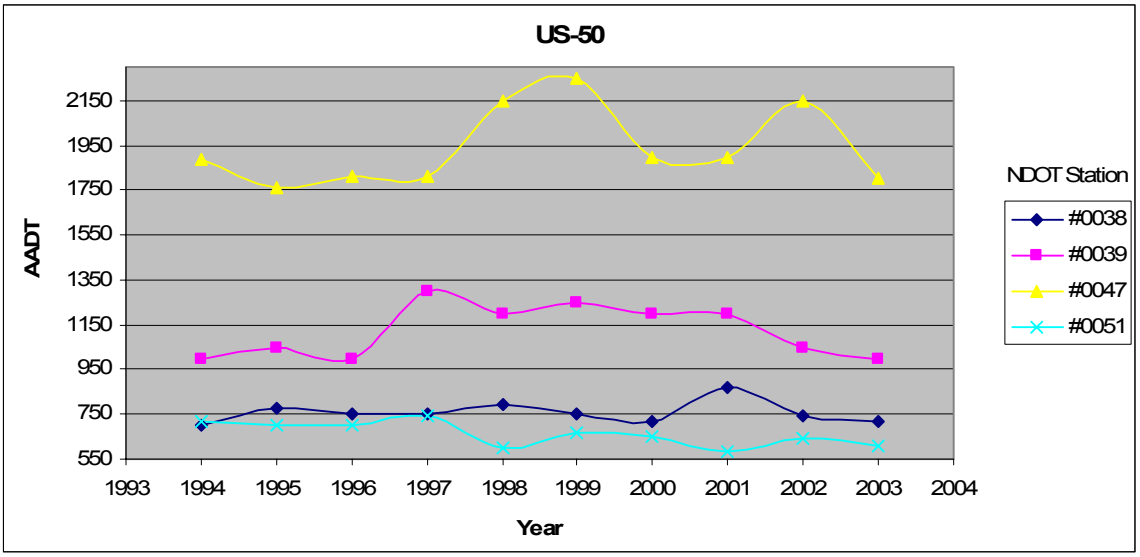
Table IV - d
Historical Annual Average Daily Traffic on US 50

Count Station # 0038 Eureka County US-50, 1.2 mi W of SR-278									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
700	775	750	*750*	790	750	*720*	870	740	720
Annual Average Growth between 1994 and 2003 = 0.31%									
Count Station # 0039 Eureka County US-50, .2 mi E of SR-278									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
1000	1050	1000	*1300*	1200	1250	1200	1200	1050	1000
Annual Average Growth between 1994 and 2003 = 0.00%									
Count Station # 0047 Eureka County US-50, 200' E of SR-780 (Ruby Hill Av) to Ruby Hill									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
1890	1760	1810	*1810*	2150	2250	1900	*1900*	*2150*	*1800*
Annual Average Growth between 1994 and 2003 = -0.54%									
Count Station #0051 Eureka County US-50, .9 mi W of County Rd to Duckwater (Fish Creek Rd.)									
1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
715	700	700	740	600	670	650	580	640	610
Annual Average Growth between 1994 and 2003 = -1.75%									
Values italicized are estimated or adjusted data									
Source: NDOT, 2003 Annual Traffic Report									

Figure IV – m
Historical Traffic on US 50



Source: NDOT 2003

F. SPEED DATA

State Monitoring

NDOT maintains permanent speed monitoring stations throughout the state. This "Annual Speed Monitoring Program" (ASMP) is administered by the Traffic Information Division, in cooperation with the U.S. Department of Transportation (USDOT), Federal Highway Administration (FHWA).

Prior to the enactment of the federally-mandated National Maximum Speed Limit (NMSL), the purpose of the ASMP was to provide reliable speed data which was used to evaluate statewide speed trends for highway design applications. After the NSML was instituted in 1974, states were required to implement comprehensive programs to monitor speeds to determine the level of motorist's compliance with the 55 MPH speed limit. At this time, the emphasis of the program was to provide speed data to determine the state's level of compliance with the NMSL.

In November 1995, the "National Highway Designation Act" was enacted, resulting in the repeal of the NMSL. Because Nevada is no longer required to submit an annual certification of speed limit enforcement, the purpose of the speed monitoring program is to provide data for trend analysis relative to the effects of the increased speed limits and the possible effects on speed related crashes.

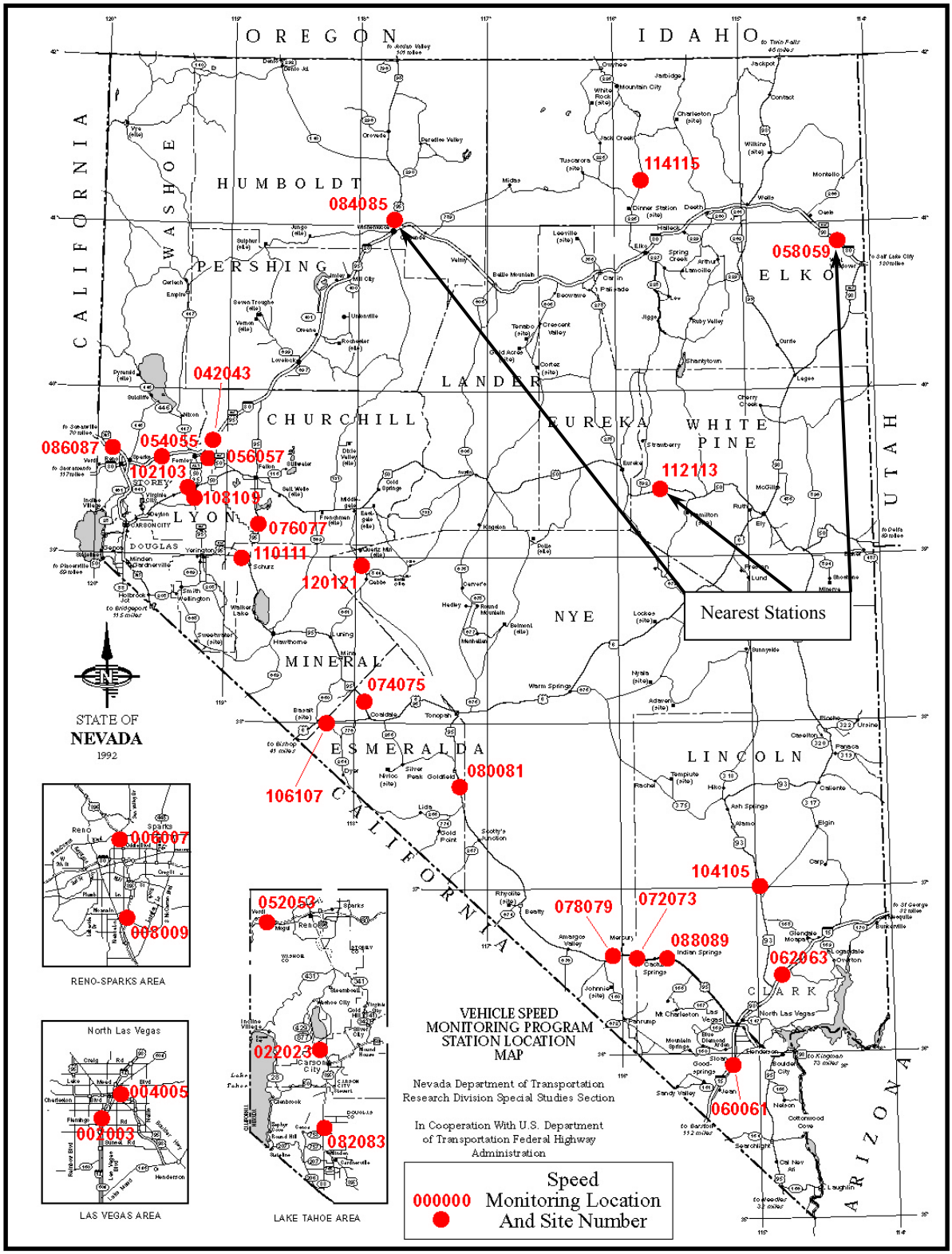
Twenty-nine locations statewide are monitored on roadways posted at 65 MPH or greater. Monitoring is conducted on an annual basis only and reporting is on a calendar year cycle. The nearest station to the study area on US 50 (#112113) is east of Eureka in White Pine County. The closest station (#058059) along I-80 is near the Utah border (see **Figure IV – n** and **Table IV-e**.) The most current data associated with these monitoring stations is in **Appendix K**. **Exhibits 3-7** display the approximate location of speed zones along the study roadways.

Table IV - e
Annual Speed Monitoring Program Stations

Station	Year	Posted Speed (mph)	Percent Exceeding Posted Speed	Average Speed (mph)	85th Percentile Speed (mph)
058 059 I-80 Near Wendover	2001	75	57.1	76.2	80.1
	2002	75	50.1	74.8	85.6
	2003	75	53.4	75.4	83.5
112 113 US 50 Near Eureka	2001	70	45.3	69.9	77.3
	2002	70	Not Monitored Due to Equipment Failure		
	2003	70	51.8	70.9	78.9

Source: NDOT Annual Speed Monitoring Report, 2003

Figure IV - n
NDOT Speed Monitoring Locations



Source: NDOT 2003

G. ADJACENT UTILITIES

Information about the utilities adjacent to the study roadways were obtained from NDOT (see **Appendix L**). NDOT provided permit information for every active permit along each corridor. Permits are required when there is any construction within NDOT right-of-way, including underground and overhead. The information below details the various permits.

Table IV - f
NDOT Right-of-Way Permits in Eureka County

Permit Type	I-80 Permits	SR 278 Permits	US 50 Permits
Underground Telephone (fiber optic)	13	39	10
Overhead Telephone	5	10	12
Overhead Electric	10	30	14
Underground Water		5	16
Underground Storm Drain			2
Underground Sewer			12
Approach & Other	7	120	87
Total number of permits	**35**	**204**	**153**
Source: NDOT District III Permits (see Appendix I)			

There is also a 6" natural gas pipeline that traverses Eureka County and crosses I-80 between Beowawe and Primeaux Springs. The pipeline continues east toward Elko on the north side of I-80 (see **Exhibit 3a**). A second 12" pipe parallels the 6" between the Palisade exit on I-80 (exit 281) and Elko.

H. ACCIDENT DATA

Various reports and information were made available from NDOT online or in print. Presented here is information from the *Nevada Traffic Crashes* report and accident data compiled for individual routes. This data was divided into segments on each study route. Three-year accident data is typically used for design and analysis for intersections and road segments. Three-year data and ten-year data was obtained and presented here to show recent accidents, accident rates, and an overview of historical rates (see **Appendix M**). During the process of interviewing NDOT and County staff it was determined that some accidents occurred that were not included in the accident data. Some accidents included deaths and major injuries.

NDOT 2002 Accident Report

Lumos obtained the most current *Nevada Traffic Crashes* (2002) report. **Tables IV – g** & **h** display some of the results from that report. Eureka County is shown to represent a very small portion of Nevada accidents in 2002 (0.18%)

with 115 accidents out of over 62,000 statewide for the year (also see **Figure IV – o**). Lumos also requested three-year accident data (October 2000-October 2003) and 10-year accident data (January 1994-July 2005). This data was provided by NDOT's Traffic and Safety Division and contains information on accident type, cause, and injuries/fatalities. The typical standard for measuring current operating conditions is three-year accident data is since it reflects current traffic volumes and geometric road changes. Ten-year data are useful to catalog historical trends. Both are presented here.

Table IV - g
Number and Percent of Crashes by County

County	Number of Crashes	Percent of Statewide Total
Clark	45,748	73.50%
Washoe	10,254	16.47%
Carson City	1,293	2.07%
Elko	1,064	1.70%
Douglas	880	1.41%
Nye	587	0.94%
Churchill	502	0.80%
Lyon	489	0.78%
Humboldt	367	0.58%
White Pine	276	0.45%
Lincoln	163	0.26%
Pershing	134	0.21%
Eureka	**115**	**0.18%**
Mineral	112	0.17%
Lander	110	0.17%
Storey	85	0.13%
Esmeralda	58	0.09%
Total	**62,237**	**100%**

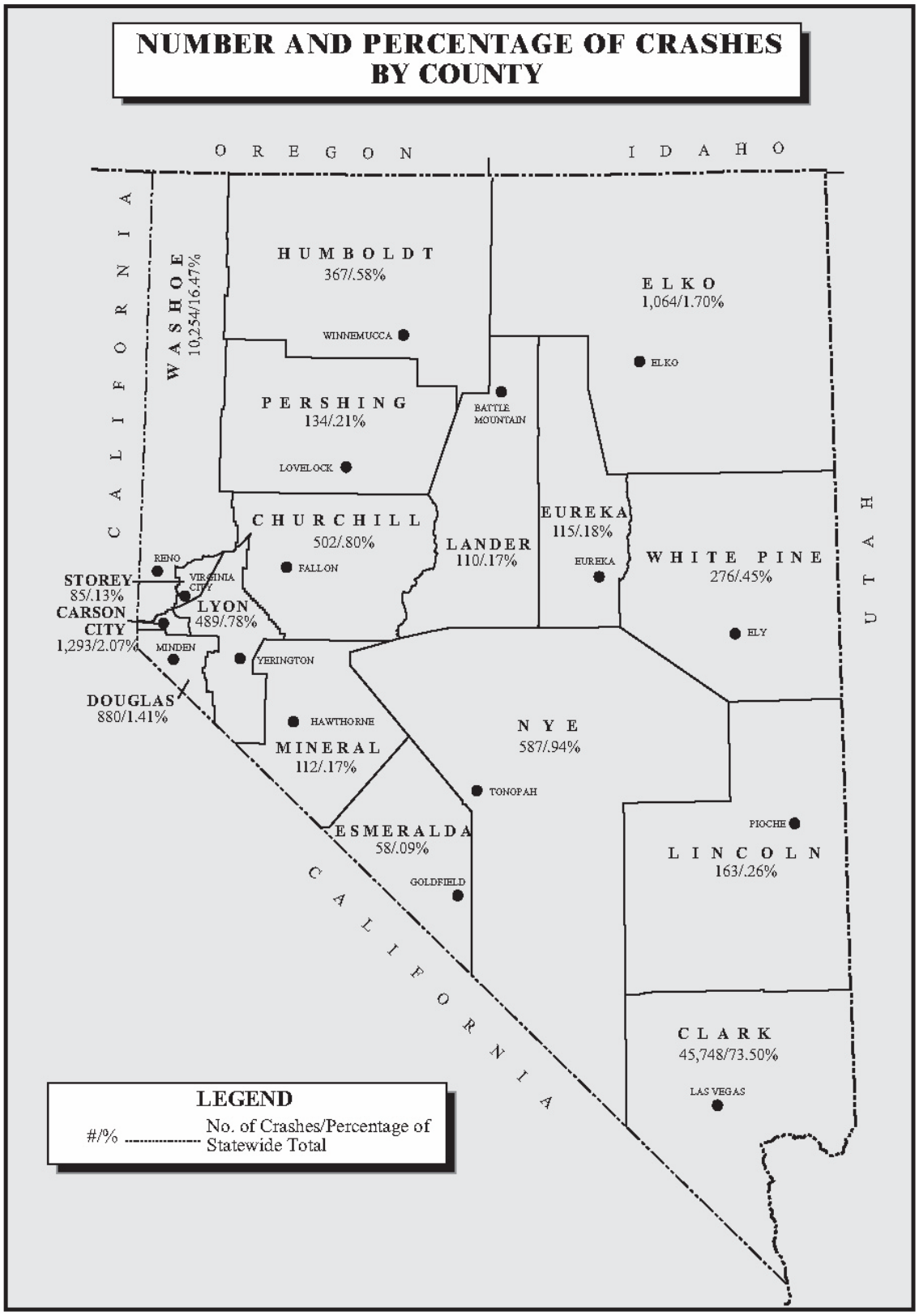
Source: NDOT 2002 Nevada Traffic Crashes

Table IV - h
Top Five Primary Crash Types by Severity-Eureka County 2002

Type of Crash	Accident Total	Injuries	Fatalities	Property Damage Only
Animal Collision	32	2	0	30
Ran Off Road-Overturned	18	9	2	8
Ran Off Road-Fixed Object	15	1	0	14
Ran Off Road-Other Combo	9	8	1	1
Out of Control	6	3	0	3
All Others	35	16	1	25
Totals	**115**	**39**	**4**	**81**

Source: NDOT 2002 Nevada Traffic Crashes

Figure IV - o
Number and Percent of Crashes by County



3-Year Accident Data

Table IV-i displays three-year accident data for each study roadway. Each segment was further divided into smaller segments by County mileposts. Milepost segments were chosen based on terrain, major road intersections, NDOT district/sub-district boundaries, etc. The data show I-80 to have the most accidents, injuries, fatalities, and property-damage-only accidents. This is expected since I-80 has more traffic, higher speeds, and a mountain pass (Emigrant Pass).

Table IV - i
Eureka County Three-Year Accident Data
October 2000 through October 2003

I-80

I - 80 Road Segments (Eureka County milepost)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 10	45	11	1	38
Mile Post 10 to 20	85	37	1	61
Mile Post 20 to W. Carlin (SR-278)	51	36	5	29
Totals	**181**	**84**	**7**	**128**

SR 278

SR - 278 Road Segments (Eureka County milepost)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 11	3	0	0	3
Mile Post 11 to 35	16	10	0	9
Mile Post 35 to 68	10	3	0	8
Mile Post 68 to 83 (Elko County Line)	15	3	1	11
Elko Co. Line to I-80 Interchange Carlin	7	5	0	4
Totals	**51**	**21**	**1**	**35**

US 50

US - 50 Road Segments (Eureka County milepost)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 30	22	13	4	10
Mile Post 30 to 40	14	7	0	9
Mile Post 40 to White Pine County	12	2	1	9
Totals	**48**	**22**	**5**	**28**

Source: NDOT-Traffic and Safety Division, Compiled in 2005

10-Year Accident Data

Table IV-j displays ten-year accident data for each study roadway with I-80 having the most accidents, injuries, fatalities, and property-damage-only accidents. Accidents were then converted to an accident *rate* using segment length, segment traffic, and the number of segment accidents. **Table IV-k** displays comparative accident rates for each roadway and road segment.

Table IV - j
Eureka County Ten-Year Accident Data
January 1994 through July 2005

I-80

I - 80 Road Segments (Eureka County mile post)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 10	176	80	9	130
Mile Post 10 to 20	257	113	6	191
Mile Post 20 to W. Carlin (SR-278) Interchange	144	76	10	98
Totals	**577**	**269**	**25**	**419**

SR 278

SR - 278 Road Segments (Eureka County mile post)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 11	26	8	0	19
Mile Post 11 to 35	47	32	0	27
Mile Post 35 to 68	43	29	1	27
Mile Post 68 to 83 (Elko County Line)	45	21	1	31
Elko Co. Line to I-80 Interchange Carlin	4	0	0	4
Totals	**165**	**90**	**2**	**108**

US 50

US - 50 Road Segments (Eureka County mile post)	Accident Total	Injuries	Fatalities	Property Damage Only
Mile Post 0 to 30	79	50	7	40
Mile Post 30 to 40	80	15	0	70
Mile Post 40 to White Pine County Line	49	9	2	41
Totals	**208**	**74**	**9**	**151**

Source: NDOT-Traffic and Safety Division Compiled in 2005

Table IV - k
Eureka County Ten-Year Accident Data
Accident Rates
January 1994 through July 2005

I-80

Study Segment	Length (mi)	Total	ADT	Accident Rate
Mile Post 0 to 9.99	10	176	6,500	0.74
Mile Post 10 to 19.99	10	257	6,700	1.05
Mile Post 20 to W. Carlin (SR-278)	7.2	144	6,700	0.82
Total	**27.2**	**577**	-	

SR 278

Study Segment	Length (mi)	Total	ADT	Accident Rate
Mile Post 0 to 10.99	11	26	600	1.08
Mile Post 11 to 34.99	15	47	320	2.68
Mile Post 35 to 67.99	33	43	320	1.12
Mile Post 68 to (Elko Co. Line)	15	45	320	2.57
Elko Co. Line to Interchange Carlin	5	4	610	0.36
Total	**79**	**165**	-	

US 50

Study Segment	Length (mi)	Total	ADT	Accident Rate
Mile Post 0 to 29.99	30	79	720	1.00
Mile Post 30 to 39.99	10	80	1,300	1.69
Mile Post 40 to White Pine County Line	7.4	49	610	2.97
Total	**47.4**	**208**	-	

Source: NDOT, Traffic & Safety Division, 2005

I-80 near Emigrant Pass shows a higher accident rate than other segments on I-80. SR 278 shows higher accident rates in the Canyon area between Carlin and the Elko/Eureka County line.

Emigrant Pass Accident Data – I-80

Every two miles of I-80 through Eureka County was reviewed for ten-year accidents and fatalities. **Table IV - l** shows that between mile posts 14 and 22 there are nearly double the amount of accidents compared to other two-mile sections of roadway. Though the total number of accidents in the Emigrant Pass area is nearly double than other sections of roadway, the number of fatalities are not substantially higher than other roadway sections. The area in bold on **Table IV – l** represents the Emigrant Pass section of roadway.

Table IV - l
Eureka County Accidents on I-80
January 1994 - July 2005

Milepost	Accidents	Fatalities
0-2	42	3
2-4	39	2
4-6	31	1
6-8	33	1
8-10	35	2
10-12	29	0
12-14	39	3
14-16	**60**	0
16-18	**69**	2
18-20	**60**	1
20-22	**68**	3
22-24	49	7
24-26	29	0
Source: NDOT, Traffic & Safety Division 2005		

Work Zone Accidents

Work zone accident information over the past 10 years, obtained from NDOT are displayed in **Table IV – m**.

Table IV - m
Eureka County Ten-Year Work Zone Accident Data
January 1994 through July 2005

I-80

Accident Total	Injuries	Fatalities	Property Damage Only
21	15	3	12

SR 278

Accident Total	Injuries	Fatalities	Property Damage Only
3	1	0	2

US 50

Accident Total	Injuries	Fatalities	Property Damage Only
4	1	0	3

Source: NDOT-Traffic and Safety Division Compiled in 2005

Specific Event #1 – NDOT Employee Work Zone Accident Death (~2000)

Another work zone accident event emerged in interviews with NDOT staff that was not included in the work zone accidents list. According to NDOT and County staff, in the early 2000's one NDOT maintenance worker was killed and others maimed due to a truck driver who fell asleep at the wheel in a construction zone. This event was located in Emigrant Pass (see **Exhibit 3b**.)

I. WEATHER/OTHER EFFECTS

Information on weather effects on roadways was requested from NDOT District III and the Ely Sub District. The principal weather effects identified by the Elko District was snow removal on I-80, blinding dust, ash, fog, and smoke. There is a snow removal priority ranking for various roadways in the County (A, B, and C). I-80 receives an "A" priority during snow events, especially near the Emigrant Pass area. As detailed in the Accident portion of this report, it is clear that the Emigrant Pass area on I-80 is a crucial area to keep clear and safe. Recent occurrences of blinding clouds of dust, ash, smoke and fog have caused traffic accidents. Some specific events are included later in this report.

The extreme weather conditions of central Nevada promote roadway deterioration. This is a maintenance issue recognized by NDOT and addressed using a three to five-year overlay or chip-seal surface treatment schedule.

NDOT Ely Sub District

The Ely Sub District prioritizes snow removal in the order of US 50, the bus route areas on SR 278, summits, then remainder of the roadway in the sub-district. US 50 receives constant plowing and sanding during snow storms, especially at Devil's Gate. The most troublesome summits on US 50 are just east of Eureka in White Pine County. Though these summits are out of the study area, the Ely Sub District staff noted that it takes much effort to keep traffic flowing through these summits (Pinto, Antelope, and Pancake).

SR 278

SR 278 milepost 0.00 to milepost 35.33 is classified as a secondary road, making it a lower priority for snow removal than US 50. The section from milepost 16.00 to milepost 35.33 is plowed after US 50 and the bus routes are taken care of. Despite this, SR 278 is a highway that many people from Eureka use to go to Elko for medical needs, shopping, etc. Ambulance services usually take patients to Elko Hospital for injuries and illness along this corridor. Therefore, if there are enough personnel and plows, the Ely Sub District tries to have a plow on that road on a steady basis, as well. The road has one summit, Garden Pass, which is between about milepost 8.00 and milepost 25.00. NDOT personnel and local informants report that this pass can get very treacherous in winter conditions.

The Ely Sub District has recorded weather occurrences on the sub-district's roads that consist mainly of snow, blowing snow, floods and, most recently, Mormon Crickets. None of these events have caused major damage to the roadways except floods. Floods have occurred on SR 278 at several locations. Heavy runoff caused flooding in late February and early March, 1984 at milepost 4.00 to 5.00. The flooding damaged about 500' to 600' of shoulder and required round-the-clock flagging for several days. Flash floods have caused

flooding and shoulder damage at several other locations on SR 278 over the years, including at mileposts 17.50, 26.00, 28.70, and 33.60 to 34.50. The heaviest flooding occurred in 1987 at the 33.60 to 34.50 mileposts. Moderate to heavy snow occurs every winter, but does not seem to cause severe damage other than the normal effects of water and freezing.

During the last several summers Mormon Crickets (*anabrus simplex*) have been a safety problem. The infestation has occurred around mileposts 21.50 to 35.33 in varying degrees of severity depending upon the cricket population. The migrating crickets do not cause any damage to the highway, but they are a safety problem because they distract drivers, and crickets crushed by passing vehicles can create a very slick road surface.

US 50

Major weather occurrences on US 50 consist mainly of winter snow storms, drifting snow and flash floods. Over the years, flash floods have occurred at several locations, including mileposts 21.00 and 36.85. Winter storms on US 50 in can be moderate to very heavy but do not cause severe damage other than the normal effects of water and freezing temperatures on flexible pavement. Drifting can occur throughout US 50, but the most troublesome areas run from mileposts 37.70 to 45.00. Heavy drifting snow in this area greatly increases man-hours spent keeping it open and causes many accidents every year.

Specific Event #2 – Stuck Animal Truck between I-80 and SR 278 (August 7, 1993)

During interviews with NDOT and County staff it was noted that trucks occasionally seek alternate routes when I-80 is closed. One incident occurred when a tractor-trailer transporting live animals left I-80 at Carlin via SR 278 south to Palisade. From Palisade the driver attempted to continue north towards Emigrant Pass on a dirt road not suitable for tractor-trailers. The vehicle became stuck and when animals died due to the high temperature and lack of food and water, the driver left the carcasses on the side of the road. This incident points to the need to monitor nuclear waste transport, and to make a clear route plan for nuclear waste truck transportation when alternate routes must be used due to incidents or closures on main routes.

Specific Event #3 – Multi-Vehicle Collision on I-80 (July 29, 2005)

On Friday, July 29, 2005 at least four people were killed and a dozen or more were injured when more than 20 vehicles collided on I-80. Their drivers were blinded by swirling dust and ash picked up by high winds from burned land near the interstate three weeks earlier. Nevada troopers said vehicles, including four or five semi-truck rigs, rear-ended each other. The accident occurred on I-

80 near the eastern portion of Emigrant Pass. This event closed the interstate and led to Special Event #4.

Specific Event #4 – Stuck Semi Truck between I-80 and SR 278 Due to Event #3 (July 29, 2005)

Due to the incident detailed in Specific Event #3, a group of semi tractor-trailers attempted to use the dirt road near Emigrant Pass that connects I-80 to Palisade. This road is not suitable for tractor-trailer travel and was posted accordingly (though during accident investigation it was determined that the sign was knocked over and not visible to the truck drivers). One truck became stuck in the same location as the truck in Special Event #2 (pig truck). The remaining trucks had to back up the steep road. **Figure IV – p** displays a picture of the stuck vehicle. The vehicle remained stuck for two days until a sufficient tow-rig was made available.

Figure IV - p
Stuck Semi Truck

Specific Event #5 – Ash & Smoke Blinded Drivers on I-80 (August 18, 1999)

Interviews with County staff have indicated that there was an accident in 1999 on I-80 near "Bob's Flat" due to ash and dust. A tractor-trailer was traveling slowly through the blinding cloud and was rear-ended by a passenger car, killing 2 people.

Specific Event #6 – Fog Blinded Drivers on I-80 (Spring 2005)

In the spring of 2005 there was a multiple-vehicle pile up on I-80 due to a fog bank near Premaux Springs. Interviews indicated that there was no fatalities but many injuries and substantial property damage.

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J. CARLIN AREA INTERCHANGES

Though Carlin area is just outside of Eureka County, the interchanges in Carlin are shown in this study due to their importance in accessing SR 278. Eastbound vehicles on I-80 that exit at the west Carlin interchange cannot get back on I-80 without passing through town. This includes traveling directly past a school zone and other sensitive areas. **Exhibit 8** displays the interchange layouts through Carlin that restrict vehicles from having full access at every interchange. This could potentially be confusing to drivers unfamiliar to the area, and cause undue civilian exposure to nuclear waste transport vehicles.

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K. CONCLUSION

Our assessment of the three study roadways concluded that the three state routes have different traits as follows.

I-80

Interstate 80 has traffic volumes of about 6,500 daily vehicles through Eureka County with approximately 32% of them being trucks. Traffic has increased over the past 10 years by 2% per year. The closest annual speed monitoring station (Wendover) shows the average speed on I-80 to be approximately 75 mph and the 85th percentile (design speed) to be approximately 83 mph. The speed limit on I-80 is 75mph.

There were 577 accidents reported in Eureka Count on I-80 since 1994, with 25 fatalities. There were 21 work-zone accidents reported with 15 injuries and three fatalities. A major work-zone accident occurring in the early 2000's was revealed during the interview process but was not included in the work-zone accident data provided by NDOT. The majority of the accidents along I-80 through Eureka County occurred in the Emigrant Pass area with nearly double the accidents compared to other segments of I-80. The top three most common accident causes over the past 10 years were "speed too fast for conditions," "inattentive driving" and "animal in roadway".

I -80, and specifically Emigrant Pass, receives top priority for snow removal and maintenance compared to other State routes within Eureka County. According to NDOT, seasonal snow, fog, wind, ash, and dust are the major weather events that affect travel along I-80. Other events not detailed in accident reports include brush fires from stalled vehicles or accidents along I-80, and trucks using alternate routes through Eureka County when I-80 is closed getting stuck or losing their load on inadequate routes.

Numerous NDOT encroachment permits for overhead and underground utilities exist along I-80 consisting mainly of phone, fiber optic, and power. Other utilities may exist outside of NDOT right-of-way or that were not included in NDOT's permits list. For example, a natural gas line crosses I-80 in the middle of the County but wasn't listed in the list of permits provided by NDOT.

Four bridge structures along I-80 near Dunphy are on the State's "structurally deficient" list. The Sufficiency Rating of these structures suggests that they can be rehabilitated in order to bring them up to sufficient standards. Three other bridges near Dunphy, not directly on I-80, are also structurally deficient. These bridges are on US 40, but could potentially disrupt nuclear waste transport by rail or road and possibly contaminate the Humboldt River if an incident occurred on these bridges.

SR 278

SR 278 serves as a north/south connector through Eureka County. Traffic volumes have increased by about three percent (3%) per year on SR 278 near Carlin and Eureka (650 daily vehicles). Traffic between Carlin and Eureka has remained relatively constant at about 350 vehicles per day. NDOT reports estimate that 12.9% of the vehicles on SR 278 are trucks. Passing is allowed 85% of the length of SR 278.

One hundred and sixty-five accidents were reported in Eureka County on SR 278 since 1994, with two fatalities. There were three work-zone accidents reported with one injury and no fatalities. The top three causes of accidents on SR 278 over the past ten years are; "animals in the roadway," "inattentive driving," and "speed too fast for conditions." Existing speed data along SR 278 does not exist or was not made available from NDOT.

Weather affects documented along SR 278 from interviews with NDOT or County staff including Mormon Crickets infestations, blowing snow, and floods. SR 278 has secondary priority in snow removal and other maintenance.

One bridge on SR 278 is on the State's structurally deficient list (B-478). This bridge is within the rehabilitation category but is expected to soon qualify for complete replacement. The County airport has access from SR 278 approximately 3.5 miles north of US 50.

US 50

This route extends from I-5 in Sacramento, through Nevada, to I-215 in Utah. In Eureka County, US 50 has seen nearly no growth in traffic over the past 10 years, with average annual daily traffic volumes at under 2,000. According to NDOT, an estimated 19.6% of those vehicles are trucks. Within Eureka County passing is allowed approximately 92.5% along the length of US 50. Speeds on US 50 near Eureka are shown to be approximately 70 mph, with an 85^{th} percentile speed of approximately 78 mph. Speed limits in the same area are 70 mph.

The top three causes of accidents on US 50 over the past ten years are "animals in the roadway", "inattentive driving," and "speed too fast for conditions." There were 208 accidents reported in Eureka Count on US 50 since 1994, with nine fatalities. There were four work-zone accidents reported with one injury and no fatalities.

Major weather occurrences on US 50 consist mainly of winter snow storms, drifting snow and flash floods. US 50 has secondary priority in snow removal and other maintenance unless recurring flooding or other events increases maintenance priorities.