



Montana Department of Transportation

PO Box 201001
Helena, MT 59620-1001

Rec'd
5-25-23
G. Cameron
MDOT

Memorandum

To: Bob Vosen, P.E. – Missoula District Administrator
From: Stan Brelin II, P.E. – Traffic Operations Engineer *SB*
Date: April 17, 2023
Subject: Speed Limit Recommendation
US 93 (N-7) – Stevensville

Please present the following report to Ravalli County for review and comment. Inform them that we would prefer to receive all comments in writing within the next 60 days. Comments not received within 120 days will be regarded as concurrence with the findings of this report. Their comments along with the Department's final recommendation may be presented to the Montana Transportation Commission for action.

Introduction

In February of 2022, Ravalli County requested a speed study be performed on US 93 from South Kootenai Creek Road to the Stevensville Wye. County Commissioners propose reducing the speed limit to 45-mph because of safety concerns posed by residents. After reviewing the study area, it was determined that the area north of the Stevensville Wye would also be reviewed. This speed study begins at milepost 65 and ends at milepost 68.

Site Characteristics

This segment of US 93 was constructed in 1930. The last geometric improvements occurred in 2021 and 2022. Project NH 7-1(157)66 was a pavement preservation project and resurfaced with updated signing in 2021. As part of a district wide installation, centerline rumble strips were installed in the area through HSIP STWD (690) in early 2022. No centerline rumble strips were observed within the study area. Within this speed study, US 93 is part of the non-interstate national highway system (N-7) and classified as a principal arterial. Typical sections are comprised of four 12-foot travel lanes (two in each direction) with varying shoulder widths. South of milepost 66 there are 10-foot shoulders and a 14-foot two-way-left-turn lane (TWLTL). North of milepost 66 the shoulders neck down to 2-feet and the center lane fluctuates between a raised median, left-turn lane, and a 20-foot TWLTL. There is curb and gutter present between milepost 66 and milepost 68. A shared use path runs the length of the study on the western side of the road and pedestrian facilities are available from approximately Horizon Drive to

Stevensville River Road on the east side. There is adequate sight distance both on and along the roadway as the alignment is both flat and primarily tangent in this area. Shoulder rumble strips are present south of milepost 66 and north of milepost 68. At the intersection of US 93 and Secondary-269 (S-269) there is a signal.

Average annual daily traffic volume from 2021 range from about 9,350 vehicles south of S-269 to approximately 12,160 vehicles north of the intersection. In both cases there has been about a 14-percent increase in traffic volumes from 2017 to 2021. The northern section observed an increase in traffic from 2017 to 2018 but a decrease from 2018 through 2020. South of S-269 observed an increase in traffic volumes from 2017 through 2019 and a decrease in 2020. The decrease in 2020 was likely because of the COVID-19 pandemic. This decrease in traffic volumes continued into 2021 south of S-269 and traffic volumes rebounded to pre pandemic levels north of the intersection. Based on preliminary data from 2022 the increase in traffic volumes has continued and south of the intersection with S-269 have also rebounded. It should be noted that traffic volumes on average were 25-percent higher throughout the study area during the summer months.

The roadside environment starts out as rural and transitions to a more urban setting around the intersection of S-269 before returning to a rural environment. Within the rural environment north of milepost 65, the land development is a mix of residential and businesses on large lots. Kootenai Creek is the beginning of the urban typical section, but the roadside environment does not resemble an urban environment until Heritage Drive. The urban typical section continues north to Stevensville Road but the roadside environment changes to rural around Canyon Breeze Court. A mix of residential and business development occurs in the urban area between Heritage Drive and Canyon Breeze Court. Residential development in this region primarily accesses US 93 from public approaches. There are very few private approaches that are not for businesses. North of Canyon Breeze Court, there are some residential, industrial, and institutional development but the majority is agricultural.

Speed Zone History

The Speed Zone from approximately milepost 66 to milepost 67.5 on US 93 was last reviewed in 2006. In April of 2007, the Transportation Commission approved the following speed limits:

A 55-mph speed limit beginning at station 376+00, project F 259(9) (150-feet south of the intersection with South Kootenai Road) and continuing north to station 405+00, an approximate distance of 2,450-feet.

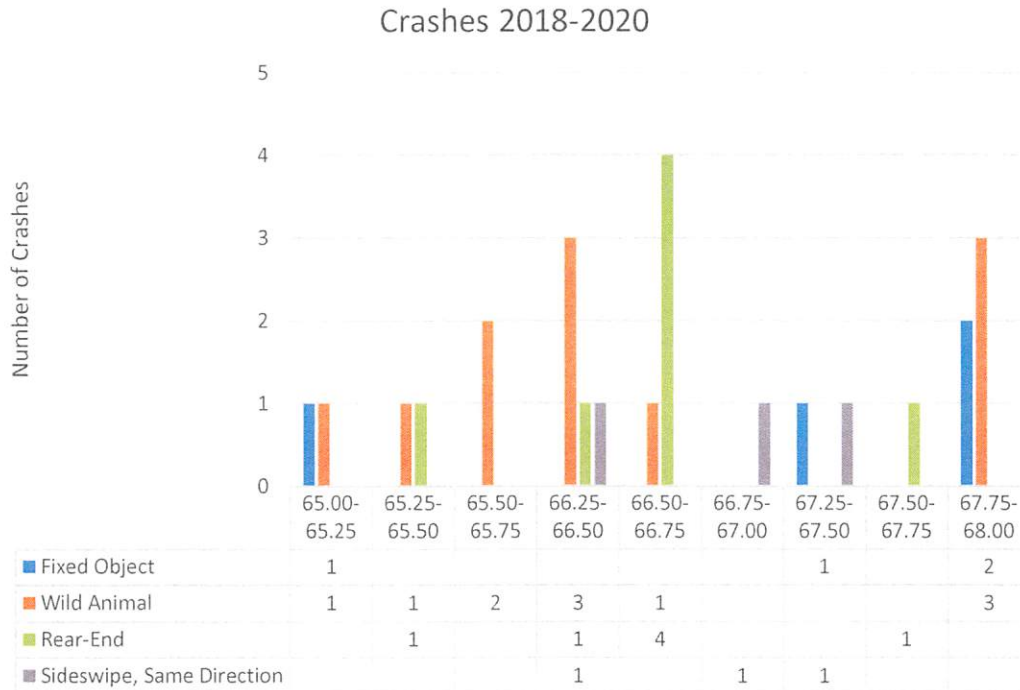
A 45-mph speed limit beginning at station 405+00, project F 259(9) (700-feet south of the intersection with Secondary 269) and continuing north to station 440+00, an approximate distance of 3,500-feet.

A 55-mph speed limit beginning at station 440+00, project F 259(9) (150-feet north of Kootenai Creek Road) and continuing north to station 466+00, an approximate distance if 2,600-feet.

The existing speed zones are approximately located at the Commission approved locations. No speed studies were found for the area after 2008.

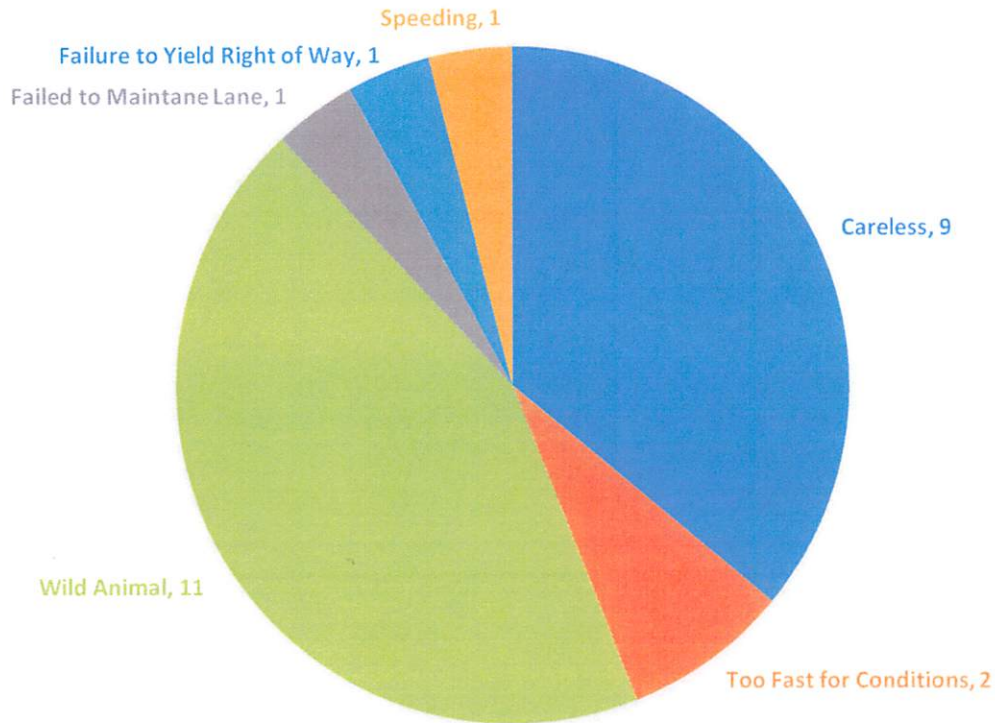
Crash and Citation History

Crash history was reviewed for a three-year period from January 1, 2018 to December 31, 2020. A total of twenty-five crashes were reported along the study segment – 1 possible injury crash and 24 no apparent injury crashes. A majority of the crashes were recorded between milepost 66.25 and milepost 66.75 with one other grouping from milepost 67.75 to milepost 68.00. Wild animal related crashes were the most common (11) followed by rear-end crashes (7) and fixed-object crashes (4). There were also three sideswipe same direction crashes. A total of seven crashes were related to intersections (5 public and 2 private). The majority (4) of these crashes occurred at the intersection of US 93 and S-269 around milepost 66.7. Of these 25 crashes, there were 7 that occurred under adverse road conditions (ice/frost, snow, wet).



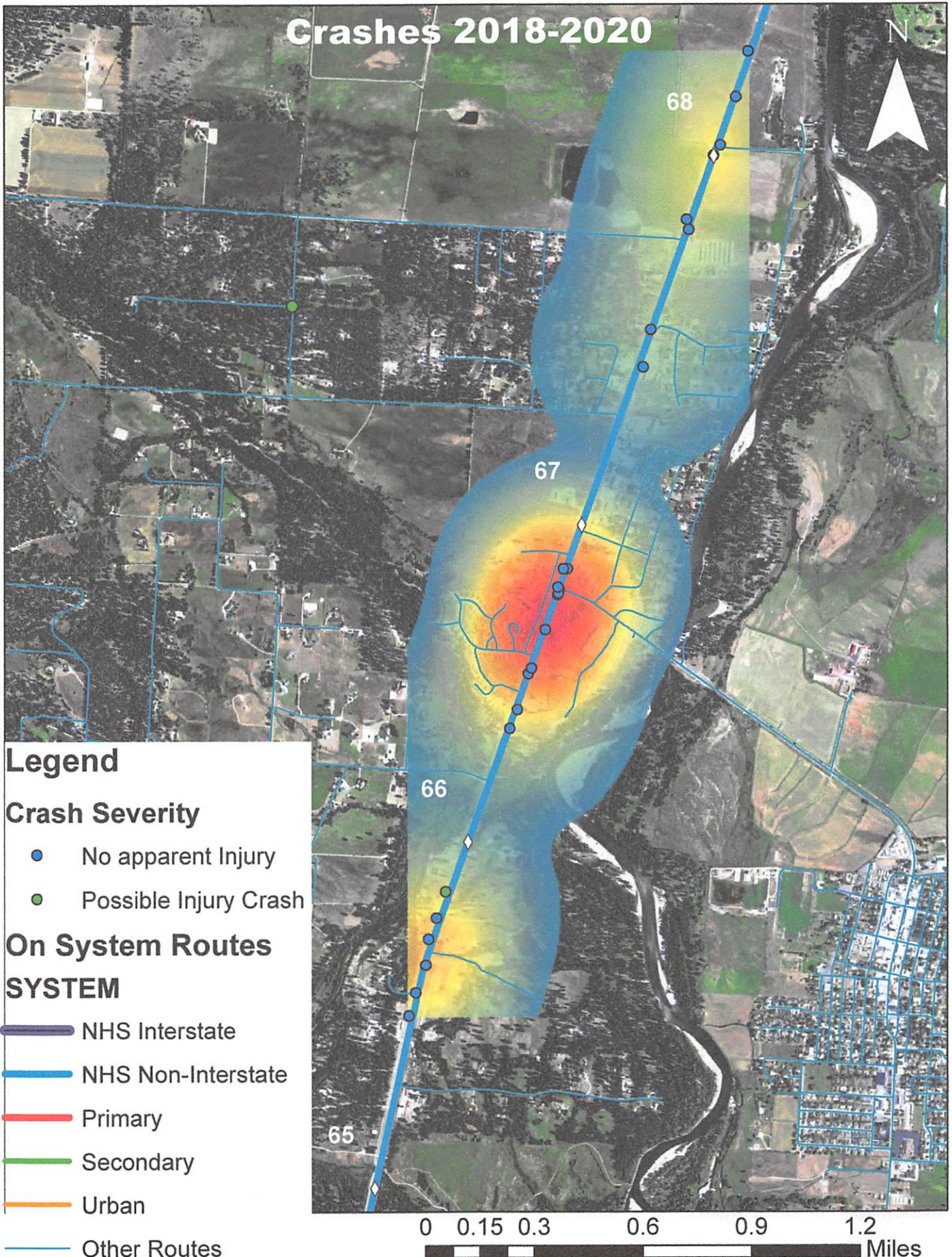
Speed played a direct role in one crash and a role in two others. There were two crashes related to driving too fast for conditions and one that involved speeding. The primary contributing circumstance was wild animal related crashes (11) followed by careless driving (9). Ice was present the two crashes where the contributing circumstance was driving too fast for conditions.

CONTRIBUTING CIRCUMSTANCES



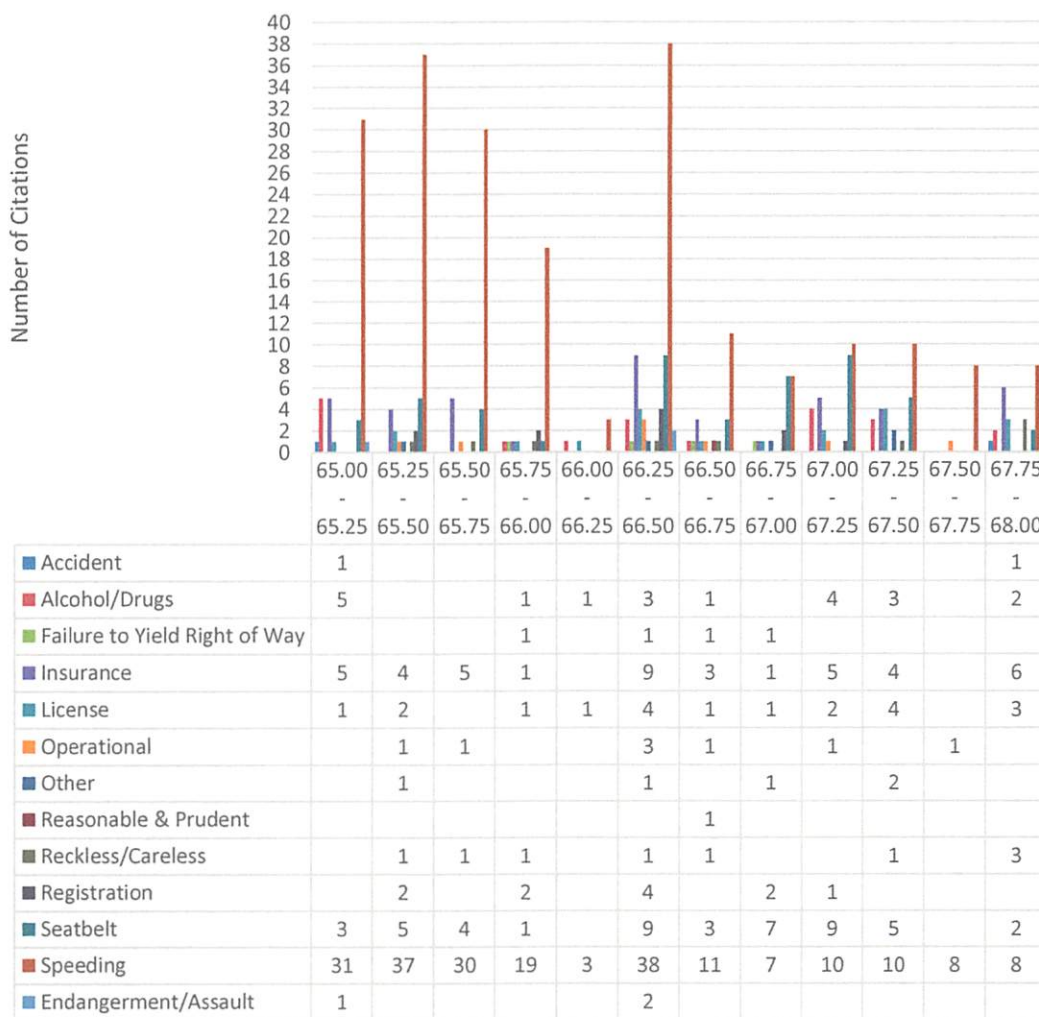
Crashes 2018-2020

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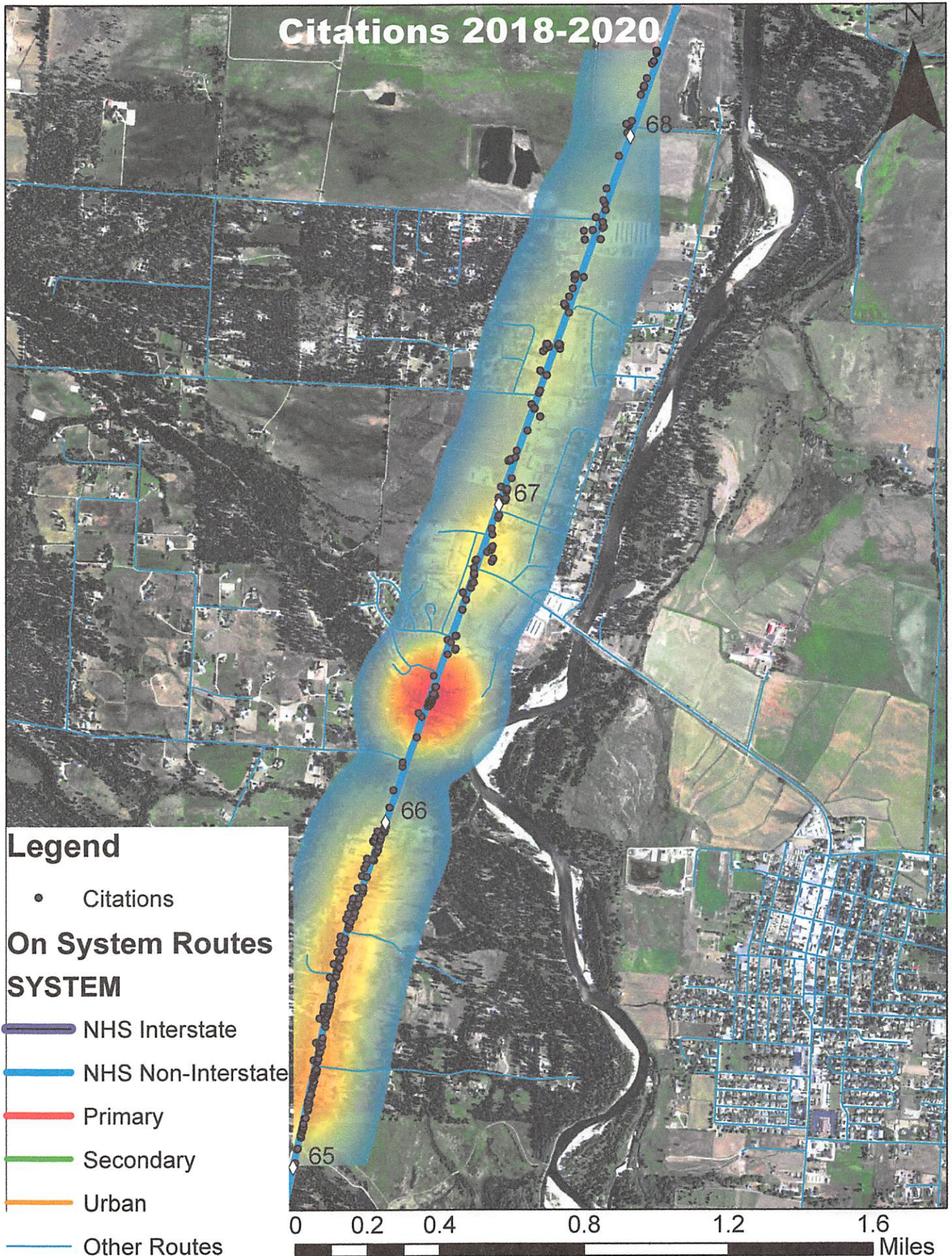


During the same period, the Montana Highway Patrol made 311 traffic stops and issued 386 citations. Fifty-five percent (212 of 386) of the citations involved speeding throughout the study segment with about 24 speeding citations issued/mile/year. Speeding citations are primarily focused from milepost 65.00 to milepost 65.75 and from milepost 66.25 to milepost 66.50. These locations are in the 70-mph and 55-mph speed limits south of the intersection with S-269. Excluding the peak areas for speeding there are approximately 13 citations/mile/year issued. On average speeding citations were written for 14-mph above the posted speed limit. Citations in the 55-mph and 45-mph speed zones had the largest speed differential, but for all speed zones the majority of citations were for 10-mph above the posted speed limit. Approximately fifty percent of the citations were recorded in the 70-mph speed zone or about 1.25-miles of the study. Another large grouping or about 39-percent of the citations were written within a half mile north or south of the intersection with S-269.

Citations 2018-2020

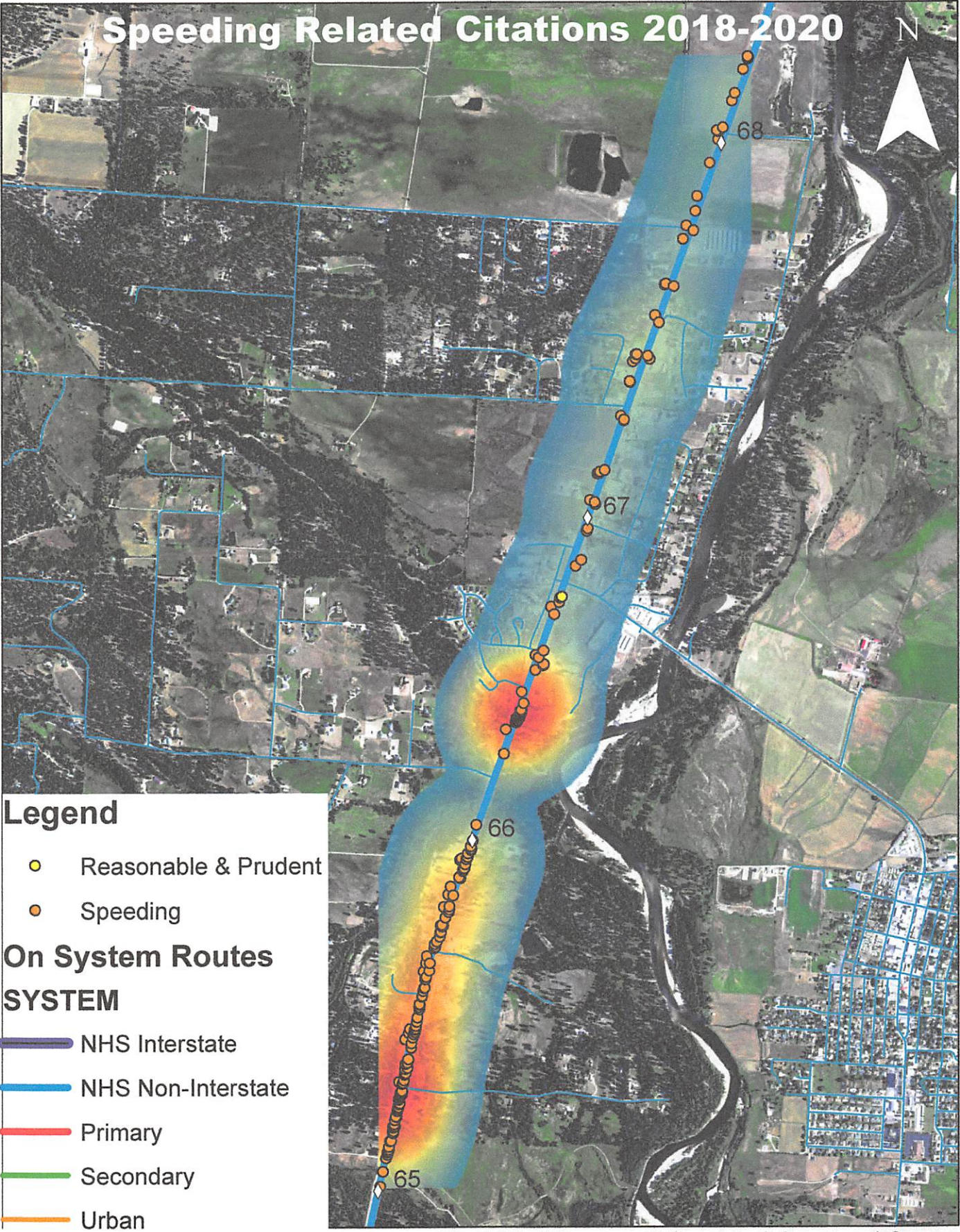


Citations 2018-2020



Speeding Related Citations 2018-2020

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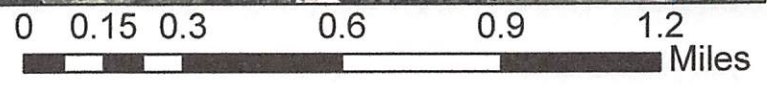


Legend

- Reasonable & Prudent
- Speeding

On System Routes SYSTEM

- NHS Interstate
- NHS Non-Interstate
- Primary
- Secondary
- Urban
- Other Routes



Travel Speed Characteristics

Vehicular travel speeds were sampled directionally at nine locations to develop a speed profile of the 85th percentile speeds, 50th percentile speeds, and the pace of the traffic stream from which to evaluate the speed limit configuration of US 93. The following spot speed sample statistics begin south of the intersection with S-269 in a 70-mph speed zone and continue north through the 55-mph speed limit transition before ending north of the intersection with S-269 in a 70-mph speed zone after passing through the 55-mph transition speed zone. Around the intersection of S-269 there is a 45-mph speed limit. Data was collected in mid-May.

Location	50th Percentile Speed	85th Percentile Speed	Pace of Traffic Stream
70-mph to 55-mph Speed Limit Transition Point	61-mph NB 64-mph SB	67-mph NB 70-mph SB	(56-mph – 66-mph) 62% (59-mph – 69-mph) 61%
500-ft North of S Kootenai Creek Rd 510-ft North of S Kootenai Creek Rd 55-mph Speed Zone	58-mph NB 60-mph SB	64-mph NB 66-mph SB	(53-mph – 63-mph) 64% (55-mph – 65-mph) 61%
120-ft North of Heritage Dr 300-ft North of Heritage Dr 55-mph Speed Zone	55-mph NB 52-mph SB	60-mph NB 57-mph SB	(50-mph – 60-mph) 65% (48-mph – 58-mph) 66%
55-mph to 45-mph Speed Limit Transition Point	44-mph NB 47-mph SB	50-mph NB 54-mph SB	(40-mph – 50-mph) 58% (42-mph – 52-mph) 58%
180-ft South of Houk Ln 70-ft South of Houk Ln 45-mph Speed Zone	44-mph NB 46-mph SB	50-mph NB 51-mph SB	(40-mph – 50-mph) 63% (41-mph – 51-mph) 72%
450-ft South of Kootenai Creek Rd 490-ft South of Kootenai Creek Rd 45-mph Speed Zone	52-mph NB 48-mph SB	57-mph NB 53-mph SB	(46-mph – 56-mph) 65% (43-mph – 53-mph) 72%
45-mph to 55-mph Speed Limit Transition Point	53-mph NB 50-mph SB	59-mph NB 55-mph SB	(48-mph – 58-mph) 66% (45-mph – 55-mph) 68%
180-ft North of Canyon Breeze Ct 100-ft North of Canyon Breeze Ct 55-mph Speed Zone	58-mph NB 55-mph SB	63-mph NB 60-mph SB	(53-mph – 63-mph) 68% (49-mph – 59-mph) 69%
55-mph to 70-mph Speed Limit Transition Point	63-mph NB 58-mph SB	68-mph NB 64-mph SB	(57-mph – 67-mph) 63% (53-mph – 63-mph) 62%

Contextual Characteristics

Recently, the National Cooperative Highway Research Program (NCHRP) completed new research for setting appropriate speed limits on rural and urban streets. *NCHRP report 17-76: Development of a Posted Speed Limit Setting Procedure and Tool* considers contextual aspects of the roadway environment and how it influences operating speed and safety (crashes). The procedure of the tool uses fact-based decision rules that consider both driver speed choice and general safety associated with the roadway. This means the roadway classification, speed, AADT, and other contextual aspects are accounted for when determining an appropriate speed limit.

Within the urbanized environment the typical section does not meet design standards. Shoulders are recommended to be 8-feet wide instead of 2-feet. A separated bicycle path is present on the west side of the roadway and some pedestrian facilities near the intersection with S-269. Due to the proximity of vulnerable road users to vehicles it was recommended that the rounded down 85th percentile speed be used when determining an appropriate speed limit.

The rural environment typical sections adhere to current design standards. However, a slightly elevated crash rate and presence of a two-way-left-turn lane separating the four lanes of traffic indicate the use of the rounded down 85th percentile speeds may be advisable.

A review of the transitional speed zones indicates the current locations may not be appropriate. Transitional speed zones of 55-mph are recommended to be a half mile in length of around 2600-feet to 2700-feet. Currently, the 55-mph speed zones are at least 50-feet to 200-feet short. Considering the contextual characteristics of the area it would be advisable to have the 55-mph speed zone match with the ends of the raised median. Further investigation reveals the 45/55-mph speed limit south of the intersection with S-269 may also be too close to the intersection. Beginning the 45-mph speed limit farther away from the intersection would be advisable.

Conclusions and Recommendations

A review of the spot speed samples shows that the prevailing speeds along US 93 based on the upper limit of the pace and 85th percentile speeds only partially match with the set speed limits. Within the 55-mph speed zones prevailing speeds are on average 6-mph above the posted speed limit. Similarly, on average prevailing speeds were 8-mph above the posted 45-mph speed limit. The statutory 70-mph speed limit matches with prevailing speeds based on the 85th percentile and upper limit of the pace. However, throughout the study area on average 65-percent of drivers were found traveling within 10-mph of each other. Drivers appear to for the most part travel at similar speeds through the study area but do not slow down to the posted speed limits. This is further supported by the 50th percentile speeds are for the most part within ± 5 -mph of the posted speed limit.

Although the prevailing speeds indicate speed limits set below driver's preference roadway context and engineering judgement indicates raising the speed limit would be ill advised. Contextual evidence shows the speed limit should be set based on the rounded down 85th percentile speeds. However, the existing speed limits for the most part match with the 50th

percentile speeds. This being said the 55-mph transitional speed zones are shorter than current practice and lengthening these speed zones is recommended. The 45/55-mph transition point south of the intersection with S-269 is approximately 570-feet south of the intersection. Starting the 45-mph speed limit approximately 1,600-feet south of the intersection is advisable. these speeds are slightly elevated above what should be considered reasonable and prudent.

Based upon these observations and *NCHRP report 17-76: Development of a Posted Speed Limit Setting Procedure and Tool* MDT recommends adjusting the transition points between the 70-mph and 55-mph speed limits and the 45/55-mph transition point south of the intersection with S-269. Further reduction to the existing speed limits is not supported. However, based on current practice and contextual evidence extending the 55-mph transitional speed limit can be supported. The existing transition point between 55-mph and 45-mph south of S-269 can be considered too close to the intersection. Citation data indicates law enforcement is present and targeting those motorists traveling outside the norm.

MDT recommends the following speed limits:

No change to the statutory 70-mph speed limit 450-feet south of milepost 66.

A 55-mph speed limit beginning approximately 1,350-feet south of S Kootenai Creek Road (straight-line station 395+80) and continuing north to a point 60-feet south of Heritage Drive (straight-line station 422+30), an approximate distance of 2,650-feet.

A 45-mph speed limit beginning approximately 60-feet south of Heritage Drive (straight-line station 422+30) and continuing to the existing 45/55-mph speed limit transition point approximately 250-feet north of Kootenai Creek Road (straight-line station 467+50), an approximate distance of 4,520-feet.

A 55-mph speed limit beginning at the existing 45/55-mph speed limit transition point approximately 250-feet north of Kootenai Creek Road (straight-line station 467+50) and continuing approximately 200-feet north of milepost 68 (straight-line station 507+00), an approximate distance of 3,950-feet.

No change to the statutory 70-mph speed limit 200-feet north of milepost 68.

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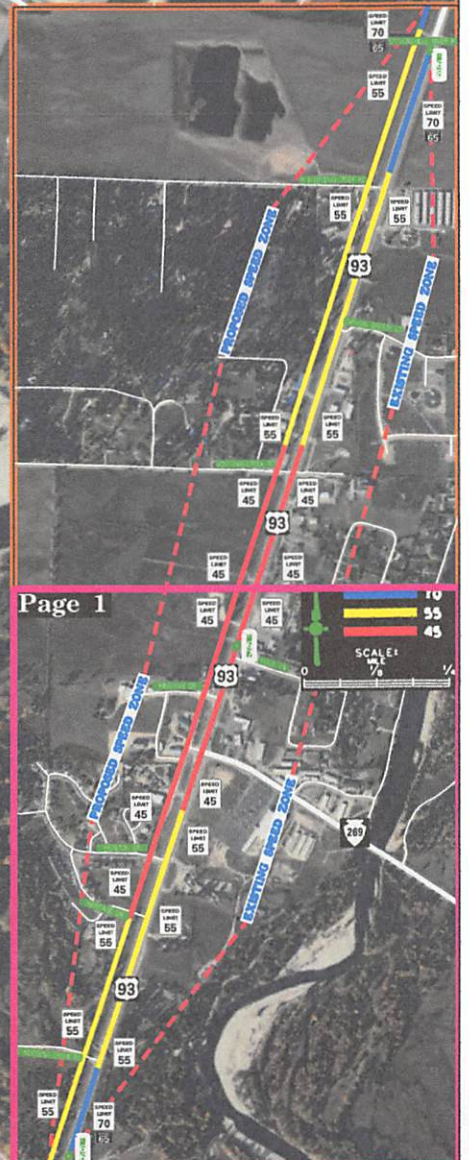
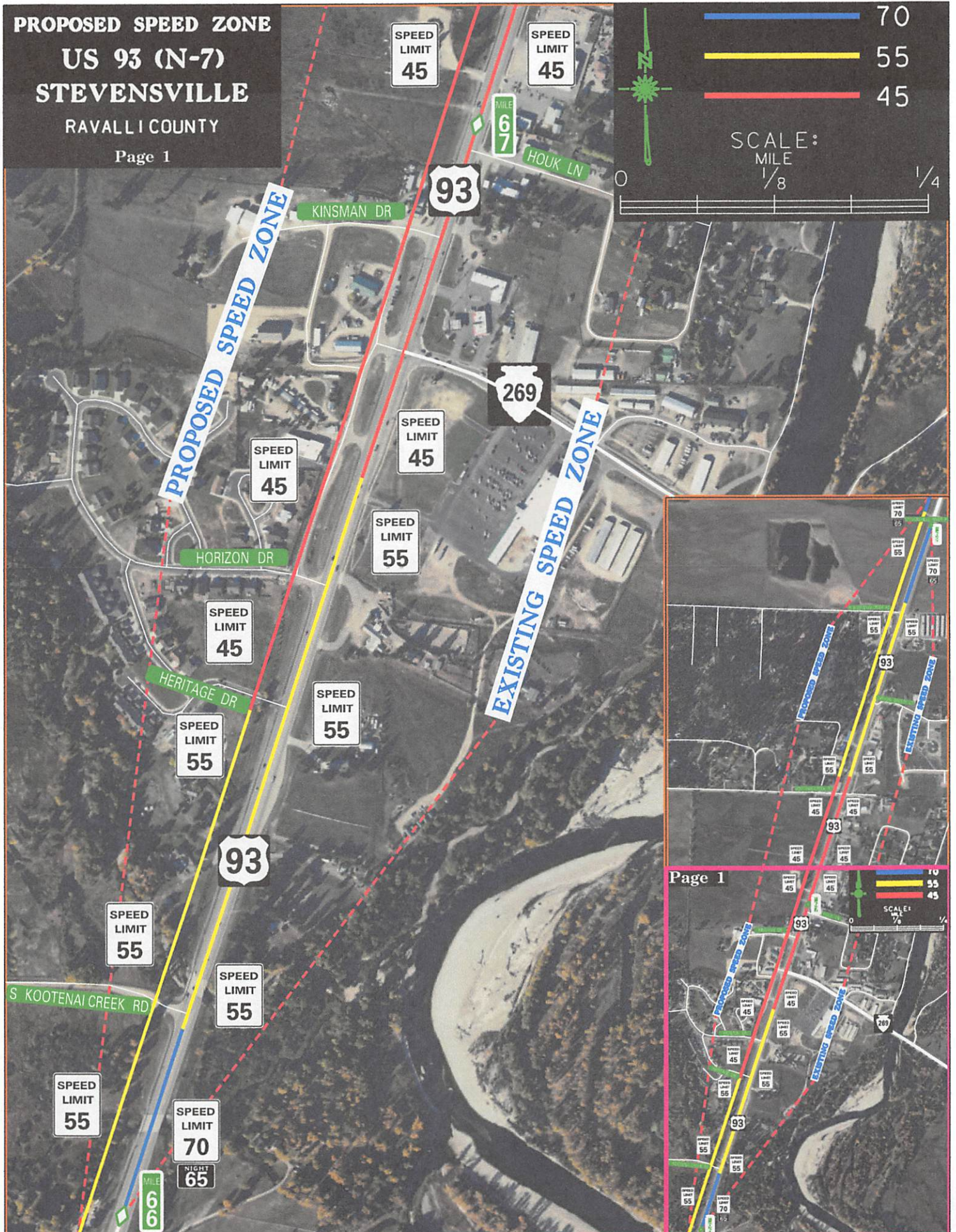
Gabe B. Priebe, P.E. – Traffic & Safety Engineer
Glen Cameron – Missoula District Traffic Engineer
David E. Relph, P.E. – Investigations Lead Worker

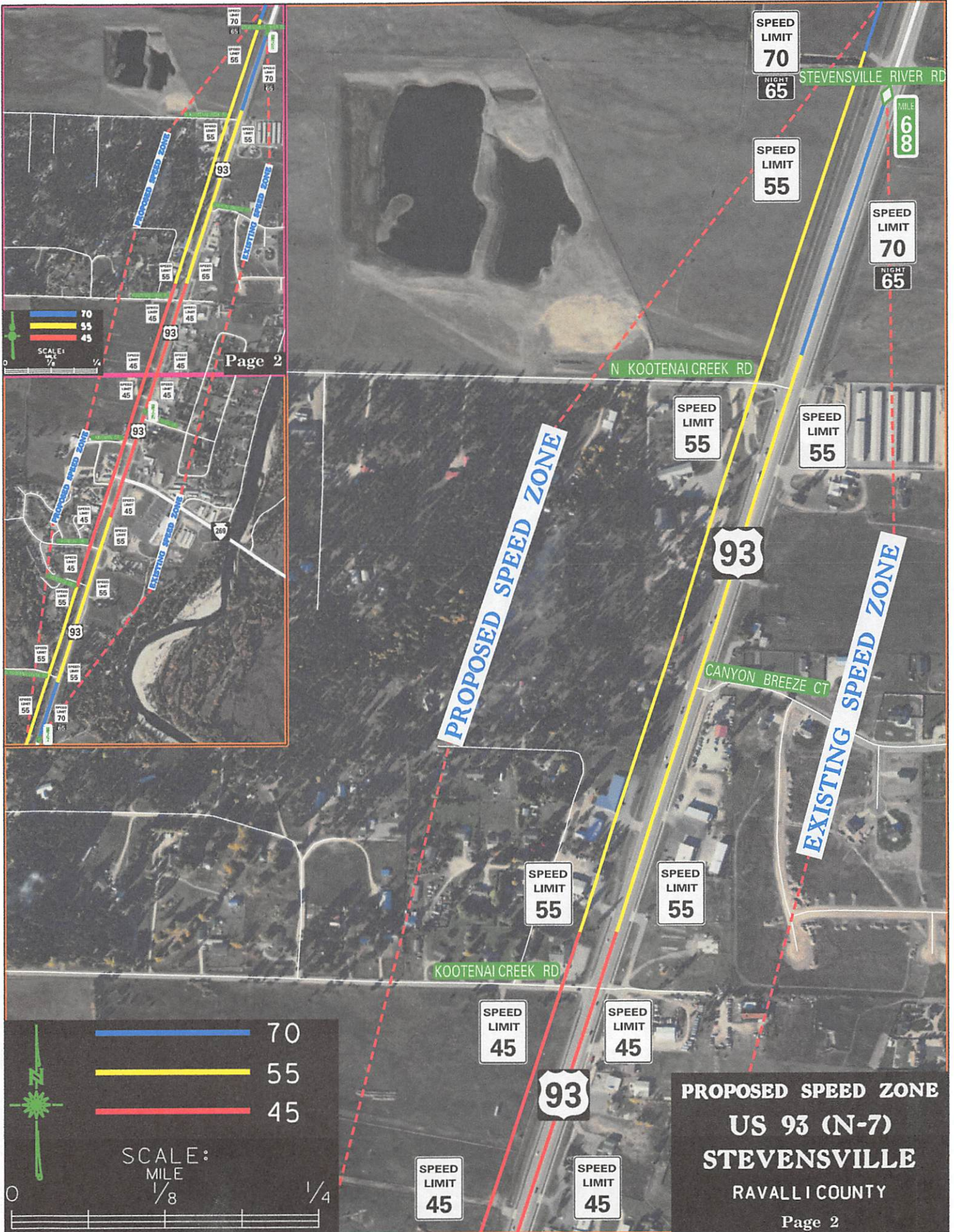
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PROPOSED SPEED ZONE
US 93 (N-7)
STEVENSVILLE
 RAVALLI COUNTY

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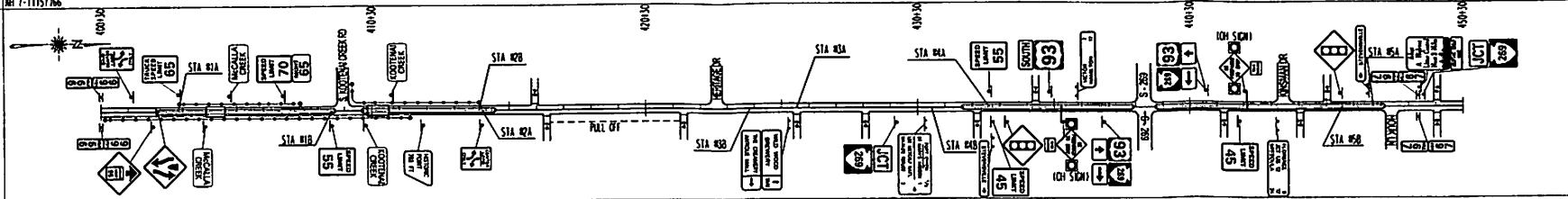




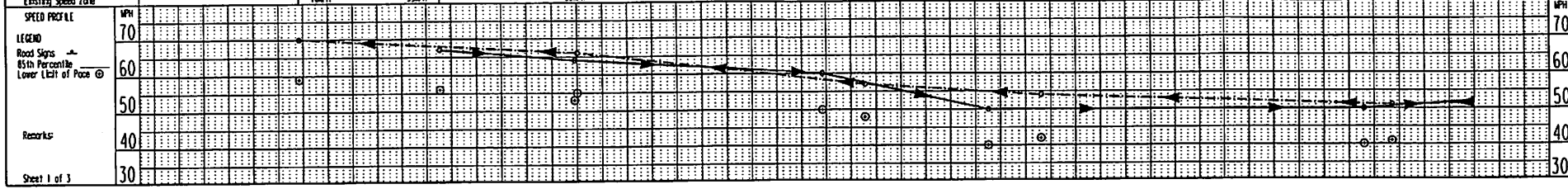
Construction Project Number: MH 7-11157166

STATE OF MONTANA
DEPARTMENT OF TRANSPORTATION
TRAFFIC UNIT
SPEED ZONE SURVEY

Location: STEVENSVILLE
County: BAVAILI
Roadway: US 33
Sta from 4500+00 to 4900+00
Scale: 1" = 100'
Date: MAY 2002



	72-FEET		72-FEET		72-FEET		72-FEET		72-FEET	
Roadway Width	72-FEET		72-FEET		72-FEET		72-FEET		72-FEET	
Number of Striped Lanes	4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH	
Type of Divider	16-FOOT RAISED MEDIAN		16-FOOT RAISED MEDIAN		20-FOOT TWO-BAY-LEFT-TURN LANE		16-FOOT RAISED MEDIAN		16-FOOT RAISED MEDIAN	
Average Daily Traffic	9,354		9,354		9,354		9,354		12,156	
Direction of Traffic	SB NB		NB SB		NB SB		NB SB		NB SB	
Number of Vehicles Observed	6819 VEH	6951 VEH	6378 VEH	6539 VEH	5973 VEH	5946 VEH	6818 VEH	6440 VEH	6381 VEH	7056 VEH
Observed Speed - Pace	59-69(1672)	56-66(1621)	53-63(1672)	55-65(1672)	50-60(1621)	48-58(1621)	40-50(1682)	42-52(1582)	40-50(1632)	41-51(1722)
85th Percentile	70MPH	67MPH	64MPH	66MPH	60MPH	57MPH	50MPH	54MPH	50MPH	51MPH
50th Percentile	60MPH	61MPH	58MPH	60MPH	55MPH	52MPH	48MPH	47MPH	46MPH	45MPH
Existing Speed Zone	70MPH		55MPH		55MPH		45MPH		45MPH	

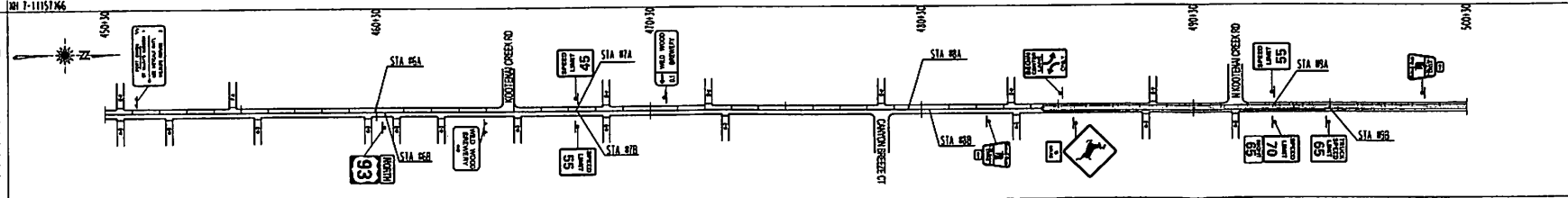


Sheet 1 of 3

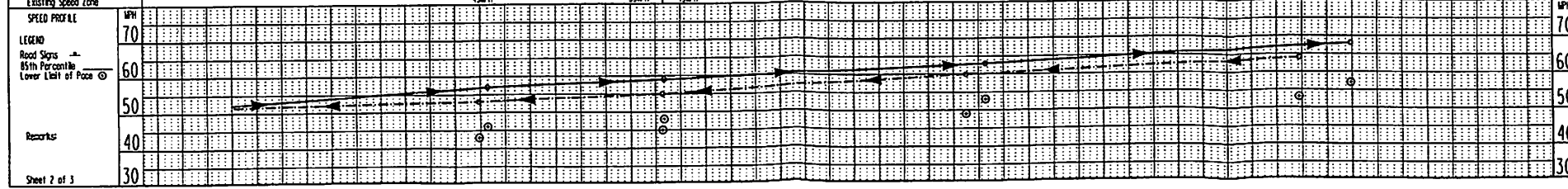
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STATE OF MONTANA
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TRAFFIC UNIT
SPEED ZONE SURVEY

Location: STEVENSVILLE
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Roadway: US 33
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Scale: 1" = 100'
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	72-FEET		72-FEET		72-FEET		72-FEET	
Roadway Width	72-FEET		72-FEET		72-FEET		72-FEET	
Number of Striped Lanes	4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH		4 LANES @ 12-FEET EACH	
Type of Divider	20-FOOT TWO-BAY-LEFT-TURN LANE		20-FOOT TWO-BAY-LEFT-TURN LANE		20-FOOT TWO-BAY-LEFT-TURN LANE		16-FOOT RAISED MEDIAN	
Average Daily Traffic	12,156		12,156		12,156		12,156	
Direction of Traffic	SB NB		NB SB		SB NB		NB SB	
Number of Vehicles Observed	8567 VEH	7493 VEH	6435 VEH	6939 VEH	8274 VEH	6315 VEH	5845 VEH	5876 VEH
Observed Speed - Pace	43-53(1722)	46-56(1632)	43-53(1662)	45-55(1682)	49-59(1672)	43-53(1682)	53-63(1622)	57-67(1632)
85th Percentile	51MPH	57MPH	55MPH	58MPH	60MPH	63MPH	64MPH	60MPH
50th Percentile	43MPH	45MPH	43MPH	45MPH	55MPH	58MPH	58MPH	63MPH
Existing Speed Zone	45MPH		55MPH		55MPH		70MPH	



Sheet 2 of 3

