

Table of Contents

Procedures for Locally Establishing Speed Limits

Chapter 30

1	Authority and Purpose	30-1
2	Procedures for Establishing Speed Limits	30-1
	Procedures for Establishing Speed Limits on Paved Roads	Appendix I
	Procedures for Establishing Speed Limits on Unpaved Roads	Appendix II

Wyoming Department of Transportation
Procedures for Locally Establishing Speed Limits

CHAPTER 30

Section 1. Authority and Purpose.

(a) These rules are promulgated by authority of W.S. 31-5-303 and W.S. 31-5-304 to administer the process by which local authorities may establish minimum and maximum speed limits as described in W.S. 31-5-303 and W.S. 31-5-304.

(b) These rules create the provisions and the format whereby local governments and counties may locally establish speed limits. These rules are enacted to reduce local burdens, streamline data gathering, describe systematic review or analysis, maintain nationally accepted engineering procedures or practices while fostering local autonomy, and allow for assistance and training from the Wyoming Department of Transportation (WYDOT) for local establishment of speed limits.

Section 2. Procedures for Establishing Speed Limits.

(a) To establish minimum and maximum speed limits for paved roads as described in W.S. 31-5-303 and W.S. 31-5-304, local authorities shall comply with the national standards for such roads as detailed in *Procedures for Establishing Local Authority Set Speed Limits on Wyoming Paved Roads* as adopted by the Transportation Commission of Wyoming and provided in Appendix I.

(b) To establish minimum and maximum unpaved road speed limits as described in W.S. 31-5-303 and W.S. 31-5-304, local authorities shall comply with the provisions of *Standards and Procedures for Establishing Speed Limits on Wyoming Unpaved Roads* as adopted by the Transportation Commission of Wyoming and provided in Appendix II.

Appendix I

Procedures for Establishing Local Authority Set Speed Limits on Wyoming Paved Roads

1.1 *PURPOSE*

- (1) Title 31, Chapter 5 – Article 3 of the Wyoming Statutes establishes the speed regulations for all public roadways in Wyoming. Effective July 1, 2011, the statutory speed limits are:
 - (a) 20 mph in school zones
 - (b) 30 mph in urban districts, as defined by W.S. 31-5-102 (a) (lvii)
 - (c) 30 mph in any residence district, as defined by W.S. 31-5-102 (a) (xxxviii)
 - (d) 30 mph in any subdivision, pursuant to W.S. 18-5-304
 - (e) 75 mph on interstate highways
 - (f) 65 mph on all other paved roadways
 - (g) 55 mph on all other unpaved roadways
- (2) The statutes, under W.S. 31-5-303, authorize local authorities to establish specific maximum speed limits on all streets and highways within their respective corporate jurisdiction. Such speed limits may be greater or less than the normal statutory speed limits for the roadways being considered.
- (3) The statutes also include a basic speed law [W.S. 31-5-301 (a)], prohibiting drivers from traveling at a speed greater than what is reasonable and prudent under the conditions and having regard to the actual and potential hazards that may exist, which recognizes that driving conditions and speeds may vary widely from time to time. No posted speed limit can adequately serve all driving conditions. Motorists must constantly adjust their driving behavior to fit the conditions they encounter.
- (4) Any speed limit, other than a statutory speed limit listed above, that is posted on Wyoming paved roads open to the public shall be based on criteria contained in this procedure and be consistent with national practices. Criteria used to set a speed limit shall include an analysis of free-flow traffic speeds. A spot speed analysis is used to measure the free-flowing traffic speed characteristics at a specified location under the traffic and environmental conditions prevailing at the time of the analysis. The purpose of this document is to establish the proper procedures for completing an analysis in accordance with the statutes, to provide guidance in setting appropriate speed limits based on data, and to establish the documentation and notification procedures when establishing new speed limits.

1.2 *SPEED ANALYSIS DATA COLLECTION*

- (1) The basics of spot speed data collection, such as site selection, sample size requirements, and the selection of target vehicles are described in the ITE Manual of Transportation Engineering Studies. For most spot speed studies used in Wyoming, vehicle speeds should be measured using automated methods such as radar or laser speed detection. The individual vehicle selection method is the preferred method of obtaining free-flow speeds, with sample sizes of at least 50 and preferably 100 vehicles per direction being considered representative samples. The lower sample size can be used on lower volume (i.e., having two-way traffic volumes of less than 1,000 vehicles per day) roadways where the time to collect 100 samples per direction could be excessive.
- (2) The data analysis required to make the final recommendations on setting proper speed limits can be conducted by professional engineers only. Those professional engineers are not required to visit the actual location where the study is being conducted as long as the required data was collected by trained technicians or engineers.

1.3 ***SPEED STUDY DATA COLLECTION SHEET***

- (1) The Speed Study Data Collection Sheet (Form TR-10) has been developed in conjunction with the Speed Study Worksheet (Form TR-11) for the collection of speed data in the field. These forms can be obtained from the Wyoming Department of Transportation for use on a computer. An example of a blank collection sheet is shown in Figure 1-1. To limit the range of speeds to what is allowed by the worksheet, the lowest anticipated free-flow speed at the study location must be entered in the red box. To help determine what value to enter in the red box, Table 1-1 provides some guidance on what lowest anticipated free-flow speeds might apply based on the posted speed limit and whether the area of the study is in an urban area, urban/rural fringe, or in a rural area.

Table 1-1 Lowest Anticipated Free-flow Speeds

Posted Speed (mph)	Extent of Roadside Development		
	Urban	Fringe Area	Rural
≤ 30	10	10	–
35 – 40	10	15	20
45 – 50	15	20	25
55 – 60	25	30	35
≥ 65	–	40	45

- (2) Prior to heading to the field to collect spot speed study data, it is recommended that several Speed Study Data Collection Sheets having varying lower limits be printed out for use by the data collection personnel.
- (3) When collecting speed study data, fill out the heading of the Speed Study Data Collection Sheet completely.
- (4) The observer enters a tally mark (|) in a data block under the appropriate direction for each observance of a speed. If more than 15 vehicles are observed at any particular speed in one direction, tally marks slanting in the opposite direction can be entered over the tally mark previously entered thus forming an “X,” which represents two vehicles observed at that speed. An example of a completed Speed Study Data Collection Sheet is shown in Figure 1-2.
- (5) If there is no interest in knowing the speed statistics for each direction, but only the combined directions, then all speed observations for both directions of travel can be entered in one column. This avoids having to add the number of tally marks from the two directions when entering the data into the Speed Study Worksheet.

Figure 1-1 Blank Speed Study Data Collection Sheet

SPEED STUDY DATA COLLECTION SHEET

Wyoming Department of Transportation

CITY _____
ROUTE _____
POSTED SPEED _____

COUNTY _____
LOCATION _____
COMMENTS _____

NOTE: This sheet is not for computer data entry. Print out and use for field data collection.

DIRECTION OF TRAVEL _____
OBSERVER _____
DATE _____
TIME _____ TO _____
WEATHER _____

DIRECTION OF TRAVEL _____
OBSERVER _____
DATE _____
TIME _____ TO _____
WEATHER _____

Enter the lowest anticipated measured freeflow speed in the red square (Must be a multiple of 5 MPH).

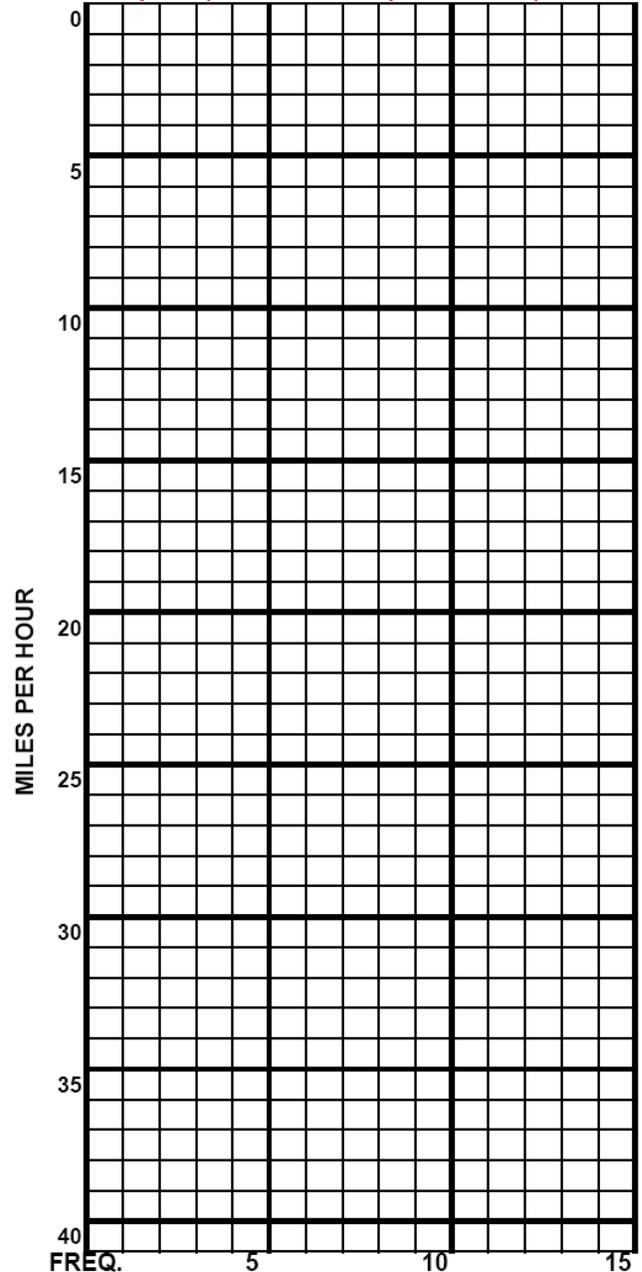
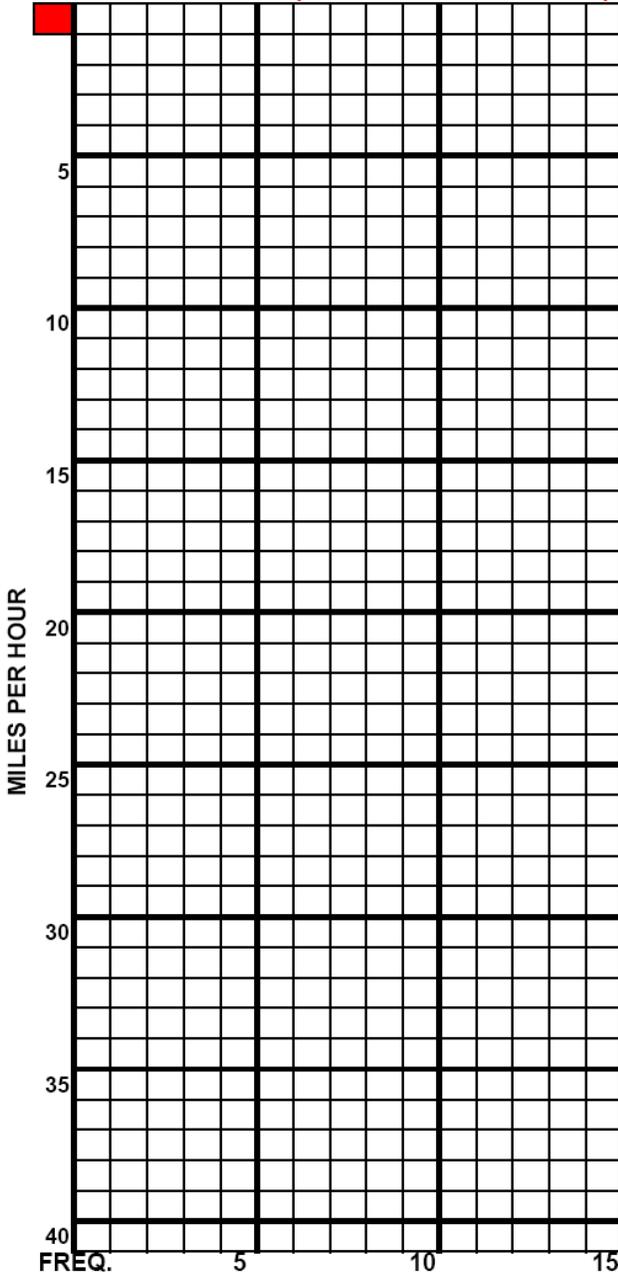


Figure 1-2 Example of a Completed Speed Study Data Collection Sheet

Form TR-10

Revised 3/4/11

SPEED STUDY DATA COLLECTION SHEET

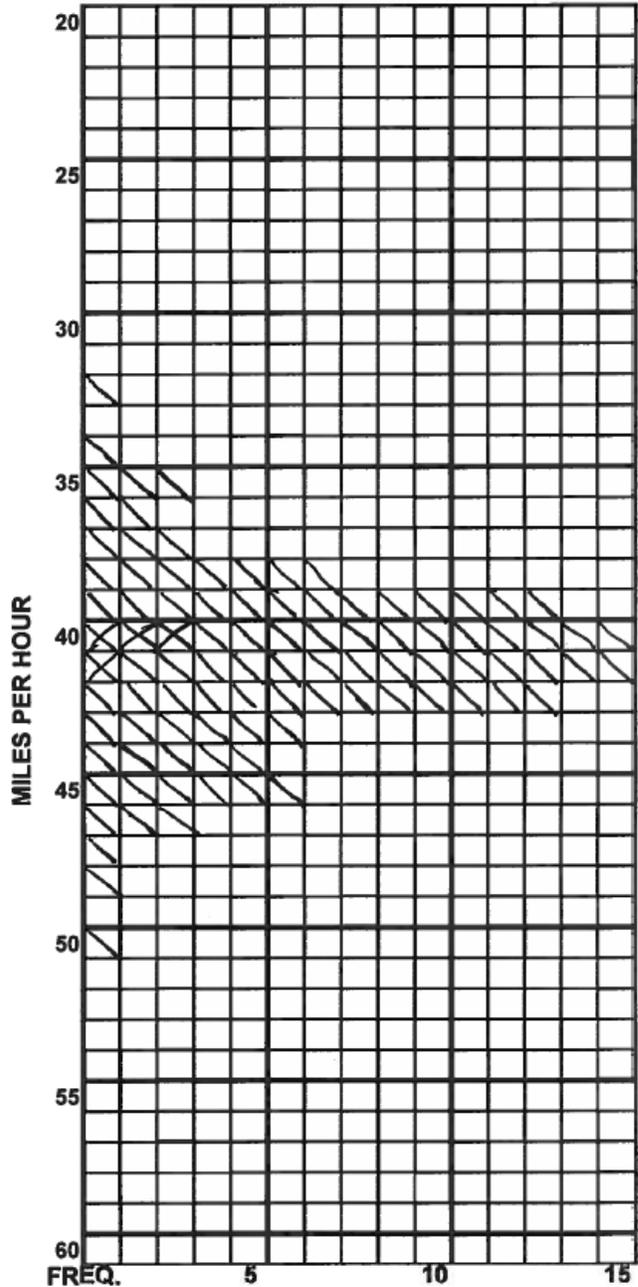
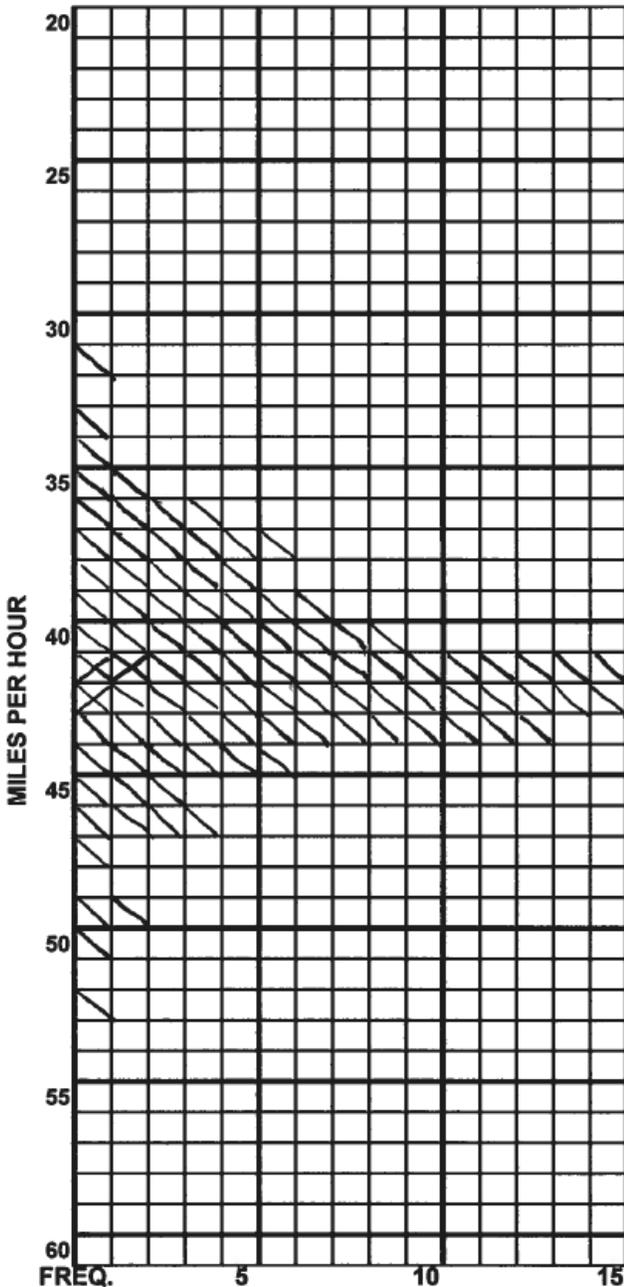
Wyoming Department of Transportation

CITY Ranchester
 ROUTE US 14 (Dayton St)
 POSTED SPEED 40

COUNTY Sheridan
 LOCATION At 4th Ave. W.
 COMMENTS Example Only

DIRECTION OF TRAVEL EB
 OBSERVER J.D.T.
 DATE 5/19/10
 TIME 8:40AM TO 9:50AM
 WEATHER Clear & warm

DIRECTION OF TRAVEL WB
 OBSERVER J.D.T.
 DATE 5/19/10
 TIME 9:55 TO 10:45AM
 WEATHER Clear & warm



- (6) The Speed Study Data Collection Sheet can also be used to document speeds based on vehicle class, either by direction or for both directions. This is accomplished by using one-letter classification codes rather than tally marks. Classification codes that may be used include the following:

P = passenger vehicle (includes cars, pickups, vans and SUVs)

T = truck (includes single units with 6 or more tires, buses, RVs, and pickups pulling trailers)

S = semi-truck (tractor-trailer combinations)

M = motorcycle

1.4 SPEED STUDY WORKSHEET

- (1) The Speed Study Worksheet has been developed to simplify and automate the processing of speed study field data. This helps reduce the chances of errors in the processing as well. The worksheet is an Excel spreadsheet with an input sheet and display sheets for each direction of travel as well as the combination of both directions analyzed. All data is entered on the input sheet, and the results are displayed on the display sheets for printing. The spreadsheet will be made available by contacting WYDOT Traffic.
- (2) The location-related data is entered at the top of the Input sheet from the data on the Speed Study Data Collection Sheet. An example of the data input sheet for the previous field data collection sheet is shown in Figure 1-3 Example Speed Study Worksheet Data Input.
- (3) Enter the lowest speed recorded and the highest speed recorded. This will help adjust the display of output data so that it is relatively centered in the display graph. If the difference between the highest and lowest recorded speeds exceeds 40 mph, an error message will display.
- (4) The number of observations at each respective speed is then entered under the appropriate direction column. If no vehicles were observed at a given speed, the respective line can be left blank or a zero (0) can be entered.
- (5) The Speed Study worksheet is designed to analyze speed statistics for each direction of travel as well as both directions at once.
- (6) If the speed study is checking speeds by vehicle classification, the Speed Study Worksheet can only process one vehicle class at a time. The class of vehicle being studied should be noted in the Comments space of the input sheet.
- (7) Once all of the necessary data is entered on the input sheet, the speed study statistics can be viewed by selecting one of the display sheets. Figure 1-4 Example Speed Study Worksheet Output gives an example of the Speed Study Worksheet output for one direction of travel.
- (8) For a neat computer-generated sheet that duplicates the hand-written data from the data collection sheet, the cleaned field data sheet uses the same data entered on the input sheet to provide a copy of the Speed Data Collection Sheet with the heading data and tally marks filled in to match the form completed by hand. Figure 1-5 Example of Cleaned Speed Study Data Collection Sheet gives an example of the cleaned field data collection sheet.

Figure 1-3 Example Speed Study Worksheet Data Input

CITY	Ranchester		
COUNTY	Sheridan		
ROUTE	US 14 (Dayton St.)		
LOCATION	At 4th Ave. W.		
POSTED SPEED LIMIT	40		
LOWEST SPEED RECORDED	30		
HIGHEST SPEED RECORDED	52		
COMMENTS	Example Only		
DIRECTION 1	Eastbound	DIRECTION 2	Westbound
OBSERVER	J.D.T.	OBSERVER	J.D.T.
DATE	5/19/10	DATE	5/19/10
START TIME	8:40 AM	START TIME	9:55 AM
END TIME	9:50 AM	END TIME	10:45 AM
WEATHER	Clear & Warm	WEATHER	Clear & Warm

SPEED	NUMBER OF OBSERVATIONS AT SPEED PER DIRECTION	
	Eastbound	Westbound
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31	1	
32		1
33	1	
34	1	1
35	2	3
36	4	2
37	6	3
38	5	7
39	7	13
40	9	18
41	17	16
42	16	13
43	13	6
44	6	5
45	3	6
46	4	3
47	1	1
48		1
49	2	
50	1	1
51		
52	1	
53		
54		
55		
56		
57		
58		
59		
60		

Figure 1-4 Example Speed Study Worksheet Output

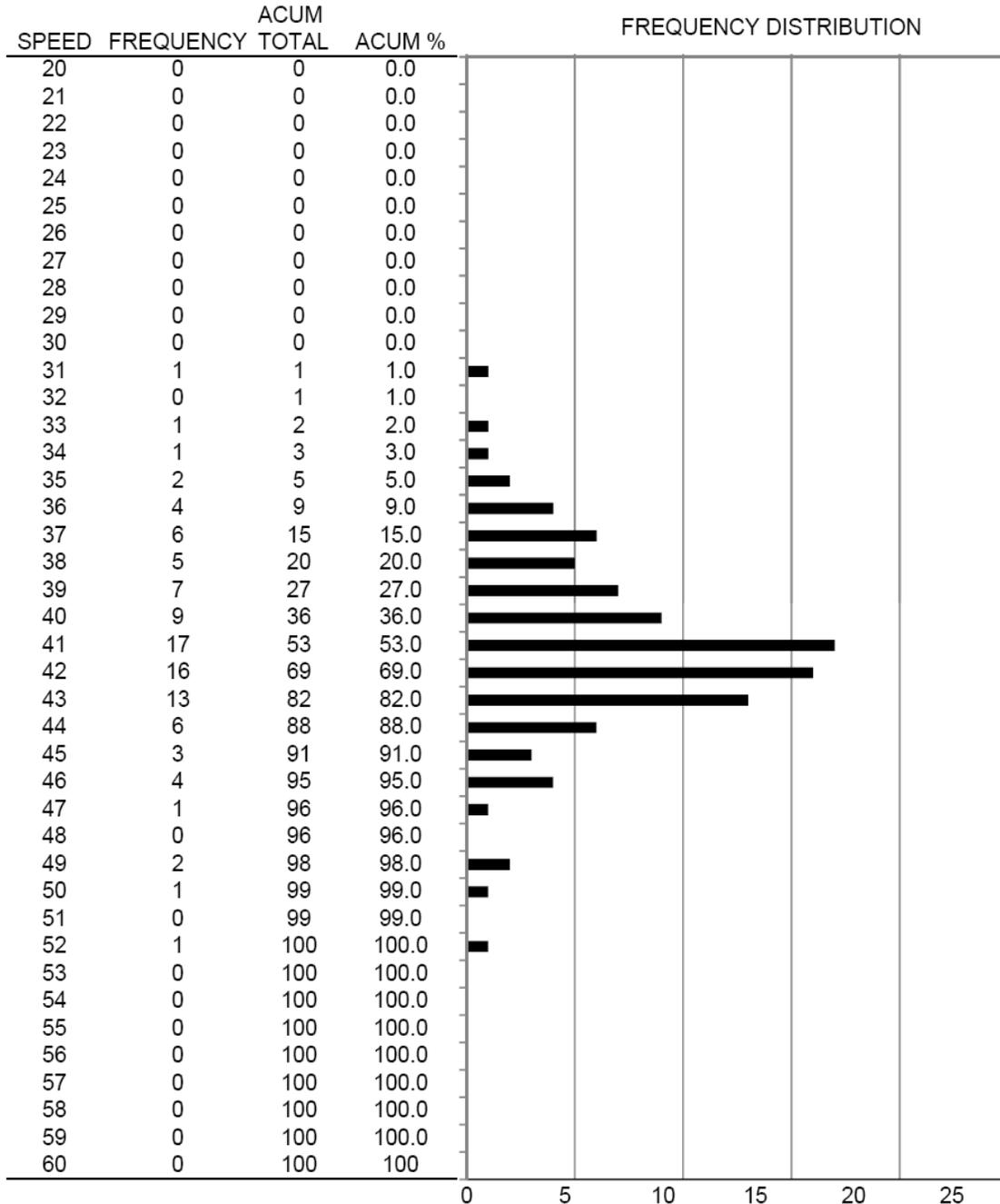
SPEED STUDY

Wyoming Department of Transportation

CITY: Ranchester
 SPEED LIMIT: 40 MPH
 OBSERVER: J.D.T.
 DATE: 5/19/10

COUNTY: Sheridan
 DIRECTION: Eastbound
 START TIME: 8:40 AM
 END TIME: 9:50 AM

ROUTE: US 14 (Dayton St.)
 LOCATION: At 4th Ave. W.
 WEATHER: Clear & Warm
 COMMENTS: Example Only



AVERAGE SPEED = 41.2
 50th PERCENTILE = 41
 67th PERCENTILE = 42
 85th PERCENTILE = 44
 95th PERCENTILE = 46

PACE SPEED = 36 to 45
 VEHICLES IN PACE = 86
 % IN PACE = 86
 % BELOW PACE = 5
 % ABOVE PACE = 9

STANDARD DEVIATION = 3.48
 % EXCEEDING POSTED LIMIT = 64
 RECOMMENDED SPEED LIMIT = 45

Figure 1-5 Example of Cleaned Speed Study Data Collection Sheet

SPEED STUDY DATA COLLECTION SHEET

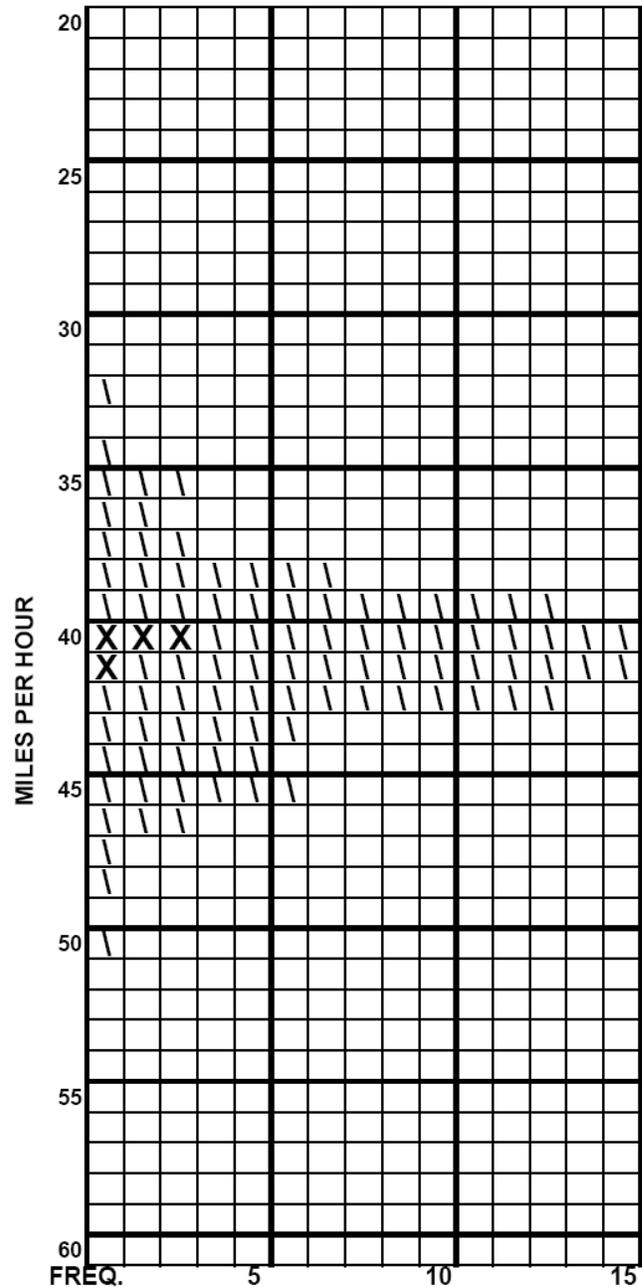
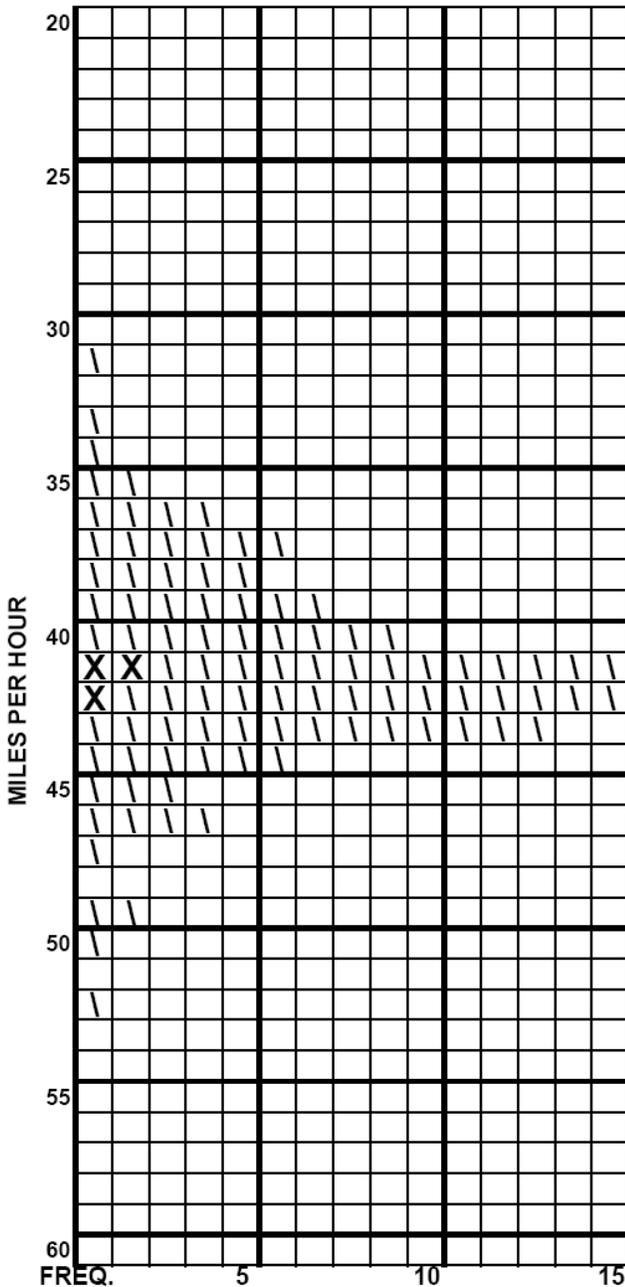
Wyoming Department of Transportation

CITY Ranchester
 ROUTE US 14 (Dayton St.)
 POSTED SPEED 40

COUNTY Sheridan
 LOCATION At 4th Ave. W.
 COMMENTS Example Only

DIRECTION OF TRAVEL Eastbound
 OBSERVER J.D.T.
 DATE 5/19/10
 TIME 8:40 AM TO 9:50 AM
 WEATHER Clear & Warm

DIRECTION OF TRAVEL Westbound
 OBSERVER J.D.T.
 DATE 5/19/10
 TIME 9:55 AM TO 10:45 AM
 WEATHER Clear & Warm



1.5 DETERMINATION OF APPROPRIATE SPEED LIMIT

- (1) Speed limits and speed zoning can be controversial. Engineers, public safety officials, and others involved in setting and enforcing speed limits may disagree on the appropriate balance between safety and road-user convenience that should prevail on particular road segments, considering conditions of topography, weather, adjacent activities, and traffic. Motorists, other road users, and roadway neighbors have their own perspectives on this balance and may not abide by the professionals' judgments.
- (2) The criteria to set a speed limit generally consider such factors as the physical features of the roadway, crash experience, traffic characteristics and control (for example, signals and other control devices), and the length of the roadway segment under consideration (speed-limit changes should not be too frequent or applied to very short road segments).
- (3) If the regulation of speed is to be effective, the posted limit must be generally consistent with speeds that drivers feel are safe and proper. Enforcement is widely recognized to be crucial to the success of speed limits as a means for making roads safer. If law enforcement officers and the courts are confident that speed limits have been developed on a reasonable basis, their enforcement of the limits will be more effective. Generally, speed limits should be set at levels that are self-enforcing so that law enforcement officials can concentrate their efforts on the worst offenders.
- (4) One of the factors considered very important for setting a speed limit is the prevailing vehicle speed. The *Manual on Uniform Traffic Control Devices (MUTCD)* is quite explicit, stating that "when a speed limit within a speed zone is posted, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic." The Speed Study output sheets show the recommended speed limit based on this criterion.
- (5) The *MUTCD* indicates other factors may also influence the appropriate speed limit, including roadway characteristics such as shoulder condition, grade, alignment, and sight distance; the pace; roadside development and environment; parking practices and pedestrian activity; and reported crash experience for at least a 12-month period.
- (6) These other factors may be used to justify a speed limit somewhat lower than the 85th-percentile speed, but in no circumstance should the speed limit be posted below the 50th-percentile speed or lower limit of the 10-mph pace.
- (7) In cases where the speed limit is posted below the 85th-percentile speed based on the other factors, the speed limit sign serves to remind motorists that conditions in the area are such that the speed reduction is reasonable. Proper use of speed limit signs instills confidence in the minds of drivers that the information on the speed limit sign is accurate and not simply a desire on the part of a policy maker to reduce speed arbitrarily for emotional or political reasons.

1.6 DECLARATION OF SPEED LIMIT

Posted speed limits (other than statutory speed limits) on Wyoming paved roads open to the public that have been established by this procedure should be documented by a Declaration of Speed Limit form similar to the form shown in Figure 1-6. A completed declaration of speed limit form is shown in Figure 1-7. Note that any speed limit change from the statutory limits shall be verified and sealed by a registered professional engineer in Wyoming. The form, with appropriate background information should be presented to the county commission where a resolution approving the proposed speed limit should be approved. The resolution number should be added to the declaration of speed limit form. The form is then returned to appropriate county officials so that the necessary signing changes can be made. Enforcement of the new speed limit cannot occur until the appropriate signs giving notice of the new speed limit have been erected.

Counties can modify this declaration form to fit their local needs. Counties should develop their own systems to record and save all relevant information associated with the speed study and the resolution.

1.7 MINIMUM SPEED LIMITS

Wyoming does not post minimum speed limits.

Figure 1-6 Declaration of Speed Limit Form for Paved Roads

DECLARATION OF SPEED LIMIT ON PAVED ROADS

LOCATION:

Method Used:

Summary of Results:

Recommendations:

Approved. _____
Professional Engineer P.E. Seal Date

ORDER TO ESTABLISH RESTRICTED SPEED ZONE

The County Commission approves changing the speed limit to _____ miles per hour on the paved roadway section described above.

Resolution number: _____

Date: _____

Figure 1-7 Example of Completed Declaration of Speed Limit Form for Paved Roads

DECLARATION OF SPEED LIMIT ON PAVED ROADS

LOCATION: Wyo 212, Four Mile Road, LA08A, MP 13.11 to 13.57.

Method Used: Visual inspection and engineering judgment.
Free flow spot speeds to determine 85th percentile speed and pace.

Summary of Results: The existing speed limit is 40 mph. The 85th percentile speeds are 51 mph eastbound and 52 mph westbound with a ten mile per hour pace of 39 mph to 48 mph in both directions.

Recommendations: Post a 50 mph speed limit by replacing the existing 40 mph speed limit sign westbound at MP 13.11 with a 50 mph sign. Replace the existing eastbound 40 mph sign at MP 13.43 with a 50 mph speed limit sign.

Approved _____
Professional Engineer P.E. Seal Date

ORDER TO ESTABLISH RESTRICTED SPEED ZONE

The County Commission approves changing the speed limit to fifty (50) miles per hour on the paved roadway section described above.

Resolution number: 55551

Date: July 1, 2011

Appendix II

Standards and Procedures for Establishing Speed Limits on Wyoming Unpaved Roads

1.1 *PURPOSE*

- (1) Title 31, Chapter 5 – Article 3 of the Wyoming Statutes establishes the speed regulations for all public roadways in Wyoming. The limits specified in this subsection or established as otherwise authorized shall be maximum lawful speeds and no person shall drive a vehicle on an unpaved roadway at a speed in excess of 55 mph.
- (2) The statutes include a basic speed law [W.S. 31-5-301 (a)] prohibiting drivers from traveling at a speed greater than what is reasonable and prudent under the conditions and having regard to the actual and potential hazards that may exist, which recognizes that driving conditions and speeds may vary widely from time to time. No posted speed limit can adequately serve all driving conditions. Motorists must constantly adjust their driving behavior to fit the conditions they encounter.
- (3) Any speed limit, other than a statutory speed limit that is posted on a Wyoming unpaved road, must be based on an engineering study. That study should include an analysis of free-flow traffic speeds and a general roadway safety evaluation. A Spot Speed Study is used to measure the free-flowing traffic speed characteristics at a specified location under the traffic and environmental conditions prevailing at the time of the study. The general safety evaluation should provide recommendations on roadway features which cannot be addressed by changing the speed limit.
- (4) The main objectives of these standards is to establish proper study procedures for completing the engineering investigation in accordance with the statutes, to provide guidance in setting appropriate speed limits based on the study data, and to establish the documentation and notification procedures when establishing new speed limits on unpaved roads. These standards and procedures summarize the minimum requirements for setting speed limits on unpaved roads. A professional engineer can consider additional information when selecting appropriate speed limits on unpaved roads.

1.2 *DATA COLLECTION/ANALYSIS*

- (1) All of the spot speed data and other information described in this section shall be collected by engineers or technicians who have been properly trained by the Wyoming T²/LTAP Center to collect field data.
- (2) The data analysis required to make the final recommendations on setting proper speed limits can be conducted by professional engineers only. Those professional engineers are not required to visit the actual location where the study is being conducted as long as the required data was collected by trained technicians or engineers.
- (3) For the engineering studies, vehicle speeds and traffic volumes should be determined using automated traffic counters. Each automated traffic counter should consist of a traffic counter device, two pneumatic tubes, and some additional accessories. The two pneumatic tubes are placed across the road at the recommended spacing. Two ends of the tubes are fixed on the shoulder, while the other two ends are connected to the traffic counter device.
- (4) For most low volume unpaved roads, 7 consecutive days of traffic counts are required. For unpaved roads with more than 200 vehicles per day, 2 days of traffic counts may be adequate. Selecting the spot to take speed measurements—the location, traffic, and weather conditions under which to conduct the spot speed study—is generally a matter of common sense. Since average speeds over the length of a section of roadway are the main interest, speed measurements should be taken at the midpoint of a typical section.

The most important aspect of the location is to avoid areas of acceleration and deceleration, such as access points, curves, bad drainage areas, and locations close to roadside hazards. The final layout of the data collection site should be fully described in any report of speed data. The crew should make an accurate sketch of the site, showing the roadway widths and the position of the traffic counters. The crew should record the start time, end time, any downtime, and the conditions prevailing during the study. Such conditions should include a description of any significant road surface distresses. It is essential that speed studies are performed only on roadway segments with average surface conditions.

- (5) A special form was developed to assist with the collection and analysis of the traffic count data and the safety aspects of the road as shown in Figure 1-1. The form includes five parts: general information, automated traffic count values, roadway characteristics, historical crash data, and range of speed limit values. In the form, the clear boxes correspond to input that trained technicians or engineers are required to obtain. The gray shaded boxes correspond to the calculations and information that the professional engineer is required to provide. An example of a completed unpaved roads speed limit form is shown in Figure 1-2.
- (6) When collecting speed study data, the general information should be completed before proceeding to the next steps.
- (7) The required automated traffic count values can be obtained from the output file that the automated traffic counters produce. As shown in Figure 1-3, the output file summarizes the different speed and traffic volumes that the automated traffic counters produce. Four of these values are required in the form and they are: 85th percentile, 50th percentile, the Average Daily Traffic (ADT) and the Average Daily Truck Traffic (ADTT).

Figure 1-1 Unpaved Roads Speed Limit Form

GENERAL INFORMATION	
LOCAL JURISDICTION:	
ROUTE:	
LOCATION:	
DATE:	

AUTOMATED TRAFFIC COUNT VALUES	
85th PERCENTILE:	
50th PERCENTILE:	
UPPER BOUND OF THE PACE SPEED:	
AVERAGE DAILY TRAFFIC:	
AVERAGE DAILY TRUCK TRAFFIC:	

ROADWAY CHARACTERISTICS	
ROADWAY LENGTH:	
NUMBER OF ACCESS POINTS:	
ACCESS POINTS PER MILE:	
ROADWAY WIDTH:	
ADJACENT LAND-USE:	
TYPE OF TERRAIN:	

HISTORICAL CRASH DATA	
FATAL:	
INJURY:	
PDO:	
EPDO:	
EPDO PER MILE:	

RANGE OF SPEED LIMIT (MAXIMUM = 55 MPH)	
PREFERRED SPEED LIMIT:	
LOWEST ACCEPTABLE SPEED LIMIT:	

Figure 1-2 Example of a Completed Unpaved Road Speed Limit Form

GENERAL INFORMATION	
LOCAL JURISDICTION:	Smart County
ROUTE:	700
LOCATION:	MP 16.1 to MP 26.1
DATE:	7/1/2011

AUTOMATED TRAFFIC COUNT VALUES	
85th PERCENTILE:	43.9
50th PERCENTILE:	35.7
UPPER BOUND OF THE PACE SPEED:	40.4
AVERAGE DAILY TRAFFIC:	141
AVERAGE DAILY TRUCK TRAFFIC:	4

ROADWAY CHARACTERISTICS	
ROADWAY LENGTH:	10
NUMBER OF ACCESS POINTS:	63
ACCESS POINTS PER MILE:	$63 / 10 = 6.3$
ROADWAY WIDTH:	20
ADJACENT LAND-USE:	Recreation/Scenic
TYPE OF TERRAIN:	Rolling

HISTORICAL CRASH DATA	
FATAL:	0
INJURY:	5
PDO:	8
EPDO:	$9.5*0 + 3.5*5 + 8 = 25.5$
EPDO PER MILE:	$25.5 / 10 = 2.55$

RANGE OF SPEED LIMIT (MAXIMUM = 55 MPH)	
PREFERRED SPEED LIMIT:	43.9 rounded to nearest 5 = 45
LOWEST ACCEPTABLE SPEED LIMIT:	$45 - 10 = 35$

Figure 1-3 Example of the Automated Traffic Counter Output

Station: 4d/Rd70N - W Rd 47

Data From: 09:47 - 09/28/2009 To: 11:37 - 10/15/2009

Vehicle General Flow Report - Grand Totals

Note: ADT and Average are based on total value of all lanes printed (Together Print).

Average Daily Traffic (ADT)

<u>Weekday</u>		<u>Weekend</u>		<u>Total ADT</u>	
Cars :	144 (96%)	Cars :	115 (98%)	Cars :	137 (97%)
Trucks :	4 (4%)	Trucks :	2 (2%)	Trucks :	4 (3%)
Total :	149	Total :	117	Total :	141

Speed Totals

50 % :	35.7 mph	Top Speed :	72.3 mph	Average Truck Speed :	28.5 mph
85 % :	43.9 mph	Low Speed :	3.4 mph	Average Car Speed :	35.4 mph
Avg :	35.2 mph	10mph Pace Speed:	30.5 - 40.4 (45.9%)		

Peak Hour Totals

<u>AM Peak Hour (Volume)</u>	<u>AM Peak Hour (Speed)</u>
Weekday : 07:15 - 08:15 (Avg 11)	03:15 - 04:15 (38.8 mph)
Weekend : 09:15 - 10:15 (Avg 11)	03:15 - 04:15 (45.1 mph)
<u>PM Peak Hour (Volume)</u>	<u>PM Peak Hour (Speed)</u>
Weekday : 16:45 - 17:45 (Avg 16)	22:15 - 23:15 (38.8 mph)
Weekend : 12:00 - 13:00 (Avg 10)	21:30 - 22:30 (45.1 mph)

Grand Totals

Total Cars :	2234 (137 ADT)	Average Length :	11.5 ft	Average Headway :	545.3 sec
Total Trucks :	69 (4 ADT)	Average Axles :	2.1	Average Gap :	545.0 sec
Total Volume :	2303 (141 ADT)				

- (8) Roadway characteristics should be collected during the field inspection of the road. The list and description of each characteristic that are included in the form are as follows:

Roadway Length: The length of the road in miles.

Access Points: Total number of access points on the whole roadway length.

Access Points per Mile: Divide the number of access points by the roadway length.

Roadway Width: The total width of the road including both shoulders.

Adjacent Land-Use: Refers to the type of users of the road. The following different types of land-uses were obtained from AASHTO's Guidelines on Geometric Design for Very Low Volume Roads:

- **Rural major access roads** serve a dual function of providing access to abutting properties as well as providing through or connecting service between other local road or higher type facilities.
- **Rural minor access roads** serve almost exclusively to provide access to adjacent property. The length of minor access roads is typically short. Because their sole function is to provide access, such roads are used predominantly by familiar drivers.
- **Industrial or commercial access roads** serve developments that may generate a significant proportion of truck or other heavy vehicle traffic. These roads are classified separately from minor access roads, which they otherwise resemble, because of the consideration for trucks and other heavy vehicles.
- **Recreation and scenic roads** serve specialized land uses, including parks, tourist attractions, and recreation facilities, such as campsites or boat-launch ramps. Their users are often unfamiliar drivers and serve recreational vehicles including motor homes, campers, and passenger vehicles pulling boats and other trailers.
- **Rural resource recovery roads** are local roads serving logging or mining operations. Resource recovery roads are distinctly different from the other functional subclasses of very low-volume local roads in that they are used primarily by vehicles involved with the resource recovery activities and the driving population consists primarily or exclusively of professional drivers with large vehicles.
- **Rural agriculture roads** are used primarily to provide access to fields and farming operations. Vehicle types that use such roads include combines, tractors, trucks that haul agricultural products, and other large and slow-moving vehicles with unique operating characteristics.

Type of Terrain: Refers to the general geometrics of the road. There are three different types of terrain that can be chosen:

- Level
- Rolling
- Mountainous

- (9) The historical crash data can be obtained from the safety division of WYDOT or the Wyoming T²/LTAP Center to get the latest crash statistics. It is recommended that 10 years of crash data be included in the evaluation. The following three types of crashes are required: number of fatalities, number of injuries, and the number of Property Damage Only (PDO). The Equivalent Property Damage Only (EPDO) is calculated by Equation 1.

$$EPDO = 9.5 * Fatalities + 3.5 * Injuries + PDO \text{ (Equation 1)}$$

Once the EPDO is calculated, the EPDO per mile is determined by dividing the EPDO by the roadway length.

- (10) The preferred speed limit is the 85th percentile speed rounded to the nearest 5 mph. The lowest acceptable speed limit may be up to 10 mph less than the preferred speed limit.

1.3 SAFETY EVALUATION

A general road safety evaluation should be considered when determining speed limits. Such an evaluation should include the following:

- (1) If there is high number of crashes on the roadway under investigation, then a detailed crash analysis should be performed to find the causes of the crashes. Once the causes are determined, then additional steps should be taken to provide safety enhancements for high crash locations. Reducing the speed limits by itself will not automatically reduce crashes.
- (2) The road should be driven at a reasonable and safe speed to determine if any curves require vehicles to slow down. Further safety enhancements such as signage, delineation, shoulder widening, and guardrails should be considered at adverse curves.
- (3) When horizontal curves are signed, they should include either chevrons, delineators or curve warning signs. Speed advisory signs are not required on unpaved roads.
- (4) Speed limits should not be reduced due to the presence of isolated fixed objects such as utility poles, trees, rocks or narrow cattle guards. Consideration should be given to using object markers, removing the hazard or widening of the road at those locations.
- (5) The speed limit should never be lowered to reduce the number of signs needed on a road.

1.4 DETERMINATION OF APPROPRIATE SPEED LIMIT

- (1) Speed limits and speed zoning remain one of the more controversial tasks for the traffic engineering profession. Engineers, public safety officials, and others involved in setting and enforcing speed limits may disagree on the appropriate balance between safety and road-user convenience that should prevail on particular road segments, considering conditions of topography, weather, adjacent activities, and traffic. Motorists, other road users, and roadway neighbors have their own perspectives on this balance and may or may not abide by the professionals' judgments.
- (2) In order for the regulation of speed to be effective, the posted limit must be generally consistent with speeds that drivers feel are safe and proper. Enforcement is widely recognized to be crucial to the success of speed limits as a means for making roads safer. If law enforcement officers and the courts are confident that speed limits have been developed on a reasonable basis, their enforcement of the limits will be more effective. Generally, speed limits should be set at levels that are self-enforcing so that law enforcement officials can concentrate their efforts on the worst offenders.

- (3) For most cases, the recommended speed limit shall be the 85th percentile speed rounded to the nearest 5 mph.
- (4) A professional engineer can consider the factors described in Section 1.2 to justify a lower speed limit. The recommended speed limit should never be below the lowest acceptable speed limit described in section 1.2 (10).
- (5) The recommended speed limit on unpaved roads shall never be higher than the statutory speed limit of 55 mph.
- (6) Speed limit signs serve to remind motorists that conditions in the area are such that a reduction in speed is reasonable. Proper use of speed limit signs would instill confidence in the minds of drivers that the information on the speed limit sign is accurate and not simply a desire on the part of a policy maker to reduce speed arbitrarily.
- (7) In cases where the speed limit is posted below the 85th-percentile speed based on the other factors, the speed limit sign serves to remind motorists that conditions in the area are such that the speed reduction is reasonable. Proper use of speed limit signs instills confidence in the minds of drivers that the information on the speed limit sign is accurate and not simply a desire on the part of a policy maker to reduce speed arbitrarily for emotional or political reasons.

1.5 DECLARATION OF SPEED LIMIT

Posted speed limits (other than statutory speed limits) on Wyoming unpaved roads open to the public that have been established by this procedure should be documented by a Declaration of Speed Limit form similar to the form shown in Figure 1-4. A completed declaration of speed limit form is shown in Figure 1-5. Note that any speed limit change from the statutory limits shall be verified and sealed by a registered professional engineer in Wyoming. The form, with appropriate background information should be presented to the county commission where a resolution approving the proposed speed limit should be approved. The resolution number should be added to the declaration of speed limit form. The form is then returned to appropriate county officials so that the necessary signing changes can be made. Enforcement of the new speed limit cannot occur until the appropriate signs giving notice of the new speed limit have been erected.

Counties can modify this declaration form to fit their local needs. Counties should develop their own systems to record and save all relevant information associated with the speed study and the resolution.

Figure 1-4 Declaration of Speed Limit Form for Unpaved Roads

DECLARATION OF SPEED LIMIT ON UNPAVED ROADS

LOCATION:

Results of Engineering Investigation

Method Used:

Summary of Results:

Recommendations:

Approved. _____
Professional Engineer P.E. Stamp Date

ORDER TO ESTABLISH RESTRICTED SPEED ZONE

The County Commission approves changing the speed limit to _____ miles per hour on the unpaved roadway section described above.

Resolution number: _____

Date: _____

Figure 1-5 Example of Completed Declaration of Speed Limit Form for Unpaved Roads

DECLARATION OF SPEED LIMIT ON UNPAVED ROADS

LOCATION: County Road 700, Smart County, MP 16.1 to 26.1.

Method Used: Visual inspection and engineering judgment.
Free flow spot speeds to determine 85th percentile speed and pace.
Standards for establishing speed limits on unpaved Wyoming roads were followed.

Summary of Results: The statutory speed limit is 55 mph. The 85th percentile speed is 43.9 mph with the upper bound of the pace speed at 40.4 mph. There are 6.3 access points per mile and the adjacent land-use is recreational/scenic.

Recommendations: Because of the high number of access points and the recreational/scenic land-use, it is recommended to declare a 40 mph speed limit. Post at least two 40 mph speed limit signs at both ends of the roadway section.

Approved _____
Professional Engineer P.E. Stamp Date

ORDER TO ESTABLISH RESTRICTED SPEED ZONE

The County Commission approves changing the speed limit to 40 miles per hour on the unpaved roadway section described above.

Resolution number: 55555

Date: July 1, 2011