

GEOMETRIC DESIGN STANDARDS FOR RURAL PRINCIPAL ARTERIAL SYSTEM (GS-1)

	TERRAIN	DESIGN SPEED (MPH)	MIN. RADIUS	(6) MINIMUM STOPPING SIGHT DISTANCE	MIN. WIDTH OF LANE	(1) MIN. WIDTH OF TOTAL SHOULDERS (GRADED & PAVED)		(2) PAVED SHOULDER WIDTH		(3) MINIMUM WIDTH OF DITCH FRONT SLOPE	(4) SLOPE	NEW AND RECONSTRUCTED MINIMUM BRIDGE WIDTHS AND VERTICAL CLEARANCES
						FILL W/GR	CUT & FILL	LT.	RT.			
FREEWAYS	LEVEL	75	2215'	820'	12'	17'	14'	4'	12'	12'	CS-4B	See Footnote (5)
		70	1821'	730'								
	ROLLING	60	1204'	570'								
MOUNTAINOUS	50	760'	425'	12'	13'	10'	4'	8'	10'	CS-4/ CS-4B CS-4/ CS-4E CS-3/ CS-3B		
LEVEL	70	1821'	730'									
	60	1204'	570'									
ROLLING	60	1204'	570'									
	50	760'	425'									
MOUNTAINOUS	50	760'	425'									
	45	589'	360'									
		40	446'	305'								

GENERAL NOTES

Freeways - A design speed of 75 mph should be used for Rural Freeways. Where terrain is mountainous a design speed of 60 mph or 50 mph, which is consistent with driver expectancy, may be used. All new and major reconstructed Interstate facilities will have a 75 mph design speed unless a lower design speed is approved by the Location and Design Engineer and FHWA.

Other Principal Arterials - A design speed of 40 to 70 mph should be used depending on terrain, driver expectancy and whether the design is constructed on new location or reconstruction of an existing facility. An important safety consideration in the selection of one of the lower design speeds in each range is to have a properly posted speed limit which is enforced during off peak hours.

Incorporated towns or other built-up areas, Urban Standard GS-5 may be used for design. "Built-up" is where there is sufficient development along the roadway that justifies a need to channelize traffic into and out of properties utilizing curb and gutter.

Standard TC-5.11R superelevation based on 8% maximum is to be used for all Rural Principal Arterials.

Clear Zone and Recoverable Area information can be found in Appendix A, Section A-2 of the Road Design Manual.

If medians are included, see [Section 2E-3 of Chapter 2E](#) of the Road Design Manual.

For additional information on roadway widths and maximum grades relative to terrain and design speed, see AASHTO Green Book, Chapter 7, Section 7.2.2, page 7-4, Tables 7-2 and Section 7.2.3, page 7-5, Table 7-3; for Freeways, see Chapter 8, Section 8.2.7, page 8-4, Table 8-1.

FOOTNOTES

- (1) Graded Shoulders (including the paved portion); Shoulder widths shown are for right shoulders and independently graded median shoulders. No additional width is necessary for guardrail situations.
For 4-lane non-Interstate (2 lanes in each direction) with independently graded median shoulders, an 8' graded median shoulder will be provided. For 6 or more lanes, the graded median shoulder shall be the same as right graded shoulder. For Freeways with trucks < 250 DDHV, the graded shoulder width shall be a minimum of 15' for fills and 12' for cuts.
- (2) Paved Shoulders: When the mainline is 6 or more lanes, the left paved shoulder width should be the same as the right paved shoulder. On Freeways, if truck traffic is < 250 DDHV, the right paved shoulder width shall be a minimum of 10'.
- (3) Ditch slopes to be 6:1 - 10' and 12' widths and 4:1 - 6' width. A hydraulic analysis is necessary to determine actual depth requirement.
- (4) Additional or modified slope criteria to apply where shown on typical sections.
- (5) See [Manual of the Structure and Bridge Division – Volume V – Part 2 Design Aids – Chapter 6 Geometrics](#).
- (6) For additional information on sight distance requirements on grades of 3 percent or greater, see Section 3.2.2, page 3-5, Tables 3-2 of the AASHTO Green Book.

FIGURE A - 1 - 1*