

Design Element			Manual Section	2-Lane					
Design Controls	Design-Year AADT		40-2.01	< 400	400 ≤ AADT < 1000	1000 ≤ AADT < 3000	3000 ≤ AADT < 5000	≥ 5000	
	Design Forecast Period		55-4.01	20 Years (2)					
	*Design Speed (mph)		55-4.01	See Section 55-4.01 (3)					
	Access Control		40-5.0	None					
	Level of Service		40-2.0	Desirable: B; Minimum: D					
Cross-Section Elements**	Travel Lane	*Width (4)	55-4.05	Des: 10 ft; Min: 9 ft (4a)		Des: 11 ft Min: 10 ft (4b)	Des: 12 ft Min: 11 ft (4c)	Des: 12 ft Min: 11 ft (4c)	
		Typical Surface Type	Ch. 52	Asphalt / Concrete / Aggregate					
	Shoulder (5)	*Width Usable	55-4.05	Min: 2 ft	Des: 4 ft Min: 2 ft	Des: 6 ft Min: 3 ft	Des: 6 ft Min: 4 ft	Des: 8 ft Min: 6 ft	
		Typical Surface Type	Ch. 52	Asphalt / Aggregate / Earth					
	Cross Slope	*Travel Lane (6)	55-4.05	2%-3% Asphalt / Concrete; 6%-8% Aggregate					
		Shoulder (7)	55-4.05	Paved Width ≤ 4 ft: 2% - 3%; Paved Width > 4 ft: 4%-6% Asphalt; 6%-8% Aggregate; 8% Earth					
	Auxiliary Lane	Lane Width	55-4.06	Des: Same As Travel Lane Min: 9 ft		Des: Same as Travel Lane Min: 10 ft			
		Shoulder Width		Des: 4 ft; Min: 2 ft					
	Obstruction-Free-Zone Width		55-5.02	See Section 55-5.02					
	Side Slopes	Cut	Foreslope	55-4.05	2:1 or Flatter (8)				
			Ditch Width		(8)				
			Backslope		2:1 or Flatter (8)				
		Fill	55-4.05	2:1 or Flatter (8)					
Bridges**	New or Reconstructed Bridge	*Structural Capacity	Ch. 60	HL-93 (8A)					
		*Clear-Roadway Width (9)	55-6.03	Travelway +4 ft	Travelway +6 ft			Full Paved Appr. Width	
	Existing Bridge to Remain in Place	*Structural Capacity	Ch. 72	HS-15 (10)					
		*Clear-Roadway Width (11)	55-6.02	20 ft	22 ft	24 ft	28 ft	28 ft	
	*Vertical Clearance, Collector Under	New or Replaced Overpassing Bridge (12)	55-6.0	14.5 ft					
		Existing Overpassing Bridge		14.0 ft					
Vertical Clearance, Collector Over Railroad (13)		Ch. 69	23.0 ft						

Des: Desirable; Min: Minimum. * Controlling design criterion. ** Selection of cross section and bridge elements is based on design-year traffic volume irrespective of design speed.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R Project

Figure 55-3D

Design Element		Manual Section	2-Lane					
Alignment Elements	Design Speed	---	30 mph	35 mph	45 mph	50 mph	55 mph	
	*Stopping Sight Distance, Desirable	55-4.02	200 ft	250 ft	360 ft	425 ft	495 ft	
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	450 ft	525 ft	675 ft	750 ft	865 ft
		Stop Maneuver		220 ft	275 ft	395 ft	465 ft	535 ft
	Passing Sight Distance	42-3.0	Existing	Existing	Existing	Existing	Existing	
	Intersection Sight Distance , -3% to +3% (14)	55-4.06	P: 330 ft SUT: 420 ft	P: 390 ft SUT: 490 ft	P: 500 ft SUT: 630 ft	P: 550 ft SUT: 780 ft	P: 610 ft SUT: 890 ft	
	*Minimum Radius	55-4.03	See Section 55-4.03					
	*Superelevation Rate	55-4.03	See Section 55-4.03					
	*Horizontal Sight Distance	55-4.03	See Section 55-4.03					
	*Vertical Curvature, K-value	Crest	55-4.04	See Section 55-4.04				
		Sag		See Section 55-4.04				
	*Maximum Grade	Level	55-4.04	10%	9%	8.5%	8%	7%
Rolling		12%		11%	10.5%	10%	9%	
Minimum Grade	44-1.03	Desirable: 0.5%; Minimum: 0.0%						

* Controlling design criterion. A deviation from such is a design exception, and is subject to approval. See Section 40-8.0.

An operational or maintenance change, permanent or temporary, exclusive of work-zone traffic control, that in fact creates substandard conditions such as by re-striping to obtain added lane(s) by reducing existing lane widths or shoulders, must be addressed in a design exception, whether or not actual construction or reconstruction is involved.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT

Figure 55-3D (Continued)

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT

Footnotes to Figure 55-3D

- (1) Applicability. This figure is applicable only to a federal-aid funded project.
- (2) Design Forecast Period. For a partial 3R project, the pavement should be designed for at least a 10-year design life.
- (3) Design Speed. The minimum design speed should equal the anticipated posted speed limit after construction or the legal speed limit, 55 mph, on a non-posted highway.
- (4) Travel Lane, Width. An 11-ft travel lane should be used where truck volume exceeds 200 trucks per day. In addition, the following will apply:
 - a. Where $V \geq 50$ mph, the minimum width is 10 ft.
 - b. Where $V \geq 50$ mph, the minimum width is 11 ft.
 - c. Where $V \geq 50$ mph, the minimum width is 12 ft.
- (5) Shoulder Width. The following will apply:
 - a. The desirable guardrail offset is 2 ft from the effective usable-shoulder width. In a restrictive situation, the guardrail offset may be 1 ft from the effective usable-shoulder width. See Section 49-5.0 for more information.
 - b. If guardrail is present, the minimum offset from E.T.L. to face of guardrail should desirably be equal to the shy-line offset distance, but not less than 4 ft (see Section 49-5.0 for shy-line offsets).
 - c. Usable-shoulder width is defined as the distance from the edge of the travel lane to the shoulder break point.
- (6) Cross Slope, Travel Lane. Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.
- (7) Cross Slope, Shoulder. Value is for a tangent section. See Figure 45-1A(1) or Figure 45-1A(2) for more-specific information. See Figure 43-3M or Figure 43-3N for shoulder cross slope on a horizontal curve.
- (8) Side Slopes. Section 55-4.05 provides additional information for side-slope criteria.
- (8A) Structural Capacity, New or Reconstructed Bridge. HL-93 loading should be applied. A bridge with an ADTT less than or equal to 1,000 may be designed for HS 25 or HS 20, whichever the LPA elects.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT

Footnotes to Figure 55-3D (Continued)

- (9) Width, New or Reconstructed Bridge. See Section 59-1.01(01) for more information. Where shoulders are paved, it is desirable to provide the full roadway width across the bridge. Otherwise, the clear-roadway width is the algebraic sum of the following:
- the approach traveled-way width;
 - the approach effective usable-shoulder width without guardrail; and
 - a bridge-railing offset (see Figure 59-1G).
- (10) Structural Capacity, Existing Bridge to Remain in Place. If the $AADT \leq 50$, an HS-10 loading is acceptable.
- (11) Width, Existing Bridge to Remain in Place. A minimum clear-roadway width that is 2 ft narrower than that shown may be used on a road with few trucks. The clear-roadway width should be at least the same width as the approach travelway. For a one-lane bridge, the width may be 18 ft. For a bridge of more than 100 ft in length, the value does not apply. The acceptability of such a bridge will be assessed individually.
- (12) Vertical Clearance, Local Under. Value includes an additional 6-in. allowance for a future pavement overlay. Vertical clearance applies from usable edge to usable edge of shoulders.
- (13) Vertical Clearance, Local Over Railroad. See Chapter Sixty-nine for additional information on railroad clearance under a highway.
- (14) Intersection Sight Distance. For left turn onto a 2-lane road, P = Passenger car; SUT = single unit truck. See Figure 46-10G for value for a combination truck.