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 (km/h)			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: 3.0 m; Min: 2.7 m (4a)		Des: 3.3 m Min: 3.0 m (4b)	Des: 3.6 m Min: 3.3 m (4c)	Des: 3.6 m Min: 3.3 m (4c)
		Typical Surface Type		Ch. 52	Asphalt / Concrete / Aggregate				
	Shoulder (5)	*Width Usable		55-4.05	Min: 0.6 m	Des: 1.2 m Min: 0.6 m	Des: 1.8 m Min: 0.9 m	Des: 1.8 m Min: 1.2 m	Des: 2.4 m Min: 1.8 m
		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 ≤ 1.2 m: 2%-3%; Paved Width > 1.2 m: 4%-6% Asphalt; 6%-8% Aggregate; 8% Earth				
	Auxiliary Lane	Lane Width		55-4.06	Des: Same As Travel Lane Min: 2.7 m		Des: Same as Travel Lane Min: 3.0 m		
		Shoulder Width			Des: 1.2 m; Min: 0.6 m				
	Obstruction-Free Zone			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 +1.2 m	Travelway +1.8 m			Full Paved Appr. Width
	Existing Bridge to Remain in Place	*Structural Capacity		Ch. 72	HS-15 (10)				
		*Clear-Roadway Width (11)		55-6.02	6.0 m	6.6 m	7.2 m	8.4 m	8.4 m
	*Vertical Clearance (Collector Under)	New or Replaced Overpassing Bridge (12)		55-6.0	4.45 m				
		Existing Overpassing Bridge			4.30 m				
	Vertical Clearance (Collector Over Railroad) (13)			Ch. 69	7.00 m				

Des: Desirable; Min: Minimum.

* Controlling design criterion.

** Selection of the cross section and bridge elements is based on the design-year traffic volume irrespective of the design speed.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT

Figure 55-3D

Design Element			Manual Section	2-Lane				
Alignment Elements	Design Speed		---	50 km/h	60 km/h	70 km/h	80 km/h	90 km/h
	*Stopping Sight Distance		55-4.02	65 m	85 m	105 m	130 m	160 m
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	145 m	170 m	200 m	230 m	270 m
		Stop Maneuver		70 m	95 m	115 m	140 m	170 m
	Passing Sight Distance		42-3.0	Existing	Existing	Existing	Existing	Existing
	Intersection Sight Distance , -3% to +3% (14)		55-4.06	P: 105 m SU: 135 m	P: 125 m SU: 160 m	P: 150 m SU: 185 m	P: 170 m SU: 235 m	P: 190 m SU: 280 m
	*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-values)	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, 88 km/h (55 mph), on a non-posted highway.

(4) Travel Lane (Width). A 3.3-m travel lane should be used where truck volume exceeds 200 trucks per day. In addition, the following will apply:

a. Where $V \geq 80$ km/h, the minimum width is 3.0 m.
b. Where $V \geq 80$ km/h, the minimum width is 3.3 m.
c. Where $V \geq 80$ km/h, the minimum width is 3.6 m.

(5) Shoulder Width. The following will apply:

a. The desirable guardrail offset is 0.3 m from the effective usable-shoulder width. In a restrictive situation, the guardrail offset may be 0.3 m 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 1.2 m (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.

GEOMETRIC DESIGN CRITERIA FOR RURAL LOCAL ROAD, 3R PROJECT

Footnotes to Figure 55-3D (Continued)

(8A) Structural Capacity (New or Reconstructed Bridge). HS-25 loading with Alternate Military Loading should be applied for each project with notice to proceed with design beginning September 1, 2004, through December 31, 2005. 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.

(9) Width (New or Reconstructed Bridge). The width of a bridge of more than 30 m in length should be analyzed individually. At a minimum, the roadway width of such a bridge will be the width of travel lanes plus a 0.6-m right shoulder and 0.6-m left shoulder. Where shoulders are paved, it is desirable to provide the full roadway width across the bridge. See Section 59-1.0 for more information on bridge width.

(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 0.6 m 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 5.4 m. For a bridge of more than 30 m 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 150-mm 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; SU = single unit truck. See Figure 46-10G for value for a combination truck.