

Design Element			Manual Section	2-Lane				Multi-Lane		
Design Controls	Design-Year AADT		40-2.01	< 400	400 ≤ AADT < 3000	3000 ≤ AADT < 5000	≥ 5000	Undivided	Divided	
	Design Forecast Period		55-4.01	20 Years (1)				20 Years (1)		
	*Design Speed, mph (2)		55-4.01	Posted Speed Limit				Posted Speed Limit		
	Access Control		40-5.0	Partial Control / None				Partial Control / None		
	Level of Service		40-2.0	Desirable: B; Minimum: D				Desirable: B; Minimum: D		
Cross-Section Elements	Travel Lane	*Width	55-4.05	12 ft	12 ft	12 ft	12 ft	12 ft.		
		Typical Surface Type (3)	Ch. 52	Asphalt / Concrete				Asphalt / Concrete		
	Shoulder (4)	*Width Usable	55-4.05	D: 6 ft M: 2 ft	D: 8 ft M: 3 ft	D: 8 ft M: 6 ft	D: 11 ft M: 8 ft	Desirable: 11 ft Minimum: 8 ft	Rt: D: 11 ft; M: 9 ft Lt: D: 4 ft; M: 4 ft	
		*Width Paved	55-4.05	D: 4 ft M: 0 ft	D: 6 ft M: 2 ft	D: 6 ft M: 2 ft	D: 10 ft M: 2 ft	Desirable: 10 ft Minimum: 8 ft	Rt: D: 10 ft; M: 8 ft Lt: D: 4 ft; M: 3 ft	
		Typical Surface Type (3)	Ch. 52	Asphalt / Concrete / Sealed Aggregate				Asphalt / Concrete / Sealed Aggregate		
	Cross Slopes	*Travel Lane (5)	55-4.05	2%				2%		
		Shoulder (6)	55-4.05	Paved Width ≤ 4 ft 2%; Paved Width > 4 ft 4% Asphalt / Concrete; 6% Sealed Aggregate				Paved Width ≤ 4 ft 2%; Paved Width > 4 ft 4% Asphalt / Concrete; 6% Sealed Aggregate		
	Auxiliary Lane	Lane Width	55-4.05	Desirable: 12 ft; Minimum: 11 ft				Desirable: 12 ft; Minimum: 11 ft		
		Shoulder Width		Des: Same as Next to Travel Lane; Min: 2 ft				Des: Same as Next to Travel Lane; Min: 2 ft		
	Median Width		55-4.05	N/A				0.0 ft.	Existing	
	Obstruction-Free-Zone Width		55-5.02	See Section 55-5.02				See Section 55-5.02		
	Side Slopes	Cut	Foreslope	55-4.05	2:1 or Flatter (7)				2:1 or Flatter (7)	
			Ditch Width		(7)				(7)	
			Backslope		2:1 or Flatter (7)				2:1 or Flatter (7)	
		Fill	2:1 or Flatter (7)				2:1 or Flatter (7)			
Median Slopes		55-4.05	N/A				Desirable: 8:1; Maximum: 4:1			
Bridges**	New or Reconstructed Bridge	*Structural Capacity	Ch. 60	HL-93 (8)						
		*Clear-Roadway Width (9)	55-6.03	Full Paved Approach Width						
	Existing Bridge to Remain in Place	*Structural Capacity	Ch. 72	HS-20						
		*Clear-Roadway Width	55-6.02	Travelway Plus 2 ft on Each Side						
	*Vertical Clearance, Arterial Under (10)	New or Replaced Overpassing Bridge	55-6.0	16.5 ft						
		Existing Overpassing Bridge (11)		14.0 ft						
		Sign Truss / Pedestrian Bridges		New: 17.5 ft; Existing: 17.0 ft						
Vertical Clearance, Arterial Over Railroad (12)		Ch. 69	23.0 ft							

D or Des: Desirable; M or 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 ARTERIAL, 3R PROJECT

Figure 55-3A

Design Element		Manual Section				
Alignment Elements	Design Speed	---	50 mph	55 mph	60 mph	
	*Stopping Sight Distance, Desirable	55-4.02	425 ft	495 ft	570 ft	
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	750 ft	865 ft	990 ft
		Stop Maneuver		465 ft	535 ft	610 ft
	Passing Sight Distance	42-3.0	Existing	Existing	Existing	
	Intersection Sight Distance, -3% to +3% (14)	55-4.06	P: 630 ft; SUT: 780 ft	P: 730 ft; SUT: 890 ft	P: 840 ft; SU: 1020 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 (13)	Level	55-4.04	5%	4.5%	4%
		Rolling		6%	5.5%	5%
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 land widths or shoulders, must be addressed in a design exception, whether or not actual construction or reconstruction is involved.

## GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIAL, 3R PROJECT

Figure 55-3A (Continued)

## GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIAL, 3R PROJECT

### Footnotes to Figure 55-3A

- (1) Design Forecast Period. For a partial 3R project, the pavement should be designed for at least a 10-year design life.
- (2) Design Speed. The minimum design speed should equal the anticipated posted speed limit after construction or the legal speed limit, 60 mph, on a non-posted multilane divided highway, or 55mph on a non-posted two-lane highway.
- (3) Surface Type. The pavement-type selection will be determined by the Office of Pavement Engineering or by the local jurisdiction.
- (4) Shoulder. The following will apply:
  - a. On an INDOT facility, the shoulder should be paved to the front face of guardrail. 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 the front face of guardrail should desirably be equal to the shy-line distance, but should not be 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.
- (5) Cross Slope, Travel Lane. Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.
- (6) 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.
- (7) Side Slopes. Section 55-4.05 provides additional information for side-slope criteria.
- (8) Structural Capacity, New or Reconstructed Bridge. The following will apply:
  - a. HL-93 loading should be applied.
  - b. Each State-highway bridge within 15 mi of a Toll-Road gate must be designed for Toll-Road loading.
  - c. Each bridge on an Extra-Heavy-Duty Highway must be designed for the Michigan Train truck loading configuration.
  - d. See Chapter Sixty for additional information on the loading configurations.

## GEOMETRIC DESIGN CRITERIA FOR RURAL ARTERIAL, 3R PROJECT

### Footnotes to Figure 55-3A (Continued)

- (9) Width, New or Reconstructed Bridge. See Section 59-1.01(01) for more information. On a State highway, the minimum clear-roadway width should be 30 ft. Otherwise, the bridge clear-roadway width is the algebraic sum of the following:
- a. the approach traveled-way width;
  - b. the approach effective usable-shoulder width without guardrail; and
  - c. a bridge-railing offset (see Figure 59-1G).
- (10) Vertical Clearance, Arterial Under. Value includes an additional 6-in. allowance for a future pavement overlay. Vertical clearance applies from usable edge to usable edge of shoulders.
- (11) Vertical Clearance, Existing Bridge. See Section 55-6.02 for additional information on minimum allowable vertical clearance.
- (12) Vertical Clearance, Arterial Over Railroad. See Chapter Sixty-nine for additional information on railroad clearance under a highway.
- (13) Maximum Grade. A grade that is 1% steeper may be used for a one-way downgrade.
- (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.