

Design Element			Manual Section	Design Values (By Type of Area)			
				Suburban	Intermediate	Built-Up	
Design Controls	Design Forecast Period		55-4.01	20 Years (1)	20 Years (1)	20 Years (1)	
	*Design Speed, mph (2)		55-4.01	Posted Speed Limit	Posted Speed Limit	Posted Speed Limit	
	Access Control		40-5.0	None	None	None	
	Level of Service		40-2.0	Desirable: C; Minimum: D	Desirable: C; Minimum: D	Desirable: C; Minimum: D	
	On-Street Parking		45-1.0	Optional (3)	Optional (3)	Optional (3)	
Cross Section Elements	Travel Lane	*Width (4)	55-4.05	Curbed: Des: 12 ft; Min: 10 ft Uncurbed: Des: 12 ft; Min: 10 ft	Curbed: Des: 12 ft; Min: 10 ft Uncurbed: Des: 12 ft; Min: 10 ft	Curbed Des: 12 ft Curbed Min: 10 ft	
		Typical Surface Type (5)	Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete	
	*Curb Offset (6)		55-4.05	Des: 2 ft; Min: 1 ft	Des: 2 ft; Min: 1 ft	Des: 2 ft; Min: 1 ft	
	Shoulder	*Paved Width (7)	55-4.05	Curbed Des: 8 ft; Min. 1 ft Uncurbed: Des: 8 ft; Min. 4 ft	Curbed Des: 6 ft; Min. 1 ft Uncurbed: Des: 6 ft; Min. 3 ft	Des: 4 ft. Min: 2 ft	
		Typical Surface Type (5)	Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete	
	Cross Slope	*Travel Lane (8)	55-4.05	2%-3%	2%-3%	2%-3%	
		Shoulder (9)	55-4.05	Paved Width ≤ 4 ft 2%-3%; Paved Width > 4 ft 4%-6%	Paved Width ≤ 4 ft 2%-3%; Paved Width > 4 ft 4%-6%	Paved Width ≤ 4 ft 2%-3%; Paved Width > 4 ft 4%-6%	
	Auxiliary Lane	Lane Width	55-4.05	Des: 12 ft; Min: 10 ft	Des: 12 ft; Min: 10 ft	Des: 12 ft; Min: 9ft	
		Curb Offset		Des: 1 ft; Min: 0 ft	Des: 1 ft; Min: 0 ft	Des: 1 ft; Min: 0 ft	
		Shoulder Width		Des: 8 ft; Min: 2 ft	Des: 6 ft; Min: 2 ft	Des: 4 ft; Min: 2 ft	
		Typical Surface Type (5)	Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete	
	TWLTL Width		46-5.0	Des: 16 ft; Min: 12 ft	Des: 14 ft; Min: 11 ft	Des: 14 ft; Min: 10 ft	
	Parking-Lane Width		45-1.04	Des: 10 ft; Min: 8 ft	Des: 10 ft; Min: 8 ft (10)	Des: 10 ft; Min: 8 ft (10)	
	Median Width	Raised Island	55-4.05	Des: 16 ft; Min: 2 ft	Des: 16 ft; Min: 2 ft	Des: 16 ft; Min: 2 ft	
		Flush / Corrugated		Des: 16 ft; Min: 2 ft	Des: 16 ft; Min: 2 ft	Des: 16 ft; Min: 2 ft	
	Sidewalk Width (11)		55-4.05	4 ft with 5 ft Buffer (Des)	Des: 6 ft; Min: 4 ft	Des: 6 ft; Min: 4 ft	
	Bicycle-Lane Width (12)		51-7.0	Curbed: 5 ft Uncurbed: Shld. Width +4 ft	Curbed: 5 ft Uncurbed: Shld. Width +4 ft	Curbed: 5 ft	
	Obstruction-Free-Zone Width		55-5.02	See Section 55-5.02	See Section 55-5.02	See Section 55-5.02	
	Typical Curbing Type, where used (13)		55-4.05	Vertical / Sloping	Vertical / Sloping	Vertical / Sloping	
	Side Slopes, Uncurbed	Cut	Foreslope	55-4.05	2:1 or Flatter (14)	2:1 or Flatter (14)	N/A
			Ditch Width		(14)	(14)	N/A
			Backslope		2:1 or Flatter (14)	2:1 or Flatter (14)	N/A
		Fill	2:1 or Flatter (14)		2:1 or Flatter (14)	N/A	
Side Slopes, Curbed	Cut, Backslope		55-4.05	(15)	(15)	(15)	
	Fill			2:1 or Flatter (14)	2:1 or Flatter (14)	2:1 or Flatter (14)	

Des: Desirable; Min: Minimum.

\* Controlling design criterion.

## GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR, 3R PROJECT

Figure 55-3G

Design Element		Manual Section	Design Values (By Type of Area)						
			Suburban	Intermediate		Built-Up			
Bridges	New or Reconstructed Bridge	*Structural Capacity (16)	Ch. 60	HL-93	HL-93	HL-93	HL-93		
		*Clear-Roadway Width(17)	55-6.03	Curbed: Full Approach Curb-to-Curb Width Uncurbed: Full Approach Paved Width					
	Existing Bridge to Remain in Place	*Structural Capacity	Ch. 72	HS-15	HS-15	HS-15	HS-15		
		*Clear-Roadway Width	55-6.02	Curbed: Full Approach Curb-to-Curb Width Uncurbed: Travelway Plus 2 ft on Each Side		Curbed: Full Approach Curb-to-Curb Width Uncurbed: Travelway + 1 ft on Each Side			
	*Vertical Clearance, Collector under	New or Replaced Overpassing Bridge (18)	55-6.0	14.5 ft	14.5 ft	14.5 ft	14.5 ft		
		Existing Overpassing Bridge (19)		14.0 ft	14.0 ft	14.0 ft	14.0 ft		
Vertical Clearance, Collector over Railroad (20)		Ch. 69	23.0 ft						
Alignment Elements	Design Speed			25 mph	30 mph	35 mph	45 mph	50 mph	55 mph
	*Stopping Sight Distance, Desirable		55-4.02	155 ft	200 ft	250 ft	360 ft	425 ft	495 ft
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	U: 515 ft SU: 445 ft	U: 620 ft SU: 535 ft	U: 720 ft SU: 625 ft	U: 930 ft SU: 800 ft	U: 1030 ft SU: 890 ft	U: 1135 ft SU: 980 ft
		Stop Maneuver		430 ft	490 ft	590 ft	800 ft	910 ft	1030 ft
	Intersection Sight Distance, -3% to +3% (22)		55-4.06	P: 280 ft SUT: 350 ft	P: 330 ft SUT: 420 ft	P: 390 ft SUT: 490 ft	P: 500 ft SUT: 630 ft	P: 630 ft SUT: 780 ft	P: 730 ft SUT: 890 ft
	*Minimum Radius		55-4.03	See Section 55-4.05					
	*Superelevation Rate		55-4.03	See Section 55-4.05					
	*Horizontal Sight Distance		55-4.03	See Section 55-4.05					
	*Vertical Curvature, K-value	Crest	55-4.04	See Section 55-4.04					
		Sag		See Section 55-4.04					
*Maximum Grade (21)	Level	55-4.04	11%	11%	11%	10%	9%	8%	
	Rolling		14%	13%	12%	11%	10%	9%	
Minimum Grade		44-1.03	Curbed Des: 0.5%; Curbed Min: 0.3% Uncurbed: 0.0%						

SU: Suburban; U: Urban. Des: Desirable; Min: Minimum.

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

## GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR, 3R PROJECT

Figure 55-3G (Continued)

## GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR, 3R PROJECT

### Footnotes to Figure 55-3G

- (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 on a non-posted highway. This is 30 mph, but with an engineering study it may be raised to a maximum of 55 mph.
- (3) On-Street Parking. In general, on-street parking is discouraged.
- (4) Travel Lane, Width. A minimum 11-ft travel lane should be used where truck volume exceeds 200 trucks per day. See Section 55-4.05.
- (5) Surface Type. The pavement-type selection will be determined by the Office of Pavement Engineering or by the local jurisdiction.
- (6) Curb Offset. The curb offset should be 2 ft. Vertical curbs which are either continuous or introduced intermittently should be offset 1 ft.
- (7) Shoulder Width. The value applies to paved-shoulder width. The following will also apply:
  - a. For an uncurbed section, the shoulder is paved to the face of guardrail. The desirable guardrail offset is 2 ft from the effective usable-shoulder width. See Section 49-5.0 for more information.
  - b. For an uncurbed section, a desirable additional 1 ft of compacted aggregate will be provided.
  - c. If guardrail is present, the minimum offset from the 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). In a restrictive situation, the guardrail offset may be 1 ft from the effective usable-shoulder width.
  - d. For a curbed section, the curb offset is included in the paved-shoulder width.
- (8) Cross Slope, Travel Lane. Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.
- (9) 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.

## GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR, 3R PROJECT

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

- (10) Parking-Lane Width. A parking lane for residential usage may be 7 ft or less. The cross slope for a parking lane is typically 1% steeper than that for the adjacent travel lane. In a residential area, a parallel parking lane from 7 to 8 ft in width should be provided on one or both sides of the street. In a commercial or industrial area, the parking-lane width should range from 8 to 11 ft, and should usually be provided on both sides of the street. Where curb-and-gutter sections are used, the gutter-pan width may be considered as part of the parking-lane width. Where practical, the parking-lane width should be in addition to the gutter-pan width.
- (11) Sidewalk Width. Value is for the installation of a new sidewalk. An existing sidewalk width of 3 ft or greater (with or without a buffer) may be retained. A buffer strip of 4 ft or wider is more desirable.
- (12) Bicycle-Lane Width. The width is in addition to the width of parking lane, if present. See Section 51-7.0 for additional details.
- (13) Curbing Type. Vertical curbs may only be used with design speed lower than 50 mph.
- (14) Side Slopes. Section 55-4.05 provides additional information for side-slope criteria.
- (15) Side Slope, Curbed, Cut. A shelf or sidewalk will be present immediately behind the curb before the toe of the backslope. The minimum width of a shelf desirably should be 6 ft. Where a sidewalk is present, the toe of the backslope will be 1 ft beyond the edge of sidewalk. See Section 45-3.0 for more information.
- (16) 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 criteria.

## GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR, 3R PROJECT

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

- (17) 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 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).
- (18) Vertical Clearance, Collector Under Railroad. Value includes an additional 6-in. allowance for a future pavement overlay. Vertical clearance applies from usable edge to usable edge of shoulder.
- (19) Vertical Clearance, Existing Bridge. See Section 55-6.02 for additional information on minimum allowable vertical clearance.
- (20) Vertical Clearance, Arterial Over Railroad. See Chapter Sixty-nine for additional information on railroad clearance under a highway.
- (21) Maximum Grades. For a grade of less than 500 ft in length (PVT to PVC), a one-way downgrade, or a street with AADT < 400, the maximum grade may be 2% steeper than the value. Where adjacent sidewalks are present, the maximum desirable grade is 5%.
- (22) 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.