

Design Element		Manual Section	Design Values (By Type of Area)				
			Suburban	Intermediate	Built-Up		
Design Controls	Design Forecast Year	40-2.02	20 Years	20 Years	20 Years		
	*Design Speed (mph) (2)	40-3.0	Curbed: 30 - 50 Uncurbed: 30 - 50	Curbed: 30 - 45 Uncurbed: 30 - 45	Curbed: 30 - 35		
	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	45-1.04	Optional (3)	Optional (3)	Optional (3)		
Alignment Elements	Travel Lane	*Width (4)	45-1.01	Curbed: Des: 12 ft; Min: 11 ft Uncurbed: Des: 12 ft; Min: 11 ft	Curbed: Des: 12 ft; Min: 11 ft Uncurbed: Des: 12 ft; Min: 11 ft	Curbed: Des: 12 ft; Min: 10 ft	
		Typical Surface Type (5)	Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete	
	*Curb Offset (6)		45-1.02	2 ft	2 ft	2 ft	
	Shoulder	*Paved Width (7)	45-1.02	Curbed Des: 8 ft; Min: 2 ft Uncurbed: 8 ft	Curbed: Des: 6 ft; Min: 2 ft Uncurbed: 6 ft	8 ft	
		Typical Surface Type (5)	Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete	
	Cross Slope	*Travel Lane (8)	45-1.01	2%	2%	2%	
		Shoulder (8A)	45-1.02	4%	4%	2%	
	Auxiliary Lanes	Lane Width	45-1.03	Des: 12 ft; Min: 11 ft	Des: 12 ft; Min: 10 ft	Des: 12 ft; Min: 10 ft	
		Curb Offset		Des: 1 ft; Min: 0.0 ft	Des: 1 ft; Min: 0.0 ft	Des: 1 ft; Min: 0.0 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 Lane Width		46-5.0	Des: 16 ft; Min: 12 ft	Des: 14 ft; Min: 12 ft	Des: 14 ft; Min: 12 ft	
	Parking Lane Width (1)		45-1.04	Des: 10 ft; Min: 8 ft	Des: 10 ft; Min: 8 ft	Des: 10 ft; Min: 8 ft	
	Median Width	Raised Island	45-2.0	Des: 18 ft; Min: 4 ft (9)	Des: 18 ft; Min: 4 ft (9)	Des: 18 ft; Min: 4 ft (9)	
		Flush / Corrugated		Des: 16 ft; Min: 4 ft (9)	Des: 16 ft; Min: 4 ft (9)	Des: 16 ft; Min: 4 ft (9)	
	Sidewalk Width (10)		45-1.06	5 ft with 5 ft Buffer (Des)	5 ft with 5 ft Buffer (Des)	Varies, 6 ft Min	
	Bicycle Lane Width (11)		51-7.0	Curbed: 5 ft Uncurbed: Shld. Width +4 ft	Curbed: 5 ft Uncurbed: Shld. Width +4 ft	Curbed: 5 ft	
	Clear Zones		49-2.0	(12)	(12)	(12)	
	Typical Curbing Type (where used) (13)		45-1.05	Sloping / Vertical	Sloping / Vertical	Sloping / Vertical	
	Side Slopes (Uncurbed) (14)	Cut	Foreslope	45-3.0	Des: 6:1; Max: 4:1 (15)	Des: 6:1; Max: 4:1 (15)	N/A
			Ditch Width		4 ft (16)	4 ft (16)	N/A
			Backslope		4:1 for 4 ft; 3:1 Max. to Top (17)	4:1 for 4 ft; 3:1 Max. to Top (17)	N/A
		Fill	Des: 6:1 to Clr Zone; 3:1 Max to Toe Max: 4:1 to Clr Zone; 3:1 Max to Toe		Des: 6:1 to Clr Zone; 3:1 Max to Toe Max: 4:1 to Clr Zone; 3:1 Max to Toe	N/A	
			Side Slopes (Curbed)		45-3.0	(18) 12:1 for 12 ft; 3:1 Max to Toe	(18) 12:1 for 12 ft; 3:1 Max to Toe

\* Controlling design criteria (see Section 40-8.0).

Des: Desirable; Min: Minimum.

**GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR**  
**(New Construction or Reconstruction)**  
**Table 53-8**

Design Element		Manual Section	Design Values (By Type of Area)				
			Suburban	Intermediate	Built-Up		
Bridges	New or Reconstructed Bridge	*Structural Capacity (20)	Ch. 60	HS-25	HS-25	HS-25	
	Existing Bridge to Remain in Place	*Clear Roadway Width(21)	45-4.01	Uncurbed: Full Paved Approach Width Curbed: Full Approach Curb-to-Curb Width			
		*Structural Capacity	Ch. 72	HS-20	HS-20	HS-20	
	*Vertical Clearance (Collector) (22)	*Clear Roadway Width	45-4.01	Uncurbed: Travelway Plus 2 ft on Each Side Curbed: Full Approach Curb-to-Curb Width			
		New or Replaced Overpassing Bridge (22)	44-4.0	14.5 ft	14.5 ft	14.5 ft	
	Existing Overpassing Bridge	14 ft		14 ft	14 ft		
Vertical Clearance (Collector over Railroad) (23)		Ch. 69	23 ft				
Alignment Element	Design Speed			30 mph	35 mph	45 mph	50 mph
	*Stopping Sight Distance		42-1.0	220 ft	280 ft	350 ft	430 ft
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	U: 640 ft SU: 560 ft	U: 770 ft SU: 680 ft	U: 910 ft SU: 770 ft	U: 1040 ft SU: 890 ft
		Stop Maneuver		510 ft	640 ft	770 ft	920 ft
	Intersection Sight Distance, -3% to +3% (28)		46-10.0	P: 350 ft SU: 450 ft	P: 410 ft SU: 530 ft	P: 500 ft SU: 610 ft	P: 630 ft SU: 770 ft
	*Minimum Radii for e <sub>max</sub> = 4% / 6%		43-2.0	270/250 ft (24a)	430 ft/400 ft (24a)	610 ft/560 ft (24a)	760 ft (24b)
	*Superelevation Rate (25)		43-3.0	Up to e <sub>max</sub> = 6%			e <sub>max</sub> = 8%
	*Horizontal Sight Distance		43-4.0	(26)			
	*Vertical Curvature (K-values)	Crest	44-3.0	19	29	61	84
		Sag		37	49	79	96
*Maximum Grade (27)	Level	44-1.02	9%	9%	8%	7%	
	Rolling		11%	10%	9%	8%	
Minimum Grade		44-1.03	Desirable: 0.5% Minimum: 0.3% (Curbed); 0.0% (Uncurbed)				

\* Controlling design criteria (see Section 40-8.0).

U: Urban; SU: Suburban.

See note at bottom of Table 53-3 for Level One design criteria exception approval authority for state urban collectors.

See note at bottom of Table 53-4 for Level One design criteria exception approval authority for Federally funded local agency urban collectors.

**GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR**  
**(New Construction or Reconstruction)**  
**Table 53-8 (Continued)**

**GEOMETRIC DESIGN CRITERIA FOR URBAN COLLECTOR**  
**(New Construction or Reconstruction)**  
**Footnotes to Table 53-8**

- (1) Parking 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, parking lane widths should range from 8 to 11 ft, and should usually be provided on both sides of the street. Where a curb-and-gutter section is 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.
- (2) Design Speed. The minimum design speed should equal a) the minimum value from the table, b) the anticipated posted speed limit after construction, or c) the state legal limit on a non-posted highway. The legal limit in an urban district is 30 mph. Based upon an engineering study, these speeds may be raised to an absolute maximum of 55 mph.
- (3) On-Street Parking. In general, on-street parking is discouraged.
- (4) Travel Lane Width. In an industrial area, a 12-ft travel lane should be used. Where right-of-way is restricted, 10-ft lanes can be used in a residential area, and 11-ft lanes can be used in an industrial area. On a multi-lane facility in a built-up area, the minimum width is 10 ft.
- (5) Surface Type. The pavement type selection will be determined by the INDOT Pavement Design Engineer for a State highway.
- (6) Curb Offset. The curb offset should be 2 ft. Vertical curbs introduced intermittently should be offset 2 ft. A continuous curb used along a median or channelizing island may be offset 1 ft.
- (7) Shoulder Width. The table values apply to paved shoulder widths. 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. 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.
- (8A) Cross Slope (Shoulder). See Figure 45-1A(1) or Figure 45-1A(2) for more-specific information.
- (9) Minimum Median Width. The criteria in the table assume the presence of mountable curbs with a 0-ft curb offset.
- (10) Sidewalk Width. A buffer of less than 2 ft wide is not permitted. If no buffer is provided, the sidewalk width should be 6 ft.
- (11) Bicycle Lane Width. The widths in the table are in addition to the width of a parking lane, if present. See Section 51-7.0 for additional details.
- (12) Clear Zones. The following will apply:
  - a. Facility with Vertical Curbs. The clear zone will be measured from the edge of travel lane or will be to the right-of-way line, whichever is less. No clear zone is required where there is 24-hour parking.
  - b. Facility with Sloping Curbs or without Curbs. The clear zone will vary according to design speed, traffic volumes, side slopes and horizontal curvature.
  - c. Curbed Facility. There should be an appurtenance-free area as measured from the gutter line of any curb.
  - d. Values. See Section 49-2.0 for specific clear zone values

- (13) Curbing Type. Vertical curbs may only be used with a design speed lower than 50 mph.
- (14) Side Slopes (Uncurbed). Values in the table are for new construction. See Section 45-3.0 and Section 45-8.0 for more information. For a reconstruction project, see Section 49-3.0.
- (15) Foreslope. See Sections 49-2.0 and 49-3.0 for the lateral extent of the foreslope in a ditch section.
- (16) Ditch Width. In a rock cut, a V ditch should be used. See Section 45-8.0.
- (17) Backslope. The backslope for a rock cut will vary according to the height of the cut and geotechnical factors. See Section 45-8.0 for typical rock cut sections.
- (18) Side Slope (Curbed) Cut. Typically, a shelf or sidewalk will be present immediately behind the curb before the toe of the backslope. The minimum width of a shelf will be 6 ft. Where a sidewalk is present, the toe of the backslope will typically be 1 ft beyond the edge of sidewalk. See Section 45-3.0 for more information.
- (19) Side Slope (Curbed) Fill. If no sidewalks are present or planned, the lateral extent of the 12:1 slope may be reduced to 4 ft.
- (20) Structural Capacity (New or Reconstructed Bridge). The following will apply:
  - a. Each bridge on a facility with greater than 600 trucks per day should be checked using the Alternate Military loading.
  - 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.
- (21) Width (New or Reconstructed Bridge). See Section 59-1.0 for more information on bridge width.
- (22) Vertical Clearance (Collector Under Railroad). Table values include an additional 6-in. allowance for future pavement overlays. Vertical clearances apply from usable edge to usable edge of shoulder.
- (23) Vertical Clearance (Collector Over Railroad). See Chapter Sixty-nine for additional information on railroad clearance under a highway.
- (24) Minimum Radii. The following will apply:
  - a. Based on  $e_{\max} = 4\%$  or  $6\%$  and low-speed urban street conditions.
  - b. Based on  $e_{\max} = 8\%$  and open-road conditions.
- (25) Superelevation Rate. See Section 43-3.0 for values of superelevation based on design speed and radii. See Section 43-3.0 and the INDOT *Standard Drawings* for information on superelevation requirements.
- (26) Horizontal Sight Distance. For a given design speed, the necessary middle ordinate will be determined by the radius and the sight distance which applies at the site. See the discussion in Section 43-4.0.
- (27) Maximum Grades. For a grade 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 table value. Where adjacent sidewalks are present, the maximum desirable grade is 5%.
- (28) Intersection Sight Distance. For left turn onto a 2-lane road. P = Passenger car; SU = single unit truck. See Figure 46-10G for values for combination trucks.