Design Element				Manual Section	Design Value (By Type of Area)		
					Suburban	Intermediate	Built-Up
Design Controls	Design Forecast Period			40-2.02	20 Years	20 Years	20 Years
	*Design Speed (km/h) (2)			40-3.0	Curbed: 50 – 60 Uncurbed: 50 – 70	Curbed: 50 – 60 Uncurbed: 50 – 60	Curbed: 40 – 60
	Access Control			40-5.0	None	None	None
	Level of Service			40-2.0	Desirable: C; Minimum: D	Desirable: C; Minimum: D	D
	On-Street Parking			45-1.04	Optional (3)	Optional (3)	Optional (3)
Cross Section Elements	Travel Lane	*Width (4)		45-1.01	Curbed: 3.3 m Uncurbed: 3.3 m	Curbed: 3.0 m Uncurbed: 3.3 m	Curbed: 3.0 m
		Typical Surface Type		Ch. 52	Asphalt / Concrete	Asphalt / Concrete	Asphalt / Concrete
	*Curb Offset (5)			45-1.02	0.6 m	0.6 m	0.6 m
	Shoulder	*Usable Width		45-1.02	Curbed Des: 1.2 m; Min. 0.6 m Uncurbed: Des: 1.2 m; Min. 0.6 m	Curbed Des: 1.2 m; Min. 0.6 m Uncurbed: Des: 1.2 m; Min. 0.6 m	Des: 1.2 m; Min: 0.6 m
		Typical Surface Type		Ch. 52	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth
	Cross Slope	*Travel Lane (6)		45-1.01	2%	2%	2%
		Shoulder		45-1.02	2%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth	2%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth	2%-6% Asph. / Conc.; 6%-8% Aggr.; 8% Earth
	Auxiliary Lane	Lane Width		45-1.03	Des: 3.3 m; Min: 3.0 m	Des: 3.3 m; Min: 3.0 m	Des: 3.0 m; Min: 2.7 m
		Curb Offset			Des: 0.3 m; Min: 0.0 m	Des: 0.3 m; Min: 0.0 m	Des: 0.3 m; Min: 0.0 m
		Shoulder Width			Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 0.6 m	Des: 1.2 m; Min: 1.6 m
		Typical Surface Type		Ch. 52	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth	Asphalt / Concrete / Aggregate / Earth
	Parking-Lane Width (1)			45-1.04	Des: 2.7 m; Min: 2.4 m	Des: 2.7 m; Min: 2.4 m	Des: 2.7 m; Min: 2.4 m
	Sidewalk Width (7)			45-1.06	1.5 m with 1.5-m Buffer (Des)	1.5 m with 1.5-m Buffer (Des)	Varies, 1.8 m Min
	Bicycle-Lane Width (8)			51-7.0	Curbed: 1.5 m Uncurbed: Shld. Width +1.2 m	Curbed: 1.5 m Uncurbed: Shld. Width +1.2 m	Curbed: 1.5 m
	Clear Zone			49-2.0	(9)	(9)	(9)
	Typical Curbing Type (where used) (9c)			45-1.05	Vertical / Sloping	Vertical / Sloping	Vertical / Sloping
	Side Slopes (Uncurbed)	Cut	Foreslope	45-3.0	3:1 Max	3:1 Max	N/A
			Ditch Width		Des: 1.2 m; Min: 0.0 m	Des: 1.2 m; Min: 0.0 m	N/A
			Backslope		3:1 Max (10)	3:1 Max. (10)	N/A
		Fill			3:1 Max	3:1 Max.	N/A
	Side Slopes (Curbed)	Cut (Backslope)		45-3.0	(11)	(11)	(11)
		Fill (12)			12:1 for 3.6 m; 3:1 Max to Toe	12:1 for 3.6 m 3:1 Max to Toe	12:1 for 3.6 m; 3:1 Max to Toe

Des: Desirable; Min: Minimum.

* Controlling design criterion.

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREET
(New Construction or Reconstruction)

Figure 53-9

Design Element			Manual Section	Design Value (By Type of Area)				
				Suburban		Intermediate		Built-Up
Bridges	New or Reconstructed Bridge	*Structural Capacity	Ch. 60	HL-93 (12A)		HL-93 (12A)		HL-93 (12A)
		*Clear-Roadway Width	45-4.01	Curbed: Full Approach Curb-to-Curb Width Uncurbed: (13)				
	Existing Bridge to Remain in Place	*Structural Capacity	Ch. 72	HS-20		HS-20		HS-20
		*Clear-Roadway Width	45-4.01	Existing Width (14)				
	*Vertical Clearance (Local Under) (15)	New or Replaced Overpassing Bridge (15)	44-4.0	4.45 m		4.45 m		4.45 m
		Existing Overpassing Bridge		4.30 m		4.30 m		4.30 m
	Vertical Clearance (Local over Railroad) (16)		Ch. 69	7.00 m				
Alignment Elements	Design Speed			30 km/h	40 km/h	50 km/h	60 km/h	70 km/h
	*Stopping Sight Distance	Desirable	42-1.0	35 m	50 m	65 m	85 m	105 m
	Decision Sight Distance	Speed / Path / DirectionChange	42-2.0	U: 120 m SU: 100 m	U: 160 m SU: 130 m	U: 195 m SU: 170 m	U: 235 m SU: 205 m	U: 275 m SU: 235 m
		Stop Maneuver		90 m	130 m	155 m	195 m	235 m
	Intersection Sight Distance, -3% to +3% (22)		46-10.0	P: 65 m SU: 80 m	P: 85 m SU: 110 m	P: 105 m SU: 135 m	P: 125 m SU: 160 m	P: 150 m SU: 185 m
	*Minimum Radius		43-2.0	20 m (17)	45 m (17)	80 m (17)	130 m (17)	185 m (17)
	*Superelevation Rate (18)		43-3.0	e_{max} = 4%				
	*Horizontal Sight Distance		43-4.0	(19)				
	*Vertical Curvature (K-value)	Crest	44-3.0	2	4	7	11	17
		Sag		6	9	13	18	23
	*Maximum Grade (20)	Level	44-1.02	10%	10%	10%	9%	8%
		Rolling		15%	11%	11%	10.5%	10%
	Minimum Grade		44-1.03	Desirable: 0.5%; Minimum: 0.3% (Curbed) (21) 0.0% (Uncurbed)				

U: Urban; SU: Suburban.

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

These criteria apply only to a federal-aid project.

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREET
(New Construction or Reconstruction)

Figure 53-9 (Continued)

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREET
(New Construction or Reconstruction)

Footnotes to Figure 53-9

(1) Parking Lane. In a residential area, the minimum width is 2.1 m. In a commercial or industrial area the minimum width is 2.4 m. Where curb-and-gutter sections are used, the gutter width should be considered part of the parking-lane width.

(2) Design Speed. The minimum design speed should equal the minimum value, the anticipated posted speed limit after construction, or the legal speed limit on a non-posted highway. The legal speed limit in an urban district is 30 mph (48 km/h). Based upon an engineering study, the design speed may be raised to an absolute maximum of 55 mph (88 km/h).

(3) On-Street Parking. In general, on-street parking is discouraged.

(4) Travel-Lane Width. In a restricted area and where there are few trucks, a width of 0.3 m narrower than the value may be used, but the total width may not be less than 3.0 m. In an industrial area, a 3.6-m width should be used. In a residential area, an 8.0-m roadway (curb face to curb face) consisting of one 3.6-m travel lane and two 2.1-m parking lanes is used. In an industrial area, a 3.6-m width is desirable and a 3.3-m width is minimum.

(5) Curb Offset. The curb offset should be 0.6 m. For a curbed section, the curb offset is included in the paved-shoulder width.

(6) Cross Slope (Travel Lane). Cross slopes of 1.5% are acceptable on an existing bridge to remain in place.

(7) Sidewalk Width. A buffer of less than 0.6 m wide is not permitted. If no buffer is provided, the sidewalk width should be 1.8 m.

(8) Bicycle-Lane Width. The value is in addition to the width of a parking lane, if present. See Section 51-7.0 for additional details.

(9) Clear Zone. 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-h parking.
- b. Facility with Sloping Curbs or without Curbs. The clear zone will vary according to design speed, traffic volume, side slopes, and horizontal curvature.
- c. Curbed Facility. There should be an appurtenance-free area as measured from the gutter line of a curb. Vertical curbs may only be used with design speed 70 km/h or lower.
- d. Value. See Section 49-2.0 for specific clear-zone values.

(10) Backslope. The backslope for a rock cut will vary according to the height of the cut and the geotechnical requirements. See the INDOT *Standard Drawings* for typical rock-cut sections.

(11) 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 is 1.8 m. Where a sidewalk is present, the toe of the backslope will be 0.3 m beyond the edge of sidewalk. See Section 45-3.0 for more information.

GEOMETRIC DESIGN CRITERIA FOR URBAN LOCAL STREET
(New Construction or Reconstruction)

Footnotes to Figure 53-9 (continued)

(12) Side Slope (Curbed) Fill. If no sidewalks are present or planned, the lateral extent of the 12:1 slope may be reduced to 1.2 m.

(12A) 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.

(13) Width (New or Reconstructed Bridge) Uncurbed. The following will apply.

Volume	Minimum Clear Width
0 < AADT < 400	Travelway + 0.6 m each side
400 ≤ AADT < 2000	Travelway + 0.3 m each side
AADT ≥ 2000	Approach Roadway Width (Travelway plus Shoulders)

(14) Width (Existing Bridge to Remain in Place). If the width of an existing bridge is less than the approach travelway width, consideration should be given to widening the bridge. For such a bridge of length greater than 60 m, the minimum shoulder width on the right and the left sides is 1.1 m.

(15) Vertical Clearance (Local Street Under Railroad). Value includes an additional 6-in. allowance for future pavement overlays. Vertical clearance applies from usable edge to usable edge of shoulder.

(16) Vertical Clearance (Local Street Over Railroad). See Chapter Sixty-nine for additional information on railroad clearance under a highway.

(17) Minimum Radius. This is based on e_{max}=4% and low-speed urban street conditions.

(18) Superelevation Rate. See Section 43-3.0 for value of superelevation rate based on design speed and radius. See Section 43-3.0 for information on superelevation requirements.

(19) 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.

(20) Maximum Grade. In a residential area, the maximum grade should not exceed 15%. In an industrial or commercial area, the maximum grade should not exceed 8%.

(21) Flat Terrain. In very flat terrain and where no drainage outlet is available, a gutter grade as low as 0.2% may be used.

(22) Intersection Sight Distance. For a left turn onto a 2-lane roadway: P = Passenger car; SU = single unit truck. See Figure 46-10G for value for a combination truck.