Design Element				Manual Section	Design Values (By Type of Area)		
					Suburban	Intermediate	Built-up
Design Controls	Design Forecast Year			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			40-5.01	Partial Control / None	None	None
	Level of Service			40-2.0	Des: B; Min: D	Des: C; Min: D	Des: C; Min: D
	On-Street Parking			45-1.0	None	Optional (3)	Optional (3)
Cross Section Elements	Travel Lane	*Width (4)		55-4.05	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. 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: 10 ft; Min. 1 ft Uncurbed: Des: 10 ft; Min. 6 ft	Curbed: Des: 8 ft; Min: 1 ft Uncurbed: Des: 8 ft; Min. 4 ft	Des: 6 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	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 Lanes	Lane Width		55-4.05	Des: 12 ft.; Min: 11 ft.	Des: 12 ft.; Min: 11 ft.	Des: 12 ft.; Min: 10 ft.
		Curb Offset			Des: 1 ft.; Min: 0 ft.	Des: 1 ft.; Min: 0 ft.	Des: 1 ft.; Min: 0 ft.
		Shoulder Width			Des: 10 ft.; Min: 2 ft.	Des: 8 ft.; Min: 2 ft.	Des: 6 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. 14 ft.	Des: 16 ft.; Min: 12 ft.	Des: 16 ft.; Min: 11 ft.
	Parking Lane Width			45-1.04	N/A	Des: 10 ft.; Min: 8 ft. (10)	Des: 10 ft.; Min: 8 ft. (10)
	Sidewalk Width (11)			45-1.06	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			55-5.02	See Section 55-5.02	See Section 55-5.02	See Section 55-5.02
	Typical Curbing Type (where used) (13)			55-5.0	Vertical / Sloping	Vertical / Sloping	Vertical / Sloping
	Side Slopes (Uncurbed)	Cut	Foreslope	55-5.0	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 criteria (see Section 40-8.0).

GEOMETRIC DESIGN CRITERIA FOR TWO-LANE URBAN ARTERIAL
(3R Project)

Table 55-3F

Design Element			Manual Section	Design Values (By Type of Area)					
				Suburban		Intermediate		Built-up	
Bridges	New or Reconstructed Bridge	*Structural Capacity (16)	Ch. 60	HS-25		HS-25		HS-25	
		*Clear Roadway Width(17)	55-6.03	Curbed: Full Approach Curb-to-Curb Width Uncurbed: Full Approach Paved Width					
	Existing Bridge to Re-main in Place	*Structural Capacity	Ch. 72	HS-20		HS-20		HS-20	
		*Clear Roadway Width	55-6.02	Curbed: Full Approach Curb-to-Curb Width; Uncurbed: Travelway Plus 2 ft. on Each Side					
	*Vertical Clearance (Arterial Under)	New or Replaced Overpassing Bridge (18a & 18c)	44-4.0	16.5 ft.		16.5 ft. (18b)		16.5 ft. (18b)	
		Existing Overpassing Bridge (19)		14 ft.		14 ft.		14 ft.	
		Sign Truss / Pedestrian Bridge (18a & 18c)		New: 17.5 ft.; Existing: 17.0 ft.		New: 17.5 ft.; Existing: 17.0 ft.		New: 17.5 ft.; Existing: 17.0 ft.	
	Vertical Clearance (Arterial 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		55-4.02	150 ft.	200 ft.	275 ft.	350 ft	425 ft.	525 ft.
	Decision Sight Distance	Speed / Path / Direction Change	42-2.0	U: 525 ft. SU: 425 ft.	U: 650 ft. SU: 550 ft.	U: 775 ft. SU: 675 ft.	U: 900 ft. SU: 775 ft.	U: 1025 ft. SU: 875 ft.	U: 1200 ft. SU: 1025 ft.
		Stop Maneuver		425 ft.	500 ft.	650 ft.	825 ft.	875 ft.	1075 ft.
	Intersection Sight Distance		55-4.06	P: 280 ft SU: 360 ft	P: 350 ft SU: 450 ft	P: 410 ft SU: 530 ft	P: 500 ft SU: 610 ft	P: 600 ft SU: 770 ft	P: 760 ft SU: 920 ft
	*Minimum Radii		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	11%	10%	9%	8.5%	8%	7%
		Rolling		12%	11%	10%	9.5%	9%	8%
	Minimum Grade		44-1.03	Curbed Des: 0.5%; Curbed Min: 0.3% Uncurbed: 0.0%					

* Controlling design criteria (see Section 40-8.0). U: Urban; SU: Suburban. Des: Desirable; Min: Minimum.
Refer to note at bottom of Table 55-3A for approval authority for Level One design exceptions.

GEOMETRIC DESIGN CRITERIA FOR TWO-LANE URBAN ARTERIAL
(3R Project)
Table 55-3F (Continued)

GEOMETRIC DESIGN CRITERIA FOR TWO-LANE URBAN ARTERIAL
(3R Project)

Footnotes to Table 55-3F

(1) Design Forecast Year. 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 a) the anticipated posted speed limit after construction, or b) the state legal limit on a non-posted highway. The legal limit is 30 mph and with an engineering study may be raised to a maximum of 55 mph.

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

(4) Travel Lane (Width). For an arterial on the National Truck Network, the right lane must be 12 ft in width. For another route, a minimum 11-ft travel lane should be used where truck volumes exceed 200 trucks a day. See Section 55-4.05.

(5) Surface Type. The pavement type selection will be determined by the Materials and Tests Division's pavement design engineer or by the local jurisdiction.

(6) Curb Offset. The curb offset should be 2 ft. Vertical curbs which are either continuous or introduced intermittently 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. 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). 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 Slopes (Shoulder). Table values are for tangent sections. 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.

(10) Parking Lane Width. The following will apply:

a. Where the parking lane will be used as a travel lane during peak hours or may be converted to a travel lane in the future, the width should be equal to the travel lane width plus the curb offset width (if present).

b. A parking lane for residential usage may be 1 ft narrower.

c. The cross slope for a parking lane is typically 1% steeper than that for the adjacent travel lane. Buffered strips of 4 ft or more are desirable.

(11) Sidewalk Width. Table values are for the installation of new sidewalks. Existing sidewalk widths of 3 ft or greater (with or without a buffer) may be retained. A buffer strip of 4 ft or wider is desirable.

(12) Bicycle Lane Width. The widths in the table are in addition to the width of parking lane, if present. See Section 51-7.0 for additional details.

(13) Curbing Types. 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 Slopes= (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 desirably should 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.

(16) 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 criteria.

(17) Width (New or Reconstructed Bridge). Widths are minimums for a 3R project. See Section 59-1.0 for additional information on bridge width.

(18) Vertical Clearance (Arterial Under Railroad). The following will apply:

a. Table value includes an additional 6 in. allowance for future pavement overlays.
b. In a highly urbanized area, a minimum clearance of 14 ft may be provided if there is at least one route with a 16-ft clearance.
c. Vertical clearances apply 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) 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.