

**BUREAU OF LOCAL ROADS & STREETS**  
**GEOMETRIC DESIGN TABLES**

32-2(2)

Oct 2008

Design Element		Manual Section	Design Volume (veh/day)				
			Under 400 ADT	400 – 750 ADT	750-2000 ADT	Over 2000 ADT	
Design Controls	Design Forecast Year	27-6.02	Current	20 Years	20 Years	20 Years	
	*Minimum Design Speed (1a, 1b)	27-5.02	40 mph (1c)	50 mph (1c)	50 mph	60 mph	
Cross Section Elements	*Level of Service	27-6.04	C	C	C	C	
	*Traveled Way Width	31-1.01	20'	22'	22'	24' (2)	
	Surface Type	Chapter 37	Aggregate Surface/Bituminous Treated (3)	High-Type Pavement	High-Type Pavement	High-Type Pavement	
	*Shoulder Width	31-1.06	2' (4a)	4' (4b)	6' (4b)	8' (4b)	
	Shoulder Type		Turf or Aggregate (5a)				
	*Auxiliary Lanes	31-1.03	10'	Des: 11' Min: 10'	Des: 11' Min: 10'	Des: 12' Min: 11'	
	Cross Slope	Shoulder Width		2'	4'	Des: 6' Min: 4'	Des: 8' Min: 4'
		*Travel Lane (6a)		2% - 4% (6b)	1.5% - 2%	1.5% - 2%	1.5% - 2%
		Shoulder		Turf: 5-8% Agg: 4-6%	Turf: 5-8% Agg: 4-6%	Agg: 4-6% Paved: 4%	Agg: 4-6% Paved: 4%
		Rollover Factor		10%	10%	8%	8%
Roadway Slopes	Cut Section	Front Slope	1V:3H	1V:3H	1V:3H	1V:4H	
			Ditch Width	Min: 2'	Min: 2'	Min: 2'	
	Back Slope	Back Slope	0'-10': 1V:3H >10': 1V:2H (7)	0'-10': 1V:3H >10': 1V:2H	0'-10': 1V:3H >10': 1V:2H	<15': 1V:4H 15'-25': 1V:3H >25': 1V:2H	
			Rock Cut	1V:0.25H	1V:0.25H	1V:0.25H	1V:0.25H
Fill Section	Fill Section	0'-6': 1V:3H >6': 1V:2H	0'-10': 1V:3H >10': 1V:2H	0'-10': 1V:3H >10': 1V:2H	0'-25': 1V:4H >25': 1V:2H		

\* Controlling design criteria (see Section 27-7).

**GEOMETRIC DESIGN CRITERIA FOR RURAL TWO-LANE COLLECTORS**  
**(New Construction/Reconstruction)**  
**Figure 32-2A (US Customary)**

**BUREAU OF LOCAL ROADS & STREETS**  
**GEOMETRIC DESIGN TABLES**

Oct 2008

32-2(3)

Design Element		Manual Section	Design Volume (vehicles/day)				
			Under 400 ADT	400 – 750 ADT	750-2000 ADT	Over 2000 ADT	
Design Controls	Design Forecast Year	27-6.02	Current	20 Years	20 Years	20 Years	
	*Minimum Design Speed (1a,1b)	27-5.02	60 km/h (1c) 50 km/h (1c)	80 km/h (1c) 60 km/h (1c)	80 km/h	100 km/h 80 km/h	
	*Level of Service	27-6.04	C	C	C	C	
Cross Section Elements	*Traveled Way Width	31-1.01	6.0 m	6.6 m	6.6 m	7.2 m (2)	
	Surface Type	Chapter 37	Aggregate Surface/ Bituminous Treated (3)	High-Type Pavement	High-Type Pavement	High-Type Pavement	
	*Shoulder Width	31-1.06	600 mm (4a)	1.2 m (4b)	1.8 m (4b)	2.4 m (4b)	
	Shoulder Type		Turf or Aggregate (5a)	Aggregate/Paved (5b)			
	*Auxiliary Lanes	31-1.03	Lane Width Shoulder Width	Des: 3.3 m Min: 3.0 m 1.2 m	Des: 3.3 m Min: 3.0 m Des: 1.8 m Min: 1.2 m	Des: 3.6 m Min: 3.3 m Des: 2.4 m Min: 1.2 m	
	Cross Slope	*Travel Lane (6a)		2% - 4% (6b)	1.5% - 2%	1.5% - 2%	
		Shoulder	31-1.08	Turf: 5-8% Agg: 4-6%	Turf: 5-8% Agg: 4-6%	Agg: 4-6% Paved: 4%	
		Rollover Factor		10%	10%	8%	
	Roadway Slopes	Cut Section	Front Slope	1V:3H	1V:3H	1V:3H	1V:4H
			Ditch Width	Min: 600 mm	Min: 600 mm	Min: 600 mm	Min: 600 mm
Back Slope		0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H (7)	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	<4.5 m: 1V:4H 4.5 m – 7.5 m: 1V:3H >7.5 m: 1V:2H	
		Rock Cut	1V:0.25H	1V:0.25H	1V:0.25H	1V:0.25H	
Fill Section	0 m – 1.8 m: 1V:3H >1.8 m: 1V:2H	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	0 m – 3.0 m: 1V:3H >3.0 m: 1V:2H	0 m – 7.5 m: 1V:4H >7.5 m: 1V:2H		

\* Controlling design criteria (see Section 27-7).

**GEOMETRIC DESIGN CRITERIA FOR RURAL TWO-LANE COLLECTORS**  
**(New Construction/Reconstruction)**

**Figure 32-2A (Metric)**

- (1) Design Speed. A rural collector may pass through a relatively built-up area. In these sections, a lower design speed may be selected with justification. However, the selected design speed should not be less than 30 mph (50 km/h). Consider the following:
  - a. For low to moderate density areas, the design speed may be reduced 5 mph to 10 mph (10 km/h) below the listed design speed.
  - b. For moderate to high density areas, the design speed may be reduced 10 mph to 15 mph (10 km/h to 20 km/h) below the listed design speed.
  - c. For rural bridge projects, the design speed may be increased to the posted or regulatory speed limit to avoid a deficient NBIS rating for approach roadway alignment appraisal. All elements of the project will be designed to the chosen design speed. The chosen design speed will be certified by the County Engineer.
- (2) Traveled Way Width. On a reconstruction project, an existing 22 ft (6.6 m) traveled way width may be maintained where the alignment and safety records are satisfactory.
- (3) Surface Type. A high-type pavement is desirable.
- (4) Shoulder Width.
  - a. Where roadside barriers are included, provide a minimum offset of 4 ft (1.2 m) from the edge of the traveled way to the roadside barrier.
  - b. Where the rural collector passes through a moderate to high density area, the shoulder width may be 4 ft (1.2 m). This width may include the width of Type B gutter or the gutter flag with curb and gutter at the outside edge of the shoulder.
- (5) Shoulder Type.
  - a. Aggregate shoulders may consist of a nominal 4 in (100 mm) thickness where the ADT is less than 750 vehicles/day.
  - b. For ADT's > 750 vehicles/day, an aggregate shoulder should be a minimum thickness of 6 in (150 mm) Type A shoulders.
- (6) Cross Slopes.
  - a. Cross slopes for outside auxiliary lanes will be at least 2.0% and desirably should be 0.5% greater than the adjacent travel lane. Inside auxiliary lane cross slopes are sloped at 1.5% to 2.0% with high-type pavements.
  - b. Use 1.5% to 2.0% with high-type pavement.
- (7) Back Slopes. For isolated restricted right-of-way, the back slope may be 1V:2H for cut depths of 0 ft to 10 ft (0 m to 3 m) or 1V:1.5H for cut depths greater than 10 ft (3 m).

**GEOMETRIC DESIGN CRITERIA FOR RURAL TWO-LANE COLLECTORS (New Construction/Reconstruction)**

**Footnotes to Figure 32-2A**