

**EXHIBIT 11-A GEOMETRIC DESIGN GUIDELINES FOR LOCAL 3R PROJECTS
(OFF THE SHS)****Table 11-1: Lane and Shoulder Widths Arterial Roads and Streets**

Design Year Volume (ADT)	Design Speed (mph)	Lane Width (feet)	Shoulder Width [a] (feet)	Total Roadway Width (feet)
Low Volumes: 1 - 750 ADT	All	10	2	24
High Volumes: 751 - 2,000 ADT	All	12	2 [b]	28 [c]
Over 2,000 ADT	All	12	6 [b]	36 [c]

- [a] All shoulders on rural and urban arterials to be paved.
 [b] Reduce by 1 foot for highways on mountainous terrain.
 [c] Reduce by 2 feet for highways on mountainous terrain.

Table 11-2: Lane and Shoulder Widths Collector Roads and Streets

Design Year Volume (ADT)	Design Speed [a] (mph)	Lane Width (feet)	Shoulder Width [b] (feet)	Total Roadway Width (feet)
Low Volumes: 1 - 750 ADT	All	10	2	24
High Volumes: 751 - 2,000 ADT	Under 50	10	2 [c]	24 [d]
	50 and over	12	2 [c]	28 [d]
Over 2,000 ADT	All	12	4 [c]	32 [d]

- [a] Highway segments should be classified as "under 50" only if most vehicles have an average speed of less than 50 mph over the length of the segment
 [b] All shoulders on collector roads and streets to be paved.
 [c] Reduce by 1 foot for highways on mountainous terrain.
 [d] Reduce by 2 feet for highways on mountainous terrain.

Table 11-3: Lane and Shoulder Widths Local Roads and Streets

Design Year Volume (ADT)	Design Speed [a] (mph)	Lane Width (feet)	Shoulder Width (feet)	Total Roadway Width (feet)
Low Volumes: 1 - 750 ADT	All	10	2	24
High Volumes: 751 - 2,000 ADT	Under 50	10	2 [b]	24 [c]
	50 and over	12	2 [b]	28 [c]
Over 2,000 ADT	All	12	4 [b]	32 [c]

- [a] Highway segments should be classified as "under 50" only if most vehicles have an average speed of less than 50 mph over the length of the segment.
 [b] Reduce by 1 foot for highways on mountainous terrain.
 [c] Reduce by 2 feet for highways on mountainous terrain.

Table 11-4: Lane Widths Urban Roads and Streets

Type of Lane	Minimum Width(feet)
Curb Lane	
No Parking Anytime [a]	11
Part-time Use (peak hour/high volume/low speed)	9
With Parking	19
Interior Lane	10
Lane Adjacent to Median	
Raised Curb	10
Painted Median	10
Left-Turn Lane	
One-Way (one lane only)	10
Two-Way (continuous)	10
Bicycle Lane (Within Roadway)	
One-Way	4
Bicycle Lane and Parking (One-Way)	12

[a] A 1 foot curb lane, with up to 2 feet wide gutter, may be used at intersections.

Table 11-5: Bridges on Arterial Roads and Streets

Design Year Volume (ADT)	Minimum Usable Bridge Width [a]
1 - 750	Width of approach lanes [b]
751 - 2,000	Width of approach lanes plus 2 feet each side
2,001 - 6,000	Width of approach lanes plus 4 feet each side
Over 6,000	Width of approach lanes plus 8 feet each side

[a] If lane widening is planned as part of a 3R project, the usable bridge width should be compared with the planned width of the approaches after they are widened.

[b] Minimum usable bridge width to be 24 feet.

Table 11-6: Bridges on Collector Roads and Streets

Design Year Volume (ADT)	Minimum Usable Bridge Width [a]
1 - 750	Width of approach lanes [b]
751 - 2,000	Width of approach lanes plus 2 feet each side
2,001 - 6,000	Width of approach lanes plus 4 feet each side
Over 6,000	Width of approach lanes plus 8 feet each side

- [a] If lane widening is planned as part of a 3R project, the usable bridge width should be compared with the planned width of the approaches after they are widened.
- [b] Minimum usable bridge width to be 24 feet.

Table 11-7: Bridges on Local Roads and Streets

Design Year Volume (ADT)	Minimum Usable Bridge Width [a]
1 - 750	Width of approach lanes
751 - 2,000	Width of approach lanes plus 2 feet each side
Over - 2,000	Width of approach lanes plus 4 feet each side

- [a] If lane widening is planned as part of a 3R project, the usable bridge width should be compared with the planned width of the approaches after they are widened.

Table 11-8: Horizontal and Vertical Alignment Arterial Roads and Streets

Design Speed (mph)	Minimum Stopping Sight Distance (feet)	Minimum Radius of Horizontal Curve (feet)		Maximum Grade (%)					
		Super-Elevation 10% (a)	Super-Elevation 8% (b)	Rural			Urban		
				Level	Rolling	Mountains	Level	Rolling	Mountains
30	200	230	250	...	...	...	8	9	11
40	275	430	470	...	...	...	7	8	10
50	400	695	765	4	5	7	6	7	9
60	525	1,090	1,205	3	4	6	5	6	8

- [a] Generally, superelevation should not exceed 10 percent.
- [b] Superelevation should not exceed 8 percent where snow and ice conditions prevail.

Table 11-9: Horizontal and Vertical Alignment Collector Roads and Streets

Design Speed (mph)	Minimum Stopping Sight Distance (feet)	Minimum Radius of Horizontal Curve (feet)		Maximum Grade (%)					
		Super-elevation 10% (a)	Super-elevation 8% (b)	Rural			Urban		
				Level	Rolling	Mountains	Level	Rolling	Mountains
20	125	100	105	7	10	12	9	12	14
30	200	230	250	7	9	10	9	11	12
40	275	430	470	7	8	10	9	10	12
50	400	695	765	6	7	9	7	8	10
60	525	1,090	1,205	5	6	8	6	7	9

[a] Generally, superelevation should not exceed 10 percent.

[b] Superelevation should not exceed 8 percent where snow and ice conditions prevail.

Table 11-10: Horizontal and Vertical Alignment Local Roads and Streets

Design Speed (mph)	Minimum Stopping Sight Distance (feet)	Minimum Radius of Horizontal Curve (feet)		Maximum Grade (%)		
		Super-Elevation 10% (a)	Super-elevation 8% (b)	Rural		
				Level	Rolling	Mountains
20	125	100	105	8	11	16
30	200	230	250	7	10	14
40	275	430	470	7	9	12
50	400	695	765	6	8	10
60	525	1,090	1,205	5	6	...

[a] Generally, superelevation should not exceed 10 percent.

[b] Superelevation should not exceed 8 percent where snow and ice conditions prevail.