## **Exhibit 11‑A Geometric Design Guidelines for Local 3R Projects**

## **(Projects Off the NHS and Off the SHS)**

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| Table 11-1: Lane and Shoulder Widths Arterial Roads and Streets | | | | | | |
| Design Year | | Design | Lane | | Shoulder | Total Roadway |
| Volume (ADT) | | Speed (mph) | Width (feet) | | Width [a] (feet) | 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 | | Design | Lane | | Shoulder | Total Roadway |
| Volume (ADT) | | Speed [a] (mph) | Width (feet) | | Width [b] (feet) | 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 | | Design | Lane | | Shoulder | Total Roadway |
| Volume (ADT) | | Speed [a] (mph) | Width (feet) | | Width (feet) | 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. | | | | | |

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| Table 11-5: Bridges on Arterial Roads and Streets | | |
|  | | |
| Design Year Volume (ADT) | | Minimum Usable Bridge Width [a] |
|  | |  |
| 1 - 750  751 - 2,000  2,001 - 6,000  Over 6,000 | | Width of approach lanes [b]  Width of approach lanes plus 2 feet each side  Width of approach lanes plus 4 feet each side  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. | |

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| Table 11-6: Bridges on Collector Roads and Streets | | |
|  | | |
| Design Year Volume (ADT) | | Minimum Usable Bridge Width [a] |
| 1 - 750  751 - 2,000  2,001 - 6,000  Over 6,000 | | Width of approach lanes [b]  Width of approach lanes plus 2 feet each side  Width of approach lanes plus 4 feet each side  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. | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Table 11-7: Bridges on Local Roads and Streets | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |
| Design Year Volume (ADT) | | | | Minimum Usable Bridge Width [a] | | | | | | | | | |
| 1 - 750  751 - 2,000  Over - 2,000 | | | | Width of approach lanes  Width of approach lanes plus 2 feet each side  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 | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | |
|  | | Minimum  Stopping | Minimum Radius of  Horizontal Curve (feet) | | | Maximum Grade (%) | | | | | | | |
| Design | | Sight | Super- | | Super- |  | Rural |  |  | Urban | |  | |
| Speed  (mph) | | Distance  (feet) | Elevation  10% (a) | | Elevation  8% (b) | 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

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | Minimum  Stopping | Minimum Radius of  Horizontal Curve (feet) | | | Maximum Grade (%) | | | | | | | |
| Design | | | Sight | Super- | Super- | |  | Rural |  | | |  | Urban |  |
| Speed  (mph) | | | Distance  (feet) | elevation  10% (a) | elevation  8% (b) | | 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** | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
|  | | | Minimum  Stopping | Minimum Radius of  Horizontal Curve  (feet) | | | Maximum Grade (%) | | | | | |
| Design | | | Sight | Super- | | Super- |  | Rural | |  | | |
| Speed  (mph) | | | Distance  (feet) | Elevation  10% (a) | | elevation  8% (b) | 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. | | | | | | | | | | | | |