## **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 - 750751 - 2,0002,001 - 6,000Over 6,000 | Width of approach lanes [b]Width of approach lanes plus 2 feet each sideWidth of approach lanes plus 4 feet each sideWidth 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 - 750751 - 2,0002,001 - 6,000Over 6,000 | Width of approach lanes [b]Width of approach lanes plus 2 feet each sideWidth of approach lanes plus 4 feet each sideWidth 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 - 750751 - 2,000Over - 2,000 | Width of approach lanesWidth of approach lanes plus 2 feet each sideWidth 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 |
|  |
|  | MinimumStopping | Minimum Radius ofHorizontal Curve (feet) | Maximum Grade (%) |
| Design | Sight | Super- | Super- |  | Rural |  |  | Urban |  |
| Speed(mph) | Distance(feet) | Elevation10% (a) | Elevation8% (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

|  |  |  |  |
| --- | --- | --- | --- |
|  | MinimumStopping | Minimum Radius ofHorizontal Curve (feet) | Maximum Grade (%) |
| Design | Sight | Super- | Super- |  | Rural |  |  | Urban |  |
| Speed(mph) | Distance(feet) | elevation10% (a) | elevation8% (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** |
|  |
|  |
|  | MinimumStopping | Minimum Radius ofHorizontal Curve(feet) | Maximum Grade (%) |
| Design | Sight | Super- | Super- |  |  Rural |  |
| Speed(mph) | Distance(feet) | Elevation10% (a) | elevation8% (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. |