# Appendix C: Methodology

The recommendations contained in this document were derived using VDOT state roadway data. This appendix describes the matrices used to determine these recommendations.

State roadway planning data is made available through ArcGIS online to the TPO and RVARC staff approximately every six to twelve months. VDOT collects data through studies on roadway sections. The methodology used by VDOT to determine these data points is not included in this document. Data collected by VDOT which was used in creating the Regional Commission's recommendations includes:
- lane widths
- shoulder surface types
- the width of the shoulder if it exists
- posted speeds
- estimated percentage of truck traffic
- current volume of traffic (AADT)
- horizon year estimate volume of traffic (Horizon AADT)
- percent grade

These elements were moved into two matrices. The first matrix included current AADT, horizon AADT, posted speed, and percent truck traffic. Scores were assigned to these values as described in "Figure 25: Bike Lane Logic".

**Figure 27: Bike Lane Logic**

| Attribute | Value | Weight |
|---|---|---|
| **Percent Truck Traffic** | <10% | 0 |
| | >10% | 1 |
| **Most Recent AADT** | <1500 | 0 |
| | 1500-3000 | 1 |
| | >3000 | 2 |
| **Horizon AADT** | <1500 | 0 |
| | 1500-3000 | 1 |
| | >3000 | 2 |
| **Posted Speed** | <35 | 0 |
| | 35-45 or no posted speed | 1 |
| | >45 | 2 |

These scores were then added up. The maximum possible score was a value of 7. The minimum possible score was a value of 0. No roadway in this matrix scored above a 6. Scores of 5 and 6 received a recommendation to include a bike lane as a future project for the stretch of roadway in question. These values were determined using the Complete Streets Guide prepared by VDOT, which recommends bike lanes for roadways with an AADT greater than or equal to 3,000 and a speed limit greater than or equal to 45 miles per hour. To receive a score of 5, a roadway had to have at least two of the following: an AADT or horizon AADT of greater than 3,000 and a speed limit of greater than 45 miles per hour. Many of the roads in question also showed truck traffic of greater than ten percent.

The remainder of roadways with statewide planning data were scored in a separate matrix. This matrix contained the percent grade of the road segment in question, the average lane width, the right shoulder lane width and type, the left shoulder lane width and type, and the posted speed. As with the previous matrix, scores were assigned to each of these values.

The possible accommodations recommended in "Figure 26: Logic for Other Recommendations" were selected from VDOT's Complete Streets Guidance. Specifically, these accommodations included paved shoulders, widened outer lanes, and signage. While ideally roadways might have some combination of these accommodations (for example, a roadway may have both paved shoulders and route signage) these are the minimum safe accommodations given roadway characteristics. Paved shoulders may exist in some cases where paved shoulders are recommended. In this case, paved shoulders should be expanded to meet the FHWA guidance found on page 3-5 of Small Town and Rural Multimodal Networks, included in "Figure 26: FHWA Guidance for Paved Shoulders".

**Figure 28: FHWA Guidance for Paved Shoulders**



**A** Paved Shoulder 4 ft (1.2 m) min.
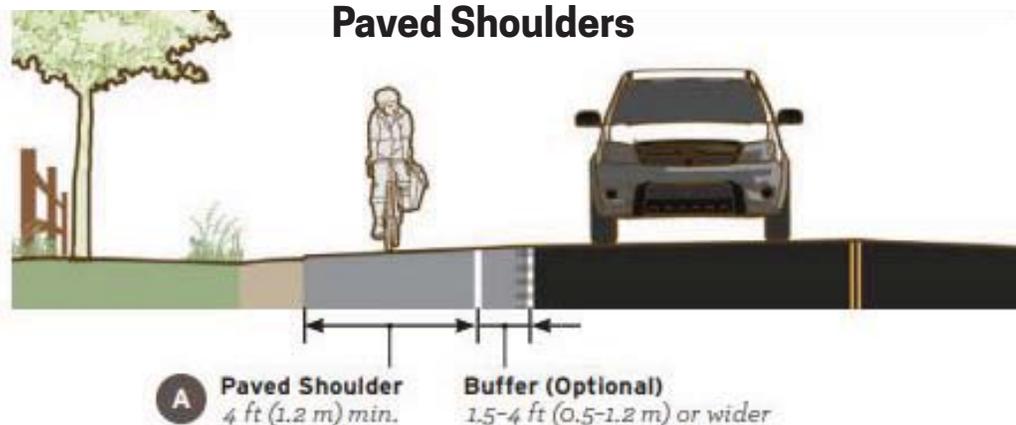
Buffer (Optional) 1.5-4 ft (0.5-1.2 m) or wider

*Figure 3-1. When adequate width is provided, shoulders can serve bicycle trips along roads too busy for comfortable shared roadway travel.*

## Figure 29: Logic for Other Recommendations

| Attribute | Value | Weight |
|---|---|---|
| **Percent Grade** | 1-3% | 1 |
| | 4-6% | 2 |
| | 7-9% | 3 |
| | >10% | 4 |
| **Average Lane Width** | 13-14 ft | 0 |
| | >15 ft | 1 |
| | <12 ft | 2 |
| **Right Shoulder Type** | Pavement | 1 |
| | Earth | 2 |
| | Gravel | 3 |
| | Curb/No Shoulder | 4 |
| **Right Shoulder Width** | >5ft | 0 |
| | 4-5 ft | 1 |
| | <4ft | 2 |
| **Left Shoulder Type** | Pavement | 1 |
| | Earth | 2 |
| | Gravel | 3 |
| | Curb/No Shoulder | 4 |
| **Left Shoulder Width** | >5ft | 0 |
| | 4-5 ft | 1 |
| | <4ft | 2 |
| **Posted Speed** | <35 mph | 0 |
| | 35-45 or not posted | 1 |
| | >45 mph | 2 |

## Works Cited

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"Appendix A(1) VDOT Complete Streets: Bicycle and Pedestrian Facility Guidelines, Bus Stop Design and Parking Guidelines," Road Design Manual. Location and Design Division, Virginia Department of Transportation. Issued January 2005 - July 2020. Accessed June 15, 2020. https://www.virginiadot.org/business/resources/LocDes/RDM/Appenda1.pdf#[6,{%22name%22:%22FitH%22},771