

ROAD DESIGN MANUAL REVISIONS

October 2020

GENERAL

- Updated References to 2018 AASHTO Greenbook
- Changed Chapter number format from 1A-1 to 1A.1 for Chapters 1 and 2
- Changed Chapter number format for Appendices from A-1 to A1 for Appendix A

CHAPTER 1B

- Added SWPPP- Stormwater Pollution Prevention Plan to abbreviations
- Added information to definition of Access Management
- Moved information from Average Running Speed under Speed
- Added Barrier definition
- Added Breakaway definition
- Revised Clear Zone definition
- Added Crash Cushion definition
- Revised Detour definition to include pedestrians
- Added End Treatment definition
- Added Gradient definition
- Revised Highway definition
- Added Impact Attenuator definition
- Added Length of Need definition
- Added Measures of Effectiveness definition
- Added Professional Engineer definition
- Added Responsible Charge definition
- Added Street definition
- Added Zone of Intrusion definition

CHAPTER 1C

- Changed Figure 1C-2
- Combined Tables 1C-4 through 1C-5 Cities and Towns and renamed as Table 1C-2
- Renamed Table 1C-6 as 1C-3
- Renamed Figure 1C-7 Systems and Operations Regions as Figure 1C-3
- Renamed Figure 1C-8 through 1C-14 as Table 1C-4 through 1C-13

CHAPTER 2A

- Updated references

CHAPTER 2B

- Updated references
- Created Section 2B.3 Occupiable Space / Buildings on Roadway Requirements
- Renumbered Section 2B-3 DETERMINATION OF ROADWAY DESIGN to 2B.4
- Renumbered Section 2B-4 - REQUEST FOR ENVIRONMENTAL EVALUATION to 2B.5
- Renumbered Section 2B-5 - COST ESTIMATES to 2B.6
- Renumbered Section 2B-6 - CONSTRUCTABILITY QUALITY REVIEW to 2B.7
- Renumbered Section 2B-7 - THE PRELIMINARY FIELD INSPECTION to 2B.8
- Renumbered Section 2B-8 - VALUE ENGINEERING to 2B.9

CHAPTER 2D

- Removed Stopping Sight Distance and Intersection Sight Distance Sections and moved them to Appendix A1 Geometric Design Standards

CHAPTER 2E

- Updated the List of Figures
- Added a Figure number for Retaining Wall Excavation on page 19: Figure 2E-1
- Added a Figure number for Porous Backfill (separate Payment): Figure 2E-9
- Added a Figure number for Porous Backfill Included Payment: Figure 2E-2
- Added a Figure number for Sample Reinforced Soil Slope Design: Figure 2E-3
- Added a Figure number for Curb / Curb and Gutter Section Detail: Figure 2E-4
- Added a Figure number for Shoulder Section Details: Figure 2E-5
- Renumbered Figure 2E-8 to Figure 2E-6 Profile for Proposed Retaining Wall
- Added a Figure number for Demolition of Pavement: Figure 2E-7
- Added a Figure number for Demolition of Untreated Pavement: Figure 2E-8
- Added a Figure number for Historical Marker Pull Off Area: Figure 2E-9
- Renumbered Figure 2E-9 to Figure 2E-10 Depicting Temporary Construction Easement Around Entrances
- Renumbered Figure 2E-10 to Figure 2E-19 Depicting Limited Access Right of Way
- Renumbered Figure 2E-11 to Figure 2E-20 Depicting Limited Access Right of Way
- Added a Figure number for Surplus Right of Way: Figure 2E-21
- Added a Figure number for Measuring “D” Limits on Plans: Figure 2E-22
- Renumbered Figure 2E-12 to Figure 2E-23 Construction Type Code for Highway Improvements-Line Item Codes
- Added a Figure number for Grading Line Below Pavement: Figure 2E-24
- Renumbered Figure 2E-13 to Figure 2E-25: Sample Hydrologic Data Sheet (No Plan)

APPENDIX A

APPENDIX A1

- Removed Figure numbers from the GS-Standards
- Updated Figure number references
- Updated references to 2019 AASHTO *Guidelines for Geometric Design of Low-Volume Roads, Second Edition*.
- Added clarifying language in Posted speed
- Added clarifying language in Functional Classification
- Changed Shoulder widths in GS Standards for Rural and Urban Minor Arterials, Collectors and Locals to reflect 2018 GB changes
- Increased ADT from 1500 to 2000 in GS Standards
- Added Section 2 – Sight Distance (taken from Chapter 2E)

APPENDIX A2

- Updated Section number
- Updated List of Figures
- Created List of Tables
- Added separate figure numbers for each Case (1-4) of showing Clear Zone
- Renumbered Figure A2-2 Cost Effective Selection Procedures to Figure A2-5
- Added a Figure number to Typical Method of Showing Clear Zone / Lateral Offset on Typical Sections: Figure A2-1
- Renumbered Figure A2-4 Example of a Parallel Embankment Slope Design to Figure A2-7
- Added a Figure number to Recovery Distance: Figure A2-8

- Added a Figure number to Example of Alternate Design Incorporating Adjustment to Reduce Total Clearance requirement: Figure A2-9

APPENDIX A3

- Updated references to figures, sources
- Created List of Tables
- Added a Figure number to Displaced Left Turn Intersection: Figure A3-1
- Added a Figure number to Median U-Turn Intersection: Figure A3-2
- Added a Figure number to Restricted Crossing U-turn Intersection: Figure A3-3
- Added a Figure number to Continuous Green T Intersection: Figure A3-4
- Added a Figure number to Quadrant Roadway Intersection: Figure A3-5
- Added a Figure number to Jug Handle Intersection: A3-6
- Created a standalone section for Roundabouts – Section 3
- Renumbered Figure A-3-1 Roundabout Design Elements to Figure A3-7
- Renumbered Figure A-3-2 Roundabout Truck Apron Curb Detail to Figure A3-8
- Added a Figure number to Features of Typical Mini-Roundabout: Figure A3-1
- Added a Figure number to Features of a Typical Single-Lane Roundabout: Figure A3-2
- Added a Figure number to Features of a Multi-Lane Roundabout: Figure A3-3
- Added a Figure number to Typical Diverging Diamond Interchange Configuration: Figure A3-4
- Added a Table number to Roundabout Category Comparison: Table A3-1
- Renumbered Table 3-1 Conflict Points to Table A3-2
- Renamed Figure A-3-3 Diverging Diamond Layout to Figure A3-13 Functional Area of a DDI Intersection
- Renumbered Figure A-3-4 Crossover Geometrics to Figure A3-14
- Renumbered Figure A-3-5 Offset Distance for Intersection to Figure A3-15
- Renumbered Figure A-3-6 Shoulder Design for DDI to Figure A3-16
- Renumbered Figure A-3-7 Expected Oncoming Traffic vs. Actual Oncoming Traffic to Figure A3-17
- Renumbered Figure A-3-8 Pedestrian access in middle of crossroad between crossover to Figure A3-5
- Renumbered Figure A-3-9 Pedestrian Access Outside of DDI to Figure A3-6
- Added a Figure number to Typical Single Point Urban Interchange Configuration: Figure A3-7
- Added a Figure number to Typical Double Roundabout Interchange Configuration: Figure A3-8

APPENDIX A4

- Changed Table A-4-1 to Table A4-1

APPENDIX A7

- Renamed Project Location Map to Figure A7-1
- Renamed Project Typical Section to Figure A7-2

APPENDIX A8

- Updated page REFERENCES To 2D-19 for Pavement Termination

APPENDIX A(1)

- Separated Figures and Tables
- Updated Figure Numbers; Separated Figures into 3 sections based on the Appendix A(1) Sections
- Updated Table Numbers; Separated Tables into 3 sections based on the Appendix A(1) Sections

Old Figure Number	Figure Name	New Figure Number
Figure A(1)-1-1 (1)	Bike Lanes With On-Street Parking	Figure A(1)-1
Figure A(1)-1-1 (2)	Parking Permitted Without Parking Stripe or Stall	Figure A(1)-2
Figure A(1)-1-2	Typical Bike Lane Cross Sections (1) Bike Lanes without On- Street Parking	Figure A(1)-3
Figure A(1)-1-2	Typical Bike Lane Cross Sections (2) Bike Accommodations within the Limits of the Required Paved Shoulder Area	Figure A(1)-4
Figure A(1)-1-3	Right-Turn-Only Lane	Figure A(1)-5
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Figure A(1)-1-5	Cross Section of Two-Way Shared Use Path	Figure A(1)-7
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Figure A(1)-1-10	Shared Use Path Pavement Structure	Figure A(1)-12
Figure A(1)-1-11	Shared Use Path Transition From Roadway Onto Bridge For Design Speeds >45 MPH	Figure A(1)-13
Figure A(1)-1-12	Interstate Bicycle Routes 1 and 76	Figure A(1)-14
Figure A(1)-1-13	Separation Between Active Rail Lines and Paths (RWT)	Figure A(1)-15
Figure A(1)-1-14	Perpendicular CG-12, Type A	Figure A(1)-16
Figure A(1)-1-15	Parallel CG-12, Type B	Figure A(1)-17
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Old Table Number	Table Title	New Table Number
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Table A(1)-1-6	Minimum Length of Crest Vertical Curve (L) Based On Stopping Sight Distance	Table A(1)-6
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Table A(1)-1-10	Table number not used in July 2020 RDM	
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Old Table Number	Table Title	New Table Number

Table A(1)-2-1	On-Street Parking Spaces	Table A(1) -9
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APPENDIX B

- Renumbered Section B-1 to Section 1
- Renumbered Section B-2 to Section 2
- Renumbered Section B-3 to Section 3
- Renumbered Section B-4 to Section 4
- Renumbered Section B-5 to Section 5
- Renumbered Section B-6 to Section 6
- Renumbered Section B-7 to Section 7
- Renumbered Section B-8 to Section 8
- Updated references to Figures and Tables

Old Figure Number	Old Figure Name	New Figure Number
Figure 1	Exhibit 2-4 scanned from "A Policy on Geometric Design of Highways and Streets," AASHTO, 2001: RENAMED TO "Minimum Turning Path for SU-30 Design Vehicle"	Figure B-1
Figure 2	Sight Distance Triangles	Figure B-2
Figure 3	Intersection design	Figure B-3
Figure 4	Cul-de-sac details	Figure B-4
Figure 5	Curb and Gutter Details	Figure B-5
Figure 6	Detail back of curbs	Figure B-6
Figure 7	Roll top curb entrance detail	Figure B-7
Figure 8	Rolltop curb entrance detail section	Figure B-8
Figure 9	Private Entrance Detail	Figure B-9
Figure 10	Setback Details with Curb and Gutter	Figure B-10
Figure 11	Setback Details with Shoulder and Ditch	Figure B-11
Figure 12	Traffic Calming Details	Figure B-12
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Figure 15	Curb Extension (Bulb-Outs) Detail	Figure B-15

Old Table Number	Table Title	New Table Number
Table 1	Curb and Gutter Section	Table B-1
Table 2	Shoulder and Ditch Section	Table B-2
Table 3	One-Lane (One-Way) Subdivision Streets	Table B-3
Table 4	School Bus Access Road	Table B-4
Table 5	Maximum Grade Lengths for Shared Use Paths	Table B-5

APPENDIX B(1)

- Renumbered figures and tables
- Updated references to 2018 AASHTO A Policy on Geometric Design of Highways and Streets (Greenbook)
- Added names to 2 Tables that were not named previously: B(1)-5 and B(1)-6

Old Figure Number	Figure Name	New Figure Number
Figure 1	Exhibit 2-4 scanned from "A Policy on Geometric Design of Highways and Streets," AASHTO, 2001: RENAMED TO "Minimum Turning Path for SU-30 Design Vehicle"	Figure B(1)-1
Figure 1.1	24' Curb to Curb No Parking / Parking on One Side	Figure B(1)-2
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Figure 1.3	36' Curb to Curb Parking on Both Sides	Figure B(1)-4
Figure 1.4	29' Curb to Curb Parking on Both Sides	Figure B(1)-5
Figure 1.5	24' Outside Width Parking One Side	Figure B(1)-6
Figure 1.6	29' Outside Width Parking on Both Sides	Figure B(1)-7
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Figure 1.8	29' Stabilized Shoulder and Ditch with Ribbon Curb	Figure B(1)-9
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Figure 3	Intersection Design	Figure B(1)-11
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Figure 9	Private Entrance Detail	Figure B(1)-17
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	Added Figure number to Sight Distance for Two Lane Major Road	Figure B(1)-20
	Added Figure number to Landscape items within Sight Triangle	Figure B(1)-21
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	Added Figure number to Cluster Box Turnout – Curb and Gutter	Figure B(1)-25
	Added Figure number to Cluster Box without Turnout – Curb and Gutter*	Figure B(1)-26
	Added Figure number to Cluster Box Turnout – Shoulder and Ditch	Figure B(1)-27
	Added Figure number to Curb Extension (Bulb Out) Detail	Figure B(1)-28

Old Table Number	Table Title	New Table Number
Table 1	Curb and Gutter Section	Table B(1)-1
Table 2	Shoulder and Ditch Section	Table B(1)-2
Table 3	One Lane (One Way) Subdivision Streets	Table B(1)-3
Table 4	School Bus Access Road	Table B(1)-4
	Added Figure number to Maximum Grade Lengths for Shared Use Paths	Table B(1)-5
	Added Figure number to American National Standards for Nursery Stock	Table B(1)-6

APPENDIX B(2)

- Added new figure numbers to existing figures that weren't numbered

Figure Name	New Figure Number
Flow Chart for Phase 1 Review	Figure B(2)-1
Flow Chart for Phase 2 review	Figure B(2)-2
Conventional Suburban Hierarchical Network	Figure B(2)-3
Traditional Urban Connected Network	Figure B(2)-4
Intersection Sight Distance	Figure B(2)-5
Curb (Bulb-Out) Extension Detail	Figure B(2)-6
Actual and Effective Curb Radii	Figure B(2)-7

Table Name	New Table Number
VDOT Functional Class Translation Matrix	Table B(2)-1
Intersection Spacing for P5 and P6 with Urban Connected Network	Table B(2)-2
Intersection Spacing for P4 Urban Connected Network	Table B(2)-3

APPENDIX C

- Renumbered Sections
- Changed Figure and Table Numbers

Old Figure Number	Figure Name	New Figure Number
Figure C-3-1	Sketch Showing Survey Property Line Tie And Proposed R/W Break Point	Figure C-1
Figure C-4-1	Permit Applications	Figure C-2
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Old Table Number	Table Title	New Table Number
	Added Table number to Permit Applications	Table C-1
Table C-7-1	Inches And Fractions Of An Inch In Decimals Of A Foot	Table C-2
Table C-8-1	Length Of Taper For Accel/ Decel	Table C-3
Table C-8-2	Minimum Length Of Taper Beyond Offset Nose	Table C-4

APPENDIX D

- Renumbered Figure D-4 Earthwork Quantity Computations to Figure D-3

APPENDIX E

- Added a Table of Contents

APPENDIX F

- Separated Tables and Figures from Table of Contents