

# On-Street Bicycle Facility Design Treatments

7/14/2017

Note: Page numbers refer to printed version of design guideline.

	Roadside Design Guide (2011)	A Policy on Geometric Design of Highways and Streets (2011)	Guide for the Development of Bicycle Facilities (2012)	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)	Manual on Uniform Traffic Control Devices (2012)	Designing Walkable Urban Thoroughfares (2010)	Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges (2014)	Traffic Control Devices Handbook (2013)	Urban Bikeway Design Guide (2014)	Urban Street Design Guide (2013)	Draft Guidelines: PROWAG, Shared Use Path Guidelines (as of 2014)
	AASHTO	AASHTO	AASHTO	AASHTO	FHWA	ITE/CNU	ITE	ITE	NACTO	NACTO	US Access Board
<b>A. Bicycle Facility Selection</b>											
A1	Guidance of appropriate use/ typical application of bicycle facilities		Section 2.5.2	N/A		N/A		Pages 571-572	Throughout entire document	N/A	N/A
<b>B. General Roadway Design</b>											
B1	Paved shoulders	Sections 2.7, 4.4	Section 4.5					Pages 598-600			
B2	Bicycle route signs		Section 2.5.3					Pages 578	Page 139		
B3	Shared lane markings		Section 4.4					Pages 588-596	Page 133		
B4	Shared lane signage		Section 4.3					Pages 597-598			
B5	Bicycle boulevards/neighborhood greenways		Section 4.10					Pages 586-587	Pages 149-214		
B6	Bicycle accommodations related to traffic calming		Sections 4.12.6, 4.12.7	N/A		N/A			Pages 167-214	N/A	N/A
B7	Bicycle accommodations on bridges/tunnels	Sections 4.10.3, 4.16.4	Section 4.12.3								
B8	Bicycle treatments at railroad crossings		Section 4.12.1					Pages 595-596, 613			
B9	Bicycle-safe drainage grate design	Section 2.7, 4.7.2	Section 4.12.8					Page 597			
B10	Rumble strips (bicycle guidance)	Section 4.5	Section 4.5.2					Pages 600-601			
B11	Colored bicycle facilities		Section 4.7.2			Interim approval (April 2011)		Pages 583-584, 616	Page 119		
<b>C. Bicycle Lanes</b>											
C1	Bicycle lane signs and pavement markings		Section 4.7					Pages 603-604	Page 3		
C2	Bicycle lane design	Section 10.2.1.7	Section, 2.7, 4.3					Pages 601-606	Page 3		
C3	Bicycle lanes on one-way streets (left or right side)		Section 4.6.3					Page 602	Page 21		
C4	Retrofitting bicycle facilities		Section 4.9								
C5	Buffered bicycle lanes		Section 4.7					Pages 605-606	Page 9	N/A	N/A
C6	Contra-flow bicycle lanes		Section 4.6.3					Pages 612-613	Page 15		
C7	Bicycle lanes adjacent to on-street parking (parallel or diagonal)		Section 4.6.5					Pages 604-605	Page 3		
C8	Advisory bicycle lanes							Experimental status (2014)			
C9	Bicycle lanes adjacent to peak-hour parking										
C10	Bicycle lanes adjacent to transit stops							Figure 9C-6			
<b>D. Separated Bicycle Lanes</b>											
D1	Sidepath/shared-use path	Section 5.2.3	Section 7.3.9	Section 5.2.2				Pages 613-623			
D2	One-way separated bicycle lanes	Sections 5.2.3, 10.2.1.7			N/A			Pages 605-606	Pages 29, 35	N/A	N/A
D3	Two-way separated bicycle lanes	Sections 5.2.3, 10.2.1.7						Pages 605-606	Page 41		
D4	Separated bicycle lane design at transit stops								Page 32		
<b>E. Intersection Design</b>											
E1	Bicycle detection		Section 4.12.5					Pages 624-625	Page 99		
E2	Signal timing for bicycle clearances	Section 7.3.9						Pages 625-628	Page 97		
E3	Bicycle signalheads	Section 4.6						Pages 628-629	Page 93		
E4	Bicycle push buttons							Pages 624	Page 96		
E5	Bicycle lane intersection approaches	Section 9.11.3	Section 4.8					Pages 606-610	Page 73	N/A	N/A
E6	Combined bicycle lane/ turn lane							Section 9C.07	Page 79		
E7	Bicycle boxes							Interim approval (2016)	Page 49		
E8	Bicycle crossing markings							Section 3B.08	Page 55		
E9	Two-stage bicycle turn boxes							Interim approval (2017)	Page 61		
E10	Separated bicycle lane intersection approaches								Page 85		
E11	Bicycle design treatments at roundabouts	Section 9.3.4	Section 4.12.11					Section 9C.04	Pages 611-612		
<b>E12 Bicycle Lanes and Interchanges</b>											
E12.1	Bicycle lane exit ramp							Page 10			
E12.2	Bicycle lanes through on-ramps		Section 4.12.10					Pages 9-16	Pages 610-611	N/A	N/A
E12.3	Bicycle lanes through off-ramps		Section 4.12.10					Page 17-21	Pages 610-611		
E12.4	Bicycle lane at Single Point Interchanges		Section 4.12.10					Page 23-25			

# Shared Use Path Design Treatments

3/2/2015

Note: Page numbers refer to printed version of design guideline.

	Roadside Design Guide (2011)	A Policy on Geometric Design of Highways and Streets (2011)	Guide for the Development of Bicycle Facilities (2012)	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)	Manual on Uniform Traffic Control Devices (2012)	Designing Walkable Urban Thoroughfares (2010)	Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges (2014)	Traffic Control Devices Handbook (2013)	Urban Bikeway Design Guide (2014)	Urban Street Design Guide (2013)	Draft Guidelines: PROWAG, Shared Use Path Guidelines (as of 2014)
	AASHTO	AASHTO	AASHTO	AASHTO	FHWA	ITE/CNU	ITE	ITE	NACTO	NACTO	US Access Board
<b>A. General Shared Use Path Design</b>											
A1			Section 5.2.1	Section 3.2.14				Page 614			R302.3.2
A2			Section 5.2.1	Section 3.2.14							R302.3
A3			Section 5.2.1	Section 3.2.14							
A4	Section 5.2.3	Section 4.10.3	Section 5.2.1								
A5		Section 2.7, 4.15.2	Section 5.2.2					Page 614-616			
A6			Section 5.2.1								
A7			Section 5.2.3								
A8		Section 2.7	Section 5.2.4								
A9		Section 2.7	Section 5.2.5								
A10			Section 5.2.6	Section 3.2.14							R302.6
A11		Section 2.7	Section 5.2.7	Section 3.2.14							R302.5
A12			Section 5.2.9								
A13		Section 4.10.3, 4.16.4	Section 5.2.10	Section 3.5.3							R302.7
A14			Section 5.2.11								
A15		Section 3.6.3	Section 5.2.12	Section 3.5.4							
A16		Section 2.7	Section 5.2.5								
A17		Section 2.7	Section 5.2.8								
A18		Section 5.2.6			Chapter 8D			Page 623			
<b>B. Intersection Design</b>											
B1	Section 5.2.3		Section 5.3.4					Page 614-616			
B2			Section 5.3.5								
B3		Section 4.17.3	Section 5.3.5	Section 3.3.5							R304.5.1.2
B4			Section 5.3.5								
B5			Section 5.3.5								
B6		Section 4.17.3	Section 5.3.5	Section 3.4.1		Pages 156-157			Page 116-117		
B7			Section 5.3.6								
B8			Section 5.3.6	Section 2.6, 3.4.2		Pages 111 - 112, 184-187, 195-197			Page 45-47		
B9			Section 5.3.6				Page 9 -21				
B10				Section 3.4.2			Page 8		Page 54, 114-115		
<b>B.I Midblock Crossings</b>											
B11.1			Section 5.3.2	Section 3.4.1	Figure 9B-7	Pages 150-155					R302.6.2
B11.2			Section 5.3.2		Section 9B.03						
B11.3			Section 5.3.2								
B11.4			Section 5.3.2								
<b>C. Signals, Signs and Markings Related to Shared Use Paths</b>											
<b>C1 Signals</b>											
C1.1			Section 5.4.3	Section 4.1.2				Pages 553-554, 381-382,			
C1.2			Section 5.4.3		Sections 4E.08, 4E.09, 9B.13, 9C.05			Pages 214-215, 402, 553, 624-625			
C1.3			Section 5.4.3		Section 4F		Page 7	Page 556-558, 225-226, 338	Page 111-116		
C1.4					Interim approval (July 2008)		Page 8	Page 560, 226	Page 105-110		
C1.5	Section 4.6			Section 4.1.4, 4.1.6	Section 4E			Page 551-553, 334-338, 412	Page 110-111		
C1.6					Interim approval (Dec 2013)			Page 628-629	Page 93-98		
C1.7					Section 4F.02			Page 628-629			
<b>C2 Signs</b>											
C2.1			Section 5.4.2		Section 9B.01						
C2.2			Section 5.4.2		Section 9B.02			Page 617			
C2.3			Section 5.4.2		Section 9B.01						
C2.4	Section 4.3.3		Section 5.4.2		Section 2C.49			Page 617-621			
<b>C3 Pavement Markings on Shared Use Path</b>											
C3.1			Section 5.4		Section 3B.20, 9C.03			Page 621-623			
C3.2			Section 5.4.1					Page 622			
C3.3			Section 5.4.1		Section 9C.03			Page 621			
C3.4			Section 5.4.1					Page 621-622			
C3.5			Section 5.4.1		Figure 9C-8			Page 623			
C3.6			Section 5.4.1								
C3.7			Section 5.4.1								
C3.8			Section 5.4.1		Section 3B.16		Page 7				

# Pedestrian Facility Design Treatments

3/2/2015

Note: Page numbers refer to printed version of design guideline.

	Roadside Design Guide (2011)	A Policy on Geometric Design of Highways and Streets (2011)	Guide for the Development of Bicycle Facilities (2012)	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)	Manual on Uniform Traffic Control Devices (2012)	Designing Walkable Urban Thoroughfares (2010)	Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges (2014)	Traffic Control Devices Handbook (2013)	Urban Bikeway Design Guide (2014)	Urban Street Design Guide (2013)	Draft Guidelines: PROWAG, Shared Use Path Guidelines (as of 2014)
	AASHTO	AASHTO	AASHTO	AASHTO	FHWA	ITE/CNU	ITE	ITE	NACTO	NACTO	US Access Board
<b>A. General Roadway</b>											
A1	Paved shoulders	Section 4.4		Section 3.2.2							
A2	Pedestrian accommodations on bridges/tunnels	Sections 4.10.3, 4.17.1, 4.17.2		Section 3.2.9						Page 41	
A3	Driveway management and design	Sections 2.6.6, 4.15.2		Section 3.2.6		Pages 125-126		Page 640			R302.3, R302.5, R408
A4	Medians	Section 4.11		Section 3.3.2, 3.4.1	Section 3i	Pages 138-140		Pages 539-540		Page 116	R302.3.1, R305.2.4
A5	On-street parking design	Section 4.20		Section 2.6.2		Pages 145-148					R309
A6	Lighting and illumination	Section 3.6.3		Sections 3.2.11, 3.3.6		Page 168 and throughout				Pages 40-41	
A7	Shared streets			Section 3.2.13						Pages 26-30	
A8	Travel lane width	Section 4.3		Section 2.6		Pages 136-138				Pages 33-36	
A9	Lane narrowing		N/A	Section 2.6				Page 217	N/A	Pages 33-36	
A10	Lane reduction					Pages 149 - 150				Pages 5-15, 33-36	
A11	Chicanes			Section 2.6.2						Pages 49, 142	
A12	Speed humps, tables, and cushions			Section 2.6.2	Sections 2C.29, 3B.25, 3B.26			Pages 202-203		Pages 51-56, 142	
A13	Diverters			Section 2.6.1						Page 142	
A14	Sight distance and sight lines	Section 3.2		Section 3.1.4, 3.3.5						Pages 121-124	
A15	Railroad grade crossings			Section 3.2.12	Sections 8C.01, 8C.02, 8C.03, 8C.10, 8C.11, 8C.13			Pages 545, 208-214, 463, 471-472			R302.7.4, R305.2.5, R208
A16	Curb ramps	Section 4.17.3		Section 3.3.5	Section 3B.18 (Line 18)			Pages 212-214		Page 113	R208, R304, R305, R407
<b>A17 Sidewalks</b>											
A17.1	Surface treatments			Section 3.2.10, 3.3.4							R302.7
A17.2	Buffer zones	Sections 10.2.1.6, 10.2.2	Section 4.17.1	Sections 3.2.4, 3.2.13		Chapter 8				Pages 38-44	
A17.3	Obstacles and protruding objects	Section 10.2.2.2		Section 3.2.12		Pages 122, 126				Pages 38-44	R210, R402, R404
A17.4	Maintenance			Section 4.3		Pages 171-172 (snow removal)		Pages 185-188, 504			
A17.5	Maintenance of facility during construction			Section 4.4	Section 6D.01			Pages 561-562	N/A	Page 41	R205
A17.6	ADA compliant access routes			Section 3.2							R302, R204
A17.7	Grade and cross slope			Section 3.2.7							R302.5, R302.6
A17.8	Sidewalk widths and geometry	Section 4.17.1		Section 3.2.3				Page 504		Pages 38-44	R302.3
A17.9	Stairs			Section 3.2.8							R408, R409
<b>A18 Pedestrians and transit</b>											
A18.1	Siting bus stops	Section 4.19				Pages 163-165, 200				Pages 60-64	R308
A18.2	Bus bulbs and boarding islands					Pages 200-202				Pages 8-13, 45-47, 50, 58-59, 62-63	
A18.3	Pedestrian accommodations at median transit					Page 141 (Table 9.1)			N/A	Pages 22-23, 60	R208, R308, R408
A18.4	Transit stop improvements									Pages 22-23, 62-64	R208, R308, R308.2, R404
A18.5	Transit stop design	Section 4.19		Section 3.2.5						Pages 62-64	
<b>B. Intersections and Crossing Locations</b>											
B1	Raised crossings			Section 3.4.2			Page 7			Pages 98, 115	
B2	Curb extensions (bulb outs)			Sections 2.6.2, 3.3.2		Pages 195-197				Pages 45-50	R304, R305
B3	Corner radii			Section 3.3.1		Pages 184-187				Pages 117-120	
B4	Crossing islands			Sections 3.3.2, 3.4.1		Pages 156-157				Page 116	R208, R302.3.1, R305.2.4
B5	Pedestrian design treatments at roundabouts			Section 3.3.3	Sections 2B.45, 3C.05	Pages 190-192					R306.3
B6	Pedestrian accommodation at complex interchanges/ intersections			Section 3.3.3			Page 9-25		N/A	Pages 100-106	
B7	Traffic circles	Section 9.3.4		Section 2.6.2						Page 99	
B8	Overpasses/underpasses	Section 7.7.2.3	Section 4.17.2	Section 3.5							R302.3, R302.5, R408
B9	Right-turn slip-lane design			Section 3.3.3		Pages 187-189	Page 5				
B10	Skewed Intersections			Section 3.2.12						Pages 100-106	

# Pedestrian Facility Design Treatments

3/2/2015

Note: Page numbers refer to printed version of design guideline.

	Roadside Design Guide (2011)	A Policy on Geometric Design of Highways and Streets (2011)	Guide for the Development of Bicycle Facilities (2012)	Guide for the Planning, Design, and Operation of Pedestrian Facilities (2004)	Manual on Uniform Traffic Control Devices (2012)	Designing Walkable Urban Thoroughfares (2010)	Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges (2014)	Traffic Control Devices Handbook (2013)	Urban Bikeway Design Guide (2014)	Urban Street Design Guide (2013)	Draft Guidelines: PROWAG, Shared Use Path Guidelines (as of 2014)
	AASHTO	AASHTO	AASHTO	AASHTO	FHWA	ITE/CNU	ITE	ITE	NACTO	NACTO	US Access Board
<b>B13 Marked crosswalks and enhancements</b>											
B13.1 Striping				Section 3.3.4	Section 3B.18	Pages 193-195	Page 4	Pages 521-522, 540-543		Pages 110-113	
B13.2 Signing at crosswalks				Section 4.2	Sections 2B.11, 2B.12		Page 4	Pages 522-524			
B13.3 Advance yield/stop lines at uncontrolled locations			N/A	Section 3.3.4	Section 3B.16		Page 7	Pages 543-544	N/A	Page 113	
B13.4 Advance stop lines at traffic signals				Section 3.3.4	Section 3B.16					Page 113	
B13.5 Other crosswalk features								Pages 640-645, 541-543		Pages 109-116	
<b>B14 Signalization</b>											
B14.1 Pedestrian detection				Section 4.1.4	Sections 4E.08, 4E.09			Pages 214-215, 402, 553		Pages 132-133	R209
B14.2 Signal timing for pedestrians				Sections 4.1.2, 4.1.6	Section 4E.06			Pages 553-554, 381-382		Pages 130-131	R306.2
B14.3 Pedestrian signalheads	Section 4.6			Section 4.1.3	Section 4E			Pages 551-553, 334-338, 412			R209
B14.4 Leading pedestrian intervals				Section 4.1.1	Section 4E.06			Page 359		Page 128-129	
B14.5 Exclusive pedestrian phase			N/A	Section 4.1.1	Sections 4E.09 (line 3), 4E.11 (line 19)			Page 359	N/A		
B14.6 Pedestrian Hybrid Beacon (HAWK Signal)					Section 4F		Page 7	Pages 556-558, 225-226, 338			
B14.7 Rectangular Rapid Flash Beacon					Interim approval (July 2008)		Page 8	Pages 560, 226			
B14.8 Warrants				Section 4.1.3	Sections 4E.09-4E.13		Page 7				
B14.9 Accessibility				Section 4.1.4				Pages 546-549			R403, R404, R406, R209
<b>B15 Pedestrian related signs</b>											
B15.1 Sign location and assembly	Section 4.3.3				Section 2A						R402
B15.2 Sign sizing			N/A		Sections 2A.06, 2B.13, 2C.04				N/A		R410, R211
B15.3 Sign types				Section 4.2.1, 4.2.2	Section 2A.05						
B15.4 Wayfinding				Section 4.2.3, 4.2.4							R410, R211
<b>B16 School Areas</b>											
B16.1 Pavement markings				Section 3.3.4, 4.2.2	Section 7C						
B16.2 Crosswalks					Sections 7B.11, 7B.12, 7C			Pages 520-522			
B16.3 School-related signs			N/A	Section 4.2.2	Section 7B			Pages 224-226, 512-525	N/A		
B16.4 Signals					Section 4C.06			Pages 525-526			
B16.5 Speed limits				Section 2.5.4	Sections 7B.15, 7B.16			Pages 508-512			
B16.6 Crossing Guards				Section 2.5.4							
<b>B17 Midblock Crossings</b>											
B17.1 Crossing distance considerations				Section 3.4.1						Pages 114-115	
B17.2 Signs and pavement markings			N/A	Section 3.4.1	Sections 3B.16, 3B.18, 2B.11, 2B.12	Pages 150-155			N/A	Pages 114-116	
B17.3 Traffic calming				Section 3.4.2						Pages 114-117	
B17.4 Signals				Section 3.4.3						Pages 114-118	