Urban Streets Roadway Criteria for Posted Speed Limits of 40 mph or Less

Functional Class	Design Year ADT Thresholds at Levels of Service C, D & E [1]				Design Basis	Roadway Criteria						
						Travel Lanes			Roadway (Face of Curb to Face of Curb) Width (feet)[4]			
									No Parking[6,7]		Parking [6,7]	
	Scenario	C[2] LOS 4.0 ADT (DHV)	D LOS 5.0 ADT (DHV)	Middle E LOS 5.5 ADT (DHV)	Urban Design Class [Design Speed] (mph)[3]	No.	Lane Width (feet)[5]	Median Widths (feet)	Range of Normal Widths[8]	Range of Widths that are sufficient for bike lane	Range of Normal Widths[8]	Range of Widths that are sufficient for bike lane
Locals	N/A	Low Volume Residential (0-250 ADT)			1a **[20-25]**	1	**12**	No	**N/A**	**N/A**	**28**	**N/A**
		Volume not a consideration			1b **[25-30**(20)]	2	**10-12** (9)	No	**28-32** (22)	**32-36** (30)	**36-40** (30)	**46-56** (44)
Arterials and Collectors	N/A	≤ 4,500 ADT (660 DHV)			2a **[30-45]**	2	**11-12** (10)	No	**32-36** (24)	**34-36** (32)	**46-48** (34)	**48-56** (46)
	Worst Best	6,500 (1086) 20,000 (2260)	7,500 (1170) 22,500 (2475)	8,000 (1216) 25,000 (2700)	2b **[30-45]**	2	**11-12** (10)	No	**32-36** (24)	**34-36** (32)	**46-48** (34)	**48-56** (46)
	Worst Best	16,000-(1888) 41,000 (4100)	17,500 (2048) 47,000 (4610)	18,000 (2088) 50,500 (4900)	3 **[30-45]**	4	**11-12** (10)	No	**54-60** (44)	**56-60** (52)	**68-72** (54)	**70-80** (66)
	Worst Best	22,000 (2440) 41,500 (4110)	22,750 (2500) 47,000 (4610)	23,000 (2530) 51,000 (4950)	4 **[30-45]**	4	**11-12** (10)	**14-30** (6)	**2 @ 29-32** (2 @ 24)	**2 @ 30-32** (2 @ 28)	**2 @ 36-38** (2 @ 29)	**2 @ 37-42** (2 @ 35)
Arterials	Worst Best	35,500 (3660) 68,000 (6390)	37,500 (3790) 76,000 (7070)	38,500 (3850) 81,500 (7580)	5 **[30-45]**	6	**11-12** (10)	**14-30** (6)	**2 @ 40-44** (2 @34)	**2 @ 41-44** (2 @ 38)	**2 @ 47-50** (2 @ 39)	**2 @ 48-54** (2 @ 45)

Desirable values are shown in bold and minimum values are shown in parentheses.

1 ADT thresholds represent typical "Worst" Case and "Best" Case scenarios for Levels of Service (LOS) C, D and middle E. These volumes are based on the 2000 Highway Capacity Manual using the assumptions shown in Attachment 1.4. See Section 5, "Travel Lanes" section for guidance on use of "worst" and "best" case thresholds. See FDM 11-5-3 for further guidance on acceptable LOS for corridors 2020 Routes, Non-corridors 2020 rural roadways, roadways in small urban areas (Pop.< 50,000), and roadways in Urbanized areas (Pop. > 50,000).

2 LOS C is not obtainable if the traffic signal density is greater than 5 signals per mile.

3 Desirable Design Speed is 5 mph greater than the posted speed. A minimum design speed equal to the posted speed limit is acceptable.

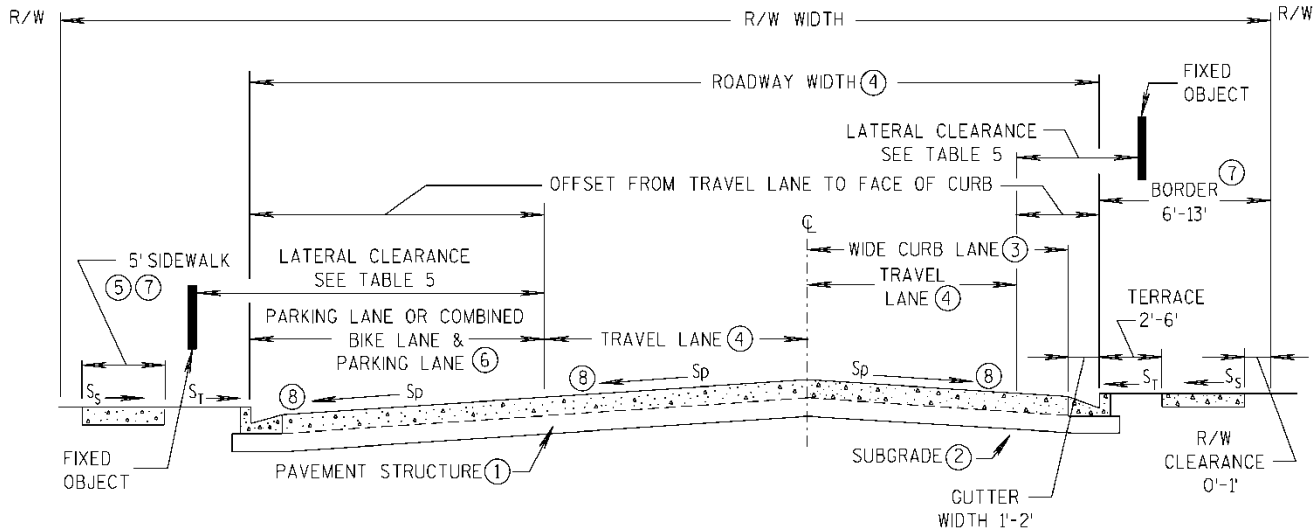
4 Based on 2-ft gutter widths. Gutter widths of 1-ft may be used when appropriate. If a 1-ft gutter is used then face-to-face widths might differ from values shown in the table.

5 Gutter width is not included.
Lane widths for Federally Designated Truck routes are 12-ft desirable and 11-ft minimum, but there shall be at least one 12-ft lane in each direction. A wide curb lane, as discussed in Section 5, "Travel Lanes", meets the 12-ft truck lane requirement.
Lane widths for NHS Routes and Arterials and Collectors that are not Federally Designated truck routes are 12-ft desirable and 11-ft minimum if truck and bus volumes are greater than or equal to 5%.

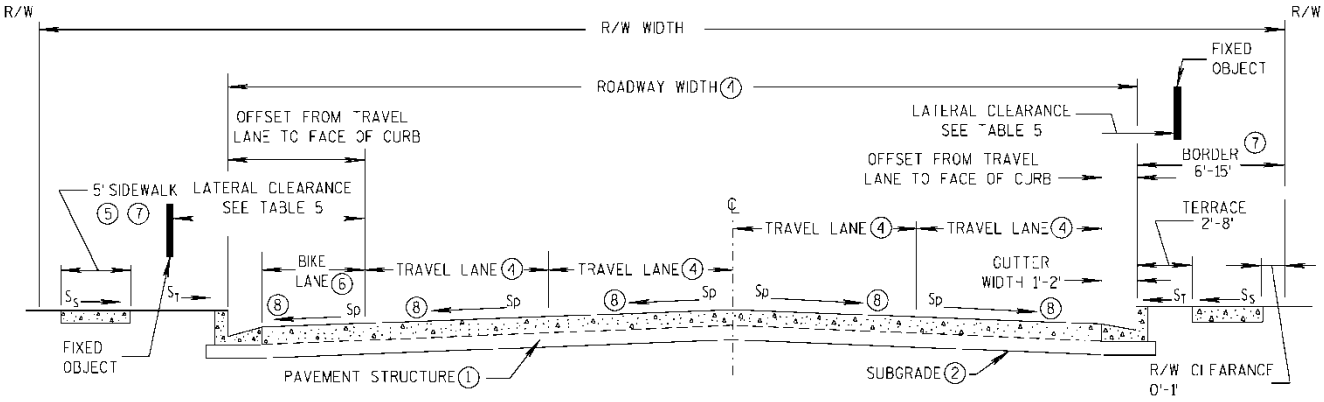
6 Two lane Connecting Highways and STHs have a desirable curb to curb width of 36 feet if no provision for parking is to be made. Designs that use parking lanes are discouraged.

7 Provide bicycle accommodations on all arterial and collector streets whenever possible. When bicycle accommodations cannot be provided, explain in the DSR why they are not possible or feasible to provide. See FDM 11-45-10 and the Wisconsin Bicycle Facility Design Handbook for further guidance on bicycle accommodations.

8 The desirable range of values include an additional roadway width between the outside edge of the outside travel lane and the face of curb to provide a wide curb lane as discussed in Section 5, "Travel Lanes", or to provide for the various urban needs as listed in Section 6, "Auxiliary And Parking Lanes".



Urban Design Classes 1b, 2a & 2b



Urban Design Class 3

Notes

① Pavement structure, materials and dimensions vary according to individual project subgrade and traffic conditions.

② Subgrade cross slope is parallel to pavement cross slope (S_P).

③ Section 5 discusses “Wide Curb Lanes”.

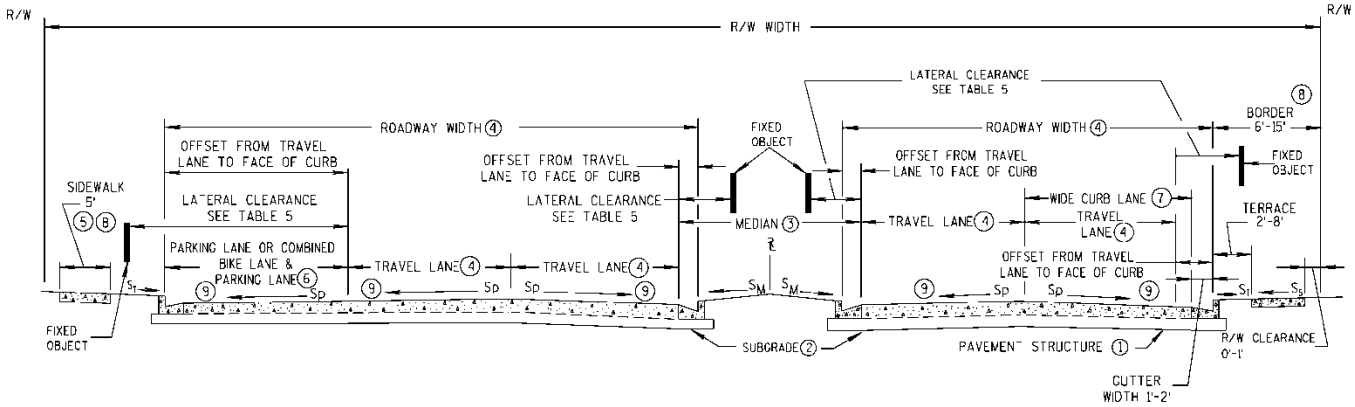
④ Attachment 1.1 shows travel lane widths and roadway widths.

⑤ The 5-foot sidewalk width shown is for residential areas where the sidewalk is adjacent to a terrace. Sidewalk is 6 ft. wide if it is adjacent to the back of curb. Sidewalk widths are 6-12 feet in central business district or in high pedestrian retail areas or where stores are directly abutting sidewalks.

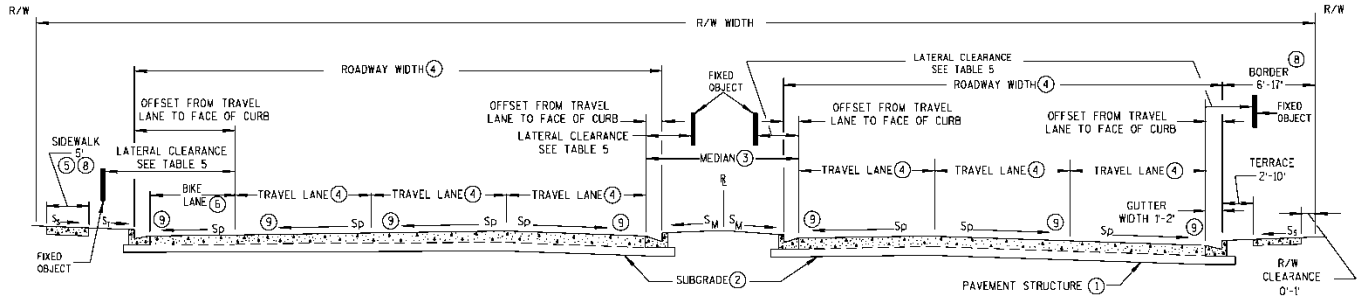
⑥ Table 4 shows parking lane widths; FDM 11-45-10 has guidance on bike lanes and on combined bike lane & parking lane; Attachment 1.1 shows roadway width design values.

⑦ Section 7 discusses borders including widths and slopes for sidewalks and terraces.
S_T = Terrace cross slope = 4% desirable minimum.
S_S = Sidewalk cross slope = 2%.

⑧ Table 1 shows pavement cross slopes.
S_P = Pavement cross slope = 2% minimum.



Urban Design Class 4



Urban Design Class 5

Notes

① Pavement structure, materials and dimensions vary according to individual project subgrade and traffic conditions.

② Subgrade cross slope is parallel to pavement cross slope (S_P).

③ Section 4, "Medians, discusses medians for urban streets. Attachment 1 shows the range of median widths to use.
S_M = Median cross slope = 2% (paved) / 4% (grass)

④ Attachment 1.1 shows travel lane widths and roadway widths.

⑤ The 5-foot sidewalk width shown is for residential areas where the sidewalk is adjacent to a terrace. Sidewalk is 6 ft. wide if it is adjacent to the back of curb. Sidewalk widths are 6-12 feet in central business district or in high pedestrian retail areas or where stores are directly abutting sidewalks.

⑥ Table 4 shows parking lane widths; FDM 11-45-10 has guidance on bike lanes and on combined bike lane & parking lane; Attachment 1.1 shows roadway width design values.

⑦ Section 5, "Travel Lanes" discusses "Wide Curb Lanes".

⑧ Section 7 discusses borders including widths and slopes for sidewalks and terraces.
S_T = Terrace cross slope = 4% desirable minimum.
S_S = Sidewalk cross slope = 2%.

⑨ Table 1 shows pavement cross slopes.
S_P = Pavement cross slope = 2% minimum.

Urban Class	Traffic Factors	Lane Width (feet)	% Trucks	Parking/Bus Stops	% Grade	Adjusted Saturation Flow Rate (pcphgpl)	% Turns From Exclusive Lanes	Number Of Through Lanes One Direction	Free Flow Speed (FFS)	HCM Urban Class	Median	Left-turn Bays	Number Of Signalized Intersections (Actuated)	Arrival Type	Cycle Length (C)	Effective Green Ratio (g/c)
2b																
Worst Case	K30	10	6	Yes	4	1700	10	1	35 30 30	3 4 4	No	No	1 4 7	3 4 4	80	0.45
	59/41 Directional Distribution	12+	2	No	0	1900	10	1	35 30 30	3 4 4	No	Yes	1 4 7	4 5 5	110	0.55
Best Case	1.00 PHF															
3																
Worst Case	K30	10	6	Yes	4	1700	10	2	40 35 30	2 3 4	No	No	1 4 7	3 4 4	90	0.40
	59/41 Directional Distribution	12	2	No	0	1900	10	2	40 35 30	2 3 4	No	Yes	1 4 7	4 5 5	110	0.50
Best Case	1.00 PHF															
4																
Worst Case	K30	10	6	Yes	4	1700	10	2	40 35 30	2 3 4	Yes	No	1 4 7	3 4 4	90	0.45
	59/41 Directional Distribution	12	2	No	0	1900	10	2	40 35 30	2 3 4	Yes	Yes	1 4 7	4 5 5	110	0.50
Best Case	1.00 PHF															
5																
Worst Case	K30	10	7.5	Yes	4	1700	10	3	40 35 30	2 3 4	Yes	No	1 4 7	3 4 4	90	0.45
	59/41 Directional Distribution	12	4	No	0	1900	10	3	40 35 30	2 3 4	Yes	Yes	1 4 7	4 5 5	110	0.50
Best Case	1.00 PHF															

Design Class[1]	Design ADT	No. Lanes	Lane Widths By Posted		Min. Median Width[3]	Shoulder (Curb Offset) Width Based On Posted Speed[4]					Recommended Clear Zone or Lateral Clearance Based On Posted Speed Limit			
			45-50 mph	55 mph		45 mph (By Level Of Development)			50-55 mph	Bike Lanes[5]	45 mph (By Level Of Development)			50-55 mph
						Undeveloped	Developing[5]	Developed[5]			Undeveloped	Developing	Developed	
Collectors & Locals											Provide Rural Clear Zone. See FDM 11-15 Attachment 1.9 Consult with Local Unit of Government or Maintaining Authority as to need for future sidewalk and terraces.	Provide Rural Clear Zone until development occurs. See FDM 11-15 Attachment 1.9. & FDM 11-20-1 Coordinate sidewalk and terrace widths with local unit of government and/or maintaining authority.	Provide lateral clearance per FDM 11-20 Table 1.5. If sidewalk is not present, discuss construction of sidewalk and terrace with the local unit of government and/or maintaining authority.	Use rural clear zone. See FDM 11-15 Attachment 1.9.
UCL1	0-400	2	11-12 (10)	11-12 (10)		2 (1.8)	2 (1.8)	2 (1)	2	5				
UCL2	400-1500	2	11-12	11-12		6 (5)	6 (1.8)	4-6 (1-1.8)	6	5-6				
UCL3	1500-2000	2	11-12	12		6	6 (1.8)	4-6 (1-1.8)	6	5-6				
UCL4	2000-3500	2	12	12		6	6 (1.8)	4-6 (1-1.8)	6	5-6				
UCL5	3500-20,000	2	12	12		8	8 (1.8)	4-8 (1-1.8)	8	5-8				
	20,000-42,000	4	12	12	30	6L (4) 10R	6L (1.8) 10R (1.8)	1.8-6L 4-10R	6L 10R	10				
Arterials														
UA1	Under 3500	2	12	12		6	6 (1.8)	4-6 (1-1.8)	6	5-6				
UA2	3500-17,000[A] 3500-19,000[B]	2	12	12		10 (8)	10 (1.8)	4-10 (1-1.8)	10 (8)	10				
UA3	17,000-39,000[A] 19,000-42,000[B]	4	12	12	30	6L (4) 10R	6L (1.8) 10R (1.8)	1.8-6L (1) 4-10R (1-1.8)	6L (4) 10R	10				
		6	12	12	30	10 L&R	10L & R (1.8)	1.8-10L, 4-10R (1-1.8)	10 L&R	10	Lateral Clearance is required for all roadways			

Desirable values are shown in bold and minimum values are shown in parentheses.

[A] For Corridors 2020 backbone and connector routes

[B] For other principal and minor arterials

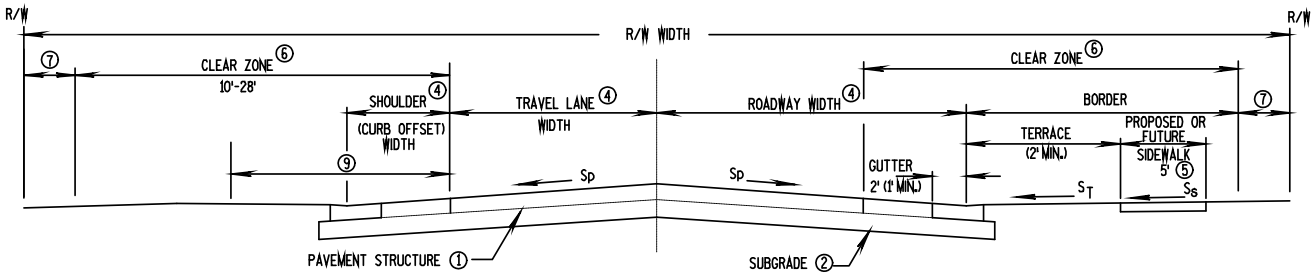
[1] The top of the traffic volume range for design class UA2 is 17,000 ADT and for design class UA3 is 39,000 ADT for Corridors 2020 routes (LOS threshold of 4.0) and 19,000 ADT and 42,000 ADT for a non-corridors 2020 routes (LOS trigger of 5.0). These volumes are based on the 2000 Highway Capacity Manual assuming; level terrain, 12-foot lanes, ≥ 6-foot shoulders, 10% trucks, K30 design factor, and 59/41 directional split,1 signal/mile, g/c=.55. See FDM 11-5-3 for additional information on thresholds and level of service for different facility types and the respective numerical value.

[2] Desirable Design Speed is 5 mph greater than the posted speed. A minimum design speed equal to the posted speed limit is acceptable.

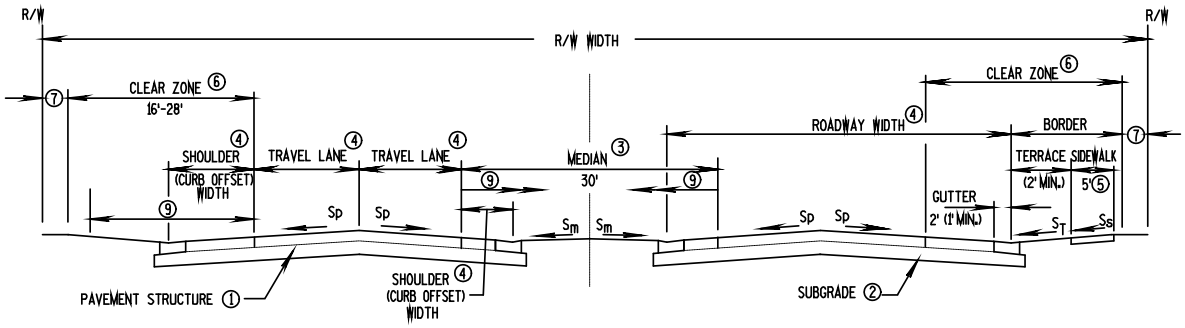
[3] Provides room for clear zone in one direction for up to a 60 mph design speed and for future cable-guard median barrier. Provides maximum width for single movement truck turning maneuvers.

[4] Curb should be eliminated if possible. Use sloped curb when posted speed limits are 45 mph or greater. See FDM 11-20-1.

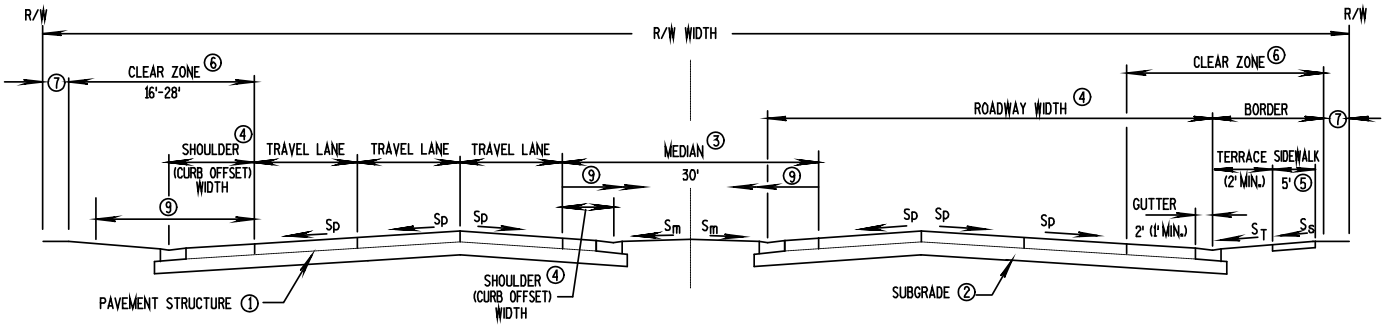
[5] Bike provisions should be provided on all arterial and collector streets whenever possible. Justification in the DSR for the use of minimum standards should include documentation on why bike provisions are not possible or feasible to provide. See FDM 11-45-10 for further guidance.



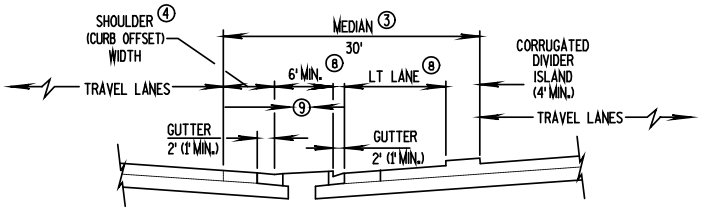
2-LANE TRANSITIONAL/HIGH SPEED URBAN CROSS SECTION



4-LANE TRANSITIONAL/HIGH SPEED URBAN CROSS SECTION



6-LANE TRANSITIONAL/HIGH SPEED URBAN CROSS SECTION



LT LANE TYPICAL CROSS SECTION

TYPICAL TRANSITIONAL/HIGH SPEED URBAN STREET CROSS SECTIONS

① *Pavement structure, materials and dimensions vary according to individual project subgrade and traffic conditions.*

② *Subgrade slope is parallel to pavement.*

③ *See discussion on "medians" for values.*

⑤ *Values given in FDM 11-20 Attachment 1.5*

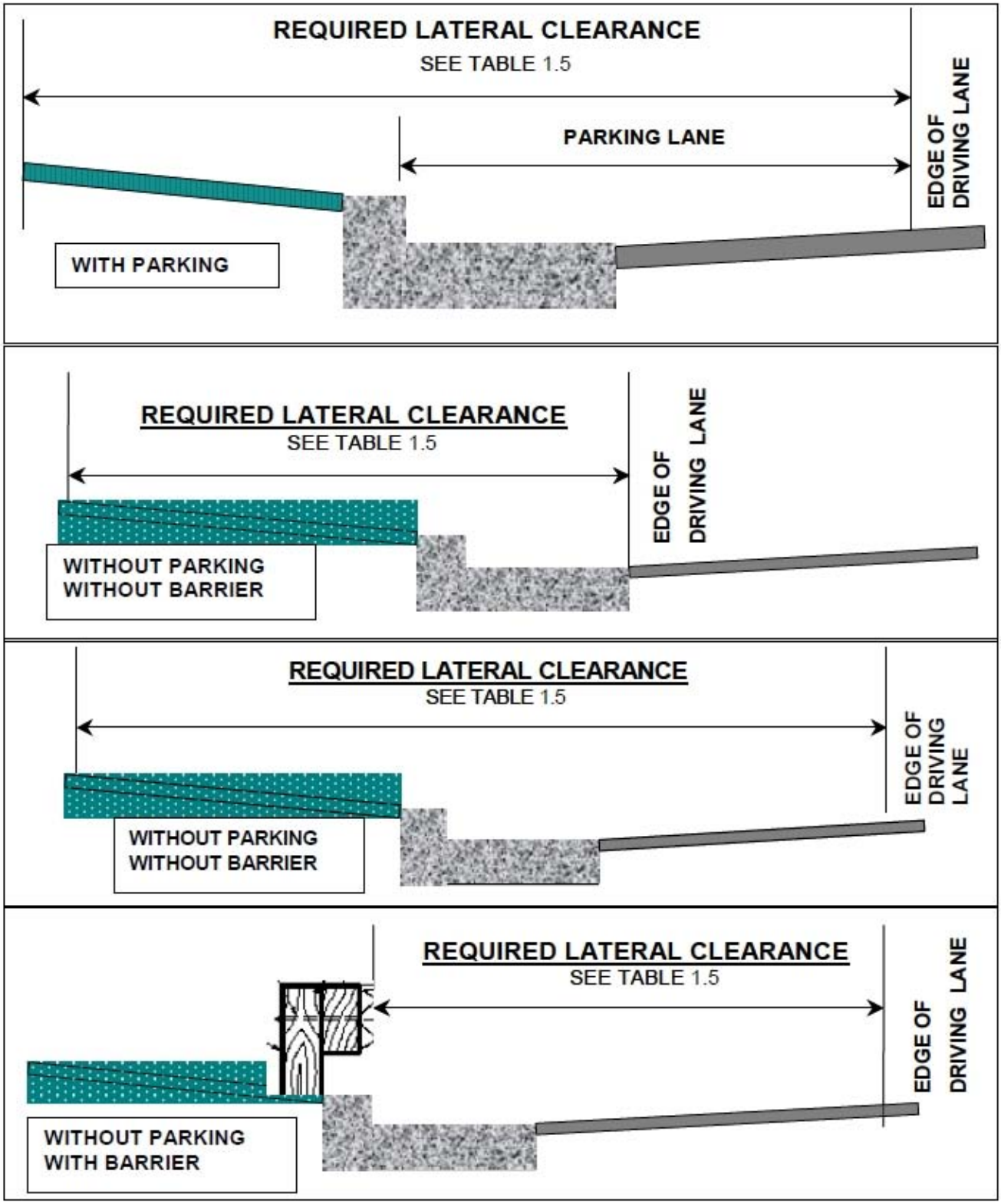
④ *Residential values, width are 6'-12' for multi-use paths or in high pedestrian areas.*

⑥ *See discussion on clear zone and lateral clearance in FDM 11-20 Attachment 1.5 in FDM*

⑦ *Additional width as needed for utilities*

⑧ *Values given in FDM 11-25-5.*

⑨ *Lateral clearance. See FDM 11-20 Table 1.5*



Urban Lateral Clearance