Roadway				
PIN Number			**Submittal Date**	
Project Number				**Approval Date**
District	(Select District)	**Assistant District Engineer**		
County	(Select a County)	**or**		
Route		**Office Director**		
Location				
Work Type				
Segment Manager				
Designer				

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Urban Multilane Roadways (Urban Arterials)

Design Element		Preferred	Acceptable Criteria	Project Values
Design speed (mph)		The anticipated posted speed limit	30	
Maximum superelevation rate (Refer to Section 2A-2)		4%	8%	
Design lane width (ft)		12	11	
Full depth paved width (ft)	Outside lane	Design lane width + curb and gutter unit or 14 feet for roadways with shoulders, 12' if using full depth shoulders	Match design lane width	
	Inside lane(s)	Design lane width + curb and gutter unit. 12' for roadways without a curb and gutter unit	Match design lane width	
Right turn lane or an auxiliary lane (ft)		12	10	
Left turn lane (ft)	With raised or painted median	12 ft + median	10 ft + median	
	With depressed median	12	10	
Two-way left turn lane (ft)		14	11	
Parking lane width (ft)		10	7	
Pavement cross-slope (on tangent sections)	Through lanes	2%, However, when adjacent lanes slope in the same direction, increase slope by 0.5% per lane up to 3%	1.5% minimum, 3% maximum	
	Auxiliary and turn lanes	3%	3% maximum	
	Crown break at centerline	4%	4% maximum	
Shoulder cross-slope (on tangent sections)	Shoulders	4%	Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders	
	Curb and gutter units	Match pavement cross-slope	6% maximum	
	Parking lanes	1% greater than pavement cross-slope	6% maximum	
Curb type (Refer to Section 3C-2)	Design speed ≤ 45 mph	6-inch standard	any shape	
Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)	Adjacent to shoulder	10:1 for 4' then 6:1	3:1	
	Beyond standard ditch depth and design clear zone	3.5:1	3:1	
	Curbed roadways	2%	not steeper than 3:1	
Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.)		3:1	2.5:1	
Transverse Slopes	w/ drainage structures	8:1	6:1	
	w/o drainage structures	10:1	6:1	
Ditches (Refer to Section 3G-1)	Outside ditch (depth x width) (ft)	5 x 10	--	
Median width (ft) (Refer to Section 3E-1)		See Section 3E-1	0	
Bridge width—new*	Bridge length ≤ 200 ft	design lane widths + effective shoulder widths or curb-to-curb width	design lane widths + effective shoulder widths or curb-to-curb width	
	Bridge length > 200 ft	design lane widths + effective shoulder widths or curb-to-curb width	Curb-to-curb width or design lane widths + 4 ft offset each side for roadways with shoulders	
Bridge width—existing*		design lane widths + no less than 2 ft left and right	design lane widths + 2 ft left and right of the design widths	
Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)	Over primary	16.5	16	
	Over non-primary	16.5 at interchange locations, 15 at all other locations	14	
	Over railroad	23.3	23.3	
	Sign truss and pedestrian crossings	17.5	17	
Structural Capacity		Contact Office of Bridges and Structures	Contact Office of Bridges and Structures	
Level of Service		C	D	

*FHWA notification via email is required if acceptable criteria is not met on the NHS system (No formal design exception required)

Roadway Design Speed (mph) =	

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Design Criteria for Low Speed Roadways

Design Element			Preferred Criteria					Acceptable Criteria					Project Values
			Design Speed, mph					Design Speed, mph					
			25	30	35	40	45	25	30	35	40	45	
Stopping sight distance (ft) (Refer to Section 6D-1)			155	200	250	305	360	155	200	250	305	360	
Minimum horizontal curve radius (ft) and superelevation rate (Refer to Sections 2A-2 and 2A-3)	Method 2 superelevation and side friction distribution	e = 4% max	See Table 10 in Section 2A-3					--					
	Method 5 superelevation and side friction distribution	e_{max} = 6%	144	231	340	485	643	144	231	340	485	643	
		e_{max} = 8%	--	--	--	--	--	134	214	314	444	587	
Minimum vertical curve length (ft) (Refer to Section 2B-1)			75	90	105	120	135	75	90	105	120	135	
Minimum rate of vertical curvature (K) (Refer to Section 2B-1)	crest vertical curves		12	19	29	44	61	12	19	29	44	61	
	sag vertical curves	roadways without fixed-source lighting	26	37	49	64	79	26	37	49	64	79	
		roadways with fixed-source lighting	26	37	49	64	79	14	20	27	35	44	
Minimum gradient (%)	(Refer to Section 2B-1)		0.5					0.3% with a curb, 0.0% without a curb					
Maximum gradient (%)	(Refer to Section 2B-1)	Urban roadways	5					--	9	8	8	7	
		Rural roadways						--	--	--	6	6	
Clear zone			See "Preferred Clear Zone" table in Section 8A-2					See "Acceptable Clear Zone" table in Section 8A-2					

Design year ADT =	

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Effective Shoulder Width and Type for Multilane Arterials

Preferred (Values shown in feet)					Acceptable (Values shown in feet)					Project Values
	Rural Roadways		Urban Roadways			Rural Roadways		Urban Roadways		
Auxiliary lanes or turn lanes with shoulders	6		6		Auxiliary lanes or turn lanes with shoulders	6		0		
Turn lanes with curbs	6		See Section 3C-2		Turn lanes with curbs	6		0		
Expressways	Outside		Median Side		Expressways	Outside		Median Side		
	Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width		Effective Shoulder Width	Paved Width	Effective Shoulder Width	Paved Width	
Routes where bicycles are to be accommodated	10	10	6	6	Routes where bicycles are to be accommodated	8	4	4	4	
On roadways approaching urban areas (due to increased bike traffic)	10	10	6	6						
On all curves with a superelevation rate of 7.0% or greater	10	10	6	6	On all other Expressways (Multilane Arterials)	8	2*	4	4	
On roadways with design year ADT > 6500 vpd	10	6	6	6						
On all other Expressways (Multilane Arterials)	10	4	6	4						

*Requires safety edge-See Section 3C-6
Curbs should be located beyond the outer edge of the effective shoulder width in rural areas
Refer to Section 3C-2 for curb offsets in urban areas

Notes: