

**Table 7.1  
Roadway Design Criteria**

Design Criteria	C-470										Remarks
	Mainline		Express Lanes		Normal Ramps		Flyover/ Directional Ramps		Loop Ramps		
	Criteria	Reference	Criteria	Reference	Criteria	Reference	Criteria	Reference	Criteria	Reference	
Posted Speed (mph)	65		65								
Design Speed (mph)	70	CDOT pg 8-1	70	CDOT pg 8-1	50	PGDH pg 829-830	60/(50)* 50/(40)**	PGDH pg 829-830	30/(25)	PGDH pg 829-830	* XX desirable/ (XX) minimum - System to System desirable/ (XX) minimum - System to Service ** XX
Lane Widths (ft)	12	CDOT pg 8-2	12	CDOT pg 8-2	15 or 12*	CDOT pg 3-31	15 or 12*	CDOT pg 3-31	16	CDOT pg 3-31	* 15' lane width for single lane ramps, 12' for dual lane ramps
Shoulder Widths (ft)											
Inside Shoulder Options (Left Ramp Shoulder)	8*		8*		4	CDOT pg 10-36	4	CDOT pg 10-36	4	CDOT pg 10-36	* Recommended shoulder width, 4' minimum in areas of constraint
	12**	PGDH pg 509	14***	NCHRP 414	6****	PGDH pg 319	6****	PGDH pg 319	6****	PGDH pg 319	** For use where truck DHV > 250 & number of express lanes exceeds 2 in one direction
	14****	NCHRP 414									*** Enforcement - Confirm location of enforcement shoulder with CSP **** For use next to barrier
Outside Shoulder Options (Right Ramp Shoulder)	12	PGDH pg 818	12	PGDH pg 818	6	CDOT pg 10-36	6	CDOT pg 10-36	6	CDOT pg 10-36	* For use adjacent to auxiliary lanes
	8*	PGDH pg 818	14**	NCHRP 414	8	CDOT pg 10-36	8	CDOT pg 10-36	8	CDOT pg 10-36	** Enforcement - Confirm location of enforcement shoulder with CSP
											Note: 6' right ramp shoulders are for single lane ramps, 8' for dual lane ramps or for shoulder adjacent to barrier
HOV Buffer	4										
Minimum Clear Zone (ft)	30	RDG pg 3-4	30	RDG pg 3-4	18	RDG pg 3-4	18	RDG pg 3-6	18	RDG pg 3-4	
Shy Line Offset (ft)	10	RDG pg 5-28	10	RDG pg 5-28	7	RDG pg 5-28	6	RDG pg 5-28	4	RDG pg 5-28	Note: For roadside structures such as signs
Normal Cross Slope (%)	2	CDOT pg 4-2	2	CDOT pg 4-2	2	CDOT pg 10-31	2	CDOT pg 10-31	2	CDOT pg 10-31	
"Z" Slope - 12 ft	6:1	CDOT pg 8-7	6:1	CDOT pg 8-7	6:1	CDOT pg 8-14	6:1	CDOT pg 8-14	6:1	CDOT pg 8-14	
Maximum Super Elevation (%)	0.06	CDOT pg 3-25	0.06	CDOT pg 3-25	0.06*		0.06*		0.06*		*CDOT Preference on ramps.
Minimum Horizontal Radius (ft)	2050	PGDH pg 145	2050	PGDH pg 145	835	PGDH pg 145	510-1340	PGDH pg 145	185-275	PGDH pg 145	Note: Based on maximum super elevation and design speed
Minimum Profile Grade (%)	0.5	CDOT pg 3-39	0.5	CDOT pg 3-39	0.5	CDOT pg 3-39	0.5	CDOT pg 3-39	0.5	CDOT pg 3-39	
Maximum Profile Grade (%)	4	CDOT pg 8-2	4	CDOT pg 8-2	5	CDOT pg 8-2	5	CDOT pg 8-2	5	CDOT pg 8-2	Note: Based on rolling terrain
Maximum Profile Grade at Intersections (%)					250' @ 2%	Douglas County	250' @ 2%	Douglas County	250' @ 2%	Douglas County	
Stopping Sight Distance (ft)	730	PGDH pg 112	730	PGDH pg 112	425	PGDH pg 112	305-570	PGDH pg 112	155-200	PGDH pg 112	Note: Allow horizontal sight distance across barriers. Use 3d graphical solutions for areas with vertical curvature. Glare screen not allowed.
Decision Sight Distance (ft)	1275	PGDH pg 116	1275	PGDH pg 116	1025	CDOT pg 3-15	825-1275	CDOT pg 3-15	625	CDOT pg 3-15	Note: Applies to express lane entrances and critical gores
Rate of Vertical Curve (K)											
Crest	247	PGDH pg 274	247	PGDH pg 274	84	PGDH pg 274	44-151	PGDH pg 274	12-19	PGDH pg 274	
Sag	181	PGDH pg 280	181	PGDH pg 280	96	PGDH pg 280	64-136	PGDH pg 280	26-37	PGDH pg 280	
Minimum Vertical Clearance (ft)	16.5	CDOT pg 3-38	16.5	CDOT pg 3-38	16.5	CDOT pg 3-38	16.5	CDOT pg 3-38	16.5	CDOT pg 3-38	
Light Rail Vertical Clearance (ft)	19-23.5		19-23.5		19-23.5		19-23.5		19-23.5		
Heavy Rail Vertical Clearance (ft)	25		25		25		25		25		
Pedestrian Bridge and Sign Bridge Clearance (ft)	17.5		17.5		17.5		17.5		17.5		
Accel Length (ft)	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	
Decel Length (ft)	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	Varies	PGDH pg 851-855	
Transition Taper Rate	70:1	PGDH pg 822	70:1	PGDH pg 822	25:1	Access pg 55	25:1	Access pg 55			Note: For lane additions and lane drops
Redirect Taper Rate	70:1	Access pg 57	70:1	Access pg 57	50:1	Access pg 57	50:1	Access pg 57			
Terminals											
Entrance	Taper	CDOT pg 10-46									
Exit	Taper	CDOT pg 10-46									
Left Exit	Parallel	CDOT pg 10-46									
Dual Lane	Fig 10-19	CDOT pg 10-51									
Design Vehicle	WB-67		WB-67		WB-67		WB-67		WB-67		

CDOT = Colorado Department of Transportation Design Guide (1995)  
PGDH = A Policy on Geometric Design of Highways and Streets (PGDH 2001 Second Printing)

RDG = Roadside Design Guide (PGDH 2002)  
Access = Colorado State Highway Access Code (March 2002)