

Texas Department of Transportation
Book 2 – Technical Provisions

IH 35E Managed Lanes Project

Attachment 11-1
Roadway Design Criteria

	MAINLANES	Managed Lanes	FRONTAGE ROADS	RAMPS (Tollway)	RAMPS (Freeway)	DIRECT CONNECTORS	CROSSING STREETS
General							
Roadway Classification	Urban Freeway or Tollway	Urban Freeway or Tollway	Low Speed Urban Street	Tollway	Freeway	Urban Freeway or Tollway	Low Speed Urban Street
Design Speed	70 mph / 65 mph ⁶ / 50 mph ⁵	70 mph / 65 mph ⁶ / 50 mph ⁵	40 mph / 35 mph ⁶ / 15 mph ⁶	70 mph	40 mph / 35 mph ⁶ / 25 mph ⁶	50 / <u>40⁹</u> mph	40mph/ 35 mph ⁶ / 30 mph ⁶
Stopping sight distance	730' / 645' / 425'	730' / 645' / 425'	305' / 250' / 80'	730'	305' / 250' / 155'	425' / <u>305'</u>	305' / 250' / 200'
Maximum super-elevation rate	6%	6%	4%	6%	6%	6%	N/A
Min. Radius of Curvature	2050' / 1660' / 835'	2050' / 1660' / 835'	490' / 345' / 40'	2050'	510' / 380' / 185'	835' / <u>510'</u>	675' / 465' / 300'
Vertical Alignment							
Minimum Grade	0.3%	0.3%	0.5 %	0.5 %	0.5 %	0.5 %	0.5 %
Maximum grade	3.0 % / 3.0 % / 6%	3.0 % / 3.0 % / 6%	7.0 %	3.0 %	7.0 %	6 %	7.0 %
Crest (Min. K-Value)	247 / 193 / 84	247 / 193 / 84	44 / 29 / 3	247	44 / 29 / 12	84 / <u>44</u>	44 / 29 / 19
Sag (Min. K-Value)	181 / 157 / 96	181 / 157 / 96	64 / 49 / 10	181	64 / 49 / 26	96 / <u>64</u>	64 / 49 / 37

Table 1: Geometric Design Criteria

	MAINLANES	Managed Lanes	FRONTAGE ROADS	RAMPS (Tollway)	RAMPS (Freeway)	DIRECT CONNECTORS	CROSSING STREETS
Cross Section							
Lane width	11'	12'	2--11' inside lanes 14' outside lane (includes 3' shared use lane)	14'	14'	14'	12'
Shoulder Width (min.)							
Inside Shoulder	2'	14' ^{7.8} and 2' (see Draft Interim Schematic)	NA (curbed) none	4' ⁴	4' ⁴	4' ⁴	Curb / none
Outside Shoulder	10'	14' ^{7.8} and 2' (see Draft Interim Schematic)	NA (curbed) 5'	8' ⁴	8' ⁴	8' ⁴	Curb / none
Curb offset	N/A	N/A	2' outside 1' inside N/A	N/A	N/A	N/A	N/A
Cross-slope (typical)	2.5 %	2.5 %					
Managed Lanes	2.5 %	2.5 %					
General Purpose Ln							
- Inside 2 lanes	2.5 %	2.5 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %
- Outside lanes	2.5 %	2.5 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %
-Shoulders	2.5 %	2.5 %	2.0 %	2.0 %	2.0 %	2.0 %	2.0 %
Clear Zone							
Distance from edge of travel lane unless noted otherwise	30'	30'	3' (measured from face of curb) 10' (measured from edge of travel lane)	16'	16'	N/A	Refer to notes 2 and 3
Side slopes:							
-within clear zone	6:1 usual (4:1 Max)	6:1 usual (4:1 Max)	6:1 (4:1 Max)	6:1 (4:1 Max)	6:1 (4:1 Max)	6:1 (4:1 Max)	6:1 (4:1 Max)

- outside clear zone	3:1 max	3:1 max	3:1 max	3:1 max	3:1 max	3:1 max	3:1 max
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Table 1: Geometric Design Criteria

	MAINLANES	Managed Lanes	FRONTAGE ROADS	RAMPS (Tollway)	RAMPS (Freeway)	DIRECT CONNECTORS	CROSSING STREETS
Vertical Clearance							
Roadway	16'-6" Min. (For ultimate bridges) 14'-6" Min. (For existing bridges to be widened)	16'-6" Min. (For ultimate bridges) 14'-6" Min. (For existing bridges to be widened)	16'-6" Desirable 14'-6" Min.	16'-6" Desirable 14'-6" Min.	16'-6" Desirable 14'-6" Min.	16'-6" Desirable 14'-6" Min.	Existing clearance 16'-6" Desirable
Railroad	23'-0"	23'-0"					
Electrified light Rail	26'	26'	23'-0" 26'	23'-0" 26'	23'-0" 26'	23'-0" 26'	14'-6" Min.
Overhead Signs	17'-6"	17'-6"					
Pedestrian	17'-6"	17'-6"	17'-6" 17'-6"	17'-6"	17'-6"	17'-6"	23'-0" 26' 17'-6"
Design Vehicles	WB-62	WB-62	WB-62	WB-62	WB-62	WB-62	As noted in Attachment 11-1, Table 2
Driveway Radius	N/A	N/A	30' min commercial, 15' min. residential	NA	NA	NA	30' min commercial, 15' min. residential

Notes:

- Design criteria lower than shown above will not be allowed without TxDOT approval
- See Attachment 11-1, Table 2 for crossing street functional classification
- The face of the new bridge columns shall be located 6 feet or more from the face of curb
- To mitigate restrictions on the design imposed by sight distance, it is acceptable to position the 8-foot shoulder on the inside of the curve and the 4-foot shoulder on the outside of the curve.
- TxDOT will allow the reduction of the Design Speed for the Mainlanes and Managed Lanes for the station ranges listed in Table 1A: Design Speed for Mainlanes and Managed Lanes. No Design Speed reductions will be allowed for other station ranges without TxDOT approval.

6. These design speeds / criteria correspond to the vertical alignment design exceptions listed in 11.2.2

7. ~~Except~~ Developer shall provide a minimum 14' immediately downstream from each tolling gantry to allow for enforcement areas..~~at access points or to allow for truss and sentry footings, but shall be no less than 10 feet~~

8. Developer shall coordinate with local entities during final design to ensure adequate enforcement zones are provided ~~and shall, at a minimum, provide enforcements zones after every toll gantry~~

~~6.9.~~ IH 35E SB to SH 121 WB Direct Connector only

Table 1A: Design Speed for Mainlanes and Managed Lanes		
STATION	STATION	DESIGN SPEED
550+00	728+00	50 mph
728+00	780+00 <u>777+00</u> 767+00	70 mph <u>[50 mph*]</u>
780+00 <u>777+00</u> 767+00	1253+00	50 mph
1253+00	1524+75	70 mph
1524+75	1625+00 <u>1632+00</u>	50 mph
1625+00 <u>1632+00</u>	1656+75 <u>1646+00</u>	70 mph
1656+75 <u>1646+00</u>	1683+75 <u>1688+00</u>	50 mph
1683+75 <u>1688+00</u>	1703+25 <u>1703+00</u>	70 mph
1703+25 <u>1703+00</u>	1980+00 <u>1986+00</u>	50 mph
1980+00 <u>1986+00</u>	2007+00 <u>1997+00</u>	70 mph
2007+00 <u>1997+00</u>	2120+00	50 mph

**Applies to Package 3 and Package 4*

Table 2: Crossing Street Function Classification

Intersecting Street	Jurisdiction	Function Classification / Roadway Classification	Design Speed (MPH)	Position (over / under)	Design Vehicle	SBNB U-Turn	Sidewalk & Min. Usable Width ³	Curb and Gutter	WB Offsets to face of curb	WB thru lanes	Turn lanes	EB thru lanes	EB Offsets to face of curb	Curb and Gutter	Sidewalk & Min. Usable Width ³	Clear Zone for Cross Street Thru Lanes	NBSB U Turn	Bike / Ped. Accommodation?	Pedestrian Rail protection barrier?
4 th St.	Carrollton	Collector Urban	30	Under	WB-62	N	N	Curb, no gutter	0	1 (158')	NA	1 (158')	NA0'	Curb, no gutter	N	3' From face of curb	N	N	N
Main W.	Carrollton	Collector Urban	30	Under	WB-62	N	N	Curb, no gutter	0	1 (14.5')	NA	1 (14.5')	NA0'	Curb, no gutter	N	2.5' From face of curb	N	N	N
Belt Line Road	Carrollton	Arterial Urban	30	Under	WB-62	Y	Y (6.5') (5' at Walls)	Y	0'-2'	4-3 (11')	median with turn bays	4-3 (11')	0'-2'	Y	Y (6.5') (5' at Walls)	3' From face of curb	Y	N	N
N. Broadway St.	Carrollton	Arterial Collector Urban	30	Over	WB-62	N	Match Existing	Match Existing	Match Existing 0'	Match Existing 2 (11')	Match Existing NA	Match Existing 2 (11')	Match Existing 0'	Match Existing	Match Existing	Match Existing	N	N	N
Dickerson Pkwy.	Carrollton	Arterial Urban	30	Over	WB-62	N	Y (5.5') (WB Only)	Y (WB Only)	2'	3-2 (124')	median with turn bays Yes	3-2 (124')	2'	N	N	3' From face of curb	N	N	N
Round Grove Rd. (FM3040)	Lewisville	Arterial Urban	30	Over	WB-62	N	Y (6')	Y	2'	2 (12') 1 (14')	2 (12') with curbed median	2 (12') 1 (14')	2'	Y	Y (6')	3' From face of curb	N	N	N
Corporate Dr.	Lewisville	Arterial Urban	30	Under	WB-62	N	Y (Variable)	Y	2'	2 (12') 1 (14')	4 (12') with curbed median	2 (12') 1 (14')	2'	Y	Y (Variable)	3' From face of curb	N	N	N

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Fox Ave.	Lewisville	Collector Urban	30	Over	WB-62	N	Y (Variable)	Y	0'-1'	2 (11')	NA	2 (11')	0'-1'	N	Y (Variable)	3' From face of curb	N	N	N
FM 1171 / Main St.	Lewisville	Arterial Urban	30	Over	WB-62	N	Y (4')	Y	0'	2 (11') 1 (10')	2 (11') with curbed median	2 (11')	0'	Y	Y (4')	3' From face of curb	N	N	N
FM 407 / Lake Park Rd. (Construction to be completed by others)	Lewisville	Arterial Urban	30	Under	WB-62	Y	Y (Variable)	Y	0'	2 (12')	4 (12') with curbed median	2 (12')	0'	Y	Y (Variable)	3' From face of curb	Y	N	N
Garden Ridge Blvd.	Lewisville	Collector Arterial Urban	30	Under	WB-62	N	Y (Variable)	Y	0'	2 (12')	2 (12') with curbed median	2 (12')	0'	Y	Y (Variable)	3' From face of curb	N	N	N
Highland Village	Lewisville	Collector Urban	30	N/A	WB-62	N	Y (Variable)	Y	0'	2 (12')	N/A	N/A	0'	Y	Y (Variable)	3' From face of curb	N	N	N
County Ln. / Denton Dr.	Lake Dallas	Collector Urban	30	Under	WB-62	N	Y (Variable)	Y	0'	2 (12')	2 (12') with curbed median	2 (12')	0'	Y	Y (Variable)	3' From face of curb	N	N	N

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Turbeville Rd. / Hurley Dr.	Lake Dallas	Collector Urban	30	<u>Over</u> <u>Under</u>	WB-62	N	N	N	<u>N/A</u> 0'	1 (12') 1 (16')	2 (16' 18') (partial)	1 (12') 1 (16')	<u>N/A</u> 0'	N	N	N/A	N	N	N
Corinth Pkwy.	Corinth	Collector Urban	30	Under	WB-62	N	Y (6')	Y	<u>±</u> 0'	<u>±</u> 1 (12') 1 (14' 16')	4 (11')	<u>±</u> 1 (12') <u>1</u> (16')	<u>±</u> 0'	Y	Y (6')	3' From face of curb	N	N	N
Post Oak	Corinth	Arterial Urban	30	<u>Under</u> <u>Over</u>	WB-62	N	Y (Variable)	Y	2'	<u>±</u> 1 (12') <u>1</u> (16')	4 (11')	1 (12') 1 (14' 16')	2'	Y	Y (Variable)	3' From face of curb	N	N	N
N. Texas Blvd.	Denton	Collector <u>Arterial</u> Urban	30	<u>Under</u> <u>Over</u>	WB-62	N	Y (Variable)	Y	0'	2 (12')	4 (11')	1 (12') 1 (14')	2'	Y	Y (15')	3' From face of curb	Y	N	N

Notes:

1. Bridge columns shall be 6' (min.) from face of curb
2. Crossing streets not indicated to include sidewalks shall be laid out (including structural elements) to not preclude sidewalk construction in the future
3. Sidewalks shall be designed in accordance with applicable standards and Section 20.3.2