APPENDIX A - SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAIN LINE SUMMARY (DIVIDED) (PART 1 OF 2, COVERING I-10)

PROJECT NUMBER:	F0475 01L	**ROUTE:**	I-10
PROJECT LOCATION:	SR 101L at I-10 TI System Interchange Improvements Design Concept Report	**BEGINNING MP:**	131.68
HIGHWAY SECTION:	I-10 (Avondale Blvd to 83rd Ave)	**ENDING MP:**	135.66
FUNCTIONAL CLASSIFICATION:	Principal Interstate		

I. TRAFFIC VOLUMES AND FACTORS

Milepost Limits	Latest 2022 AADT	Design Year 2050 AADT	Traffic Factors: 2022 Factors		2050 Factors	
Milepost 131.68 to 135.66	264,500	216,700	K % =	6	K % =	6
			D % =	55	D % =	55
			T % =	10	T % =	10

II. DESIGN SPEED:

Posted Speed (I-10 Mainline):	65 mph	**AASHTO Design Speed:**	50 mph minimum	**Average Elevation Is:** 1040'	**Terrain is:** Level
Design Speed (I-10 Mainline):	70 mph				
Posted Speed (Connector Rds):	40 mph	**AASHTO Design Speed:**	40 mph (urban collector)		
Design Speed (Connector Rds):	45 mph				
Posted Speed (Service TI Ramps):	50 mph	**AASHTO Design Speed:**	50 mph		
Design Speed (Service TI Ramps):	60 mph exit gore, 55 mph entrance gore, 50 mph ramp body, 35 mph at crossroad				

III. LANE AND SHOULDER WIDTHS

	EXISTING (Feet)	AASHTO RECOMMENDED **MINIMUM** (Feet)
LANE WIDTH (EB MAINLINE):	12	12
LANE WIDTH (WB MAINLINE):	**11**	12
LANE WIDTH (CONNECTORS AND RAMPS):	12'	12
INSIDE SHOULDER WIDTH (EB MAINLINE):	12	10
INSIDE SHOULDER WIDTH (EB ML AT SR101l TI):	**4**	10
INSIDE SHOULDER WIDTH (WB MAINLINE):	**3' - 5'**	10
OUTSIDE SHOULDER WIDTH (EB MAINLINE):	10' - 12'	10
OUTSIDE SHOULDER WIDTH (WB MAINLINE):	10'-14'	10
INSIDE SHOULDER WIDTH (CONNECTOR RDS):	2	*
OUTSIDE SHOULDER WIDTH (CONNECTOR RDS):	2	*
2 LANES+SHOULDERS (CONNECTOR RDS):	28	* 28' combined traveled way + shoulder for two lanes of traffic, vertical C&G
INSIDE SHOULDER WIDTH (1 & 2-LANE RAMPS):	2	2
OUTSIDE SHOULDER WIDTH (1-LANE RAMPS):	8	6
1 LANE+SHOULDERS (1-LANE RAMPS):	22	22
2 LANES+SHOULDERS (2-LANE RAMPS):	34	34
2 LANES+SHOULDERS (METERED RAMPS):	28	** 26' combined traveled way + shoulder for two lanes of traffic, sloping C&G

APPENDIX A - SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAIN LINE SUMMARY (DIVIDED) (PART 1 OF 2, COVERING I-10)

IV. GRADES

Existing Maximum Grade (I-10 mainline):	2.0239%	**AASHTO Maximum Allowable Grade is:**	3% (for 65 mph posted speed)
Existing Maximum Grade (Connector Rds):	2.3867%	**AASHTO Maximum Allowable Grade is:**	6% (for 40 mph posted speed)
Existing Maximum Grade (Ramps):	2.7367%	**AASHTO Maximum Allowable Grade is:**	5% (for 50 mph design speed)

V. CROSS SLOPE

Normal Cross Slope (ALL):	2.00%	**AASHTO Recommended Range is:**	1.5% to 2%

VI. VERTICAL CLEARANCE

Structure	Milepost	Posted Clearance (ft)	AASHTO Minimum Allowable Clearance (ft)
Avondale Blvd OP	131.68	16.52	16.00
107th Ave TI OP	132.66	16.3	16.00
99th Ave TI OP	133.66	16.54	16.00
Ramp 91B	133.87	16.51	16.00
91st Ave TI UP	134.67	16.99	16.00
83rd Ave TI UP	135.66	16.43	16.00

VII. STRUCTURES

Structure	Sta. Milepost MP	Existing Bridge Length	Existing Bridge Width	Recommended Bridge Width	Bridge Barrier Geometry Adequate	Bridge Barrier Structural Adequate	Existing Inventory Rating Structural Capacity (Ton)	Recommended Inventory Rating Structural Capacity (Ton)
Avondale Blvd OP	131.68	153	167	167	1	1	44	36
107th Ave TI OP	132.66	200	215	215	1	1	36	36
99th Ave TI OP	133.66	153	167	167	1	1	36	36
Ramp 91B	133.87	149	26	26	1	1	58	36
91st Ave TI UP	134.67	317	80	80	1	1	58	36
83rd Ave TI UP	135.66	333	116	116	1	1	54	36

VIII. VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE:

See Attachment No. 1

IX. HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE:

See Attachment No. 2.

X. REMARKS:

This report is based on the existing geometry and current posted speed. This section of the AASHTO Criteria Report involves the I-10 freeway corridor, including mainline, service TI ramps, and connector roads that parallel I-10.
The SR 101L freeway corridor and the four directional ramps that connect I-10 to SR 101L are included in a separate section of the AASHTO Criteria Report.

A Design Exception was approved February 12, 2021 for reduced lane width, reduced left shoulder width, and reduced right shoulder width along I-10 WB associated with restriping to provide an additional general purpose lane.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY
I-10 (Mainline, Service TI Ramps, Connector Roads)

Project Name: SR 101L/I-10 TI DCR (DHOV and other improvements)
Project Number: F0475 01X
Roadway Type: Urban Freeway

VPI STATION	MILEPOST		TRAFFIC DIRECTION (1w, 1a or 2)	GRADE IN (%)	GRADE OUT (%)	CURVE LENGTH (ft)	CURVE TYPE	STOPPING SIGHT DISTANCE		SPEED	
	BEGIN	END						AVAILABLE (ft)	AASHTO MINIMUM (ft)	AVAILABLE (mph)	DESIGN (mph)
I-10											
EB ML 6947+00	131.58	131.84	1w	1.8143	-1.5833	1400	Crest	943	663	80	65
EB ML 6959+00	131.84	132.03	1w	-1.5833	0.2504	1000	Sag	13343	663	+100	65
EB ML 6970+00	132.15	132.15	1w	0.2504	0.1217	0	GB	GB	GB	GB	65
EB ML 6982+00	132.28	132.47	1w	0.1217	1.8000	1000	Sag	+9999	642	+100	65
EB ML 6999+00	132.56	132.83	1w	1.8000	-1.5000	1400	Crest	957	662	81	65
EB ML 7014+00	132.89	133.08	1w	-1.5000	0.2600	1000	Sag	108000	662	+100	65
EB ML 7039+00	133.36	133.55	1w	0.2600	1.7308	1000	Sag	+9999	641	+100	65
EB ML 7052+00	133.57	133.83	1w	1.7308	-1.9308	1400	Crest	908	668	78	65
EB ML 7065+00	133.85	134.04	1w	-1.9308	0.2000	1000	Sag	3323	668	+100	65
EB ML 7085+00	134.23	134.42	1w	0.2000	-1.4639	1000	Crest	1148	662	90	65
EB ML 7103+00	134.57	134.76	1w	-1.4639	2.0239	1000	Sag	1119	662	89	65
EB ML 7118+00	134.82	135.08	1w	2.0239	-0.4550	1400	Crest	1104	649	89	65
EB ML 7156+00	135.58	135.77	1w	-0.4550	0.5453	1000	Sag	+9999	649	+100	65
WB ML 6947+00	131.58	131.84	1a	1.8143	-1.5833	1400	Crest	943	666	80	65
WB ML 6959+00	131.84	132.03	1a	-1.5833	0.2504	1000	Sag	13343	647	+100	65
WB ML 6970+00	132.15	132.15	1a	0.2504	0.3314	0	GB	GB	GB	GB	65
WB ML 6983+00	132.30	132.49	1a	0.3314	1.8000	1000	Sag	+9999	666	+100	65
WB ML 6999+00	132.56	132.83	1a	1.8000	-1.5000	1400	Crest	957	666	81	65
WB ML 7014+00	132.89	133.08	1a	-1.5000	0.2600	1000	Sag	108000	647	+100	65
WB ML 7039+00	133.36	133.55	1a	0.2600	1.7308	1000	Sag	+9999	665	+100	65
WB ML 7052+00	133.57	133.83	1a	1.7308	-1.9300	1400	Crest	908	665	78	65
WB ML 7065+00	133.85	134.04	1a	-1.9300	0.2000	1000	Sag	3329	646	+100	65
WB ML 7085+00	134.23	134.42	1a	0.2000	-1.4700	1000	Crest	1146	646	92	65
WB ML 7103+00	134.57	134.76	1a	-1.4700	2.0108	1000	Sag	1121	669	88	65

Notes:

Traffic Direction:
1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.
* Indicates design exception required.
GB indicates grade break. Stopping Sight Distance and Speed not calculated.
Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

2/16/2023

ATTACHMENT 1 - VERTICAL CURVE INVENTORY
I-10 (Mainline, Service TI Ramps, Connector Roads)

Project Name: SR 101L/I-10 TI DCR (DHOV and other improvements)
Project Number: F0475 01X
Roadway Type: Urban Freeway

VPI STATION	MILEPOST		TRAFFIC DIRECTION (1w, 1a or 2)	GRADE IN (%)	GRADE OUT (%)	CURVE LENGTH (ft)	CURVE TYPE	STOPPING SIGHT DISTANCE		SPEED	
	BEGIN	END						AVAILABLE (ft)	AASHTO MINIMUM (ft)	AVAILABLE (mph)	DESIGN (mph)
WB ML 7118+00	134.82	135.08	1a	2.0108	-0.4556	1400	Crest	1107	669	88	65
WB ML 7156+00	135.58	135.77	1a	-0.4556	0.5453	1000	Sag	+9999	650	+100	65
Ramp Avon B 8+68			1a	1.5972	-0.1484	336	Crest	786	435	72	50
Ramp Avon B 12+00			1a	-0.1484	-0.4739	250	Crest	3440	422	+100	50
Ramp Avon C 9+50			1w	1.6866	-0.6073	400	Crest	670	428	66	50
Ramp 107 A 2+80			1a	0.8528	-1.0220	400	Crest	776	429	72	50
Ramp 107A 6+78.48			1a	-1.0220	-1.7900	230.97	Crest	1520	416	+100	50
Ramp 107 B 10+80			1w	1.2436	-1.2390	500	Crest	685	432	67	50
Ramp 99 A 7+35			1a	0.1147	-1.1577	270	Crest	983	493	84	55
Ramp 99 A 9+35			1a	-1.1577	-0.2000	130	Sag	+9999	490	+100	55
Ramp 99B 17+28.54			1w	-1.6360	-2.5925	400	Crest	1328	443	97	50
Ramp 99B 21+28.54			1w	-2.5925	0.2500	400	Sag	703	443	67	50
Ramp 99 C 1+50			1a	-2.0000	1.8657	200	Sag	277	253	37	35
Ramp 99 C 5+00			1a	1.8657	0.4730	400	Crest	975	437	82	50
Ramp 99 C 11+50			1a	0.4730	-0.5691	400	Crest	1235	496	95	55
Ramp 99 D 1+50			1w	-2.0000	-0.3010	200	Sag	+9999	253	+100	35
Ramp 99 D 6+25			1w	-0.3010	-1.5410	400	Crest	1070	434	87	50
Ramp 99 D 11+00			1w	-1.5410	2.7367	550	Sag	544	434	58	50
Ramp 99 D 17+00			1w	2.7367	0.2400	500	Crest	682	422	68	50
Ramp 91 B 6+60			1w	-1.4979	-0.2838	400	Sag	+9999	505	+100	55
Ramp 91 B 14+00			1w	-0.2838	-2.3660	500	Crest	768	441	70	50
Ramp 91 B 19+00			1w	-2.3660	0.3900	500	Sag	884	441	77	50
Ramp 91 B 32+00			1w	0.3900	-0.4321	400	Crest	1512	426	+100	50
Ramp 91 B 46+00			1w	-0.4321	1.5375	400	Sag	2705	426	+100	50

Notes:

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GB indicates grade break. Stopping Sight Distance and Speed not calculated.
Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

2/16/2023

ATTACHMENT 1 - VERTICAL CURVE INVENTORY
I-10 (Mainline, Service TI Ramps, Connector Roads)

Project Name: SR 101L/I-10 TI DCR (DHOV and other improvements)
Project Number: F0475 01X
Roadway Type: Urban Freeway

VPI STATION	MILEPOST		TRAFFIC DIRECTION (1w, 1a or 2)	GRADE IN (%)	GRADE OUT (%)	CURVE LENGTH (ft)	CURVE TYPE	STOPPING SIGHT DISTANCE		SPEED	
	BEGIN	END						AVAILABLE (ft)	AASHTO MINIMUM (ft)	AVAILABLE (mph)	DESIGN (mph)
Ramp 91 B 50+00			1w	1.5375	1.6600	0	GB	GB	GB	GB	50
Ramp 91 C 9+00			1a	-0.5256	-0.5240	0	GB	GB	GB	GB	50
Ramp 91 C 11+50			1a	-0.5240	1.2642	200	Sag	9917	503	+100	55
Ramp 91 D 8+00			1w	-1.3373	1.5000	400	Sag	706	433	68	50
Ramp 91 D 12+50			1w	1.5000	0.6507	400	Crest	1470	419	+100	50
Ramp 83 A 37+92.51			1a	-0.6500	2.5429	500	Sag	692	515	66	55
Ramp 83 B 8+00			1w	-0.5936	1.8579	400	Sag	984	427	83	50
S. Connector 7001+00			1w	1.1538	0.2500	200	Crest	1294	299	99	40
S. Connector 7022+50			1w	0.2500	0.1753	0	GB	GB	GB	GB	40
S. Connector 7046+00			1w	0.1753	-2.3867	500	Crest	671	312	65	40
S. Connector 7049+75			1w	-2.3867	2.0000	250	Sag	284	255	38	35
N. Connector 7004+00			1a	1.2507	-0.4700	400	Crest	827	306	75	40
N. Connector 7010+00			1a	-0.4700	0.2870	400	Sag	+9999	302	+100	40
N. Connector 7020+00			1a	0.2870	-0.4000	400	Crest	1771	302	+100	40
N. Connector 7027+00			1a	-0.4000	0.5000	400	Sag	+9999	303	+100	40
N. Connector 7038+00			1a	0.5000	-0.5100	400	Crest	1268	303	97	40
N. Connector 7050+00			1a	-0.5100	2.0000	200	Sag	593	253	60	35
N. Connector 7062+50			1a	0.3200	-0.7815	400	Crest	1180	302	93	40
N. Connector 7069+00			1a	-0.7815	0.4250	400	Sag	+9999	302	+100	40
N. Connector 7083+00			1a	0.4250	-0.4881	400	Crest	1382	302	+100	40
N. Connector 7099+00			1a	-0.4881	2.1200	400	Sag	841	310	75	40
N. Connector 7102+00			1a	2.1200	2.1600	0	GB	GB	GB	GB	40

Notes:

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1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.
* Indicates design exception required.
GB indicates grade break. Stopping Sight Distance and Speed not calculated.
Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

2/16/2023

ATTACHMENT 2 - HORIZONTAL ALIGNMENT
I-10 (Mainline, Service TI Ramps, Connector Roads)

Project Name: SR 101L/I-10 TI DCR (DHOV and other improvements)
Project Number: F0475 01X
Roadway Type: Urban Freeway

Note: Stationing is based on ADOT Projects: I-10-2(70), H120101C, and H457701C

STOPPING SIGHT DISTANCE:

Curve # or location	PI Station	SDs (ft) (Posted Speed)	Dc	Centerline Radius (ft)	Adjustment to controlling lane	M required (ft)	M standard (ft) (face of curb or barrier)	Extra width from M standard	Comment
I-10 Mainline (WB)	6979+76.21	645	0.7441	7700.44	-42.0	6.8	18.0	0.0	OK
I-10 Mainline (EB)	6979+64.47	645	0.7560	7578.44	-18.0	6.9	16.0	0.0	OK
I-10 Mainline (WB)	7057+17.67	645	0.2507	22857.32	-42.0	2.3	16.0	0.0	OK
I-10 Mainline (EB)	7057+20.21	645	0.2493	22979.32	-18.0	2.3	9.0	0.0	OK
I-10 Mainline (WB)	7106+73.89	645	0.2491	23002.43	-42.0	2.3	8.8	0.0	OK
I-10 Mainline (EB)	7102+18.19	645	0.2500	22918.31	-18.0	2.3	16.0	0.0	OK
I-10 Mainline (WB)	7151+27.51	645	0.2507	22853.31	-24.0	2.3	16.0	0.0	OK
I-10 Mainline (EB)	7151+30.09	645	0.2500	22918.31	20.0	2.3	16.0	0.0	OK
Avondale Blvd Ramp B	14+81.77	570	0.7167	7994.76	6.0	5.1	14.0	0.0	OK
Avondale Blvd Ramp C	11+84.49	495	2.0000	2864.79	6.0	10.7	14.0	0.0	OK
107th Ave Ramp A	No Curves								OK
107th Ave Ramp B	3+46.39	570	0.7500	7639.44	6.0	5.3	14.0	0.0	OK
99th Ave Ramp A	4+72.57	495	0.5000	11459.16	-6.0	2.7	14.0	0.0	OK
99th Ave Ramp B	22+52.09	425	1.0000	5729.58	-6.0	3.9	8.0	0.0	OK
99th Ave Ramp C	12+03.13	425	1.5000	3819.72	6.0	5.9	14.0	0.0	OK
99th Ave Ramp D	6+67.27	425	2.5000	2291.83	-6.0	9.9	10.0	0.0	OK
99th Ave Ramp D	16+58.36	425	1.5000	3819.72	-6.0	5.9	8.0	0.0	OK
91st Ave Ramp B	8+69.25	425	4.0000	1432.40	6.0	15.7	16.0	0.0	OK
91st Ave Ramp B	15+84.37	425	4.0000	1432.39	-6.0	15.8	10.0	**5.8**	
91st Ave Ramp B	45+65.82	425	1.5000	3819.72	6.0	5.9	14.0	0.0	OK
91st Ave Ramp C	No Curves								OK
91st Ave Ramp D	11+11.17	495	1.5000	3819.72	-6.0	8.0	14.0	0.0	OK
83rd Ave Ramp A	2+89.09	495	1.5000	3819.72	-6.0	8.0	8.0	0.0	OK
83rd Ave Ramp B	No Curves								OK
South Connector Rd	7036+29.69	305	0.3333	17188.73	-6.0	0.7	8.0	0.0	OK
North Connector Rd	7015+00.40	305	0.1250	45836.62	-6.0	0.0	8.0	0.0	OK
North Connector Rd	7041+45.00	305	0.5000	11459.16	-6.0	0.7	8.0	0.0	OK
North Connector Rd	7059+68.12	305	1.5001	3819.58	-6.0	0.3	10.0	0.0	OK
North Connector Rd	7097+66.79	305	1.5000	3819.72	-6.0	1.0	8.0	0.0	OK

ATTACHMENT 2 - HORIZONTAL ALIGNMENT
I-10 (Mainline, Service TI Ramps, Connector Roads)

Project Name: SR 101L/I-10 TI DCR (DHOV and other improvements)
Project Number: F0475 01X
Roadway Type: Urban Freeway

Note: Stationing is based on ADOT Projects: I-10-2(70), H120101C, and H457701C

SUPERELEVATION: Mainline

Curve # or location	PI Station	Posted Speed	Dc	Centerline Radius (ft)		Existing e (%)	e (%) method 5	f required	f allowed	Method 2 speed	Comment
I-10 Mainline (WB)	6979+76.21	65	0.7441	7700.44		**2.9**	2.3	0.008	0.11	> 80	75 mph original design speed
I-10 Mainline (EB)	6979+64.47	65	0.7560	7578.44		**2.9**	2.3	0.008	0.11	> 80	75 mph original design speed
I-10 Mainline (WB)	7057+17.67	65	0.2507	22857.32		2.0	2.0	-0.008	0.11	> 80	OK
I-10 Mainline (EB)	7057+20.21	65	0.2493	22979.32		2.0	2.0	-0.008	0.11	> 80	OK
I-10 Mainline (WB)	7106+73.89	65	0.2491	23002.43		2.0	2.0	-0.008	0.11	> 80	OK
I-10 Mainline (EB)	7102+18.19	65	0.2500	22918.31		2.0	2.0	-0.008	0.11	> 80	OK
I-10 Mainline (WB)	7151+27.51	65	0.2507	22853.31		2.0	2.0	-0.008	0.11	> 80	OK
I-10 Mainline (EB)	7151+30.09	65	0.2500	22918.31		2.0	2.0	-0.008	0.11	> 80	OK

SUPERELEVATION: Ramps and Connector Roads

Curve # or location	PI Station	Design Speed	Dc	Radius (ft)		Existing e (%)	e (%) method 5	f required	f allowed	Method 2 speed	Comment
Avondale Blvd Ramp B	14+81.77	60	0.7167	7994.76		**3.2**	2.0	-0.002	0.12	> 80	
Avondale Blvd Ramp C	11+84.49	55	2.0000	2864.79		**5.8**	4.0	0.012	0.13	> 80	
107th Ave Ramp A	No Curves	55									
107th Ave Ramp B	3+46.39	60	0.7500	7639.44		**2.9**	2.1	0.002	0.12	> 80	
99th Ave Ramp A	4+72.57	55	0.5000	11459.16		2.0	2.0	-0.002	0.13	> 80	OK
99th Ave Ramp B	22+52.09	50	1.0000	5729.58		2.0	2.0	0.009	0.14	> 80	OK
99th Ave Ramp C	12+03.13	50	1.5000	3819.72		**3.0**	2.8	0.014	0.14	> 80	
99th Ave Ramp D	6+67.27	50	2.5000	2291.83		**4.6**	4.0	0.027	0.14	80	
99th Ave Ramp D	16+58.36	50	1.5000	3819.72		**3.0**	2.8	0.014	0.14	>80	
91st Ave Ramp B	8+69.25	50	4.0000	1432.40		**6.3**	5.1	0.053	0.14	66	
91st Ave Ramp B	15+84.37	50	4.0000	1432.39		**6.3**	5.1	0.053	0.14	66	
91st Ave Ramp B	45+65.82	50	1.5000	3819.72		**3.0**	2.8	0.014	0.14	> 80	
91st Ave Ramp C	No Curves										
91st Ave Ramp D	11+11.17	50	1.5000	3819.72		**3.0**	2.8	0.014	0.14	> 80	
83rd Ave Ramp A	2+89.09	55	1.5000	3819.72		**4.6**	3.2	0.007	0.13	> 80	
83rd Ave Ramp B	No Curves		0.0000	0.00							
South Connector Rd	7036+29.69	40	0.3333	17188.73		2.0	2.0	-0.014	0.16	> 80	OK
North Connector Rd	7015+00.40	40	0.1250	45836.62		2.0	2.0	-0.018	0.16	> 80	OK
North Connector Rd	7041+45.00	40	0.5000	11459.16		2.0	2.0	-0.011	0.16	> 80	OK
North Connector Rd	7059+68.12	40	1.5001	3819.58		2.0	2.0	0.008	0.16	> 80	OK
North Connector Rd	7097+66.79	40	1.5000	3819.72		**3.0**	2.0	-0.002	0.16	> 80	

APPENDIX A - SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAIN LINE SUMMARY (DIVIDED) (PART 2 OF 2, COVERING SR 101L)

PROJECT NUMBER:	F0475 01L	**ROUTE:**	SR 101L
PROJECT LOCATION:	SR 101L at I-10 TI System Interchange Improvements Design Concept Report	**BEGINNING MP:**	0.00
HIGHWAY SECTION:	SR 101L (I-10 to Indian School Rd)	**ENDING MP:**	3.95
FUNCTIONAL CLASSIFICATION:	Urban Freeway		

I. TRAFFIC VOLUMES AND FACTORS

Milepost Limits	Latest 2022 AADT	Design Year 2050 AADT	Traffic Factors: 2022 Factors		2050 Factors	
Milepost 0.00 to 3.95	182,400	246,600	K % =	6	K % =	6
			D % =	56	D % =	56
			T % =	10	T % =	10

II. DESIGN SPEED:

Posted Speed (SR 101L Mainline): 65 mph **AASHTO Design Speed:** 50 mph minimum **Average Elevation Is:** 1040' **Terrain is:** Level

Design Speed (SR 101L Mainline): 65 mph

Posted Speed (Directional Ramps): 45 Ramp SW **AASHTO Design Speed:** 50 mph (40 mph minimum)
45 Ramp WN
45 Ramp SE
35 Ramp EN

Design Speed (Directional Ramps): 50 mph per record drawings

Posted Speed (Service TI Ramps): 50 mph **AASHTO Design Speed:** 50 mph

Design Speed (Service TI Ramps): 60 mph exit gore, 55 mph entrance gore, 50 mph ramp body, 35 mph at crossroad

III. LANE AND SHOULDER WIDTHS

	EXISTING (Feet)	AASHTO RECOMMENDED **MINIMUM** (Feet)
LANE WIDTH (MAINLINE):	12	12
LANE WIDTH (SERVICE TI RAMPS):	12	12
LANE WIDTH (DIRECTIONAL RAMP EN & SW):	**11**	12
LANE WIDTH (DIRECTIONAL RAMPS SE & WN):	12	12
INSIDE SHOULDER WIDTH (MAINLINE):	10	10
OUTSIDE SHOULDER WIDTH (MAINLINE):	10 - 12	10
INSIDE SHOULDER WIDTH (RAMPS EN & SW):	2.5	1' - 6'
OUTSIDE SHOULDER WIDTH (RAMPS EN & SW):	**3.5**	8' - 10'
INSIDE SHOULDER WIDTH (RAMPS WN & SE):	4	1' - 6'
OUTSIDE SHOULDER WIDTH (RAMPS WN & SE):	8	8' - 10'
INSIDE SHOULDER WIDTH (1 & 2-LANE RAMPS):	2	2
OUTSIDE SHOULDER WIDTH (1-LANE RAMPS):	8	6
1 LANE+SHOULDERS (1-LANE RAMPS):	22	22
2 LANES+SHOULDERS (2-LANE RAMPS):	34	34
2 LANES+SHOULDERS (METERED RAMPS):	28	** 26' combined traveled way + shoulder for two lanes of traffic, sloping C&G

APPENDIX A - SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA
MAIN LINE SUMMARY (DIVIDED) (PART 2 OF 2, COVERING SR 101L)

IV. GRADES

Existing Maximum Grade (SR 101L mainline): 1.9202% **AASHTO Maximum Allowable Grade is:** 3% (for 65 mph posted speed)

Existing Maximum Grade (Directional Ramps): 4.9502% **AASHTO Maximum Allowable Grade is:** 5% (for 45 mph posted speed)
6% (for 35 mph posted speed)

Existing Maximum Grade (Service TI Ramps): 2.8759% **AASHTO Maximum Allowable Grade is:** 5% (for 50 mph design speed)

V. CROSS SLOPE

Normal Cross Slope (ALL): 2.00% **AASHTO Recommended Range is:** 1.5% to 2%

VI. VERTICAL CLEARANCE

Structure	Milepost	Posted Clearance (ft)	AASHTO Minimum Allowable Clearance (ft)
McDowell Rd OP SB	1.45	17.33	16.00
McDowell Rd OP NB	1.45	17.78	16.00
Thomas Rd OP NB	2.93	16.23	16.00
Thomas Rd OP SB	2.93	16.09	16.00
Indian School Rd TI UP	3.95	17.31	16.00
Ramp SW	133.66	16.53	16.00
Ramp SE	134.00	16.94	16.00
Ramp EN	133.86	18.08	16.00
Ramp WN	134.08	17.41	16.00

VII. STRUCTURES

Structure	Sta. Milepost MP	Existing Bridge Length	Existing Bridge Width	Recommended Bridge Width	Bridge Barrier Geometry Adequate	Bridge Barrier Structural Adequate	Existing Inventory Rating Structural Capacity (Ton)	Recommended Inventory Rating Structural Capacity (Ton)
McDowell Rd OP SB	1.45	192	58	58	1	1	44	36
McDowell Rd OP NB	1.45	192	36	36	1	1	36	36
Thomas Rd OP NB	2.93	206	68	68	1	1	36	36
Thomas Rd OP SB	2.93	206	68	68	1	1	58	36
Indian School Rd TI UP	3.95	255	104	104	1	1	58	36
Ramp SW	16.53	1140	31	31	1	1	51	36
Ramp SE	16.94	678	39	39	1	1	51	36
Ramp EN	18.08	2483	31	31	1	1	48	36
Ramp WN	17.41	756	39	39	1	1	52	36

VIII. VERTICAL ALIGNMENT AND STOPPING SIGHT DISTANCE:

See Attachment No. 1

IX. HORIZONTAL ALIGNMENT, SUPERELEVATION, AND STOPPING SIGHT DISTANCE:

See Attachment No. 2.

X. REMARKS:

This report is based on the existing geometry and current posted speed. This section of the AASHTO Criteria Report involves the SR 101L freeway corridor, including mainline, service TI ramps, and directional ramps.

The I-10 freeway corridor with ramps and connector roads are included in a separate section of the AASHTO Criteria Report.

A Design Exception was approved February 12, 2021 for reduced lane width, reduced left shoulder width, and reduced horizontal stopping sight distance on Ramp SW associated with restriping Ramp S-W to add an additional lane.

The posted advisory speed limit for directional ramp EN is 35 mph.

The posted advisory speed limit for directional ramps SW, SE, and WN is 45 mph.

ATTACHMENT 1 - VERTICAL CURVE INVENTORY
SR 101L (Mainline, Directional Ramps, Service TI Ramps)

Project Name: SR 101L at I-10 TI System Interchange Improvements Design Concept Report
Project Number: F0475 01L
Roadway Type: Urban Freeway

VPI STATION	MILEPOST		TRAFFIC DIRECTION (1w, 1a or 2)	GRADE IN (%)	GRADE OUT (%)	CURVE LENGTH (ft)	CURVE TYPE	STOPPING SIGHT DISTANCE		SPEED	
	BEGIN	END						AVAILABLE (ft)	AASHTO MINIMUM (ft)	AVAILABLE (mph)	DESIGN (mph)
SR 101L											
ML 158+00			2	-0.4000	0.3000	800	Sag	+9999	648	+100	65
ML 164+50			2	0.3000	0.4041	0	GB	GB	GB	GB	65
ML 180+00			2	0.4041	1.8744	800	Sag	+9999	667	+100	65
ML 195+45			2	1.8744	-1.9202	2135	Crest	1102	667	88	65
ML 213+00			2	-1.9202	-0.4100	800	Sag	+9999	667	+100	65
ML 248+00			2	-0.4100	0.4791	800	Sag	+9999	649	+100	65
Directional Ramps											
Ramp EN 16+00			1w	0.6501	4.8360	600	Sag	598	244	63	35
Ramp EN 31+00			1w	4.8360	-4.9502	1600	Crest	594	266	58	35
Ramp EN 44+85			1w	-4.9502	-0.4022	600	Sag	557	392	56	45
Ramp SW 5+45			1a	1.6587	0.8080	700	Crest	1618	369	+100	45
Ramp SW 21+80			1w	0.8080	-1.8512	440	Crest	626	370	63	45
Ramp SE 15+00			1a	0.8859	2.8000	400	Sag	3552	376	+100	45
Ramp SE 22+00			1a	2.8000	0.2955	500	Crest	681	376	65	45
Ramp SE 30+80			1a	0.2955	-2.8127	700	Crest	697	361	68	45
Ramp SE 38+65			1a	-2.8127	-0.4029	450	Sag	1125	357	91	45
Ramp WN 8+50			1w	-0.2996	3.4972	400	Sag	469	361	53	45
Ramp WN 21+00			1w	3.4972	-2.6838	1500	Crest	724	376	68	45
Service TI Ramps											
McDowell C 3+00			1a	2.0000	0.4832	400	Crest	911	253	78	35
McDowell C 12+50			1a	0.4832	-0.7309	400	Crest	1089	427	89	50

Notes:

Traffic Direction:
1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.
* Indicates design exception required.
GB indicates grade break. Stopping Sight Distance and Speed not calculated.
Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

2/16/2023

ATTACHMENT 1 - VERTICAL CURVE INVENTORY
SR 101L (Mainline, Directional Ramps, Service TI Ramps)

Project Name: SR 101L at I-10 TI System Interchange Improvements Design Concept Report
Project Number: F0475 01L
Roadway Type: Urban Freeway

VPI STATION	MILEPOST		TRAFFIC DIRECTION (1w, 1a or 2)	GRADE IN (%)	GRADE OUT (%)	CURVE LENGTH (ft)	CURVE TYPE	STOPPING SIGHT DISTANCE		SPEED	
	BEGIN	END						AVAILABLE (ft)	AASHTO MINIMUM (ft)	AVAILABLE (mph)	DESIGN (mph)
McDowell D 2+00			1w	2.0000	0.2578	200	Crest	719	245	70	35
McDowell D 11+00			1w	0.2578	-0.3184	400	Crest	2073	495	+100	55
Thomas TA 7+20			1a	0.2950	-0.5891	500	Crest	1470	495	+100	55
Thomas TB 10+88			1w	1.9196	-1.3759	500	Crest	577	433	60	50
Thomas TC 10+10			1a	1.5569	-1.6807	750	Crest	707	435	68	50
Thomas TD 10+65			1w	1.5118	-1.8394	550	Crest	597	508	61	55
Indian School IA 9+25			1a	-0.5823	2.8759	550	Sag	674	445	65	50
Indian School IA 14+65			1a	2.8759	1.9000	250	Crest	1231	445	92	50
Indian School IB 9+55			1w	-0.6047	2.0453	500	Sag	958	428	82	50
Indian School IB 17+05			1w	2.0453	1.8967	300	Crest	7411	411	+100	50

Notes:

Traffic Direction:
1w = One Way Traffic in Station direction
1a = One Way Traffic against Station direction
2 = Two Way Traffic

Grades are with respect to Station direction.
* Indicates design exception required.
GB indicates grade break. Stopping Sight Distance and Speed not calculated.
Calculations are based on AASHTO 2001 and ADOT 2004 Roadway Design Guidelines formulas with adjustments for effective grade.

2/16/2023

ATTACHMENT 2 - HORIZONTAL ALIGNMENT
SR 101L (Mainline, Directional Ramps, Service TI Ramps)

Project Name: SR 101L at I-10 TI System Interchange Improvements Design Concept Report
Project Number: F0475 01L
Roadway Type: Urban Freeway

Note: Stationing is based on ADOT Project H457701C

STOPPING SIGHT DISTANCE:

Curve # or location	PI Station	SDs (ft) (Posted Speed)	Dc	Centerline Radius (ft)	Adjustment to controlling lane	M required (ft)	M standard (ft) (face of curb or barrier)	Extra width from M standard	Comment
SR 101L Mainline	158+68.51	645	1.5000	3819.72	17.0	13.5	16.0	0.0	OK
SR 101L Mainline	188+50.83	645	1.5000	3819.72	17.0	13.5	16.0	0.0	OK
SR 101L Mainline	251+05.97	645	1.5000	3819.72	17.0	13.5	16.0	0.0	OK
Directional Ramps									
Ramp EN	30+66.68	250	6.5000	881.47	-10.5	9.0	8.0	**1.0**	OK per Design Exception of July 31, 2019 - Advisory 35 mph
Ramp SW	3+13.23	360	1.0000	5729.58	0.0	2.8	14.0	0.0	OK
Ramp SW	17+99.46	360	7.5000	763.94	-1.5	21.2	9.0	**12.2**	OK per Design Exception of February 12, 2021 - Advisory 45 mph
Ramp SE	4+62.50	360	0.5000	11459.16	-6.0	1.4	14.0	0.0	OK
Ramp SE	24+29.65	360	7.0000	818.51	-6.0	19.9	10.0	**9.9**	Design Exception needed - Posted Advisory 45 mph
Ramp WN	9+59.40	495	0.5000	11459.16	-6.0	2.7	8.0	0.0	OK
Ramp WN	21+14.72	360	7.5000	763.94	-7.0	21.3	14.0	**7.3**	Design Exception needed - Posted Advisory 45 mph
Ramp WN	35+18.53	645	0.5000	11459.16	-8.5	4.5	14.0	0.0	OK
Service TI Ramps		Design Speed							
McDowell Rd Ramp C	11+83.56	425	2.0000	2864.79	-6.0	7.9	8.0	0.0	OK
McDowell Rd Ramp D	11+69.10	495	2.5000	2291.83	-6.0	13.4	8.0	5.4	OK - No barrier
Thomas Rd Ramp TA	6+62.64	495	1.7500	3274.04	-6.0	9.4	8.0	1.4	OK - No barrier
Thomas Rd Ramp TB	4+04.96	570	0.5000	11459.16	6.0	3.5	14.0	0.0	OK
Thomas Rd Ramp TB	15+20.02	425	4.0000	1432.40	-6.0	15.8	8.0	7.8	OK - No barrier
Thomas Rd Ramp TC	17+81.88	570	0.7500	7639.39	6.0	5.3	14.0	0.0	OK
Thomas Rd Ramp TD	16+85.03	495	0.7500	7639.39	6.0	15.7	14.0	1.7	OK - No barrier
Indian School Rd Ramp IA	4+79.57	495	0.7500	7639.45	-6.0	5.3	8.0	0.0	OK
Indian School Rd Ramp IB	3+38.03	570	0.7500	7639.45	6.0	4.0	14.0	0.0	OK
Indian School Rd Ramp IB	15+23.20	425	1.5000	3819.72	-6.0	4.0	8.0	0.0	OK

ATTACHMENT 2 - HORIZONTAL ALIGNMENT
SR 101L (Mainline, Directional Ramps, Service TI Ramps)

Project Name: SR 101L at I-10 TI System Interchange Improvements Design Concept Report
Project Number: F0475 01L
Roadway Type: Urban Freeway

Note: Stationing is based on ADOT Project H457701C

SUPERELEVATION: Mainline

Curve # or location	PI Station	Posted Speed	Dc	Centerline Radius (ft)		Existing e (%)	e (%) method 5	f required	f allowed	Method 2 speed	Comment
SR 101L Mainline	158+68.51	65	1.5000	3819.72		**4.0**	4.1	0.034	0.11	> 80	
SR 101L Mainline	188+50.83	65	1.5000	3819.72		4.1	4.1	0.033	0.11	> 80	OK
SR 101L Mainline	251+05.97	65	1.5000	3819.72		4.1	4.1	0.033	0.11	> 80	OK

SUPERELEVATION: Service TI Ramps and Directional Ramps

Curve # or location	PI Station	Evaluated Speed	Dc	Centerline Radius (ft)		Existing e (%)	e (%) method 5	f required	f allowed	Method 2 speed	Comment
Service TI Ramps		Design Speed									
McDowell Rd Ramp C	11+83.56	50	2.0000	2864.79		3.5	3.5	0.023	0.14	> 80	OK
McDowell Rd Ramp D	11+69.10	50	2.5000	2291.83		4.0	4.0	0.033	0.14	76	OK
Thomas Rd Ramp TA	6+62.64	55	1.7500	3274.04		3.6	3.6	0.026	0.13	> 80	OK
Thomas Rd Ramp TB	4+04.96	60	0.5000	11459.16		**3.6**	2.0	-0.015	0.12	> 80	
Thomas Rd Ramp TB	15+20.02	50	4.0000	1432.40		5.1	5.1	0.065	0.14	64	OK
Thomas Rd Ramp TC	17+81.88	60	0.7500	7639.39		**2.0**	2.1	0.011	0.12	> 80	
Thomas Rd Ramp TD	16+85.03	55	0.7500	7639.39		2.0	2.0	0.006	0.13	> 80	OK
Indian School Rd Ramp IA	4+79.57	55	0.7500	7639.45		2.0	2.0	0.006	0.13	> 80	OK
Indian School Rd Ramp IB	3+38.03	60	0.7500	7639.45		**2.0**	2.1	0.011	0.12	> 80	
Indian School Rd Ramp IB	15+23.20	50	1.5000	3819.72		2.8	2.8	0.016	0.14	>80	OK
Directional Ramps		Posted Speed									
Ramp EN	30+66.68	35	6.5000	881.47		**7.8**	4.4	0.015	0.18	58	
Ramp SW	3+79.39	45	1.0000	5729.58		2.0	2.0	0.004	0.15	> 80	OK
Ramp SW	17+99.46	45	7.5000	763.94		**8.0**	5.9	0.097	0.15	51	
Ramp SE	4+62.50	45	0.5000	11459.16		2.0	2.0	-0.008	0.15	> 80	OK
Ramp SE	24+29.65	45	7.0000	818.51		**7.9**	5.8	0.086	0.15	53	
Ramp WN	9+59.40	55	0.5000	11459.16		2.0	2.0	-0.002	0.13	> 80	OK
Ramp WN	21+14.72	45	7.5000	763.94		**8.0**	5.9	0.097	0.15	51	
Ramp WN	35+18.53	65	0.5000	11459.16		2.0	2.0	0.005	0.11	> 80	OK