

Appendix E
Review of Mainline
Geometry

INVENTORY OF LANE AND SHOULDER MEASUREMENTS

Functional Class	MP	Route Log Point	Direction Measurement was taken from HIS	Lane Width	Median Width	Inside Shoulder Paved	Inside Shoulder	Outside Shoulder Paved	Outside Shoulder
RUR P A	0.000	I-24							
RUR P A	0.298	[.198-.398] Interstate 24 - 024B00177R							
RUR P A	1.093	[1.078-1.108] Beverly Branch - 024B00176R	N	12	40	4	6	10	12
RUR P A	1.841	[Masonville-Beverly Road over B - 024B00175N		12	40	4	6	10	12
RUR P A	2.234	[Locust Grove Church Rd., Bridg - 024B00174N		12	40	4	6	10	12
RUR P A	4.369	[4.35-4.388] Rock Bridge Branch - 024B00173R		12	40	4	6	10	12
URB F E	5.175	LOVERS LN UNDERPASS		12	40	4	6	10	12
URB F E	5.177	On Lovers Lane over 9004 - 024B00168N		12	40	4	6	10	12
URB F E	5.674	[Culvert] Blue Creek - 024B00171N	N	12	40	4	6	10	12
URB F E	5.759	US 68B OVERPASS		12	40	4	6	10	12
URB F E	5.786	[5.759-5.813] US 68 By-Pass - 024B00167R		12	40	4	6	10	12
URB F E	6.566	[6.551-6.581] Sivley Rd. - 024B00166R	N	12	40	4	6	10	12
URB F E	6.826	US 41A OVERPASS		12	40	4	6	10	12
URB F E	6.861	[6.824-6.898] US 41A - 024B00165R		12	40	4	6	10	12
URB F E	7.513	[7.498-7.528] CSX RAILROAD - 024B00102R	N	12	40	4	6	10	12
URB F E	7.657	[Culvert] CALVIN DRIVE - 024B00103N		12	36	3 ***	6	10	12
URB F E	7.915	US 41 OVERPASS		12	36	3 ***	6	10	12
URB F E	7.935	[7.916-7.954] US41 - 024B00104R		12	36	3 ***	6	10	12
URB F E	8.635	[8.621-8.649] SOUTH FORK LITTLE RIVER - 024B00105R	N	12	36	3 ***	6	10	12
URB F E	9.005	[Culvert] KY.2629,QUARRY ROAD - 024B00106N		12	36	3 ***	6	10	12
URB F E	9.347	US 68 UNDERPASS		12	36	3 ***	6	10	12
URB F E	9.356	[US 68 over EB 9004] - 024B00116N		12	36	3 ***	6	10	12
URB F E	9.517	7th St. over 9004 - 024B00117N	N	12	36	3 ***	6	10	12
URB F E	9.728	[9.722-9.734] FIRST STREET - 024B00118R		12	36	3 ***	6	10	12
URB F E	10.771	[Culvert] NORTH FORK LITTLE RIVER - 024B00092N		12	36	3 ***	6	10	12
URB F E	11.692	1682 over 9004 - 024B00093R		12	36	3 ***	6	12	12
RUR P A	11.697	KY 1682 UNDERPASS		12	36	3 ***	6	12	12
RUR P A	11.705	1682 ove 9004 - 024B00093L		12	36	3 ***	6	12	12
RUR P A	13.764	CR1009 over 9004 - 024B00094N	N	12	36	3 ***	6	12	12
RUR P A	15.511	KY 2641 over 9004 - 024B00095N		12	36	3 ***	6	12	12
RUR P A	18.474	Cavanaugh Lane over 9004 - 024B00096N		12	36	3 **	6	12	12
RUR P A	19.721	KY 2640 over 9004 - 024B00097N		12	36	3 **	6	12	12
RUR P A	21.214	CR 1108 over 9004 - 024B00098N		12	36	3 **	6	12	12
RUR P A	22.641	KY 800 UNDERPASS		12	36	3 **	6	12	12
RUR P A	22.649	KY 800 across 9004 - 024B00099N		12	36	3 **	6	12	12
RUR P A	25.117	KY 2637 over 9004 - 024B00100N	N	12	36	3 **	6	12	12
RUR P A	28.095	CHRISTIAN - HOPKINS COUNTY LINE		12	36 *	3 **	6	12	12
RUR P A	29.131	[KY 2647 over EB 9004] - 054B00013N		12	36 *	3 **	6	12	12
RUR P A	29.448	[29.433-29.463] DRAKES CREEK - 054B00014R	N	12	36 *	3 **	6	12	12
RUR P A	29.559	[EB 9004 over EB 9004] - 054B00015N		12	36 *	3 **	6	12	12
RUR P A	29.568	NORTHBOUND ON RAMP FROM US 41 UNDERPASS		12 ****	36 *	4 ****	6	12	****
RUR P A	30.33	[30.314-30.346] CRAB ORCHARD CREEK - 054B00106R		12 ****	36 *	4 ****	10	10	****
RUR P A	31.355	[31.346-31.364] PLEASANT HILL CHURCH ROA - 054B00098R		12 ****	36 *	4 ****	10	10	****
RUR P A	32.29	[32.275-32.305] OLD WHITE PLAINS RD&CREE - 054B00097R		12 ****	36 *	4 ****	10	10	****
RUR P A	32.623	[32.597-32.649] P&L RR-PLEASANT RUN RD - 054B00099R		12 ****	36 *	4 ****	10	10	****
RUR P A	32.85	US 62 UNDERPASS		12 ****	36 *	4 ****	10	10	****
RUR P A	32.852	[US 62 over EB 9004] - 054B00048N		12 ****	36 *	4 ****	10	10	****
RUR P A	34.256	[WK 9001 over EB 9004] - 054B00145R		12 ****	36 *	4 ****	10	10	****
RUR P A	34.268	[WK 9001 over EB 9004] - 054B00145L		12 ****	36 *	4 ****	10	10	****
RUR P A	34.271	I-69 & WESTERN KY PKWY OVERPASS							
				HIS shows 11	HIS shows 30	HIS shows 3 for 6 and 4 for 3			

Notes

- * HIS shows 30 feet here. The HIS measurement excludes the inside shoulder. Field verified to 36 feet
- ** HIS shows 3 feet, plans show 6 feet, 3 feet is correct from field verification.
- ***HIS shows 4 feet; field verification shows 3 feet
- **** HIS field measurements are usually in the non-Cardinal direction only. The southbound lanes revealed the travel lane from inside stripe to inside stripe varies from 22'9" to 23" which is where HIS input was 11' lanes. However, the inside shoulder width from inside white stripe to edge of paved area measures anywhere from 3' 8" to 5' 2", with an outside shoulder measuring from inside stripe to edge of pavement measures 10'. Therefore, in this area, the lane widths are not 12', the outside shoulder width is not 10' and the inside shoulder is not consistently 4'. The stripe measures 6". It seems to be a striping issue.

EXISTING CONDITIONS INVENTORY

Route	County	Beginning MP	Beginning Feature	Ending MP	Ending Feature	Length	Year Open to Traffic	Rural /Urban	# of Lanes	Lane Width	Pavement Type	Shoulder Type	Paved Shoulder Width (inside)	Paved Shoulder Width (outside)	Median Type	Median Width	Divided/ Undivided	Speed Limit		
EB 9004	Christian	0.000	I-24	0.204		0.204	2012	Rural	2	15	Composite; Flexible Over Rigid	Paved w/ Bituminous Material		10	Depressed	99	Divided	70		
		0.204		0.307		0.103				Concrete Barrier			30							
		0.307		0.468		0.161														
		0.468		0.587	End of I-24 NB Ramp to NB ETB	0.119														
		0.587	End of I-24 NB Ramp to NB ETB	4.8	LOVERS LANE	4.213	2011	Urban	4	12										
		4.8	LOVERS LANE	5.759	US 68B OVERPASS	0.959														
		5.759	US 68B OVERPASS	6.826	US 41A	1.067														
		6.826	US 41A	7.5	Southern End of Railroad Bridge	0.674														
		7.5	Railroad	7.915	US 41 OVERPASS	0.415														
		7.915	US 41 OVERPASS	9.347	US 68 UNDERPASS	1.432														
	9.347	US 68 UNDERPASS	11.697	KY 1682 U-PASS	2.350	1960's														
	11.697	KY 1682 U-PASS	12.100		0.403	1960's	Rural	4	12											
	12.100		16.780		4.680															
	16.780		22.641	KY 800 U-PASS	5.861															
	22.641	KY 800 U-PASS	28.095	HOPKINS COUNTY LINE	5.454															
	28.095	HOPKINS COUNTY LINE	29.568	US 41 UNDERPASS	1.473															
29.568	US 41 UNDERPASS	32.861	US 62 OVERPASS	3.293																
32.861	US 62 OVERPASS	34.271	WESTERN KENTUCKY PARKWAY	1.410																

Analyzed with ramp data

* HIS field measurements are usually in the non-Cardinal direction only. The southbound lanes revealed the travel lane from inside stripe to inside stripe varies from 22'9" to 23" which is where HIS input was 11' lanes. However, the inside shoulder width from inside white stripe to edge of paved area measures anywhere from 3' 8" to 5' 2", with an outside shoulder measuring from inside stripe to edge of pavement measures 10'. Therefore, in this area, the lane widths are not 12', the outside shoulder width is not 10' and the inside shoulder is not consistently 4'. It seems to be a striping issue.

EXISTING CONDITIONS INVENTORY

Route	County	Beginning MP	Beginning Feature	Ending MP	Ending Feature	Length	Year Open to Traffic	Rural /Urban	Traffic Count (ADT)	Estimate / Actual (Year)	% Total Trucks	Terrain	%Sight Difference > or = 1,500 feet	Federal System	State Highway System	Truck Weight Class	Scenic Byway	2013 ADT* (two-way)	Truck %	2013 LOS	2040 ADT (two-way)	Truck %	2040 LOS	Avg Crash Rate	ADT	Critical Crash Rate	Actual Crash Rate	Avg Fatality Rate	Critical Fatality Rate	Actual Fatality Rate	Crashes				Critical Crash Rate Factor	Critical Fatality Rate Factor										
																															Fatal	Injury	PDO	Total												
EB 9004	Christian	0.000	I-24	0.204		0.204	2012	Rural				Flat	100	(Rural) Principal Arterial - Other Freeways and Expressways	State Primary (Parkway)	AAA (80 000 lbs)	None																													
		0.204		0.307		0.103																																								
		0.307		0.468		0.161																																								
		0.468		0.587	End of I-24 NB Ramp to NB ETB	LOVERS LANE	4.213																		9,100	22		12,000	25																	
		0.587	End of I-24 NB Ramp to NB ETB	LOVERS LANE	4.8	LOVERS LANE	4.213																																							
		4.8	LOVERS LANE	5.759	US 68B OVERPASS	US 41A	0.959	2011	Urban	8549	Actual Count (2012)							18.28%																												
		5.759	US 68B OVERPASS	6.826	US 41A	1.067					11203							Actual Count (2012)	16.80%																											
		6.826	US 41A	7.5	Southern End of Railroad Bridge		0.674																																							
		7.5	Railroad	7.915	US 41 OVERPASS	US 68 UNDERPASS	0.415	1960's	Urban	12737																																				
		7.915	US 41 OVERPASS	9.347	US 68 UNDERPASS		1.432																																							
	9.347	US 68 UNDERPASS	11.697	KY 1682 U-PASS		2.350					11741	Actual Count (2011)																																		
	11.697	KY 1682 U-PASS	12.100			0.403	1960's	Rural	11480																																					
	12.100		16.780	KY 800 U-PASS		4.680																																								
	16.780		22.641	KY 800 U-PASS		5.861																																								
	22.641	KY 800 U-PASS	28.095	HOPKINS COUNTY LINE		5.454																																								
	28.095	HOPKINS COUNTY LINE	29.568	US 41 UNDERPASS		1.473					10902	Actual Count (2012)	33.6%																																	
	29.568	US 41 UNDERPASS	32.861	US 62 OVERPASS		3.293					11736		29.5%																																	
	32.861	US 62 OVERPASS	34.271	WESTERN KENTUCKY PARKWAY		1.410					14570																																			
		Hopkins																																												

Analyzed with ramp data

Adequacy Ratings Provided by KYTC

BMP	EMP	Section Length	Condition	Safety	Service	Composite	Percentile	IRI	VSF	CRF	Lane Width	Median Width	Shoulder Width Right	Peak Capacity	Speed Limit	Horizontal Alignment	Vertical Alignment	Critical Rate Factor	Design Speed	Actual Rate	Average Rate	Critical Rate
0.000	5.175	5.175	35	26	30	91	43.12	78	0.13	0.384168	12	36	10	3922	70	4	2	0.29	65	39.27901	69.44275	102.24435
5.175	6.826	1.651	30	29	40	99	82.21	64	0.29	0.041246	12	36	10	4027	70	0	1	0.29	70	6.35762	105.39792	154.13868
6.826	9.347	2.521	30	29	40	99	82.21	69	0.22	0.697323	12	36	10	4027	70	0	1	0.18	70	105.65500	105.39792	151.51525
9.347	11.697	2.35	30	29	40	99	82.21	75	0.2	0.855741	12	36	10	4027	70	0	1	0.65	70	132.85939	105.39792	155.25656
11.697	28.095	16.398	35	35	30	100	100	73	0.17	0.773109	12	36	10	3922	70	1	1	0.54	70	66.11325	69.44275	85.51613
28.095	34.271	6.176	35	35	30	100	100	69	0.2	1.039096	11	36	10	3744	70	1	2	0.45	70	97.40271	69.44275	93.73796
34.271	42.418	8.147	35	35	30	100	100	67	0.4	0.698682	11	36	10	3867	70	1	1	0.42	70	58.75974	69.44275	84.10078

HORIZONTAL INVENTORY

Urban\ Rural	PI Station	Mile Point	L	Radius (Ft)	Superelevation (e)	e (10% table)	e (8% table)	Target Design Speed (Rural or Urban)	Required Radius (based on Design Speed and 8% Max. Superelevation)	Does Horizontal curve meet/exceed minimum radius for Design Speed	Does Horizontal Curve have superelevation Range between that shown on the 8% & 10% Tables (Table 3-10b & 3-11b)?	In High Crash Segments	In High Crash 0.3 Mile Spot	Is Existing Superelevation Rate Adequate?	Comments	e -superelevation rate shown on plans	f - side friction factor - used a value of 0.1 for all speeds, including those in urban area	Calculated Design Speed based on actual superelevation rate, f, & Curve Radius (equation 3-9)
Rural	404+59.60	1.152	2884.98	7700	2.7	2.80	2.80	70	1810	Yes	No	Y	N	Yes	Using equation 3-9, the calculated design speed based on actual superelevation rate, f, and curve radius is 121 mph. Therefore, the superelevation provided is sufficient.	0.027	0.1	121
Rural	444+59.08	1.909	3899.23	7700	2.7	2.80	2.80	70	1810	Yes	No	Y	N	Yes	Using equation 3-9, the calculated design speed based on actual superelevation rate, f, and curve radius is 121 mph. Therefore, the superelevation provided is sufficient.	0.027	0.1	121
Rural	499+67.53	2.952	1812.42	23000	NC	NC	NC	70	1810	Yes	Yes	Y	N	Yes		-0.02	0.1	166
Rural	603+07.39	4.911	4954.63	12500	RC	RC	RC	70	1810	Yes	Yes	Y	N	Yes		0.02	0.1	150
Urban	647+98.37	5.761	1915.11	23000	NC	NC	NC	50	758	Yes	Yes	Y	N	Yes	*Originally designed as Rural, Now classified as Urban	-0.02	0.1	166
Urban	730+56.24	7.325	1266.48	6875.49	3.2	RC	RC	50	758	Yes	No	Y	Y	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, and although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b for a 50 mph design, it does fall within the range of values for a 70 mph design.	0.032	0.1	117
Urban	778+00.00	8.224		1909.86	6	5.80	5.40	50	758	Yes	No	N	N	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, but less than required for 70 mph.	0.06	0.1	68
Urban	826+83.73	9.149		1909.86	8.3	5.80	5.40	50	758	Yes	No	N	N	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, and is only marginally more than required for 70 mph based on equation 3-9.	0.083	0.1	72
Urban	869+42.74	9.955		1909.86	8.3	5.80	5.40	50	758	Yes	No	N	N	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, and is only marginally more than required for 70 mph based on equation 3-9.	0.083	0.1	72
Urban	888+28.26	10.312		1909.86	8.3	5.80	5.40	50	758	Yes	No	N	N	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, and is only marginally more than required for 70 mph based on equation 3-9.	0.083	0.1	72
Urban	905+23.32	11.031	1138.89	9549.3	1.74	NC	NC	50	758	Yes	No	N	N	Yes	*Originally designed as Rural, now classified as Urban. Super exceeds that required for 50 mph, and although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 130 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.0174	0.1	130
Rural	956+14.73	11.995	2337.22	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	Y	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	990+92.72	12.654	2418.33	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	Y	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105

Urban\ Rural	PI Station	Mile Point	L	Radius (Ft)	Superelevation (e)	e (10% table)	e (8% table)	Target Design Speed (Rural or Urban)	Required Radius (based on Design Speed and 8% Max. Superelevation)	Does Horizontal curve meet/exceed minimum radius for Design Speed	Does Horizontal Curve have superelevation Range between that shown on the 8% & 10% Tables (Table 3-10b & 3-11b)?	In High Crash Segments	In High Crash 0.3 Mile Spot	Is Existing Superelevation Rate Adequate?	Comments	e -superelevation rate shown on plans	f - side friction factor - used a value of 0.1 for all speeds, including those in urban area	Calculated Design Speed based on actual superelevation rate, f, & Curve Radius (equation 3-9)
Rural	1028+24.19	13.361	1500	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	N	Yes	although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	1076+20.70	14.241	960	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	N	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	1119+97.35	15.07	737.78	22918.32	RC	NC	NC	70	1810	Yes	No	Y	Y	Yes	Reverse crown provided, but only normal crown necessary. Superelevation rate is ok.	0.02	0.1	203
Rural	1157+21.12	15.689	604.19	22918.32	RC	NC	NC	70	1810	Yes	No	Y	Y	Yes	Reverse crown provided, but only normal crown necessary. Superelevation rate is ok.	0.02	0.1	203
Rural	1241+28.24	17.367	2346.67	11459.16	RC	RC	RC	70	1810	Yes	Yes	Y	N	Yes		0.02	0.1	144
Rural	1308+71.34	18.644	3144.44	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	N	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	1384+46.05	20.079	3449.44	5729.58	2.8	3.80	3.60	70	1810	Yes	No	Y	N	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	1571+44.94	23.534	1686.67	5729.58	2.8	3.80	3.60	70	1810	Yes	No	N	N	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 105 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.028	0.1	105
Rural	1821+25.00	28.265	2800	4583.664	3.5	4.40	4.40	70	1810	Yes	No	N	Y	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 96 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.035	0.1	96
Rural	1888+84.34	29.546		3819.72	4.2	5.60	5.20	70	1810	Yes	No	N	N	Yes	Although the super rate doesn't fall within the range of values shown on tables 3-10b & 3-11b, equation 3-9 shows a calculated design speed of 90 mph based on existing conditions. Therefore, superelevation provided is sufficient for 70 mph design.	0.042	0.1	90
Rural	200+18.30	31.565	2601.67	11459.16	?	RC	RC	70	1810	Yes		N	Y		Superelevation not listed		0.1	
Rural	300+35.45	33.462	3508.89	7640	?	3.00	2.80	70	1810	Yes		N	N		PC & PT stations on plans do not match this. PI station likely should be listed as 300+85.45. Superelevation not listed.		0.1	

VERTICAL INVENTORY

Urban/Rural	Required Design Speed (70 MPH Rural - 50 MPH Urban)	Station	Elevation	MP	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Design Control Length of Vertical Curve based on K (Crest Vertical table 3-34 & Sag Vertical (Table 3-36) (ft)	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Length of Sag Vertical Curve for Passenger Comfort	Minimum Length of Sag Vertical Curve for Appearance 100 x A	HLSD	SSD	Minimum SSD (based on design speed)	In High Crash Segment (Y or N)	In high Crash 0.3 Mile Spot	
Christian County - MP 0.000																			
Rural	70	346+00.00	541.000	0.042	S	-1.000	3.000	800	4.00	724	668	421.5	400	800		730	N	N	
Rural	70	364+00.00	595.000	0.383	C	3.000	-3.000	2600	6.00	1482					967	730	N	N	
Rural	70	383+80.00	535.600	0.758	S	-3.000	-0.500	1000	2.50	453	418	263.4	250	1933.3		730	Y	N	
Rural	70	409+00.00	523.000	1.235	S	-0.500	0.500	1000	1.00	181	167	105.4	100	3610.8		730	Y	N	
Rural	70	505+50.00	571.250	3.063	C	0.500	-0.500	1200	1.00	247					1679	730	Y	N	
Rural	70	564+00.00	542.000	4.171	C	-0.500	-2.500	1100	2.00	494					1089.4	730	Y	N	
Rural	70	577+00.00	509.500	4.417	S	-2.500	0.530	1400	3.03	548	506	319.3	303	1813.3		730	Y	N	
Rural	70	607+00.00	525.400	4.985	C	0.530	-0.500	1800	1.03	254					1947.6	730	Y	N	
Urban*	50	626+00.00	515.900	5.345	S	-0.500	1.692	1200	2.19	210	366	117.8	219	3430.6		425	N	N	
Urban*	50	642+37.50	543.600	5.655	C	1.692	0.665	675	1.03	86					1388.5	425	N	N	
Urban*	50	650+00.00	556.500	5.799	C	1.692	-1.656	2200	3.35	281					1190.8	425	Y	N	
Urban*	50	666+00.00	530.000	6.103	S	-1.656	1.735	800	3.39	326	566	182.3	339	948.3		425	Y	N	
Urban*	50	685+00.00	562.970	6.462	C	1.735	0.860	1000	0.87	73					1733.3	425	Y	N	
Urban*	50	705+70.00	580.780	6.854	C	0.860	-3.000	954	3.86	324					730.3	425	Y	Y	
Urban*	50	721+00.00	534.880	7.144	S	-3.000	2.989	1525	5.99	575	1000	322	599	993.7		425	Y	Y	
Urban*	50	735+80.00	579.120	7.424	C	2.989	0.494	600	2.50	210					732.4	425	Y	Y	
Urban*	50	739+00.00	580.700	7.485	C	0.494				0						425	Y	Y	
Urban*	50	740+50.00	592.010	7.513	C	3.000	-2.880	1550	5.88	494					754.2	425	N	Y	
Urban*	50	752+00.00	558.890	7.731	S	-2.880	2.450	750	5.33	512	890	286.6	533	588.2		425	N	N	
Urban*	50	763+00.00	585.840	7.94	C	2.450	-3.000	1400	5.45	458					744.5	425	N	N	
Urban*	50	777+00.00	543.840	8.205	S	-3.000	-0.325	1400	2.68	257	447	143.8	268	2240.5		425	N	N	
Urban*	50	811+00.00	532.790	8.849	S	-0.325	4.000	1200	4.33	415	722	232.5	433	1074.4		425	N	N	
Urban	50	836+75.00	635.790	9.336	C	4.000	-1.060	1400	5.06	425					772.7	425	N	N	
Urban*	50	859+75.00	611.410	9.772	S	-1.060	2.400	450	3.46	332	578	186	346	572.2		425	N	N	

Urban/Rural	Required Design Speed (70 MPH Rural - 50 MPH Urban)	Station	Elevation	MP	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Design Control Length of Vertical Curve based on K (Crest Vertical table 3-34 & Sag Vertical (Table 3-36) (ft)	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Length of Sag Vertical Curve for Passenger Comfort	Minimum Length of Sag Vertical Curve for Appearance 100 x A	HLSD	SSD	Minimum SSD (based on design speed)	In High Crash Segment (Y or N)	In high Crash 0.3 Mile Spot
Urban*	50	869+25.00	634.210	9.952	C	2.400	-3.080	1450	5.48	460					755.6	425	N	N
Urban*	50	895+00.00	554.900	10.44	S	-3.080	0.789	800	3.87	371	646	208	387	824.8		425	N	N
Urban*	50	904+00.00	562.000	10.61	C	0.789	-2.720	1000	3.51	295					784.2	425	N	N
Urban*	50	916+50.00	528.000	10.847	S	-2.720	2.250	900	4.97	477	830	267.2	497	732.7		425	N	N
Urban*	50	929+10.00	556.350	11.085	C	2.250	-0.504	1100	2.75	231					928.5	425	N	N
Urban*	50	916+20.00	552.520	11.239	S	-0.500	1.600	400	2.10	202	351	112.9	210	1771.4		425	N	N
Urban*	50	929+00.00	573.000	11.481	C	1.600	-0.600	900	2.20	185					940.5	425	N	Y
Rural	70	944+00.00	564.000	11.765	S	-0.600	1.200	400	1.80	326	301	189.7	180	11200		730	Y	Y
Rural	70	959+00.00	582.000	12.049	C	1.200	0.500	400	0.70	173					1741.4	730	Y	Y
Rural	70	976+00.00	590.500	12.371	S	0.500	3.000	400	2.50	453	418	263.4	250	933.3		730	Y	Y
Rural	70	991+00.00	635.500	12.655	C	3.000	-3.000	2500	6.00	1482					948.2	730	Y	Y
Rural	70	1010+00.00	578.500	13.015	S	-3.000	1.800	900	4.80	869	802	505.8	480	755.5		730	Y	Y
Rural	70	1025+00.00	605.500	13.299	S	1.800	2.903	400	1.10	200	184	116.3	110	1374.5		730	Y	Y
Rural	70	1056+00.00	695.500	13.887	C	2.903	-2.500	2400	5.40	1335					979	730	Y	Y
Rural	70	1086+00.00	620.500	14.455	S	-2.500	0.900	600	3.40	615	568	358.3	340	739.4		730	Y	N
Rural	70	1101+00.00	634.000	14.739	S	0.900	3.000	400	2.10	380	351	221.3	210	1771.4		730	Y	N
Rural	70	1123+00.00	700.000	15.155	C	3.000	-2.400	2200	5.40	1334					937.6	730	Y	Y
Rural	70	1142+00.00	654.400	15.487	S	-2.400	2.600	900	5.00	905	835	526.9	500	728.8		730	Y	Y
Rural	70	1155+00.00	688.200	15.733	C	2.600	-1.000	1500	3.60	889					948.2	730	Y	Y
Rural	70	1165+00.00	678.200	15.923	S	-1.000	0.500	400	1.50	272	251	158.1	150	1036.3		730	Y	N
Rural	70	1173+00.00	682.200	16.074	C	0.500	-1.650	900	2.15	531					951.9	730	Y	N
Rural	70	1186+00.00	660.750	16.32	S	-1.650	1.000	400	2.65	480	443	279.2	265	811.1		730	Y	N
Rural	70	1198+25.00	673.000	16.552	S	1.000	2.000	400	1.00	181	167	105.4	100	1506.2		730	Y	N
Rural	70	1219+50.00	715.500	16.955	C	2.000	-3.000	2000	5.00	1235					929.1	730	Y	N
Rural	70	1268+50.00	568.500	17.883	S	-3.000	3.000	1100	6.00	1086	1002	632.3	600	740.7		730	Y	N
Rural	70	1303+00.00	672.000	18.536	C	3.000	-3.000	2400	6.00	1482					929.1	730	Y	N

Urban/Rural	Required Design Speed (70 MPH Rural - 50 MPH Urban)	Station	Elevation	MP	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Design Control Length of Vertical Curve based on K (Crest Vertical table 3-34 & Sag Vertical (Table 3-36) (ft)	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Length of Sag Vertical Curve for Passenger Comfort	Minimum Length of Sag Vertical Curve for Appearance 100 x A	HLSD	SSD	Minimum SSD (based on design speed)	In High Crash Segment (Y or N)	In high Crash 0.3 Mile Spot
Rural	70	1334+00.00	579.000	19.123	S	-3.000	0.850	700	3.85	697	643	405.7	385	736.9		730	Y	N
Rural	70	1388+00.00	624.900	20.146	C	0.850	-3.000	1600	3.85	951				947		730	Y	N
Rural	70	1412+50.00	551.400	20.61	S	-3.000	3.000	1100	6.00	1086	1002	632.3	600	740.7		730	Y	N
Rural	70	1427+50.00	596.400	20.894	C	3.000	-0.500	1400	3.50	865				929.1		730	Y	N
Rural	70	1449+50.00	585.400	21.311	S	-0.500	0.300	400	0.80	145	134	84.3	80	1857.7		730	Y	N
Rural	70	1459+00.00	588.250	21.491	C	0.300	-0.500	400	0.80	198				1548.8		730	Y	N
Rural	70	1482+00.00	576.750	21.926	S	-0.500	0.750	400	1.25	226	209	131.7	125	1224.5		730	Y	N
Rural	70	1499+50.00	589.875	22.258	C	0.750	-0.500	400	1.25	309				1063.2		730	Y	N
Rural	70	1527+50.00	575.875	22.788	C	-0.500	-1.977	600	1.48	365				1030.3		730	N	N
Rural	70	1547+00.00	544.500	23.071	S	-1.977	2.500	900	4.48	810	748	471.8	448	803.6		730	N	N
Rural	70	1582+00.00	632.000	23.734	C	2.500	-2.928	2400	5.43	1341				976.9		730	N	N
Rural	70	1616+50.00	531.000	24.388	S	-2.928	3.000	1200	5.93	1073	990	624.6	593	808.7		730	N	N
Rural	70	1640+50.00	603.000	24.842	C	3.000	1.500	700	1.50	371				1069.3		730	N	N
Rural	70	1653+50.00	622.500	25.088	C	1.500	-3.000	1900	4.50	1112				954.5		730	N	N
Rural	70	1673+00.00	564.000	25.458	S	-3.000	-0.698	400	2.30	417	384	242.6	230	1195.8		730	N	N
Rural	70	1716+00.00	534.000	26.272	S	-0.698	3.000	700	3.70	669	618	389.6	370	767.2		730	N	N
Rural	70	1744+00.00	618.000	26.802	C	3.000	-3.000	2600	6.00	1482				967		730	N	N
Rural	70	1796+00.00	462.000	27.787	S	-3.000	-2.000	400	1.00	181	167	105.4	100	1506.2		730	N	N
Rural	70	1809+00.00	436.000	28.033	S	-2.000	1.500	1000	3.50	634	585	368.8	350	1114.3		730	N	Y
Rural	70	1835+00.00	475.000	28.52	C	1.500	-0.500	1000	2.00	494				1039.5		730	N	N
Rural	70	1847+00.00	469.000	28.747	S	-0.500	0.500	400	1.00	181	167	105.4	100	1506.2		730	N	N
Rural	70	1861+00.00	476.000	29.013	C	0.500	-2.976	1500	3.48	859				965		730	N	Y
Rural	70	1877+50.00	426.900	29.325	S	-2.976	-0.600	500	2.38	430	397	250.3	238	1268.8		730	N	N
Rural	70	1890+00.00	419.400	29.562	S	-0.600	0.388	400	0.99	179	165	104.1	99	1524		730	N	N
Rural	70	1894+00.00	420.950	29.638	C	0.388	-0.300	400	0.69	170				1769.5		730	N	N
Rural	70	123+00.00	413.850	30.103	S	-0.300	0.272	400	0.57	104	96	60.3	57	2556		730	N	Y

Urban/Rural	Required Design Speed (70 MPH Rural - 50 MPH Urban)	Station	Elevation	MP	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Design Control Length of Vertical Curve based on K (Crest Vertical table 3-34 & Sag Vertical Table 3-36) (ft)	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Length of Sag Vertical Curve for Passenger Comfort	Minimum Length of Sag Vertical Curve for Appearance 100 x A	HLSD	SSD	Minimum SSD (based on design speed)	In High Crash Segment (Y or N)	In high Crash 0.3 Mile Spot
Rural	70	132+00.00	416.300	30.273	C	0.272	0.000	350	0.27	67					4138.7	730	N	Y
Rural	70	138+00.00	416.300	30.387	C	0.000	-0.400	350	0.40	99					2872.5	730	N	Y
Rural	70	150+00.00	411.500	30.614	S	-0.400	0.523	400	0.92	167	154	97.3	92	1623.1		730	N	N
Rural	70	217+50.00	446.820	31.893	C	0.523	-1.316	800	1.84	454					986.6	730	N	N
Rural	70	245+00.00	410.630	32.413	S	-1.316	2.400	600	3.72	673	621	391.6	372	668.8		730	N	Y
Rural	70	256+00.00	437.030	32.622	C	2.400	-1.900	1200	4.30	1062					776	730	N	Y
Rural	70	270+00.00	410.430	32.887	S	-1.900	2.800	600	4.70	851	785	495.3	470	541.2		730	N	N
Rural	70	298+00.00	488.830	33.417	C	2.800	-1.480	1600	4.28	1057					898.2	730	N	N
Rural	70	341+50.00	424.450	34.241	S	-1.480	0.800	400	2.28	413	381	240.3	228	1237.7		730	N	N
Rural	70	359+50.00	438.850	34.582	C	0.800	-0.500	600	1.30	321					1130	731	N	Y
Rural	70	385+00.00	426.100	35.065	S	-0.500	2.000	600	2.50	453	418	263.4	250	1266.7		732	N	N