Appendix G
Interchanges and Ramps

INTERCHANGE VERTICAL RAMP GEOMETRY

Note: Minimum Ramp Design Speed is 25 mph in Urban Area, & 35 mph in Rural Area.																
Urban/Rural	Ramp VPE Station		Notes	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Sag Vertical for Passenger Comfort	Minimum Sag Vertical for Appearance 100 x A	HLSD	SSD	Minimum SSD	Does Vertical Meet MPH Design	Comments
US 62 - Exit 33																
Ramp A	06+75.00			s	-1.450	2.000	200	3.45	576.15	185.5	345	320.6		250	YES	Interchange is lighted & L> L required for Comfort based on a 50 mph design speed, therefore compliant
Ramp B	02+75.00			S	-5.240	2.228	225	7.47	1247.156	196.7	746.8	174.5		250	YES	Interchange is lighted, Length of curve < L required for Comfort based on 50 mph design, but > than L required for 35 mph design, therefore compliant
Ramp C	02+75.00			s	-4.120	1.750	225	5.87	980.29	154.6	587	207.9		250	YES	Interchange is lighted, Length of curve < L required for Comfort based on 50 mph design, but > than L required for 35 mph design, therefore compliant
Ramp D	*			S	-1.280	2.800	225	4.08	681.36	219.4	408	282.8		250	YES	Interchange is lighted & L> L required for Comfort (based on 50 mph design), therefore compliant. * Existing plans has too little information to accurately determine PI Station. Lengths of curve was estimated from old plans. 2.8% upgrade was taken from information provided on ramp development sheet.
US 41 NB	40+50.00			S	-0.300	4.000	500	4.30	718.1	453.1	430	500		250	YES	
	50+50.00			C	4.000	-2.000	1000	6.00					599.7	250	YES	
	69+50.00			S	-2.000	-0.385	400	1.62	269.705	170.2	161.5	969.1		250	YES	
US 41 SB	16+50.00			C	-0.360	0.300	400	0.66					1834.8	250	YES	

INTERCHANGE VERTICAL RAMP GEOMETRY

Urban/Rural	Ramp VPE Station		Notes	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Sag Vertical for Passenger Comfort	Minimum Sag Vertical for Appearance 100 x A	HLSD	SSD	Minimum SSD	Does Vertical Meet MPH Design	Comments
Note: Minimum Ramp Design Speed is 25 mph in Urban Area, & 35 mph in Rural Area.																
KY 800 - Exit 23																
Ramp A	03+50.00			C	1.600	-2.800	400	4.40					445.2	250	YES	
Ramp B	03+00.00			S	-0.830	1.769	400	2.60	434.033	273.9	259.9	847.8		250	YES	
Ramp C	08+50.00			C	3.815	0.698	300	3.12					496.2	250	YES	
Ramp D	02+50.00			C	2.148	-4.000	400	6.15					374.7	250	YES	Although 375'<425' required for 50 mph, this is at the stop condition at the top of the ramp. This meets 45 mph design.
US 68 - Exit 9																
Ramp E	111+50.00			C	-1.630	-6.400	200	4.77					326.2	250	YES	6.4% Downgrade at top of ramp. Stop condition - Meets 40 mph design
	119+00.00			S	-6.400	-2.730	250	3.67	612.89	197.3	367	343.1		250	Yes	Sag on Ramp, meets 40 mph design, Intersection is lighted, and meets requirement for comfort based on 50 mph design- Therefore meets standard.
Ramp F	251+00.00			S	0.720	4.680	350	3.96	661.32	212.9	396	404.1		250	YES	Meets 45 mph design
	256+25.00			C	4.680	0.930	270	3.75					422.7		YES	Crest at top of hill (Stop Condition). Almost meets 50 mph design.
Ramp G	340+00.00			C	-1.000	-6.930	230	5.93					297	250	YES	Crest at top of hill meets 35 mph design, and is sufficient from stop condition or 15 mph approach speed.

INTERCHANGE VERTICAL RAMP GEOMETRY

Note: Minimum Ramp Design Speed is 25 mph in Urban Area, & 35 mph in Rural Area.																
Urban/Rural	Ramp VPE Station		Notes	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Sag Vertical for Passenger Comfort	Minimum Sag Vertical for Appearance 100 x A	HLSD	SSD	Minimum SSD	Does Vertical Meet MPH Design	Comments
	343+00.00			S	-6.930	-0.400	300	6.53	1090.51	284.4	653	238		250	YES	HLSD doesn't meet 35 mph, but interchange ramp is lighted, and the minimum sag vertical for passenger comfort meets 45 mph design.
Ramp H	422+50.00			S	3.040	6.040	300	3.00	501	161.3	300	520		250	YES	
	434+75.00			C	6.040	0.700	200	5.34					302.1	250	YES	Crest at top of hill with (Stop Condition). Meets 35 mph design, a SSD of 305' meets 40 mph design.
US 41 - Exit 8																
Ramp A	131+00.00			S	-1.140	1.891	400	3.03	506.177	163	303.1	629.4		155	#REF!	
	137+25.00			C	1.891	0.500	400	1.39					975.7	155	#REF!	
	140+25.00			S	0.500	1.440	200	0.94	156.98	50.5	94	845.4		155	YES	
Ramp B	290+50.00			C	1.080	-1.410	400	2.49					633.3	155	YES	
	293+50.00			S	-1.410	1.550	200	2.96	494.32	159.1	296	409.9		155	YES	Sag at stop condition doesn't meet 50 MPH design, but meets 35 mph design and it is in urban classification
Ramp C	362+00.00			S	-1.560	0.089	200	1.65	275.383	88.7	164.9	518.1		155		
	374+00.00			C	0.089	-1.920	400	2.01					737.1	155	YES	all verticals ok
Ramp D	452+00.00			S	-1.300	-0.346	150	0.95	159.318	51.3	95.4	647.5		155	YES	all verticals ok
				S	-0.346	0.400	170	0.75	124.582	78.6	74.6	899		155	YES	
US 68 Bypass																
Ramp B1	198+50.00			S	-0.620	0.450	200	1.07	178.69	112.8	107	753.4		155	YES	
Ramp C	101+50.00			S	0.530	1.540	200	1.01	168.67	106.4	101	793		155	YES	
Ramp E	80+00.00			S	-1.840	1.280	670	3.12	521.04	328.8	312	908.9		155	YES	
	87+00.00			C	1.280	-1.457	600	2.74					694.2	155	YES	
Ramp F	203+50.00			S	0.578	3.440	400	2.86	477.954	301.6	286.2	694.6		155	YES	

INTERCHANGE VERTICAL RAMP GEOMETRY

Urban/Rural	Ramp VPE Station		Notes	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Sag Vertical for Passenger Comfort	Minimum Sag Vertical for Appearance 100 x A	HLSD	SSD	Minimum SSD	Does Vertical Meet MPH Design	Comments
Note: Minimum Ramp Design Speed is 25 mph in Urban Area, & 35 mph in Rural Area.																
	209+25.00			C	3.440	-1.886	500	5.33					450.1	155	YES	
	212+75.00			S	-1.886	-0.230	200	1.66	276.552	174.5	165.6	516.3		155	YES	
	217+50.00			S	-0.230	1.760	300	1.99	332.33	209.7	199	2077.1		155	YES	
US 41A- Exit 7																
Ramp G	172+50.00			S	1.000	4.562	400	3.56	594.854	375.4	356.2	503.5		155	YES	
	177+00.00			C	4.562	-0.420	500	4.98					465.4	155	YES	
Ramp H	103+50.00			C	0.860	-1.576	200	2.44					542.9	155	YES	
	106+00.00			C	-1.576	-5.000	300	3.42					465.1	155	YES	
	111+00.00			S	-5.000	0.470	200	5.47	913.49	576.4	547	200.8		155	YES	
	113+00.00			S	0.470	1.830	100	1.36	227.12	143.3	136	343.1		155	YES	
Ramp I	318+75.00			S	-2.250	-1.390	200	0.86	143.62	90.6	86	915.6		155	YES	
	320+75.00			S	-1.390	0.830	200	2.22	370.74	233.9	222	897.9		155	YES	
Ramp J	230+50.00			S	0.350	1.180	200	0.83	138.61	87.5	83	945.3		155	YES	
	236+00.00			C	1.180	-2.520	300	3.70					441.6	155	YES	
	238+25.00			C	-2.520	-4.500	50	1.98					569.9	155	YES	
Lover's Lane - Exit 5																
Ramp A1	10+00.00	Loop Ramp SB exit to EB Lover's Lane		S	-0.325	1.798	400	2.12	354.541	223.7	212.3	1674.5		155	YES	
Ramp A2	02+00.18	SB Entrance to Breathitt	top of ramp terminal	S	-2.657	0.122	200	2.78	464.093	292.8	277.9	464.4		155	YES	
	4+00		top of ramp terminal	C	0.122	-0.897	100	1.02					1108.9	155	YES	
	16+00		TIE	S	-0.897	-0.540	100	0.36	59.619	37.6	35.7	1083.8		155	YES	
Ramp B1	157+40.73	NB Exit from Breathitt		C	0.398	-0.317	600	0.72					1809.1	155	YES	
	175+00			S	-0.317	0.385	400	0.70	117.234	74	70.2	2102.7		155	YES	
	190+00			C	0.385	-0.62	400	1.01					1273.6	155	YES	
	198+50.00			S	-0.62	0.45	200	1.07	178.69	112.8	107	753.4		155	YES	

INTERCHANGE VERTICAL RAMP GEOMETRY

Urban/Rural	Ramp VPE Station		Notes	Crest (C) or Sag (S)	Grade In %	Grade Out %	Plan Length of Vertical Curve (Ft)	A	Maximum Length of Sag Vertical Curve when Drainage is an Issue (K=167)	Minimum Sag Vertical for Passenger Comfort	Minimum Sag Vertical for Appearance 100 x A	HLSD	SSD	Minimum SSD	Does Vertical Meet MPH Design	Comments
Note: Minimum Ramp Design Speed is 25 mph in Urban Area, & 35 mph in Rural Area.																
Ramp B2	287+50.51	NB Exit ramp continuation of Ramp B1		S	0.415	3	300	2.59	431.695	272.4	258.5	703.9		155	YES	
	296+75.51			C	3	2.441	400	0.56					2130.2	155	YES	
Ramp C	101+50			S	0.09	1.54	200	1.45	242.15	152.8	145	578.2		155	YES	
	111+00			C	1.54	-1.63	600	3.17					640.4	155	YES	
Ramp D1	309+50.00	NB Entrance to Breathitt		C	-1.41	-3.2	400	1.79					802.8	155	YES	
	315+00			S	-3.2	2.04	600	5.24	875.08	552.2	524	493.6		155	YES	
D2	188+09.43			S	-1.4024	0.16	400	1.56	260.9208	164.6	156.24	998.6		155	YES	
I-24																
Ramp A	10+50.00			C	1.895	-1.115	400	3.01					558.5	250	YES	
	21+50.00			S	-1.115	1.390	250	2.51	418.335	264	250.5	679.6		250	YES	
Ramp B	8+50			S	-0.640	1.840	150	2.48	414.16	261.3	248	528.8		250	YES	
	20+50.00			C	1.840	-1.687	300	3.53					456	250	YES	
Ramp C	18+50.00			S	0.817	2.563	300	1.75	291.582	184	174.6	699.6		250	YES	
Ramp D	9+00			C	1.000	-0.531	400	1.53					904.8	250	YES	

INTERCHANGE HORIZONTAL RAMP GEOMETRY INVENTORY

Urban/Rural	Ramp/Location	Ramp Type	Minimum Ramp Deisgn Speed	Entrance or Exit Curve	Description	Type	Lane Width	Left Paved Shoulder	Right Paved Shoulder	Typical Meets 2011 AASHTO Lane/Shoulder Width Recommendation Table 3-29 - Page 3-103 and Page 10-102	Rolled Curb Present on curve closest to Breathitt?	Rolled Curb present anywhere on ramp?	Ramp Curve Radius (Non 70 MPH Design Horizontal Curve nearest Entrance/Exit of the Adjacent Parkway/Interstate)	Superelevation	Minimum value of f based on emax of 8% - From AASHTO Table 3-7	Design Speed based on Radius and e using Table 3-10b (e_{max} of 8% for e_{actual} < 8% or Table 3-11b for e $_{actual}$ >8%) in 2011 AASHTO Green Book	Does Ramp Meet AASHTO Min Design Speed (35 MPH Rural-25 MPH Urban)	AASHTO recommended Deceleration Length (Table 10-5 - Exit Ramps)	AASHTO recommended Acceleration Length (Table 10-3 - Entrance Ramps)	Speed Change Lane adjustment for grade AASHTO Table 10-4	Exit Length of Deceleration/ Entrance Length of Acceleration as defined by AASHTO Figure 10-70 & 10-69	Does Ramp Meet Deceleration/Acceleration length as defined by AASHTO?	AASHTO Desired Divergence Angle (Page 10-112)	Ramp Divergence Angle	Does Ramp meet Divergence Angle as defined by AASHTO	Does Ramp Meet Standards for Interstate Compliance	Comments	Speed from formula 3-8 and Friction Factor in Figure 3-6 of Green Book, superelevation and radius of curve
Exit #1 - Breathitt at I-24 (MP 0.298)																												
Rural	Ramp A	Ramp	35	Exit	from SB Breathitt	Taper	15	4	6	Yes	No	No	800	8		50	Yes	340			634.9	Yes	2° - 5°	3.8	Yes	Yes	25:1 Exit Taper	51
Rural	Ramp A	Ramp	35	Entrance	to WB I-24	Parallel	15	4	6	Yes	No	No	800	8		50	Yes		580		1000	Yes				Yes		51
Rural	Ramp B	Ramp	35	Entrance - Add Lane	NB to Breathitt	Parallel	15	4	6	Yes	No	No	1600	5.9		50	Yes		580			Yes				Yes		69
Rural	Ramp B	Ramp	35	Exit	From WB I-24	Taper	15	4	6	Yes	No	No	1600	5.9		50	Yes	340			560.1	Yes	2° - 5°	3.8	Yes	Yes		69
Rural	Ramp C	Loop	25	Entrance - Add Lane	to NB Breathitt	Parallel	15	4	6	Yes	No	No	350	8		35	Yes		1230			Yes				Yes	Add Lane Design	36
Rural	Ramp C	Loop	25	Exit	from EB I-24	Taper	15	4	6	Yes	No	No	350	8		35	Yes	490			520	Yes		parallel exit		Yes		36
Rural	Ramp D	Ramp	35	Exit	from SB Breathitt	Taper	15	4	6	Yes	No	No	3000	5		60	Yes					Yes		Flyover	Yes	Yes	Flyover transitions from 70 mph to 50 mph to 70 mph. Meets design standards	90
Rural	Ramp D	Ramp	35	Entrance	to EB I-24	Parallel	15	4	6	Yes	No	No	1150	7.2		50	Yes		580		1000	Yes				Yes		59
Exit #5 - Lovers Lane (MP 5.175)																												
Urban	Ramp A1	Loop	25	Exit	Loop Ramp SB exit to EB Lover's Lane	Parallel	15	4	6	Yes	No	No	230	7.04	0.2	25	Yes	355			520	Yes		Curvelinear		Yes	AASHTO Green Book allows for 25 mph minimum design for loop ramps. See discussion on Page 10-89 of 2011 Edition. Used 50 mph minimum Urban Interstate design speed due to Urban designation.	32
Urban	Ramp A2	Ramp	25	Entrance	SB Entrance to Breathitt	Parallel	15	4	6	Yes	No	No	1200	7.7	0.12	55	Yes		0		1036.89	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	61
Urban	Ramp B1	Ramp	25	Exit	NB Exit from Breathitt	Taper	15	4	6	Yes	No	No	1000	7.6		50	Yes	0			2797	Yes	2° - 5°		Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed. 12' offset at approx. ml sta 594+50, or approx. 143+61 ramp sta. Parallel Design	57
Urban	Ramp B2	Ramp	25	Exit	NB Exit ramp continuation of Ramp B1	Taper	15	4	6	Yes	No	No	1802.59	5.5		50	Yes	0			588.69	Yes		3.9	Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed. 12' at approx. ml sta 594+50, or approx. 143+61 ramp sta	73
Urban	Ramp D1	Ramp	25	Entrance	NB Entrance to Breathitt	Parallel	15	4	6	Yes	No	No	3000	4.3		55	Yes		0		1153.33	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	88
Exit #6 - US 68B (MP 5.759)																												
Urban	Ramp C	Ramp	25	Entrance	Entrance from US 68B to SB Breathitt	Parallel	15	4	6	Yes	No	No	1000	7.6		50	Yes		0		1009.95	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	57

INTERCHANGE HORIZONTAL RAMP GEOMETRY INVENTORY

Urban/Rural	Ramp/Location	Ramp Type	Minimum Ramp Deisgn Speed	Entrance or Exit Curve	Description	Type	Lane Width	Left Paved Shoulder	Right Paved Shoulder	Typical Meets 2011 AASHTO Lane/Shoulder Width Recommendation Table 3-29 - Page 3-103 and Page 10-102	Rolled Curb Present on curve closest to Breathitt?	Rolled Curb present anywhere on ramp?	Ramp Curve Radius (Non 70 MPH Design Horizontal Curve nearest Entrance/Exit of the Adjacent Parkway/Interstate)	Superelevation	Minimum value of f based on emax of 8% - From AASHTO Table 3-7	Design Speed based on Radius and e using Table 3-10b (e_{max} of 8% for e_{actual} < 8% or Table 3-11b for e $_{actual}$ >8%) in 2011 AASHTO Green Book	Does Ramp Meet AASHTO Min Design Speed (35 MPH Rural-25 MPH Urban)	AASHTO recommended Deceleration Length (Table 10-5 - Exit Ramps)	AASHTO recommended Acceleration Length (Table 10-3 - Entrance Ramps)	Speed Change Lane adjustment for grade AASHTO Table 10-4	Exit Length of Deceleration/ Entrance Length of Acceleration as defined by AASHTO Figure 10-70 & 10-69	Does Ramp Meet Deceleration/Acceleration length as defined by AASHTO?	AASHTO Desired Divergence Angle (Page 10-112)	Ramp Divergence Angle	Does Ramp meet Divergence Angle as defined by AASHTO	Does Ramp Meet Standards for Interstate Compliance	Comments	Speed from formula 3-8 and Friction Factor in Figure 3-6 of Green Book, superelevation and radius of curve
Urban	Ramp E	Ramp	25	Exit	SB Exit to US 68B	Taper	15	4	6	Yes	No	No	1000	7.6		50	Yes	0			738.4	Yes	2° - 5°	3.9	Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed. Taper Ramp Design, Rt Shoulder paved 8' to retaining wall	57
Urban	Ramp F	Ramp	25	Entrance	To NB Breathitt	Parallel	15	4	6	Yes	No	No	2000	5.1		50	Yes		0	1.8	1013.79	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	76
25																												
Exit #7 - US 41A (MP 6.826)																												
Vertical alignment Ck Ramps H & J																												
Urban	Ramp G	Ramp	25	Entrance	SB Entrance to Brethitt	Parallel	15	4	6	Yes	No	No	1200	7		50	Yes		0		1288.4	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	61
Urban	Ramp H	Ramp	25	Exit	NB Exit to US 41A	Taper	15	4	6	Yes	No	No	800	8		50	Yes	0			1020.2	Yes	2° - 5°	3.8	Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed. Taper Ramp Design	51
Urban	Ramp I	Ramp	25	Entrance	NB Entrance to Breathitt	Taper	15	4	6	Yes	No	No	954.93	7.7		50	Yes		0		860.99	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	56
Urban	Ramp J	Ramp	25	Exit	SB Exit to US 41A	Parallel	15	4	6	Yes	No	No	8000	2		45	Yes	175			1232.89	Yes			Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Curvlinear design.	143
Exit #8 - US 41 (MP 7.915)																												
Urban	Ramp A	Ramp	25	Entrance	Entrance to SB Breathitt from US 41	Taper	18	4	6	YES	No	No	1041.74	8.8		50	Yes		0		450	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	60
Urban	Ramp B	Ramp	25	Exit	SB Breathitt Exit to US 41	Taper	19	4	6	Yes	No	No	1145.92	8.3		50	Yes	0			0	Yes		3.8	Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	62

INTERCHANGE HORIZONTAL RAMP GEOMETRY INVENTORY

Urban/Rural	Ramp/Location	Ramp Type	Minimum Ramp Deisgn Speed	Entrance or Exit Curve	Description	Type	Lane Width	Left Paved Shoulder	Right Paved Shoulder	Typical Meets 2011 AASHTO Lane/Shoulder Width Recommendation Table 3-29 - Page 3-103 and Page 10-102	Rolled Curb Present on curve closest to Breathitt?	Rolled Curb present anywhere on ramp?	Ramp Curve Radius (Non 70 MPH Design Horizontal Curve nearest Entrance/Exit of the Adjacent Parkway/Interstate)	Superelevation	Minimum value of f based on emax of 8% - From AASHTO Table 3-7	Design Speed based on Radius and e using Table 3-10b (e_{max} of 8% for e_{actual} < 8% or Table 3-11b for e $_{actual}$ >8%) in 2011 AASHTO Green Book	Does Ramp Meet AASHTO Min Design Speed (35 MPH Rural-25 MPH Urban)	AASHTO recommended Deceleration Length (Table 10-5 - Exit Ramps)	AASHTO recommended Acceleration Length (Table 10-3 - Entrance Ramps)	Speed Change Lane adjustment for grade AASHTO Table 10-4	Exit Length of Deceleration/ Entrance Length of Acceleration as defined by AASHTO Figure 10-70 & 10-69	Does Ramp Meet Deceleration/Acceleration length as defined by AASHTO?	AASHTO Desired Divergence Angle (Page 10-112)	Ramp Divergence Angle	Does Ramp meet Divergence Angle as defined by AASHTO	Does Ramp Meet Standards for Interstate Compliance	Comments	Speed from formula 3-8 and Friction Factor in Figure 3-6 of Green Book, superelevation and radius of curve
Urban	Ramp C	Ramp	25	Entrance	Entrance to NB Breathitt from US 41	Taper	18	4	6	Yes	No	No	2083.48	6		55	Yes		0		0	Yes				Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	77
Urban	Ramp D	Ramp	25	Exit	NB Breathitt Exit to US 41	Taper	18	4	6	Yes	No	No	1909.86	5.4		50	Yes	0			456.3	Yes	2° - 5°	4.5	Yes	Yes	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	75
Exit #9 - US 68 (MP 9.347)																												
Urban	Ramp E	Ramp	25	Entrance	Entrance to SB Breathitt from US 68	Taper	18	4	6	YES	No	No	2083.48	4.59		50	Yes		0							YES	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	76
Urban	Ramp F	Ramp	25	Exit	SB exit from Breathitt to US 68	Taper	18	4	6	YES	No	No	690	10		45	Yes	175			256.3		2° - 5°	4.5	Yes	YES	Used 50 mph minimum Urban Interstate design speed due to Urban designation.	51
Urban	Ramp G	Ramp	25	Entrance	Entrance to NB Breathitt from US 68	Taper	18	5	6	YES	No	Yes	690	10		45	Yes		130		449.9					YES	Used 50 mph minimum Urban Interstate design speed due to Urban designation.	51
Urban	Ramp H	Ramp	25	Exit	NB exit from Breathitt to US 68	Taper	18	4	6	YES	No	No	1432.39	8.3		55	Yes	0			0			4.75	Yes	YES	Used 50 mph minimum Urban Interstate design speed due to Urban designation. Decel/Accel not necessary because design speed for entrance/exit curve >= minimum Mainline Interstate Design Speed.	68
CK ROLLED																												
Exit #11 - KY 1682 Poor House Road (MP 11.697)																												
Urban	es Not Meet Interstate Stand					All Loops	18	0	0	No	Yes																	
CK ROLLED																												
Exit #23 - KY 800 (MP 22.641)																												
Rural	Ramp A	Ramp	35	Entrance	Entrance to SB Breathitt from KY 800	Taper	15	4	6	Yes	No	Yes	716.18	10		50	Yes		580		450	NO				NO	Ramp Acceleration Length too short	51
Rural	Ramp B	Ramp	35	Exit	NB Exit from Breathitt to KY 800	Taper	15	4	6	Yes	No	Yes	716.18	10		50	Yes	340			456.3	Yes	2° - 5°	4.5	Yes	YES		51
Rural	Ramp C	Ramp	35	Exit	SB Exit from Breathitt to KY 800	Taper	14	4	6	Yes	No	Yes	716.18	10		50	Yes	340			456.3	Yes	2° - 5°	4.5	Yes	YES		51
Rural	Ramp D	Ramp	35	Entrance	Entrance to NB Breathitt from KY 800	Taper	14	4	6	Yes	No	Yes	716.18	10		50	Yes		580		450	NO				NO	Ramp Acceleration Length too short	51
Exit #30 - US 41 (MP 29.559)																												
Rural	US 41 NB	Ramp	35	Entrance	NB Entrance from US 41 to NB Breathitt	Taper	16	7	13	Yes	No	Yes	2864.79	4.6		55	Yes		580		450	NO				NO	Ramp Acceleration Length too Short	87

INTERCHANGE HORIZONTAL RAMP GEOMETRY INVENTORY

Urban/Rural	Ramp/Location	Ramp Type	Minimum Ramp Deisgn Speed	Entrance or Exit Curve	Description	Type	Lane Width	Left Paved Shoulder	Right Paved Shoulder	Typical Meets 2011 AASHTO Lane/Shoulder Width Recommendation Table 3-29 - Page 3-103 and Page 10-102	Rolled Curb Present on curve closest to Breathitt?	Rolled Curb present anywhere on ramp?	Ramp Curve Radius (Non 70 MPH Design Horizontal Curve nearest Entrance/Exit of the Adjacent Parkway/Interstate)	Superelevation	Minimum value of f based on emax of 8% - From AASHTO Table 3-7	Design Speed based on Radius and e using Table 3-10b (e_{max} of 8% for e_{actual} < 8% or Table 3-11b for e $_{actual}$ >8%) in 2011 AASHTO Green Book	Does Ramp Meet AASHTO Min Design Speed (35 MPH Rural-25 MPH Urban)	AASHTO recommended Deceleration Length (Table 10-5 - Exit Ramps)	AASHTO recommended Acceleration Length (Table 10-3 - Entrance Ramps)	Speed Change Lane adjustment for grade AASHTO Table 10-4	Exit Length of Deceleration/ Entrance Length of Acceleration as defined by AASHTO Figure 10-70 & 10-69	Does Ramp Meet Deceleration/Acceleration length as defined by AASHTO?	AASHTO Desired Divergence Angle (Page 10-112)	Ramp Divergence Angle	Does Ramp meet Divergence Angle as defined by AASHTO	Does Ramp Meet Standards for Interstate Compliance	Comments	Speed from formula 3-8 and Friction Factor in Figure 3-6 of Green Book, superelevation and radius of curve
Rural	US 41 SB	Ramp	35	Exit	SB Breathitt Exit to KY 41	Taper	16	0	0	No	Yes	Yes	3819.72	3.4		50	Yes	340			795.4	Yes	2° - 5°	4.5	Yes	NO	Rolled Curb	100
Exit #33 - US 62 (MP 32.850)																												
Rural	Ramp A	Ramp	35	Entrance	Entrance to SB Breathitt from US 62	Taper	16	6	7	YES	No		716.2	?		50*	Yes		580		0	NO				NO	*50 mph design using 10% table - No acceleration lane provided & ties to bridge without AASHTO recommended 300' taper (179.72' provided). GUARDAIL IS NON STANDARD (HEIGHT AND POST SPACING)	No super given
Rural	Ramp B	Ramp	35	Exit	SB Exit from Breathitt to US 62		16	4	11	YES	No		716.2	?		50*	Yes	340			100	NO	2° - 5°		Yes	NO	*50 mph design using 10% table - Deceleration Lane inadequate, Parallel Ramp Design.	No super given
Rural	Ramp C	Ramp	35	Exit	NB Exit from Breathitt to US 62	Taper	16	6	8	YES	No		716.2	?		50*	Yes	340			0	NO	2° - 5°	2.58	Yes	NO	*50 mph design using 10% table - No Deceleration Provided.	No super given
Rural	Ramp D	Ramp	35	Entrance	Entrance to NB Breathitt from US 62	Taper	16	6	8	YES	No		716.2	?		50*	Yes		580		100	NO				NO	*50 mph design using 10% table - insufficient acceleration lane provided.	No super given
Exit #34 - I-69 (MP 34.256)																												
Rebuild																												
Rural	Ramp A	Loop			Being rebuilt with DB project																							0
Rural	Ramp B	Loop		Entrance	Loop Ramp from WB WKY to SB Breathitt	WKP Ramp																						0
Rural	Ramp C	Ramp		Entrance	From NB I-69 to SB Breathitt	Taper	16	6	8	YES	No		716.2	10		50	YES		580		450	NO				NO	Insufficient acceleration lane provided.	51
Rural	Ramp D	Loop		Exit	Loop Ramp from SB I-69 to EB WKY	I-69 Ramp																						0
Rural	Ramp E	Ramp		Entrance	WB WKY to NB I-69	WKP Ramp																						0
Rural	Ramp F	Loop		Exit	Loop Ramp from NB Breathitt to SB I-69	Flyover as part of this study																						0
Rural	Ramp G	Ramp		Exit	From NB Breathitt to EB WKY	Taper	16	6	8	YES	No		716.2 (both)	10		50	YES	340			425	Yes	2° - 5°	4.7	Yes	Yes		51
Rural	Ramp H	Ramp		Entrance	Being rebuilt with DB project																							0

Interchange Spacing

MP	RURAL/URBAN	INTERSECTING ROUTE	EXIT	SPACING CROSSROAD TO CROSSROAD
0	RURAL	I-24	1	
5.175	RURAL	Lovers Lane	5	5.175
5.759	URBAN	US 68B/ Dr. Martin Luther King Jr. Way	6	0.584
6.826	URBAN	41A	7	1.067
7.915	URBAN	US 41	8	1.089
9.347	URBAN	US 68	9	1.432
11.697	URBAN	KY 1682	11	2.350
22.641	RURAL	KY 800	23	10.944
29.568	RURAL	US 41	30	6.928
32.85	RURAL	US 62	33	3.282
34.271	RURAL	I 69	34	1.421

Crossroad Access Control

MP	RURAL/URBAN	INTERSECTING ROUTE	EXIT	QUADRANTS	DISTANCE (FEET)
5.175	RURAL	Lovers Lane	5	NE	2836’
				NW	185’
				SE	1375’
				SW	185’
5.759	URBAN	US 68B/ Dr. Martin Luther King Jr. Way	6	NE	700’
				NW	970’
				SE	2637
				SW	970’
6.826	URBAN	41A	7	NE	-188
				NW	208, -780
				SE	670
				SW	245, -617’
7.915	URBAN	US 41	8	NE	304
				NW	355
				SE	480
				SW	**290**
9.347	URBAN	US 68	9	NE	877
				NW	390
				SE	963
				SW	185
11.697	URBAN	KY 1682	11	NE	500
				NW	2980
				SE	1110 OR 480 OR 300
				SW	2980
22.641	RURAL	KY 800	23	NE	460
				NW	600
				SE	510
				SW	506
29.568	RURAL	US 41	30	NE	
				NW	
				SE	315
				SW	3300
32.85	RURAL	US 62	33	NE	65
				NW	790
				SE	1.0 mile
				SW	600