Appendix D KYTC Traffic Forecast



Steven L. Beshear Governor Frankfort, Kentucky 40622 www.transportation.ky.gov/

Michael W. Hancock, P.E. Secretary

MEMORANDUM

TO:

Joseph McClearn, P.E.

Chief District Engineer
District 2 - Madisonville

ATTN:

Nick Hall

FROM:

John Moore, P.E.

Director

Division of Planning

DATE:

February 26, 2014

SUBJECT:

Christian and Hopkins County Traffic Forecast

Breathitt Parkway Deficiencies Study

Item No. N/A

In response to your July 1, 2014 request, we are providing the following forecasts on the attached report:

- 2014 and 2040 Average Daily Traffic
- 2014 and 2040 Peak Hour Traffic
- 2014 and 2040 Daily Truck Percentages

If you have any questions, please call Daniel Hulker of this Division at (502) 782-5064.

JM/DAH/BC

Attachments

c/att: Charles Martin

John Rudd

Paul Looney

Dan Hite

Shane McKenzie Mikael Pelfrey



Executive Summary

Traffic Forecast Report Christian and Hopkins County Traffic Forecast for Breathitt Parkway Deficiencies Study

Prepared for:



Prepared by:

Daniel Hulker

Division of Planning

Kentucky Transportation Cabinet

February 25, 2014

Table of Contents

Vicinity Map	Page 2
Executive Summary	Page 3
Population Summaries	Page 5
Segment Summaries	Page 7
No-Build Summary Maps	Page 10
Build Summary Maps	Page 27

Commonly Used Abbreviations and their Descriptions

ADT	Average Daily Traffic	Without any adjustment
DHV	Design Hour Volume	30 th highest hour of a <u>year</u>
ESAL	Equivalent Single Axle Load	A measure of traffic's impact on roadway
%T	Truck Percentage	The percentage of trucks to total volume
FC	Functional Class	Refers to a road's importance
GR	Growth Rate	A value normally compounded annually
PHF	Peak Hour Factor	Considers a 15 minute spike in an hourly count
K-Factor	K-30 th hour Factor	DHV divided by ADT (DHV/ADT)
D-Factor	Directional Factor	Percentage of dominant flow to total
MP	Mile Point	Miles increase easterly and northerly
ATR	Automatic Traffic Recorder	A permanent & continuous recording station
KYSTM	Kentucky Statewide Model	A computerized representation of KY roads

Vicinity Map 109 **Build Scenario** Note: No difference with 1687 No-Build south of **Hopkins County** Intersection with US 41 (See Page 24 & 29) 1338 1296 1348 1914 No-Build Scenario 1026 624 Intersection with KY 1682 (See Page 21) 1663 (1349) Intersection with US 68 (See Page 19) 1843 Intersection with US 41 (See Page 17) Intersection with US 41A (See Page 16) Intersection with US 68B (See Pages 14 & 15) Intersection with Lovers Ln. (See Pages 13 & 14) 1027 1453 41A Intersection with I-24 (See Page 11) 345 LEGEND Christian and Hopkins County Intersection Breathitt Parkway Parkway Deficiencies Study

Traffic Forecast Executive Summary Christian and Hopkins County: Traffic Forecast for Breathitt Parkway Deficiencies Study

FORECAST SUMMARY

This traffic forecast is for the Breathitt Parkway Deficiencies Study. The forecast covers Breathitt Parkway from it's beginning at the intersection of Interstate 24 in Christian County to milepoint 33.566 in Hopkins County. Ramps at certain intersections are also covered in this report. A No-Build scenario was developed that assumed no additional ramps would be constructed at the partial interchange in Hopkins County at Exit 30. An alternative scenario was developed that would turn Exit 30 from a partial interchange into a full interchange. There were other proposed changes to the geometry of the Breathitt Parkway including a proposal to reconstruct Exit 11 from its current configuration to a diamond interchange. These changes were not expected to significantly alter traffic volumes so no separate alternatives were developed for them.

FORECAST TYPE

The following types of forecasts were developed for the No-Build and the Build Scenarios:

- 2014 and 2040 ADT volumes
- 2014 and 2040 AM and PM peak hour volumes
- 2014 and 2040 Daily Truck Percentages

CURRENT-YEAR VOLUMES

The current year volumes were based upon the ramp counts done by Qk4 in 2013 as well as the most recent volume and class counts on the Breathitt Parkway done by KYTC.

Station	County	Milepoint	ADT	Year
054-262	Hopkins	33.5	14,600	2012
054-264	Hopkins	32	11,700	2012
024-105	Christian	23.1	10,900	2012
024-123	Christian	22	11,500	2012
024-A81	Christian	11.425	11,800	2011
024-A73	Christian	8.6	16,100	2012
024-A82	Christian	7.3	12,700	2012
024-D07	Christian	6.292	11,200	2012
024-D06	Christian	5.467	8,600	2012
024-566	Christian	2.587	9,500	2012

The ADT volumes for the Breathitt Parkway on the segment charts and the summary maps will differ from the most recent counts due to balancing volumes. This variance is due to ramp and mainline volume counts not being measured on the same days.

DESIGN-YEAR/GROWTH FACTORS

The growth rates of the Breathitt Parkway were determined by cross streets of each intersection, historic parkway counts, the statewide model, and the US Census projections. The US census projects Christian County's population to grow at a rate of 2% through to 2035. Hopkins County's population is projected to decrease at a rate of -0.04% through to 2035. Each cross street's historic growth rate was examined to determine the rate at which ramps connecting the streets to the Breathitt Parkway might also increase in traffic. The overall increase in ramp traffic drove the increases in Breathitt Parkway traffic and was consistent with the rate of traffic growth predicted by the Kentucky Statewide Model or about 1% annually.

DESIGN HOUR FACTORS

The design hour factor was determined by the peak hour of traffic of each ramp count or the most recent count of each section of the Breathitt Parkway.

TRUCK PERCENTAGE

Where possible, mainline Breathitt Parkway truck counts were used to estimate the truck percentages and other sections of the Breathitt Parkway were estimated based upon the sections of the parkway with available class count data. Ramp truck percentages were based upon the functional class averages of the cross streets they intersected.

ESALs

The ESAL values were not requested and therefore not included.

TURN MOVEMENTS

Turn movements were not requested and therefore not included.

	00 - 10	Pct	Change	7.4%	2.3%
	90 - 00	Pct	Change	89.6	4.8%
	80 - 90	Pct	Change	0.7%	3.1%
	70 - 80	Pct	Change	13.6%	18.9%
ARY	02 - 09	Pct	Change	%0.9	
AL POPULATION SUMMARY		2010	Population	4,339,367	73,955
DPULATIC		2000	Population	4,041,769	72,265
HISTORICAL PO		1990	Population	3,686,892	68,941
HISTO		1980	Population	3,660,334	828,999
		1970	Population	3,220,711	56,224
		1960	Population	3,038,156	£
				Kentucky	Christian Co

Sources: US Bureau of the Census; Kentucky State Data Center

	30 - 35	Pct	Change	2.9%	7.5%
	25 - 30	Pct	Change	3.4%	8.0%
	20 - 25	Pct	Change	3.6%	8.2%
RY	15-20	Pct	Change	3.6%	8.3%
SUMMA	10 - 15	Pct	Change	3.9%	23.3%
PROJECTIONS (2035	Projection	5,147,274	124,142
		2030	Projection	5,001,748	115,451
POPULATION		2025	Projection	4,838,370	106,897
FUTURE PO		2020	Projection	4,669,801	98,768
FU		2015	Projection	4,506,569	91,158
		2010	Projection	4,339,367	73,955
				Kentucky	Christian Co

Sources: US Bureau of the Census; Kentucky State Data Center

PROJECTIONS			% 0.55%	
PROJE	25-3	GR	0.58%	1.46%
	20 - 25	GR	0.67%	1.55%
L DATA	15 - 20	GR	0.71%	1.59%
ROM HISTORICAL DATA AND	10 - 15	S. S	0.71%	1.62%
FROM I	05 - 10	GR	0.76%	4.27%
GROWTH RATES	00 - 06	GR	0.92%	0.47%
GROWT	80 - 90	SR	0.07%	0.30%
POPULATION	70 - 80	GR	1.29%	1.75%
_	02 - 09	GR SR	0.59%	J
ANNO			Kentucky	Christian Co

:	00 - 10 Pct Change 7.4% 0.9%		30 - 35	Pct Change 2.9%	%9·0-			10 - 35 GR	0.69%	
1	90 - 00 Pot Change 9.6% 0.9%		25 - 30	Pct Change 3.4%	-0.3%		TIONS	10 - 30 GR	0.55%	
)	80 - 90 Pct Change 0.7% -0.1%		20 - 25	Pct Change 3.6%	-0.1%		ROJEC	25 - 30 GR	0.58%	
	70 - 80 Pct Change 13.6% 21.0%	}	15-20	Pct Change 3.6%	0.3%		AND P	20 - 25 GR	0.67% -0.06%	
ARY	60 - 70 Pct Change 6.0%	1	10 - 15	Pct Change 3.9%	-0.2%		IL DATA	15 - 20 GR	0.71%	
HISTORICAL POPULATION SUMMARY	2010 Population 4,339,367 46,920	CIACI	TOTORE TOTOREALION TROJECTIONS SOMMAN.	2035 Projection 5,147,274	46,472		ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS	10 - 15 GR	0.71%	
PULATIC	2000 Population 4,041,769 46,519	<u>.</u>	TROOP N	2030 Projection 5,001,748	46,759		FROM H	05 - 10 GR	0.76%	
RICAL PC	1990 Population 3,686,892 46,126	enter		2025 Projection 4,838,370	46,898	enter	H RATES	90 - 00 GR	0.92%	
HISTO	1980 Population 3,660,334 46,174	State Data Ce	JUNE TO	2020 Projection 4,669,801	46,951	State Data Ce	GROWT	80 - 90 GR	0.07%	
	1970 Population 3,220,711 38,167	sus; Kentucky	2	2015 Projection 4,506,569	46,823	sus; Kentucky	ULATION	70 - 80 GR	1.29%	
	1960 Population 3,038,156	u of the Cens		2010 Projection 4,339,367	46,920	tu of the Cens	UAL POF	60 - 70 GR	0.59%	
	Kentucky Hopkins Co	Sources: US Bureau of the Census; Kentucky State Data Center		Kentucky	Hopkins Co	Sources: US Bureau of the Census; Kentucky State Data Center	ANN		Kentucky Hopkins Co	

See Map	on Page	56	25	24	24	23	22	21	21	21	21	20	19	19	19	19	18	17	17	17	17	17	16	16	16	16	
	_	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	l
Truck %	2014 2040	18 %	%81 %	% 53%	% 53%	% T8%	%81 %	% 14%	% 14%	% 14%	% 14%	%81 %	% 14%	% 14%	% 14%	% 14%	%81 %	% 14%	% 14%	% 14%	% 14%	%81 %	% 14%	% 14%	% 14%	% 14%	
Ė		15%	12%	70%	70%	%ST 0	15%	10%	10%	10%	10%	%ST 0	10%	10%	10%	10%	15%	10%	10%	10%	10%	15%	10%	10%	10%	10%	l
PM Peak	2040	1,400	1,200	40	40	1,200	1,000	280	410	08	100	1,700	06	120	280	280	2,000	240	360	290	180	2,000	470	550	300	220	its.
PM	2014	1,100	930	30	30	880	780	210	310	09	80	1,300	70	06	200	200	1,500	160	250	190	120	1,500	360	420	240	170	intdig
sak	2040	1,200	1,100	30	40	1,000	920	420	280	80	80	1,600	150	06	260	250	1,900	370	180	170	240	1,600	420	370	140	260	gnifica
AM Peak	2014	900	810	20	30	170	069	320	210	09	09	1,200	110	20	190	180	1,400	250	120	110	160	1,200	320	280	110	200	two si
ADT	GR 2	1.0%	1.0%	0.5%	0.5%	0.3%	1.1%	1.0%	1.0%	1.0%	1.0%	1.1% 1	1.2%	1.2%	1.2%	1.2%	1.2%	2%	1.5%	1.5%	1.5%	1.1%	1.0%	1.0%	1.0%	1.0%	eyond
A		_		_														1,									racy b
ADT	2040	18,800	15,100	320	320	14,400	13,100	3,900	3,800	006	1,000	18,900	1,200	1,200	3,300	3,300	23,100	3,400	3,200	2,700	2,500	21,700	5,700	000'9	2,800	2,600	faccui
A	2014	14,600	11,600	300	300	11,000	9,800	3,000	2,900	200	800	14,200	006	006	2,400	2,400	17,200	2,300	2,200	1,800	1,700	16,200	4,400	4,600	2,200	2,000	ative o
Flow	DIR	ВОТН	вотн	SB	NB	ВОТН	ВОТН	SB	NB	SB	NB	ВОТН	SB	NB	SB	NB	ВОТН	SB	NB	SB	NB	ВОТН	SB	NB	SB	NB	as indi
NO BUILD SEGMENT INFORMATION	EMP RD NAME	1 33,566 Edward T Breathitt Parkway	29.568 32.861 Edward T Breathitt Parkway	0.463 EB Parkway Ramp to US 41	0.825 EB Parkway Ramp from US 41	22.641 29.568 Edward T Breathitt Parkway	22.641 Edward T Breathitt Parkway	0.207 EB Parkway Ramp from KY 1682	0.2 EB Parkway Ramp to KY 1682	0.194 EB Parkway Ramp to KY 1682	0.183 EB Parkway Ramp from KY 1682	7 11.7 Edward T Breathitt Parkway	0.239 EB Parkway Ramp to US 68	0.269 EB Parkway Ramp from US 68	0.36 EB Parkway Ramp from US 68	0.363 EB Parkway Ramp to US 68	5 9.347 Edward T Breathitt Parkway	0.246 EB Parkway Ramp to US 41	0.369 EB Parkway Ramp from US 41	0.362 EB Parkway Ramp from US 41	0.321 EB Parkway Ramp to US 41	6 7.915 Edward T Breathitt Parkway	0.259 EB Parkway Ramp to US 41A	0.594 EB Parkway Ramp from US 41A	0.383 EB Parkway Ramp from US 41A	0.425 EB Parkway Ramp to US 41A	* All Figures are subject to rounding and balancing and should not be taken as indicative of accuracy beyond two significant digits.
NO BUIL	BMP	32.861	29.568	0	0	22.641	11.7	0	0	0	0	9.347	0	0	0	0	7.915	0	0	0	0	6.826	0	0	0	0	ect to r
	ROUTE UNIQUE ID	054-EB-9004 -000	054-EB-9004 -000	054-EB-9004 -131	054-EB-9004 -121	024-EB-9004 -000	024-EB-9004 -000	024-EB-9004 -431	024-EB-9004 -421	024-EB-9004 -441	024-EB-9004 -411	024-EB-9004 -000	024-EB-9004 -331	024-EB-9004 -321	024-EB-9004 -341	024-EB-9004 -311	024-EB-9004 -000	024-EB-9004 -231	024-EB-9004 -221	024-EB-9004 -241	024-EB-9004 -211	024-EB-9004 -000	024-EB-9004 -131	024-EB-9004 -121	024-EB-9004 -141	024-EB-9004 -111	* All Figures are sub

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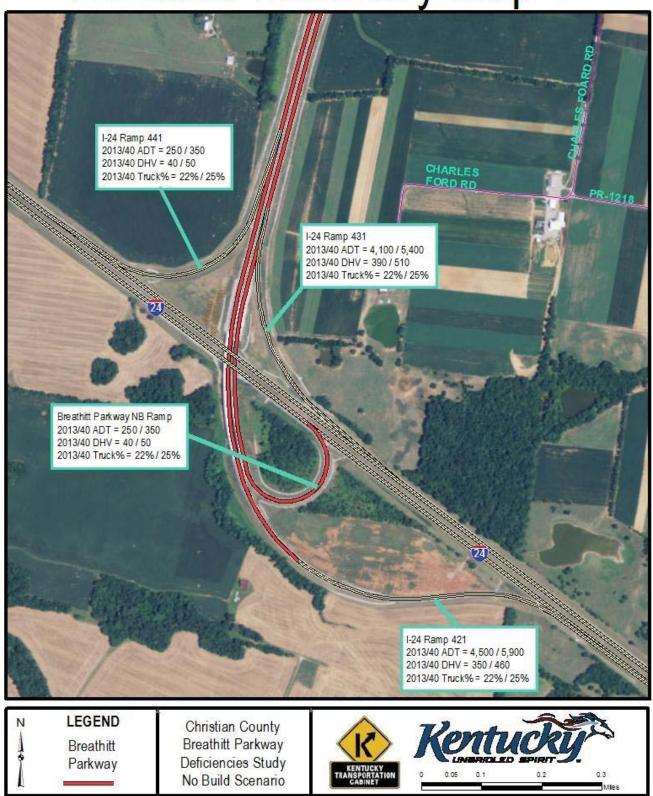
2	NO BUILD SEGMENT II	SEGME	NT INFORMATION	Flow	ADT	T	ADT	AM Peak	eak	PM Peak	eak	Truck %		See Map
ROUTE UNIQUE ID	BMP	EMP	RD NAME	DIR	2014	2040	GR	2014	2040	2014	2040	2014 2040	_	on Page
024-EB-9004 -000	5.759	6.826 Edw	Edward T Breathitt Parkway	вотн	14,000	15,400	0.4%	1,100	1,200	1,300	1,400	791	50%	16
024-EB-9004 -631	0	0.457 EB P	EB Parkway Ramp to US 68B	SB	2,300	3,400	1.5%	170	250	250	370	10%	14%	15
024-EB-9004 -621	0	0.455 EB P	EB Parkway Ramp from US 68B	NB	2,000	2,900	1.5%	200	290	160	230	10%	14%	15
024-EB-9004 -641	0	0.258 EB P	EB Parkway Ramp from US 68B	SB	1,500	2,200	1.5%	170	250	120	180	10%	14%	14
024-EB-9004 -611	0.774	0.91	EB Parkway Ramp to US 68B	NB	1,200	1,800	1.5%	90	140	150	230	10%	14%	14
024-EB-9004 -612	0	0.2	EB Parkway Ramp to US 68B	NB	100	200	1.5%	10	20	10	20	10%	14%	14
024-EB-9004 -611	0	0.774 EB P	EB Parkway Ramp to US 68B	NB	1,100	1,600	1.5%	80	120	140	200	10%	14%	13, 14
024-EB-9004 -000	5.175	5.759 Edw	Edward T Breathitt Parkway	ндоя	8,700	10,700	7.0%	750	920	850	1,000	11%	21%	14
024-EB-9004 -721	0.268	0.412 EB P	EB Parkway Ramp from Lovers Ln.	NB.	400	009	1.5%	09	06	40	09	10%	14%	14
024-EB-9004 -721	0	0.268 EBP	EB Parkway Ramp from Lovers Ln.	NB	200	200	1.5%	40	09	70	100	10%	14%	14
024-EB-9004 -744	0	0.157 EB P	EB Parkway Ramp to Lovers Ln.	SB	400	009	1.5%	20	30	09	06	10%	14%	13
024-EB-9004 -741	0	0.362 EB P	EB Parkway Ramp from Lovers Ln.	SB	100	150	1.5%	15	20	10	15	10%	14%	13
024-EB-9004 -711	0	0.129 EB P	EB Parkway Ramp to Lovers Ln.	NB	1,200	1,800	1.5%	06	140	160	230	10%	14%	13
024-EB-9004 -711	0.129	0.446 EB P	EB Parkway Ramp to Lovers Ln.	NB	100	150	1.5%	10	20	20	30	10%	14%	13
024-EB-9004 -000	0	5.175 Edw	ard T Breathitt Parkway	вотн	9,100	12,000	1.1%	800	1,100	006	1,200	75%	25%	12
024-1-0024 -441	0	0.569 1-24	I-24 Ramp from EB Parkway	8S	250	350	%5'0	30	40	40	20	75%	72%	11
024-1-0024 -431	0	0.555 1-24	I-24 Ramp from EB Parkway	NB	4,100	5,400	1.1%	300	400	390	510	22%	25%	11
024-1-0024 -421	0	0.741 1-24	I-24 Ramp from EB Parkway	SB	4,500	5,900	0.7%	350	460	300	390	25%	72%	11
024-EB-9004 -000	0	0.204	0.204 Parkway Ramp From I-24 to EB	NB	250	350	0.5%	30	40	40	20	22%	25%	11
			Parkway											
* All Figures are subj	ect to ro	unding	* All Figures are subject to rounding and balancing and should not be taken as indicative of accuracy beyond two significant digits.	n as indi	cative of	accurac	y beyor	d two	significa	ant digi	ts.			

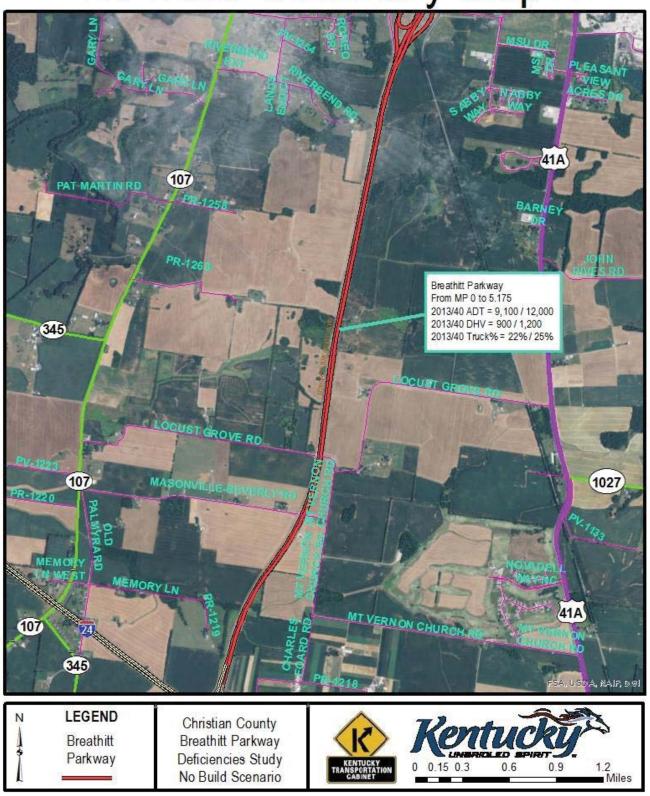
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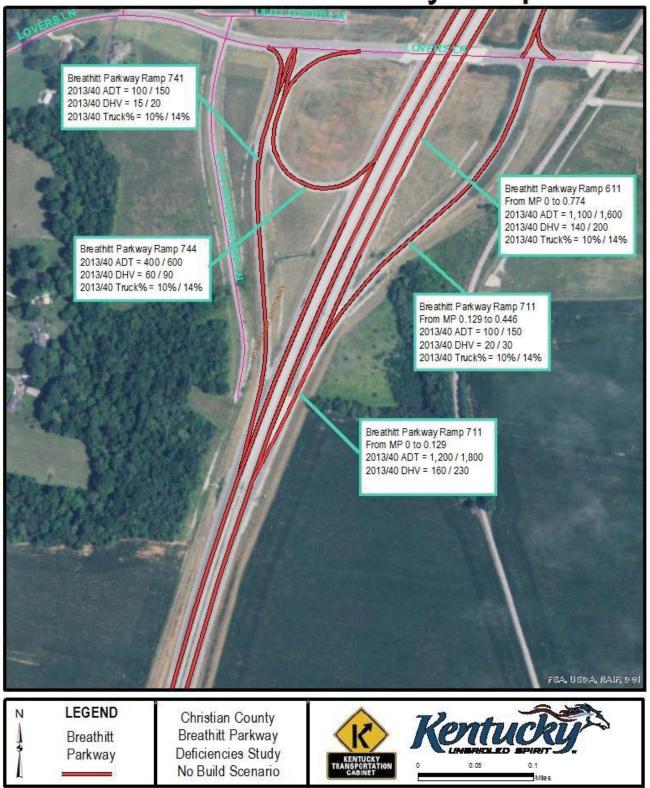
	10.	BUILD	BUILD SEGMENT	NT INFORMATION	Flow	ADI	T	ADT	AM Peak	eak	PM Peak	eak	%L		See Map
	ROUTE UNIQUE ID	BMP	EMP	RD NAME	DIR	2014	2040	GR	2014	2040	2014	2040	2014	040	on Page
<	054-EB-9004 -000	32.861	33,566	32.861 33.566 Edward T Breathitt Parkway	ВОТН	14,000	18,200	1.0%	026	1,200	1,100	1,400	15%	%81	31
100000	054-EB-9004 -000	29.568	32.861	29.568 32.861 Edward T Breathitt Parkway	ВОТН	11,000	14,400	1.0%	800	1,100	006	1,200	15%	18%	30
	054-EB-9004 -131	0	0.463	0.463 EB Parkway Ramp to US 41	SB	300	320	0.5%	20	30	30	40	70%	23%	59
	054-EB-9004 -121	0	0.825	EB Parkway Ramp from US 41	NB	300	350	0.5%	30	40	30	40	70%	23%	29
цµ	Unknown	N/A	N/A	New Ramp from US 41 to EB Parkway	SB	300	350	0.5%	20	30	30	40	70%	23%	29
οN	Unknown	N/A	N/A	New Ramp from EB Parkway to US 41	NB	300	350	0.5%	30	40	30	40	50%	23%	29
	024-EB-9004 -000 22.641 29.568 Edward	22.641	29.568	Edward T Breathitt Parkway	ВОТН	11,000	14,400	0.3%	770	1,000	880	1,200	15%	78%	28
	* All Figures are subject to rounding and baland	ect to ro	unding a	and balancing and should not be taken as indicative of accuracy beyond two significant digits	indicative	e of accu	racy bey	ond tw	o signif	icant d	igits.				
	*The Build scenario	does not	differ fr	*The Build scenario does not differ from the No-Build scenario south of EB parkway Milepoint 29	way Mil	epoint 2	6								

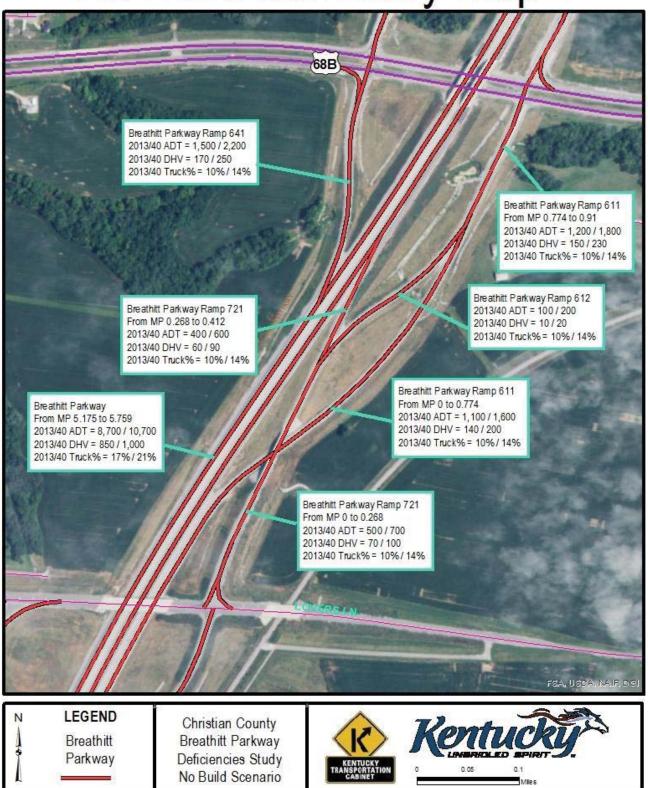
KYTC Division of Planning

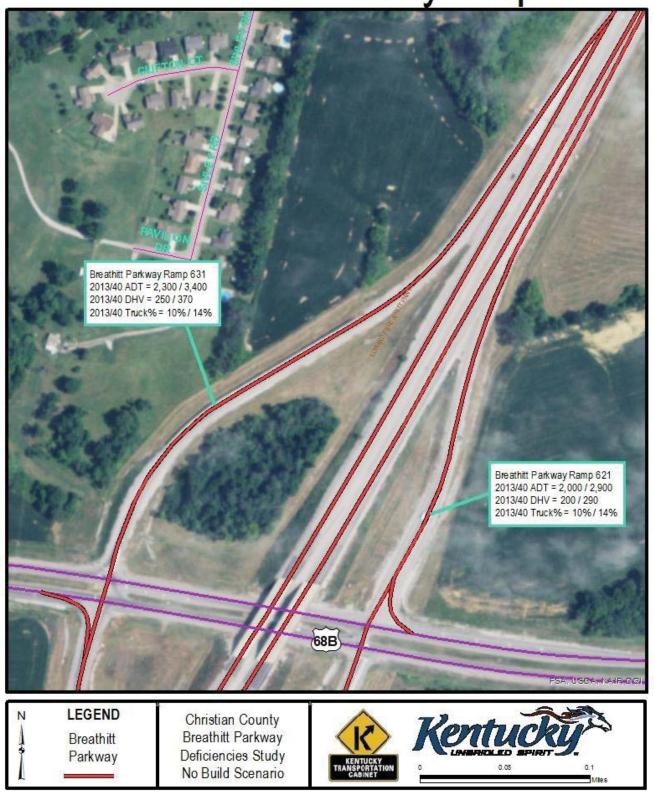
Traffic Forecast Technical Report Christian & Hopkins County: Traffic Forecast for Breathitt Parkway Deficiencies Study

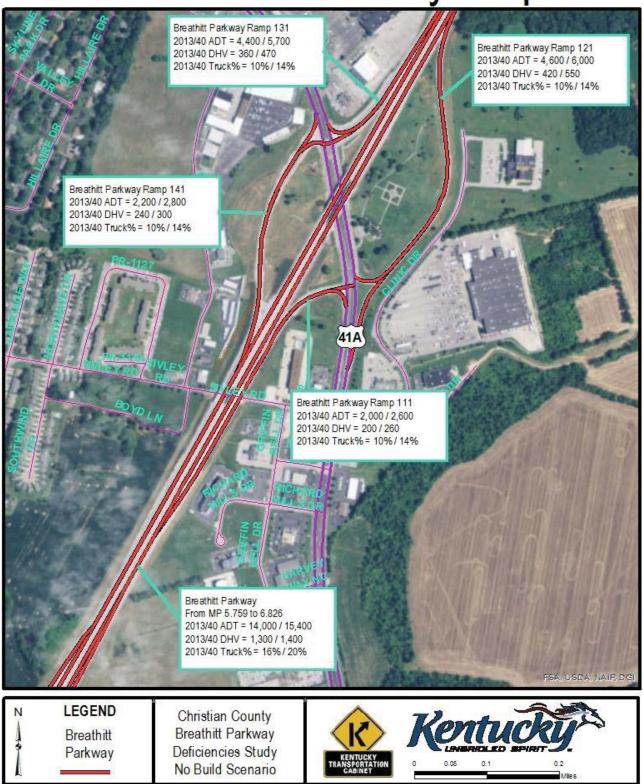


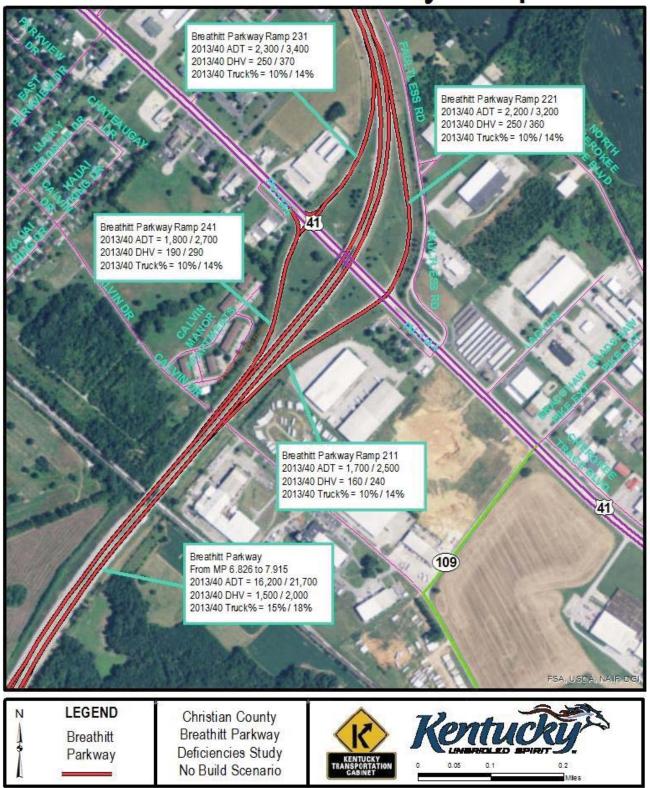


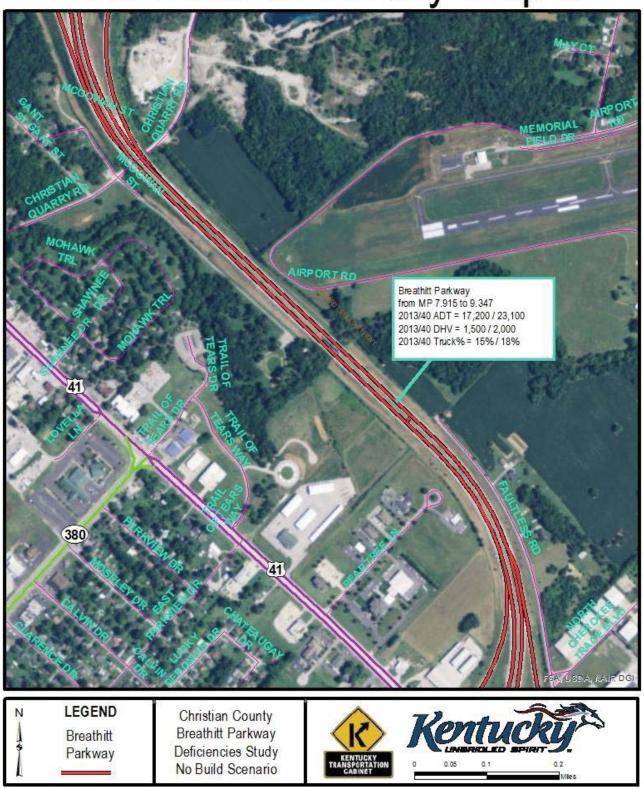


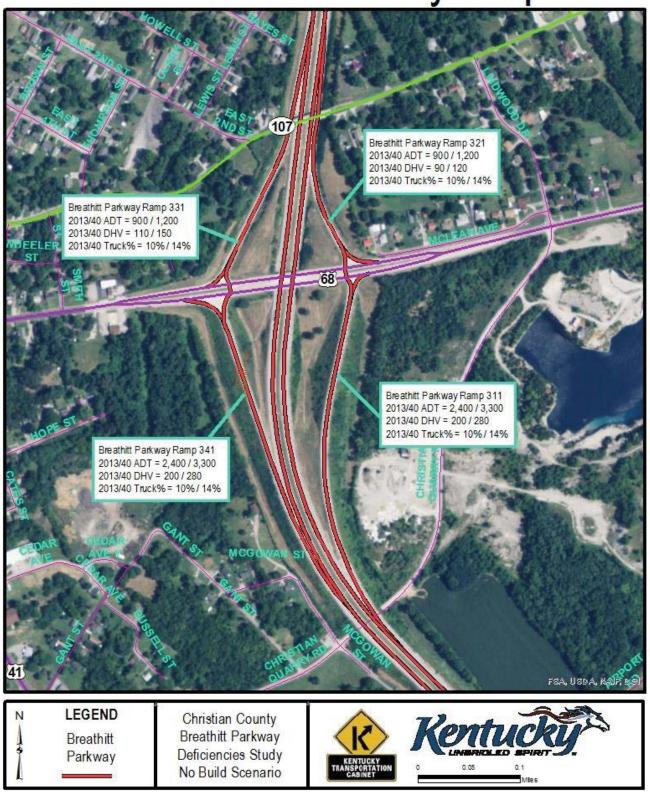


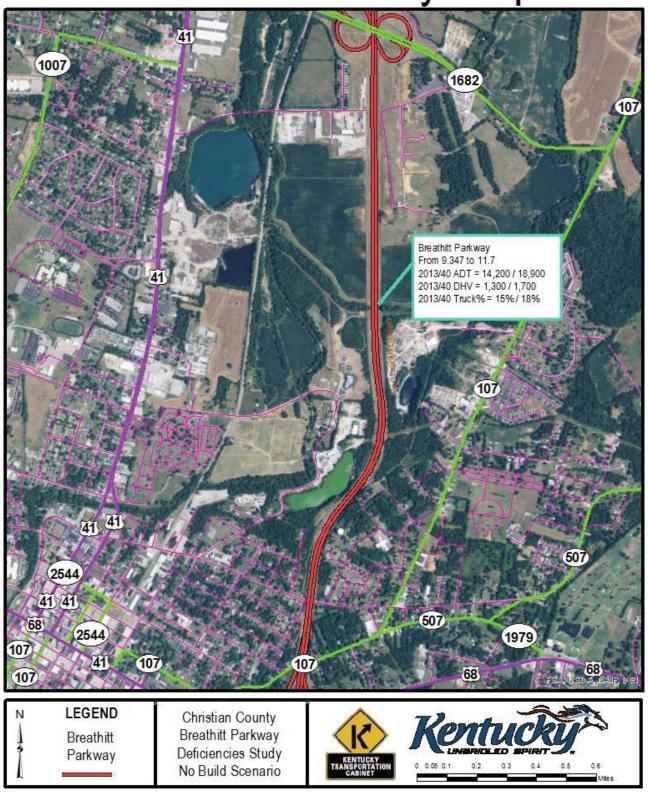


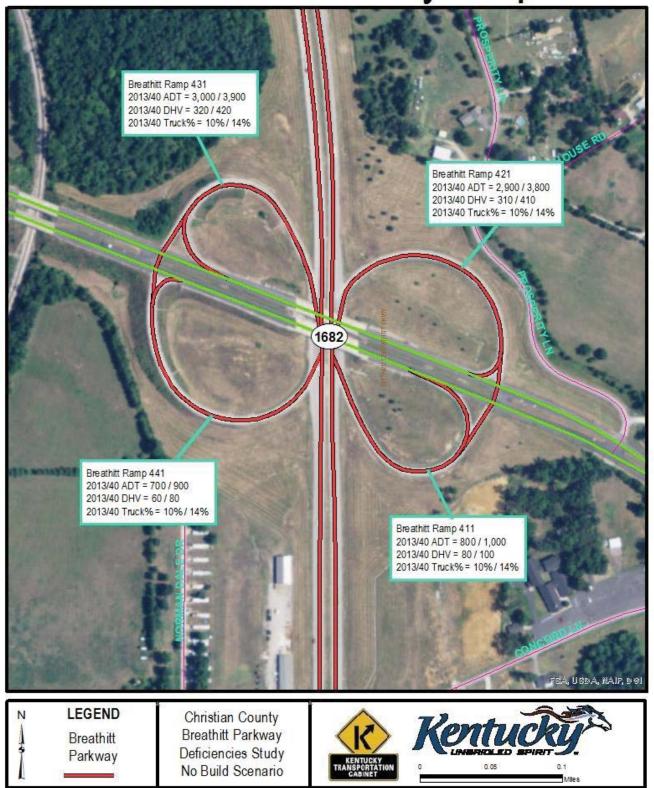


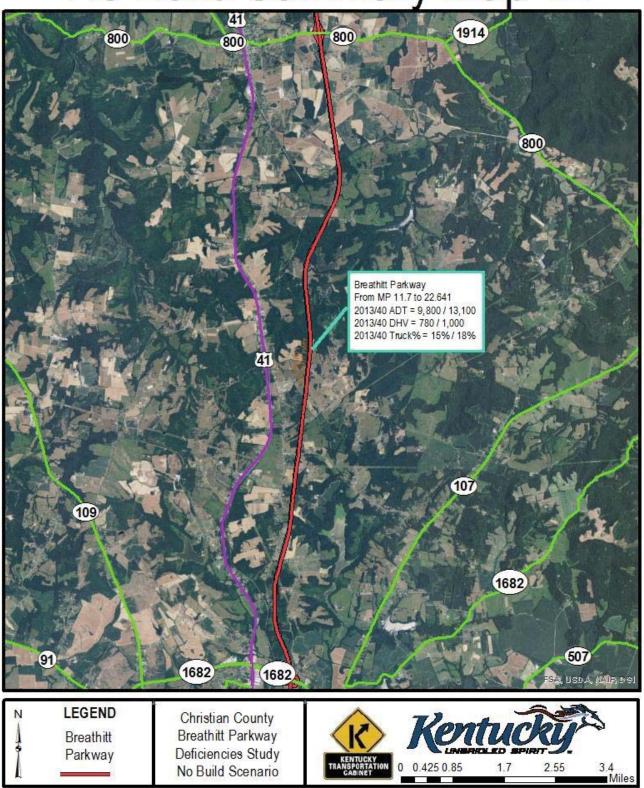


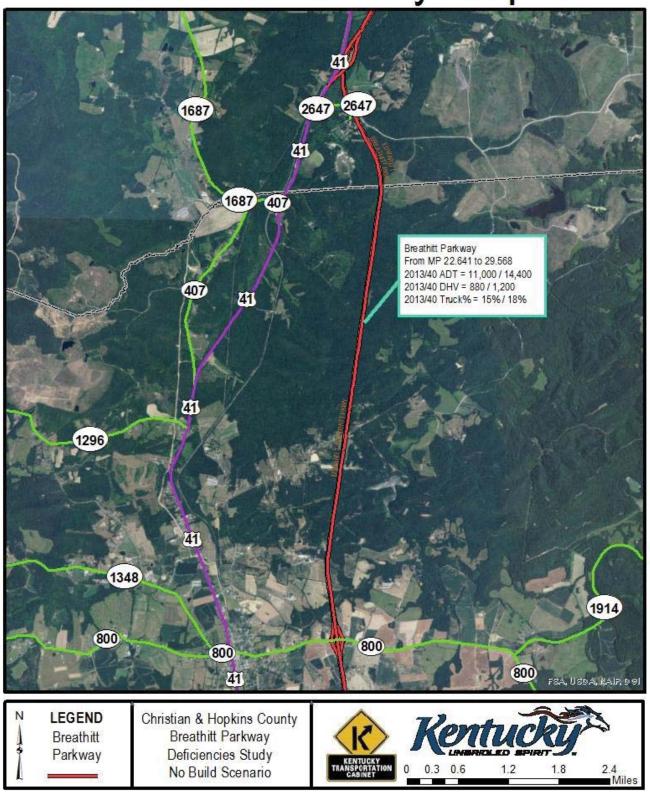


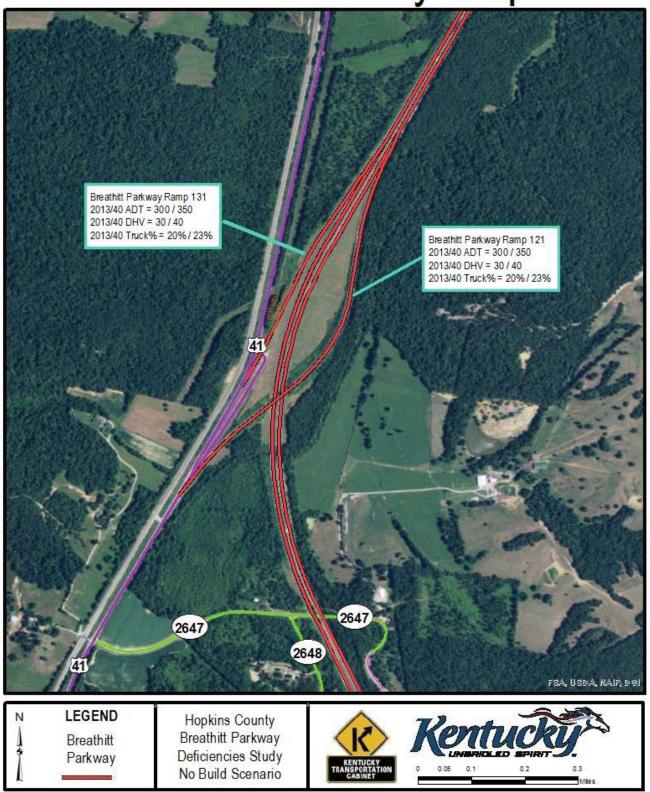


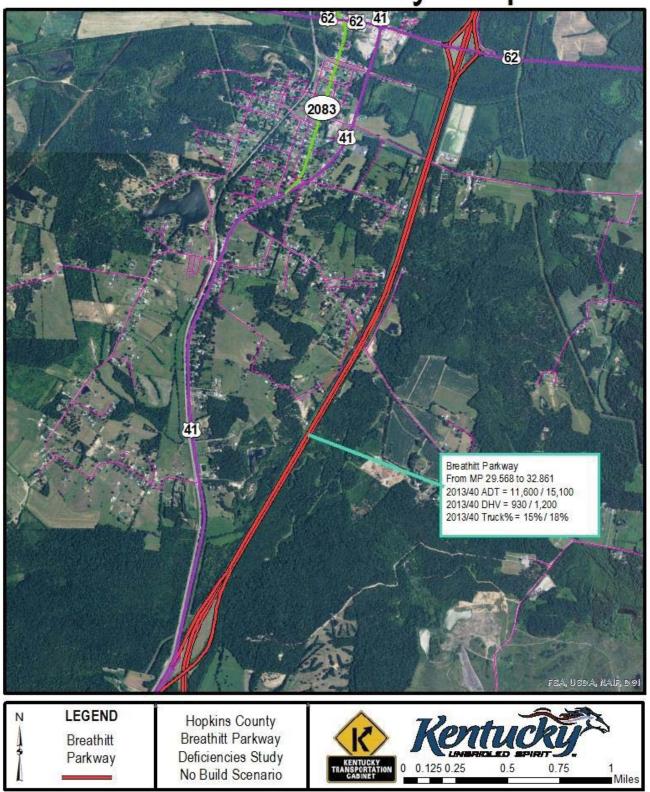


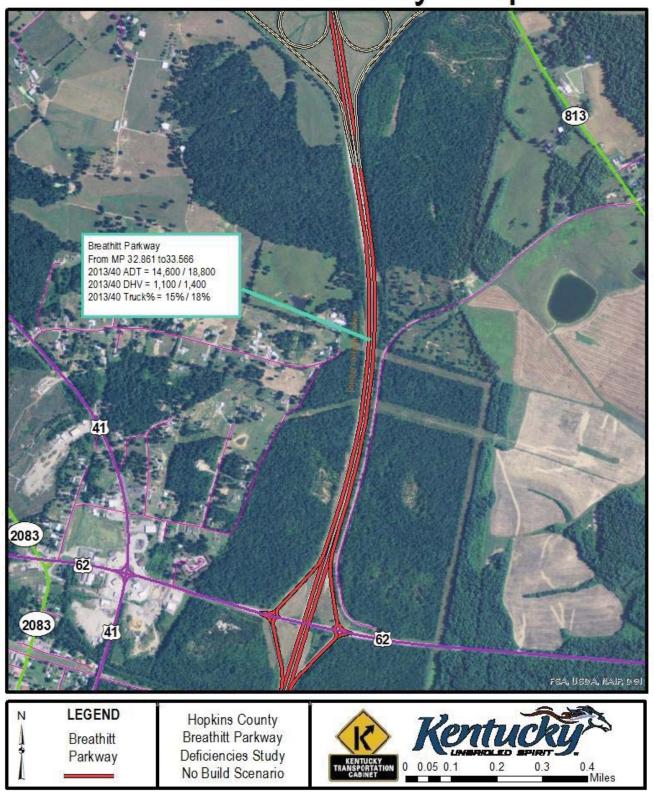


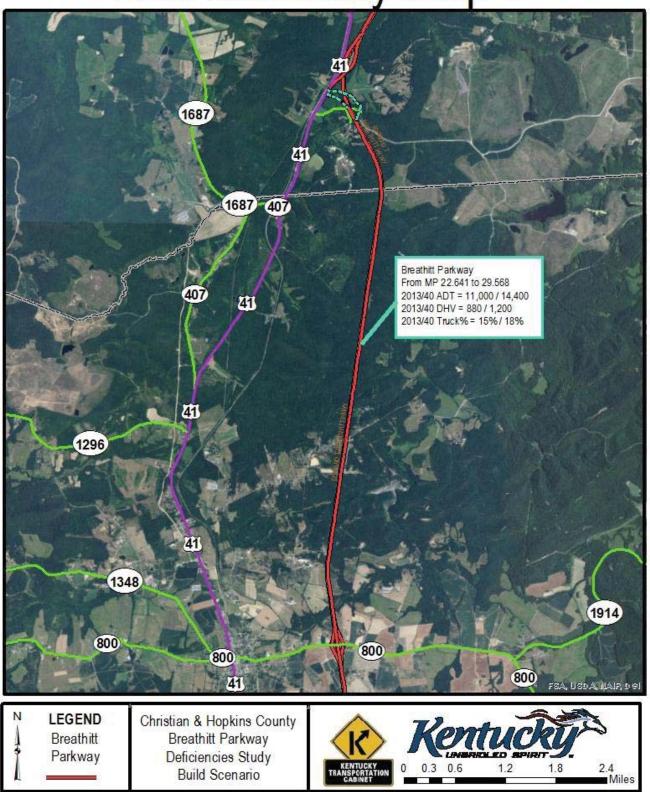




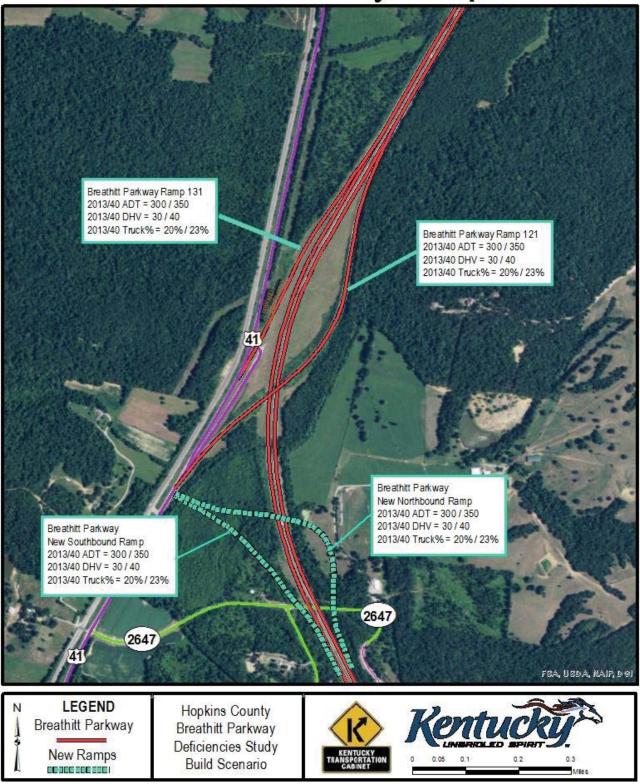


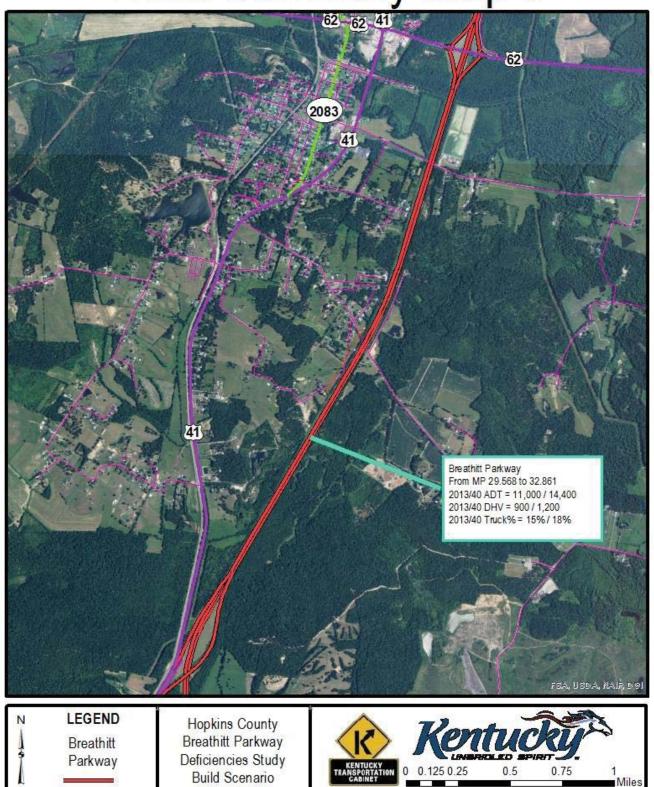


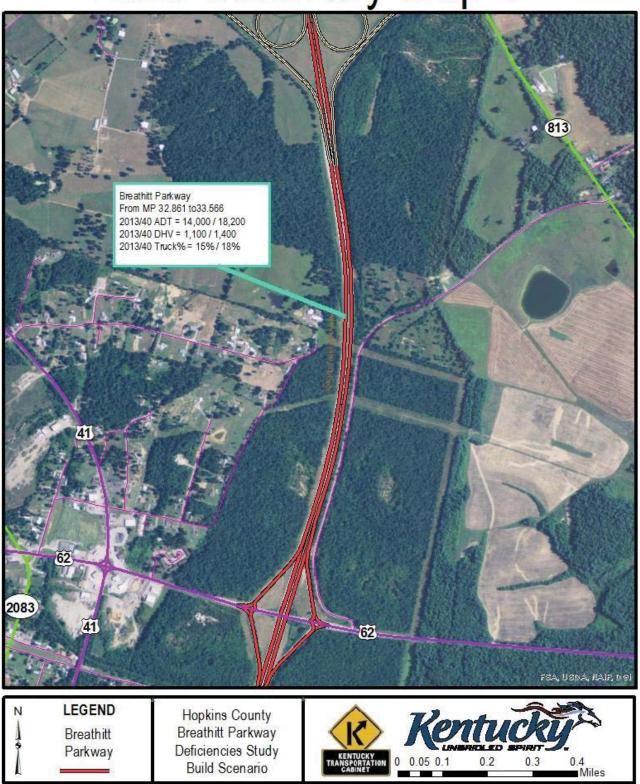




Note: The Build and No-Build Scenarios do not differ from each other south of the US 41 Exit in Hopkins County







Traffic Forecast Technical Report Christian & Hopkins County: Traffic Forecast for Breathitt Parkway Deficiencies Study