

APPENDIX D:

Traffic Forecast

Traffic Forecast Report

US 25 from Corbin to London Connector Study

Laurel County

11-8515.00

Prepared for:

Kentucky Transportation Cabinet



Prepared by:

HMB Professional Engineers



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COMMONLY USED ABBREVIATIONS

AADT	Average Annual Daily Traffic	Adjusted for seasonal and monthly factors
AADTT	Average Annual Daily Truck Traffic	Truck adjusted for seasonal and monthly factors
DHV	Design Hour Volume	30 th highest hour of a year
%T	Truck Percentage	Percentage of trucks to total volume
FC	Functional Class	Street or highway's group based on service
GR	Growth Rate	Calculated value to estimate future volumes
PHF	Peak Hour Factor	Considers 15 min. spike in an hourly count
K-Factor	30 th Highest 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	Permanent and continuous recording station
KYSTM	Kentucky Statewide Model	Computerized representation of KY roads

INTRODUCTION AND STUDY AREA

The US 25 Corbin to London Connector Study was initiated by the Kentucky Transportation Cabinet (KYTC) in 2018 through the contract between Municipal Engineering Company (later HMB Professional Engineers) and KYTC to complete a Phase I Preliminary Engineering design effort that included major widening and new construction on US 25 from US 25E to KY 1006. The purpose of the study was to provide an updated safety and operational analysis of the US 25 corridor and evaluate the short term and long-term transportation needs of US 25 from Corbin to London. The traffic forecast study area incorporates US 25 from Corbin to London, I-75 from Corbin to London, US 25E from I-75 to US 25, and KY 192 from I-75 to US 25. The study area is presented in **Figure 1**.

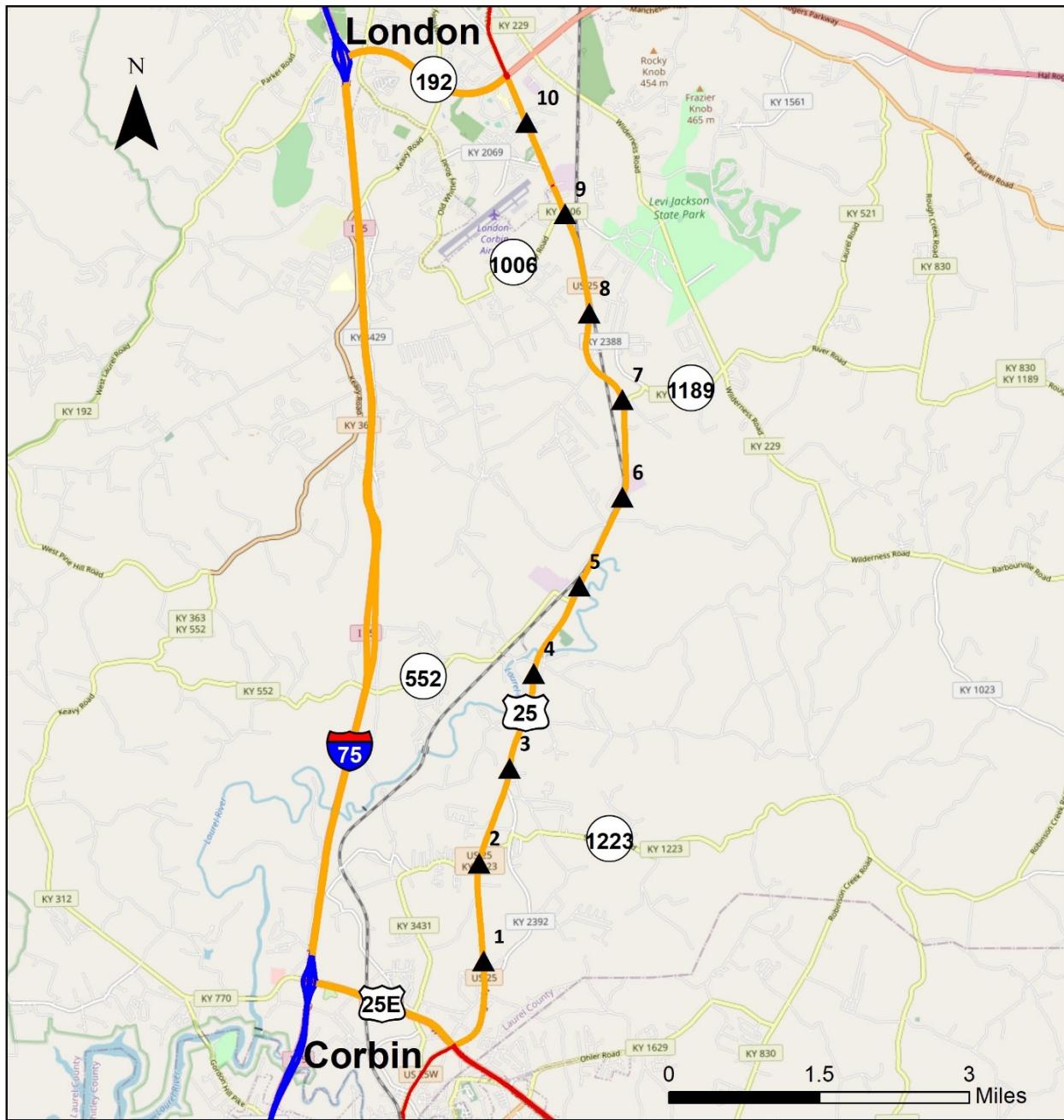
The current project phase is a planning study. Following Phase I Preliminary Engineering completed by Municipal Engineering in 2013, Phase II Final Design was not funded. Due to the ongoing widening of I-75 in the project area, KYTC wanted to ensure that widening US 25 was still justified and analyze a potential interchange and connection from I-75 to US 25. This connector was not a part of the Phase I Preliminary Engineering effort but was previously evaluated as a part of the 2015 Corbin Bypass (KY 3041) Extension Study (Item No. 11-190.00). This study also considers lower-cost, short-term improvements, such as spot and safety improvements, along US 25.

This document summarizes the US 25 traffic forecast procedure and presents the following types of forecasts:

- 2017 AADT, DHV, AADTT
- 2019 AADT, DHV, AADTT
- 2025 AADT, DHV, AADTT
- 2040 AADT, DHV, AADTT

The following sections provide the information relative to the development and presentation of the traffic forecast numbers.

Figure 1. Study Area



US 25, Corbin to London Connector Study

Study Area

▲ US 25 Milepoint ━ Interstate
— Study Area — US Highways



HMB



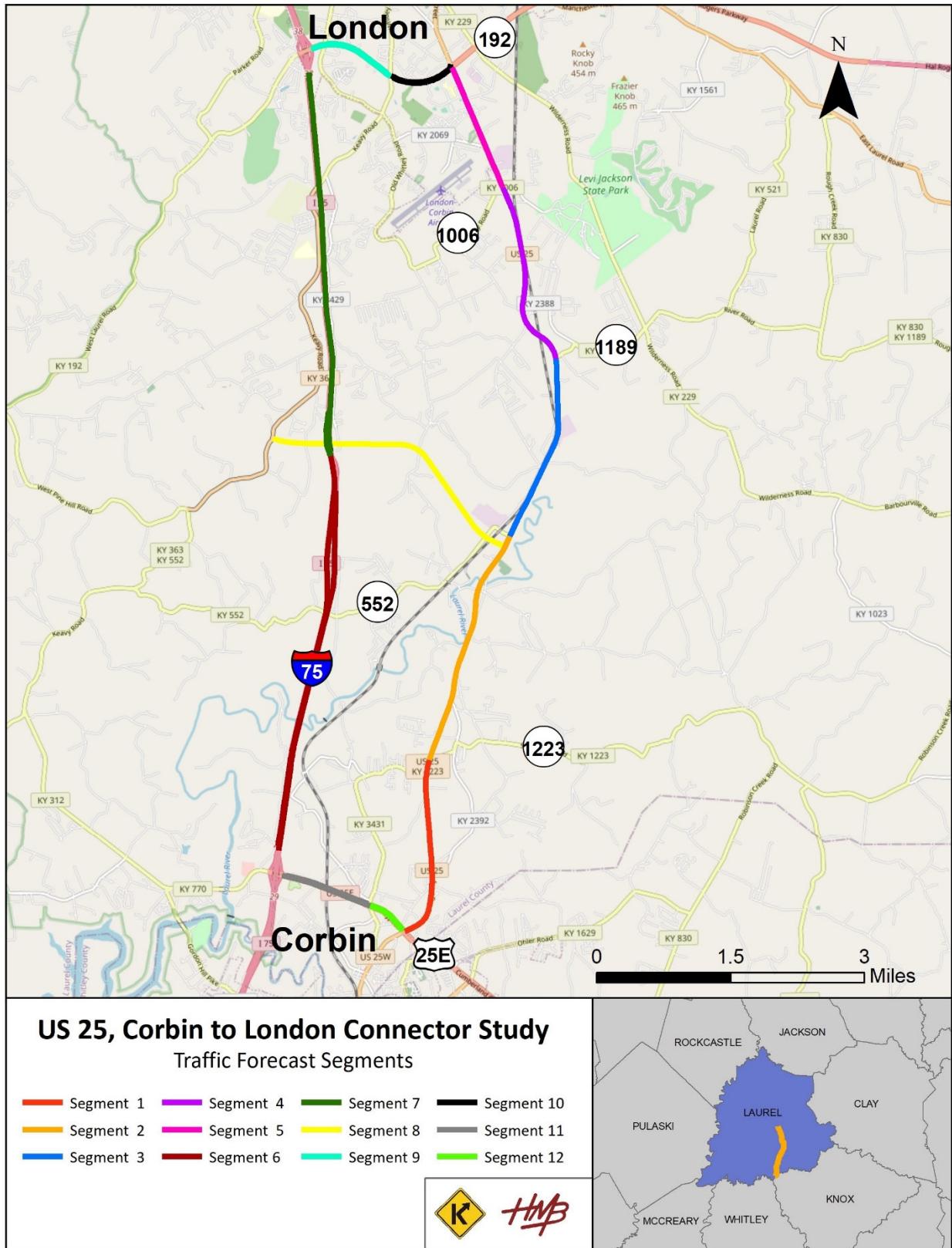
EXISTING TRAFFIC VOLUMES

The most recent AADT volumes for US 25 and surrounding roads in the study area were obtained from the KYTC Traffic Count Reporting System (CTS). The segment, station numbers, last year of count, and traffic volumes (AADT) are shown in **Table 1**. **Figure 2** illustrates each of the traffic forecast segments.

Table 1. Existing Traffic Volumes

Segment No.	Route	Count ID	Beginning Description	End Description	Last Year of Count	AADT	AADT Used in Model (2017)
1	US 25	255	US 25E	KY 1223	2019	12,314	16,743
2	US 25	251	KY 1223	KY 552	2017	14,040	15,399
3	US 25	263	KY 552	KY 1189	2017	13,706	15,677
4	US 25	053	KY 1189	KY 1006	2019	12,489	14,415
5	US 25	074	KY 1006	KY 192	2019	19,454	20,346
6	I-75	547	US 25E	Connector	2018	42,462	43,564
7	I-75	547	Connector	KY 192	2018	42,462	43,564
8	I-75 Connector	N/A	I-75	US 25E	N/A	N/A	N/A
9	KY 192	A91	I-75	KY 363	2019	29,909	25,199
10	KY 192	A87	KY 363	US 25	2018	22,732	18,349
11	US 25E	C09	I-75	KY 3431	2019	24,797	20,573
12	US 25E	C03	KY 3431	US 25	2019	20,859	14,863

Figure 2. Traffic Forecast Segments



FUTURE TRAFFIC VOLUMES

Design Year

The Design Year for a construction project is typically 20 years beyond the project's opening date per AASHTO's "A Policy on Design Standards – Interstate System". Given the uncertainty of funding and the construction schedule, a design year of 2040 was agreed upon by the Project Team at the initial scoping meeting.

Growth Rate / Model Output

The growth rates selected for this study were based on a historical traffic growth analysis and consultation with the updated Laurel Pulaski Travel Demand Model. The historical growth rates for this study are based upon traffic growth analysis within the study area. The analysis utilized traffic counts obtained from KYTC's Traffic Database which includes counts from 2000 to 2020. The resulting historical growth rate is shown by count station in **Table 2**. Highlighted values in green show stations with positive growth.

Table 2. Historical Growth Rate

Segment No.	Route	Count ID	Beginning Description	End Description	Historical Growth Rate
1	US 25	255	US 25E	KY 1223	-0.2%
2	US 25	251	KY 1223	KY 552	-0.7%
3	US 25	263	KY 552	KY 1189	-0.9%
4	US 25	053	KY 1189	KY 1006	0.4%
5	US 25	074	KY 1006	KY 192	0.4%
6	I-75	547	US 25E	Connector	0.4%
7	I-75	547	Connector	KY 192	0.4%
8	I-75 Connector	N/A	I-75	US 25E	N/A
9	KY 192	A91	I-75	KY 363	0.6%
10	KY 192	A87	KY 363	US 25	0.0%
11	US 25E	C09	I-75	KY 3431	0.6%
12	US 25E	C03	KY 3431	US 25	0.6%

KYTC provided data from the Laurel Pulaski Travel Demand Model that was updated through a separate contract after this study was initiated. The model was updated to evaluate the following nine scenarios:

- 2017 Base Year
- 2025 No Build
- 2040 No Build
- 2025/2040 US 25 On Alignment Widening with New Interchange
- 2025/2040 US 25 Off Alignment Widening with New Interchange
- 2025/2040 US 25 On Alignment Widening with No New Interchange

The model growth rates are shown for the No Build and all Build scenarios in **Tables 3**. Highlighted values in green show stations with positive growth.

Table 3. Model Growth Rates

Segment No.	Route	Count ID	Beginning Description	End Description	Growth Rates			
					No Build	Build - On Alignment	Build - Off Alignment	Build - No Interchange
1	US 25	255	US 25E	KY 1223	0.3%	0.2%	0.2%	0.3%
2	US 25	251	KY 1223	KY 552	0.0%	-0.1%	0.0%	0.0%
3	US 25	263	KY 552	KY 1189	-0.2%	-1.2%	-1.5%	-0.2%
4	US 25	053	KY 1189	KY 1006	-0.7%	-0.3%	-1.5%	-0.7%
5	US 25	074	KY 1006	KY 192	-0.9%	-1.2%	-1.2%	-0.9%
6	I-75	547	US 25E	Connector	0.4%	0.4%	0.4%	-0.4%
7	I-75	547	Connector	KY 192	0.4%	0.4%	0.3%	-0.4%
8	I-75 Connector	N/A	I-75	US 25E	N/A	1.4%	1.3%	N/A
9	KY 192	A91	I-75	KY 363	0.6%	0.3%	0.3%	0.4%
10	KY 192	A87	KY 363	US 25	0.3%	0.1%	0.3%	0.2%
11	US 25E	C09	I-75	KY 3431	0.7%	0.6%	0.6%	0.3%
12	US 25E	C03	KY 3431	US 25	0.6%	0.6%	0.6%	0.3%

Based on historical traffic volumes and the updated Laurel Pulaski Travel Demand Model, a growth rate of 0.50% was proposed for US 25 and a growth rate of 1.00% was proposed for US 25E, KY 192, and I-75.

2025 and 2040 Traffic Volumes

Year 2025 and 2040 traffic forecasts for US 25, I-75 (US 25E to KY 192), US 25E (I-75 to US 25), and KY 192 (I-75 to US 25) were generated using the proposed growth rates and calibration from the updated Laurel Pulaski Travel Demand model. The resulting No Build 2025 and 2040 segment volumes for US 25 are provided on **Figure 2**. The figure includes DHV along with AADT and AADTT for all segments. Traffic forecast results for the No Build and all Build scenarios can be found in **Appendix B**.

DESIGN FACTORS

K-Factor

Hourly factors were calculated from the count data collected for the project segments. Specific factors per each segment are included in **Table 4**.

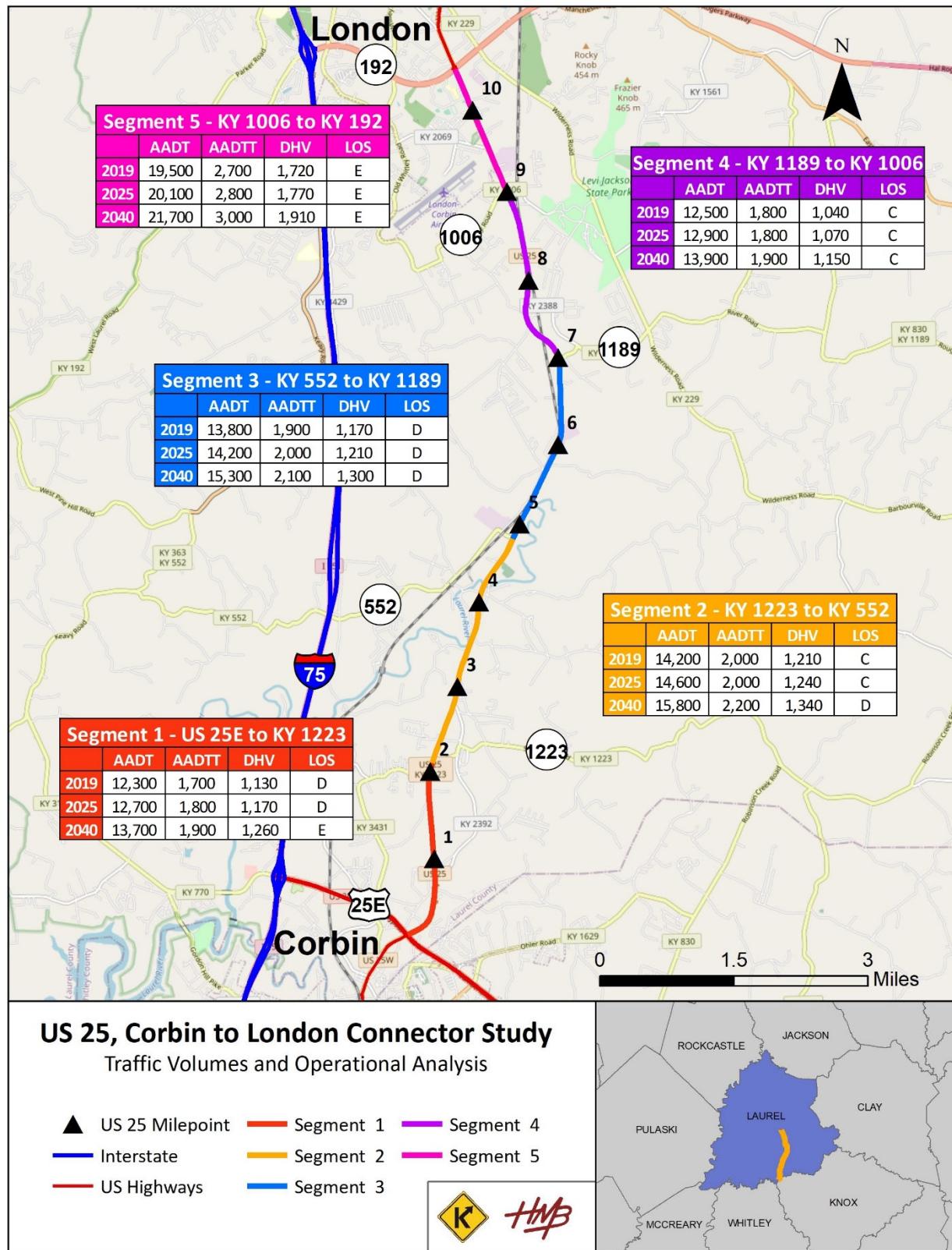
D-Factor

Directional factors were calculated from the count data collected and shown by segment in **Table 4.**

Table 4. Design Factors

Segment No.	Route	Count ID	Beginning Description	End Description	K Factor	D-Factor
1	US 25	255	US 25E	KY 1223	9.2%	56%
2	US 25	251	KY 1223	KY 552	8.5%	56%
3	US 25	263	KY 552	KY 1189	8.5%	56%
4	US 25	053	KY 1189	KY 1006	8.3%	56%
5	US 25	074	KY 1006	KY 192	8.8%	56%
6	I-75	547	US 25E	Connector	9.5%	55%
7	I-75	547	Connector	KY 192	9.5%	55%
8	I-75 Connector	N/A	I-75	US 25E	8.7%	56%
9	KY 192	A91	I-75	KY 363	9.6%	53%
10	KY 192	A87	KY 363	US 25	8.8%	58%
11	US 25E	C09	I-75	KY 3431	9.0%	60%
12	US 25E	C03	KY 3431	US 25	8.5%	51%

Figure 3. US 25 Forecasted Traffic Volumes



TRUCK VOLUMES

Truck percentages and volumes were derived from count information available through the KYTC Traffic Count Reporting System and the KYTC Vehicle Classification spreadsheet.

The same growth rate used for overall traffic growth is recommended to be applied for the truck volumes. Truck volumes by segment are listed in **Table 5**.

Table 5. Truck Volumes

Segment No.	Route	Count ID	Beginning Description	End Description	2019 AADTT	2040 AADTT
1	US 25	255	US 25E	KY 1223	1700	1900
2	US 25	251	KY 1223	KY 552	2000	2200
3	US 25	263	KY 552	KY 1189	1900	2100
4	US 25	053	KY 1189	KY 1006	1800	1900
5	US 25	074	KY 1006	KY 192	2700	3000
6	I-75	547	US 25E	Connector	12200	15000
7	I-75	547	Connector	KY 192	12200	15000
8	I-75 Connector	N/A	I-75	US 25E	N/A	N/A
9	KY 192	A91	I-75	KY 363	4900	6000
11	KY 192	A87	KY 363	US 25	3800	4600
12	US 25E	C09	I-75	KY 3431	3000	3700
13	US 25E	C03	KY 3431	US 25	2700	3300

POPULATION

Population data was obtained from the Kentucky State Data Center for Kentucky and all three counties to assist with the determination of growth rates. **Table 6** provides historical population growth by decade. **Table 7** displays population projections by decade.

Table 6. Historical Population Growth

	1990	2000	2010	% Growth (2000-2010)	Annual Growth
Kentucky	3,685,296	4,041,769	4,339,367	7.4%	0.8%
Knox	29,676	31,795	31,883	0.3%	0.4%
Laurel	43,438	52,715	58,849	11.6%	1.5%
Whitley	33,326	35,865	35,637	-0.6%	0.3%

Source: Kentucky State Data Center (Vintage 2016)

Table 7. Population Projections

	2010 Census	2015 Estimate	2020	2030	2040	% Growth (2010-2040)	Annual Growth
Kentucky	4,339,367	4,425,092	4,533,464	4,762,382	4,886,381	12.6%	0.4%
Knox	31,883	31,044	30,746	29,591	27,892	-12.5%	-0.4%
Laurel	58,849	59,395	60,809	62,697	63,290	7.5%	0.2%
Whitley	35,637	34,396	34,223	33,287	31,774	-10.8%	-0.4%

Source: Kentucky State Data Center (Vintage 2016)

Historically, population growth in all three counties is less than that for the state. Population forecasts show decreasing population numbers between 2010 and 2040 for Knox and Whitley County, while Laurel County shows a growth rate of 0.2%.

Appendix A:

Count Data

Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 10/21/201 through 10/23/2019

Site names: 063255
 County: Laurel
 Funct Class: U Minor Arterial
 Location: 063-US-0025 -000 @ .100 From: US 25E (IN CORBIN) To: KY

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 16
 Growth Factor Grp: 16

Sun, Oct 20, 2019			Mon, Oct 21, 2019			Tue, Oct 22, 2019			Wed, Oct 23, 2019			Thu, Oct 24, 2019			Fri, Oct 25, 2019			Sat, Oct 26, 2019				
Road	Pos	Neg																				
00:00						96			95													
01:00						52			57													
02:00						52			56													
03:00						82			70													
04:00						226			229													
05:00						301			295													
06:00						451			444													
07:00						938			935													
08:00						783			820													
09:00						778			729													
10:00						865			844													
11:00						886																
12:00			845			945																
13:00			881			922																
14:00			1,006			999																
15:00			1,023			1,039																
16:00			1,128			1,182																
17:00			1,121			1,151																
18:00			718			716																
19:00			565			636																
20:00			399			428																
21:00			261			300																
22:00			190			172																
23:00			128			132																
Total			8,265			14,132			4,574													
AM Peak Vol						970																
AM Peak Fct						.875																
AM Peak Hr			:			7: 15																
PM Peak Vol			1,217			1,258																
PM Peak Fct			.914			.971																
PM Peak Hr			16: 30			16: 30																
Seasonal Fct			.970			.970			.970													
Daily Fct			.974			.948			.944													
Axle Fct			.477			.477			.477													
Pulse Fct			2.000			2.000			2.000													

Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 08/01/2017 through 08/03/2017

Site names: 063251
 County: Laurel
 Funct Class: U Minor Arterial
 Location: 063-US-0025 -000 @ 3.700 From: KY 1223 (AMERICAN)

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 16
 Growth Factor Grp: 16

	Sun, Jul 30, 2017			Mon, Jul 31, 2017			Tue, Aug 1, 2017			Wed, Aug 2, 2017			Thu, Aug 3, 2017			Fri, Aug 4, 2017			Sat, Aug 5, 2017			
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	
00:00										160			156									
01:00										110			111									
02:00										86			101									
03:00										87			132									
04:00										309			323									
05:00										350			344									
06:00										491			533									
07:00										772			790									
08:00										786			812									
09:00							892			817												
10:00							896			857												
11:00							977			896												
12:00							1,052			1,000												
13:00							1,096			1,024												
14:00							1,146			1,040												
15:00							1,240			1,244												
16:00							1,346			1,196												
17:00							1,193			1,114												
18:00							924			889												
19:00							710			639												
20:00							588			553												
21:00							465			465												
22:00							287			319												
23:00							203			178												
Total							13,015			15,382			3,302									
AM Peak Vol							0			896			0									
AM Peak Fct							0			1			0									
AM Peak Hr							:			11: 00			:									
PM Peak Vol							1,346			1,244			0									
PM Peak Fct							1			1			0									
PM Peak Hr							16: 00			15: 00			:									
Seasonal Fct							.956			.956			.956									
Daily Fct							.974			.950			.925									
Axle Fct							.484			.484			.484									
Pulse Fct							2.000			2.000			2.000									

Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 08/01/2017 through 08/03/2017

Site names: 063263
 County: Laurel
 Funct Class: U Minor Arterial
 Location: 063-US-0025 -000 @ 5.300 From: KY 552 To: KY 1189

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 16
 Growth Factor Grp: 16

	Sun, Jul 30, 2017			Mon, Jul 31, 2017			Tue, Aug 1, 2017			Wed, Aug 2, 2017			Thu, Aug 3, 2017			Fri, Aug 4, 2017			Sat, Aug 5, 2017			
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	
00:00										136			151									
01:00										93			99									
02:00										89			108									
03:00										96			122									
04:00										294			298									
05:00										352			344									
06:00										490			553									
07:00										808			828									
08:00										785			821									
09:00							879			806												
10:00							909			859												
11:00							964			917												
12:00							1,022			966												
13:00							1,071			1,002												
14:00							1,125			1,075												
15:00							1,202			1,197												
16:00							1,315			1,163												
17:00							1,148			1,032												
18:00							883			839												
19:00							659			570												
20:00							540			520												
21:00							433			449												
22:00							300			304												
23:00							192			140												
Total							12,642			14,982			3,324									
AM Peak Vol							0			917			0									
AM Peak Fct							0			1			0									
AM Peak Hr							:			11: 00			:									
PM Peak Vol							1,315			1,197			0									
PM Peak Fct							1			1			0									
PM Peak Hr							16: 00			15: 00			:									
Seasonal Fct							.956			.956			.956									
Daily Fct							.974			.950			.925									
Axle Fct							.484			.484			.484									
Pulse Fct							2.000			2.000			2.000									

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Short-term Hourly Traffic Volume for 08/20/2011 through 08/22/2019

Site names: 063053
 County: Laurel
 Funct Class: U Minor Arterial
 Location: 063-US-0025 -000 @ 8.500 From: KY 1189 To: KY 1006

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 16
 Growth Factor Grp: 16

	Sun, Aug 18, 2019			Mon, Aug 19, 2019			Tue, Aug 20, 2019			Wed, Aug 21, 2019			Thu, Aug 22, 2019			Fri, Aug 23, 2019			Sat, Aug 24, 2019		
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg
00:00										114	70	44	128	76	52						
01:00										56	24	32	73	39	34						
02:00										60	30	30	87	49	38						
03:00										88	41	47	92	47	45						
04:00										223	122	101	203	114	89						
05:00										321	122	199	325	128	197						
06:00										421	179	242	427	185	242						
07:00										916	364	552	922	334	588						
08:00										931	480	451	812	359	453						
09:00										873	482	391	771	346	425						
10:00										852	427	425									
11:00					907	452	455			804	415	389									
12:00					832	420	412			857	439	418									
13:00					936	478	458			855	402	453									
14:00					887	449	438			970	496	474									
15:00					1,032	578	454			944	524	420									
16:00					1,022	564	458			1,024	559	465									
17:00					1,008	564	444			1,022	554	468									
18:00					661	348	313			671	364	307									
19:00					499	257	242			482	261	221									
20:00					425	258	167			470	241	229									
21:00					345	197	148			417	228	189									
22:00					231	135	96			219	136	83									
23:00					136	93	43			151	86	65									
Total					8,921	4,793	4,128			13,741	7,046	6,695				3,840	1,677	2,163			
AM Peak Vol										1,024	501	585									
AM Peak Fct										.898	.914	.778									
AM Peak Hr					:	:	:			7: 30	8: 30	7: 15									
PM Peak Vol					1,080	614	469			1,081	588	493									
PM Peak Fct					.944	.919	.902			.945	.88	.955									
PM Peak Hr					16: 45	16: 45	16: 15			16: 30	16: 30	16: 30									
Seasonal Fct					.954	.954	.954			.954	.954	.954									
Daily Fct					.966	.966	.966			.958	.958	.958									
Axle Fct					.500	.500	.500			.500	.500	.500									
Pulse Fct					2.000	2.000	2.000			2.000	2.000	2.000									

Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 08/19/201 through 08/21/2019

Site names: 063074
 County: Laurel
 Funct Class: U Minor Arterial
 Location: 063-US-0025 -000 @ 10.000 From: KY 1006 To: KY 192

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 16
 Growth Factor Grp: 16

	Sun, Aug 18, 2019			Mon, Aug 19, 2019			Tue, Aug 20, 2019			Wed, Aug 21, 2019			Thu, Aug 22, 2019			Fri, Aug 23, 2019			Sat, Aug 24, 2019			
	Road	Pos	Neg																			
00:00							170			180												
01:00							78			94												
02:00							75			87												
03:00							111			122												
04:00							287			278												
05:00							499			500												
06:00							708			642												
07:00							1,347			1,381												
08:00							1,425			1,486												
09:00							1,356															
10:00				1,211			1,313															
11:00				1,347			1,529															
12:00				1,456			1,465															
13:00				1,509			1,585															
14:00				1,523			1,482															
15:00				1,749			1,764															
16:00				1,583			1,568															
17:00				1,564			1,624															
18:00				1,123			1,114															
19:00				820			851															
20:00				771			716															
21:00				631			632															
22:00				335			340															
23:00				195			205															
Total				15,817			22,244			4,770												
AM Peak Vol							1,573															
AM Peak Fct							.884															
AM Peak Hr				:			7: 45															
PM Peak Vol				1,749			1,764															
PM Peak Fct				.936			.944															
PM Peak Hr				15: 00			15: 00															
Seasonal Fct				.954			.954			.954												
Daily Fct				.966			.966			.958												
Axle Fct				.478			.478			.478												
Pulse Fct				2.000			2.000			2.000												

Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 08/22/201 through 08/25/2018

Site names: 063547
 County: Laurel
 Funct Class: R Principal Arterial - Interstate
 Location: 063-I -0075 -000 @ 30.660 From: US 25E To: KY 192

Seasonal Factor Grp: 1
 Daily Factor Grp: 1
 Axle Factor Grp: 01
 Growth Factor Grp: 01

	Sun, Aug 19, 2018			Mon, Aug 20, 2018			Tue, Aug 21, 2018			Wed, Aug 22, 2018			Thu, Aug 23, 2018			Fri, Aug 24, 2018			Sat, Aug 25, 2018			
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	
00:00										648	307	341	698	309	389	762	328	434				
01:00										528	276	252	533	247	286	549	235	314				
02:00										452	221	231	511	232	279	463	218	245				
03:00										508	270	238	552	297	255	506	255	251				
04:00										663	387	276	647	344	303	526	281	245				
05:00										914	534	380	912	517	395	692	351	341				
06:00										1,449	798	651	1,425	775	650	917	458	459				
07:00										2,293	1,304	989	2,413	1,350	1,063	1,314	703	611				
08:00										2,365	1,277	1,088	2,384	1,221	1,163	1,777	906	871				
09:00										2,371	1,232	1,139	2,592	1,306	1,286	2,240	1,195	1,045				
10:00										2,737	1,460	1,277	2,803	1,466	1,337	2,689	1,416	1,273				
11:00										2,890	1,451	1,439	3,400	1,658	1,742	2,985	1,604	1,381				
12:00										3,149	1,522	1,627	3,484	1,587	1,897	3,023	1,534	1,489				
13:00										3,218	1,531	1,687	3,520	1,761	1,759							
14:00										3,329	1,522	1,807	4,017	1,801	2,216							
15:00										3,407	1,476	1,931	3,709	1,685	2,024							
16:00										3,355	1,537	1,818	3,592	1,500	2,092							
17:00										2,961	1,378	1,583	3,288	1,462	1,826	3,649	1,569	2,080				
18:00										2,292	1,015	1,277	2,676	1,171	1,505	3,208	1,435	1,773				
19:00										1,755	842	913	2,092	985	1,107	2,607	1,155	1,452				
20:00										1,447	653	794	1,909	902	1,007	2,138	931	1,207				
21:00										1,163	546	617	1,490	602	888	1,684	774	910				
22:00										975	409	566	1,238	511	727	1,506	635	871				
23:00										802	360	442	854	382	472	1,075	447	628				
Total										11,395	5,203	6,192	47,823	23,120	24,703	53,059	25,002	28,057	18,443	9,484	8,959	
AM Peak Vol													2,890	1,460	1,439	3,400	1,658	1,742	2,985	1,604	1,381	
AM Peak Fct													1	1	1	1	1	1	1	1	1	
AM Peak Hr													11:00	10:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	
PM Peak Vol													3,407	1,537	1,931	4,017	1,801	2,216				
PM Peak Fct													1	1	1	1	1	1				
PM Peak Hr													15:00	16:00	15:00	14:00	14:00	14:00	:	:	:	
Seasonal Fct										.949	.949	.949	.949	.949	.949	.949	.949	.949	.949	.949	.949	
Daily Fct										1.055	1.055	1.055	.961	.961	.841	.841	.841	1.028	1.028	1.028	1.028	
Axle Fct										.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	.500	
Pulse Fct										1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	

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Short-term Hourly Traffic Volume for 08/19/201 through 08/21/2019

Site names: 063A91
 County: Laurel
 Funct Class: U Principal Arterial - Other
 Location: 063-KY-0192 -000 @ 18.700 From: I 75 OVERPASS To: KY 363

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 14
 Growth Factor Grp: 14

	Sun, Aug 18, 2019			Mon, Aug 19, 2019			Tue, Aug 20, 2019			Wed, Aug 21, 2019			Thu, Aug 22, 2019			Fri, Aug 23, 2019			Sat, Aug 24, 2019			
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	
00:00							210	112	98	232	122	110										
01:00							177	105	72	119	76	43										
02:00							156	96	60	125	75	50										
03:00							132	66	66	160	88	72										
04:00							254	138	116	230	110	120										
05:00							460	257	203	407	235	172										
06:00							802	473	329	742	423	319										
07:00							1,823	1,105	718	1,680	1,029	651										
08:00							1,914	1,029	885	1,902	1,075	827										
09:00							1,976	1,088	888													
10:00				2,201	1,196	1,005	1,999	1,043	956													
11:00				2,331	1,213	1,118	2,306	1,229	1,077													
12:00				2,444	1,356	1,088	2,372	1,262	1,110													
13:00				2,473	1,352	1,121	2,311	1,185	1,126													
14:00				2,500	1,435	1,065	2,302	1,251	1,051													
15:00				2,860	1,516	1,344	2,616	1,350	1,266													
16:00				2,725	1,482	1,243	2,534	1,307	1,227													
17:00				2,710	1,447	1,263	2,438	1,221	1,217													
18:00				2,115	1,202	913	1,768	910	858													
19:00					1,504	849	655	1,453	779	674												
20:00						1,243	713	530	1,181	656	525											
21:00						839	479	360	877	487	390											
22:00						526	311	215	457	269	188											
23:00						349	237	112	306	176	130											
Total				26,820	14,788	12,032	32,824	17,594	15,230	5,597	3,233	2,364										
AM Peak Vol								2,306	1,260	1,077												
AM Peak Fct								.883	.808	.925												
AM Peak Hr		:	:		:	:	11: 00	7: 30	11: 00													
PM Peak Vol				2,906	1,602	1,354	2,645	1,356	1,297													
PM Peak Fct				.913	.942	.9	.917	.894	.921													
PM Peak Hr				16: 30	16: 30	15: 15	15: 15	15: 45	16: 30													
Seasonal Fct					.954	.954	.954	.954	.954	.954	.954	.954										
Daily Fct					.966	.966	.966	.966	.966	.966	.966	.966	.958	.958	.958							
Axle Fct					.483	.483	.483	.483	.483	.483	.483	.483	.483	.483	.483							
Pulse Fct					2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000							

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Short-term Hourly Traffic Volume for 04/10/2018 through 04/12/2018

Site names: 063A87
 County: Laurel
 Funct Class: U Principal Arterial - Other
 Location: 063-KY-0192 -000 @ 19.700 From: KY 363 To: KY 229

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 14
 Growth Factor Grp: 14

Sun, Apr 8, 2018			Mon, Apr 9, 2018			Tue, Apr 10, 2018			Wed, Apr 11, 2018			Thu, Apr 12, 2018			Fri, Apr 13, 2018			Sat, Apr 14, 2018		
Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg
00:00									173	72	101	171	74	97						
01:00									101	44	57	86	35	51						
02:00									91	46	45	67	28	39						
03:00									103	56	47	95	54	41						
04:00									133	72	61	164	86	78						
05:00									337	189	148	335	177	158						
06:00									631	334	297	661	361	300						
07:00									1,534	655	879	1,589	715	874						
08:00									1,445	696	749	1,548	819	729						
09:00									1,251	644	607	1,423	699	724						
10:00									1,367	714	653	1,437	741	696						
11:00				1,624	859	765	1,627		887	740	1,544	848	696							
12:00				1,675	865	810	1,681		839	842										
13:00				1,665	837	828	1,652		822	830										
14:00				1,662	798	864	1,706		820	886										
15:00				1,992	1,156	836	1,979		1,106	873										
16:00				1,797	904	893	1,774		921	853										
17:00				1,779	862	917	1,826		905	921										
18:00				1,393	661	732	1,484		700	784										
19:00				1,108	560	548	1,061		489	572										
20:00				906	424	482	1,031		475	556										
21:00				654	303	351	682		326	356										
22:00				454	226	228	451		217	234										
23:00				290	124	166	278		113	165										
Total				16,999	8,579	8,420	24,398		12,142	12,256	9,120	4,637	4,483							
AM Peak Vol									1,627	887	879	1,589	819	874						
AM Peak Fct									1	1	1	1	1	1						
AM Peak Hr				:	:	:	11:00		11:00	7:00	7:00	8:00	7:00							
PM Peak Vol				1,992	1,156	917	1,979		1,106	921										
PM Peak Fct					1	1	1		1	1										
PM Peak Hr				15:00	15:00	17:00	15:00		15:00	17:00	:	:	:							
Seasonal Fct					.980	.980	.980		.980	.980	.980	.980	.980	.980						
Daily Fct					.970	.970	.970		.944	.944	.944	.916	.916	.916						
Axle Fct					.500	.500	.500		.500	.500	.500	.500	.500	.500						
Pulse Fct					2.000	2.000	2.000		2.000	2.000	2.000	2.000	2.000	2.000						

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Short-term Hourly Traffic Volume for 06/11/201 through 06/13/2019

Site names: 063C09
 County: Laurel
 Funct Class: U Principal Arterial - Other
 Location: 063-US-0025E -000 @ 1.000 From: KY 3431 To: I 75 RAMPS

Seasonal Factor Grp: 3
 Daily Factor Grp: 3
 Axle Factor Grp: 14
 Growth Factor Grp: 14

Sun, Jun 9, 2019			Mon, Jun 10, 2019			Tue, Jun 11, 2019			Wed, Jun 12, 2019			Thu, Jun 13, 2019			Fri, Jun 14, 2019			Sat, Jun 15, 2019		
Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg
00:00									273	114	159	285	114	171						
01:00									171	69	102	178	85	93						
02:00									134	64	70	131	61	70						
03:00									160	106	54	178	107	71						
04:00									267	141	126	287	157	130						
05:00									450	256	194	444	236	208						
06:00									735	382	353	733	392	341						
07:00									1,259	610	649	1,173	562	611						
08:00									1,323	644	679	1,338	675	663						
09:00									1,288	616	672	1,404	701	703						
10:00									1,523	801	722	1,577	837	740						
11:00						1,372			1,738	874	864									
12:00				2,275	1,367	908			1,758	904	854									
13:00						1,836	976	860	1,763	883	880									
14:00						1,778	885	893	1,842	934	908									
15:00						1,878	946	932	1,869	931	938									
16:00						1,967	933	1,034	2,067	1,008	1,059									
17:00						2,061	1,095	966	2,015	1,026	989									
18:00						1,683	834	849	1,673	801	872									
19:00						1,316	627	689	1,336	639	697									
20:00						1,014	484	530	1,081	517	564									
21:00						821	373	448	773	385	388									
22:00						613	293	320	530	239	291									
23:00						420	164	256	403	175	228									
Total						17,662	10,349	8,685	26,431	13,119	13,312	7,728	3,927	3,801						
AM Peak Vol									1,738	874	864									
AM Peak Fct									.934	.91	.943									
AM Peak Hr						:	:	:	11: 00	11: 00	11: 00									
PM Peak Vol				2,275	1,367	1,047			2,106	1,086	1,059									
PM Peak Fct						.942	.921	.903	.968	.956	.959									
PM Peak Hr						12: 00	12: 00	15: 45	16: 30	16: 30	16: 00									
Seasonal Fct						.961	.961	.961	.961	.961	.961									
Daily Fct						.979	.979	.979	.962	.962	.962	.938	.938	.938						
Axle Fct						.500	.500	.500	.500	.500	.500	.500	.500	.500						
Pulse Fct						2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000						

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Short-term Hourly Traffic Volume for 06/24/201 through 06/26/2019

Site names: 063C03
 County: Laurel
 Funct Class: U Principal Arterial - Other
 Location: 063-US-0025E -000 @ .500 From: US 25 & US 25W To: KY 3431

		Seasonal Factor Grp:	3
		Daily Factor Grp:	3
		Axle Factor Grp:	14
		Growth Factor Grp:	14

Sun, Jun 23, 2019			Mon, Jun 24, 2019			Tue, Jun 25, 2019			Wed, Jun 26, 2019			Thu, Jun 27, 2019			Fri, Jun 28, 2019			Sat, Jun 29, 2019			
Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	
00:00						206	87	119	236	109	127										
01:00						133	62	71	122	54	68										
02:00						118	57	61	101	48	53										
03:00						154	92	62	154	85	69										
04:00						201	115	86	202	108	94										
05:00						330	211	119	332	200	132										
06:00						592	326	266	606	349	257										
07:00						942	512	430	902	514	388										
08:00						989	484	505	1,060	563	497										
09:00						1,105	582	523	1,223	667	556										
10:00						1,321	712	609	1,404	744	660										
11:00				826		1,447	719	728													
12:00			1,675	831	844	1,654	857	797													
13:00			1,662	833	829	1,535	789	746													
14:00			1,665	754	911	1,673	826	847													
15:00			1,631	784	847	1,629	802	827													
16:00			1,680	793	887	1,706	824	882													
17:00			1,521	760	761	1,792	882	910													
18:00			1,330	663	667	1,390	672	718													
19:00			992	476	516	1,075	496	579													
20:00			794	367	427	842	384	458													
21:00			650	292	358	687	319	368													
22:00			420	187	233	492	217	275													
23:00			293	124	169	333	133	200													
Total			14,313	7,690	7,449	22,346	11,160	11,186	6,342	3,441	2,901										
AM Peak Vol						1,447	747	728													
AM Peak Fct						.847	.805	.867													
AM Peak Hr			:	:	:	11: 00	10: 30	11: 00													
PM Peak Vol			1,718	833	939	1,804	886	923													
PM Peak Fct			.952	.93	.947	.924	.927	.861													
PM Peak Hr			13: 30	13: 00	13: 30	16: 30	16: 45	16: 30													
Seasonal Fct			.961	.961	.961	.961	.961	.961	.961	.961	.961										
Daily Fct			.981	.981	.981	.979	.979	.979	.962	.962	.962										
Axle Fct			.500	.500	.500	.500	.500	.500	.500	.500	.500										
Pulse Fct			2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000										

Appendix B:

Traffic Forecast Results

US-25 Corbin to London Connector Study
Traffic Forecast Summary Table - No Build

										For Calibration		No Build															
Segment	Count ID	Route/Ramp	Beginning Description	Ending Description	Most Recent AADT	Most Recent AADT Year	2017 AADT ¹	2017 Model Volume AADT	Calibration Adjustment ²	2019 AADT ³	CTS K Factor	CTS D Factor	DHV	Peak Direction DDHV	Non-Peak Direction DDHV	Growth Rate	2025 AADT	2025 DHV	2025 Peak Direction DDHV	2025 Non-Peak Direction DDHV	2040 AADT	2040 DHV	2040 Peak Direction DDHV	2040 Non-Peak Direction DDHV			
US 25																											
1	255	US 25	US 25E	KY 1223	12,314	2019	13,353	16,743	-0.202	12,300	9.2%	56%	1,130	630	500	0.50%	12,700	1,170	650	510	13,700	1,260	710	550			
2	251		KY 1223	KY 552	14,040	2017	14,040	15,399	-0.088	14,200	8.5%	56%	1,210	680	530	0.50%	14,600	1,240	690	550	15,800	1,340	750	590			
3	263		KY 552	KY 1189	13,706	2017	13,706	15,677	-0.126	13,800	8.5%	56%	1,170	660	520	0.50%	14,200	1,210	680	530	15,300	1,300	730	570			
4	053		KY 1189	KY 1006	12,489	2019	12,373	14,415	-0.142	12,500	8.3%	56%	1,040	580	460	0.50%	12,900	1,070	600	470	13,900	1,150	650	510			
5	074		KY 1006	KY 192	19,454	2019	21,273	20,346	0.046	19,500	8.8%	56%	1,720	960	760	0.50%	20,100	1,770	990	780	21,700	1,910	1,070	840			
I-75																											
6	547	I-75	US 25E	Connector	42,462	2018	45,597	43,564	0.047	42,900	9.5%	55%	4,080	2,240	1,830	1.00%	45,500	4,320	2,380	1,950	52,900	5,030	2,760	2,260			
7			Connector	KY 192	42,462	2018	45,597	43,564	0.047	42,900	9.5%	55%	4,080	2,240	1,830	1.00%	45,500	4,320	2,380	1,950	52,900	5,030	2,760	2,260			
I-75 Connector																											
8	-	I-75 Connector	I-75	US 25E	N/A	N/A	N/A	N/A		N/A	8.7%	56%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
KY 192																											
9	A91	KY 192	I-75	KY 1006	29,909	2019	26,531	25,199	0.053	29,900	9.6%	53%	2,870	1,520	1,350	1.00%	31,700	3,040	1,610	1,430	36,800	3,530	1,870	1,660			
10	A87		KY 363	US 25	22,732	2018	24,175	18,349	0.318	23,000	8.8%	58%	2,020	1,170	850	1.00%	24,400	2,150	1,250	900	28,300	2,490	1,440	1,050			
US 25E																											
11	C09	US 25E	I-75	KY 3431	24,797	2019	25,048	20,573	0.218	24,800	9.0%	60%	2,230	1,340	890	1.00%	26,300	2,370	1,420	950	30,600	2,750	1,650	1,100			
12	C03		KY 3431	US 25	20,859	2019	22,433	14,863	0.509	20,900	8.5%	51%	1,780	910	870	1.00%	22,200	1,890	960	920	25,800	2,190	1,120	1,070			

1) This column represents a 2017 volume derived in order to determine the calibration between the model year 2017 volumes and the count volumes. If a 2017 volume was collected, this was used. If no 2017 volume existed, a volume was derived from the closest year above and below 2017.

2) This column compares the "2017 AADT" values to the "2017 Model Volume AADT" values and proportionately adjusts the "NB to Build Adjustment" values

3) This column represents the most recent AADT grown to 2019 volumes.

4) "2025 Model Volume" for each Build Option is adjusted based on the "Calibration Adjustment" to yield a "2025 AADT"

5) 2040 Build volumes were derived by applying the Build growth rate to 2025 volumes

US-25 Corbin to London Connector Study Traffic Forecast Summary Table - Build

		Build (Widened On-Alignment)															Build (Off-Alignment)															Build (No-Interchange)															
Segment	Count ID	Route/Ramp	Beginning Description	Ending Description	2025 Model Volume	2025 AADT ⁴	2025 AADT Rounded	2025 DHV	2025 Peak Direction DDHV	2025 Non-Peak Direction DDHV	Growth Rate	2040 AADT ⁵	2040 DHV	2040 Peak Direction DDHV	2040 Non-Peak Direction DDHV	2025 Model Volume	2025 AADT ⁴	2025 AADT Rounded	2025 DHV	2025 Peak Direction DDHV	2025 Non-Peak Direction DDHV	Growth Rate	2040 AADT ⁵	2040 DHV	2040 Peak Direction DDHV	2040 Non-Peak Direction DDHV	2025 Model Volume	2025 AADT ⁴	2025 AADT Rounded	2025 DHV	2025 Peak Direction DDHV	2025 Non-Peak Direction DDHV	Growth Rate	2040 AADT ⁵	2040 DHV	2040 Peak Direction DDHV	2040 Non-Peak Direction DDHV										
US 25																																															
1	255	US 25	US 25E	KY 1223	15,244	12,158	12,200	1,120	630	490	0.50%	13,100	1,210	670	530	15,186	12,111	12,100	1,110	620	490	0.50%	13,000	1,200	670	530	16,448	13,118	13,100	1,210	670	530	0.50%	14,100	1,300	730	570										
2	251		KY 1223	KY 552	14,491	13,212	13,200	1,120	630	490	0.50%	14,200	1,210	680	530	15,243	13,898	13,900	1,180	660	520	0.50%	15,000	1,280	710	560	15,441	14,078	14,100	1,200	670	530	0.50%	15,200	1,290	720	570										
3	263		KY 552	KY 1189	15,377	13,444	13,400	1,140	640	500	0.50%	14,400	1,220	690	540	9,459	8,270	8,300	710	400	310	0.50%	8,900	760	420	330	15,943	13,939	13,900	1,180	660	520	0.50%	15,000	1,280	710	560										
4	053		KY 1189	KY 1006	13,211	11,340	11,300	940	530	410	0.50%	12,200	1,010	570	450	9,459	8,119	8,100	670	380	300	0.50%	8,700	720	400	320	14,517	12,461	12,500	1,040	580	460	0.50%	13,500	1,120	630	490										
5	074		KY 1006	KY 192	18,104	18,929	18,900	1,660	930	730	0.50%	20,400	1,800	1,010	790	18,106	18,931	18,900	1,660	930	730	0.50%	20,400	1,800	1,010	790	19,700	20,598	20,600	1,810	1,020	800	0.50%	22,200	1,950	1,090	860										
I-75																																															
6	547	I-75	US 25E	Connector	51,220	53,610	53,600	5,090	2,800	2,290	1.00%	62,200	5,910	3,250	2,660	50,353	52,703	52,700	5,010	2,750	2,250	1.00%	61,200	5,810	3,200	2,620	46,913	49,102	49,100	4,660	2,570	2,100	1.00%	57,000	5,420	2,980	2,440										
7			Connector	KY 192	49,046	51,335	51,300	4,870	2,680	2,190	1.00%	59,600	5,660	3,110	2,550	50,700	53,066	53,100	5,040	2,770	2,270	1.00%	61,600	5,850	3,220	2,630	46,913	49,102	49,100	4,660	2,570	2,100	1.00%	57,000	5,420	2,980	2,440										
I-75 Connector																																															
8	-	I-75 Connector	I-75	US 25E	N/A	4,043	4,000	350	190	150	1.50%	5,000	440	240	190	6,014	6,014	6,000	520	290	230	1.50%	7,500	650	370	290	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KY 192																																															
9	A91	KY 192	I-75	KY 1006	25,931	27,302	27,300	2,620	1,390	1,230	1.00%	31,700	3,040	1,610	1,430	26,954	28,379	28,400	2,730	1,440	1,280	1.00%	33,000	3,170	1,680	1,490	27,898	29,373	29,400	2,820	1,500	1,330	1.00%	34,100	3,270	1,740	1,540										
10	A87		KY 363	US 25	16,623	21,901	21,900	1,930	1,120	810	1.00%	25,400	2,240	1,300	940	16,846	22,195	22,200	1,950	1,130	820	1.00%	25,800	2,270	1,320	950	18,605	24,512	24,500	2,160	1,250	910	1.00%	28,400	2,500	1,450	1,050										
US 25E																																															
11	C09	US 25E	I-75	KY 3431	22,303	27,154	27,200	2,450	1,470	980	1.00%	31,600	2,840	1,710	1,140	21,340	25,982	26,000	2,340	1,400	940	1.00%	30,200	2,720	1,630	1,090	22,041	26,835	26,800	2,410	1,450	960	1.00%	31,100	2,800	1,680	1,120										
12	C03		KY 3431	US 25	16,529	24,948	24,900	2,120	1,080	1,040	1.00%	28,900	2,460	1,250	1,200	16,294	24,593	24,600	2,090	1,070	1,020	1.00%	28,600	2,430	1,240	1,190	16,239	24,510	24,500	2,080	1,060	1,020	1.00%	28,400	2,410	1,230	1,180										

1) This column represents a 2017 volume derived in order to determine the calibration between the model year 2017 volumes and the count volumes. If a 2017 volume was collected, this was used. If no 2017 volume existed, a volume was derived from the closest year above and below 2017.

2) This column compares the "2017 AADT" values to the "2017 Model Volume AADT" values and proportionately adjusts the "NB to Build Adjustment" values.

3) This column represents the most recent AADT grown to 2019 volumes.

4) "2035 Model Volume" for each Build Option is adjusted based on the "C

4) "2025 Model Volume" for each Build Option is adjusted based on the "Calibration Adjustment" to yield a "2025 AADT"

5) 2040 Build volumes were derived by applying the Build growth rate to 2025 volumes