

Appendix B

Traffic Forecast Report

Traffic Forecast Final Report

**McCracken County
KY 1286/KY 998 Planning Study
Item No. 1-153.00**

Prepared for:



Prepared by:



December 2013

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Forecast Summary

This project is located west of Paducah, in McCracken County, Kentucky. The scope of this study contains two state highways: KY 1286 (locally Friendship Road) from US 45 (Lone Oak Road) to KY 998 (Olivet Church Road) and KY 998 from KY 1286 to US 60 (Hinkleville Road). The total project length is approximately 3.9 miles.

The Kentucky Transportation Cabinet (KYTC) has requested that CDM Smith complete a planning study for the route to evaluate proposed improvements. KY 1286 is classified as an Urban Minor Arterial with a posted speed limit of 35-45 mph in the study area. It is a two lane facility with 9 to 11 foot lanes with 2 to 8 foot shoulders along the study area. KY 998 is classified as an Urban Minor Arterial with a posted speed limit of 45 mph in the study area. It is a two lane facility with 9 to 12 foot lanes with 2 to 10 foot shoulders along the study area.

Peak period turning movement counts and 24-hour tube counts were completed by KYTC in March 2013. A 24-hour classification count and speed study from October 2012 was also provided.

The turning movement count locations were as follows:

- KY 1286 at US 45
- KY 1286 at US 62
- KY 1286 at New Holt Road
- KY 1286 at KY 998

24-hour tube counts were provided at the following locations:

- KY 1286 milepoint 4.300 (between US 45 and US 62)
- KY 1286 milepoint 5.724 (between US 62 and Woodcreek Drive)
- KY 1286 milepoint 6.828 (between Woodcreek Drive and KY 998)
- KY 998 milepoint 0.300 (between US 62 and KY 1286)
- KY 998 milepoint 2.100 (between KY 1286 and US 60)

Forecast Type

The following types of forecasts are being developed for these projects:

- 2013 and 2040 No-Build ADT and DHV values

Current-Year Volumes

The traffic volumes, turning movements, and vehicle classification were reviewed and balanced. Approach volumes were adjusted using the seasonal adjustment factors in *KYTC Traffic Forecasting Report – 2008* Table D2. This approach provides a realistic portrait of the existing conditions on the roadways. Intersection turning movement counts and segment AADTs are shown on **Figure 1**.

Design Year/Growth Factors

Seven road segments were used in the calculation of the growth rate: three segments of KY 998 (milepoints 0.000 through 4.080) and four segments along KY 1286 (milepoints 0.000 through 5.790). Based on these roadway segments, the linear growth rate was calculated to be 1.3%. In addition, KYTC has established a methodology that blends linear growth with exponential growth. Using this method, the growth rates increases to 1.75%.

For further comparison, population projections prepared by the Kentucky State Data Center at the University of Louisville were reviewed. Comparing 2010 population to the 2040 population forecast, an average annual growth rate was calculated to be -0.02% for McCracken County. According to Woods and Poole’s 2012 Complete Economic and Demographic Data Source (CEDDS), a growth rate was calculated to be 0.04% for McCracken County.

The 2012 CEDDS also forecasts employment through 2040. Comparing 2010 employment to the 2040 employment forecast, growth for McCracken County is 1.3%.

A number of previous transportation studies have been completed in the vicinity that have established growth rates.

- The *Paducah-McCracken County Transportation Study* (March 2002) estimates an average annual population growth rate of 0.4% based on 1999 and 2025 estimates. The same data shows an average annual employment growth rate of 0.8% for the county. The Travel Demand Model showed a 1999 ADT volume of 5,100 vpd on KY 1286, which increased to 8,300 vpd in 2025.
- The *McCracken County Consolidated High School Traffic Impact Study* (April 2010) forecast a range of annual growth rates for background traffic, ranging from 1.5% along US 60 to 3.0% for local roads.
- The *US 60 Scoping Study, Item No 1-125.00* (September 2012) estimates an average annual population growth rate of 0.3% for the county based on 2010 and 2030 estimates. The same data shows an average annual employment growth rate of 0.7% for the county. The Travel Demand Model applied approximately a 0.5% average annual growth rate for the network.

A summary of all the growth rates discussed above is presented below.

<u>Traffic/Demographic Data:</u>	<u>Annual Growth Rates</u>
Traffic Volume Growth (linear)	1.3%
Traffic Volume Growth (blended linear/exponential) <i>source: KYTC, based on 20 yrs of data</i>	1.75%
Traffic Volume Growth (linear) <i>source: 2002 Transportation Study</i>	2.4%
Traffic Volume Growth (network-wide) <i>source: 2010 MCHS TIS</i>	1.5%-3.0%
Traffic Volume Growth (TDM network-wide) <i>source:2012 US 60 Scoping Study</i>	0.5%

County Population Forecast (2010-2040) <i>source: Kentucky State Data Center</i>	-0.2%
County Population Forecast (2010-2040) <i>source: Woods & Poole 2012 CEDDS</i>	0.04%
County Population Forecast (1999-2025) <i>source: 2002 Transportation Study</i>	0.4%
County Population Forecast (2010-2030) <i>source: 2012 US 60 Scoping Study</i>	0.3%
County Employment Forecast (2010-2040) <i>source: Woods & Poole 2012 CEDDS</i>	1.3%
County Employment Forecast (1999-2025) <i>source: 2002 Transportation Study</i>	0.8%
County Employment Forecast (2010-2030) <i>source: 2012 US 60 Scoping Study</i>	0.7%

Based on the above information, it is recommended a **growth rate of 1.5%** be used for the KY 1286 planning study traffic analysis. This growth rate accounts for background traffic growth and anticipated traffic growth associated with the operation of the new McCracken County Consolidated High School, located immediately north of the study area.

Design Parameters

K-factors were calculated for each approach using the turning movement data provided by KYTC. Based on the raw data, K-factors by segment varied from 7 to 8% during the AM peak and from 9 to 10% during the PM peak. For the 30th highest hour, a **K-factor of 10% was recommended**, which is comparable with the statewide average rate for urban minor arterials (9.8%).

Similarly, D-factors were calculated for each segment, then analyzed and applied to each route as a whole. The **recommended D-factor for is 54%**, traveling northbound in the AM peak period and southbound in the PM peak period. This matches the statewide average D-factor for this functional classification identified in the 2008 *Traffic Forecasting Report*.

Truck Percentages

Based on the October 2012 count conducted by KYTC, buses and trucks compose approximately 3% of the traffic using the corridor. In absence of additional data, this was applied to the entire corridor. During the design process, additional classification counts are recommended to validate the truck percentages.

No-Build and Build Segment Volumes

Illustrated in **Figure 2** are the 2040 No Build AADT volumes and ESALs for each segment. The proposed build alternates on existing alignment are not anticipated to increase traffic volumes along the corridor. Therefore, the 2040 No Build volumes apply to the 2040 Build scenarios as well. The one exception is Alternate 1G, which is a new link between Seneca Lane and US 45 that passes through Mount Kenton Cemetery in Section 1 and ties into US 45 at Lakeview Drive. This alternate was developed after the existing traffic data had been collected. Therefore there was not enough information to accurately estimate traffic conditions on the new segment and US 45. Thus, if Alternate 1G is recommended for further study, additional data collection and traffic forecasting will be required to determine the impacts to Segment 1 and the intersections at US 45/Lakeview Drive and US 45/KY 1286.

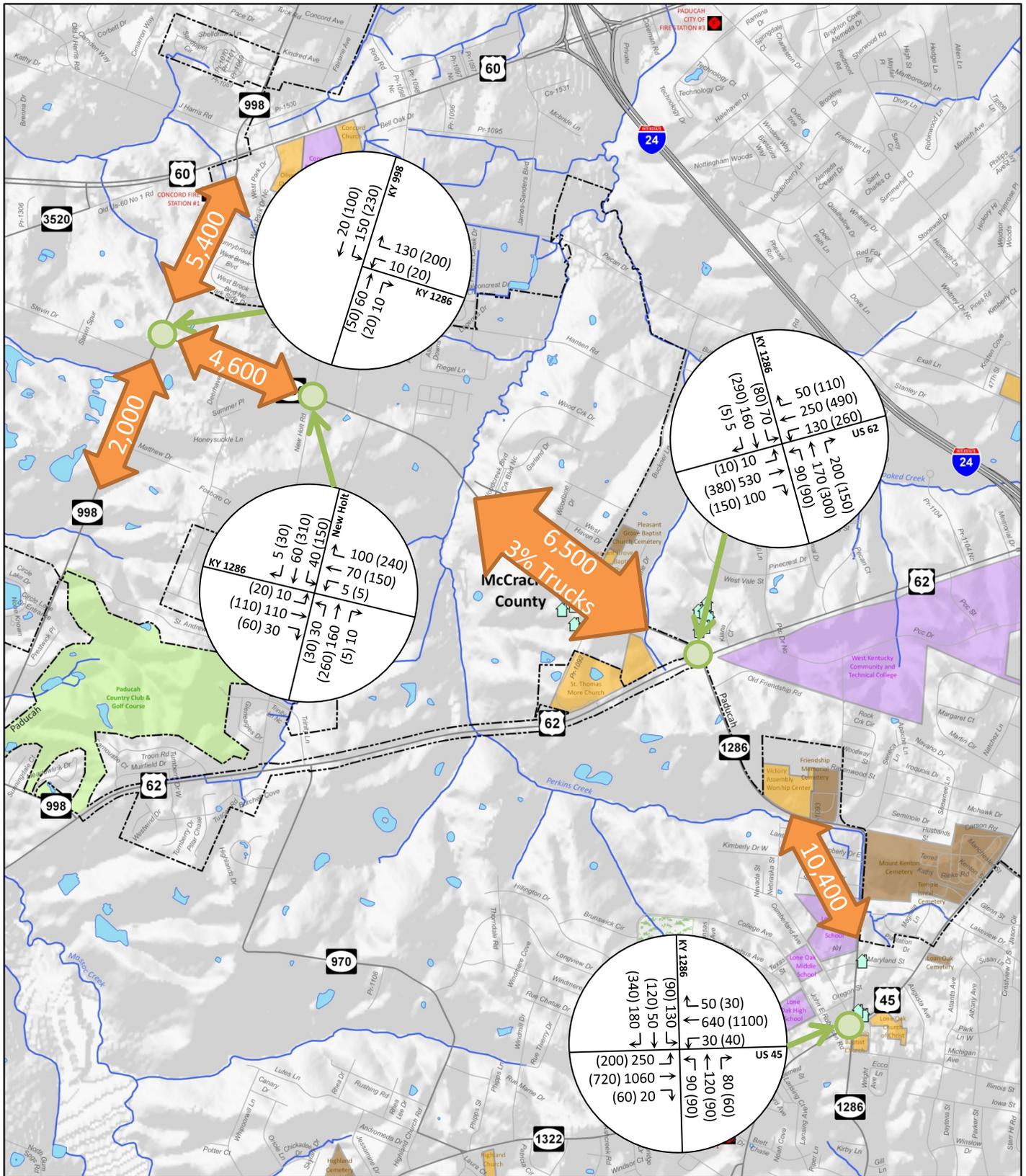
ESALs

ESAL values were calculated using the ESAL spreadsheet provided by KYTC. Forecast data was inputted including functional class, current year ADT, future year ADT, K-factor, directional factor, and truck percentage. Default axles per truck were used in the calculations. The resulting 20-year ESALs are presented on **Figure 2**. The calculation sheets are presented in **Appendix B**.

Turning Movements

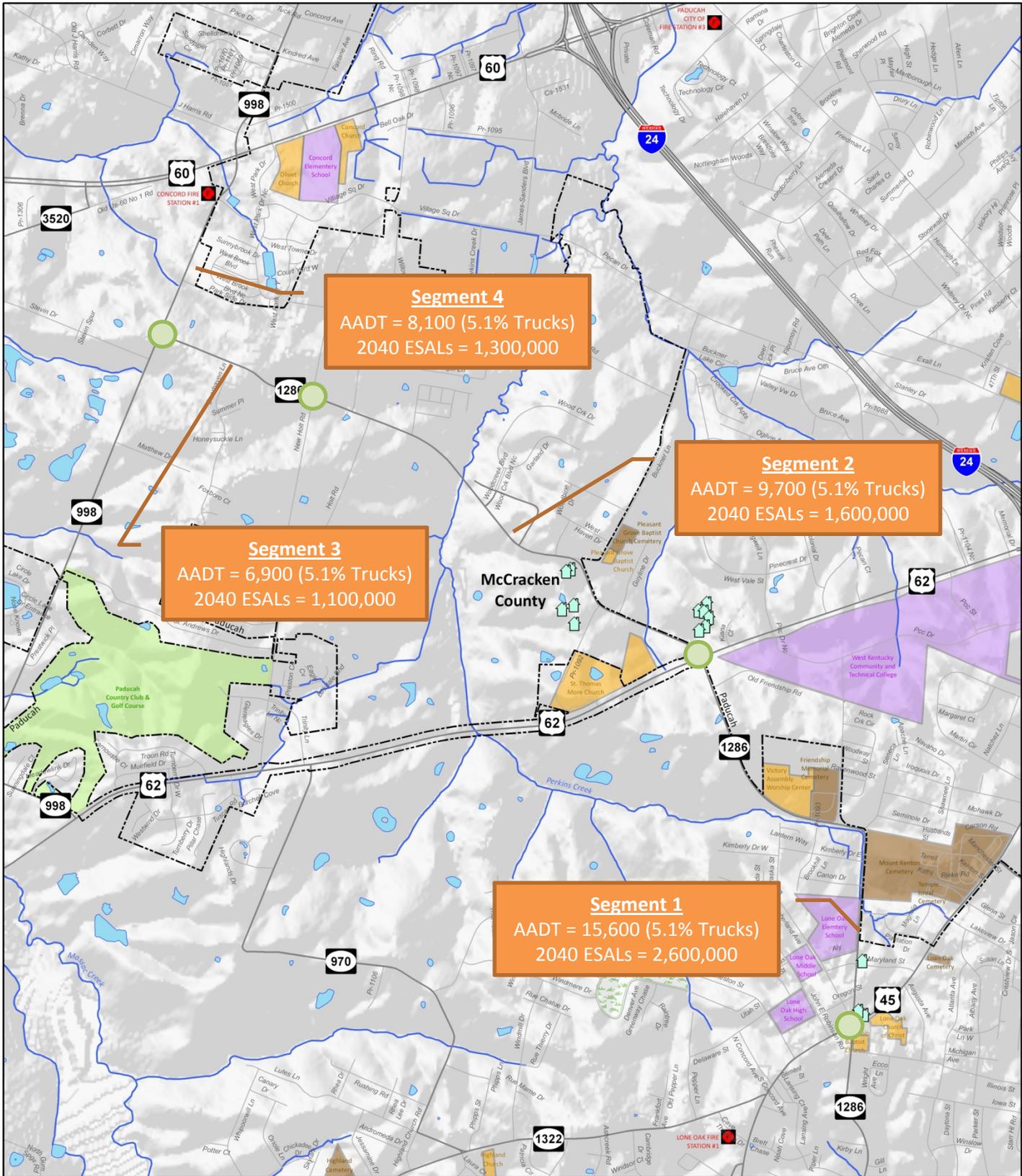
2040 No Build turning movements are illustrated on **Figure 3**.

Appendix A: Report Figures



AADT: Annual Average Daily Traffic
 AM (PM) Peak Hour Volume

Figure 1:
2013 Traffic Volumes
 KY 1286/KY 998 Planning Study
 McCracken County, KY
 Item # 1-153.00



AADT: Annual Average Daily Traffic
 ESALS: Equivalent Single Axle Load

Figure 2:
2040 No Build Traffic Volumes
 KY 1286/KY 998 Planning Study
 McCracken County, KY
 Item # 1-153.00

Appendix B: ESAL Calculations

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County

McCracken

Date 12/17/13

Forecaster Stephen De Witte

Road Name

Friendship Road

Functional Class

16 - Urban Minor Arterial

MARS No. 0

Item No. 1-153.00

Route No. KY 1286

Project Description

KY 1286 Planning Study

Beg. MP 3.369

End MP 5

Scenario

2040 Forecast

T.F. No. 0.000

Segment Description

US 45 to US 62

No. of Lanes 2

1 or 2 way 2

REFERENCES:

Previous Forecasts

None

K- Factor Value 10.0%

K-Factor Source Measured

Traffic Volume

Special Count

PHF 0.9

Milepoint

4.3

Truck Percent

Special Count

Full Route Unique Identifier

Milepoint

4.3

073-KY-1286-000

ESAL Information

2007 Aggregated ESALS

Growth Rate

1.50%

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2013		2020	2030	2040
Volume	(AADT)	10400	1.50%	12000	13000	16000
Percent Trucks	(%T)	3.0%	2.0%	3.4%	4.2%	5.1%
Number of Trucks		310	3.5%	410	550	820
Percent Trucks Hauling Coal	(%CT)	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.100	1.00%	3.324	3.671	4.055
ESALs/Axle	(ESAL/A)	0.200	2.00%	0.230	0.280	0.341
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS:

SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

2,600,000

General Comments:

US 45 to US 62 (2040 Forecast)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AXT	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	11,542	96.6%	3.4%	11145	398	0.00%	3.32	0.23	0	0	0.500	65,597
2021	11,716	96.5%	3.5%	11304	412	0.00%	3.36	0.23	0	0	0.500	69,431
2022	11,891	96.4%	3.6%	11465	426	0.00%	3.39	0.24	0	0	0.500	73,514
2023	12,070	96.3%	3.7%	11628	441	0.00%	3.42	0.24	0	0	0.500	77,860
2024	12,251	96.3%	3.7%	11794	457	0.00%	3.46	0.25	0	0	0.500	82,487
2025	12,434	96.2%	3.8%	11961	473	0.00%	3.49	0.25	0	0	0.500	87,415
2026	12,621	96.1%	3.9%	12131	490	0.00%	3.53	0.26	0	0	0.500	92,662
2027	12,810	96.0%	4.0%	12303	507	0.00%	3.56	0.26	0	0	0.500	98,250
2028	13,002	96.0%	4.0%	12477	525	0.00%	3.60	0.27	0	0	0.500	104,202
2029	13,197	95.9%	4.1%	12654	544	0.00%	3.63	0.27	0	0	0.500	110,542
2030	13,395	95.8%	4.2%	12833	563	0.00%	3.67	0.28	0	0	0.500	117,295
2031	13,596	95.7%	4.3%	13014	583	0.00%	3.71	0.29	0	0	0.500	124,488
2032	13,800	95.6%	4.4%	13197	603	0.00%	3.75	0.29	0	0	0.500	132,152
2033	14,007	95.5%	4.5%	13383	624	0.00%	3.78	0.30	0	0	0.500	140,316
2034	14,217	95.5%	4.5%	13571	646	0.00%	3.82	0.30	0	0	0.500	149,015
2035	14,431	95.4%	4.6%	13761	669	0.00%	3.86	0.31	0	0	0.500	158,284
2036	14,647	95.3%	4.7%	13954	693	0.00%	3.90	0.32	0	0	0.500	168,161
2037	14,867	95.2%	4.8%	14149	717	0.00%	3.94	0.32	0	0	0.500	178,685
2038	15,090	95.1%	4.9%	14347	743	0.00%	3.98	0.33	0	0	0.500	189,900
2039	15,316	95.0%	5.0%	14547	769	0.00%	4.02	0.33	0	0	0.500	201,852
2040	15,546	94.9%	5.1%	14750	796	0.00%	4.06	0.34	0	0	0.500	214,590

5-yr ESALS
400,000

10-yr ESALS
900,000

15-yr ESALS
1,600,000

20-yr ESALS
2,600,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County	McCracken	Date	12/17/13
Road Name	Friendship Road	Forecaster	Stephen De Witte
Functional Class	16 - Urban Minor Arterial	MARS No.	0
Project Description	KY 1286 Planning Study	Item No.	1-153.00
Scenario	2040 Forecast	Route No.	KY 1286
Segment Description	US 62 to New Holt Rd	Beg. MP	5
		End MP	6.423
		T.F. No.	0.000
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	None	K- Factor Value	10.0%
Traffic Volume	Special Count	K-Factor Source	Measured
Milepoint	5.724	PHF	0.9
Truck Percent	Special Count	Full Route Unique Identifier	
Milepoint	5.724	073-KY-1286-000	
ESAL Information	2007 Aggregated ESALS		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2013		2020	2030	2040
Volume	(AADT)	6500	1.50%	7200	8400	9700
Percent Trucks	(%T)	3.0%	2.0%	3.4%	4.2%	5.1%
Number of Trucks		200	3.5%	240	350	490
Percent Trucks Hauling Coal	(%CT)	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.100	1.00%	3.324	3.671	4.055
ESALs/Axle	(ESAL/A)	0.200	2.00%	0.230	0.280	0.341
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS:

SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 1,600,000

General Comments:

US 62 to New Holt Rd (2040 Forecast)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	7,214	96.6%	3.4%	6965	249	0.00%	3.32	0.23	0	0	0.500	40,998
2021	7,322	96.5%	3.5%	7065	257	0.00%	3.36	0.23	0	0	0.500	43,395
2022	7,432	96.4%	3.6%	7166	266	0.00%	3.39	0.24	0	0	0.500	45,946
2023	7,544	96.3%	3.7%	7268	276	0.00%	3.42	0.24	0	0	0.500	48,662
2024	7,657	96.3%	3.7%	7371	286	0.00%	3.46	0.25	0	0	0.500	51,555
2025	7,772	96.2%	3.8%	7476	296	0.00%	3.49	0.25	0	0	0.500	54,634
2026	7,888	96.1%	3.9%	7582	306	0.00%	3.53	0.26	0	0	0.500	57,914
2027	8,006	96.0%	4.0%	7689	317	0.00%	3.56	0.26	0	0	0.500	61,406
2028	8,127	96.0%	4.0%	7798	328	0.00%	3.60	0.27	0	0	0.500	65,126
2029	8,248	95.9%	4.1%	7909	340	0.00%	3.63	0.27	0	0	0.500	69,089
2030	8,372	95.8%	4.2%	8020	352	0.00%	3.67	0.28	0	0	0.500	73,309
2031	8,498	95.7%	4.3%	8134	364	0.00%	3.71	0.29	0	0	0.500	77,805
2032	8,625	95.6%	4.4%	8248	377	0.00%	3.75	0.29	0	0	0.500	82,595
2033	8,755	95.5%	4.5%	8364	390	0.00%	3.78	0.30	0	0	0.500	87,698
2034	8,886	95.5%	4.5%	8482	404	0.00%	3.82	0.30	0	0	0.500	93,135
2035	9,019	95.4%	4.6%	8601	418	0.00%	3.86	0.31	0	0	0.500	98,928
2036	9,154	95.3%	4.7%	8721	433	0.00%	3.90	0.32	0	0	0.500	105,100
2037	9,292	95.2%	4.8%	8843	448	0.00%	3.94	0.32	0	0	0.500	111,678
2038	9,431	95.1%	4.9%	8967	464	0.00%	3.98	0.33	0	0	0.500	118,688
2039	9,573	95.0%	5.0%	9092	481	0.00%	4.02	0.33	0	0	0.500	126,158
2040	9,716	94.9%	5.1%	9219	498	0.00%	4.06	0.34	0	0	0.500	134,119

5-yr ESALS
200,000

10-yr ESALS
600,000

15-yr ESALS
1,000,000

20-yr ESALS
1,600,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County

McCracken

Date 12/17/13

Forecaster Stephen De Witte

Road Name

Friendship Road

Functional Class

16 - Urban Minor Arterial

MARS No. 0

Item No. 1-153.00

Route No. KY 1286

Project Description

KY 1286 Planning Study

Beg. MP 6.423

End MP 6.916

Scenario

2040 Forecast

T.F. No. 0.000

Segment Description

New Holt Rd to KY 998

No. of Lanes 2

1 or 2 way 2

REFERENCES:

Previous Forecasts

None

K- Factor Value 10.0%

K-Factor Source Measured

Traffic Volume

Special Count

PHF 0.9

Milepoint

6.828

Truck Percent

Special Count

Full Route Unique Identifier

Milepoint

6.828

073-KY-1286-000

ESAL Information

2007 Aggregated ESALS

Growth Rate

1.50%

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2013		2020	2030	2040
Volume	(AADT)	4600	1.50%	5100	5900	6900
Percent Trucks	(%T)	3.0%	2.0%	3.4%	4.2%	5.1%
Number of Trucks		140	3.5%	170	250	350
Percent Trucks Hauling Coal	(%CT)	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.100	1.00%	3.324	3.671	4.055
ESALs/Axle	(ESAL/A)	0.200	2.00%	0.230	0.280	0.341
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS:

SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

1,100,000

General Comments:

New Holt Rd to KY 998 (2040 Forecast)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	5,105	96.6%	3.4%	4929	176	0.00%	3.32	0.23	0	0	0.500	29,014
2021	5,182	96.5%	3.5%	5000	182	0.00%	3.36	0.23	0	0	0.500	30,710
2022	5,260	96.4%	3.6%	5071	189	0.00%	3.39	0.24	0	0	0.500	32,516
2023	5,338	96.3%	3.7%	5143	195	0.00%	3.42	0.24	0	0	0.500	34,438
2024	5,419	96.3%	3.7%	5216	202	0.00%	3.46	0.25	0	0	0.500	36,485
2025	5,500	96.2%	3.8%	5291	209	0.00%	3.49	0.25	0	0	0.500	38,664
2026	5,582	96.1%	3.9%	5366	217	0.00%	3.53	0.26	0	0	0.500	40,985
2027	5,666	96.0%	4.0%	5442	224	0.00%	3.56	0.26	0	0	0.500	43,457
2028	5,751	96.0%	4.0%	5519	232	0.00%	3.60	0.27	0	0	0.500	46,089
2029	5,837	95.9%	4.1%	5597	240	0.00%	3.63	0.27	0	0	0.500	48,893
2030	5,925	95.8%	4.2%	5676	249	0.00%	3.67	0.28	0	0	0.500	51,880
2031	6,014	95.7%	4.3%	5756	258	0.00%	3.71	0.29	0	0	0.500	55,062
2032	6,104	95.6%	4.4%	5837	267	0.00%	3.75	0.29	0	0	0.500	58,452
2033	6,196	95.5%	4.5%	5919	276	0.00%	3.78	0.30	0	0	0.500	62,063
2034	6,288	95.5%	4.5%	6003	286	0.00%	3.82	0.30	0	0	0.500	65,911
2035	6,383	95.4%	4.6%	6087	296	0.00%	3.86	0.31	0	0	0.500	70,010
2036	6,479	95.3%	4.7%	6172	306	0.00%	3.90	0.32	0	0	0.500	74,379
2037	6,576	95.2%	4.8%	6258	317	0.00%	3.94	0.32	0	0	0.500	79,034
2038	6,674	95.1%	4.9%	6346	328	0.00%	3.98	0.33	0	0	0.500	83,994
2039	6,774	95.0%	5.0%	6434	340	0.00%	4.02	0.33	0	0	0.500	89,281
2040	6,876	94.9%	5.1%	6524	352	0.00%	4.06	0.34	0	0	0.500	94,915

5-yr ESALS
200,000

10-yr ESALS
400,000

15-yr ESALS
700,000

20-yr ESALS
1,100,000

FORECAST OF EQUIVALENT SINGLE AXLE LOAD ACCUMULATIONS (20-year)

ROUTE ID:

County

McCracken

Date 12/17/13

Forecaster Stephen De Witte

Road Name

Olivet Church Road

MARS No. 0
Item No. 1-153.00

Functional Class

16 - Urban Minor Arterial

Route No. KY 998

Project Description

KY 1286 Planning Study

Beg. MP 1.718

End MP 2.314

Scenario

2040 Forecast

T.F. No. 0.000

Segment Description

KY 1286 to US 60

No. of Lanes 2

1 or 2 way 2

REFERENCES:

Previous Forecasts

None

K- Factor Value 10.0%

K-Factor Source Measured

Traffic Volume

Special Count

PHF 0.9

Milepoint

2.1

Truck Percent

Special Count

Full Route Unique Identifier

Milepoint

2.1

073-KY-0998-000

ESAL Information

2007 Aggregated ESALS

Growth Rate

1.50%

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2013		2020	2030	2040
Volume	(AADT)	5400	1.50%	6000	7000	8100
Percent Trucks	(%T)	3.0%	2.0%	3.4%	4.2%	5.1%
Number of Trucks		160	3.5%	200	290	410
Percent Trucks Hauling Coal	(%CT)	0.0%	0.0%	0.0%	0.0%	0.0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.100	1.00%	3.324	3.671	4.055
ESALs/Axle	(ESAL/A)	0.200	2.00%	0.230	0.280	0.341
<i>Coal Trucks:</i>						
Axles/Truck	(A/CT)	0	0.00%	0.000	0.000	0.000
ESALs/Axle	(ESAL/CA)	0	0.00%	0.000	0.000	0.000

ESAL CALCULATIONS:

SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane

1,300,000

General Comments:

KY 1286 to US 60 (2040 Forecast)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2020	5,993	96.6%	3.4%	5787	207	0.00%	3.32	0.23	0	0	0.500	34,060
2021	6,083	96.5%	3.5%	5869	214	0.00%	3.36	0.23	0	0	0.500	36,051
2022	6,174	96.4%	3.6%	5953	221	0.00%	3.39	0.24	0	0	0.500	38,171
2023	6,267	96.3%	3.7%	6038	229	0.00%	3.42	0.24	0	0	0.500	40,427
2024	6,361	96.3%	3.7%	6124	237	0.00%	3.46	0.25	0	0	0.500	42,830
2025	6,456	96.2%	3.8%	6211	246	0.00%	3.49	0.25	0	0	0.500	45,388
2026	6,553	96.1%	3.9%	6299	254	0.00%	3.53	0.26	0	0	0.500	48,113
2027	6,651	96.0%	4.0%	6388	263	0.00%	3.56	0.26	0	0	0.500	51,015
2028	6,751	96.0%	4.0%	6479	273	0.00%	3.60	0.27	0	0	0.500	54,105
2029	6,853	95.9%	4.1%	6570	282	0.00%	3.63	0.27	0	0	0.500	57,397
2030	6,955	95.8%	4.2%	6663	292	0.00%	3.67	0.28	0	0	0.500	60,903
2031	7,060	95.7%	4.3%	6757	302	0.00%	3.71	0.29	0	0	0.500	64,638
2032	7,166	95.6%	4.4%	6852	313	0.00%	3.75	0.29	0	0	0.500	68,617
2033	7,273	95.5%	4.5%	6949	324	0.00%	3.78	0.30	0	0	0.500	72,857
2034	7,382	95.5%	4.5%	7046	336	0.00%	3.82	0.30	0	0	0.500	77,373
2035	7,493	95.4%	4.6%	7145	348	0.00%	3.86	0.31	0	0	0.500	82,186
2036	7,605	95.3%	4.7%	7245	360	0.00%	3.90	0.32	0	0	0.500	87,314
2037	7,719	95.2%	4.8%	7347	372	0.00%	3.94	0.32	0	0	0.500	92,779
2038	7,835	95.1%	4.9%	7449	386	0.00%	3.98	0.33	0	0	0.500	98,602
2039	7,953	95.0%	5.0%	7553	399	0.00%	4.02	0.33	0	0	0.500	104,808
2040	8,072	94.9%	5.1%	7659	413	0.00%	4.06	0.34	0	0	0.500	111,422

5-yr ESALS
200,000

10-yr ESALS
500,000

15-yr ESALS
800,000

20-yr ESALS
1,300,000