

US 150 SCOPING STUDY - FINAL REPORT

Appendix E - TRAFFIC FORECAST REPORT



TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.transportation.ky.gov/


Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Secretary

MEMORANDUM

TO: Patricia Dunaway, P.E.
Chief District Engineer
District 4

ATTN: Charles Allen, P.E.

FROM: John Moore, P.E. 
Director
Division of Planning

DATE: July 17, 2014

SUBJECT: Nelson/Washington County Traffic Forecast
Scoping Study on US 150
Item No. 04-0396.00

We are providing the following forecasts on the attached report, in response to your June 17, 2014, request:

- 2014 and 2035 Average Daily Traffic
- Truck Percentages and 20-year ESALs
- Bicycle and Pedestrian Considerations

We are currently undergoing changes with our Traffic Forecast Report and would appreciate any suggestions/comments/questions that you might have. If you have any questions, please call Justin Harrod of this Division at (502) 782-5059.

JM/JH/BC

Attachments

C/att: Brent Sweger
Charlie Allen
Dan Hite
Paul Looney



Executive Summary

Traffic Forecast Report and Bike/Ped Accommodation Assessment for Nelson/Washington County Scoping Study on US 150 Item No. 04-0396.00

Prepared for:



Prepared by:
Justin Harrod
Division of Planning
Kentucky Transportation Cabinet
July 16, 2014

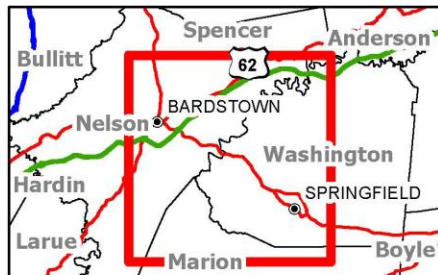
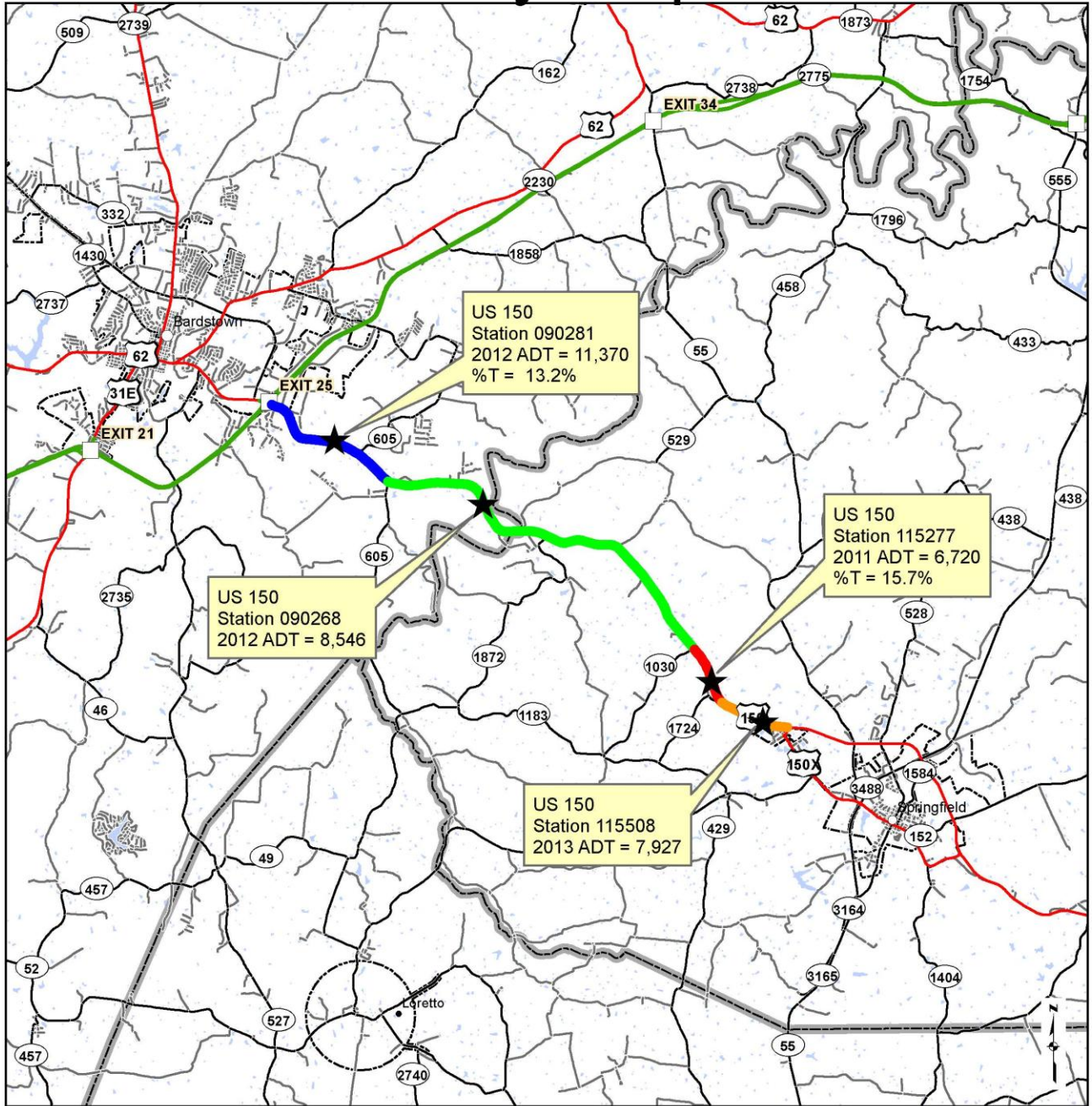
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Commonly Used Abbreviations and their Descriptions

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



Nelson/Washington County
 Scoping Study for US 150
 between Bardstown and Springfield
 Item #04-0396.00



Legend

- █ Segment 1 of Project
- █ Segment 2 of Project
- █ Segment 3 of Project
- █ Segment 4 of Project
- ★ Traffic Count Stations

0 2 4 Miles

Traffic Forecast Executive Summary

Nelson/Washington County: Scoping Study

Item No. 04-0396.00

FORECAST SUMMARY

The project calls for a scoping study on US 150 between Bardstown and Springfield. The purpose of this report is to analyze current and future traffic utilizing US 150 between MP 2.032 to MP 7.653 in Nelson County and MP 0.000 to MP 6.557 in Washington County.

FORECAST TYPE

The following types of forecasts were developed for each of the four project segments:

- 2014 and 2035 Average Daily and Design Hourly Truck Percent Forecasts
- 2014 and 2035 ADT and DHV values
- 20-year ESALs

CURRENT YEAR VOLUMES

The 2014 ADT volume is unique in each of the four different segments that break up the project length of the scoping study. Segment one consists of the 2014 ADT volume being based on a 2012 24-hour classification count collected at traffic station 090281 at MP 3.3. Segment two consists of the 2014 ADT volume being based on a 2012 48-hour hourly count collected at traffic station 090268 at MP 6.6. Segment three consists of the 2014 ADT volume being based on a 2011 48-hour classification count collected at traffic station 115277 at MP 4.95. Segment four consists of the 2014 ADT volume being based on a 2013 48-hour hourly count collected at traffic station 115508 at MP 5.95. All figures are subject to rounding.

DESIGN YEAR/GROWTH FACTORS

The Kentucky State Data Center forecasts that Nelson County's population will increase 1.23% annually over the next 20 years, and Washington County's population will increase 0.50% annually over the next 20 years. Exponential growth analyses were performed on historical data at traffic stations 090281(MP 3.3), 090268(MP 6.6), 115277(MP 4.95), and 115508(MP 5.95). The following table shows the corridor represented by four different segments, and the growth rate that was used for each one of those segments.

US-150 Corridor	Growth Rate
Segment 1	2.2%
Segment 2	2.0%
Segment 3	0.2%
Segment 4	1.9%

DESIGN HOUR FACTORS

DHVs were estimated by analyzing each traffic count along each one of the four segments collected at station 090281, 090268, 115277, and 115508. The peak AM and PM volumes were derived by dividing the highest hourly volumes from these counts by the daily total. Functional class design hour factors based on the day and month of these counts were then applied. Finally, the calculated K-factors were used in combination with the ADT forecast to produce DHVs for 2014 and 2035.

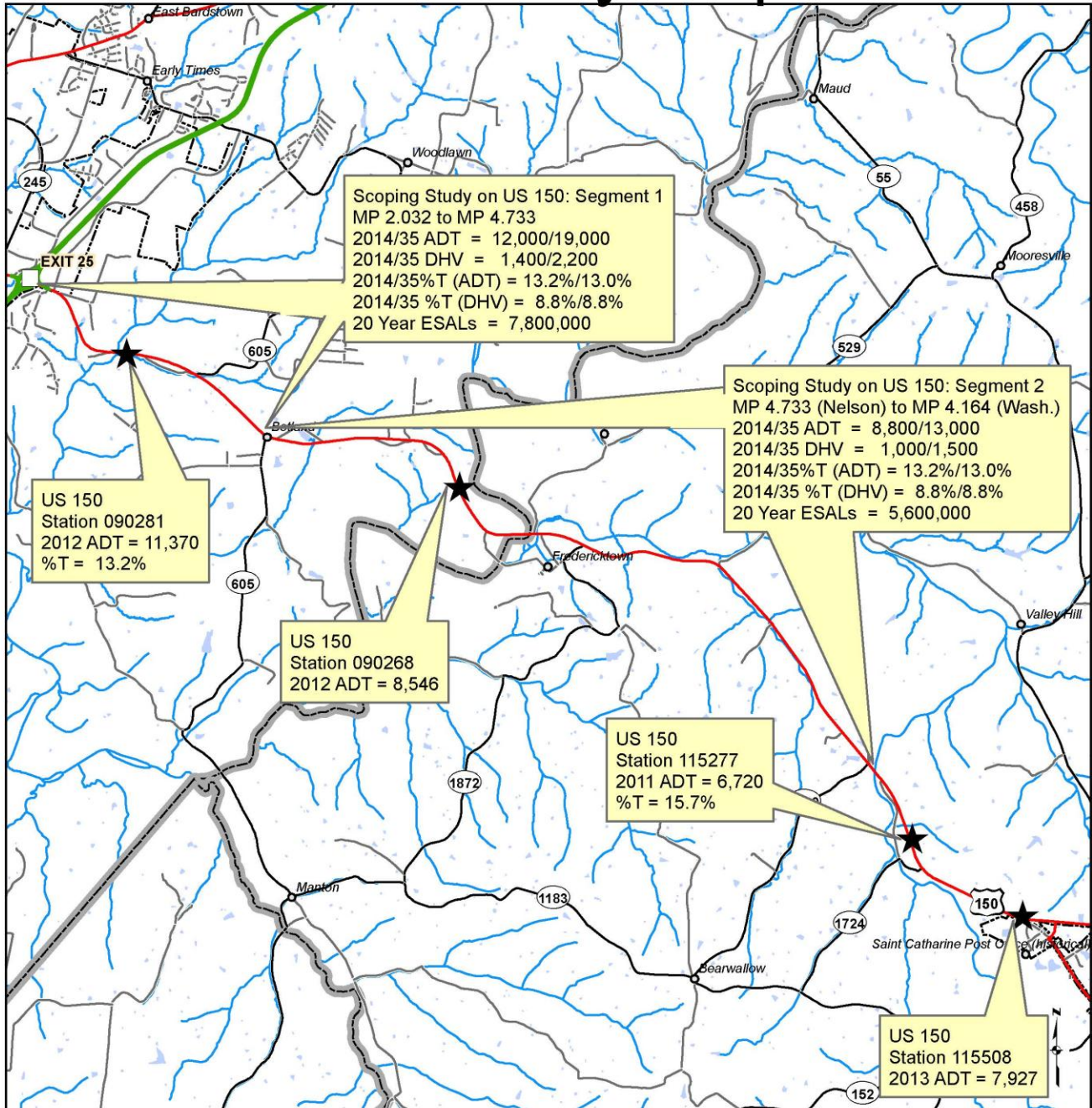
TRUCK PERCENTAGE

The truck percentage for segment one and two were calculated using a 2012 24-hour class count at traffic station 090281 at MP 3.3. A truck percentage of 13.2% and a truck growth rate of 0.0% were used to estimate future truck volumes. The truck percentage for segment three and four were calculated using a 2011 48-hour classification count at traffic station 115277 at MP 4.95. A truck percentage of 15.7% and a truck growth rate of 0.0% were used to estimate future truck volumes.

ESALs

Functional class averages and the 2035 ADT projections were used to estimate 20-year ESALs on the project road segment. The 2007 aggregated ESAL report, generated by the Kentucky Transportation Center in collaboration with the Kentucky Transportation Cabinet, was used to grow the important ESAL calculation variables. For more information, please see the attached ESAL calculation sheets.

Summary Map #1



Nelson/Washington County
 Scoping Study on US 150
 Between Bardstown and Springfield
 Item #04-0396.00

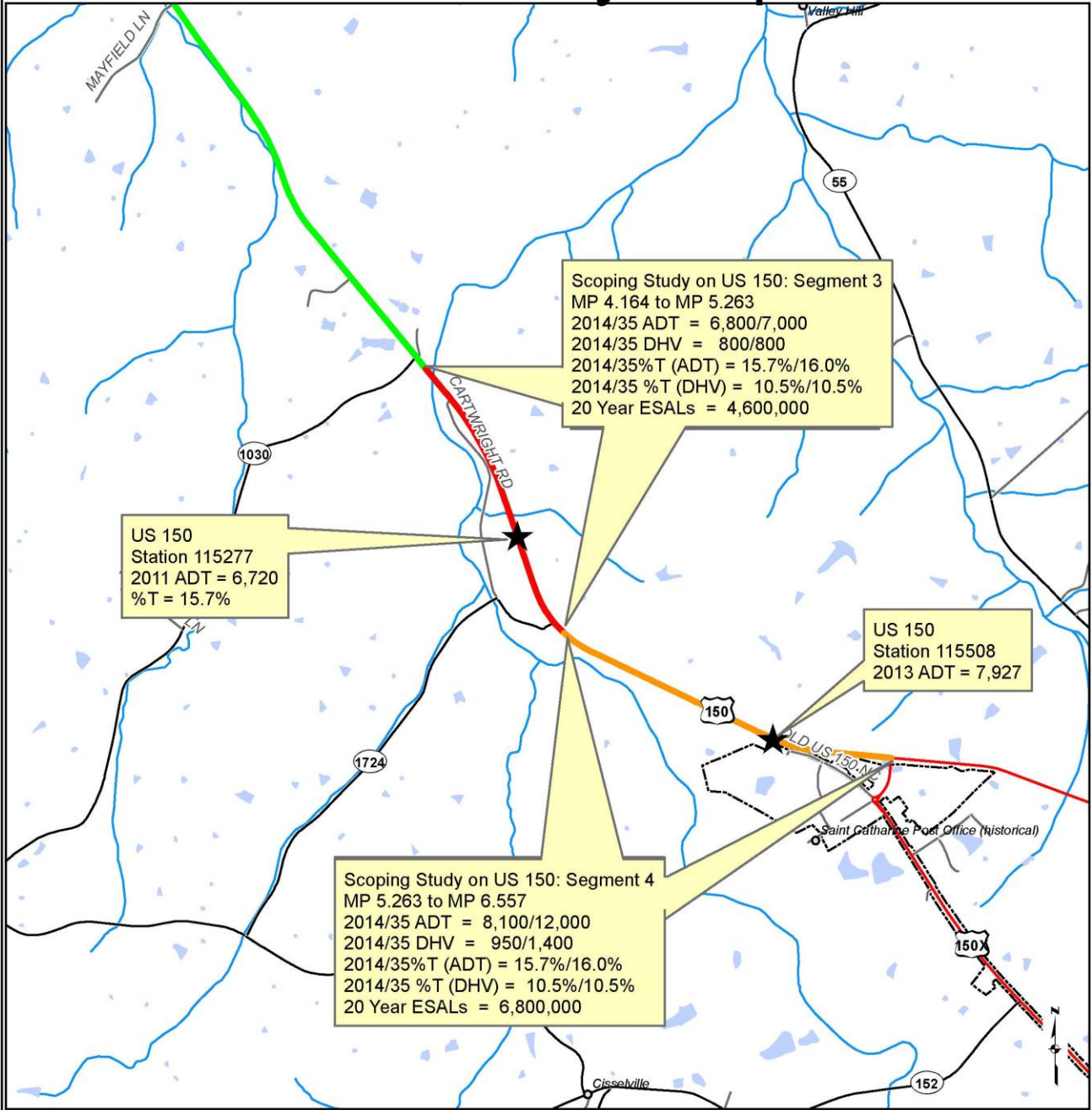


Legend

- Segment 1 of Project (Blue line)
- Segment 2 of Project (Green line)
- Segment 3 of Project (Red line)
- Segment 4 of Project (Orange line)
- Traffic Count Stations (Black star)

0 1 2 Miles

Summary Map #2



Nelson/Washington County
 Scoping Study on US 150
 Between Bardstown and Springfield
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Legend

- Segment 2 of Project
- Segment 3 of Project
- Segment 4 of Project
- ★ Traffic Count Stations

0 0.425 0.85
 Miles

HISTORICAL POPULATION SUMMARY

	1960	1970	1980	1990	2000	2010	60 - 70	70 - 80	80 - 90	90 - 00	00 - 10
	Population	Population	Population	Population	Population	Population	Pct	Pct	Pct	Pct	Pct
Kentucky	3,038,156	3,220,711	3,660,334	3,686,892	4,041,769	4,339,367	6.0%	13.6%	0.7%	9.6%	7.4%
Nelson Co	-	23,477	27,584	29,710	37,477	43,437	-	17.5%	7.7%	26.1%	15.9%
Washington Co	-	10,728	10,764	10,441	10,916	11,717	-	0.3%	-3.0%	4.5%	7.3%
							Change	Change	Change	Change	Change

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

FUTURE POPULATION PROJECTIONS SUMMARY

	2010	2015	2020	2025	2030	2035	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
	Projection	Projection	Projection	Projection	Projection	Projection	Pct	Pct	Pct	Pct	Pct
Kentucky	4,339,367	4,509,429	4,672,754	4,820,390	4,951,178	5,063,331	3.9%	3.6%	3.2%	2.7%	2.3%
Nelson Co	43,437	46,791	50,119	53,337	56,309	59,003	7.7%	7.1%	6.4%	5.6%	4.8%
Washington Co	11,717	12,118	12,486	12,813	13,086	13,276	3.4%	3.0%	2.6%	2.1%	1.5%
							Change	Change	Change	Change	Change

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

ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS

	60 - 70	70 - 80	80 - 90	90 - 00	05 - 10	10 - 15	15 - 20	20 - 25	25 - 30	10 - 30	10 - 35
	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR
Kentucky	0.59%	1.29%	0.07%	0.92%	0.77%	0.71%	0.62%	0.54%	0.45%	0.53%	0.62%
Nelson Co	-	1.63%	0.75%	2.35%	1.50%	1.38%	1.25%	1.09%	0.94%	1.03%	1.23%
Washington Co	-	0.03%	-0.30%	0.45%	0.68%	0.60%	0.52%	0.42%	0.29%	0.45%	0.50%

*Traffic Forecast Technical Report
 Nelson/Washington County: Scoping Study on US 150
 Item No. 04-0396.00*

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

ROUTE ID:

County	Nelson
Road Name	Springfield Rd
Functional Class	6 - Rural Minor Arterial
Project Description	Scoping Study for US 150 between Bardstown and Springfield
Scenario	Build
Segment Description	Segment 1

Date	07/14/14
Forecaster	Justin Harrod
MARS No.	N/A
Item No.	04-0396.00
Route No.	US 150
Beg. MP	2.032
End MP	4.733
T.F. No.	14.019
No. of Lanes	2
1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A
Traffic Volume	090281
Milepoint	3.3
Truck Percent	090281
Milepoint	3.3
ESAL Information	2007 Aggregated ESALS
Growth Rate	2.2%

K-Factor Value	11.7%
K-Factor Source	FC Avg.
PHF	0.85

Full Route Unique Identifier
 090-US-0150 -000

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2015	2025	2035
Volume (AADT)	12000	2.2%	12000	15000	19000
Percent Trucks (%T)	13.2%	0.0%	13.0%	13.0%	13.0%
Number of Trucks	1600	2.2%	1600	2000	2500
Percent Trucks Hauling Coal (%CT)	0.0	0.0	0.0	0.0	0.0
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.2	0.0%	3.2	3.2	3.2
ESALs/Axle (ESAL/A)	0.3	1.6%	0.3	0.3	0.4
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0.0	0.0%	0.0	0.0	0.0
ESALs/Axle (ESAL/CA)	0.0	0.0%	0.0	0.0	0.0

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane
 7,800,000

General Comments: _____

Scoping Study on US 150 between Bardstown and Springfield: Segment 1

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2015	12,264	86.8%	13.2%	10645	1619	0.00%	3.20	0.26	0	0	0.500	259,452
2016	12,534	86.8%	13.2%	10879	1654	0.00%	3.20	0.27	0	0	0.500	269,244
2017	12,810	86.8%	13.2%	11119	1691	0.00%	3.20	0.27	0	0	0.500	279,408
2018	13,091	86.8%	13.2%	11363	1728	0.00%	3.20	0.28	0	0	0.500	289,958
2019	13,379	86.8%	13.2%	11613	1766	0.00%	3.20	0.28	0	0	0.500	300,909
2020	13,674	86.8%	13.2%	11869	1805	0.00%	3.20	0.29	0	0	0.500	312,276
2021	13,975	86.8%	13.2%	12130	1845	0.00%	3.20	0.29	0	0	0.500	324,075
2022	14,282	86.8%	13.2%	12397	1885	0.00%	3.20	0.30	0	0	0.500	336,323
2023	14,596	86.8%	13.2%	12669	1927	0.00%	3.20	0.30	0	0	0.500	349,037
2024	14,917	86.8%	13.2%	12948	1969	0.00%	3.20	0.30	0	0	0.500	362,234
2025	15,245	86.8%	13.2%	13233	2012	0.00%	3.20	0.31	0	0	0.500	375,933
2026	15,581	86.8%	13.2%	13524	2057	0.00%	3.20	0.31	0	0	0.500	390,154
2027	15,924	86.8%	13.2%	13822	2102	0.00%	3.20	0.32	0	0	0.500	404,915
2028	16,274	86.8%	13.2%	14126	2148	0.00%	3.20	0.32	0	0	0.500	420,238
2029	16,632	86.8%	13.2%	14437	2195	0.00%	3.20	0.33	0	0	0.500	436,144
2030	16,998	86.8%	13.2%	14754	2244	0.00%	3.20	0.34	0	0	0.500	452,656
2031	17,372	86.8%	13.2%	15079	2293	0.00%	3.20	0.34	0	0	0.500	469,796
2032	17,754	86.8%	13.2%	15411	2344	0.00%	3.20	0.35	0	0	0.500	487,589
2033	18,145	86.8%	13.2%	15750	2395	0.00%	3.20	0.35	0	0	0.500	506,059
2034	18,544	86.8%	13.2%	16096	2448	0.00%	3.20	0.36	0	0	0.500	525,232
2035	18,952	86.8%	13.2%	16450	2502	0.00%	3.20	0.36	0	0	0.500	545,135

5-yr ESALS
1,500,000

10-yr ESALS
3,200,000

15-yr ESALS
5,300,000

20-yr ESALS
7,800,000

*Traffic Forecast Technical Report
 Nelson/Washington County: Scoping Study on US 150
 Item No. 04-0396.00*

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

ROUTE ID:

County	Nelson and Washington
Road Name	Springfield Rd/Bardstown Rd
Functional Class	6 - Rural Minor Arterial
Project Description	Scoping Study for US 150 between Bardstown and Springfield
Scenario	Build
Segment Description	Segment 2

Date	07/14/14
Forecaster	Justin Harrod
MARS No.	N/A
Item No.	04-0396.00
Route No.	US 150
Beg. MP	4.733 (Nelson)
End MP	4.164 (Wash.)
T.F. No.	14.019
No. of Lanes	2
1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A
Traffic Volume	090268
Milepoint	6.6
Truck Percent	090281
Milepoint	3.3
ESAL Information	2007 Aggregated ESALS
Growth Rate	2.0%

K- Factor Value	11.7%
K-Factor Source	FC Avg.
PHF	0.85

Full Route Unique Identifier
 090-US-0150 -000

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2015	2025	2035
Volume (AADT)	8800	2.0%	9000	11000	13000
Percent Trucks (%T)	13.2%	0.0%	13.0%	13.0%	13.0%
Number of Trucks	1200	2.0%	1200	1400	1700
Percent Trucks Hauling Coal (%CT)	0.0	0.0	0.0	0.0	0.0
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.2	0.0%	3.2	3.2	3.2
ESALs/Axle (ESAL/A)	0.3	1.6%	0.3	0.3	0.4
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0.0	0.0%	0.0	0.0	0.0
ESALs/Axle (ESAL/CA)	0.0	0.0%	0.0	0.0	0.0

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane
 5,600,000

General Comments: _____

Scoping Study on US 150 between Bardstown and Springfield: Segment 2

Year	ADT	Car %	Truck %	Cats	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDf	ESALs
2015	8,976	86.8%	13.2%	7791	1185	0.00%	3.20	0.26	0	0	0.500	189,893
2016	9,156	86.8%	13.2%	7947	1209	0.00%	3.20	0.27	0	0	0.500	196,674
2017	9,339	86.8%	13.2%	8106	1233	0.00%	3.20	0.27	0	0	0.500	203,699
2018	9,525	86.8%	13.2%	8268	1257	0.00%	3.20	0.28	0	0	0.500	210,976
2019	9,716	86.8%	13.2%	8433	1283	0.00%	3.20	0.28	0	0	0.500	218,516
2020	9,910	86.8%	13.2%	8602	1308	0.00%	3.20	0.29	0	0	0.500	226,327
2021	10,108	86.8%	13.2%	8774	1334	0.00%	3.20	0.29	0	0	0.500	234,419
2022	10,311	86.8%	13.2%	8950	1361	0.00%	3.20	0.30	0	0	0.500	242,802
2023	10,517	86.8%	13.2%	9129	1388	0.00%	3.20	0.30	0	0	0.500	251,487
2024	10,727	86.8%	13.2%	9311	1416	0.00%	3.20	0.30	0	0	0.500	260,485
2025	10,942	86.8%	13.2%	9497	1444	0.00%	3.20	0.31	0	0	0.500	269,808
2026	11,161	86.8%	13.2%	9687	1473	0.00%	3.20	0.31	0	0	0.500	279,466
2027	11,384	86.8%	13.2%	9881	1503	0.00%	3.20	0.32	0	0	0.500	289,472
2028	11,611	86.8%	13.2%	10079	1533	0.00%	3.20	0.32	0	0	0.500	299,838
2029	11,844	86.8%	13.2%	10280	1563	0.00%	3.20	0.33	0	0	0.500	310,578
2030	12,081	86.8%	13.2%	10486	1595	0.00%	3.20	0.34	0	0	0.500	321,705
2031	12,322	86.8%	13.2%	10696	1627	0.00%	3.20	0.34	0	0	0.500	333,233
2032	12,569	86.8%	13.2%	10910	1659	0.00%	3.20	0.35	0	0	0.500	345,177
2033	12,820	86.8%	13.2%	11128	1692	0.00%	3.20	0.35	0	0	0.500	357,551
2034	13,076	86.8%	13.2%	11350	1726	0.00%	3.20	0.36	0	0	0.500	370,372
2035	13,338	86.8%	13.2%	11577	1761	0.00%	3.20	0.36	0	0	0.500	383,655

5-yr ESALs
1,100,000

10-yr ESALs
2,300,000

15-yr ESALs
3,800,000

20-yr ESALs
5,600,000

*Traffic Forecast Technical Report
 Nelson/Washington County: Scoping Study on US 150
 Item No. 04-0396.00*

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

ROUTE ID:

County	Washington	Date	07/14/14
Road Name	Bardstown Rd	Forecaster	Justin Harrod
Functional Class	6 - Rural Minor Arterial	MARS No.	N/A
Project Description	Scoping Study for US 150 between Bardstown and Springfield	Item No.	04-0396.00
Scenario	Build	Route No.	US 150
Segment Description	Segment 3	Beg. MP	4.164
		End MP	5.263
		T.F. No.	14.019
		No. of Lanes	2
		1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A	K- Factor Value	11.7%
Traffic Volume	115277	K-Factor Source	FC Avg.
Milepoint	4.95	PHF	0.85
Truck Percent	115277	Full Route Unique Identifier	115-US-0150 -000
Milepoint	4.95		
ESAL Information	2007 Aggregated ESALS		
Growth Rate	0.2%		

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2015	2025	2035
Volume (AADT)	6800	0.2%	6800	7000	7000
Percent Trucks (%T)	15.7%	0.0%	16.0%	16.0%	16.0%
Number of Trucks	1100	0.2%	1100	1100	1100
Percent Trucks Hauling Coal (%CT)	0.0	0.0	0.0	0.0	0.0
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.6	0.0%	3.6	3.6	3.6
ESALs/Axle (ESAL/A)	0.3	1.6%	0.3	0.3	0.4
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0.0	0.0%	0.0	0.0	0.0
ESALs/Axle (ESAL/CA)	0.0	0.0%	0.0	0.0	0.0

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane 4,600,000

General Comments:

Scoping Study on US 150 between Bardstown and Springfield: Segment 3

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AXT	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2015	6,814	84.3%	15.7%	5744	1070	0.00%	3.60	0.26	0	0	0.500	190,897
2016	6,827	84.3%	15.7%	5755	1072	0.00%	3.60	0.27	0	0	0.500	194,255
2017	6,841	84.3%	15.7%	5767	1074	0.00%	3.60	0.27	0	0	0.500	197,674
2018	6,855	84.3%	15.7%	5778	1076	0.00%	3.60	0.28	0	0	0.500	201,154
2019	6,868	84.3%	15.7%	5790	1078	0.00%	3.60	0.28	0	0	0.500	204,697
2020	6,882	84.3%	15.7%	5802	1080	0.00%	3.60	0.29	0	0	0.500	208,303
2021	6,896	84.3%	15.7%	5813	1083	0.00%	3.60	0.29	0	0	0.500	211,974
2022	6,910	84.3%	15.7%	5825	1085	0.00%	3.60	0.30	0	0	0.500	215,712
2023	6,923	84.3%	15.7%	5836	1087	0.00%	3.60	0.30	0	0	0.500	219,516
2024	6,937	84.3%	15.7%	5848	1089	0.00%	3.60	0.30	0	0	0.500	223,389
2025	6,951	84.3%	15.7%	5860	1091	0.00%	3.60	0.31	0	0	0.500	227,332
2026	6,965	84.3%	15.7%	5872	1094	0.00%	3.60	0.31	0	0	0.500	231,345
2027	6,979	84.3%	15.7%	5883	1096	0.00%	3.60	0.32	0	0	0.500	235,431
2028	6,993	84.3%	15.7%	5895	1098	0.00%	3.60	0.32	0	0	0.500	239,590
2029	7,007	84.3%	15.7%	5907	1100	0.00%	3.60	0.33	0	0	0.500	243,824
2030	7,021	84.3%	15.7%	5919	1102	0.00%	3.60	0.34	0	0	0.500	248,134
2031	7,035	84.3%	15.7%	5930	1104	0.00%	3.60	0.34	0	0	0.500	252,522
2032	7,049	84.3%	15.7%	5942	1107	0.00%	3.60	0.35	0	0	0.500	256,989
2033	7,063	84.3%	15.7%	5954	1109	0.00%	3.60	0.35	0	0	0.500	261,536
2034	7,077	84.3%	15.7%	5966	1111	0.00%	3.60	0.36	0	0	0.500	266,165
2035	7,091	84.3%	15.7%	5978	1113	0.00%	3.60	0.36	0	0	0.500	270,877

5-yr ESALS
1,000,000

10-yr ESALS
2,100,000

15-yr ESALS
3,300,000

20-yr ESALS
4,600,000

*Traffic Forecast Technical Report
 Nelson/Washington County: Scoping Study on US 150
 Item No. 04-0396.00*

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

ROUTE ID:

County	Washington
Road Name	Bardstown Rd
Functional Class	6 - Rural Minor Arterial
Project Description	Scoping Study for US 150 between Bardstown and Springfield
Scenario	Build
Segment Description	Segment 4

Date	07/14/14
Forecaster	Justin Harrod
MARS No.	N/A
Item No.	04-0396.00
Route No.	US 150
Beg. MP	5.263
End MP	6.557
T.F. No.	14.019
No. of Lanes	2
1 or 2 way	2

REFERENCES:

Previous Forecasts	N/A
Traffic Volume	115508
Milepoint	5.95
Truck Percent	115277
Milepoint	4.95
ESAL Information	2007 Aggregated ESALS
Growth Rate	1.9%

K- Factor Value	11.7%
K-Factor Source	115508
PHF	0.85

Full Route Unique Identifier
 115-US-0150 -000

TRAFFIC PARAMETERS:

	Present Year	Growth Rate	Construction Year	Median Year	Design Year
	2014		2015	2025	2035
Volume (AADT)	8100	1.9%	8300	10000	12000
Percent Trucks (%T)	15.7%	0.0%	16.0%	16.0%	16.0%
Number of Trucks	1300	1.9%	1300	1600	1900
Percent Trucks Hauling Coal (%CT)	0.0	0.0	0.0	0.0	0.0
<i>Non-Coal Trucks:</i>					
Axles/Truck (A/T)	3.6	0.0%	3.6	3.6	3.6
ESALs/Axle (ESAL/A)	0.3	1.6%	0.3	0.3	0.4
<i>Coal Trucks:</i>					
Axles/Truck (A/CT)	0.0	0.0%	0.0	0.0	0.0
ESALs/Axle (ESAL/CA)	0.0	0.0%	0.0	0.0	0.0

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane
 6,800,000

General Comments: _____

Scoping Study on US 150 between Bardstown and Springfield: Segment 4

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALS
2015	8,254	84.3%	15.7%	6958	1296	0.00%	3.60	0.26	0	0	0.500	231,250
2016	8,411	84.3%	15.7%	7090	1320	0.00%	3.60	0.27	0	0	0.500	239,311
2017	8,571	84.3%	15.7%	7225	1346	0.00%	3.60	0.27	0	0	0.500	247,654
2018	8,733	84.3%	15.7%	7362	1371	0.00%	3.60	0.28	0	0	0.500	256,290
2019	8,899	84.3%	15.7%	7502	1397	0.00%	3.60	0.28	0	0	0.500	265,228
2020	9,068	84.3%	15.7%	7645	1424	0.00%	3.60	0.29	0	0	0.500	274,480
2021	9,241	84.3%	15.7%	7790	1451	0.00%	3.60	0.29	0	0	0.500	284,057
2022	9,416	84.3%	15.7%	7938	1478	0.00%	3.60	0.30	0	0	0.500	293,969
2023	9,595	84.3%	15.7%	8089	1506	0.00%	3.60	0.30	0	0	0.500	304,229
2024	9,777	84.3%	15.7%	8242	1535	0.00%	3.60	0.30	0	0	0.500	314,849
2025	9,963	84.3%	15.7%	8399	1564	0.00%	3.60	0.31	0	0	0.500	325,842
2026	10,153	84.3%	15.7%	8559	1594	0.00%	3.60	0.31	0	0	0.500	337,221
2027	10,345	84.3%	15.7%	8721	1624	0.00%	3.60	0.32	0	0	0.500	348,999
2028	10,542	84.3%	15.7%	8887	1655	0.00%	3.60	0.32	0	0	0.500	361,190
2029	10,742	84.3%	15.7%	9056	1687	0.00%	3.60	0.33	0	0	0.500	373,809
2030	10,946	84.3%	15.7%	9228	1719	0.00%	3.60	0.34	0	0	0.500	386,871
2031	11,154	84.3%	15.7%	9403	1751	0.00%	3.60	0.34	0	0	0.500	400,392
2032	11,366	84.3%	15.7%	9582	1785	0.00%	3.60	0.35	0	0	0.500	414,388
2033	11,582	84.3%	15.7%	9764	1818	0.00%	3.60	0.35	0	0	0.500	428,875
2034	11,802	84.3%	15.7%	9949	1853	0.00%	3.60	0.36	0	0	0.500	443,870
2035	12,027	84.3%	15.7%	10138	1888	0.00%	3.60	0.36	0	0	0.500	459,393

5-yr ESALS
1,300,000

10-yr ESALS
2,800,000

15-yr ESALS
4,600,000

20-yr ESALS
6,800,000

Bicycle and Pedestrian Review for Project #04-0396.00

Project Overview:

- Design study to determine improvements needed for US 150 between Springfield and Bardstown (MP 2.032-7.653 in Nelson County & MP 0.000-6.557 in Washington County)

Local Governments/Regional Bicycle and Pedestrian Plan:

- City of Bardstown Bicycle and Pedestrian master Plan (<http://transportation.ky.gov/Bike-Walk/Documents/Nelson%20Bike%20Transportation%20Plan.pdf>)
 - a. Updated plan has specific plans for shared use paths along US-150 to KY-605 (MP .44-1.67 / Phase 1) & (MP 1.67-3.82 / Phase 2)
- US Bike Route 76 (Trans America) route / <http://transportation.ky.gov/Bike-Walk/Pages/transamerica-bike-tour.aspx>

Existing Conditions:

- ADT range (11370-6720)
 - b. MP 3.3 (Nelson County) = 11370 (2012)
 - c. MP 6.6 (Nelson County) = 8546 (2012)
 - d. MP 4.95 (Washington County) = 6720 (2011)
 - e. MP 5.95 (Washington County) = 7927 (2013)
- Posted Speed Limit is 45-55 mph
- 2 Lane / rural cross section design
- No shoulder space for cyclists (less than 6 feet)
- Current Bicyclists Comfort Index (BCI) rating is an **E (the lowest Rating)**

The KYTC Bicycle and Pedestrian program team recommendations are:

Reference to D-4 DNA Study (<http://transportation.ky.gov/Planning/Pages/Project-Details.aspx?Project=US%20150%20DNA%20-%20Data%20Needs%20Assessment>)

US-150 provides a vital connection between the Cities of Bardstown and Springfield. The project to widen US-150 from MP-2.032 (Nelson) – 7.653 (Washington) will need to address several structurally deficient bridges and major widening. With such extensive work being done; this would be the best time to pursue the inclusion on a multiuse path along this roadway corridor. Further study needs to be done to decide the specific location (Northern or southern side).

- **Best:** Multiuse path along the entire roadway project corridor
 - a. Northern side of US-150 seems to provide better connection to similar planned facilities in the area
 - b. 10 foot minimum design
 - c. Usage and maintenance agreements need to be created with both local governments
 - d. The BCI would be an **A+ (the best rating)**
- **Better:** Using the 8-12 foot planned shoulders for marked bike lanes
 - a. Provide a stripped buffered space between motor vehicle traffic and the bike lane (http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/design_flexibility.cfm)
 - b. Bike lanes would be on both side of the roadway (4foot lane width minimum)

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- c. Special consideration for milled rumble strip pattern used(http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/t504039/)
- d. Usage and maintenance agreements need to be created with both local governments
- e. The BCI would be an **A**
- Good: provide an 8-12 foot shoulder space for pedestrians and bicyclists to use for general travel purposes
 - a. Special consideration for milled rumble strip pattern used (http://safety.fhwa.dot.gov/roadway_dept/pavement/rumble_strips/t504039/)
 - b. Allow for future additions of bike lanes with future resurfacing projects as the local governments update their bicycle and pedestrian master plans
 - c. The BCI would be an **C**

Prepared by:

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Division of Planning, www.transportation.ky.gov/Bike-Walk
Kentucky Transportation Cabinet
June 25th, 2014