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

Steven L. Beshear
Governor

Michael W. Hancock, P.E.
Acting Secretary

MEMORANDUM

TO: James Ballinger, P.E.
Chief District Engineer
District 7 – Lexington

ATTN: Robin Sprague, P.E.

FROM: Keith R. Damron, P.E.
Director
Division of Planning

DATE: April 28, 2010

SUBJECT: Clark County Traffic Forecast
I-64 and Mountain Parkway Interchange Feasibility Study
Item No. 7-8506.01

In response to your February 24, 2010, request we are providing the following forecast on the attached maps and worksheets:

- Build 2010 and 2032 Average Daily Traffic and Design Hour Volumes
- Build 2010 and 2032 Average Daily and Design Hour Truck Percentages
- Build 20 year ESALs

If you have any questions please contact Nathan Wilkinson of this Division.

KD/NW/BC

Attachments

c/att: Keith Caudill
Paul Looney
Bob Nunley
Randy Turner

Executive Summary

Clark County Traffic Forecast Report
I-64 at Bert T Combs Mountain Parkway
Interchange Feasibility Study
Item No. 7-8506.01

Prepared for:

Prepared by:
Nathan Wilkinson
Division of Planning
Kentucky Transportation Cabinet

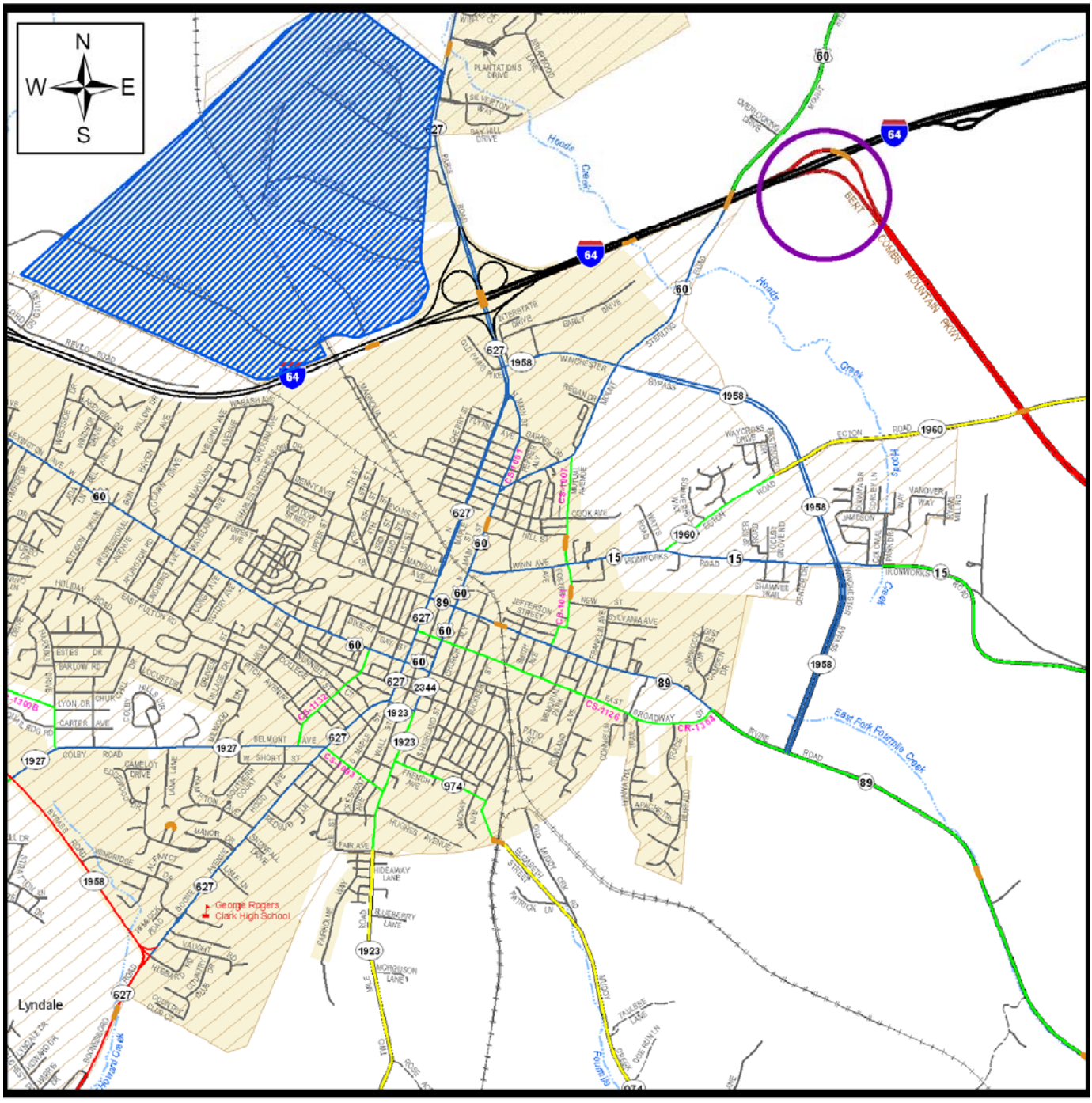
April 2010

Table of Contents

Commonly Used Abbreviations and their Descriptions

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

Project Vicinity



LEGEND
- Project Site Location
- Bridge or Overpass
- Developing Industrial Park

Clark County
I-64 at Bert T Combs Mountain Parkway
Interchange Feasibility Study
Item # 7-8506.01

Kentucky UNBRIDLED SPIRIT
KENTUCKY TRANSPORTATION CABINET
0 0.25 0.5 0.75 1 Miles

Traffic Forecast Executive Summary
Clark County: I-64 at Mountain Parkway
Interchange Feasibility Study
Item No. 7-8506.01

PROJECT DESCRIPTION

The project, which is currently in the design phase, calls for improving the I-64 and Bert T Combs Mountain Parkway interchange in Clark County into a fully directional interchange. The purpose of this report is to analyze current and future traffic utilizing the two existing and two proposed ramps at the project interchange. District Seven requested traffic forecasts for the project ramps.

TYPE OF FORECASTS

The following types of forecasts were developed:

- Build 2010 and 2032 Average Daily Traffic and Design Hour Volumes
- Build 2010 and 2032 Average Daily and Design Hour Truck Percent Forecasts
- Build Twenty-Year ESAL Forecasts

CURRENT YEAR VOLUMES

The Build 2010 ADT volume estimates for project segments 1 and 4 are based on 2006 and 2007 ramp count averages collected at traffic stations 025X11, 025X12, 025Y09, and 025Y10 (see pg. 6). The count data averages from these four stations were forecasted to estimate 2010 traffic volumes. Current year Build ADTs for segments 2 and 3 were developed using output results from the KY Statewide Traffic Model as well as directional data collected from the I-64/KY 627 and I-64/US 60 interchanges. All figures are subject to rounding.

FUTURE YEAR VOLUMES / GROWTH RATES

The Kentucky State Data Center predicts slightly above average population growth in Clark County between now and 2030 (see pg. 5). Linear growth analyses performed on historical data from stations 025001, 025003, 025004, and 025P20 reveal traffic volumes within the area have been growing 1.5% annually (see pg. 6). Meanwhile, traffic on all of Clark County's rural principal arterial roads increased at an average linear rate of 1.71% during the twenty-five year period between 1982 and 2007. The Winchester Industrial Park as well as the Midland Trail Industrial Park and Woodland Industrial Park, both located in Mount Sterling, could potentially impact traffic growth at the project interchange. Based upon these observations, a 1.5% exponential growth rate was applied to forecast future traffic volumes on the subject ramps. All figures are subject to rounding.

DESIGN HOUR VOLUMES

DHVs were determined by analyzing the most recent hourly volume data collected at stations 025X11, 025X12, 025P20 E, and 025P20 W. The peak AM and PM hourly traffic volumes for the project road segments were identified directly from these counts. Next, these peak hour volume counts were used to develop daily K-factors to which functional class design hour factors based

upon the day and month of the counts were then applied. Finally, these calculated 2010 K-factors were used in combination with the ADT forecasts to produce annual DHVs for 2010 and 2032.

PERCENT TRUCKS

A 2007 directional vehicle classification count conducted on the Bert T Combs Mountain Parkway at station 025P20 was forecasted to provide the 2010 truck percentage estimates that were used to complete the ESAL analyses for all four project ramps. Statewide research indicates that a 1.0% annual growth rate for %T should be applied as a component of the overall traffic growth on rural principal arterial roads. This truck percent growth rate corresponds to a 2.5% truck volume growth rate on the I-64 and Mountain Parkway interchange ramps. All figures are subject to rounding.

ESAL CALCULATIONS

Functional class averages from ATR data, traffic counts, and the 2032 ADT projections were used to estimate twenty-year ESALs on the project road segments. The 2007 functional class average growth rates, generated by the Kentucky Transportation Center in collaboration with the Transportation Cabinet, were used to grow the important ESAL calculation variables. For more information please see the attached ESAL calculation sheets.

HISTORICAL POPULATION SUMMARY

	1950 Population	1960 Population	1970 Population	1980 Population	1990 Population	2000 Population	50 - 60 Pct Change	60 - 70 Pct Change	70 - 80 Pct Change	80 - 90 Pct Change	90 - 00 Pct Change
Kentucky	-	3,038,156	3,220,711	3,660,334	3,686,892	4,041,769	-	6.0%	13.6%	0.7%	9.6%
Clark Co	-	-	24,090	28,322	29,496	33,144	-	-	17.6%	4.1%	12.4%
Winchester city	-	-	-	-	15,821	16,724	-	-	-	-	5.7%
Mount Sterling city	-	-	-	-	5,472	5,876	-	-	-	-	7.4%

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

FUTURE POPULATION PROJECTIONS SUMMARY

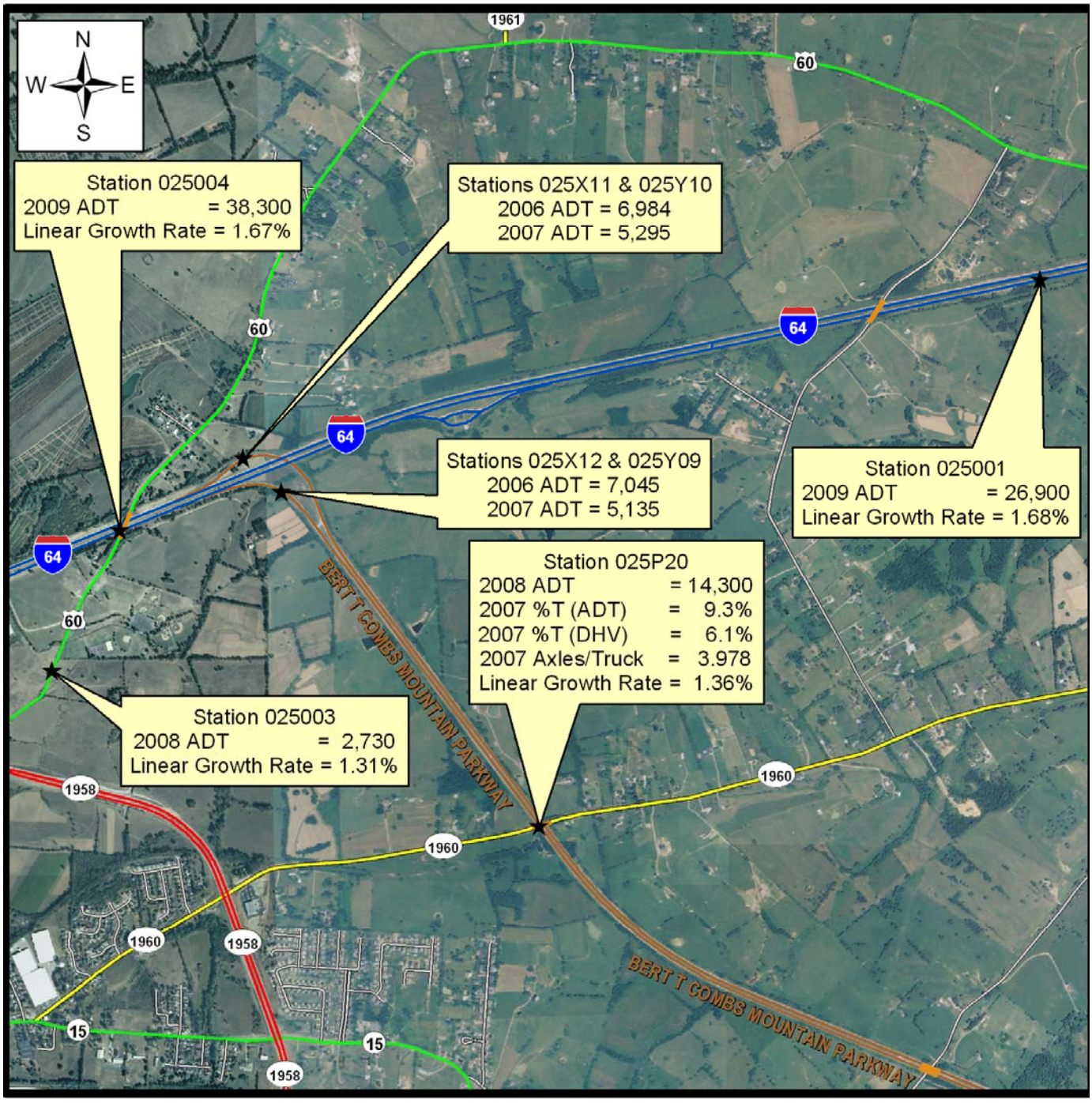
	2005 Projection	2010 Projection	2015 Projection	2020 Projection	2025 Projection	2030 Projection	05 - 10 Pct Change	10 - 15 Pct Change	15 - 20 Pct Change	20 - 25 Pct Change	25 - 30 Pct Change
Kentucky	4,170,163	4,338,878	4,506,569	4,669,801	4,838,370	5,001,748	4.0%	3.9%	3.6%	3.6%	3.4%
Clark Co	34,638	36,361	38,008	39,611	41,151	42,487	5.0%	4.5%	4.2%	3.9%	3.2%

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

ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS

	50 - 60 GR	60 - 70 GR	70 - 80 GR	80 - 90 GR	90 - 00 GR	05 - 10 GR	10 - 15 GR	15 - 20 GR	20 - 25 GR	25 - 30 GR	10 - 30 GR
Kentucky	-	0.59%	1.29%	0.07%	0.92%	0.80%	0.76%	0.71%	0.71%	0.67%	0.71%
Clark Co	-	-	1.63%	0.41%	1.17%	0.98%	0.89%	0.83%	0.77%	0.64%	0.78%

Traffic Count Stations

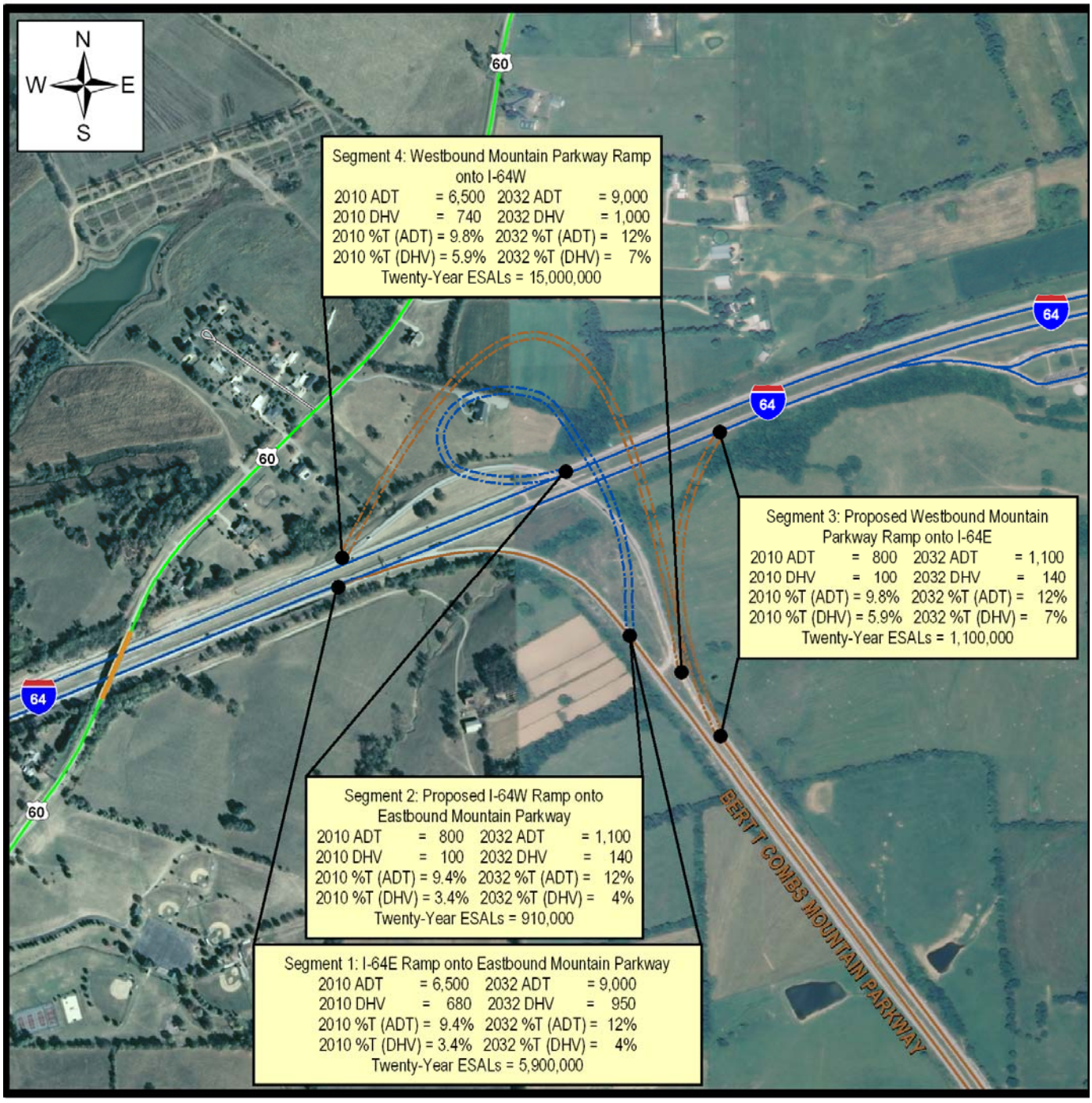


LEGEND
★ Count Station
Bridge or Overpass

Clark County
I-64 at Bert T Combs Mountain Parkway
Interchange Feasibility Study
Item # 7-8506.01

Kentucky UNBRIDLED SPIRIT
KENTUCKY TRANSPORTATION CABINET
0 0.25 0.5 0.75 Miles

Build Forecast Summary



LEGEND
- ESAL Segment Endpoint
- Bridge or Overpass

Clark County
I-64 at Bert T Combs Mountain Parkway
Interchange Feasibility Study
Item # 7-8506.01

Kentucky UNBRIDLED SPIRIT
KENTUCKY TRANSPORTATION CABINET
0 0.05 0.1 0.15 0.2 0.25 Miles

Appendix A: ESAL Forecasts and Calculations

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

ROUTE ID:

County	Clark	Date	04/21/10
		Forecaster	Nathan Wilkinson
Road Name	Bert T Combs Mountain Parkway		
		MARS No.	8352401D
Functional Class	2 - Rural Principal Arterial	Item No.	7-8506.01
		Route No.	KY 9000
Project Description	I-64 at Bert T Combs Mountain Parkway Interchange Feasibility Study	Beg. M.P.	0
		End M.P.	0.500
Scenario	Build	T.F. No.	10.004
Segment Description	Segment 1: I-64E Ramp onto Eastbound Mountain Parkway	No. of Lanes	2
		1 or 2 way	1

REFERENCES:

Previous Forecasts	None	K- Factor Value	10.5%
		K-Factor Source	025X12
Traffic Volume	Station 025X12 and 025Y09	PHF	0.9
Milepoint	NA		
Truck Percent	Station 025P20 E		
Milepoint	1.3		
ESAL Information	2007 Aggregated ESALS		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2010		**2012**	**2022**	**2032**
Volume	(AADT)	6500	1.50%	6700	7800	9000
Percent Trucks	(%T)	9.4%	1.0%	10%	11%	12%
Number of Trucks		610	2.5%	670	860	1100
Percent Trucks Hauling Coal	(%CT)	0%	0.0%	0%	0%	0%
Non-Coal Trucks:						
Axles/Truck	(A/T)	3.613	0.00%	3.613	3.613	3.613
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
Coal Trucks:						
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: 5,900,000

General Comments:

Segment 1: I-64E Ramp onto Eastbound Mountain Parkway (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2012	6,696	90.4%	9.6%	6056	641	0.00%	3.61	0.27	0	0	0.800	190,274	
2013	6,797	90.3%	9.7%	6140	657	0.00%	3.61	0.27	0	0	0.800	197,936	
2014	6,899	90.2%	9.8%	6226	673	0.00%	3.61	0.28	0	0	0.800	205,913	
2015	7,002	90.1%	9.9%	6312	690	0.00%	3.61	0.28	0	0	0.800	214,218	
2016	7,107	90.0%	10.0%	6400	708	0.00%	3.61	0.29	0	0	0.800	222,864	5-yr ESALs 1,100,000
2017	7,214	89.9%	10.1%	6489	725	0.00%	3.61	0.29	0	0	0.800	231,866	
2018	7,322	89.8%	10.2%	6579	744	0.00%	3.61	0.30	0	0	0.800	241,238	
2019	7,432	89.7%	10.3%	6670	762	0.00%	3.61	0.30	0	0	0.800	250,996	
2020	7,544	89.6%	10.4%	6762	782	0.00%	3.61	0.30	0	0	0.800	261,156	
2021	7,657	89.5%	10.5%	6855	801	0.00%	3.61	0.31	0	0	0.800	271,734	10-yr ESALs 2,400,000
2022	7,772	89.4%	10.6%	6950	821	0.00%	3.61	0.31	0	0	0.800	282,747	
2023	7,888	89.3%	10.7%	7046	842	0.00%	3.61	0.32	0	0	0.800	294,214	
2024	8,006	89.2%	10.8%	7143	863	0.00%	3.61	0.32	0	0	0.800	306,154	
2025	8,127	89.1%	10.9%	7242	885	0.00%	3.61	0.33	0	0	0.800	318,586	
2026	8,248	89.0%	11.0%	7341	907	0.00%	3.61	0.34	0	0	0.800	331,530	15-yr ESALs 4,000,000
2027	8,372	88.9%	11.1%	7442	930	0.00%	3.61	0.34	0	0	0.800	345,008	
2028	8,498	88.8%	11.2%	7544	953	0.00%	3.61	0.35	0	0	0.800	359,041	
2029	8,625	88.7%	11.3%	7648	977	0.00%	3.61	0.35	0	0	0.800	373,654	
2030	8,755	88.6%	11.4%	7753	1002	0.00%	3.61	0.36	0	0	0.800	388,869	
2031	8,886	88.4%	11.6%	7859	1027	0.00%	3.61	0.36	0	0	0.800	404,712	20-yr ESALs 5,900,000
2032	9,019	88.3%	11.7%	7966	1053	0.00%	3.61	0.37	0	0	0.800	421,209	

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

ROUTE ID:

County	Clark	Date	04/21/10
		Forecaster	Nathan Wilkinson
Road Name	Bert T Combs Mountain Parkway		
		MARS No.	8352401D
Functional Class	2 - Rural Principal Arterial	Item No.	7-8506.01
		Route No.	KY 9000
Project Description	I-64 at Bert T Combs Mountain Parkway Interchange Feasibility Study	Beg. M.P.	0
		End M.P.	0.500
Scenario	Build	T.F. No.	10.004
Segment Description	Segment 2: Proposed I-64W Ramp onto Eastbound Mountain Parkway	No. of Lanes	1
		1 or 2 way	1

REFERENCES:

Previous Forecasts	None	K- Factor Value	12.9%
		K-Factor Source	025P20 E
Traffic Volume	KY Statewide Traffic Model	PHF	0.9
Milepoint	NA		
Truck Percent	Station 025P20 E		
Milepoint	1.3		
ESAL Information	2007 Aggregated ESALS		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2010		**2012**	**2022**	**2032**
Volume	(AADT)	800	1.50%	820	960	1100
Percent Trucks	(%T)	9.4%	1.0%	10%	11%	12%
Number of Trucks		80	2.5%	80	110	130
Percent Trucks Hauling Coal	(%CT)	0%	0.0%	0%	0%	0%
Non-Coal Trucks:						
Axles/Truck	(A/T)	3.613	0.00%	3.613	3.613	3.613
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
Coal Trucks:						
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: 910,000

General Comments:

Segment 2: Proposed I-64W Ramp onto Eastbound Mountain Parkway (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2012	824	90.4%	9.6%	745	79	0.00%	3.61	0.27	0	0	1.000	29,273	
2013	837	90.3%	9.7%	756	81	0.00%	3.61	0.27	0	0	1.000	30,452	
2014	849	90.2%	9.8%	766	83	0.00%	3.61	0.28	0	0	1.000	31,679	
2015	862	90.1%	9.9%	777	85	0.00%	3.61	0.28	0	0	1.000	32,957	
2016	875	90.0%	10.0%	788	87	0.00%	3.61	0.29	0	0	1.000	34,287	5-yr ESALs 200,000
2017	888	89.9%	10.1%	799	89	0.00%	3.61	0.29	0	0	1.000	35,672	
2018	901	89.8%	10.2%	810	92	0.00%	3.61	0.30	0	0	1.000	37,114	
2019	915	89.7%	10.3%	821	94	0.00%	3.61	0.30	0	0	1.000	38,615	
2020	928	89.6%	10.4%	832	96	0.00%	3.61	0.30	0	0	1.000	40,178	
2021	942	89.5%	10.5%	844	99	0.00%	3.61	0.31	0	0	1.000	41,805	10-yr ESALs 400,000
2022	956	89.4%	10.6%	855	101	0.00%	3.61	0.31	0	0	1.000	43,500	
2023	971	89.3%	10.7%	867	104	0.00%	3.61	0.32	0	0	1.000	45,264	
2024	985	89.2%	10.8%	879	106	0.00%	3.61	0.32	0	0	1.000	47,101	
2025	1,000	89.1%	10.9%	891	109	0.00%	3.61	0.33	0	0	1.000	49,013	
2026	1,015	89.0%	11.0%	904	112	0.00%	3.61	0.34	0	0	1.000	51,005	15-yr ESALs 600,000
2027	1,030	88.9%	11.1%	916	114	0.00%	3.61	0.34	0	0	1.000	53,078	
2028	1,046	88.8%	11.2%	929	117	0.00%	3.61	0.35	0	0	1.000	55,237	
2029	1,062	88.7%	11.3%	941	120	0.00%	3.61	0.35	0	0	1.000	57,485	
2030	1,077	88.6%	11.4%	954	123	0.00%	3.61	0.36	0	0	1.000	59,826	
2031	1,094	88.4%	11.6%	967	126	0.00%	3.61	0.36	0	0	1.000	62,263	20-yr ESALs 910,000
2032	1,110	88.3%	11.7%	980	130	0.00%	3.61	0.37	0	0	1.000	64,801	

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

ROUTE ID:

County	Clark	Date	04/21/10
		Forecaster	Nathan Wilkinson
Road Name	Bert T Combs Mountain Parkway		
		MARS No.	8352401D
Functional Class	2 - Rural Principal Arterial	Item No.	7-8506.01
		Route No.	KY 9000
Project Description	I-64 at Bert T Combs Mountain Parkway Interchange Feasibility Study	Beg. M.P.	0
		End M.P.	0.500
Scenario	Build	T.F. No.	10.004
Segment Description	Segment 3: Proposed Westbound Mountain Parkway Ramp onto I-64E	No. of Lanes	1
		1 or 2 way	1

REFERENCES:

Previous Forecasts	None	K- Factor Value	12.7%
		K-Factor Source	025P20 W
Traffic Volume	KY Statewide Traffic Model	PHF	0.9
Milepoint	NA		
Truck Percent	Station 025P20 W		
Milepoint	1.3		
ESAL Information	2007 Aggregated ESALS		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2010		**2012**	**2022**	**2032**
Volume	(AADT)	800	1.50%	820	960	1100
Percent Trucks	(%T)	9.8%	1.0%	10%	11%	12%
Number of Trucks		80	2.5%	80	110	130
Percent Trucks Hauling Coal	(%CT)	0%	0.0%	0%	0%	0%
Non-Coal Trucks:						
Axles/Truck	(A/T)	4.314	0.00%	4.314	4.314	4.314
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
Coal Trucks:						
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:

Segment 3: Proposed Westbound Mountain Parkway Ramp onto I-64E (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2012	824	90.0%	10.0%	742	82	0.00%	4.31	0.27	0	0	1.000	36,211	
2013	837	89.9%	10.1%	752	85	0.00%	4.31	0.27	0	0	1.000	37,678	
2014	849	89.8%	10.2%	762	87	0.00%	4.31	0.28	0	0	1.000	39,205	
2015	862	89.7%	10.3%	773	89	0.00%	4.31	0.28	0	0	1.000	40,796	
2016	875	89.6%	10.4%	784	91	0.00%	4.31	0.29	0	0	1.000	42,452	5-yr ESALs 200,000
2017	888	89.5%	10.5%	794	93	0.00%	4.31	0.29	0	0	1.000	44,176	
2018	901	89.4%	10.6%	805	96	0.00%	4.31	0.30	0	0	1.000	45,972	
2019	915	89.3%	10.7%	817	98	0.00%	4.31	0.30	0	0	1.000	47,841	
2020	928	89.2%	10.8%	828	101	0.00%	4.31	0.30	0	0	1.000	49,788	
2021	942	89.1%	10.9%	839	103	0.00%	4.31	0.31	0	0	1.000	51,815	10-yr ESALs 500,000
2022	956	88.9%	11.1%	851	106	0.00%	4.31	0.31	0	0	1.000	53,925	
2023	971	88.8%	11.2%	862	108	0.00%	4.31	0.32	0	0	1.000	56,122	
2024	985	88.7%	11.3%	874	111	0.00%	4.31	0.32	0	0	1.000	58,411	
2025	1,000	88.6%	11.4%	886	114	0.00%	4.31	0.33	0	0	1.000	60,793	
2026	1,015	88.5%	11.5%	898	117	0.00%	4.31	0.34	0	0	1.000	63,274	15-yr ESALs 800,000
2027	1,030	88.4%	11.6%	911	120	0.00%	4.31	0.34	0	0	1.000	65,858	
2028	1,046	88.3%	11.7%	923	123	0.00%	4.31	0.35	0	0	1.000	68,548	
2029	1,062	88.1%	11.9%	936	126	0.00%	4.31	0.35	0	0	1.000	71,349	
2030	1,077	88.0%	12.0%	949	129	0.00%	4.31	0.36	0	0	1.000	74,267	
2031	1,094	87.9%	12.1%	961	132	0.00%	4.31	0.36	0	0	1.000	77,304	20-yr ESALs 1,100,000
2032	1,110	87.8%	12.2%	975	136	0.00%	4.31	0.37	0	0	1.000	80,467	

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

ROUTE ID:

County	Clark	Date	04/21/10
		Forecaster	Nathan Wilkinson
Road Name	Bert T Combs Mountain Parkway		
		MARS No.	8352401D
Functional Class	2 - Rural Principal Arterial	Item No.	7-8506.01
		Route No.	KY 9000
Project Description	I-64 at Bert T Combs Mountain Parkway Interchange Feasibility Study	Beg. M.P.	0
		End M.P.	0.500
Scenario	Build	T.F. No.	10.004
Segment Description	Segment 4: Westbound Mountain Parkway Ramp onto I-64W	No. of Lanes	1
		1 or 2 way	1

REFERENCES:

Previous Forecasts	None	K- Factor Value	11.4%
		K-Factor Source	025X11
Traffic Volume	Stations 025X11 and 025Y10	PHF	0.9
Milepoint	NA		
Truck Percent	Station 025P20 W		
Milepoint	1.3		
ESAL Information	2007 Aggregated ESALS		
Growth Rate	1.50%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2010		**2012**	**2022**	**2032**
Volume	(AADT)	6500	1.50%	6700	7800	9000
Percent Trucks	(%T)	9.8%	1.0%	10%	11%	12%
Number of Trucks		640	2.5%	670	860	1100
Percent Trucks Hauling Coal	(%CT)	8%	-2.4%	8%	6%	5%
Non-Coal Trucks:						
Axles/Truck	(A/T)	4.314	0.00%	4.314	4.314	4.314
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
Coal Trucks:						
Axles/Truck	(A/CT)	5.123	0.00%	5.123	5.123	5.123
ESALs/Axle	(ESAL/CA)	3.3	0.00%	3.300	3.300	3.300

ESAL CALCULATIONS: SEE ATTACHED ESAL CALCULATION SHEET

Design ESALs in Critical Lane: 15,000,000

General Comments:

Segment 4: Westbound Mountain Parkway Ramp onto I-64W (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs
2012	6,696	90.0%	10.0%	6026	670	7.69%	4.31	0.27	5.123	3.3	1.000	590,085
2013	6,797	89.9%	10.1%	6110	687	7.50%	4.31	0.27	5.123	3.3	1.000	601,654
2014	6,899	89.8%	10.2%	6195	704	7.31%	4.31	0.28	5.123	3.3	1.000	613,709
2015	7,002	89.7%	10.3%	6280	722	7.13%	4.31	0.28	5.123	3.3	1.000	626,269
2016	7,107	89.6%	10.4%	6367	740	6.96%	4.31	0.29	5.123	3.3	1.000	639,356
2017	7,214	89.5%	10.5%	6455	759	6.79%	4.31	0.29	5.123	3.3	1.000	652,991
2018	7,322	89.4%	10.6%	6544	778	6.62%	4.31	0.30	5.123	3.3	1.000	667,198
2019	7,432	89.3%	10.7%	6635	797	6.46%	4.31	0.30	5.123	3.3	1.000	682,000
2020	7,544	89.2%	10.8%	6726	817	6.30%	4.31	0.30	5.123	3.3	1.000	697,423
2021	7,657	89.1%	10.9%	6819	838	6.15%	4.31	0.31	5.123	3.3	1.000	713,492
2022	7,772	88.9%	11.1%	6912	859	6.00%	4.31	0.31	5.123	3.3	1.000	730,233
2023	7,888	88.8%	11.2%	7007	881	5.85%	4.31	0.32	5.123	3.3	1.000	747,676
2024	8,006	88.7%	11.3%	7104	903	5.71%	4.31	0.32	5.123	3.3	1.000	765,849
2025	8,127	88.6%	11.4%	7201	926	5.57%	4.31	0.33	5.123	3.3	1.000	784,783
2026	8,248	88.5%	11.5%	7300	949	5.43%	4.31	0.34	5.123	3.3	1.000	804,510
2027	8,372	88.4%	11.6%	7399	973	5.30%	4.31	0.34	5.123	3.3	1.000	825,061
2028	8,498	88.3%	11.7%	7501	997	5.17%	4.31	0.35	5.123	3.3	1.000	846,473
2029	8,625	88.1%	11.9%	7603	1022	5.04%	4.31	0.35	5.123	3.3	1.000	868,781
2030	8,755	88.0%	12.0%	7707	1048	4.92%	4.31	0.36	5.123	3.3	1.000	892,021
2031	8,886	87.9%	12.1%	7812	1074	4.79%	4.31	0.36	5.123	3.3	1.000	916,234
2032	9,019	87.8%	12.2%	7918	1101	4.68%	4.31	0.37	5.123	3.3	1.000	941,459

5-yr ESALs
3,100,000

10-yr ESALs
6,600,000

15-yr ESALs
10,600,000

20-yr ESALs
15,000,000