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Governor

TRANSPORTATION CABINET
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INTRA-DEPARTMENTAL MEMO

TO: Patty Dunaway, P.E.
Chief District Engineer
District 4 – Elizabethtown

ATTN: John Moore, P.E.

FROM: Daryl J. Greer, P.E. *DJG*
Director
Division of Planning

DATE: March 3, 2008

SUBJECT: Nelson County Traffic Forecast
KY 245 Major Widening
Item No. 4-8307.00

In response to your November 26, 2007, request, we are providing the following forecasts on the attached maps and worksheets:

- 2008 and 2030 Average Daily Traffic
- 2008 and 2030 Daily and Design Hour Turning Movements
- Truck Percentages and 20 year ESALs

If you have any questions, please contact David Hamilton or Scott Thomson of this Division at (502) 564-7183.

DJG/DAH/BC

Attachments

c/att: Dan Hite
Rob Martin
Gary Valentine
Josh Hornbeck



TF 07_070

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Executive Summary

Traffic Forecast Report Nelson County KY 245 Major Widening from US 150 to US 62 Item No. 4-8307.00

Prepared for:



Prepared by:
David Hamilton, P.E.
Division of Planning
Kentucky Transportation Cabinet
February 27, 2008

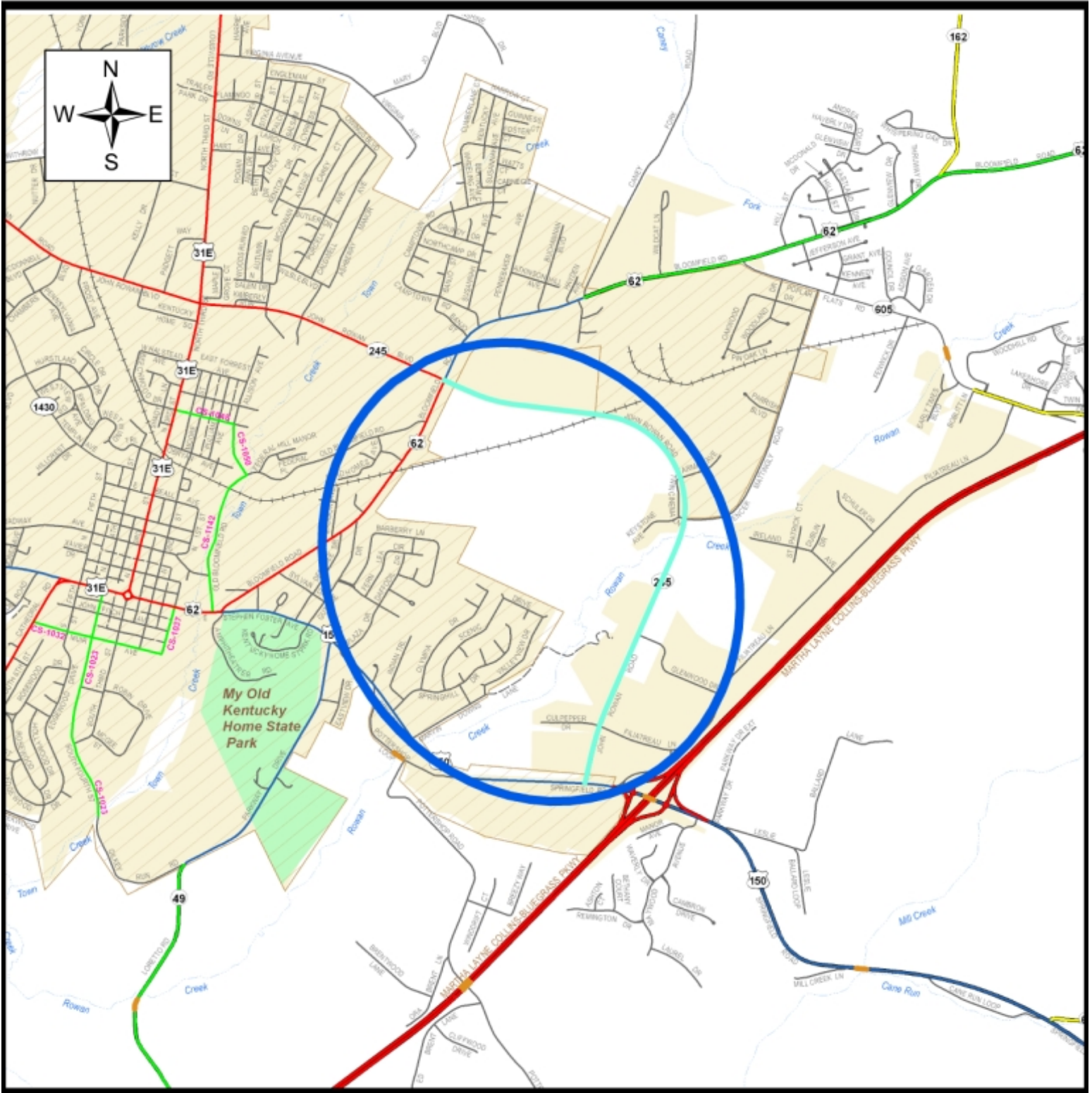
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Commonly Used Abbreviations and their Descriptions

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 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



LEGEND

-  Project Site Location
-  Project Road (KY 245)

Nelson County
KY 245 Widening
From US 150 to US 62
Item # 4-8307.00



Kentucky
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0 0.5 1 Miles

Traffic Forecast Executive Summary

Nelson County: KY 245 Major Widening from US 150 to US 62

Item No. 4-8307.00

FORECAST SUMMARY

The purpose of this forecast is to analyze traffic along KY 245 in Nelson County from US 150 (MP 0) to US 62 (MP 2.334). The forecast will be used for the Design phase of this project to help determine turn lane configurations, pavement thickness, number of lanes, etc. The traffic analysis for this forecast is for the Build project scenario.

FORECAST TYPE

The following types of forecasts were developed:

- 2008 and 2030 ADT and DHV Volumes
- 2008 and 2030 ADT and DHV Truck Percentages
- 2008 and 2030 Daily and Design Hour Turn Movements
- 20-year ESAL Projections

CURRENT-YEAR VOLUMES

The 2008 traffic volumes were based on historical counts at traffic station 255 on KY 245 (MP 1.3), special turn movement counts performed for this forecast, and special volume and classification counts performed for this forecast.

DESIGN-YEAR/GROWTH FACTORS

Multiple sources were analyzed to develop a growth rate. Historical counts were analyzed at station 255 to determine the growth rate on this section of KY 245. It has been growing at 5.83% annually since 1993. The Joint City-County Planning Commission of Nelson County was contacted to determine how much more development was likely to occur in the future. The Planning Commission provided proposed developments, zoning maps, and development forecasts for the side roads analyzed in this forecast. They projected a large quantity of retail developments to be built in this area in the future.

Population forecasts for Nelson County performed by the Kentucky State Data Center and previous forecasts were also used to determine growth rates for this forecast. After evaluating all of these sources, a growth rate around 4.0% was used for this forecast on KY 245.

DESIGN HOUR FACTORS

DHVs for the project came from factored historical counts and special turn movement counts. The counts were factored based on month and day of the count to estimate 30th highest hour of the year traffic conditions. The DHVs provided are not average peak hours; they are factored to estimate 30th highest hour of the year volumes and maneuvers.

TURN MOVEMENTS

Three turn movements were analyzed for this project. They occur along KY 245 at the intersections of Keystone Avenue / Spencer Mattingly Road (T1), Glenwood Drive (T2), and Culpepper Drive / Filiatreau Lane (T3). These intersections were counted in January 2008. The counts were factored to determine current year ADT and DHV turn movements. Directional DHVs do not align from T2 to T3 in the current year due to a significant access point lying between the two intersections. The current year turn movements were grown using methods described above to determine future year turn movements.

The DHV turn movements provided are not average peak hours; they are factored to estimate 30th highest hour of the year volumes and maneuvers. For a peak hour analysis (to be used for signal warrants and timing, simulation modeling, etc.), the DHVs should be factored down around 20%.

TRUCK PERCENTAGE

The 2008 truck volumes in this forecast were synthesized from classification counts performed in January 2008. Research across the state indicates an annual 2.0% growth rate is appropriate for truck percentages for all Rural Minor Arterial functional class roads. This factor was used for all project segments.

ESALs

Functional class averages and classification counts were used with the ADT projections to estimate 20-year ESALs. ADT truck percentage, DHV truck percentage, and axles per truck were synthesized from the classification counts for the current year. ESALs per axle were derived from functional class averages. Functional class average growth rates were used to grow the important ESAL calculation variables. These growth rates come from the 2006 aggregated ESAL report generated by the Kentucky Transportation Center. ESAL sheets for all Build scenarios may be found within Appendix B.

HISTORICAL POPULATION SUMMARY

	1950	1960	1970	1980	1990	2000	50 - 60	60 - 70	70 - 80	80 - 90	90 - 00
	Population	Population	Population	Population	Population	Population	Pct	Pct	Pct	Pct	Pct
							Change	Change	Change	Change	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%
Nelson Co	-	-	23,477	27,584	29,710	37,477	-	-	17.5%	7.7%	26.1%

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

FUTURE POPULATION PROJECTIONS SUMMARY

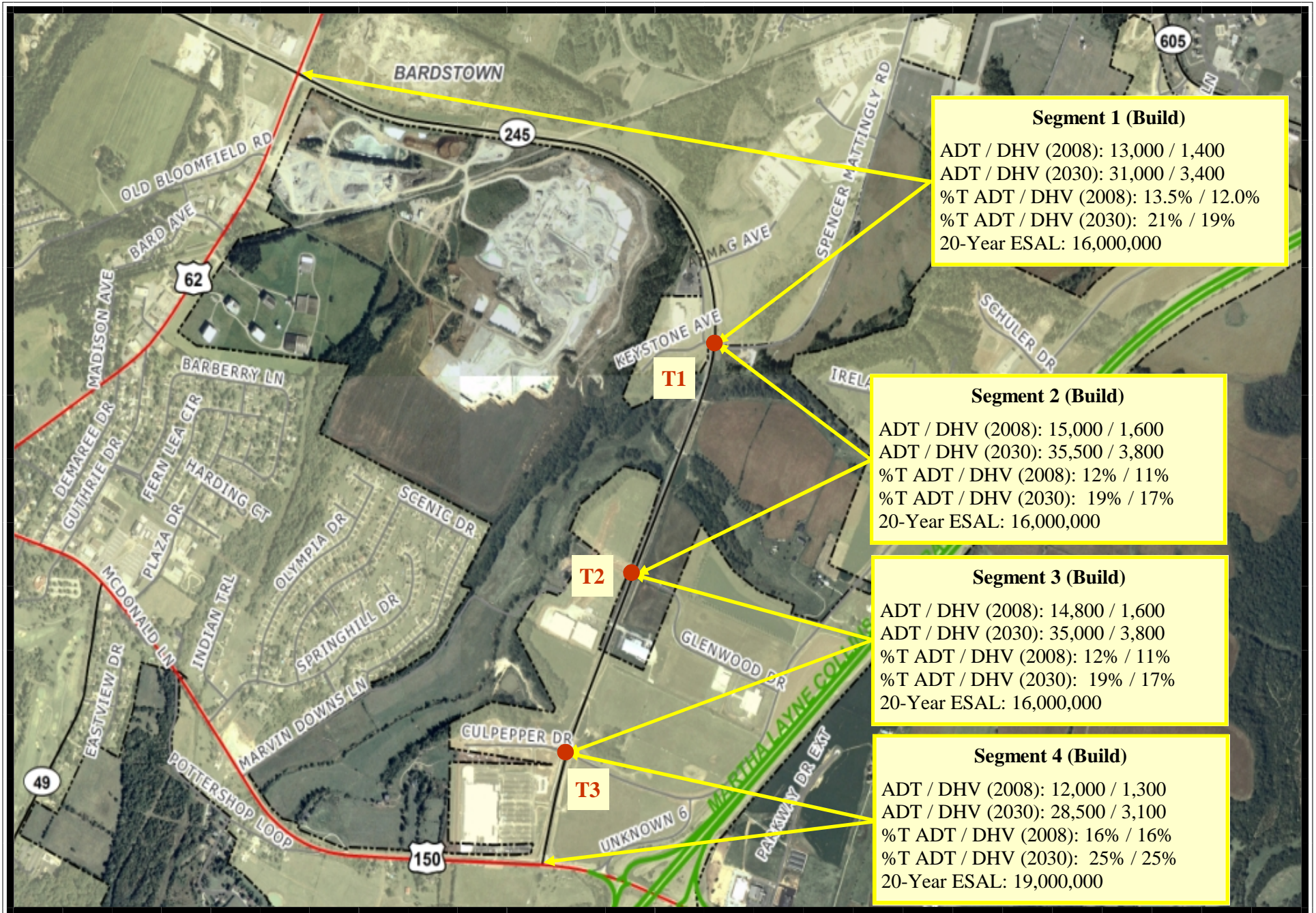
	2005	2010	2015	2020	2025	2030	05 - 10	10 - 15	15 - 20	20 - 25	25 - 30
	Projection	Projection	Projection	Projection	Projection	Projection	Pct	Pct	Pct	Pct	Pct
							Change	Change	Change	Change	Change
Kentucky	4,172,608	4,326,490	4,502,595	4,660,703	4,799,443	4,912,621	3.7%	4.1%	3.5%	3.0%	2.4%
Nelson Co	41,066	45,000	48,601	51,858	54,779	57,293	9.6%	8.0%	6.7%	5.6%	4.6%

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

ANNUAL POPULATION GROWTH RATES FROM HISTORICAL DATA AND PROJECTIONS

	50 - 60	60 - 70	70 - 80	80 - 90	90 - 00	05 - 10	10 - 15	15 - 20	20 - 25	25 - 30	05 - 25
	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR	GR
Kentucky	-	0.59%	1.29%	0.07%	0.92%	0.73%	0.80%	0.69%	0.59%	0.47%	0.70%
Nelson Co	-	-	1.63%	0.75%	2.35%	1.85%	1.55%	1.31%	1.10%	0.90%	1.45%

SUMMARY MAP



Appendix A

Build Turn Movements

2008 BUILD TURNING MOVEMENTS

T1: KY 245 @ Spencer Mattingly Rd. / Keystone Ave.

T2: KY 245 @ Glenwood Dr.

T3: KY 245 @ Culpepper Dr / Filiatreau Ln

Traffic Forecast Technical Report
 Nelson County: KY 245 Major Widening (Item No. 4-8307.00)

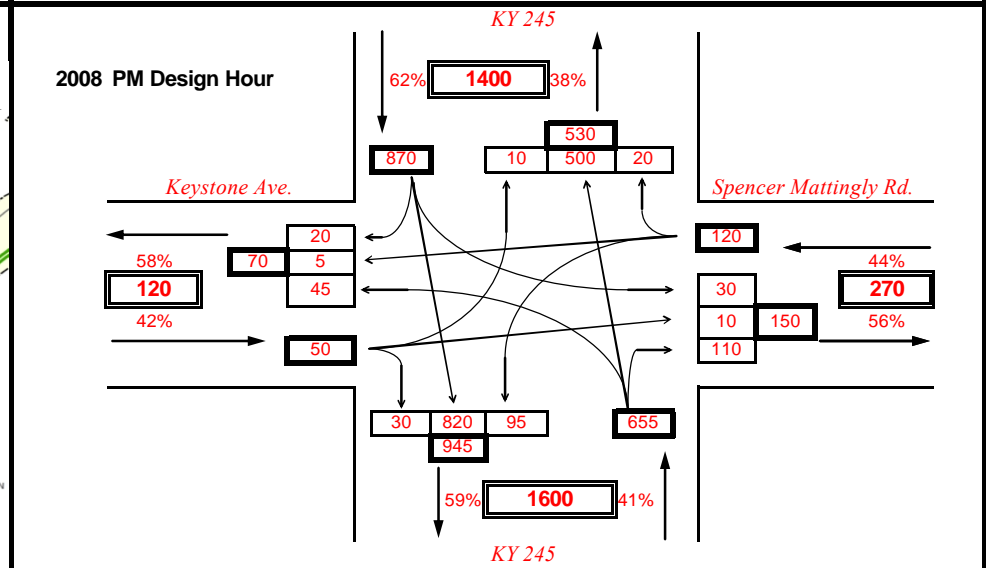
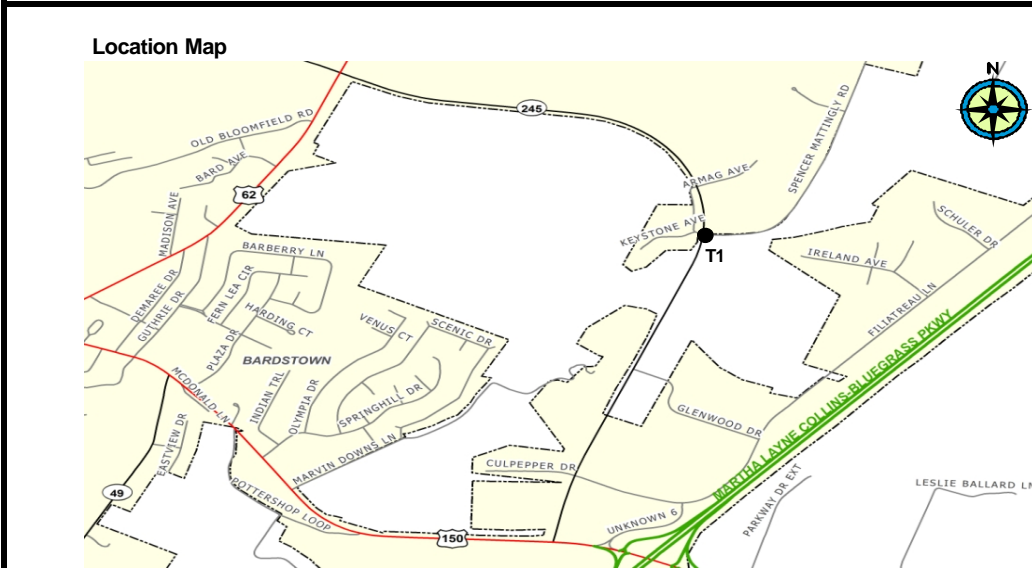
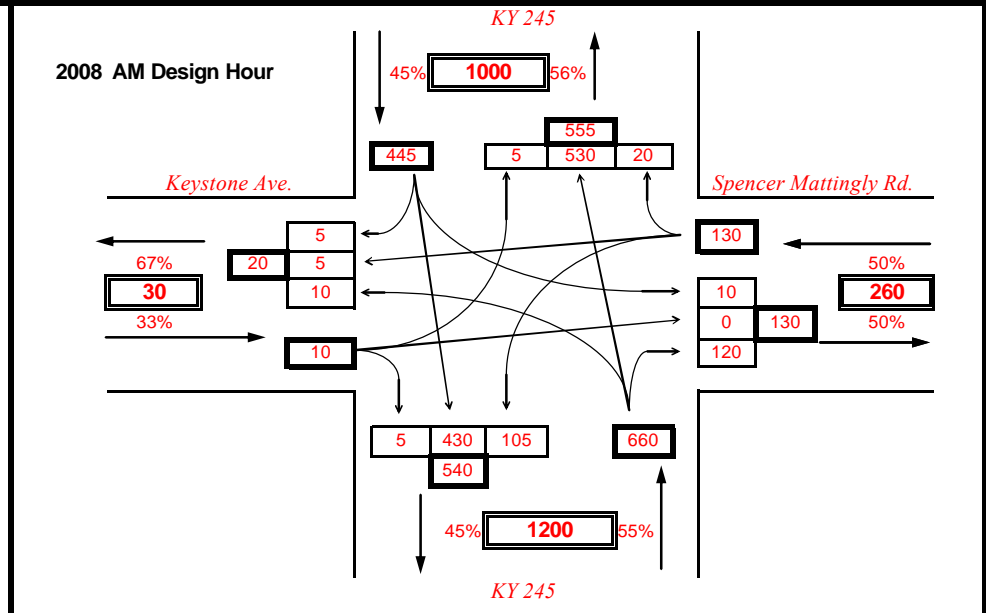
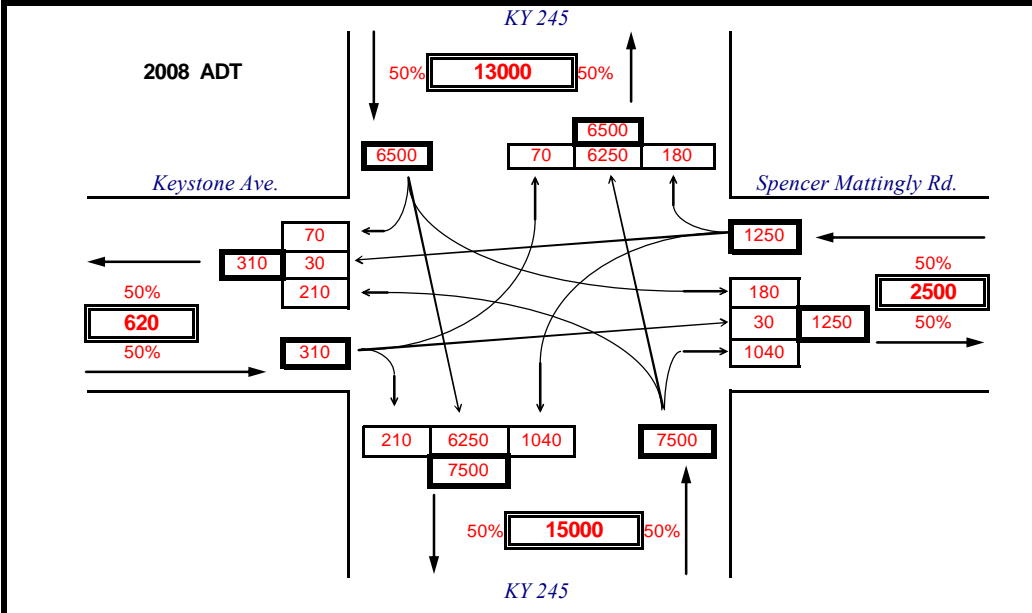
PROJECT: KY 245 Major Widening from US 150 to US 62
 ITEM NUMBER: 4-8307.00
 MARS NUMBER: 7966401P
 REQUEST DATE: 11/26/2007
 ANALYST: D. Hamilton
 SCENARIO: **2008 ADT and Design Hour Volumes**
 INTERSECTION: T1: KY 245 @ Spencer Mattingly Rd. / Keystone Ave.

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2008 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

Peak Hour Factors	AM	PM	Thru		Right		Left	
			AM	PM	AM	PM	AM	PM
↓ Southbound	0.92	0.93	0.95	0.85	0.38	0.58	0.75	0.68
↑ Northbound	0.91	0.92	0.88	0.96	0.80	0.73	0.67	0.81
← Westbound	0.61	0.86	0.50	0.50	0.54	0.88	0.52	0.88
→ Eastbound	0.75	0.78	0.25	0.75	0.25	0.67	0.25	0.29

****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL ANALYSIS**

* Arrows indicate approach direction, PHF given by approach and approach movement



Traffic Forecast Technical Report
 Nelson County: KY 245 Major Widening (Item No. 4-8307.00)

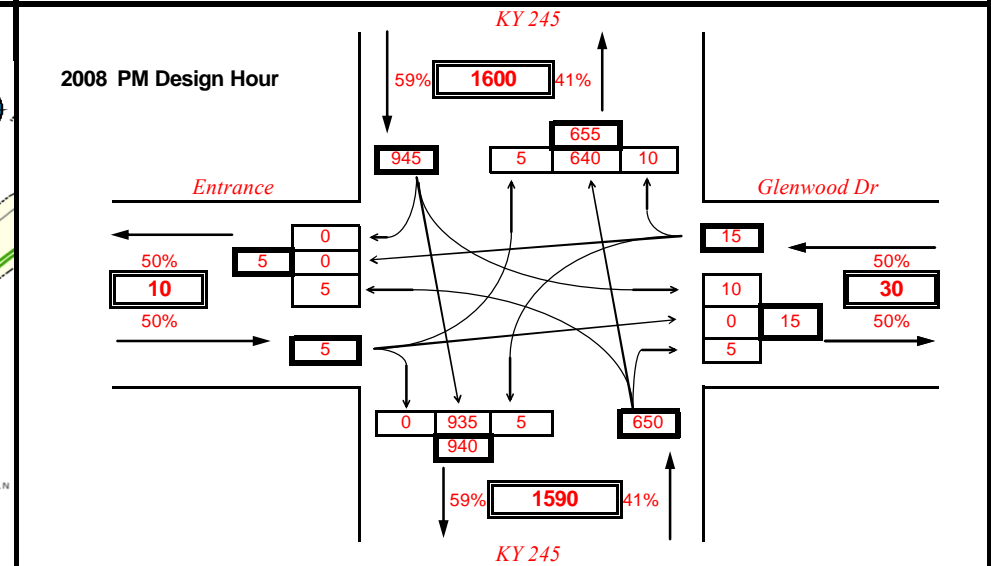
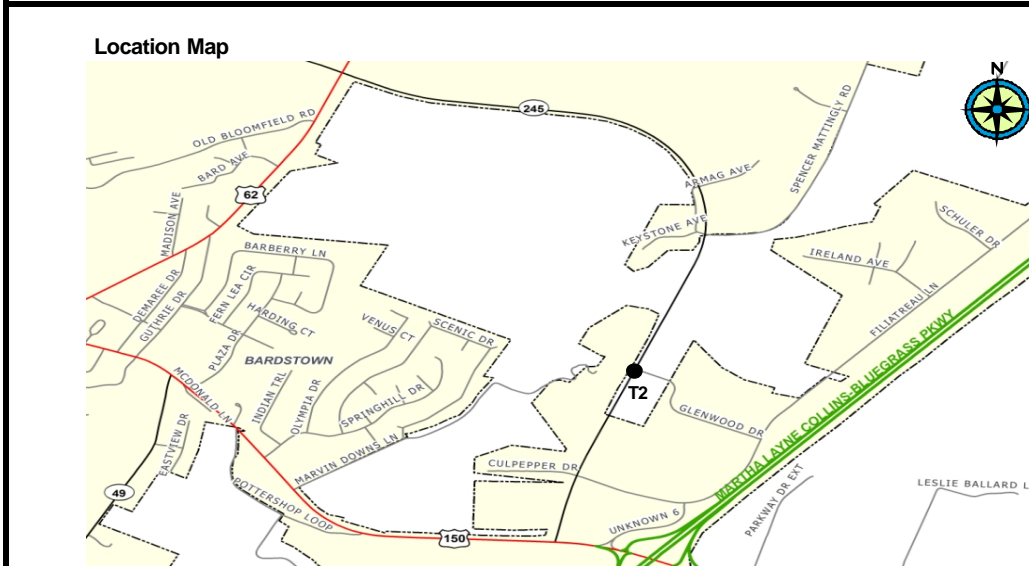
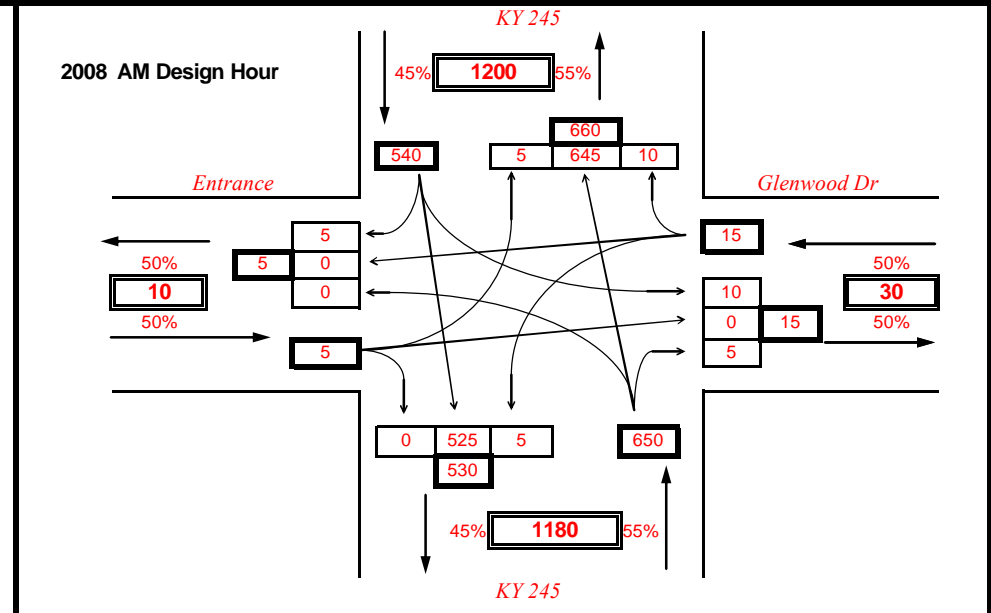
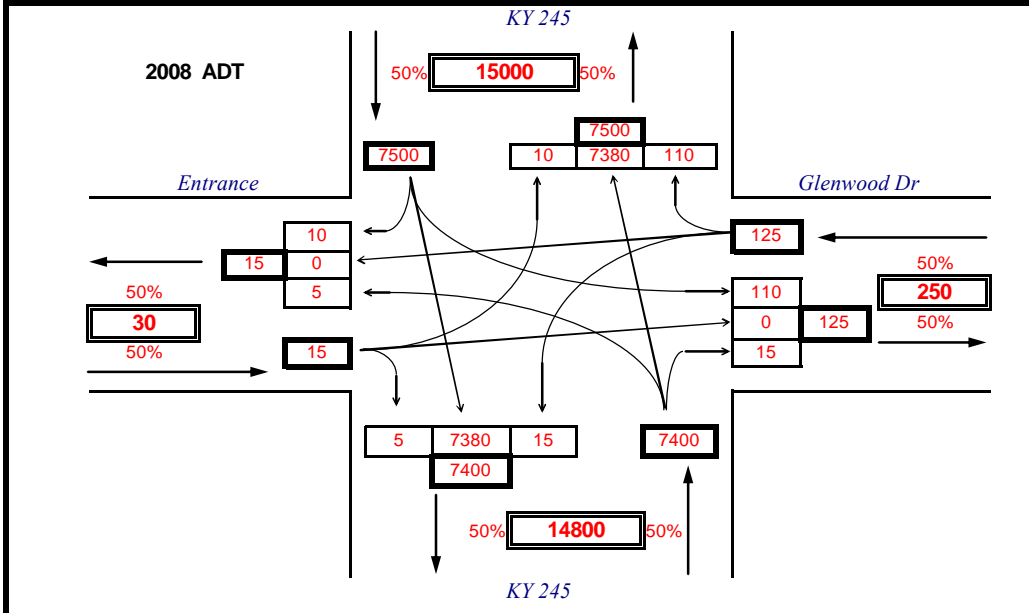
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 MARS NUMBER: 7966401P
 REQUEST DATE: 11/26/2007
 ANALYST: D. Hamilton
 SCENARIO: 2008 ADT and Design Hour Volumes
 INTERSECTION: T2: KY 245 @ Glenwood Dr

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2008 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

Peak Hour Factors		AM	PM	Thru		Right		Left	
				AM	PM	AM	PM	AM	PM
↓	Southbound	0.92	0.93	0.92	0.91	0.25	0.25	0.60	0.88
↑	Northbound	0.93	0.94	0.91	0.91		0.50	0.25	0.50
←	Westbound	0.67	0.69			0.45	0.83	0.50	0.38
→	Eastbound	0.50	0.38			0.25		0.50	0.25

****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL ANALYSIS**

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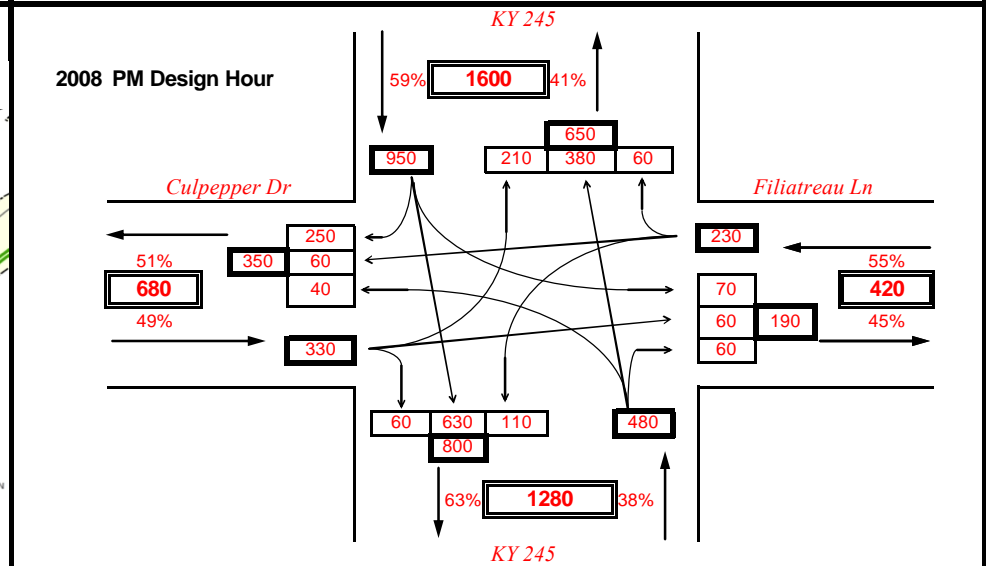
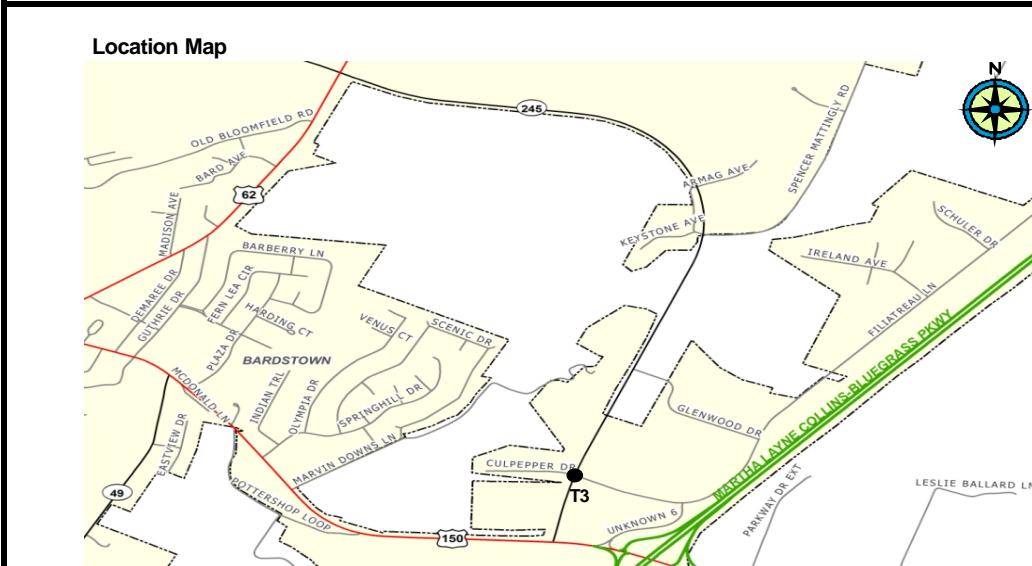
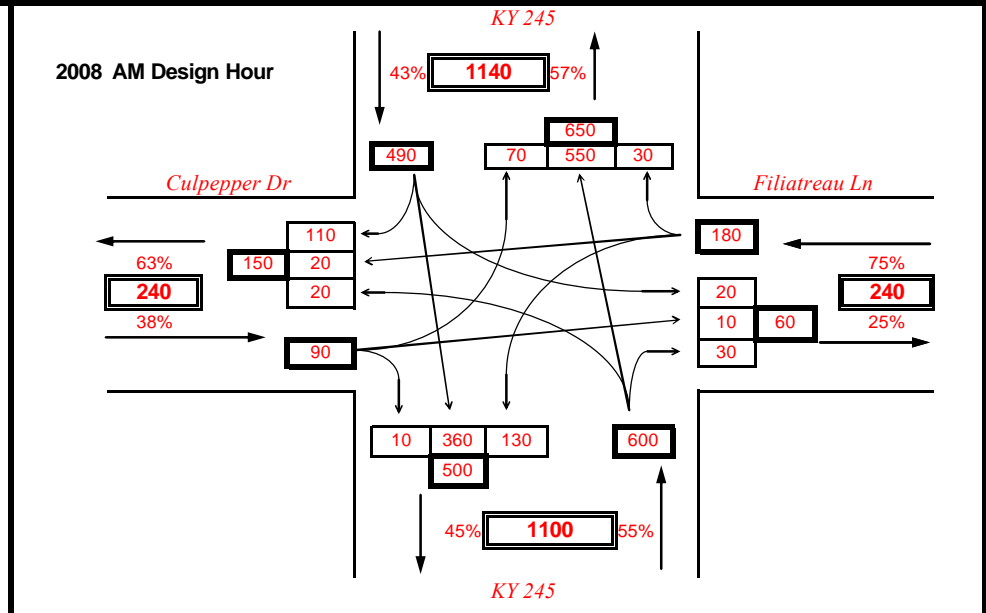
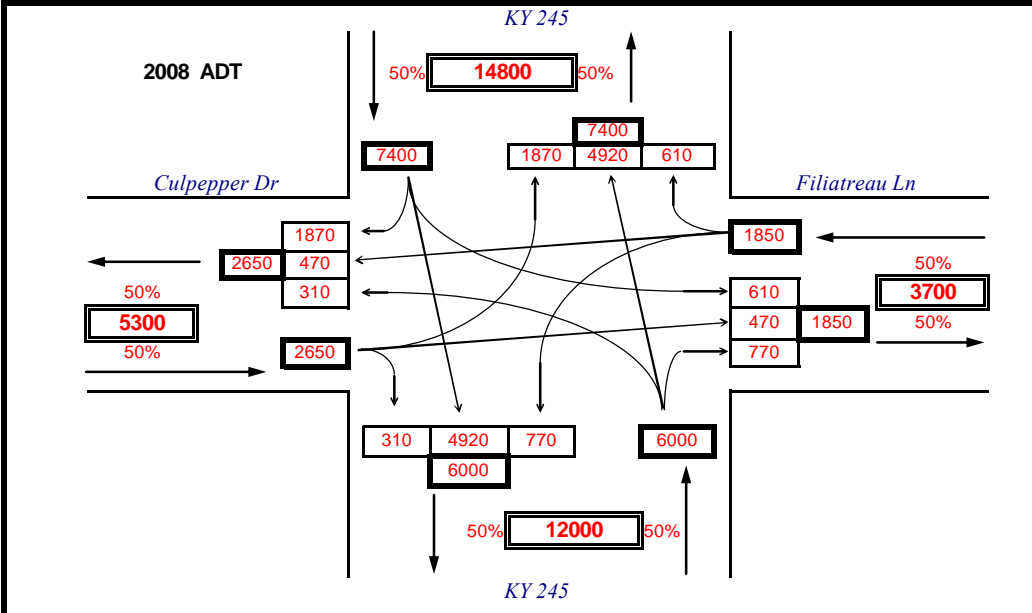
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 REQUEST DATE: 11/26/2007
 ANALYST: D. Hamilton
 SCENARIO: 2008 ADT and Design Hour Volumes
 INTERSECTION: T3: KY 245 @ Culpepper Dr / Filiatreau Ln

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2008 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

Peak Hour Factors		AM	PM	Thru		Right		Left	
				AM	PM	AM	PM	AM	PM
↓	Southbound	0.85	0.95	0.80	0.82	0.85	0.93	0.83	0.74
↑	Northbound	0.87	0.98	0.95	0.86	0.69	0.65	0.65	0.67
←	Westbound	0.81	0.79	0.63	0.78	0.69	0.70	0.72	0.78
→	Eastbound	0.94	0.91	0.67	0.91	0.75	0.82	0.98	0.79

****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL ANALYSIS**

* Arrows indicate approach direction, PHF given by approach and approach movement



2030 BUILD TURNING MOVEMENTS

T1: KY 245 @ Spencer Mattingly Rd. / Keystone Ave.

T2: KY 245 @ Glenwood Dr.

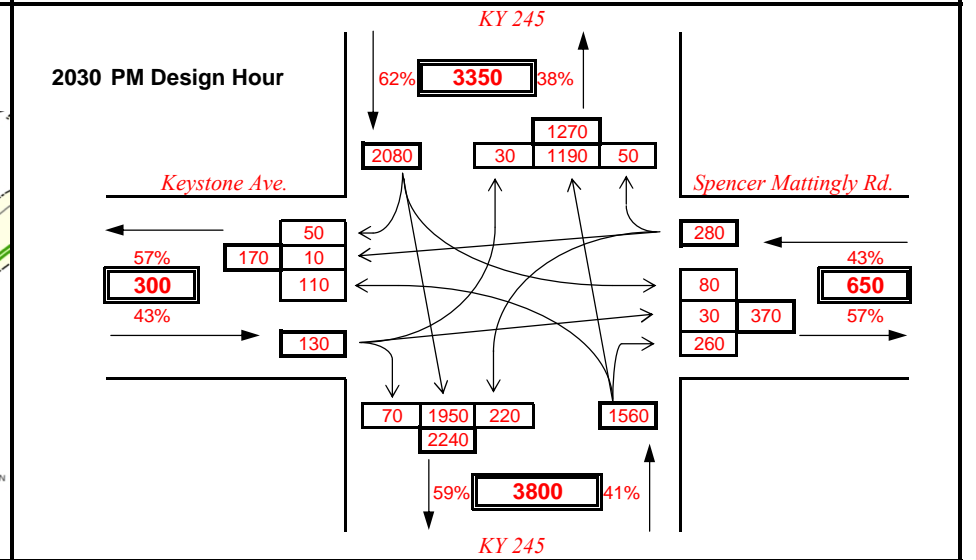
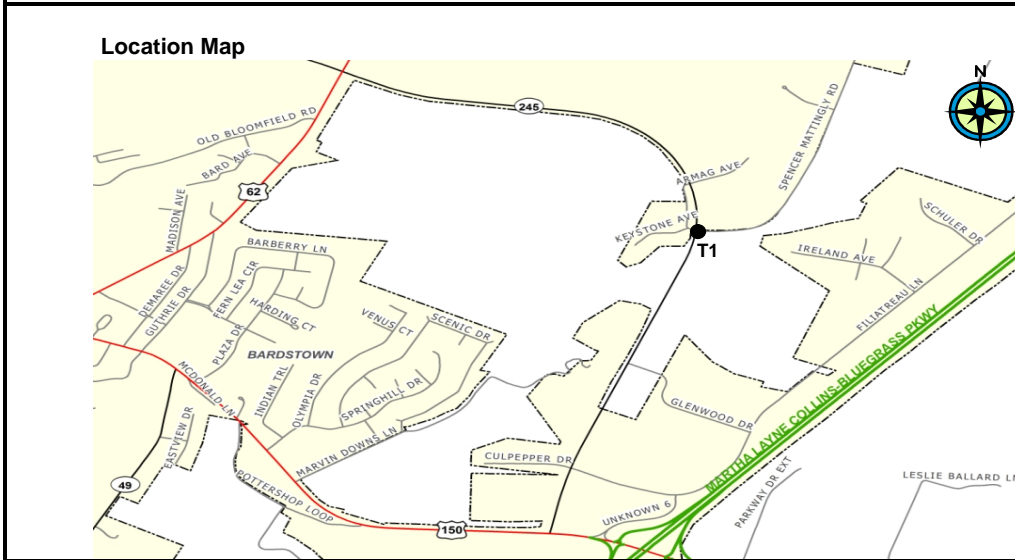
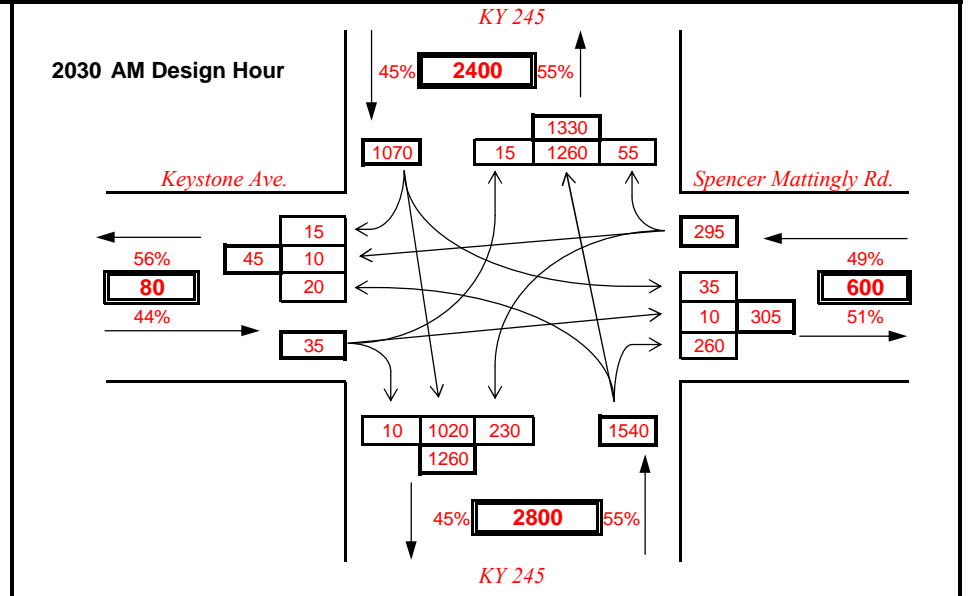
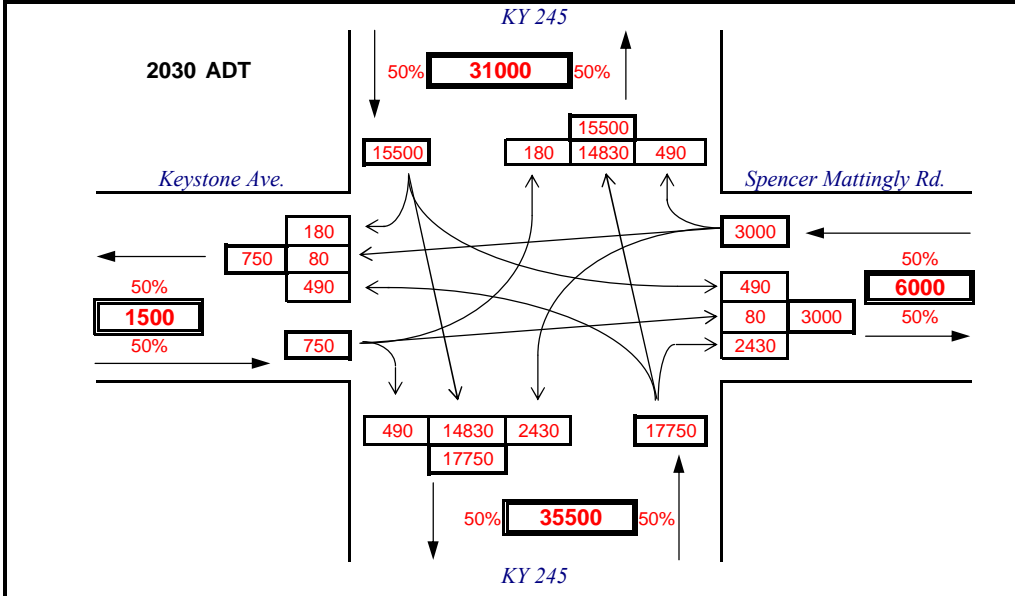
T3: KY 245 @ Culpepper Dr / Filiatreau Ln

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 REQUEST DATE: 11/26/2007
 ANALYST: D. Hamilton
 SCENARIO: **2030 Build ADT and Design Hour Volumes**
 INTERSECTION: T1: KY 245 @ Spencer Mattingly Rd. / Keystone Ave.

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2008 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

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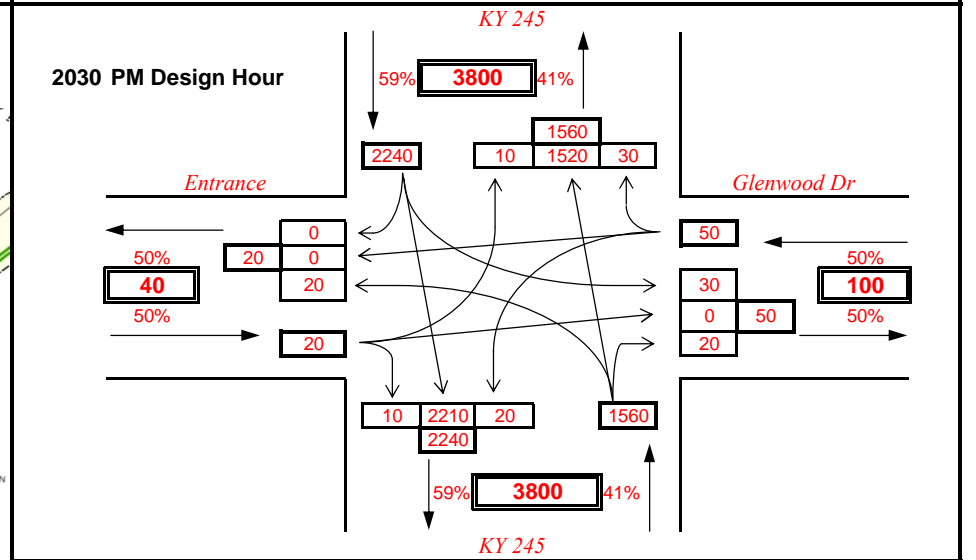
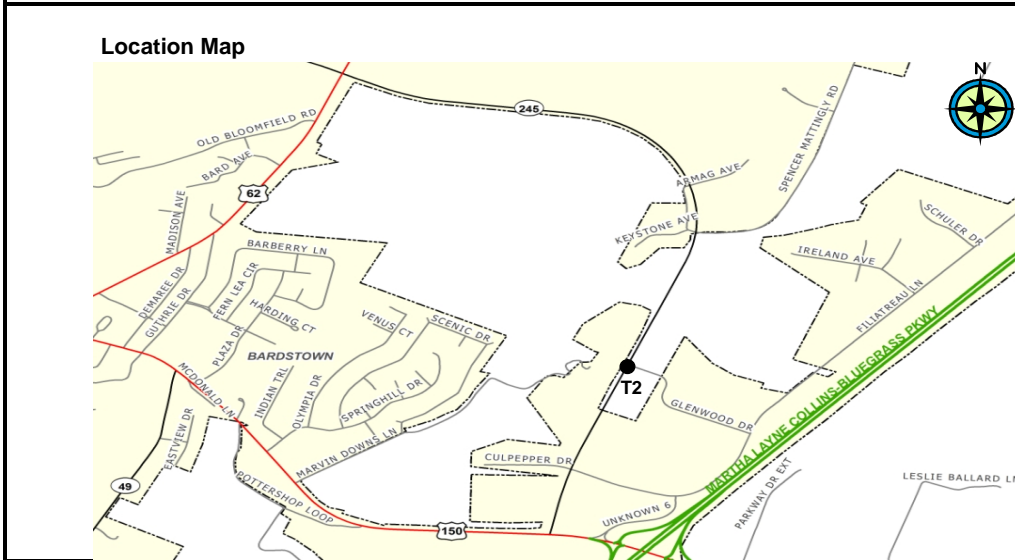
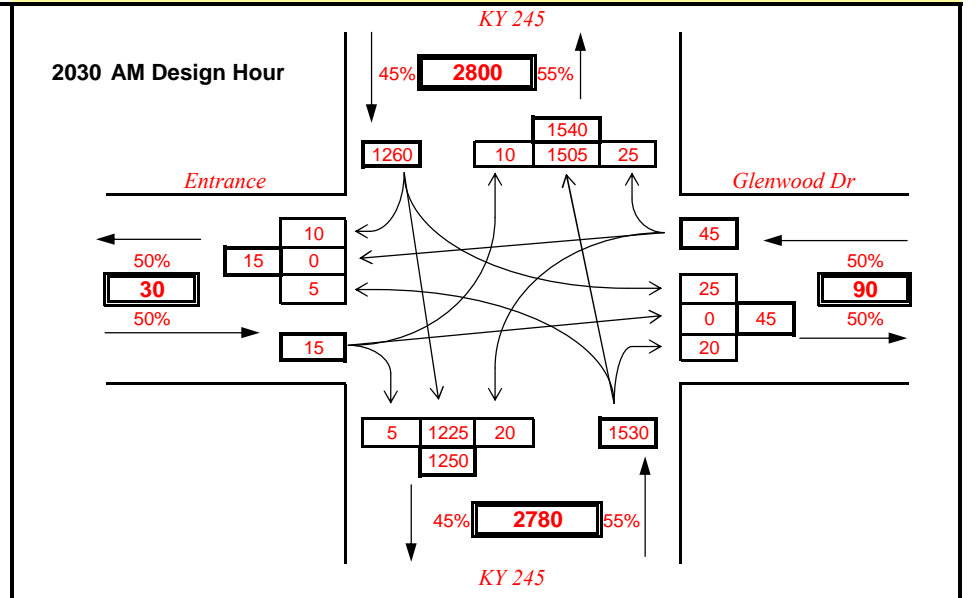
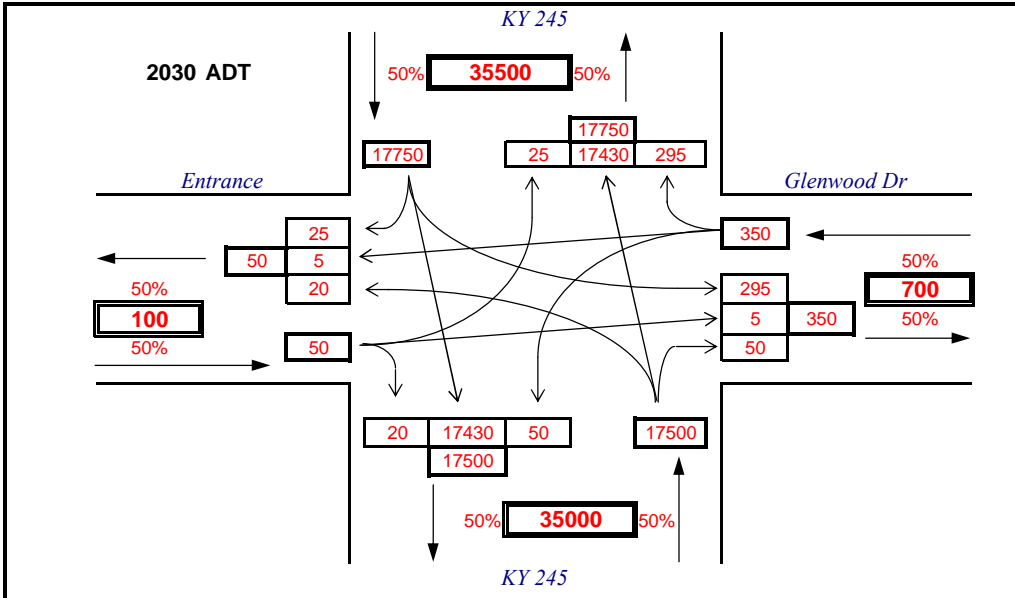


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 ANALYST: D. Hamilton
 SCENARIO: **2030 Build ADT and Design Hour Volumes**
 INTERSECTION: T2: KY 245 @ Glenwood Dr

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2008 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL ANALYSIS**

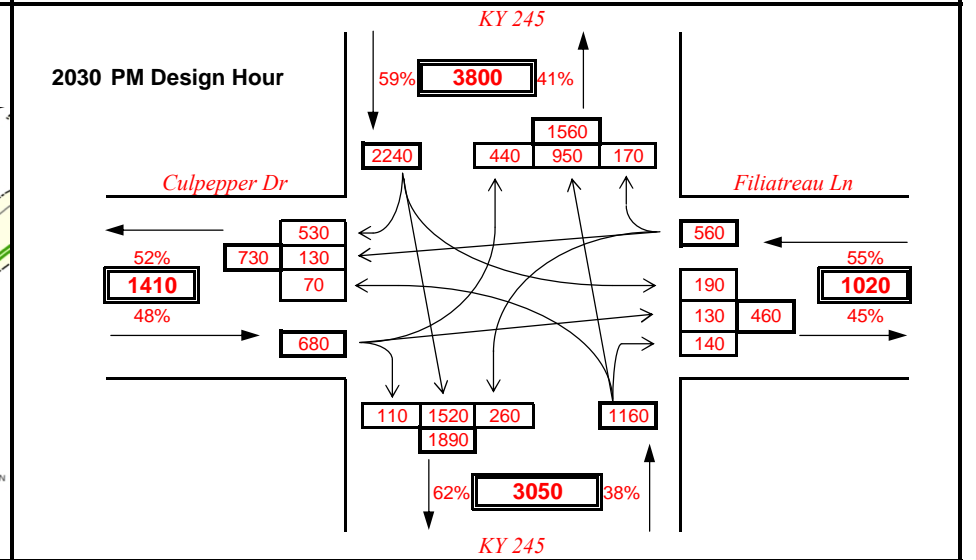
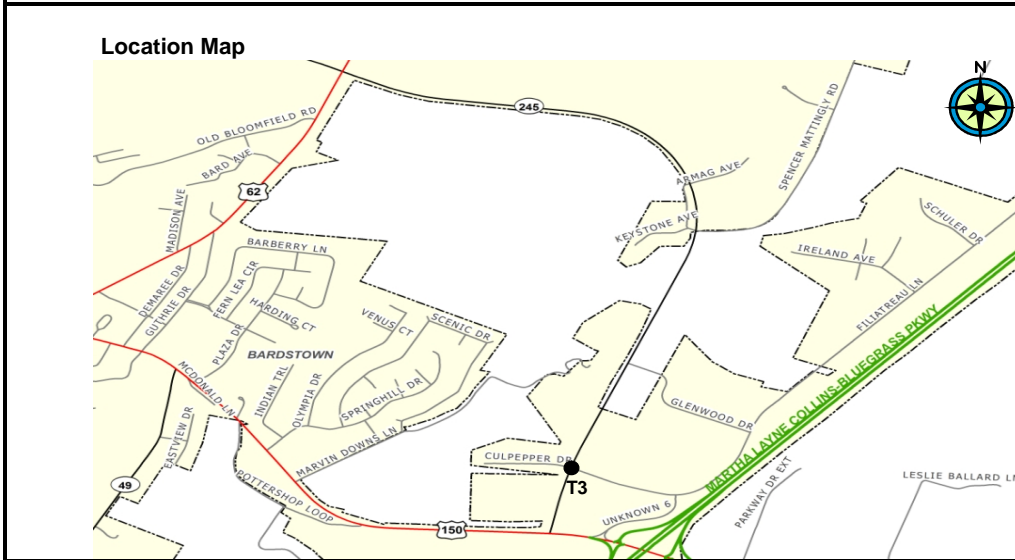
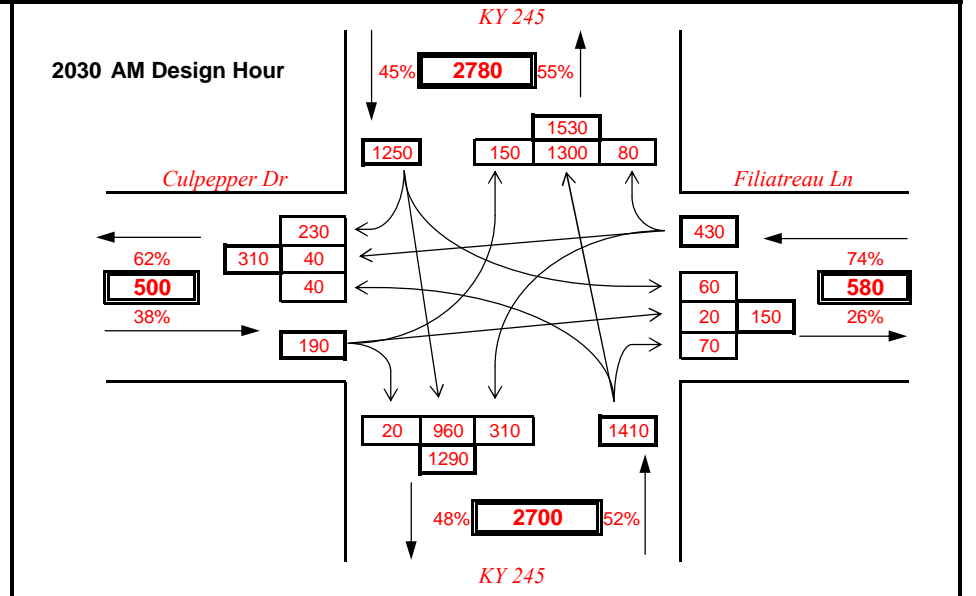
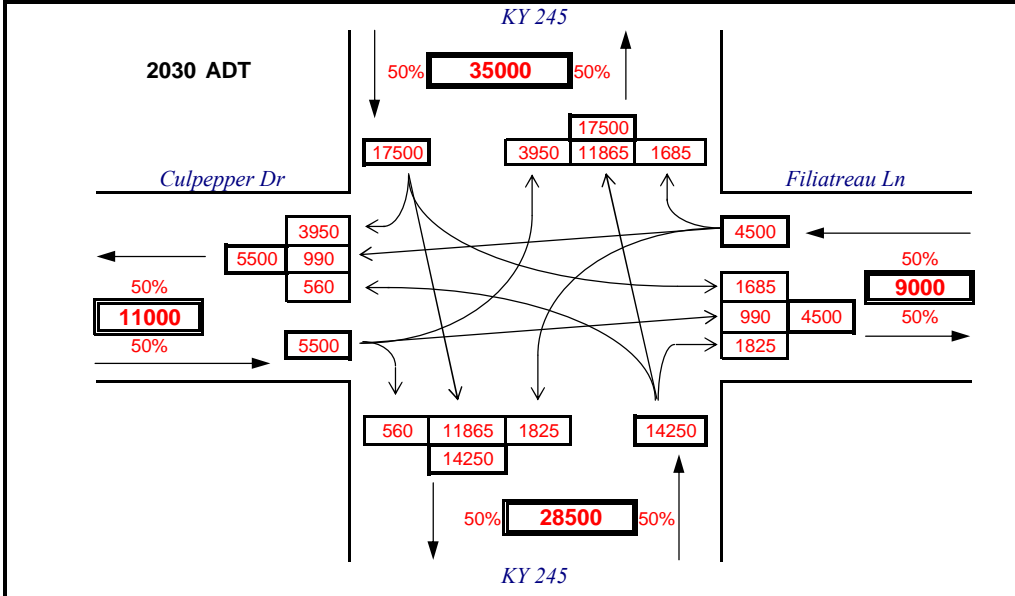


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****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL ANALYSIS**



Appendix B
ESAL Forecast Summary Sheets

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

ROUTE ID:

County	Nelson	Date	02/27/08
Road Name	245	Forecaster	David Hamilton
Functional Class	6 - Rural Minor Arterial	MARS No.	7966401P
Project Description	Major Widening of US 245 From US 150 to US 62	Item No.	4-8307.00
Scenario	Build	Route No.	US
Segment Description	Segment 1 - US 245 from US 150 to Spencer Mattingly Rd / Keystone Ave	Beg. MP	1.113
		End MP	2.334
		T.F. No.	7.070
		No. of Lanes	4
		1 or 2 way	2

REFERENCES:

Previous Forecasts	0	K- Factor Value	11.0%
Traffic Volume	Z01, 255	K-Factor Source	TM Counts
Milepoint	1.9, 1.3	PHF	0.93
Truck Percent	Z01		
Milepoint	1.9		
ESAL Information	2006 Aggregated ESALS		
Growth Rate	4.03%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2008		2010	2020	2030
Volume	(AADT)	13000	4.03%	14000	20000	31000
Percent Trucks	(%T)	13.5%	2.0%	14.0%	17.0%	21.0%
Number of Trucks		1800		2000	3400	6500
Percent Trucks Hauling Coal	(%CT)	0%	-5.8%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.322	0.48%	3.354	3.518	3.690
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
<i>Coal Trucks:</i>						
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 16,000,000

General Comments:

Segment 1 - US 245 from US 150 to Spencer Mattingly Rd / Keystone Ave (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2010	14,069	86.0%	14.0%	12093	1976	0.31%	3.35	0.27	5.123	3.3	0.455	322,338	
2011	14,636	85.7%	14.3%	12539	2097	0.30%	3.37	0.27	5.123	3.3	0.455	347,302	
2012	15,225	85.4%	14.6%	13000	2225	0.28%	3.39	0.28	5.123	3.3	0.455	374,327	
2013	15,839	85.1%	14.9%	13478	2361	0.26%	3.40	0.28	5.123	3.3	0.455	403,584	
2014	16,477	84.8%	15.2%	13972	2505	0.25%	3.42	0.29	5.123	3.3	0.455	435,257	5-yr ESALs 2,000,000
2015	17,141	84.5%	15.5%	14483	2658	0.23%	3.44	0.29	5.123	3.3	0.455	469,548	
2016	17,831	84.2%	15.8%	15011	2820	0.22%	3.45	0.30	5.123	3.3	0.455	506,674	
2017	18,550	83.9%	16.1%	15557	2993	0.21%	3.47	0.30	5.123	3.3	0.455	546,869	
2018	19,297	83.5%	16.5%	16122	3176	0.19%	3.48	0.30	5.123	3.3	0.455	590,389	
2019	20,075	83.2%	16.8%	16705	3370	0.18%	3.50	0.31	5.123	3.3	0.455	637,509	10-yr ESALs 5,000,000
2020	20,884	82.9%	17.1%	17308	3576	0.17%	3.52	0.31	5.123	3.3	0.455	688,528	
2021	21,725	82.5%	17.5%	17931	3794	0.16%	3.53	0.32	5.123	3.3	0.455	743,771	
2022	22,601	82.2%	17.8%	18575	4026	0.15%	3.55	0.32	5.123	3.3	0.455	803,586	
2023	23,511	81.8%	18.2%	19239	4272	0.14%	3.57	0.33	5.123	3.3	0.455	868,356	
2024	24,458	81.5%	18.5%	19926	4533	0.14%	3.59	0.34	5.123	3.3	0.455	938,489	15-yr ESALs 9,400,000
2025	25,444	81.1%	18.9%	20634	4810	0.13%	3.60	0.34	5.123	3.3	0.455	1,014,433	
2026	26,469	80.7%	19.3%	21366	5104	0.12%	3.62	0.35	5.123	3.3	0.455	1,096,670	
2027	27,536	80.3%	19.7%	22120	5415	0.11%	3.64	0.35	5.123	3.3	0.455	1,185,722	
2028	28,645	79.9%	20.1%	22899	5746	0.11%	3.66	0.36	5.123	3.3	0.455	1,282,156	
2029	29,799	79.5%	20.5%	23702	6097	0.10%	3.67	0.36	5.123	3.3	0.455	1,386,585	20-yr ESALs 16,000,000
2030	31,000	79.1%	20.9%	24530	6470	0.10%	3.69	0.37	5.123	3.3	0.455	1,499,673	

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

ROUTE ID:

County	Nelson	Date	02/27/08
Road Name	245	Forecaster	David Hamilton
Functional Class	6 - Rural Minor Arterial	MARS No.	7966401P
Project Description	Major Widening of US 245 From US 150 to US 62	Item No.	4-8307.00
Scenario	Build	Route No.	US
Segment Description	Segment 2 - US 245 from Spencer Mattingly Rd to Glenwood Dr	Beg. MP	0.622
		End MP	1.113
		T.F. No.	7.070
		No. of Lanes	4
		1 or 2 way	2

REFERENCES:

Previous Forecasts	0	K- Factor Value	10.8%
Traffic Volume	Z01, 255, TM Counts	K-Factor Source	TM Counts
Milepoint	1.9, 1.3	PHF	0.93
Truck Percent	Z01		
Milepoint	1.9		
ESAL Information	2006 Aggregated ESALS		
Growth Rate	3.99%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2008		2010	2020	2030
Volume	(AADT)	15000	3.99%	16000	20000	36000
Percent Trucks	(%T)	12.0%	2.0%	12.0%	15.0%	19.0%
Number of Trucks		1800		1900	3000	6800
Percent Trucks Hauling Coal	(%CT)	0%	-5.9%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.322	0.48%	3.354	3.518	3.690
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
<i>Coal Trucks:</i>						
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 16,000,000

General Comments:

Segment 2 - US 245 from Spencer Mattingly Rd to Glenwood Dr (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs
2010	16,222	87.5%	12.5%	14197	2025	0.31%	3.35	0.27	5.123	3.3	0.456	331,873
2011	16,870	87.3%	12.7%	14722	2148	0.29%	3.37	0.27	5.123	3.3	0.456	357,435
2012	17,543	87.0%	13.0%	15265	2279	0.27%	3.39	0.28	5.123	3.3	0.456	385,095
2013	18,244	86.8%	13.2%	15827	2417	0.26%	3.40	0.28	5.123	3.3	0.456	415,027
2014	18,973	86.5%	13.5%	16409	2564	0.24%	3.42	0.29	5.123	3.3	0.456	447,418
2015	19,730	86.2%	13.8%	17011	2720	0.23%	3.44	0.29	5.123	3.3	0.456	482,470
2016	20,518	85.9%	14.1%	17633	2885	0.21%	3.45	0.30	5.123	3.3	0.456	520,405
2017	21,338	85.7%	14.3%	18278	3060	0.20%	3.47	0.30	5.123	3.3	0.456	561,459
2018	22,190	85.4%	14.6%	18944	3246	0.19%	3.48	0.30	5.123	3.3	0.456	605,889
2019	23,076	85.1%	14.9%	19633	3443	0.18%	3.50	0.31	5.123	3.3	0.456	653,976
2020	23,998	84.8%	15.2%	20345	3652	0.17%	3.52	0.31	5.123	3.3	0.456	706,021
2021	24,956	84.5%	15.5%	21082	3874	0.16%	3.53	0.32	5.123	3.3	0.456	762,351
2022	25,952	84.2%	15.8%	21843	4109	0.15%	3.55	0.32	5.123	3.3	0.456	823,319
2023	26,989	83.8%	16.2%	22630	4359	0.14%	3.57	0.33	5.123	3.3	0.456	889,310
2024	28,067	83.5%	16.5%	23443	4624	0.13%	3.59	0.34	5.123	3.3	0.456	960,739
2025	29,188	83.2%	16.8%	24283	4904	0.13%	3.60	0.34	5.123	3.3	0.456	1,038,054
2026	30,353	82.9%	17.1%	25151	5202	0.12%	3.62	0.35	5.123	3.3	0.456	1,121,742
2027	31,565	82.5%	17.5%	26047	5518	0.11%	3.64	0.35	5.123	3.3	0.456	1,212,331
2028	32,826	82.2%	17.8%	26973	5853	0.11%	3.66	0.36	5.123	3.3	0.456	1,310,390
2029	34,137	81.8%	18.2%	27928	6209	0.10%	3.67	0.36	5.123	3.3	0.456	1,416,538
2030	35,500	81.4%	18.6%	28914	6586	0.09%	3.69	0.37	5.123	3.3	0.456	1,531,443

5-yr ESALs
2,100,000

10-yr ESALs
5,100,000

15-yr ESALs
9,600,000

20-yr ESALs
16,000,000

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

ROUTE ID:

County	Nelson	Date	02/27/08
Road Name	245	Forecaster	David Hamilton
Functional Class	6 - Rural Minor Arterial	MARS No.	7966401P
Project Description	Major Widening of US 245 From US 150 to US 62	Item No.	4-8307.00
Scenario	Build	Route No.	US
Segment Description	Segment 3 - US 245 from Glenwood Dr to Culpepper Dr / Filiatreau Ln	Beg. MP	0.2
		End MP	0.622
		T.F. No.	7.070
		No. of Lanes	4
		1 or 2 way	2

REFERENCES:

Previous Forecasts	0	K- Factor Value	10.8%
Traffic Volume	Z01, 255, Z02, TM Counts	K-Factor Source	TM Counts
Milepoint	1.9, 1.3, .5	PHF	0.93
Truck Percent	Z01		
Milepoint	1.9		
ESAL Information	2006 Aggregated ESALS		
Growth Rate	3.99%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2008		2010	2020	2030
Volume	(AADT)	14800	3.99%	16000	20000	35000
Percent Trucks	(%T)	12.0%	2.0%	12.0%	15.0%	19.0%
Number of Trucks		1800		1900	3000	6700
Percent Trucks Hauling Coal	(%CT)	0%	-5.8%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.322	0.48%	3.354	3.518	3.690
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
<i>Coal Trucks:</i>						
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 16,000,000

General Comments:

Segment 3 - US 245 from Glenwood Dr to Culpepper Dr / Filiatreau Ln (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2010	16,005	87.5%	12.5%	14006	1998	0.31%	3.35	0.27	5.123	3.3	0.456	327,648	
2011	16,643	87.3%	12.7%	14524	2119	0.29%	3.37	0.27	5.123	3.3	0.456	352,856	
2012	17,307	87.0%	13.0%	15059	2248	0.28%	3.39	0.28	5.123	3.3	0.456	380,132	
2013	17,998	86.8%	13.2%	15613	2385	0.26%	3.40	0.28	5.123	3.3	0.456	409,647	
2014	18,716	86.5%	13.5%	16187	2529	0.24%	3.42	0.29	5.123	3.3	0.456	441,585	5-yr ESALs
2015	19,463	86.2%	13.8%	16780	2683	0.23%	3.44	0.29	5.123	3.3	0.456	476,147	2,100,000
2016	20,239	85.9%	14.1%	17394	2846	0.22%	3.45	0.30	5.123	3.3	0.456	513,549	
2017	21,047	85.7%	14.3%	18028	3018	0.21%	3.47	0.30	5.123	3.3	0.456	554,026	
2018	21,886	85.4%	14.6%	18685	3202	0.19%	3.48	0.30	5.123	3.3	0.456	597,830	
2019	22,760	85.1%	14.9%	19364	3396	0.18%	3.50	0.31	5.123	3.3	0.456	645,237	10-yr ESALs
2020	23,668	84.8%	15.2%	20066	3602	0.17%	3.52	0.31	5.123	3.3	0.456	696,545	5,100,000
2021	24,612	84.5%	15.5%	20791	3821	0.16%	3.53	0.32	5.123	3.3	0.456	752,075	
2022	25,594	84.2%	15.8%	21542	4052	0.15%	3.55	0.32	5.123	3.3	0.456	812,176	
2023	26,615	83.8%	16.2%	22317	4298	0.14%	3.57	0.33	5.123	3.3	0.456	877,225	
2024	27,677	83.5%	16.5%	23118	4559	0.14%	3.59	0.34	5.123	3.3	0.456	947,632	15-yr ESALs
2025	28,781	83.2%	16.8%	23945	4836	0.13%	3.60	0.34	5.123	3.3	0.456	1,023,839	9,500,000
2026	29,930	82.9%	17.1%	24800	5130	0.12%	3.62	0.35	5.123	3.3	0.456	1,106,325	
2027	31,124	82.5%	17.5%	25683	5441	0.11%	3.64	0.35	5.123	3.3	0.456	1,195,609	
2028	32,366	82.2%	17.8%	26594	5771	0.11%	3.66	0.36	5.123	3.3	0.456	1,292,253	
2029	33,657	81.8%	18.2%	27536	6122	0.10%	3.67	0.36	5.123	3.3	0.456	1,396,864	20-yr ESALs
2030	35,000	81.4%	18.6%	28507	6493	0.10%	3.69	0.37	5.123	3.3	0.456	1,510,103	16,000,000

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

ROUTE ID:

County	Nelson	Date	02/27/08
Road Name	245	Forecaster	David Hamilton
Functional Class	6 - Rural Minor Arterial	MARS No.	7966401P
Project Description	Major Widening of US 245 From US 150 to US 62	Item No.	4-8307.00
Scenario	Build	Route No.	US
Segment Description	Segment 4 - US 245 from Culpepper Dr / Filiatreau Ln to US 150	Beg. MP	0
		End MP	0.2
		T.F. No.	7.070
		No. of Lanes	4
		1 or 2 way	2

REFERENCES:

Previous Forecasts	0	K- Factor Value	10.8%
Traffic Volume	Z01, 255, Z02, TM Counts	K-Factor Source	TM Counts
Milepoint	1.9, 1.3, .5	PHF	0.93
Truck Percent	Z02		
Milepoint	0.5		
ESAL Information	2006 Aggregated ESALS		
Growth Rate	4.01%		

TRAFFIC PARAMETERS:

		Present Year	Growth Rate	Construction Year	Median Year	Design Year
		2008		2010	2020	2030
Volume	(AADT)	12000	4.01%	13000	20000	29000
Percent Trucks	(%T)	16.0%	2.0%	17.0%	20.0%	25.0%
Number of Trucks		1900		2200	4000	7300
Percent Trucks Hauling Coal	(%CT)	0%	-5.9%	0%	0%	0%
<i>Non-Coal Trucks:</i>						
Axles/Truck	(A/T)	3.682	0.48%	3.717	3.899	4.090
ESALs/Axle	(ESAL/A)	0.260	1.60%	0.268	0.315	0.369
<i>Coal Trucks:</i>						
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 19,000,000

General Comments:

Segment 4 - US 245 from Culpepper Dr / Filiatreau Ln to US 150 (Build)

Year	ADT	Car %	Truck %	Cars	Trucks	CT%	AX/T	ESAL/AX	AX/CT	ESAL/CA	LDF	ESALs	
2010	12,982	83.4%	16.6%	10821	2161	0.29%	3.72	0.27	5.123	3.3	0.455	383,195	
2011	13,502	83.0%	17.0%	11210	2293	0.27%	3.74	0.27	5.123	3.3	0.455	413,202	
2012	14,044	82.7%	17.3%	11612	2432	0.25%	3.75	0.28	5.123	3.3	0.455	445,686	
2013	14,607	82.3%	17.7%	12027	2580	0.24%	3.77	0.28	5.123	3.3	0.455	480,852	
2014	15,193	82.0%	18.0%	12455	2738	0.23%	3.79	0.29	5.123	3.3	0.455	518,922	5-yr ESALs 2,400,000
2015	15,802	81.6%	18.4%	12898	2904	0.21%	3.81	0.29	5.123	3.3	0.455	560,137	
2016	16,436	81.3%	18.7%	13355	3081	0.20%	3.83	0.30	5.123	3.3	0.455	604,757	
2017	17,095	80.9%	19.1%	13826	3269	0.19%	3.84	0.30	5.123	3.3	0.455	653,063	
2018	17,780	80.5%	19.5%	14312	3468	0.18%	3.86	0.30	5.123	3.3	0.455	705,362	
2019	18,493	80.1%	19.9%	14814	3679	0.17%	3.88	0.31	5.123	3.3	0.455	761,985	10-yr ESALs 6,000,000
2020	19,235	79.7%	20.3%	15332	3903	0.16%	3.90	0.31	5.123	3.3	0.455	823,290	
2021	20,006	79.3%	20.7%	15865	4141	0.15%	3.92	0.32	5.123	3.3	0.455	889,664	
2022	20,808	78.9%	21.1%	16415	4393	0.14%	3.94	0.32	5.123	3.3	0.455	961,528	
2023	21,643	78.5%	21.5%	16982	4661	0.13%	3.96	0.33	5.123	3.3	0.455	1,039,337	
2024	22,511	78.0%	22.0%	17566	4944	0.13%	3.97	0.34	5.123	3.3	0.455	1,123,584	15-yr ESALs 11,200,000
2025	23,414	77.6%	22.4%	18168	5246	0.12%	3.99	0.34	5.123	3.3	0.455	1,214,803	
2026	24,352	77.1%	22.9%	18787	5565	0.11%	4.01	0.35	5.123	3.3	0.455	1,313,572	
2027	25,329	76.7%	23.3%	19425	5904	0.10%	4.03	0.35	5.123	3.3	0.455	1,420,516	
2028	26,345	76.2%	23.8%	20081	6263	0.10%	4.05	0.36	5.123	3.3	0.455	1,536,314	
2029	27,401	75.7%	24.3%	20756	6645	0.09%	4.07	0.36	5.123	3.3	0.455	1,661,699	20-yr ESALs 19,000,000
2030	28,500	75.3%	24.7%	21450	7050	0.09%	4.09	0.37	5.123	3.3	0.455	1,797,468	