

# Appendix A

## Abbreviated Traffic Report

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## ABBREVIATED TRAFFIC FORECAST REPORT

Volume or classification counts for roadway segments were not part of the scope of work for this SUA. To assess intersections in the study area, Qk4 collected AM and PM peak hour turning movement counts along KY 1 and US 60 at 17 intersections, of which 11 are signalized and six (along KY 1) are unsignalized. Several peak hour turning movement counts for minor streets did not show a reversal in directionality between the AM and PM peak hours; therefore, the same directional split was used for the 2040 traffic forecast (e.g. KY 1 and Third Street intersection).

Table 1: Intersection AM and PM Peak Hour Traffic Count Locations

Intersection	Turning Movement #*	MP
KY 1/KY 9	1	12.009
KY 1/KY 1947/CW Stevens Boulevard	2	11.746
KY 1/Interstate Drive/Everman Drive (KY 1 MP 11.391) (unsignalized)	3	11.391
KY 1/I-64 WB ramp terminal	4	11.648
KY 1/I-64 EB ramp terminal	5	11.480
KY 1/Love's Truck Stop North Entrance (unsignalized)	6	11.340
KY 1/Love's Truck Stop South Entrance (unsignalized)	7	11.310
KY 1/McDonald's Entrance (unsignalized)	8	11.280
KY 1/Super Eight Lane (unsignalized)	9	11.240
KY 1/Academic Parkway (unsignalized)	10	11.159
KY 1/College Street	11	11.004
KY 1/Third Street	12	10.766
US 60/Landsdowne Avenue	13	23.691
US 60/South Hord Street	14	23.756
US 60/KY 1/KY 7 (US 60 MP 23.940)	15	10.646
US 60/KY 3297	16	24.078
US 60/KY 1 (US 60 MP 24.632)	17	24.632

Grayson SUA (below provided by KYTC)

## TRAFFIC FORECAST AND FUTURE YEAR ANALYSES

To determine the need for and purpose of potential transportation improvement projects, it is necessary to estimate future conditions within the study area. This chapter summarizes the anticipated future conditions within the study area portion of Carter County.

## DISTRICT 9 TRAVEL DEMAND MODEL

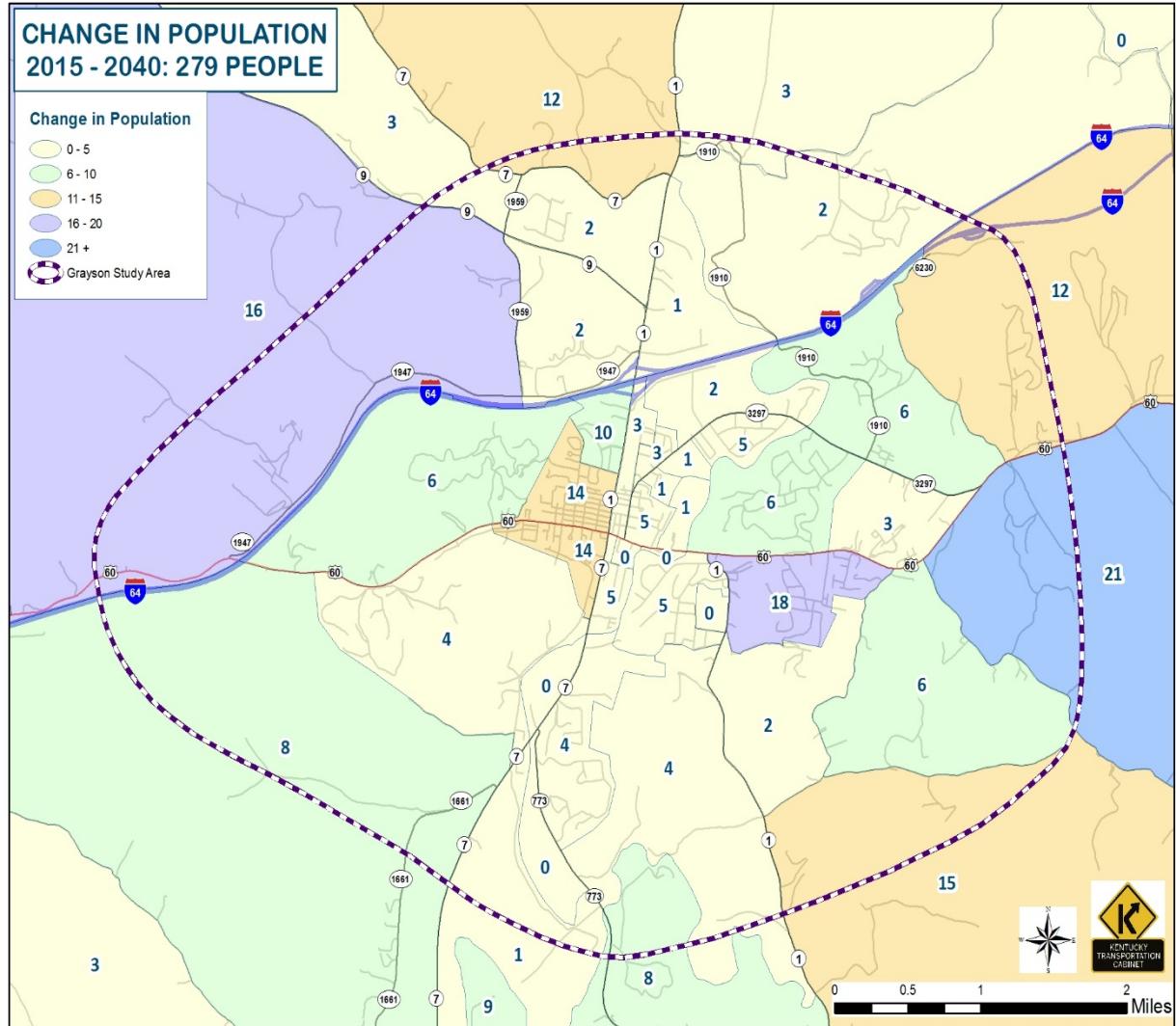
Traffic forecasts for the Grayson SUA were developed from the District 9 Area Travel Demand Model, which covers eight D-9 Counties, including Carter County and three southern Ohio Counties. The model was first developed in 2015 based on KYTC's preferred model structure and contains household and employment information and an updated roadway network for the 2015 base year. As a part of the development of the Grayson SUA Study, the Grayson area was further updated to reflect 2015 socioeconomic conditions and roadway updates. Household

and employment data for the 2040 forecast year were also revised to more accurately reflect the local development patterns expected to occur.

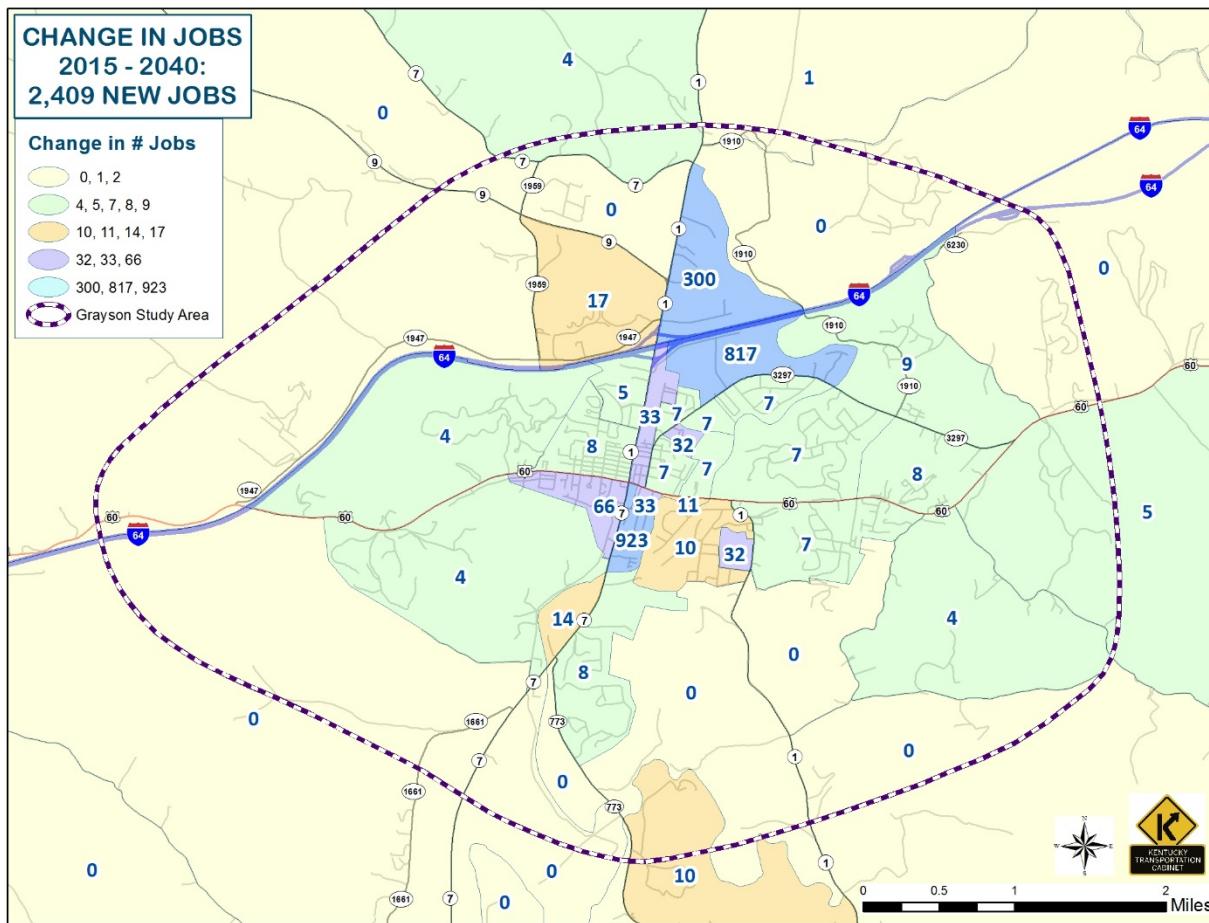
Traffic Analysis Zones (TAZs) form the geographical basis for delineating and organizing the socioeconomic data used by the model to generate the vehicular trips that are assigned to the roadway network. Household and population data, as well as employment and school enrollment, are stored in each zone, with forecast values for households and population used to determine the levels of travel demand throughout the model area. The D-9 model network results were delivered with separate map files for each model scenario, including the 2015 base year and the 2040 future year no build scenarios. The TAZ boundaries from the Kentucky Statewide model and the Rowan County Model initially served as the basis for the development of the model's TAZ boundaries for the D-9 area, including Carter County.

In order to add more zonal details those TAZs from both models were further refined, with a focus on urbanized areas in Kentucky. These zones for urbanized areas in the D-9 model depict the interaction of local trips within a small city the size of Grayson to the level of detail needed for the SUA. These smaller, more defined zones made it possible to represent the distribution of trips between zones more accurately, which meant a better fit of traffic assignments and observed counts on the study area roadway network.

Initially, household growth forecast in Carter County for the 2040 future year model was developed from county-wide level growth factors calculated from population forecasts produced by the Kentucky State Data Center. Employment growth was based on a third party forecast using trends from the Bureau of Labor Statistics. The KYTC consulted with local planning staff to update the socioeconomic data for the 2040 future year model within Carter County. The locations of proposed developments were identified and the physical and infrastructure-related constraints influencing the placement of future growth were taken into account in the placement of future households and employment centers. While the population projections were reasonable, the amount of job growth was tempered and was redirected to grow in areas based on the local officials input. The changes in population and employment within each of the TAZs in the study area are shown in Figure 1 and Figure 2, respectively.

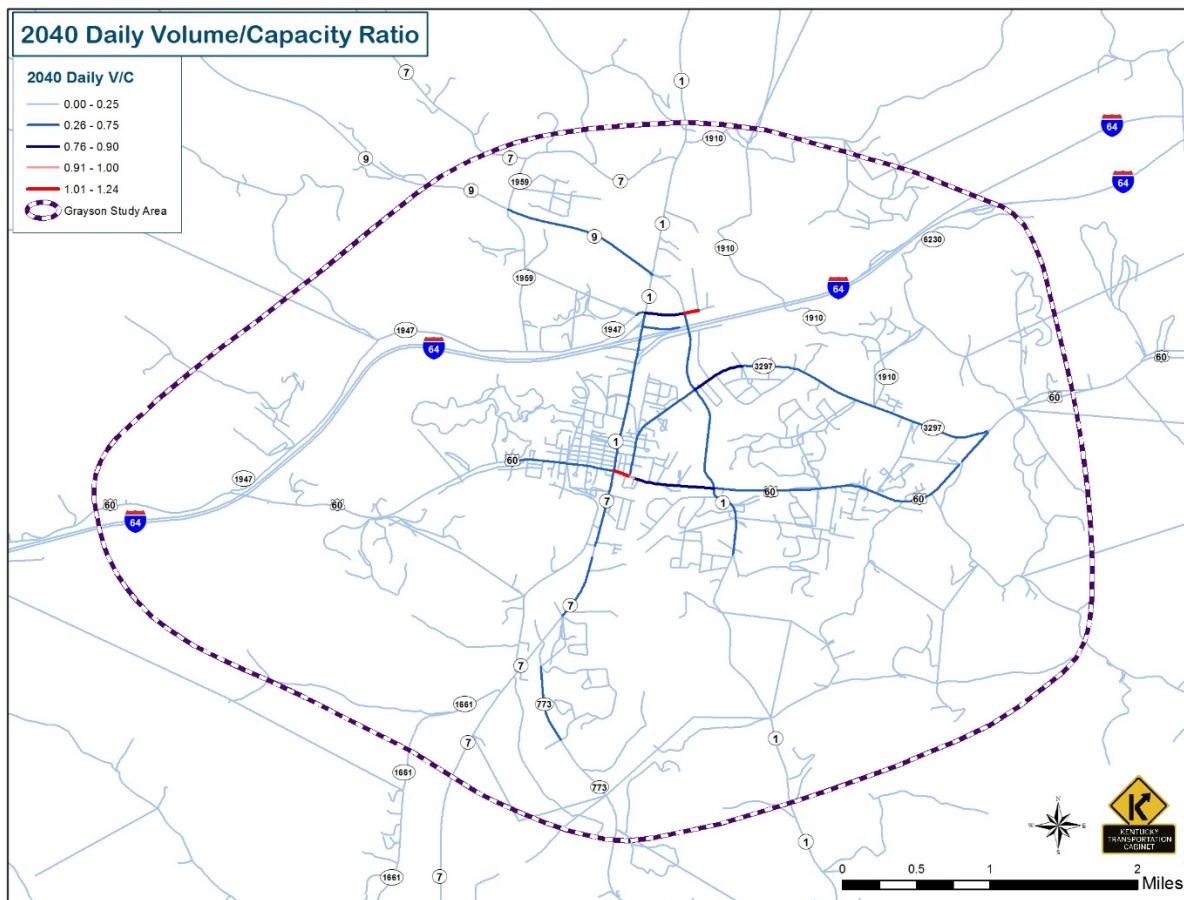


**Figure 1: Traffic Analysis Zones – Change in Population**



**Figure 2: Traffic Analysis Zones – Change in Employment**

The 2040 model includes projects listed in the 2016 KYTC Highway Plan. To evaluate the adequacy of roadway segments, 2040 ADT volumes were compared to the road's theoretical capacity. A V/C analysis using Highway Capacity Manual (HCM) procedures shows that portions of US 60 and CW Stevens Blvd have a V/C greater than 1.0. A V/C greater than 1.0 indicates that mitigation measures (including adding additional lanes) may be warranted. All other roadway segments are expected to operate at less than capacity with a V/C less than 1.0, as shown in Figure 3.



**Figure 3: 2040 Volume-To-Capacity Ratios from the D-9 Model**

**Grayson Small Urban Area Study**  
**KYTC Traffic Counts Forecast to 2016**

Routes for Model and Capacity Analysis	Station ID	Count Year	Count Year AADT	Historical Growth Rate %	Years to 2016	2016 AADT	Truck %
I-64	022554	2015	13,219	0.70	1	13,312	30.0
	022P47	2015	15,407	0.00	1	15,407	22.8
	022031	2013	21,129	0.30	3	21,319	25.3
KY 1	022293	2015	3,300	0.00	1	3,300	5.9
	022A55	2015	5,162	0.10	1	5,167	5.9
	022A54	2013	13,603	0.00	3	13,603	20.9
	022048	2014	7,713	0.00	2	7,713	18.8
	022035	2015	3,114	0.00	1	3,114	6.1
KY 7	022313	2014	5,479	0.00	2	5,479	7.1
	022A67	2015	8,656	1.20	1	8,760	7.1
KY 9	022044	2015	4,721	0.00	1	4,721	26.2
US 60	022P13	2015	2,783	0.00	1	2,783	3.8
	022A50	2014	2,703	0.00	2	2,703	3.8
	022A03	2013	5,703	0.00	3	5,703	9.0
	022A12	2014	9,085	0.00	2	9,085	8.6
	022A49	2014	5,409	0.00	2	5,409	8.6
	022A60	2014	3,942	0.00	2	3,942	8.6
	022024	2014	3,303	0.00	2	3,303	5.2
KY 773	022290	2015	1,910	0.00	1	1,910	4.9
KY 1910	081286	2015	676	1.80	1	688	10.2*
KY 1947	022005	2013	1,238	0.00	3	1,238	9.2*
	022037	2015	1,853	0.00	1	1,853	7.4*
	022A15	2015	3,518	0.00	1	3,518	7.4*
KY 3297	022A08	2014	3,407	0.00	2	3,407	7.4*
	022A21	2014	3,911	0.00	2	3,911	7.4*
	022A22	2015	3,058	0.10	1	3,061	7.4*
	022A46	2015	2,945	0.00	1	2,945	7.4*
	022A61	2015	2,009	0.00	1	2,009	7.4*

\* Truck % based on statewide functional class averages from 2005-2007

**2016 Intersection Levels of Service**

		2016 No Build											
		AM						PM					
Intersection		Intersection, Approach, or Control Delay	Intersection or Approach LOS	LOS D, E, OR F	V/C Ratio	Queue	Control Delay	Intersection Delay or Approach Delay	Intersection or Approach LOS	Problems D, E, OR F	V/C Ratio	Queue	Control Delay
KY 1	ACADEMIC PARKWAY	16.8(EB)	C					30.9(EB)	D	EBL-E	0.26	1	43.8
	COLLEGE STREET	5.5	A					6.6	A				
	I-64 EB RAMPS	19.4	B	EBT-D EBL-D	0.163 0.824	1 6	36.4 50.0	17.6	B				
	I-64 WB RAMPS	18.4	B	WBL-D WBTR-D	0.814 0.540	7 4	46.5 39.2	34.0	C	WBL-F WBTR-E	1.011 0.713	21 9	89.0 46.9
	INTERSTATE DRIVE	15.7 42.1	C E	WBLTR-C EBLTR-E	0.19 0.10	1 1		115.8 206.0	F F	WBLTR EBLTR	0.96 0.75	8 3	115.8 206.0
	KY 9	1.4	A					4.6	A				
	KY 1947	24.3	C	EBL-D EBT-E WBL-E WBT-D	0.046 0.882 0.653 0.339	1 7 2 1	38.5 70.9 57.2 49.5	47.3	D	EBT-F WBL-F WBT-D	1.004 0.977 0.533	11 11 3.5	95.8 85.3 38.5
	MCDONALDS	30.1(EB)	D	EBL-F	0.52	3	61.4	28.9(EB)	D	EBL-F	0.42	2	81.5
	NORTH LOVES ENTRANCE	10.5 24.2	B C					11.7 65.7	B F	EBLTR-F	0.44	2	65.7
	SOUTH LOVES ENTRANCE	10.5 28.2	B D	EBLTR	0.3	2	28.2	35.3 32.6	E D	WBLTR-E EBLTR-D	0.46 0.25	3 1	35.3 32.6
	SUPER 8 LANE	18.8	C					154.4	F	WBLR-F	1.12	11	154.4
(US 60) MAIN STREET	THIRD STREET	6.8	A					7.1	A				
	HORD STREET	4.1	A					A	8.0				
	LANDSDOWNE AVENUE	6.1	A					A	7.9				
US 60	KY 1	12.1	B					A	9.7				
	KY 1/7	58.1	E	NBL-E NBR-D SBL-F SBR-F	0.885 0.810 1.083 0.886	11 8 14 12	57.1 48.9 116.8 89.2	49.5	D	EBT-D WBT-D WBR-D NBL-E NBR-D SBL-E SBR-D	0.593 0.396 0.654 0.873 0.802 0.919 0.836	6 4 7 11 9 16 13	46.6 39.9 48.8 60.5 53.6 58.5 47.9
	KY 3297	16.1	B	NBT-D SBT-D	0.484 0.734	3.9 6.0	35.9 42.0	B	10.5				

NOTE:

Delay is in seconds/vehicle Queue – 50% (average) according to Highway Capacity Software (HCS)

Red letters signify LOS E or F. NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; R – Right; L – Left; T – Through

# Grayson Small Urban Area Study

## Industry Questionnaire

This information will be shared with the Kentucky Transportation Cabinet's Division of Planning only. Any reports generated from this information will be grouped in such a way that individual business information cannot be identified.

1. Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/Town: \_\_\_\_\_  
State: \_\_\_\_\_  
ZIP: \_\_\_\_\_  
Email Address: \_\_\_\_\_  
Phone Number: \_\_\_\_\_
  
2. Number of Employees per shift? Please include contract employees for cleaning and industrial sanitation if applicable. \_\_\_\_\_
  
3. Size (in square feet) of existing building space: \_\_\_\_\_
  
4. Type of Business (please include NAICS classification number)  
\_\_\_\_\_
  
5. Does your business distribute and/or receive materials via trucks?  
 Yes *If you answered YES please continue to Question Number 6.*  
 No *If you answered NO please skip to Question Number 10.*
  
6. How many trucks per day access and leave your facility?  
\_\_\_\_\_
  
7. What types of trucks?  
 Single Unit  
 Trailered
  
8. How many trucks access your facility during the peak hours of 7AM to 9AM; 4PM to 6PM?  
\_\_\_\_\_

9. Please identify on the attached map the primary routes used by these trucks to access your business.
  
10. In the next 25 years, do you propose any expansion at your current location?  
 Yes *If you answered YES please continue to Question Number 11.*  
 No *If you answered NO please skip to Question Number 17.*
  
11. Please provide a brief description of the expansion:

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12. Number of Employees (after expansion): \_\_\_\_\_
  
13. Size (in square feet) of future additional building space: \_\_\_\_\_
  
14. How many additional trucks per day will access and leave your facility?  
\_\_\_\_\_

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15. What types of trucks?  
 Single Unit  
 Trailered
  
16. How many trucks will access your facility during the peak hours at 7AM to 9AM; 4PM to 6PM?  
\_\_\_\_\_

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17. Additional Comments (Use additional pages if necessary)  
\_\_\_\_\_

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Please submit this questionnaire by **July 18, 2016**.

If you would like to complete and submit the Industry Questionnaire electronically please visit:  
<https://www.surveymonkey.com/r/GraysonSUA>

***For further information or to submit your Industry Questionnaire by mail:***

**Qk4, Inc.**  
**ATT: Annette Coffey**  
**2225 Lawrenceburg Road**  
**Frankfort, KY 40601**  
**(502) 352-2197**  
**acoffey@qk4.com**

***Thank you for your comments!***

**Grayson Small Urban Area Study**  
**KYTC Traffic Counts Forecast**

Routes for Model and Capacity Analysis	2016 EXISTING								2040 NO BUILD		
	Station ID	Count Year	Count AADT	Historical Growth Rate %	Years to 2016	2016 AADT	2016 AADT (rounded up to nearest 20)	Truck %	2016 to 2040 Growth Factor	2040 AADT	2040 AADT (rounded to nearest 20)
I-64	022554	2015	13,219	0.70	1	13,312	13,320	30.0	1.15	15,308	15,320
	022P47	2015	15,407	0.00	1	15,407	15,420	22.8	1.15	17,718	17,720
	022031	2013	21,129	0.30	3	21,319	21,320	25.3	1.15	24,517	24,520
KY 1	022293	2015	3,300	0.00	1	3,300	3,300	5.9	1.15	3,795	3,800
	022A55	2015	5,162	0.10	1	5,167	5,180	5.9	1.15	5,942	5,960
	022A54	2013	13,603	0.00	3	13,603	13,620	20.9	1.15	15,643	15,640
	022048	2014	7,713	0.00	2	7,713	7,720	18.8	1.15	8,870	8,880
	022035	2015	3,114	0.00	1	3,114	3,120	6.1	1.15	3,581	3,600
KY 7	022316	2014	3,950	0.00	2	3,950	3,960	7.1	1.15	4,543	4,560
	022313	2014	5,479	0.00	2	5,479	5,480	7.1	1.15	6,301	6,320
	022A67	2015	8,656	1.20	1	8,760	8,760	7.1	1.15	10,074	10,080
KY 9	022044	2015	4,721	0.00	1	4,721	4,740	26.2	1.15	5,429	5,440
	022045	2013	3,790	0.00	3	3,790	3,800	27.1	1.15	4,359	4,360
US 60	022P13	2015	2,783	0.00	1	2,783	2,800	3.8	1.15	3,200	3,200
	022A50	2014	2,703	0.00	2	2,703	2,720	3.8	1.15	3,108	3,120
	022A03	2013	5,703	0.00	3	5,703	5,720	9.0	1.15	6,558	6,560
	022A12	2014	9,085	0.00	2	9,085	9,100	8.6	1.15	10,448	10,460
	022A49	2014	5,409	0.00	2	5,409	5,420	8.6	1.15	6,220	6,220
	022A60	2014	3,942	0.00	2	3,942	3,960	8.6	1.15	4,533	4,540
	022024	2014	3,303	0.00	2	3,303	3,320	5.2	1.15	3,798	3,800
KY 773	022290	2015	1,910	0.00	1	1,910	1,920	4.9	1.15	2,197	2,200
KY 1910	081286	2015	676	1.80	1	688	700	10.2*	1.15	791	800
KY 1947	022005	2013	1,238	0.00	3	1,238	1,240	9.2*	1.15	1,424	1,440
	022037	2015	1,853	0.00	1	1,853	1,860	7.4*	1.15	2,131	2,140
	022A15	2015	3,518	0.00	1	3,518	3,520	7.4*	1.15	4,046	4,060
KY 3297	022A08	2014	3,407	0.00	2	3,407	3,420	7.4*	1.15	3,918	3,920
	022A21	2014	3,911	0.00	2	3,911	3,920	7.4*	1.15	4,498	4,500
	022A22	2015	3,058	0.10	1	3,061	3,080	7.4*	1.15	3,520	3,520
	022A46	2015	2,945	0.00	1	2,945	2,960	7.4*	1.15	3,387	3,400
	022A61	2015	2,009	0.00	1	2,009	2,020	7.4*	1.15	2,310	2,320

\* Truck % based on statewide functional class averages from 2005-2007

**2040 No Build Intersections LOS and Capacity**

	Intersection	2040 AM						2040 PM					
		Intersection Delay or Approach Delay	Intersection or Approach LOS	Problems E, OR F	V/C Ratio	Queue	Control Delay	Intersection Delay or Approach Delay	Intersection or Approach LOS	Problems E, OR F	V/C Ratio	Queue	Control Delay
KY 1	ACADEMIC PARKWAY	19.6 (EB)	C	EBL-28.5	0.21	1	28.5	43.6 (EB)	E	EBL-F	0.36	2	64.6
	COLLEGE STREET	5.9	A					7.4	A				
	I-64 EB RAMPS	20.3	C	EBL-D	0.84	7	48.5	18.8	B	EBL-D EBT-E SBL	0.221 0.844 0.729	7 4 6	47.7 63.5 59.5
	I-64 WB RAMPS	19	B	WBL-D WBTR-D	0.828 0.558	7 4	45.1 37.8	46.8	D	WBL-F WBTR-D	1.176 0.819	28 12	144.6 54.9
	INTERSTATE DRIVE	62.0 (EBLTR)	F	EBLTR-F	0.15	1	62.0						
	KY 9	1.5	A					4.7	A	WBT-D	0.062	1	35.1
	KY 1947	29.1	C	EBL-D EBT-F WBL-E WBT-D	0.043 0.966 0.714 0.297	1 9 2 1	35.6 91.4 58.4 48.1	62.9	E	EBT-F WBL-F WBT-D NBL-D	1.127 1.158 0.614 0.761	14 16 5 3	133.1 141.9 40.9 35.9
	MCDONALDS	62.0 (EBLR)	F	EBL-F	0.88	5	147.8	42.9	E	EBL-F	0.63	3	154.9
	NORTH LOVES ENTRANCE	11.0 (WBLTR) 31.2 (EBLTR)	B D	EBLTR-D	0.24	1	31.2	12.6 (WBLTR) 140.4 (EBLTR)	B F	EBLTR-F	0.69	3	140.4
	SOUTH LOVES ENTRANCE	11.0 (WBLTR) 52.0 (EBLTR)	B F	EBLTR-F	52	0.55	3	67.2 (WBLTR) 48.4 (EBLTR)	F E	WBLTR-F EBLTR-E	0.69 0.40	5 2	67.2 48.4
	SUPER 8 LANE	23.1 (WB)	C					526.2 (WBLR)	F	WBLR-F	1.98	20	526.2
	THIRD STREET	6.8	A					7.6	A				
MAIN STREET	HORD STREET	4	A					8.3	A				
	LANDSDOWNE AVENUE	5.9	A					8.1	A				
US 60	KY 1	13	B					10.1	B				
	KY 1/7	75.3	E	NBL-E NBR-D SBL-F SBR-F	0.930 0.848 1.233 1.122	13 10 19 15	64.6 52.5 171.2 130.2	63.0	E	EBL-D EBT-E WBL-D WBT-D WBR-E NBL-E NBR-E SBL-F SBR-E	0.551 0.821 0.724 0.515 0.857 0.933 0.854 1.012 0.921	4 9 6 5 9 14 10 22 17	36.5 65.8 43.1 45.6 69.1 72.1 60.0 79.7 58.6
	KY 3297	11.4	B					11.9	B				

Delay is in seconds/vehicle Queue – 50% (average) according to Highway Capacity Software (HCS)

Red letters signify Intersection or Intersection Approach LOS E or F. NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound; R – Right; L – Left; T – Through

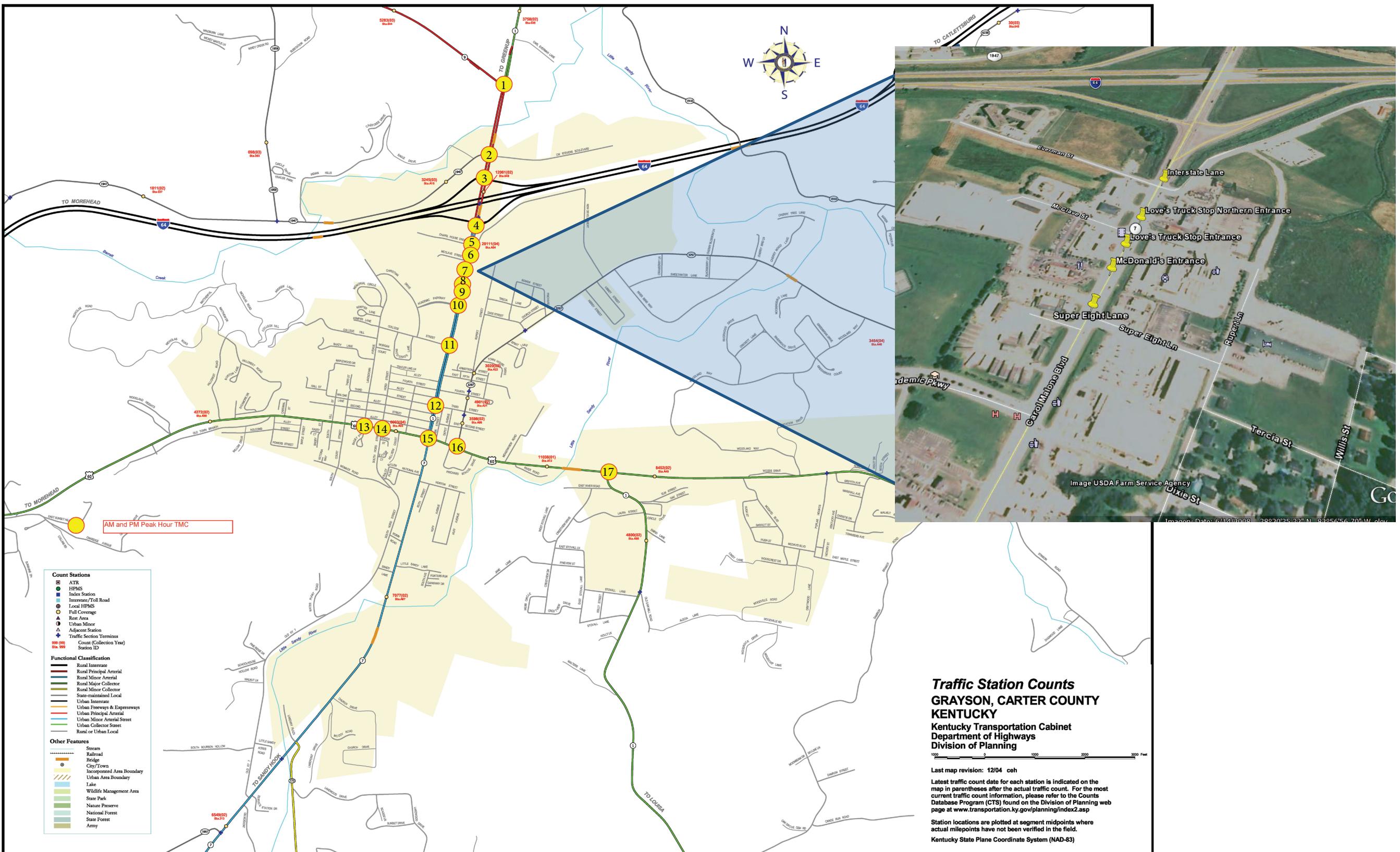


Figure 1 Count Locations

# TM 1

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

YEAR: 2016 Design Hour Volumes

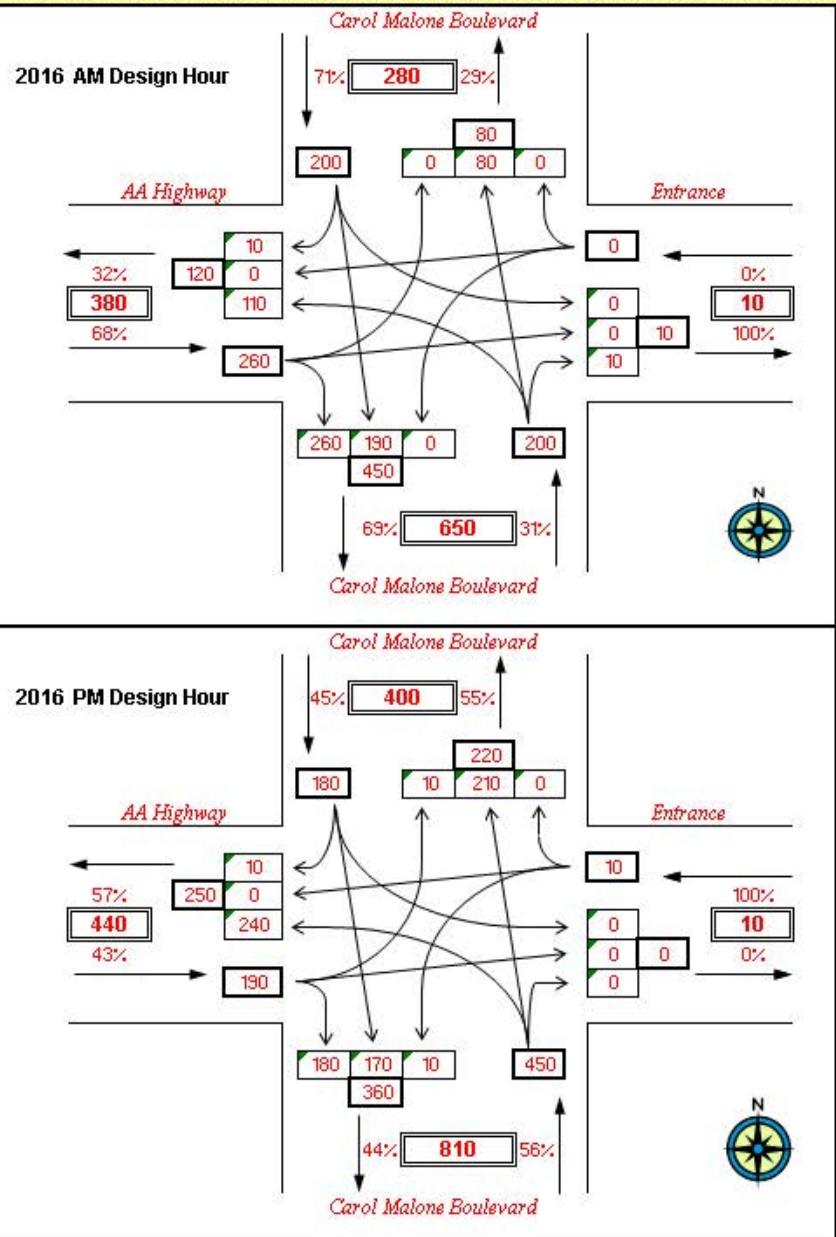
INTERSECTION: Carol Malone Boulevard (KY 1) and AA Highway (KY 9)

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)



**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

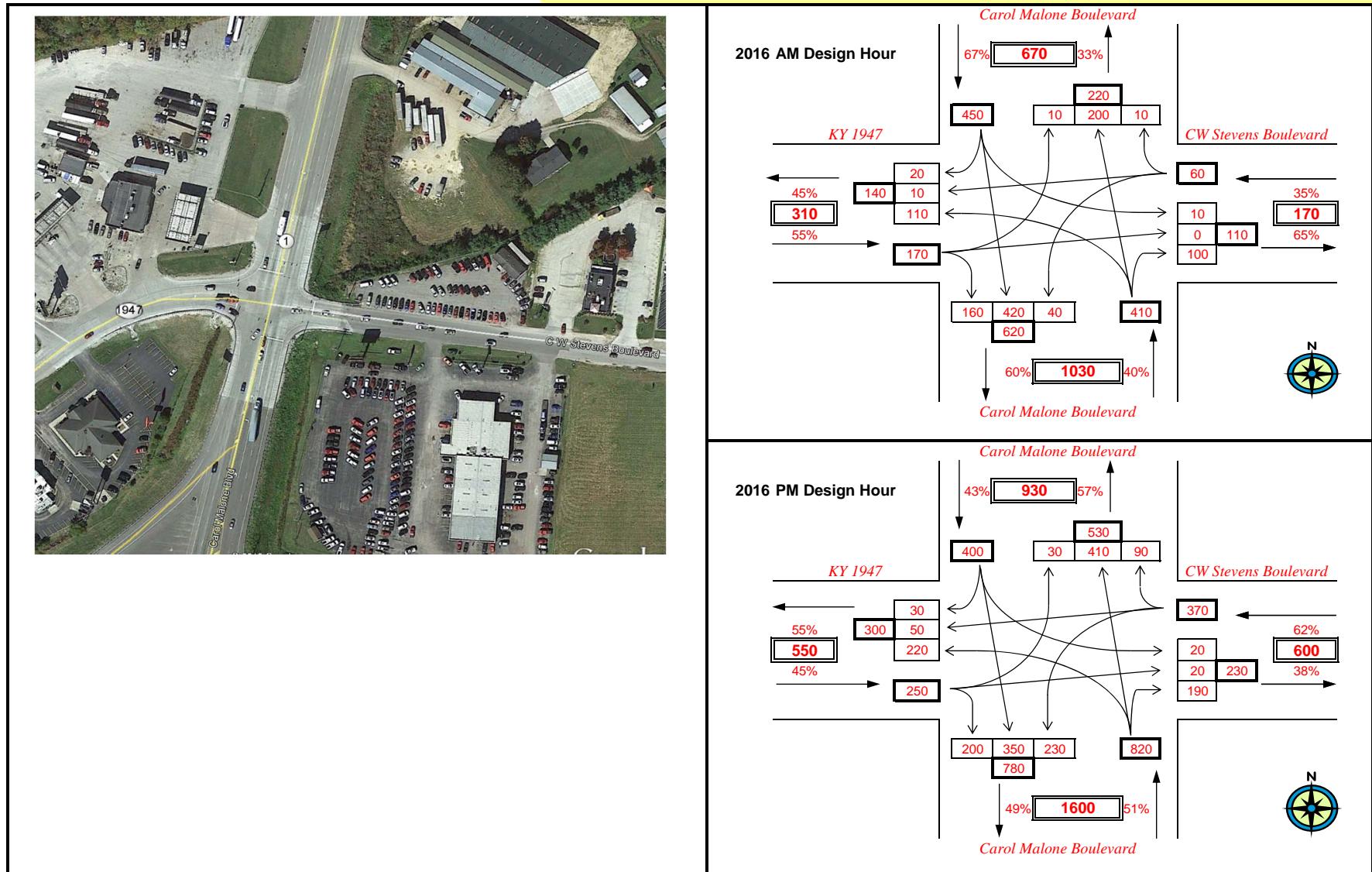


## TM 2

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and KY 1947/ CW Stevens Boulevard

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)



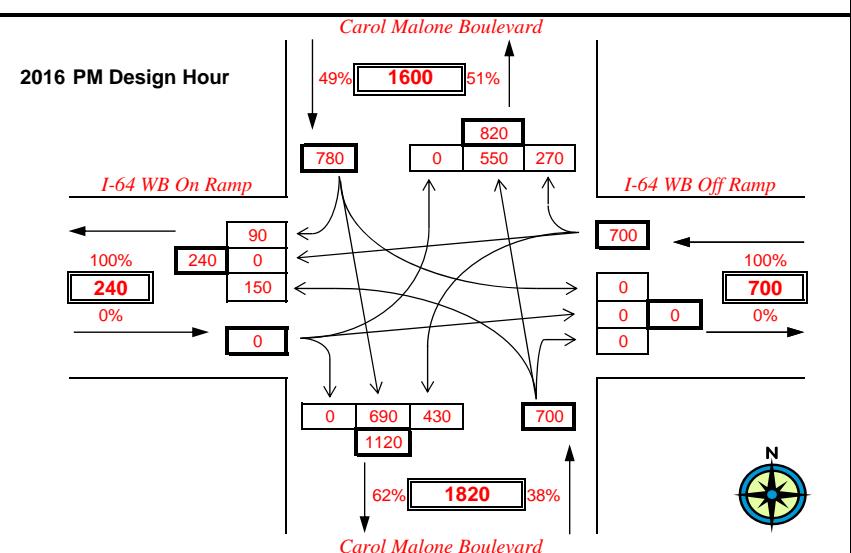
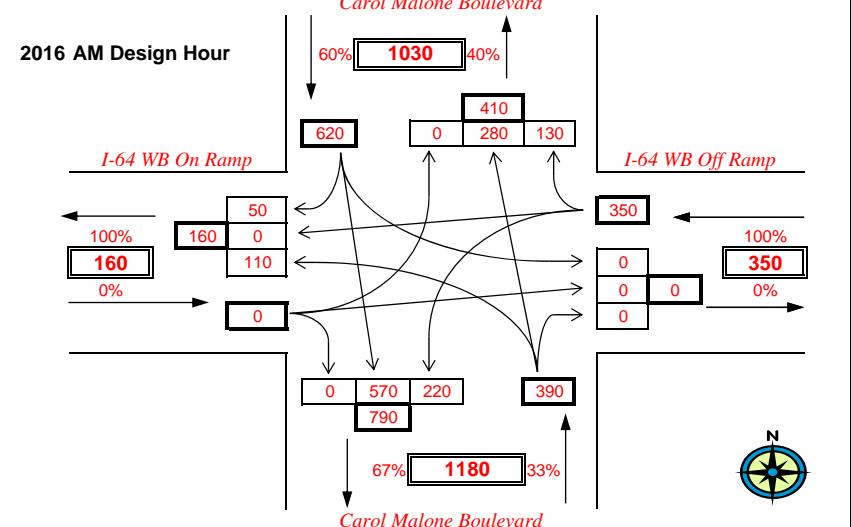
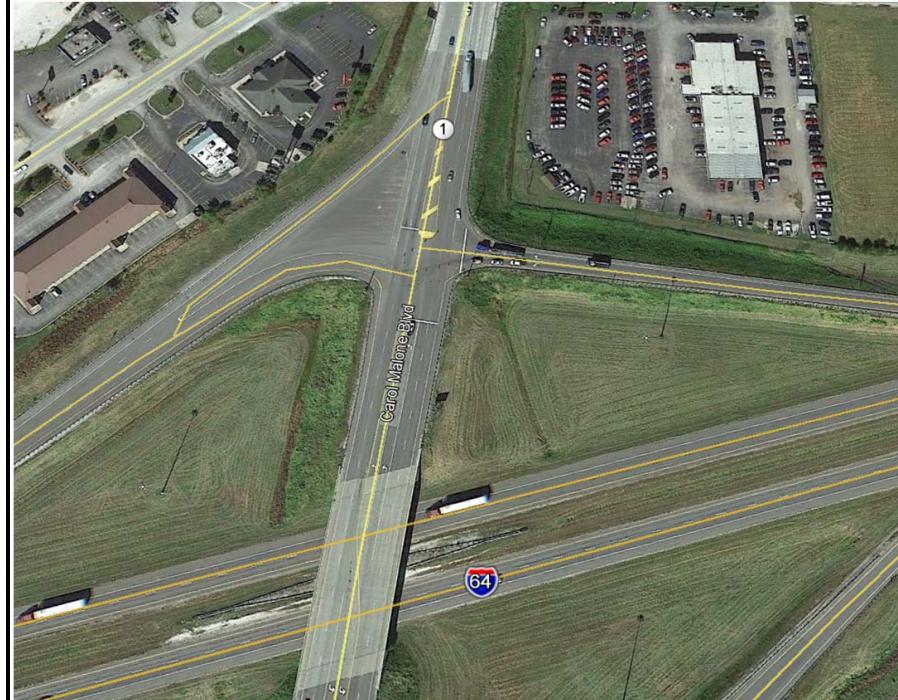
## TM 3

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and I-64 WB Ramps

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



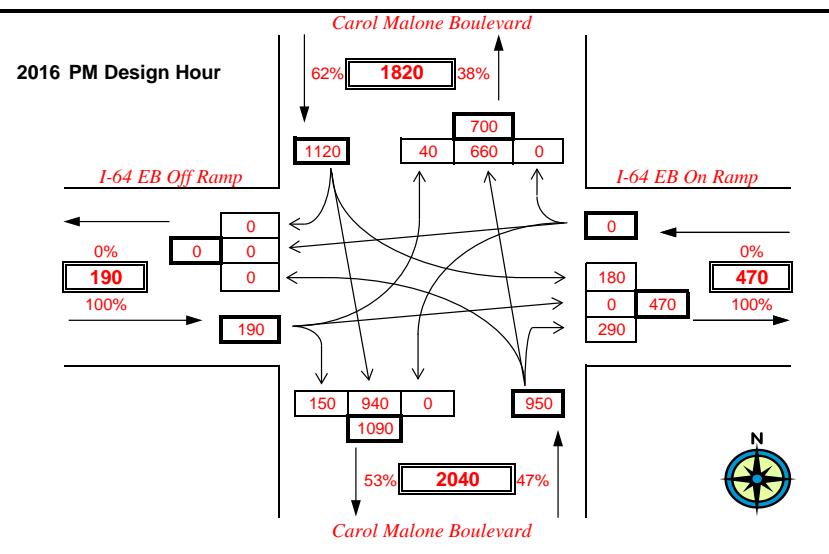
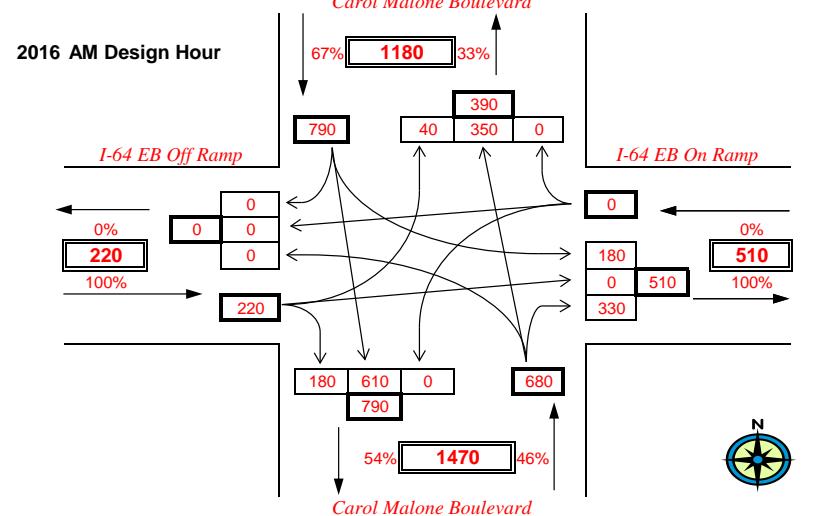
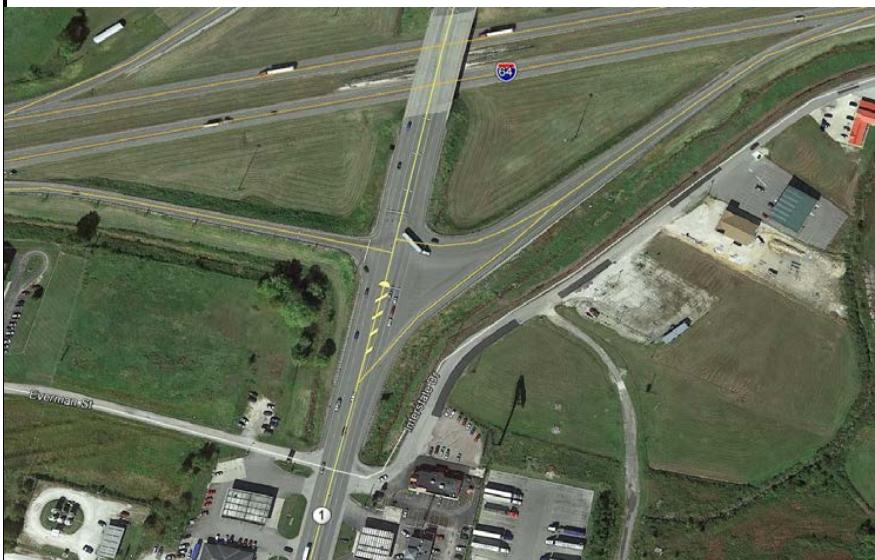
## TM 4

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and I-64 EB Ramps

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



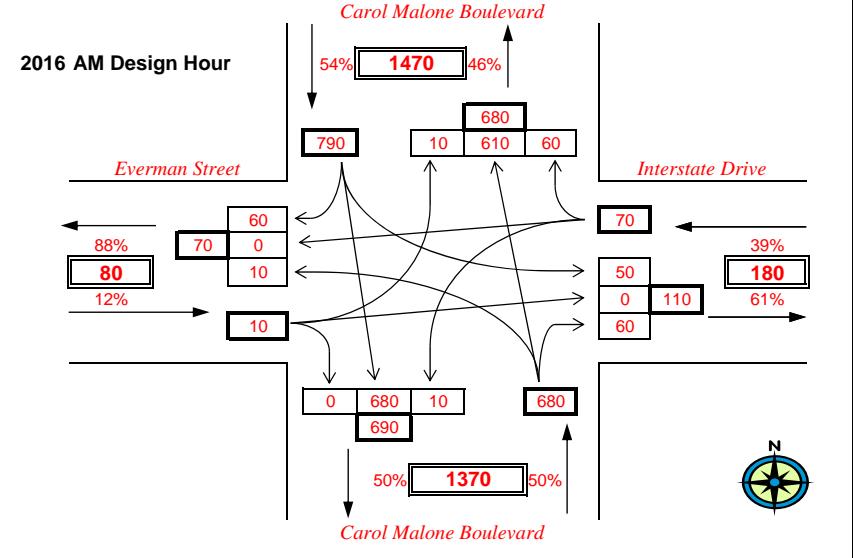
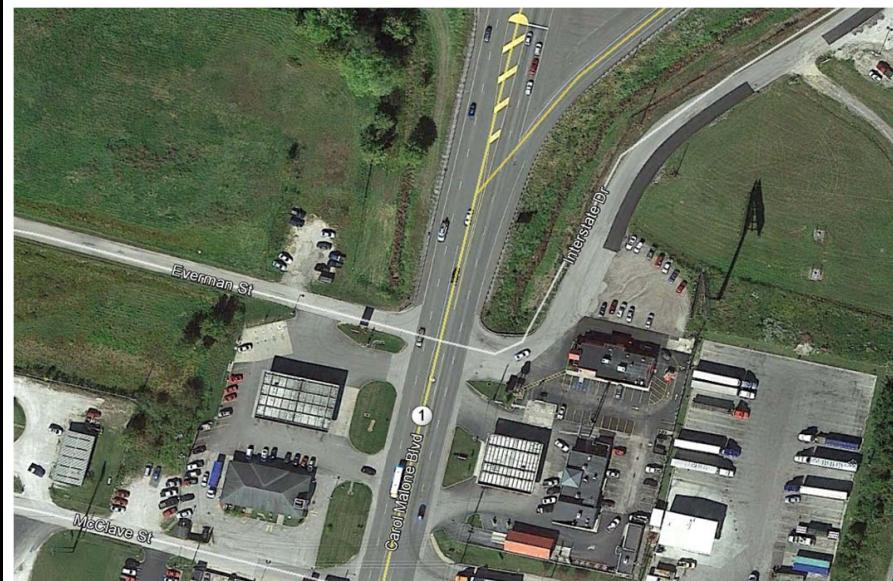
## TM 5

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and Everman Street/Interstate Drive

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



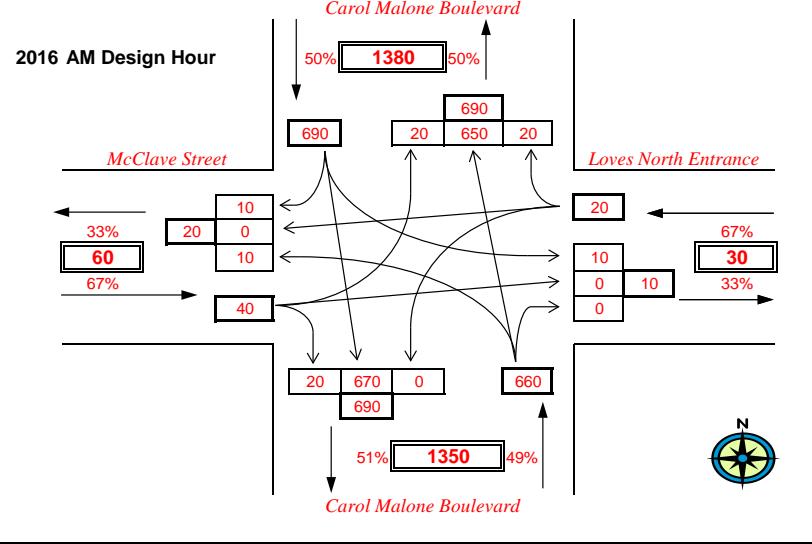
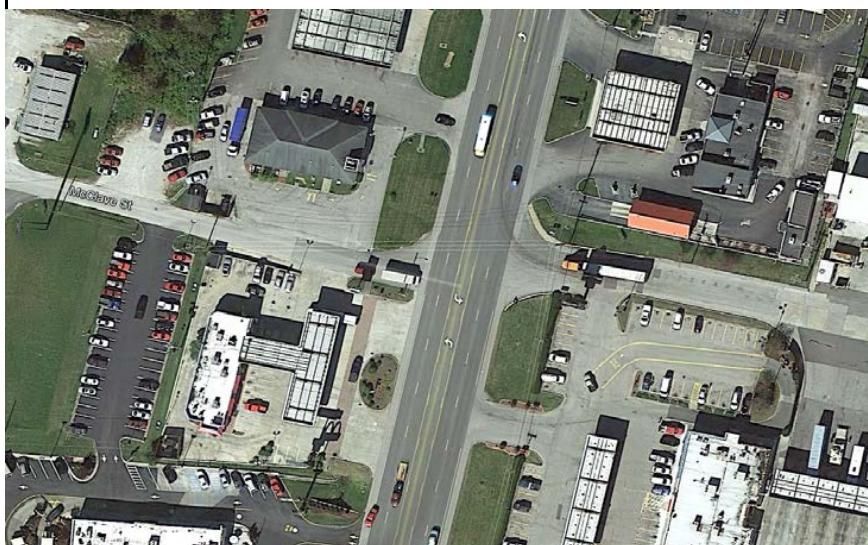
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PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and McClave Street/Loves North Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



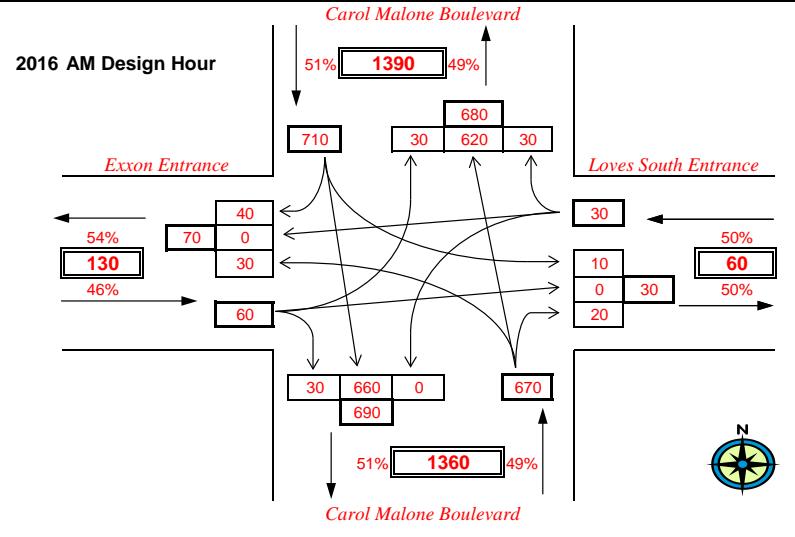
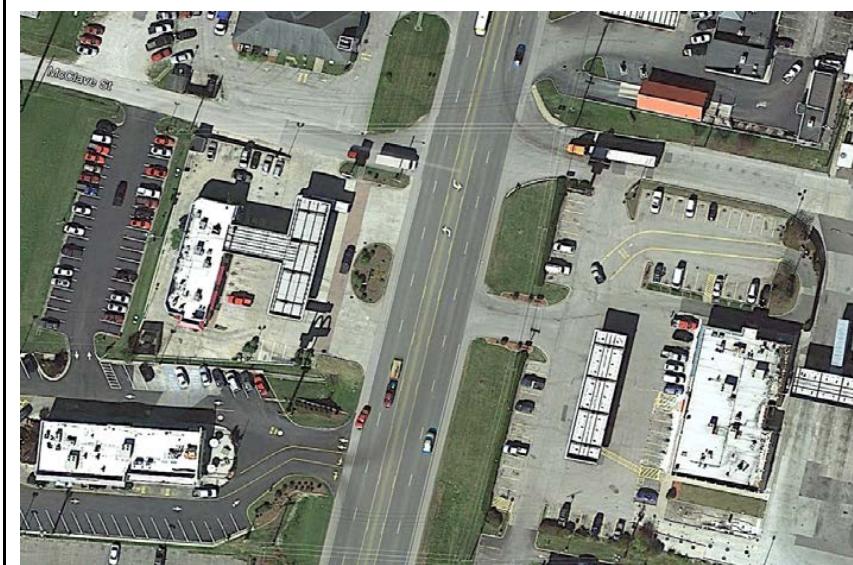
## TM 7

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and Exxon Entrance/Loves South Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

### TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



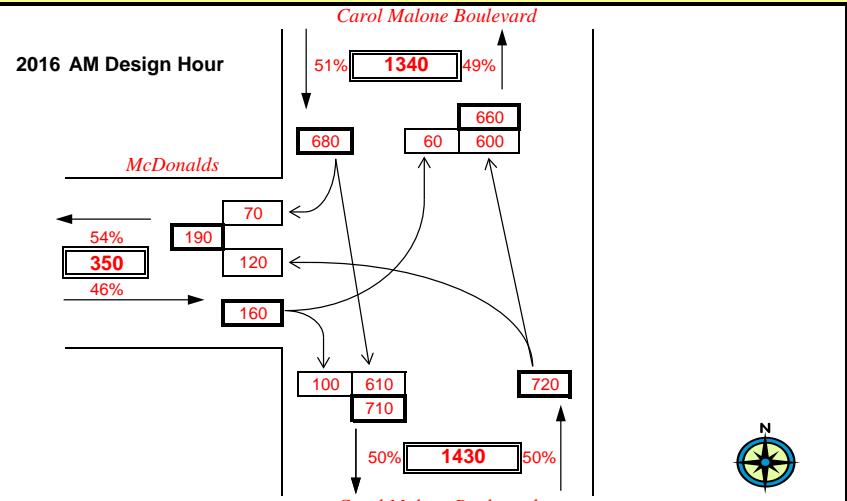
## TM 8

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and McDonalds Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

### TURN MOVEMENT (2016)

\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS

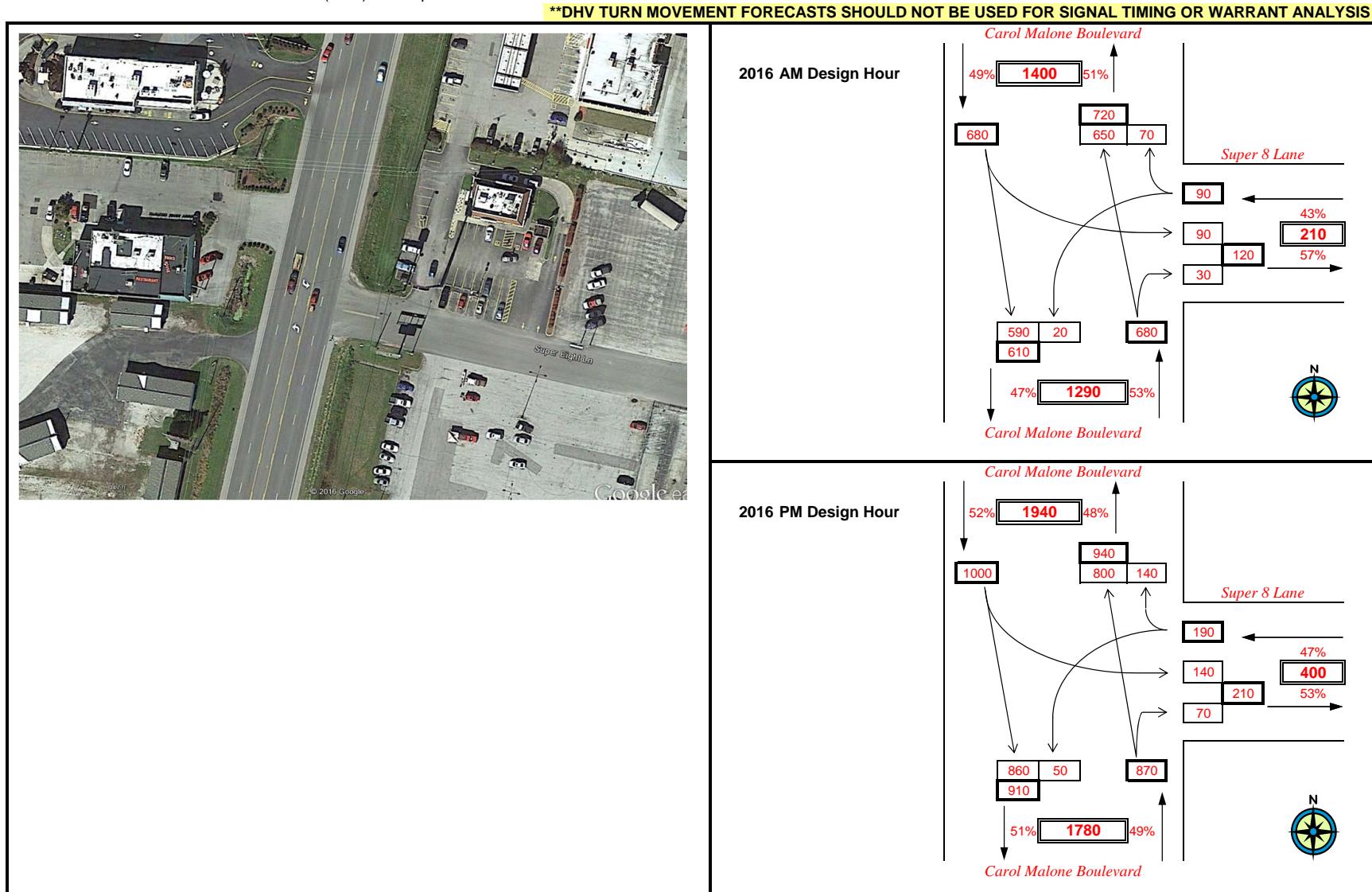


## TM 9

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and Super 8 Lane

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)



## TM 10

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

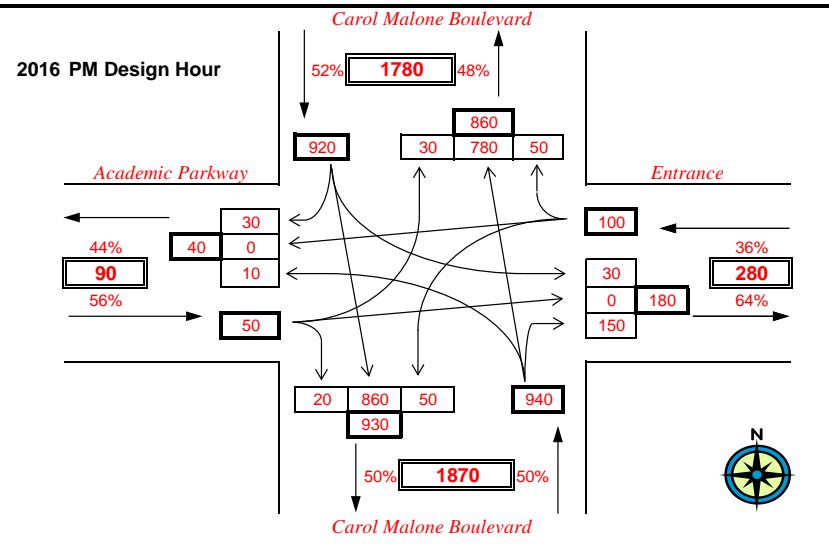
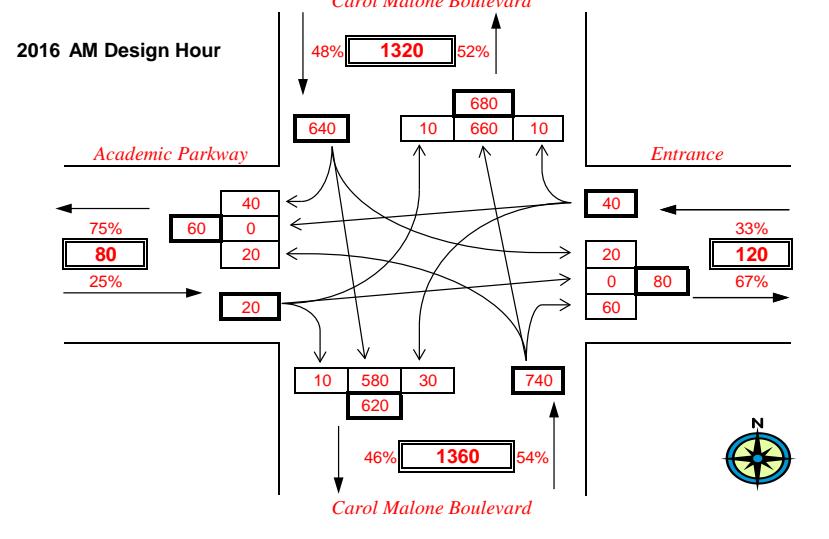
YEAR: 2016 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and Academic Parkway

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



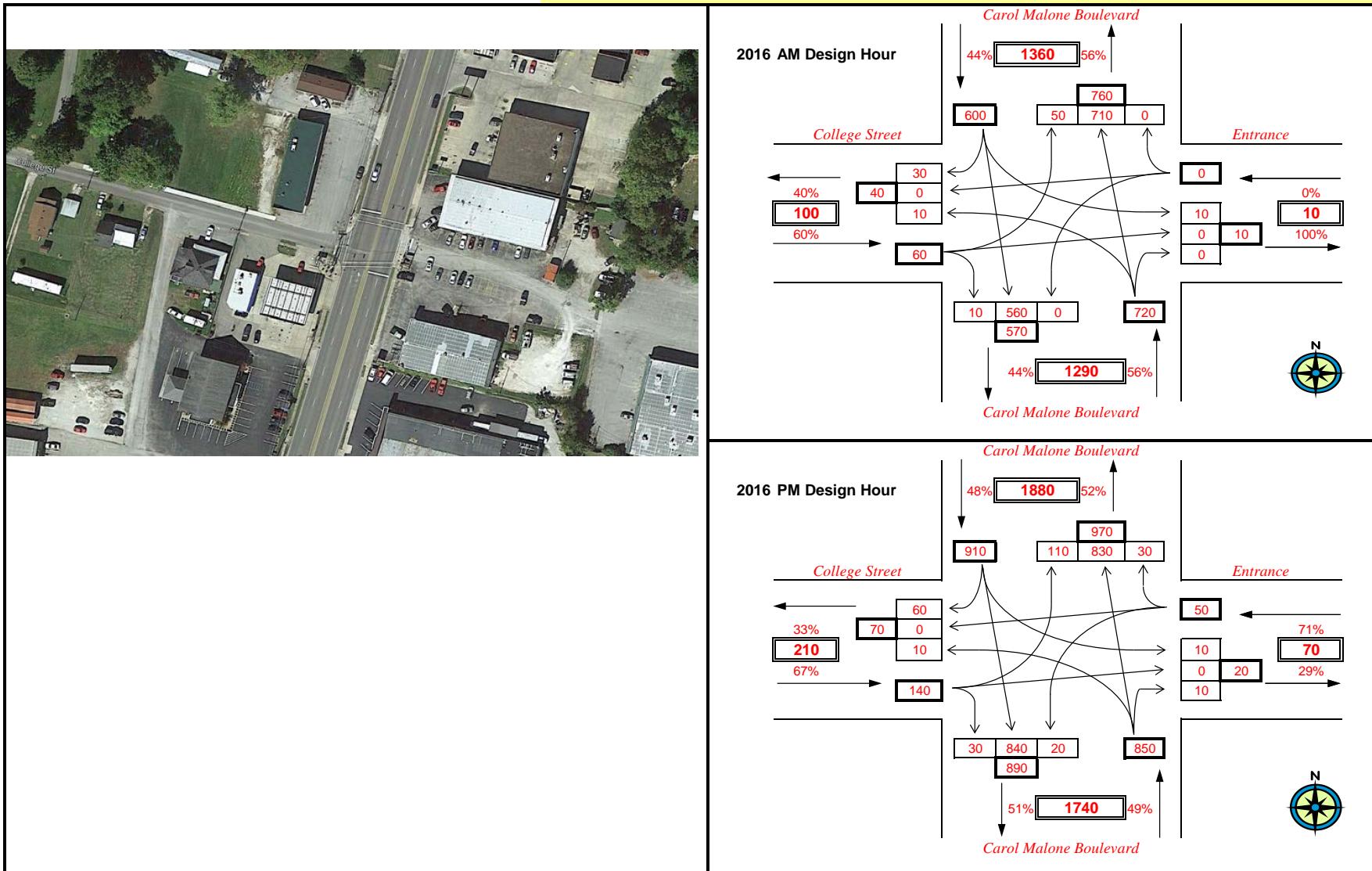
## TM 11

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and College Street

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

### TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



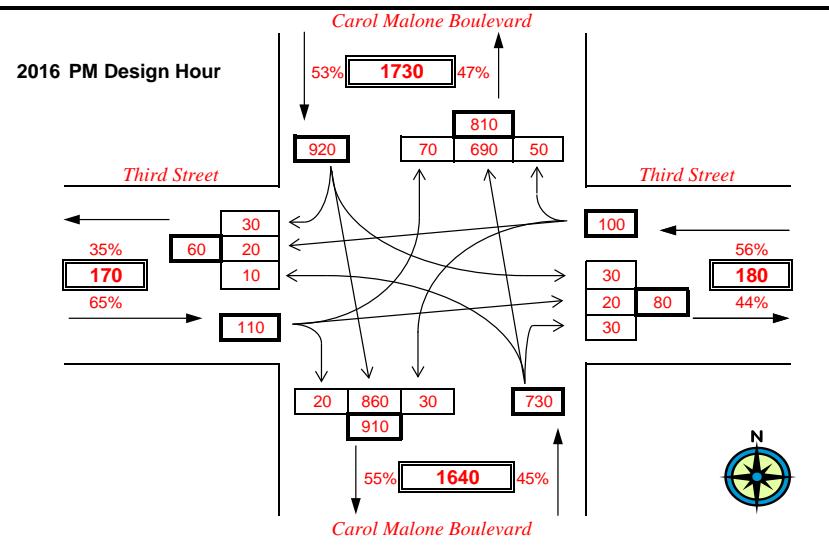
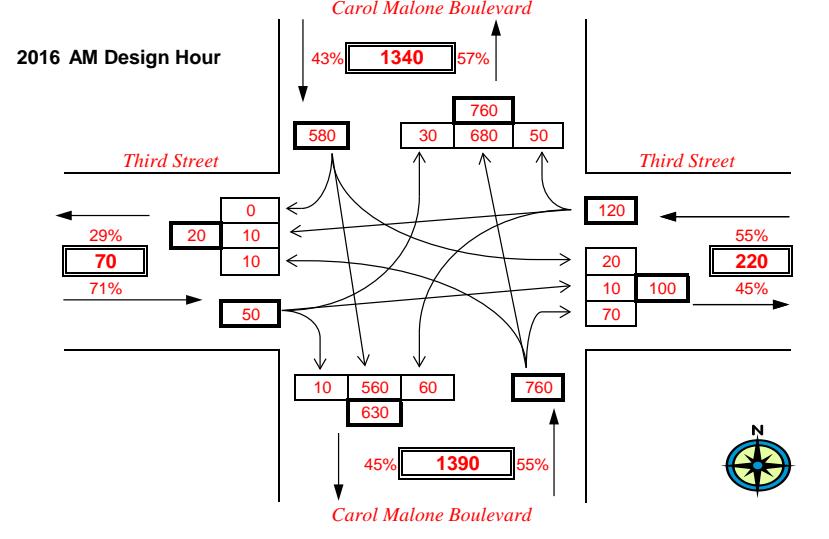
## TM 12

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) & Third Street

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



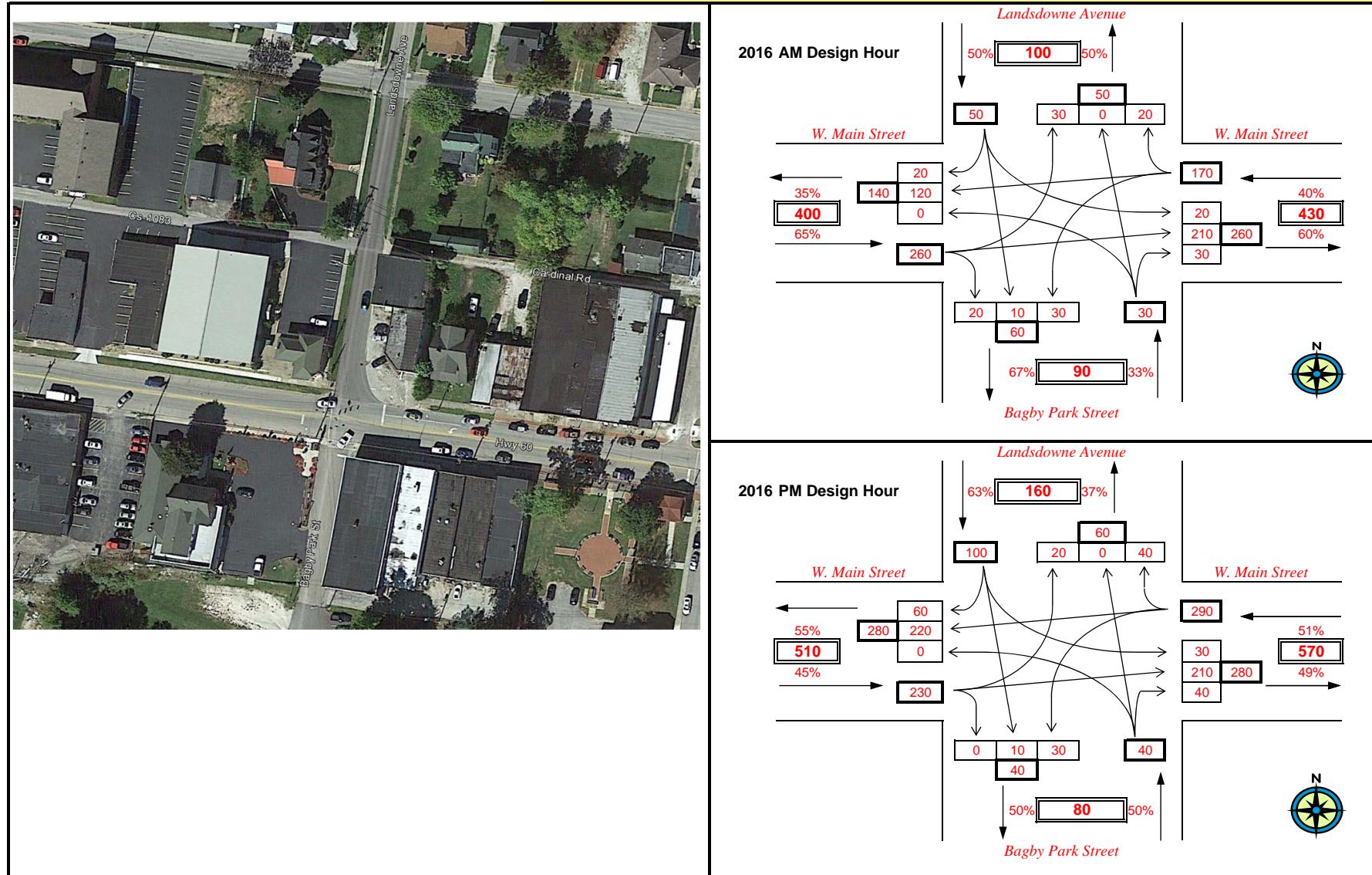
## TM 13

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Main Street (US 60) and Lansdowne Ave

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



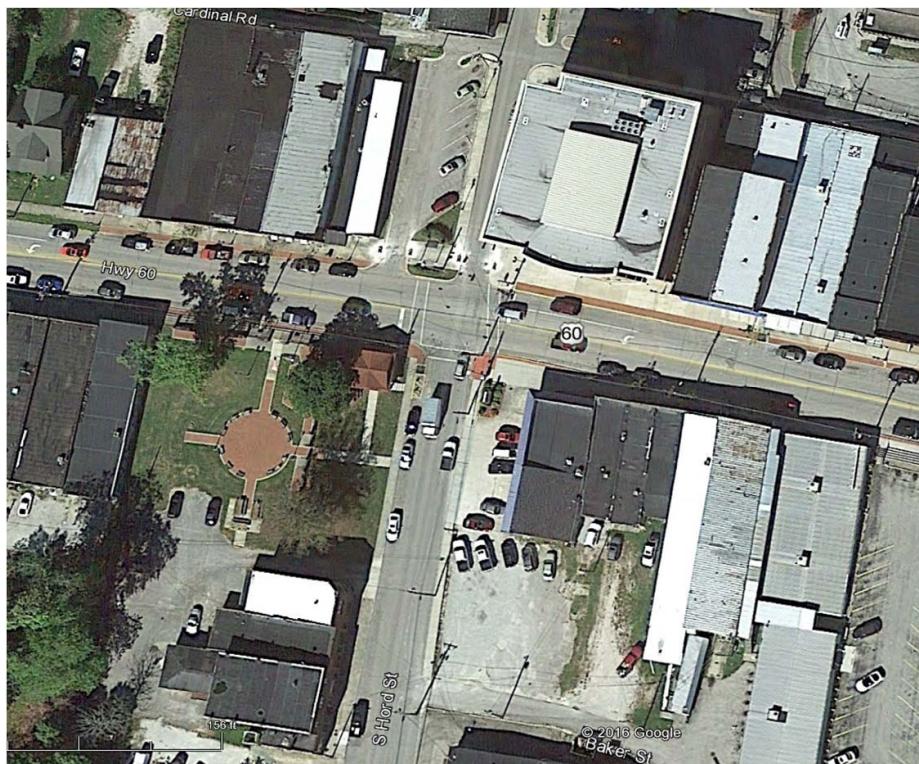
## TM 14

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Main Street (US 60) and Hord Street

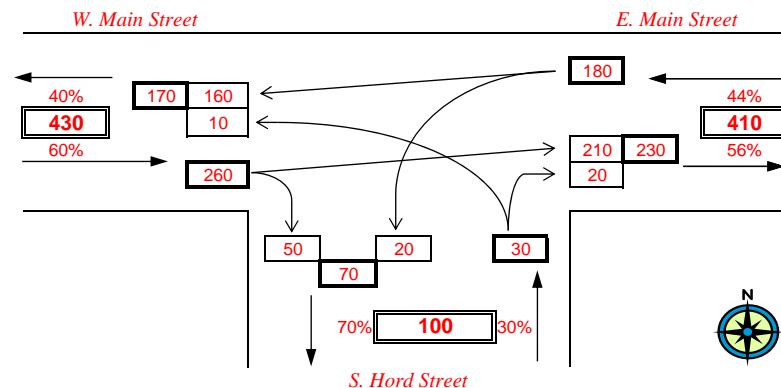
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

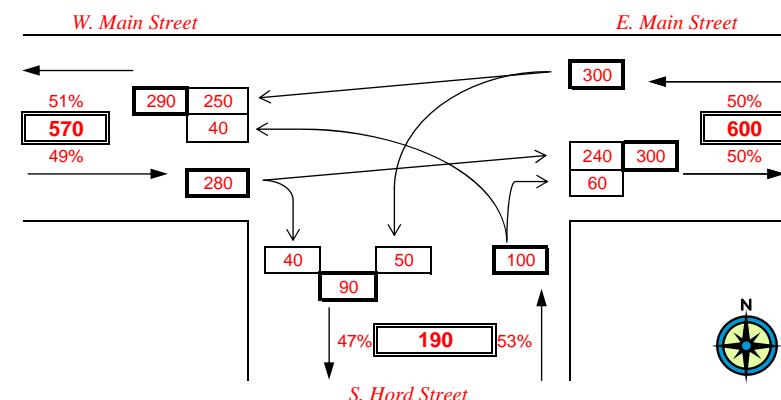
**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



### 2016 AM Design Hour



### 2016 PM Design Hour



## TM 15

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

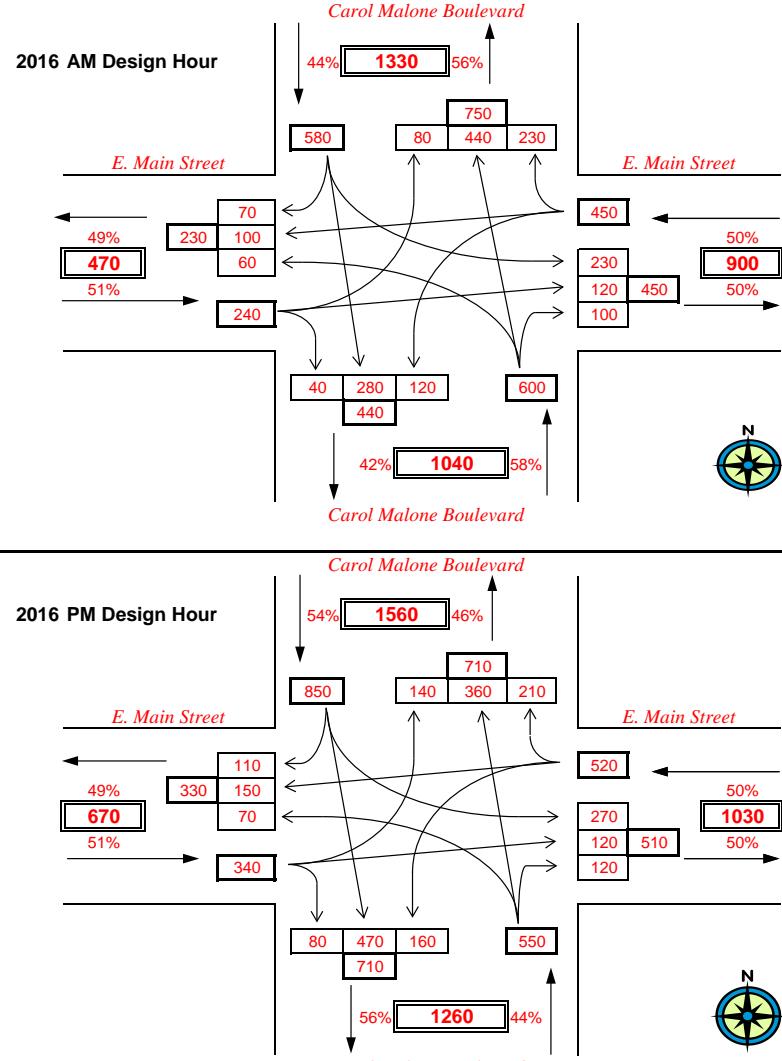
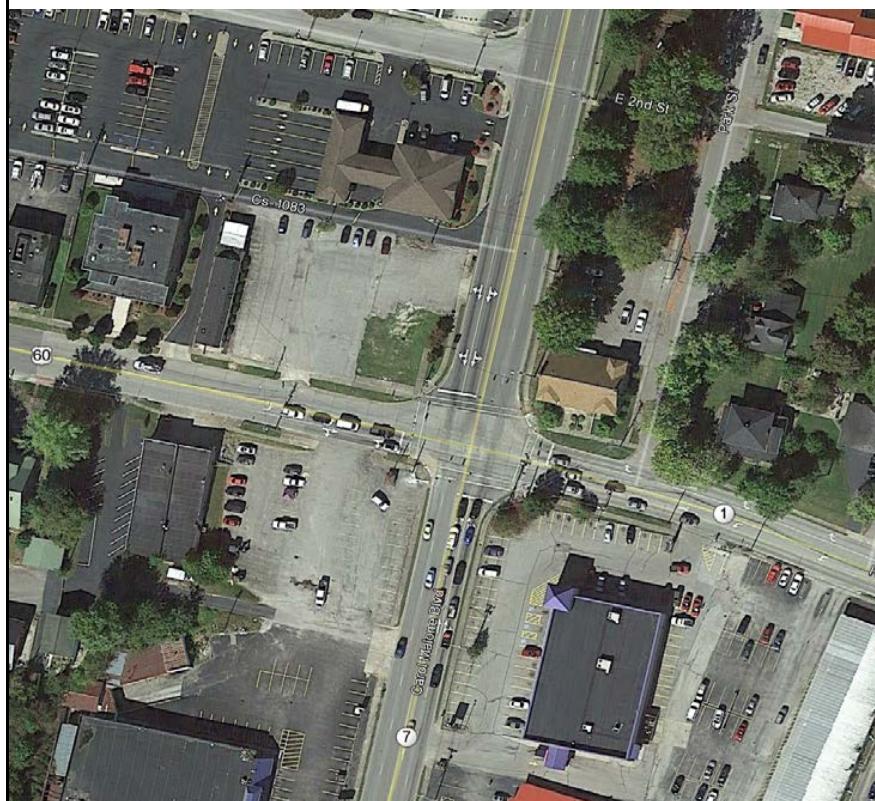
YEAR: 2016 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1/KY7) and E. Main Street  
(US 60)

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



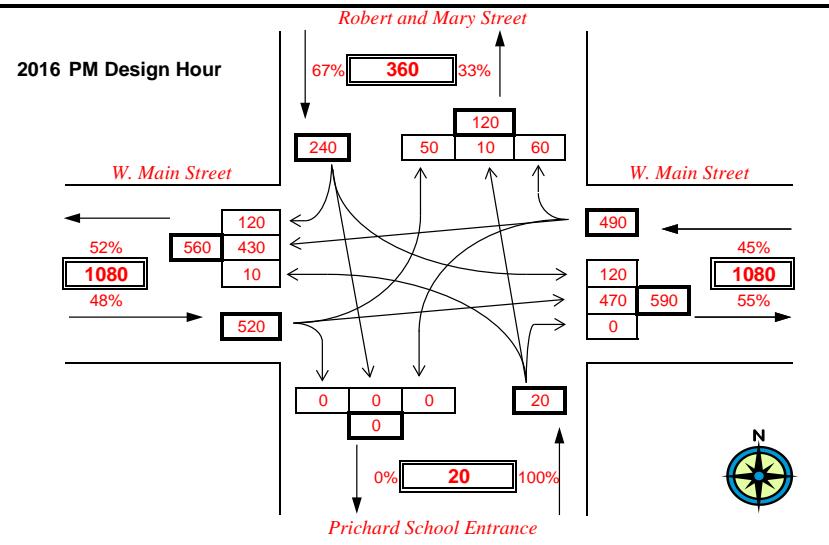
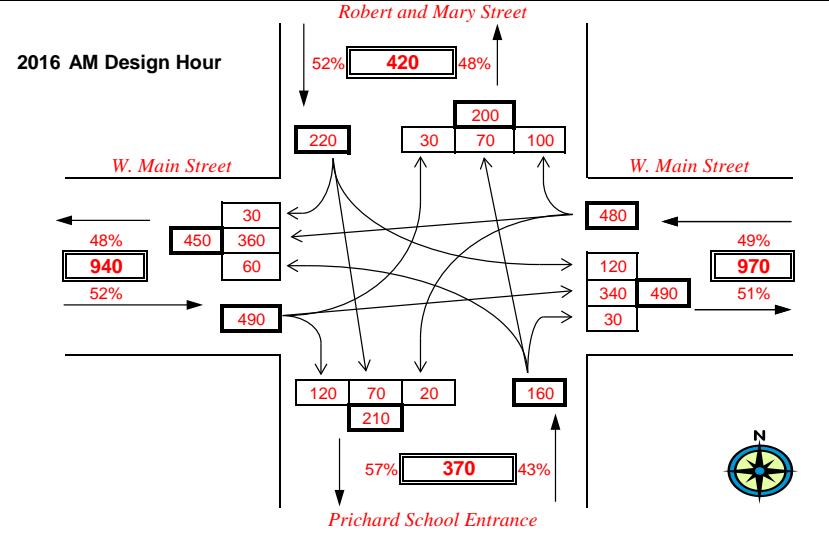
# TM 16

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Main Street (US 60) and Robert and Mary Street (KY 3297)

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



# TM 17

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2016 Design Hour Volumes  
 INTERSECTION: Hitchens Road (KY 1) and E. Main Street (US 60)

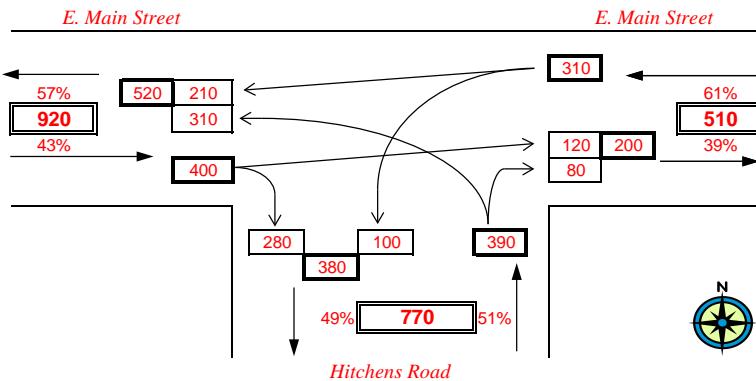
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2016 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2016)

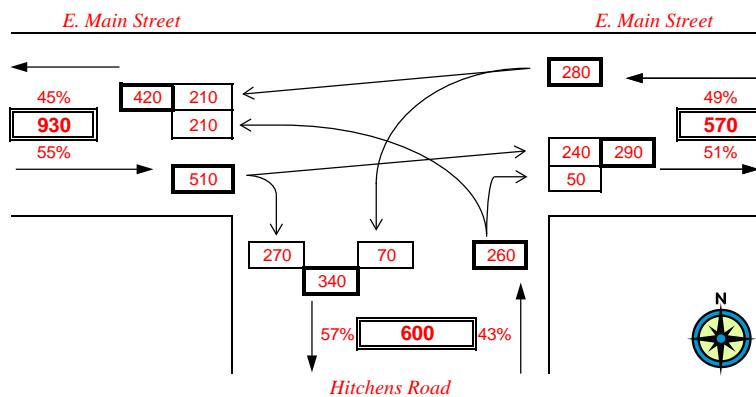
**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



### 2016 AM Design Hour



### 2016 PM Design Hour



# TM 1

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

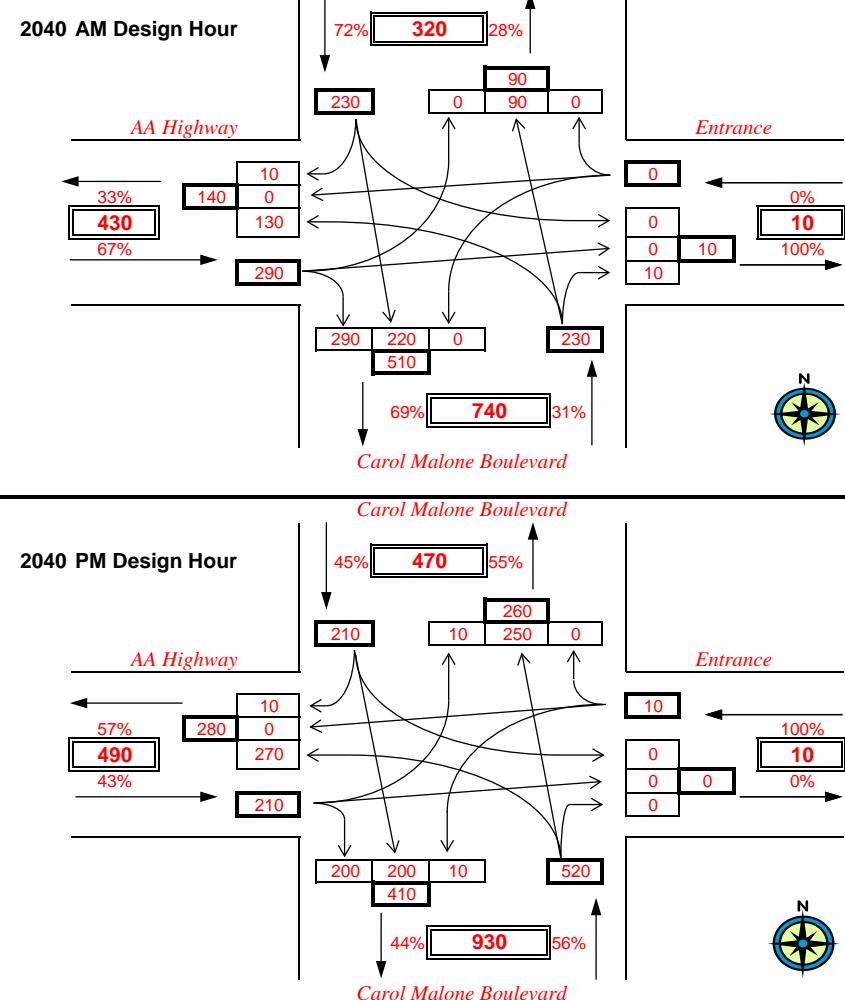
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and AA Highway (KY 9)

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



## TM 2

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

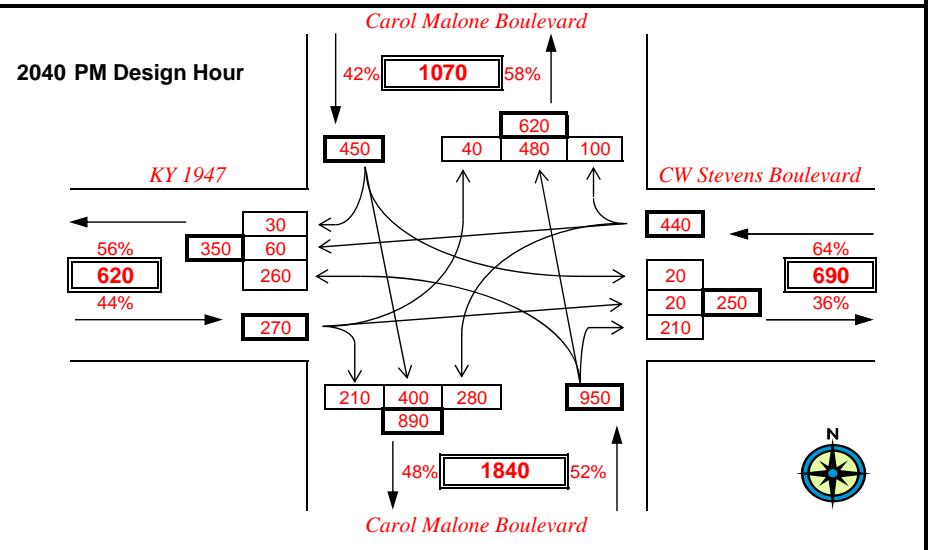
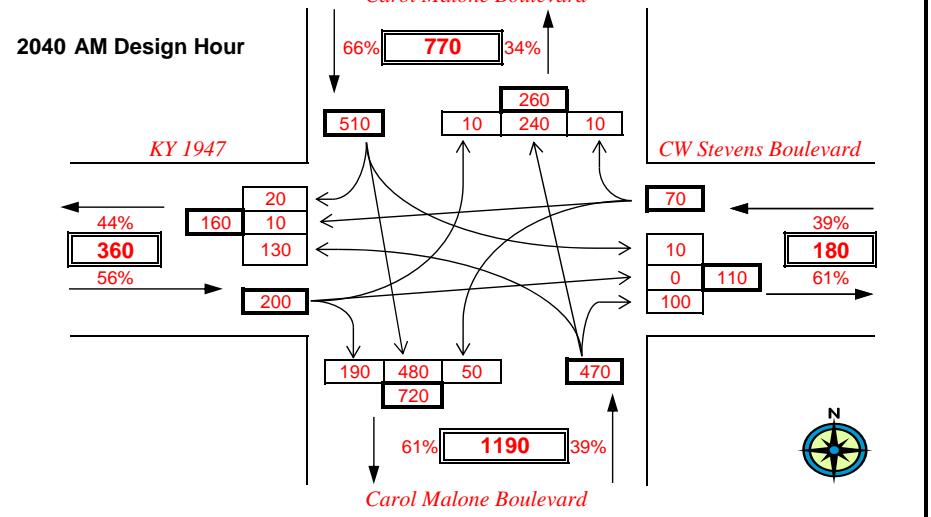
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and KY 1947/ CW Stevens Boulevard

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



## TM 3

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

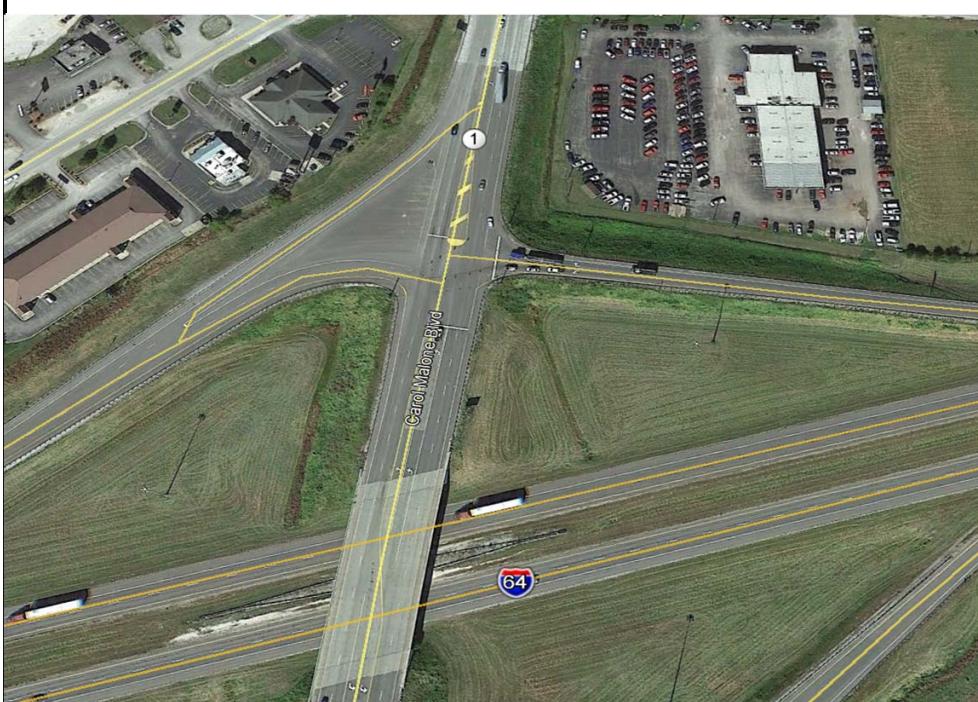
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and I-64 WB Ramps

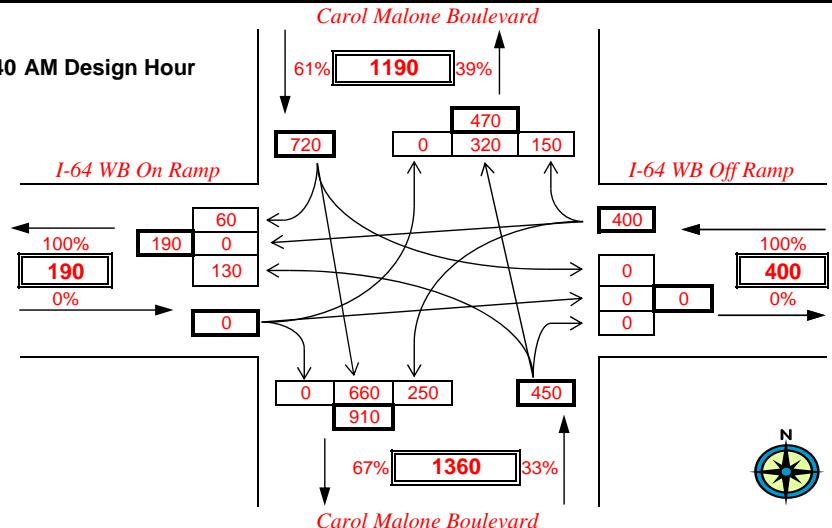
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

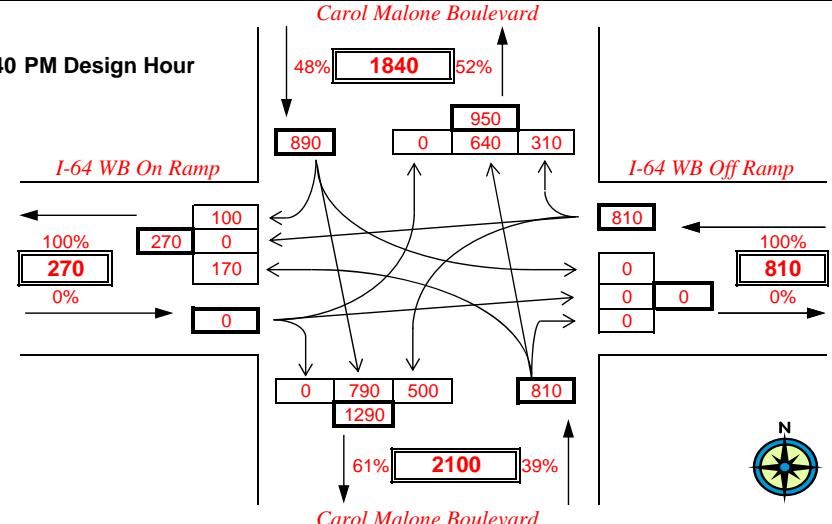
**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



### 2040 AM Design Hour



### 2040 PM Design Hour



## TM 4

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

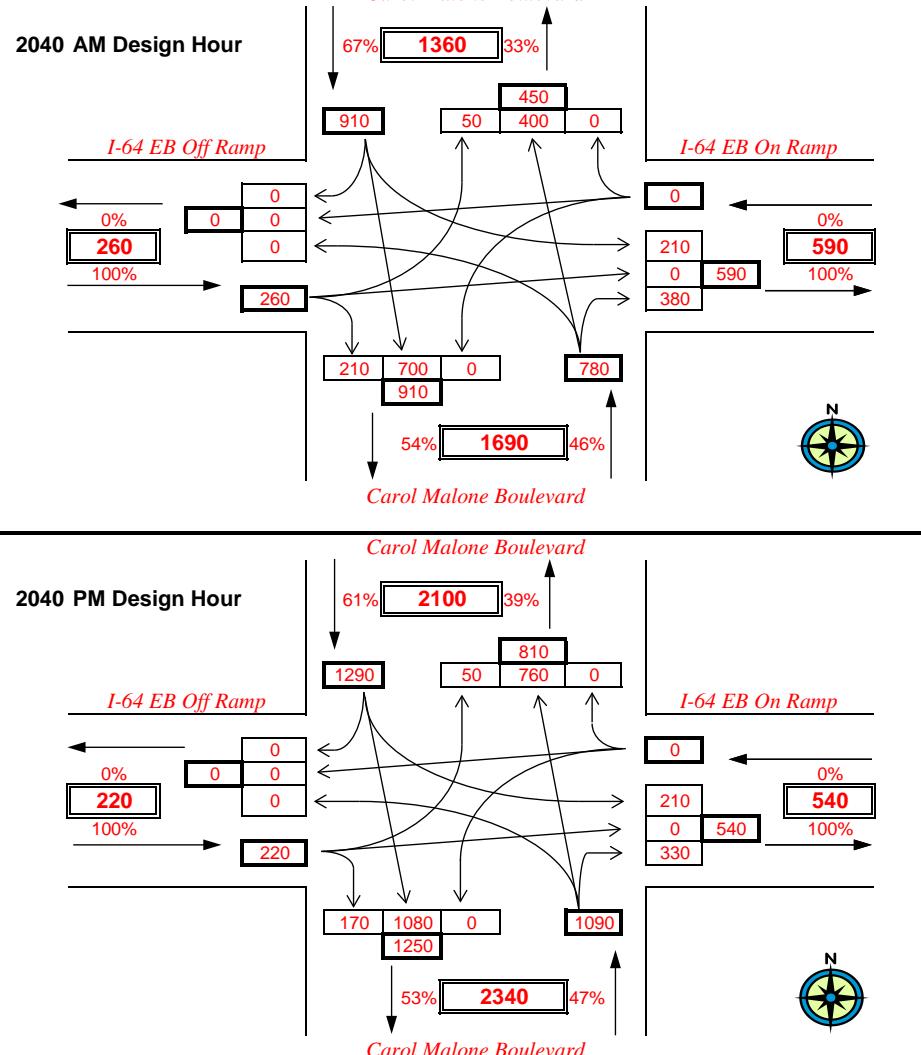
**2040 Design Hour Volumes**

INTERSECTION: Carol Malone Boulevard (KY 1) and I-64 EB Ramps

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



## TM 5

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

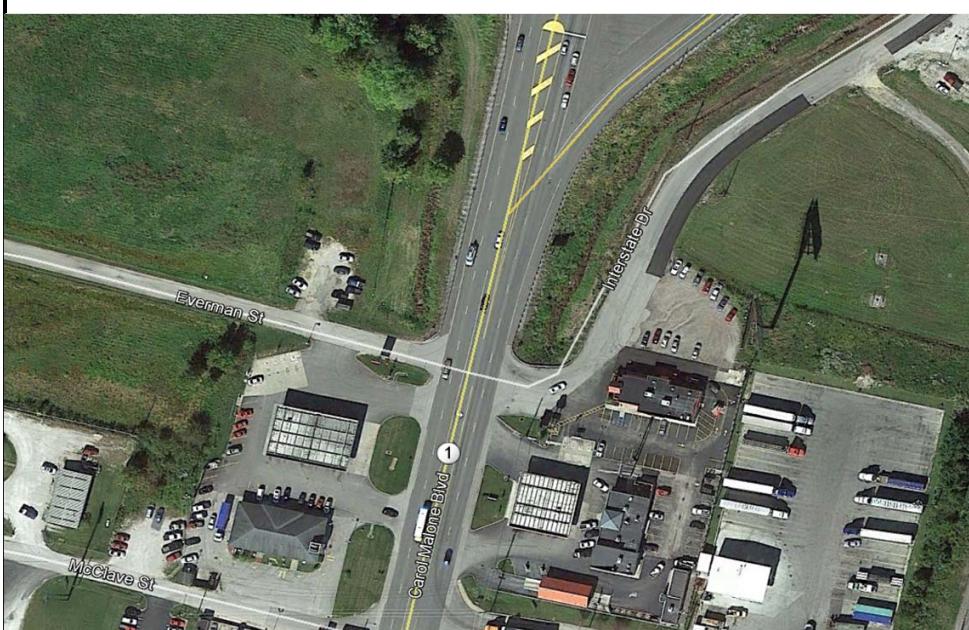
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and Everman Street/Interstate Drive

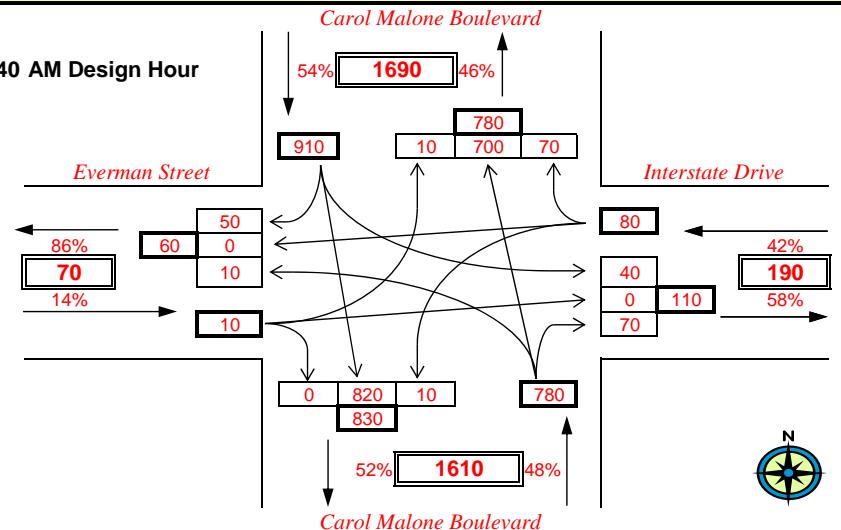
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

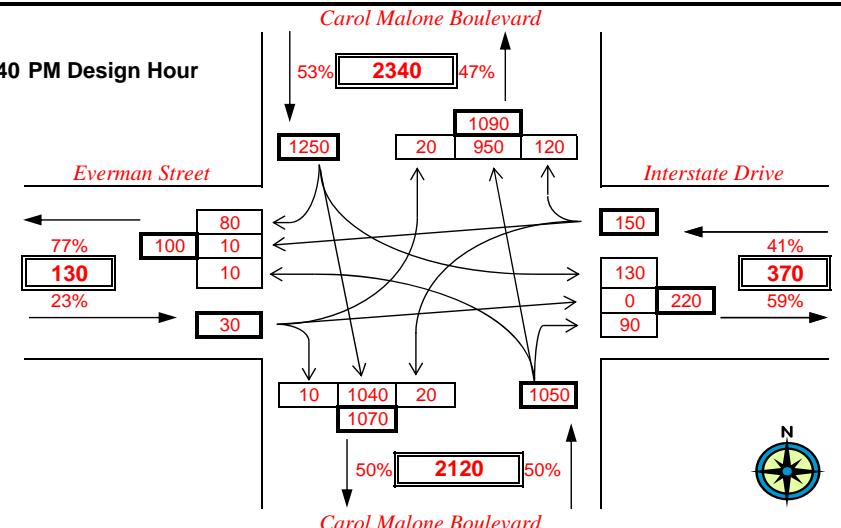
**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



### 2040 AM Design Hour



### 2040 PM Design Hour



## TM 6

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

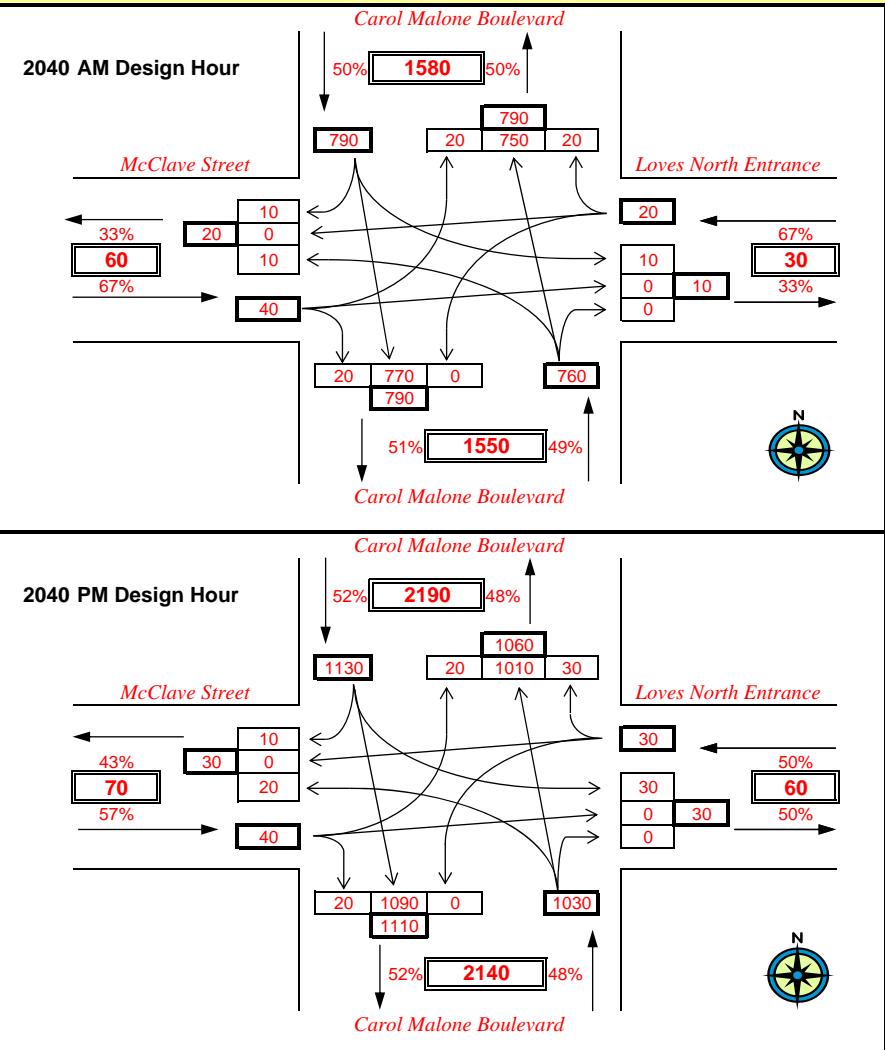
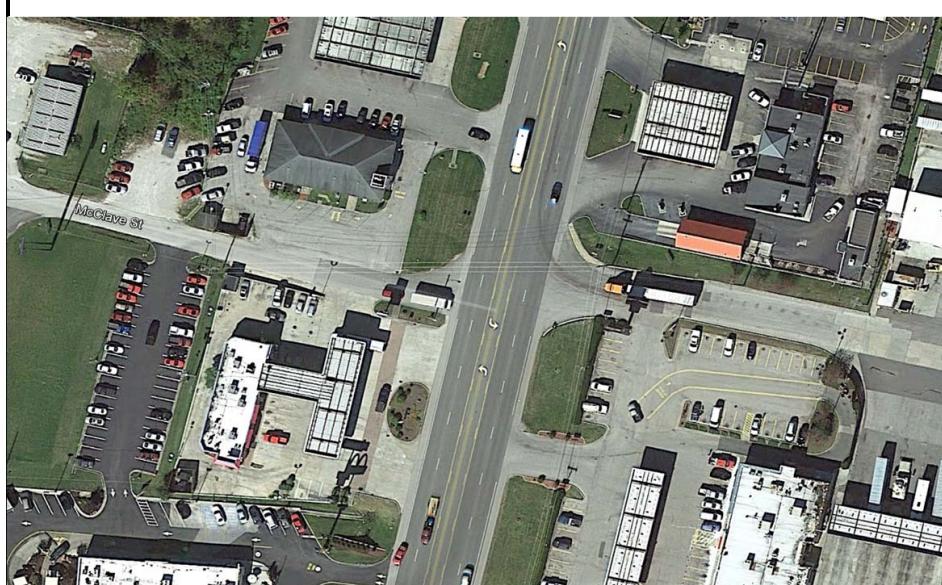
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and McClave Street/Loves North Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



## TM 7

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

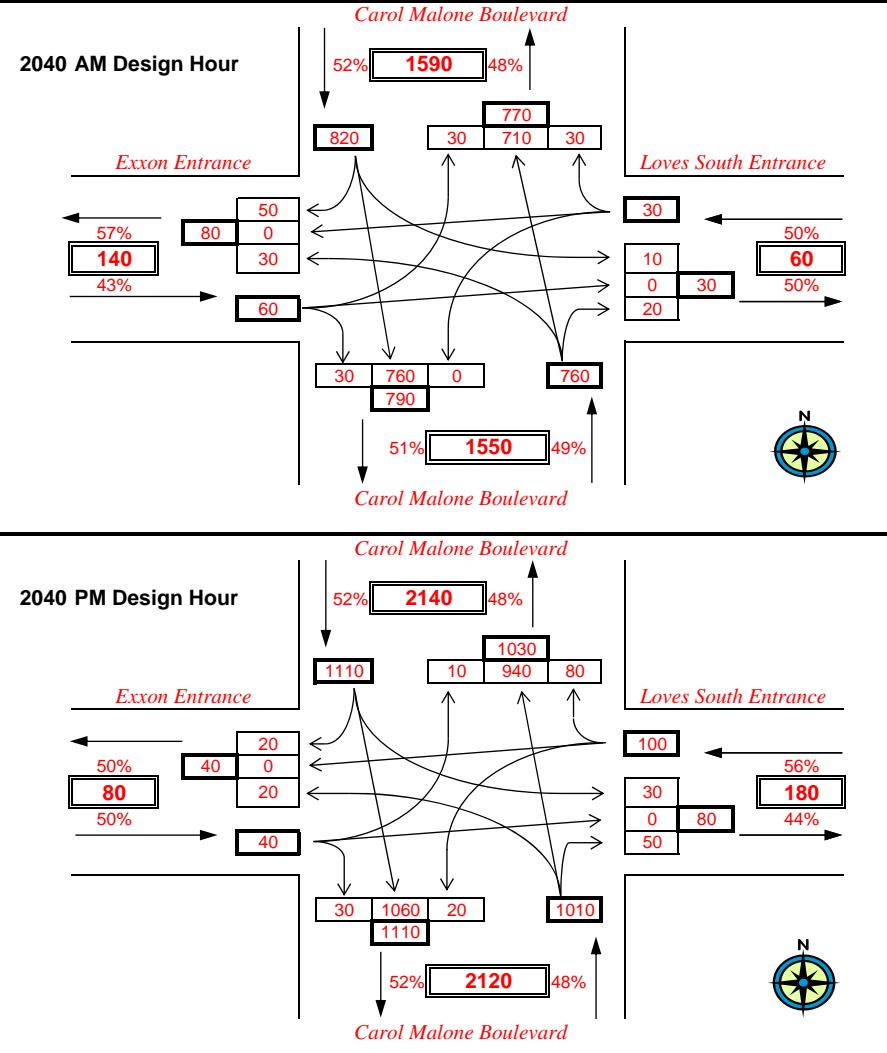
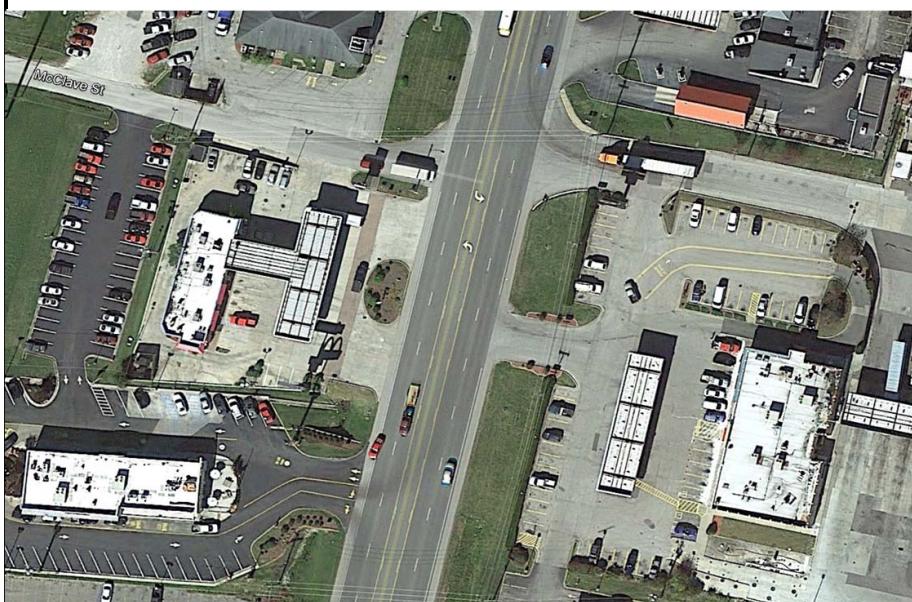
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and Exxon Entrance/Loves South Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



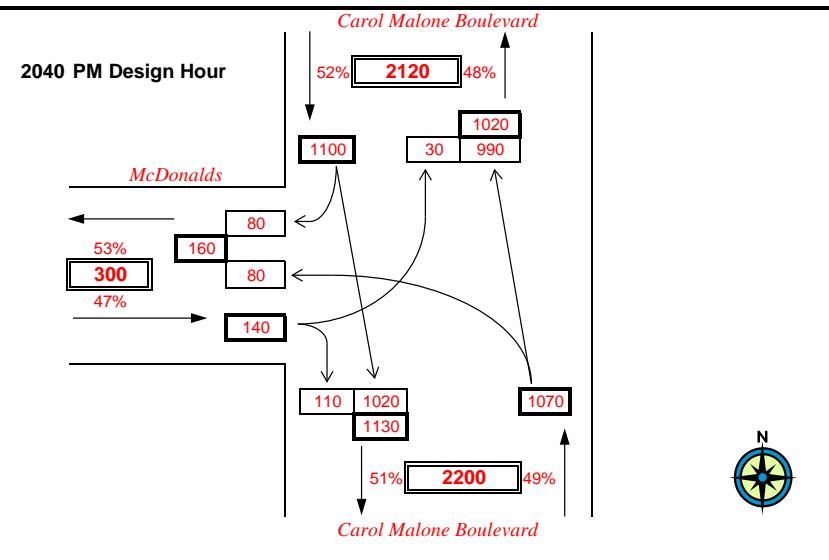
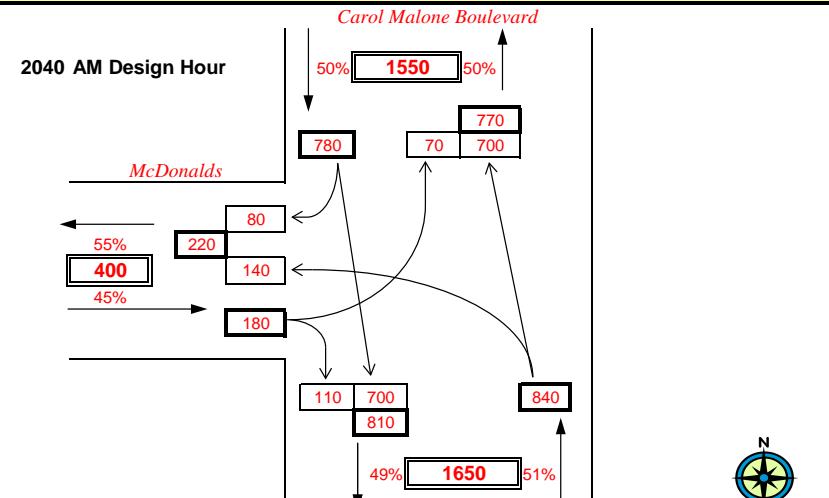
## TM 8

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and McDonalds Entrance

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



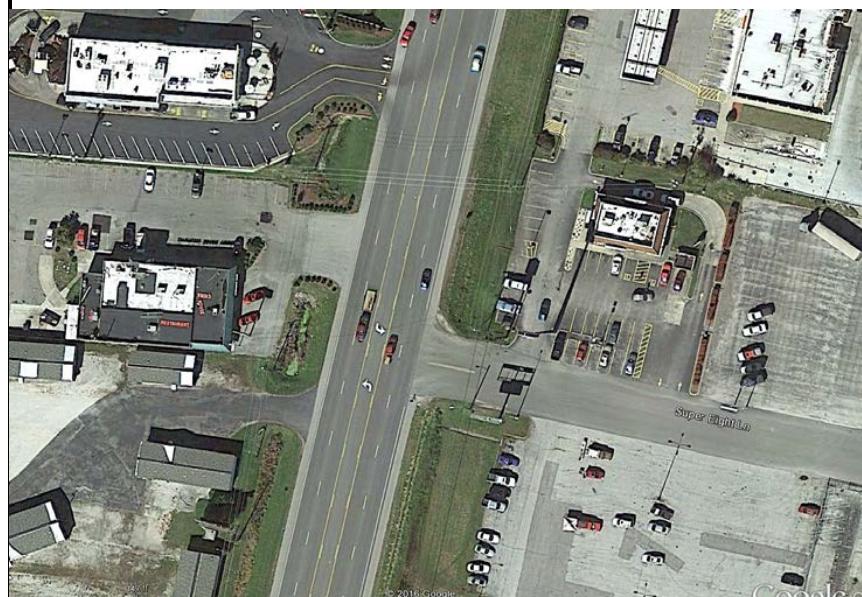
## TM 9

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and Super 8 Lane

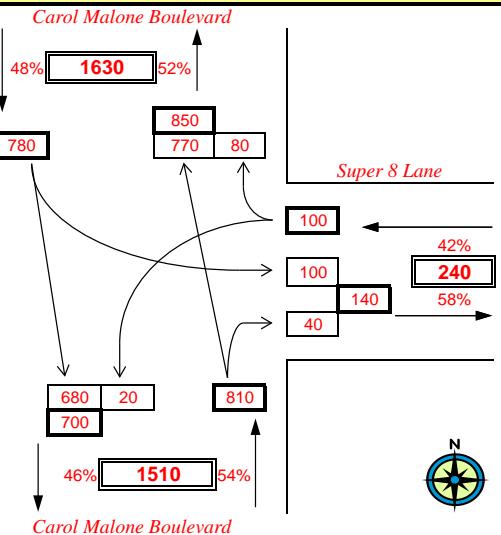
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

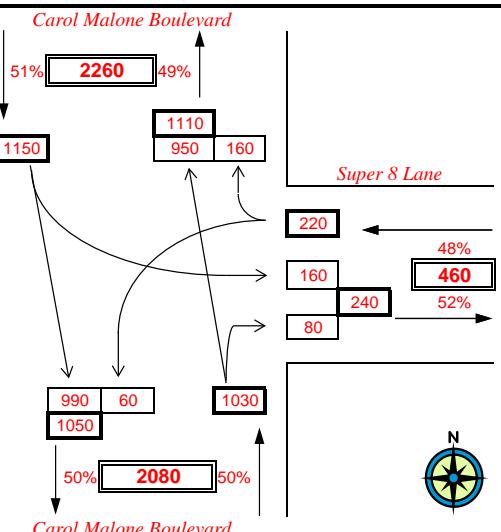
**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



2040 AM Design Hour



2040 PM Design Hour



## TM 10

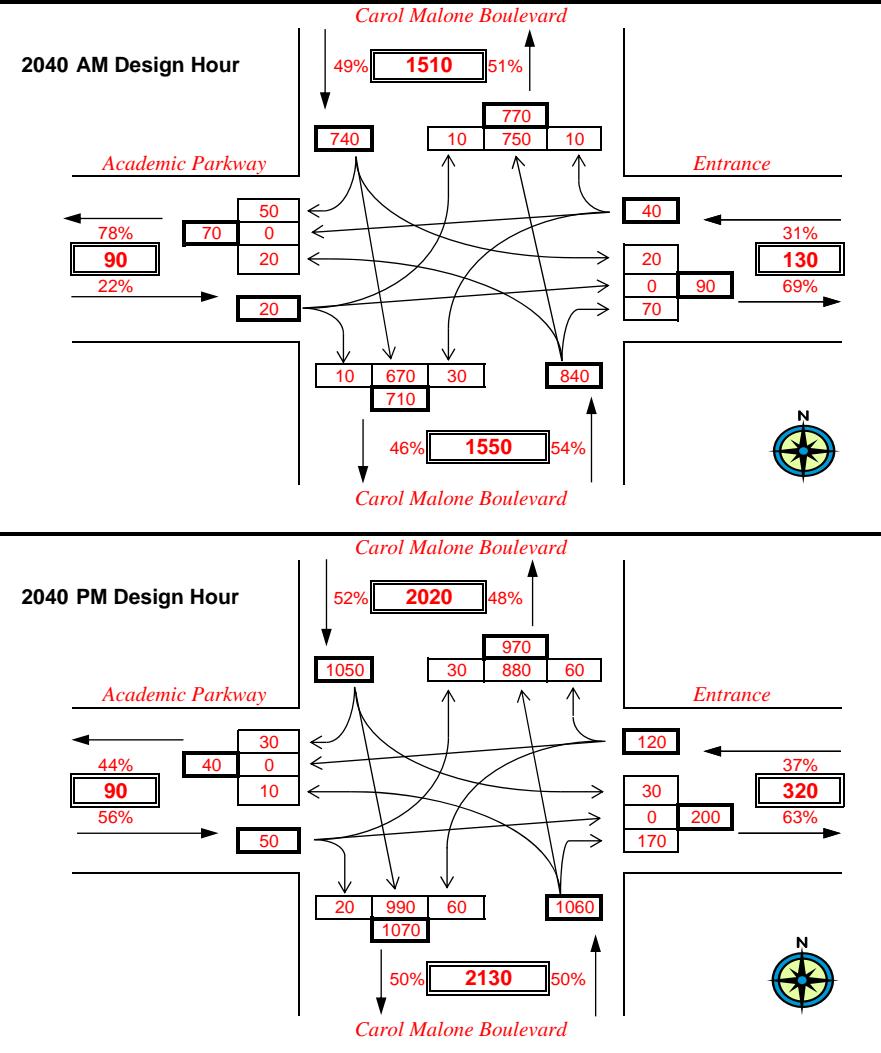
PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat

YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Carol Malone Boulevard (KY 1) and Academic Parkway

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



# TM 11

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

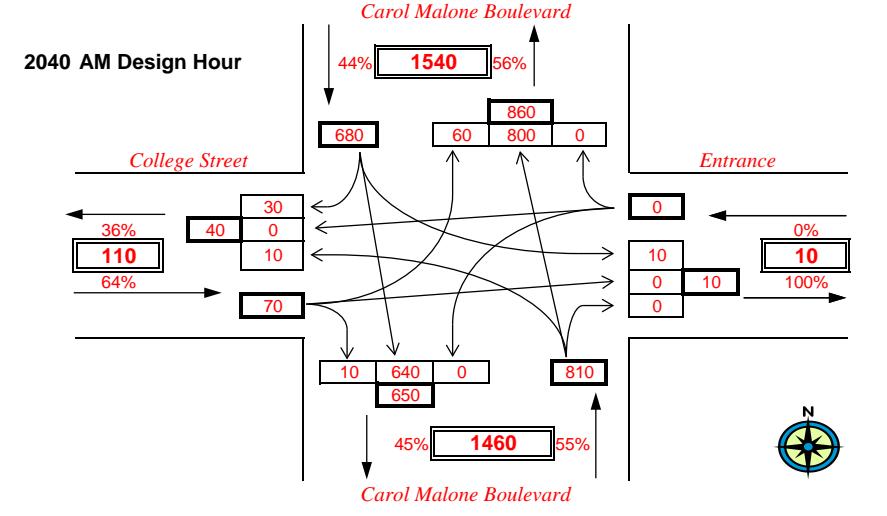
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) and College Street

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



## TM 12

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

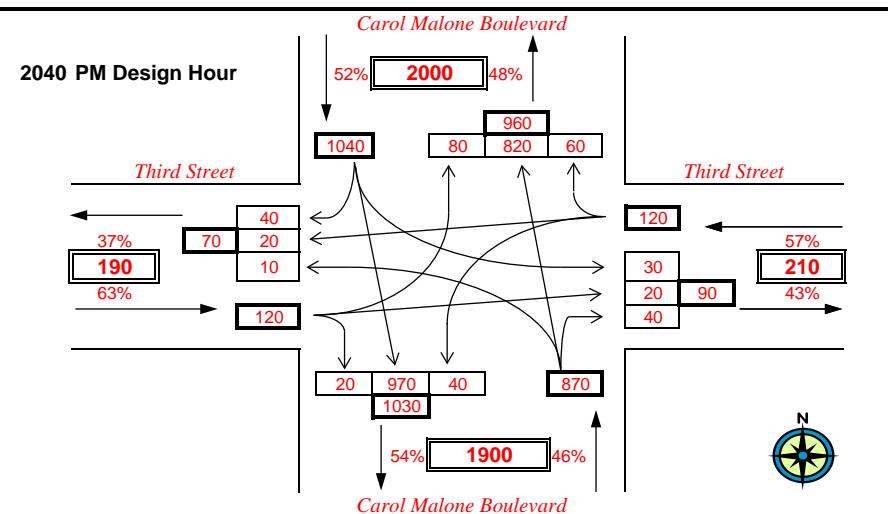
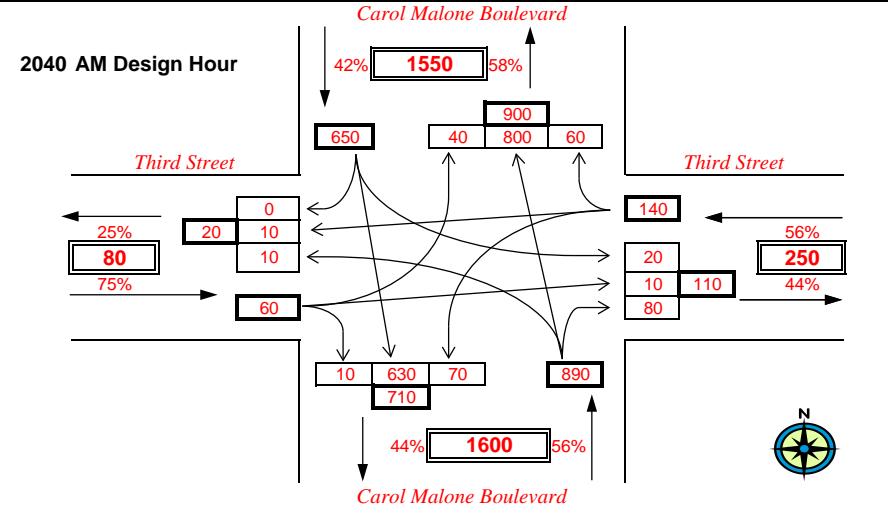
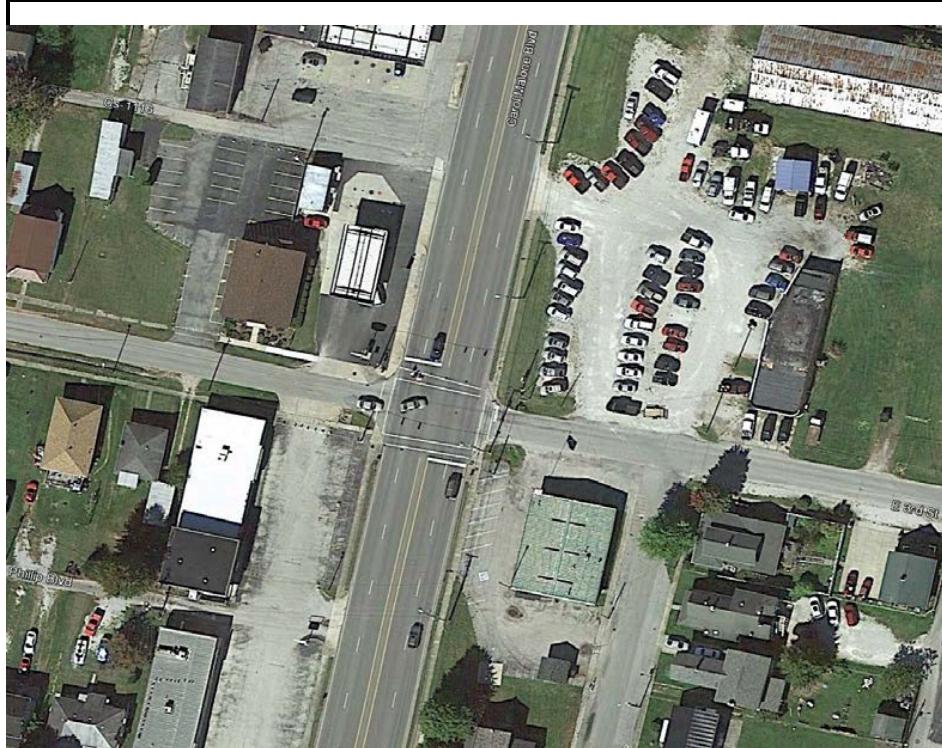
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1) & Third Street

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

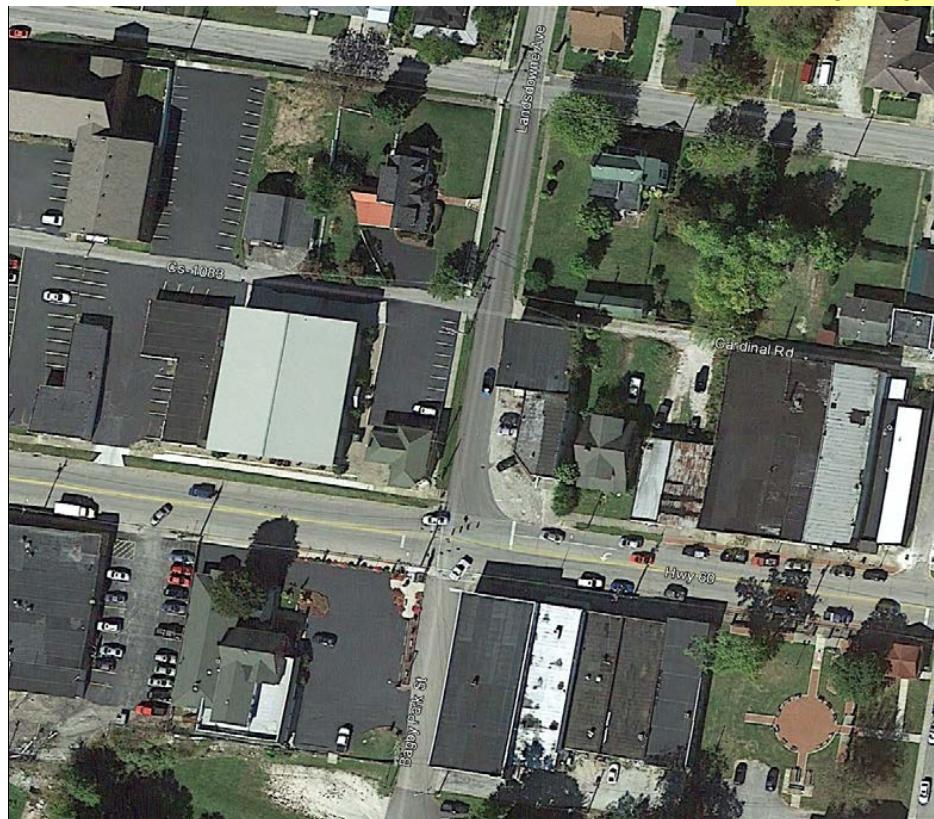


## TM 13

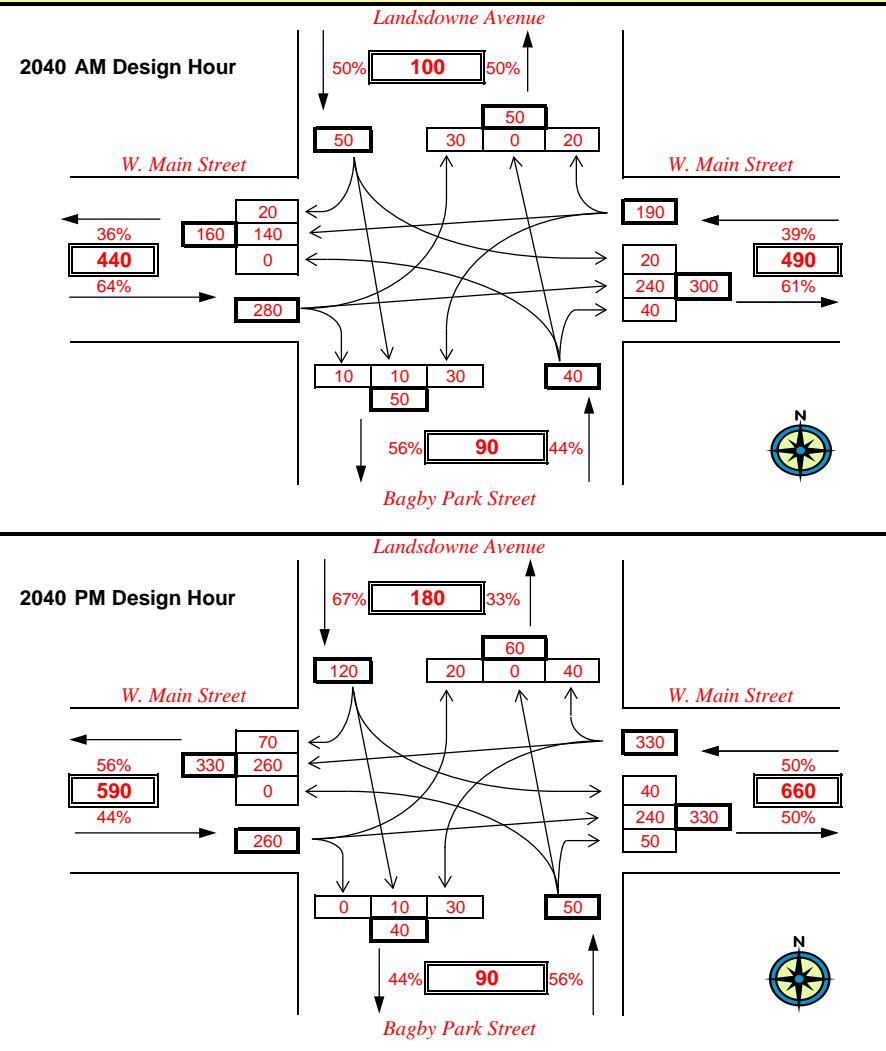
PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Main Street (US 60) and Lansdowne Ave

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)



\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS



## TM 14

PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 REQUEST DATE: 0  
 ANALYST: Jeremy Lukat  
 YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Main Street (US 60) and Hord Street

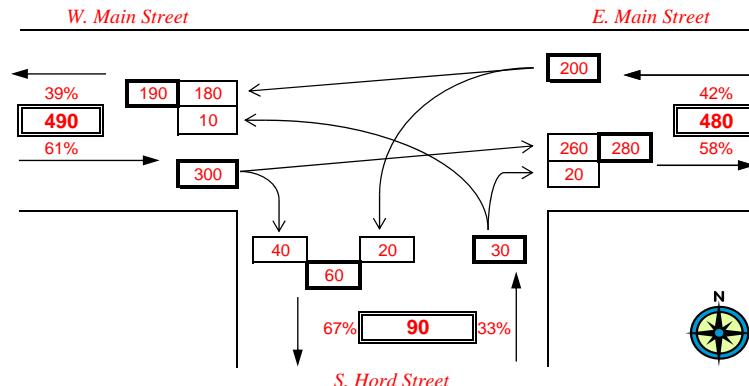
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

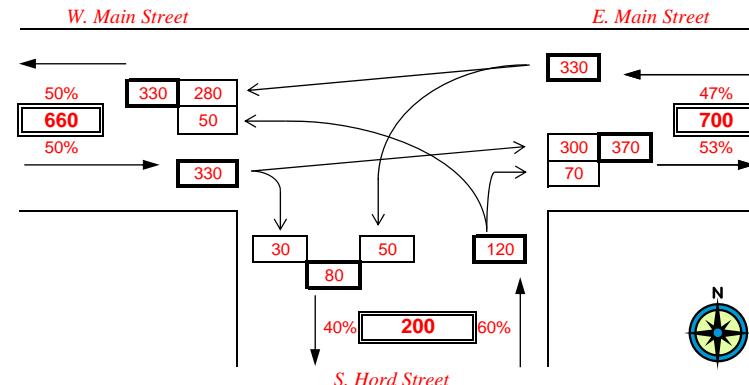


\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS

### 2040 AM Design Hour



### 2040 PM Design Hour



## TM 15

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

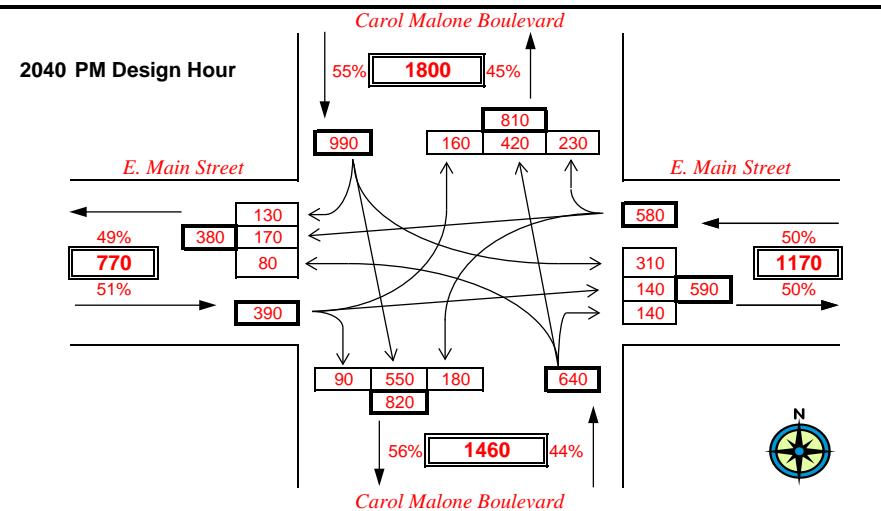
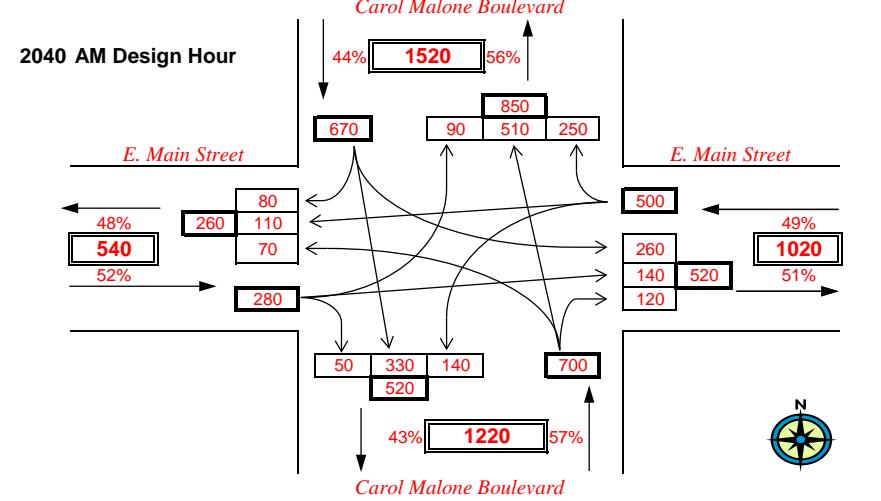
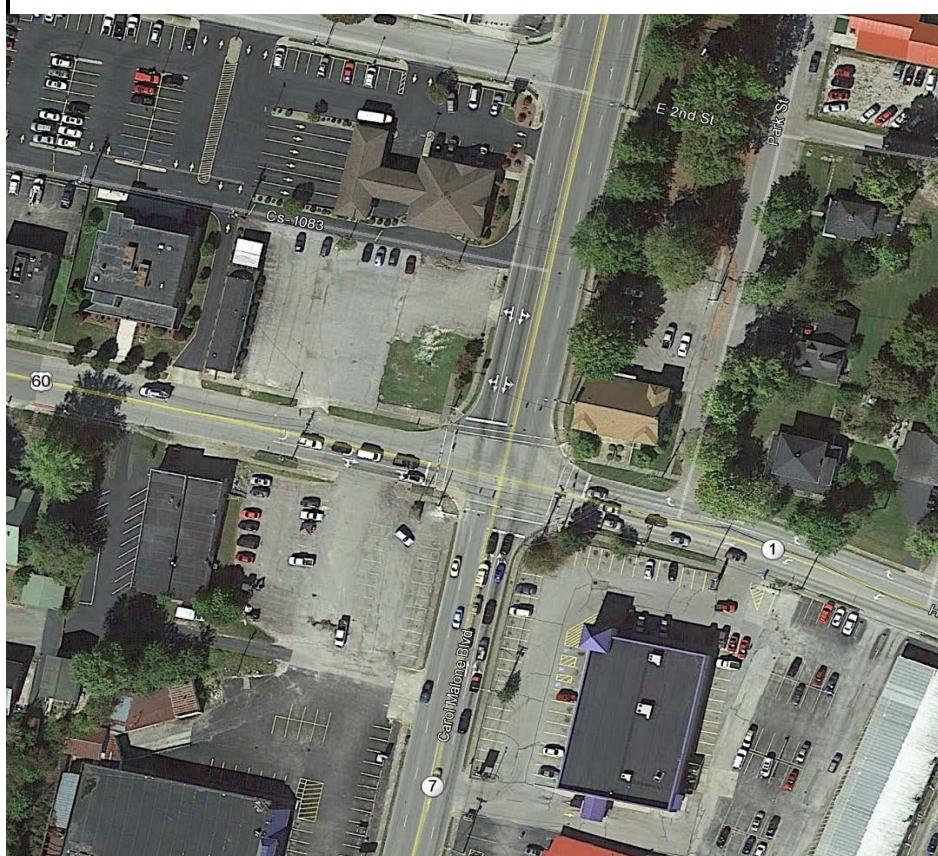
YEAR: 2040 Design Hour Volumes

INTERSECTION: Carol Malone Boulevard (KY 1/KY7) and E. Main Street  
(US 60)

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



## TM 16

PROJECT: Grayson Small Urban Area Study

ITEM NUMBER: 0

MARS NUMBER: 0

REQUEST DATE: 0

ANALYST: Jeremy Lukat

YEAR: 2040 Design Hour Volumes

INTERSECTION: Main Street (US 60) and Robert and Mary Street (KY 3297)

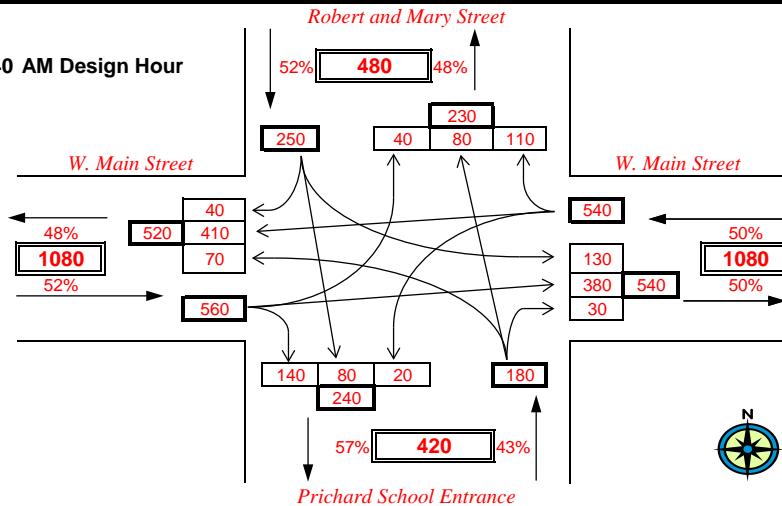
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

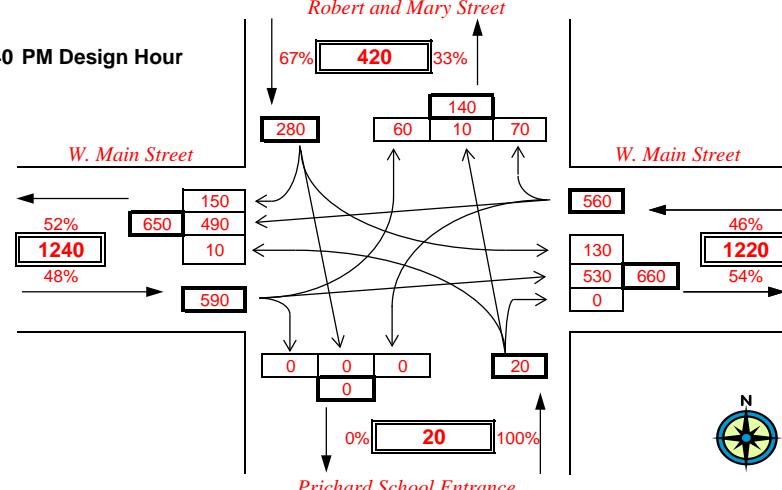


**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2040 AM Design Hour



2040 PM Design Hour



## TM 17

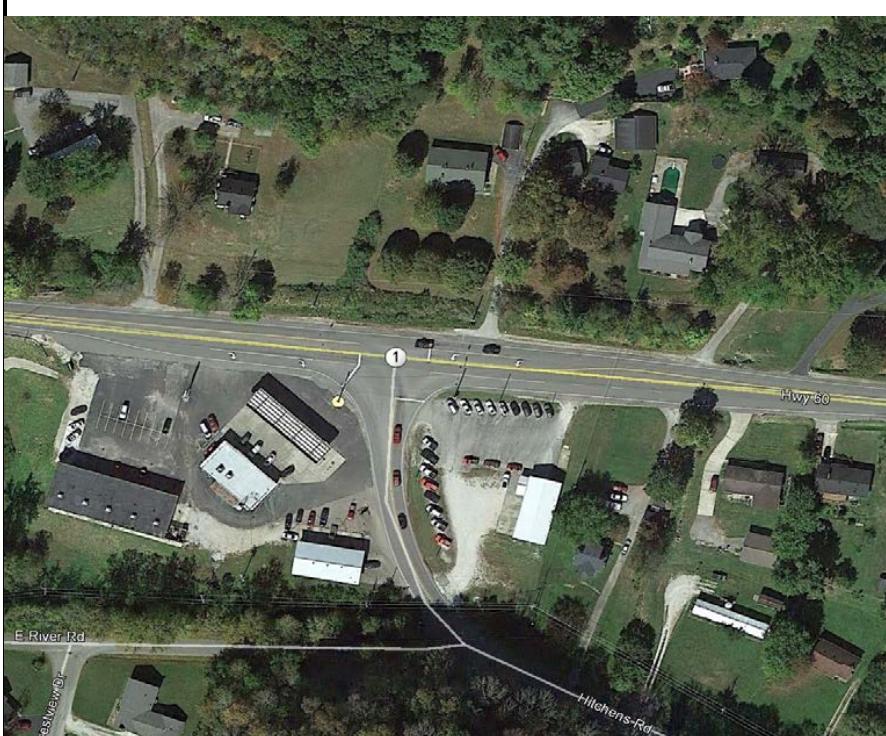
PROJECT: Grayson Small Urban Area Study  
 ITEM NUMBER: 0  
 MARS NUMBER: 0  
 ANALYST: Jeremy Lukat

YEAR: 2040 Design Hour Volumes  
 INTERSECTION: Hitchens Road (KY 1) and E. Main Street (US 60)

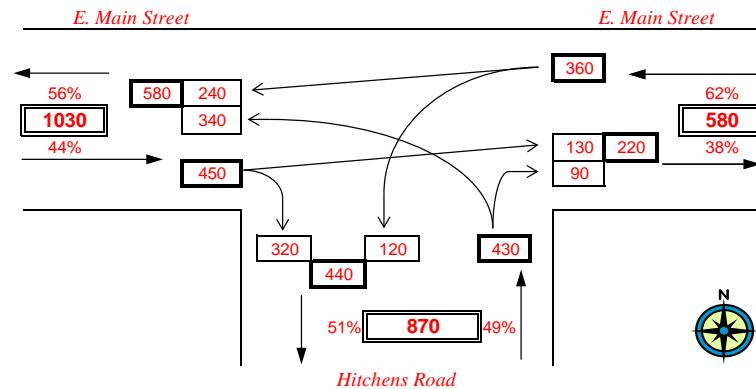
NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

## TURN MOVEMENT (2040)

**\*\*DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**



### 2040 AM Design Hour



### 2040 PM Design Hour

