KY 321 Corridor Study

Johnson County | Item No. 12-80116

Traffic Forecast Report

TEAM KENTUCKY®
TRANSPORTATION CABINET

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FIGURES

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1.0 PROJECT DESCRIPTION

This traffic analysis has been prepared by Qk4 for the Kentucky Transportation Cabinet (KYTC) to analyze existing conditions and proposed future traffic to assess options for improving mobility and accessibility along KY 321. Traffic impacts are evaluated for base year (2023) and future year (2045).

The study area, shown in **Figure 1**, captures the KY 321 corridor across significant portion of Paintsville, which provides access to a regional commercial hub, two schools, a hospital, and downtown Paintsville. This study accounts for a new Johnson County High School campus and connection (Item 12-80250), which is proposed to be in operation for the 2026-2027 school year.

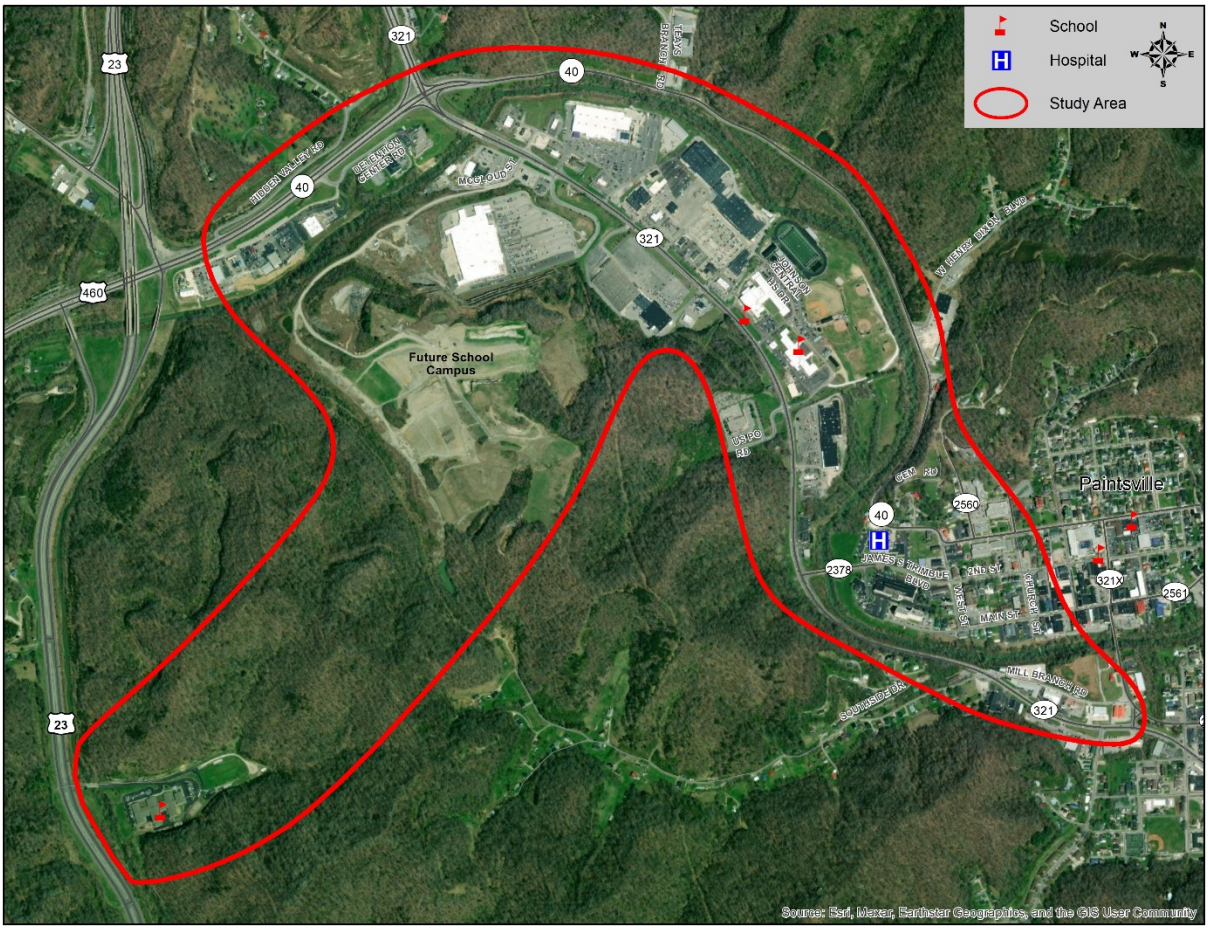

Figure 1: Study Area

2.0 TRAFFIC DATA COLLECTION

Historic traffic count data between 2002 and 2022 were retrieved from the KYTC traffic counts database for 11 locations. Three counts from 2020, identified with atypical volume data due to pandemic impacts, were excluded from this analysis. A list of stations and their most recent count are provided in **Table 1**.

Table 1: Study Area Count Stations

Station	Route	Location	Year	AADT	K	D	T%
058501	KY 40	North of US 460	2018	7801	9.3	77	8.5
058259	3RD ST	South of Highland Elementary	2022	11278	9.4	52	6.7
058A80	3RD ST	By Hoss Mill Branch	2017[1]	5982	10.2	56	-
058A82	KY 321	North of James S Trimble Blvd	2021	12825	8.7	52	9.4
058A35	KY 321	South of James S Trimble Blvd	2017[1]	13520	10.6	56	-
058A47	KY 321	Eleventh Street	2022	6654	8.9	56	-
058250	KY 321	Between US 23 & KY 40	2022	6014	9.2	57	-
058285	KY 321	North of KY 40	2022	5797	10.3	51	8.2
058529	US 23	South of Highland Elementary	2017[1]	11277	9.7	59	-
058304	US 23	North of US 460	2022	6159	9.6	52	-
058517	US 460	West of US 23	2022	4749	9.5	53	9.4

Additionally, video-based peak period turning movement counts were collected at 15 study area intersections during March 7-22, 2023. Twelve-hour counts were conducted at KY 321 intersections with KY 40 and KY 2378 (James Trimble Boulevard) with five hours of data (7-9 AM and 3-6 PM) at other intersections. These videos were processed to count and classify vehicles into five categories: motorcycles, cars & light good vehicles, buses, single unit trucks, and articulated trucks. Pedestrians and on-street cyclists were also identified when applicable. Unadjusted turning movement counts are provided as a deliverable. The count stations and turning movement locations are mapped in **Figure 2**.

In addition to turning movement counts, analysts collected field data on peak period travel speeds and queue lengths, discussed further in **Section 5.1**.

Count station data for a representative set of stations in the study area are plotted in **Figure 3**. Overall, historical trendlines for these stations are flat or declining, with an average annual rate of -1.0%.

[1] Indicates available 2020 count that was omitted from historical analysis

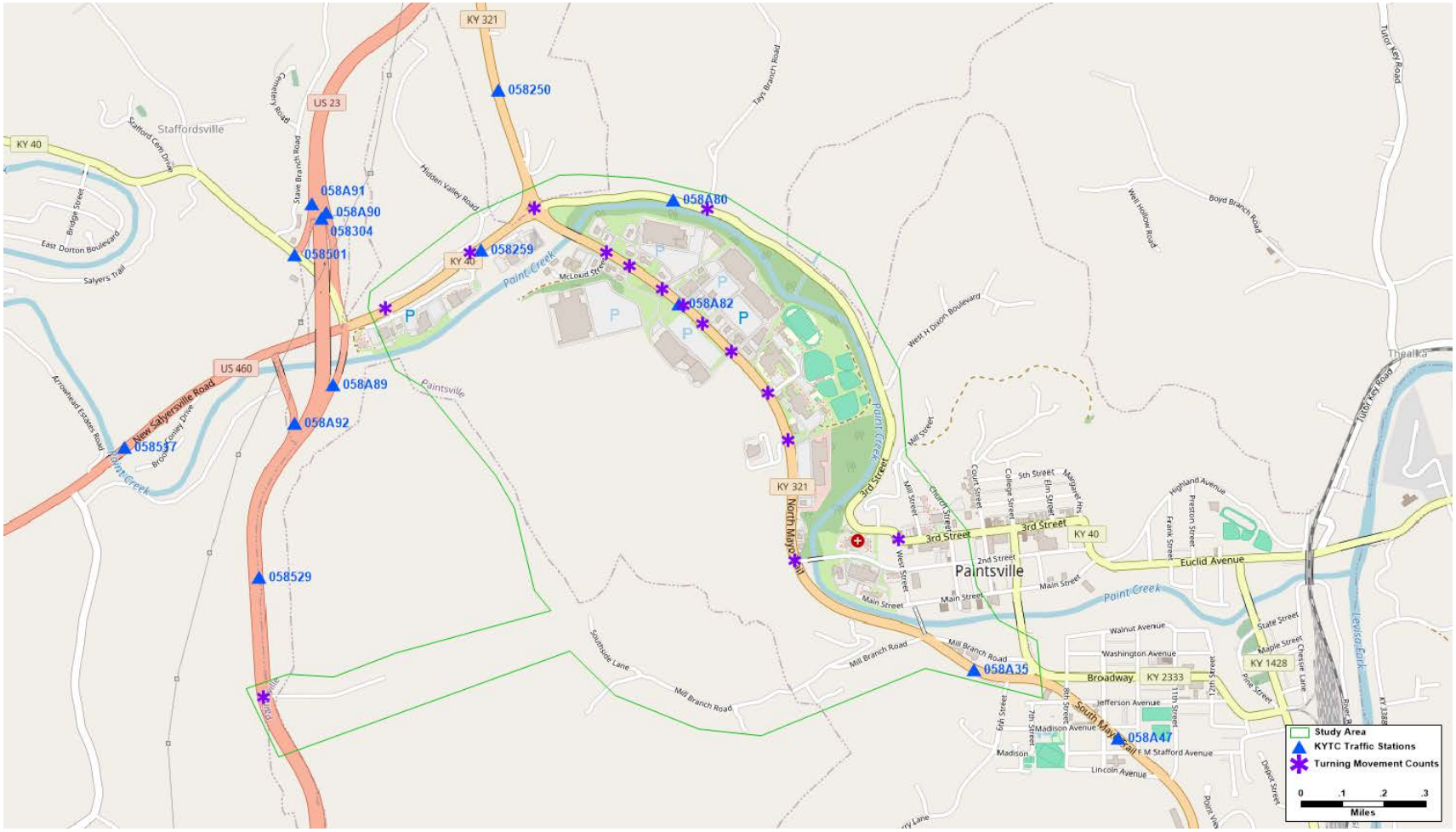

Figure 2: Study Area Traffic Count Station Locations

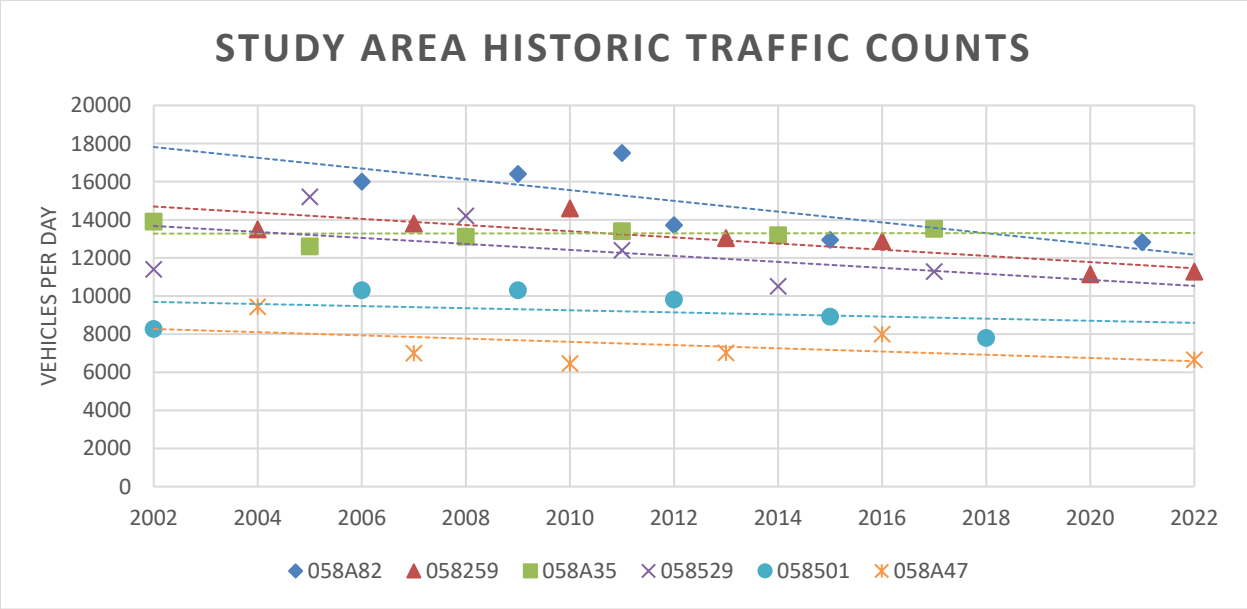

Figure 3: Average Daily Traffic Counts and Trendlines (2002 - 2022)

3.0 SOCIOECONOMIC DATA

Population data for Johnson County were obtained from decennial Census data and the August 2022 release of the Kentucky State Data Center (KSDC) projections. Shown in **Table 2**, the KSDC data projects declining population through 2045. Employment and household estimates, provided in **Table 3**, were obtained from Kentucky Statewide Travel Demand Model (KYSTMv19, 6008 zones). KSDC estimates an annual decline in population of -0.7% countywide, while the KYSTM, with final adjustments described in **Section 3.1**, estimates an annual decline households of -0.11% and an annual employment growth of 0.43% through 2045.

Table 2: Population Projections - Johnson County

Johnson County Population	2010	2020	2025	2030	2035	2040	2045
Census	23,356	22,680					
KSDC Projections (Aug 2022)			21,992	21,193	20,319	19,470	18,628

Table 3: KYSTM Socioeconomic Data Projections

KYSTM Johnson County Projections			
	2021	**2045**	**Annual Rate**
Households	9,238	8,701	-0.24%
Employment	5,454	6,017	0.43%

3.1 2045 MODEL FORECAST

To project future year traffic forecasts, the Kentucky Statewide Travel Demand Model (KYSTMv19, 6008 zones) was utilized to support this study. A model year of 2021 served to represent the existing scenario with a future year forecast for 2045. The KSYTM runs in TransCAD 7.0 and is a 24-hour model providing daily volume projections.

With support from KYTC, traffic analysis zone (TAZ) boundaries were modified and updated to provide more granularity and updated socioeconomic data. As shown in **Figure 4**, three TAZs were split along geographical boundaries, primarily following roadways and waterways, into 5 new TAZs. This process updated the KYSTM from 6003 zones to 6008 zones, facilitated by procedures built into the KYSTM.

In March 2023, KYTC Modal Team provided updated socioeconomic data and enrollment estimates for this updated TAZ structure. The data was reviewed and the model was validated against a 2018 model year. The root mean square error (RMSE) for Johnson County improved from 58.38% to 54.58%, while the overall statewide model RMSE increased from 55.69% to 57.55% against all count stations in the KYSTM.

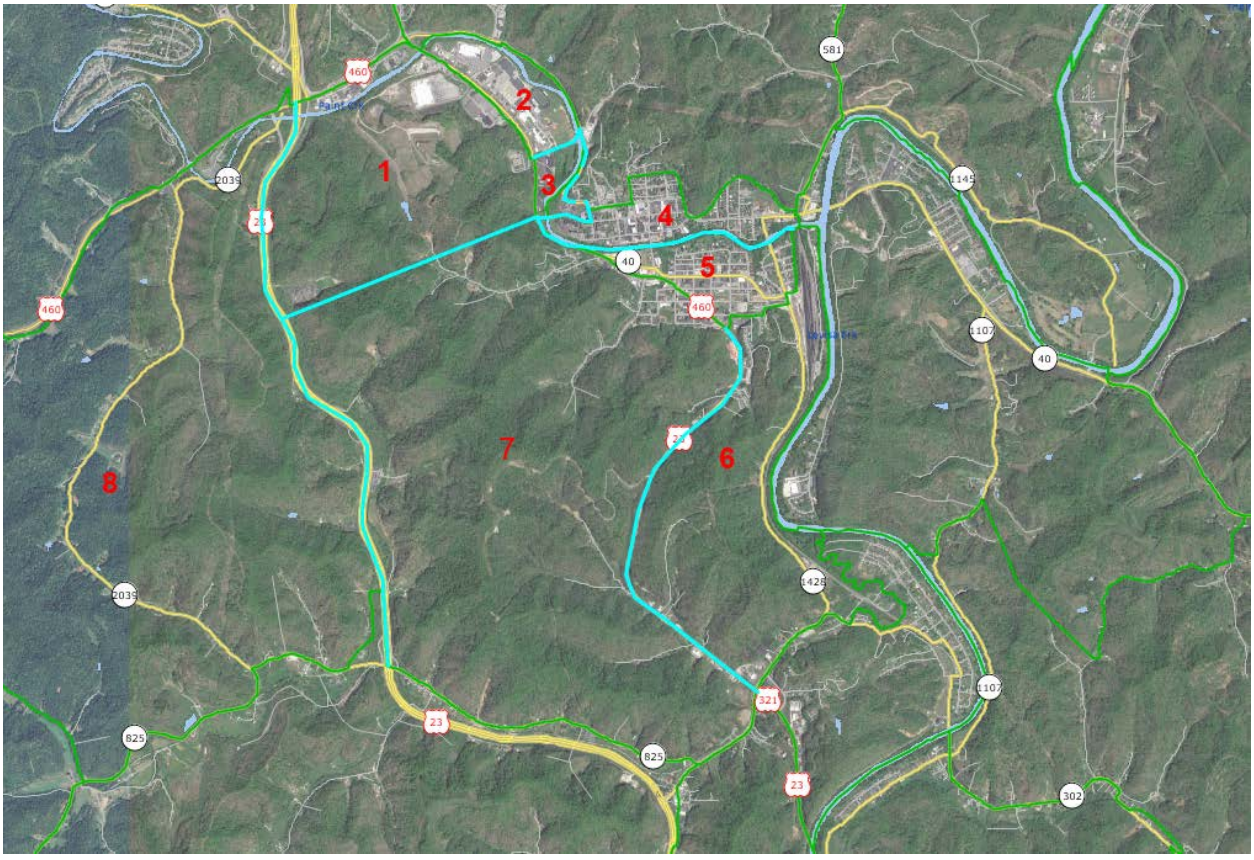

Figure 4: Modified TAZ Boundaries in the KYSTM

As a result of conversations with local officials and stakeholders, several adjustments to the KYSTM socioeconomic assumptions were implemented in producing a 2045 No-Build scenario to better reflect expected growth in the region.

- School enrollment was shifted from the existing Johnson County High School to the new campus location, located west of Walmart with access from KY 40 near Tractor Supply. A traffic impact study was completed in January 2020, conservatively assuming 1,200 students at the new campus. While plans for the former school facility are undetermined, existing peak period volumes were assumed to continue accessing the site to reflect future reuse.
- Employment estimates around the Mayo Plaza were increased to reflect ongoing economic development as new retail establishments move in.
- Household and employment rates were increased in areas along US 23 north and south of town where sewer expansions are proposed.
- Added employment to reflect a new Kings Daughters clinic, under construction at the former Kmart. Plans call for a 26,000 SF medical facility at this location.

Figure 5 and **Figure 6** summarize the final distribution and 2045 forecast of households and employment for the study vicinity TAZs.

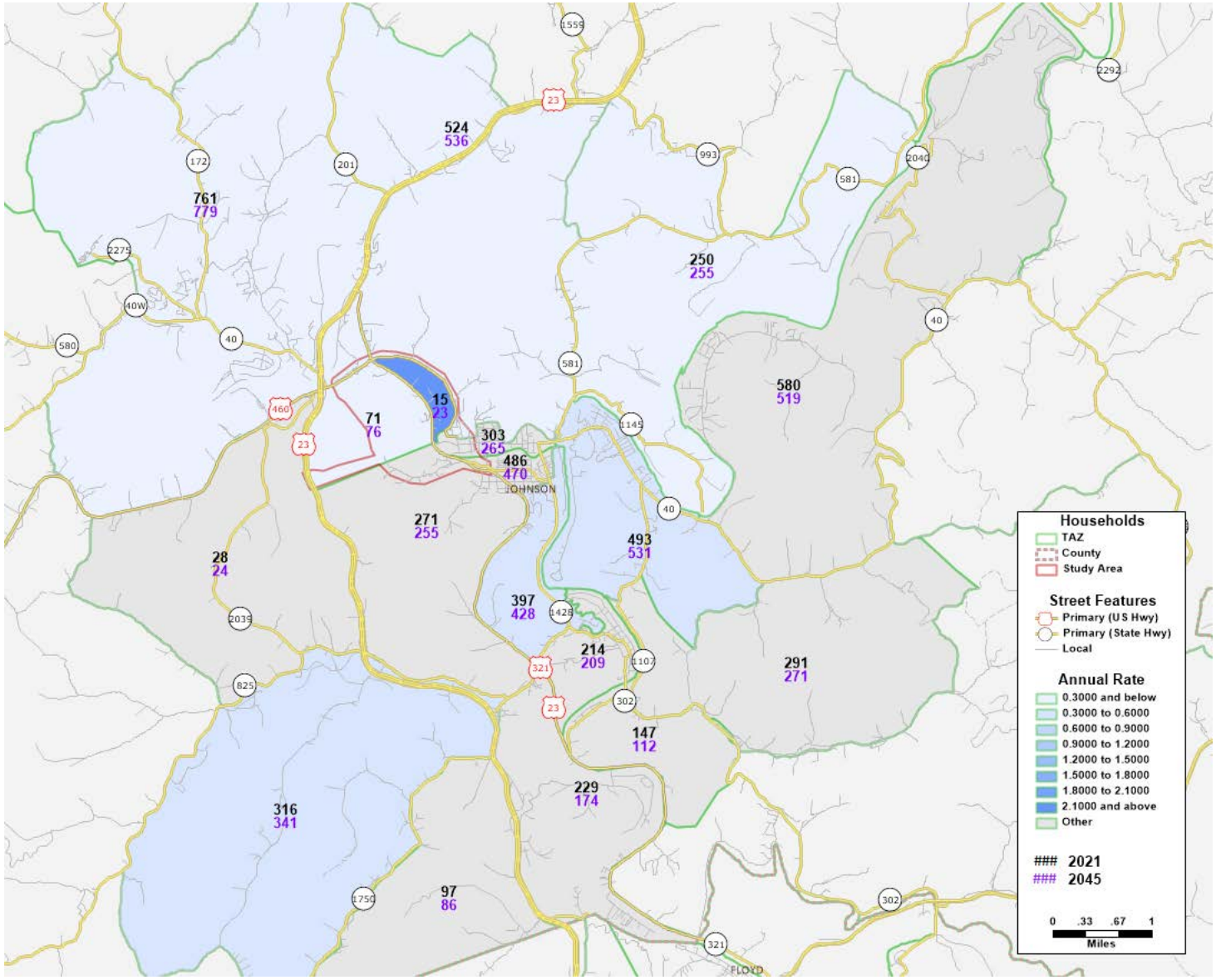

Figure 5: KYSTM (6008 TAZ) Household Projections, 2021 to 2045

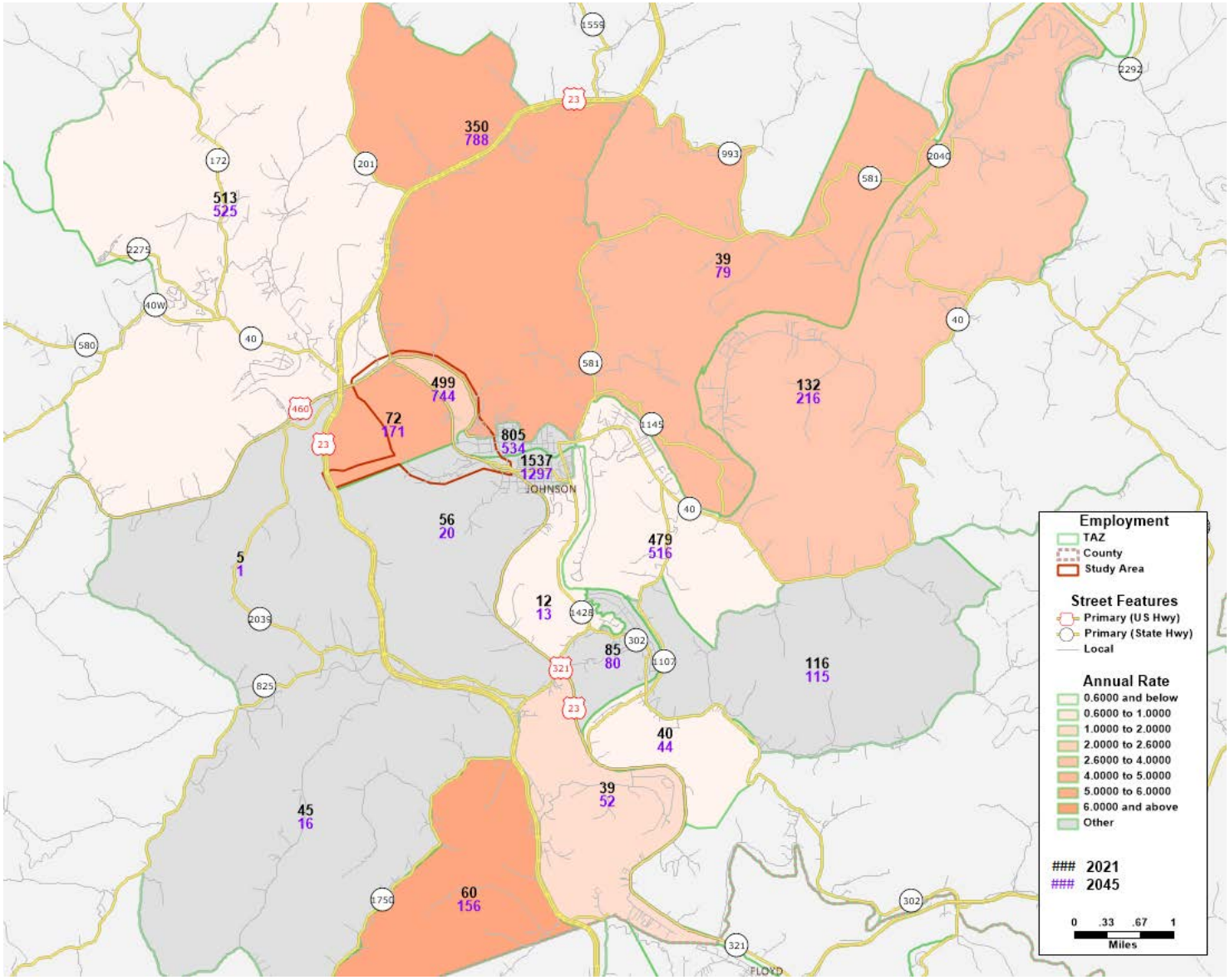

Figure 6: KYSTM (6008 TAZ) Employment Projections, 2021 to 2045

4.0 GROWTH RATE

Model outputs from the KYSTM were assessed to estimate a regional growth rate. Accounting for socioeconomic adjustments above, modeled vehicle volumes for Johnson County show an average annual growth of 0.78% through the year 2045.

From discussions with local officials, anticipated development, and analysis of the KYSTM, an annual growth rate of 1.0% for the study area was selected. This growth rate was applied to projected turning movement counts and 2045 microsimulation scenarios.

Peak hour turning movement forecasts for 2023 and 2045 scenarios are available in **Appendix A** and **Appendix B**, respectively. **Figure 7** summarizes daily volume forecasts in the study area: up to 15,100 vehicles per day (vpd) along KY 321 in 2023 compared to 18,800 vpd in 2045.

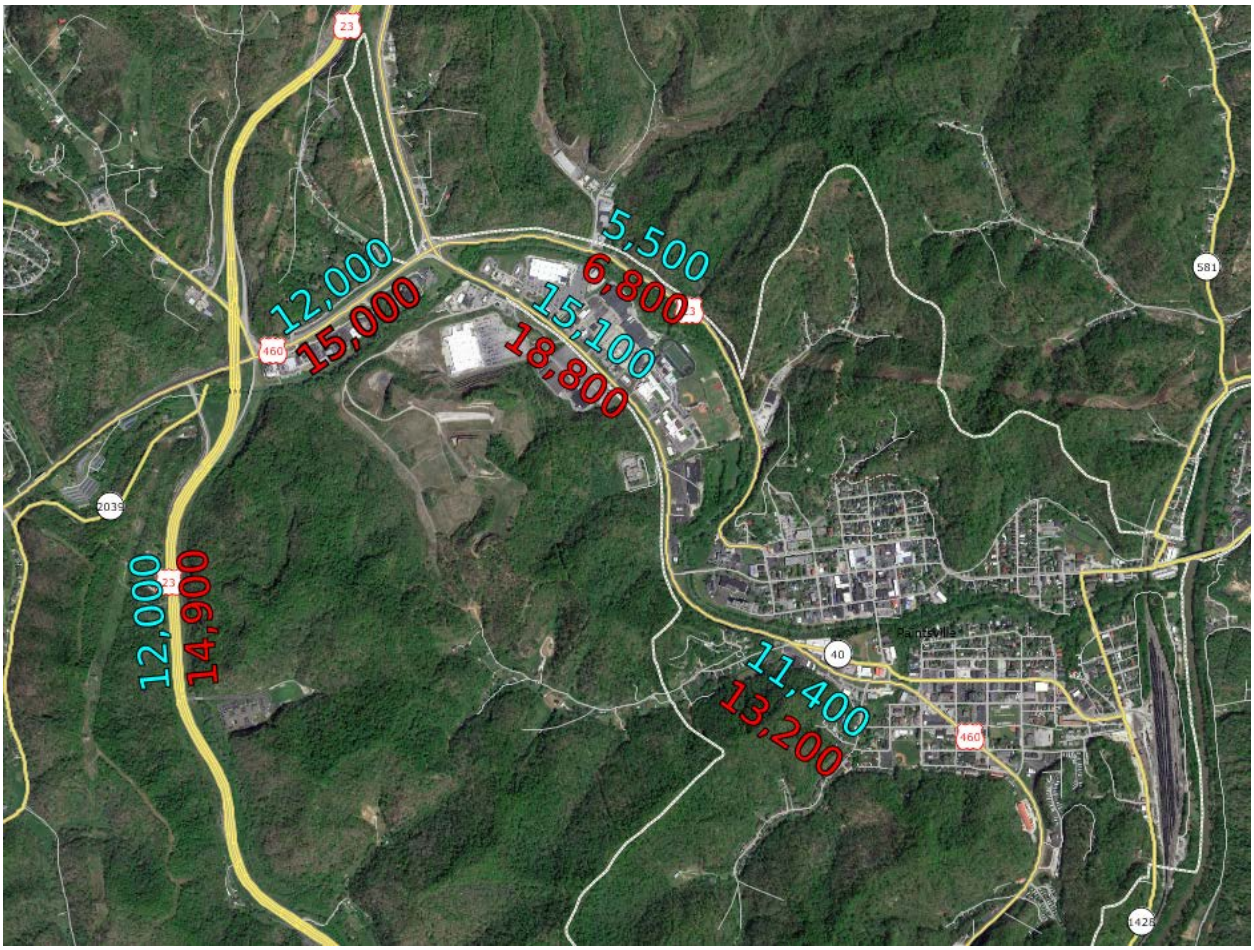

Figure 7: 2023 Existing (blue) & 2045 No-Build (red) Volume Summary

5.0 MICROSIMULATION MODEL

Microsimulation models using the Vissim software package[2] were developed to measure AM and PM peak hour operations for each scenario. The AM peak hour simulated operations from 7:30-8:30 AM; the PM peak hour simulated operations from 3:15-4:15 PM. The Existing scenario was calibrated using data collected specifically capturing the existing conditions for this project to ensure models replicate existing performance. The starting model parameters utilized the available KYTC Vissim Seed File (June 2022), which follows the *KYTC Microsimulation Guidelines* (November 2021). From these defaults, parameters were calibrated to reflect the data collected and driver behavior specific to this region. The default parameters for heavy vehicle fleet assumption of 2% was used, which aligns with classification counts collected for this study.

5.1 VISSIM CALIBRATION

AM and PM Vissim models were built to evaluate traffic operations under the Existing 2023 and Future 2045 scenarios. Lane configurations and traffic control types were coded to match existing infrastructure. To ensure accuracy of these models, AM and PM Existing models were calibrated by link movement volumes, observed queue lengths, and travel speeds.

Using collected travel time data along the KY 40 and KY 321 corridors, simulation speeds profiles assumed *35 mph arterial rural* (KY 321) and *40 mph arterial rural* (KY 40) to best represent observed operations. Peak period travel speeds collected along KY 321 are presented in **Figure 8**. Summarized in **Table 4**, this resulted in slightly faster simulated speeds than observed for all cases except KY 40 in the AM peak hour.

[2] PTV Vissim 2022 – SP 11 [256686]

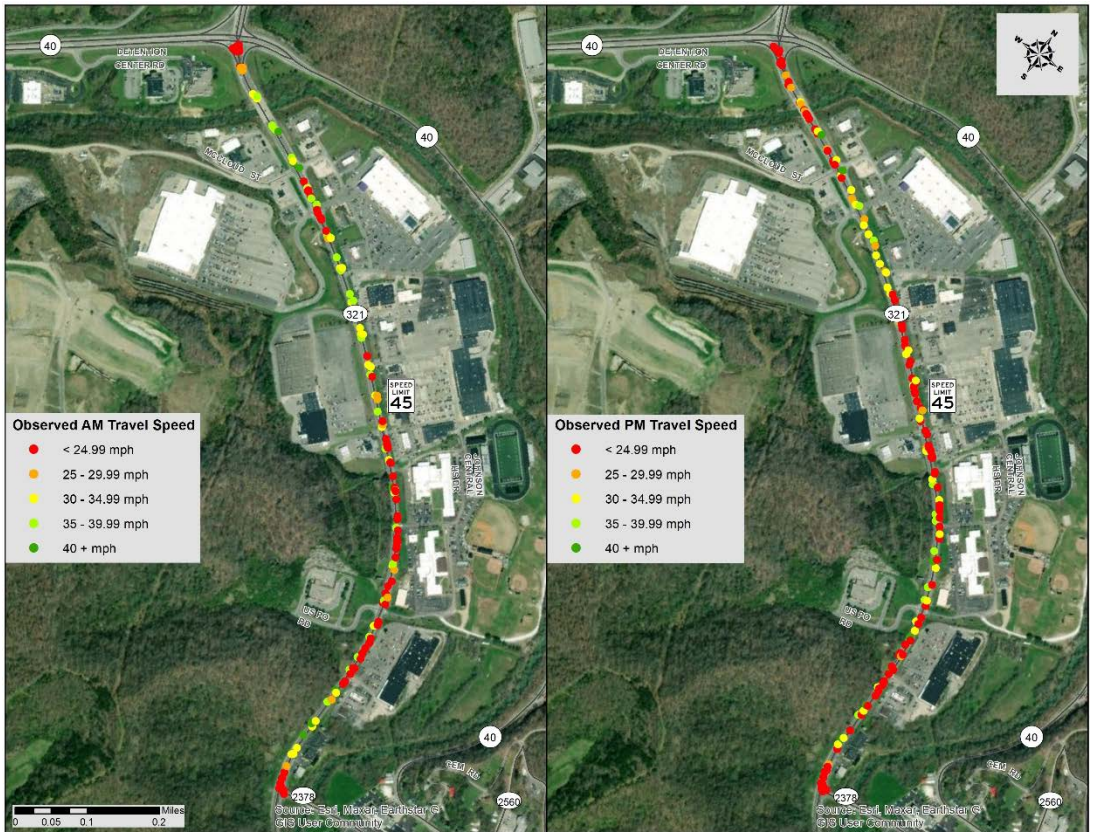

Figure 8: Collected Travel Speed Data on KY 321 Corridor

Table 4: Calibration Metrics along Study Corridors

Corridor	Observed			Simulated		
	Time (min)	Distance (mi)	Speed (mph)	Time (min)	Distance (mi)	Speed (mph)
AM Peak						
KY 40	0.83	0.53	**38.2**	0.84	.052	**37.2**
KY 321	3.35	1.12	**20.0**	2.76	1.12	**24.3**
PM Peak						
KY 40	0.87	0.53	**36.3**	0.82	0.52	**38.0**
KY 321	3.94	1.12	**17.1**	3.06	1.12	**21.9**

Queue lengths and turning movement counts were calibrated for two key study intersections: KY 321/KY 40 and KY 321/Walmart Way. Queue lengths were estimated from drone video footage and were assessed qualitatively against simulation queues for key intersection movements. Turning movement counts were also evaluated against the simulation model.

Figure 9: Imagery from Drone Footage taken March 16, 2023

Table 5: Approach Volumes and Queue Lengths - KY 321 and KY 40

Approach	Volumes		Queue Length (ft)	
	Observed	Simulated	Observed[3]	Simulated
AM Peak				
Northbound	440	420	240	208.0
Eastbound	766	737	170	155.0
Southbound	414	412		
Westbound	230	231		
AM Total	**1850**	**1801**		
PM Peak				
Northbound	856	880	300	336.1
Eastbound	523	508	120	85.1
Southbound	228	232		
Westbound	350	351		
PM Total	**1957**	**1971**		

[3] Approximation of queue length from drone footage

Table 6: Approach Volumes and Queue Lengths - KY 321 and Walmart Way

Approach	Volumes		Queue Length (ft)	
	Observed	Simulated	Observed[3]	Simulated
AM Peak				
Northbound	430	387	225	172.6
Eastbound	116	117		
Southbound	854	840	780	795.9
Westbound	66	65		
AM Total	**1466**	**1410**		
PM Peak				
Northbound	697	711	730	694.1
Eastbound	332	347		
Southbound	675	657	650	544.9
Westbound	157	165		
PM Total	**1861**	**1880**		

5.2 EXISTING PERFORMANCE

KY 321 is an urban minor arterial with two to three 12-foot lanes with varying width shoulders. All curves and grades meet current common practice guidelines. The posted speed limit is 45 mph, with observed peak hour travel times between 20-40 mph. There are no dedicated bicycle or pedestrian facilities. Existing daily vehicle volumes in the study area along KY 321 range from 11,000-13,000 with signalized intersections operating at Level of Service (LOS) C or better overall during peak hours but several left turn movements from cross-streets operating at LOS E.

Table 7: Simulated Signalized Intersection LOS and Delay - 2021 Existing Scenario

Intersection	AM LOS	AM Delay (sec)	PM LOS	PM Delay (sec)	LOS E-F Movements
KY 321 & Trimble	A	7.4	A	7.6	WBL
KY 321 & Save A Lot	A	2.0	A	2.3	WBL
KY 321 & US Post Office Rd	B	10.9	B	10.6	EBL
KY 321 & Food City	B	19.0	C	21.8	WBL, WBT
KY 321 & Walmart Way	B	10.1	C	21.5	WBL, WBT, EBL, EBT
KY 321 & US 40	C	26.8	C	31.2	WBL, EBL, SBL, SBT

5.3 NO-BUILD PERFORMANCE

The 2045 No-Build scenario was run in Vissim with optimized signal timing, where appropriate, to enhance network operations. Signal timing optimization was performed in Synchro software and parameters were transferred to Vissim models. Output operational metrics (i.e., queue lengths, LOS, delay) were reviewed for AM and PM peaks. Many of the minor street movements improve from existing conditions with optimized signals. These metrics are provided in **Table 8**. While intersection

delay provides a more comprehensive metric, simulated maximum queues were noted to extend beyond available storage for US Post Office Rd and Walmart Way where upstream cross-streets and driveways are closely spaced.

Table 8: Modeled Optimized Signalized Intersection LOS and Delay – 2045 No-Build Scenario

Intersection	AM LOS	AM Delay (sec)	AM Max Queue (ft)	PM LOS	PM Delay (sec)	PM Max Queue (ft)	LOS E-F Movements
KY 321 & Trimble	A	6.2	304	A	6.9	313	WBL
KY 321 & Save A Lot	A	2.0	269	A	2.1	313	WBL
KY 321 & US Post Office Rd	B	10.7	604[4]	B	7.8	498[4]	
KY 321 & Food City / McDonalds	B	10.5	503	B	13.9	579	
KY 321 & Walmart Way	B	13.9	361[4]	C	23.6	543[4]	WBT
KY 321 & US 40	C	26.0	343	C	26.4	394	EBL

5.4 BUILD SCENARIOS

Several 2045 build concepts were assessed as part of the study, with three modeled in Vissim to simulate network performance.

- Build 1 (**Figure 10**) widens KY 321 to five lanes between KY 40 and US Post Office Road (MP 7.987) and 4 lanes from US Post Office Road to James Trimble Boulevard (MP 7.715). This scenario assumes the KY 321 & McCloud intersection becomes Right-in/Right-out.

- Build 2 (**Figure 11**) connects eastern developments with a frontage road to divert trips off KY 321, consolidating interim access points. For simulation, unsignalized intersections along KY 321 were configured as Right-in/Right-out.

- Build 3 (**Figure 12**) replaces the signals at US 40 and Walmart with a 2-lane roundabout and the signal at Food City / McDonalds with a 1-lane roundabout. This scenario assumes unsignalized intersections along KY 321 between roundabouts become Right-in/Right-out.

[4] Max queue exceeds available storage

Figure 10: Build 1 – KY 321 5 Lane Widening

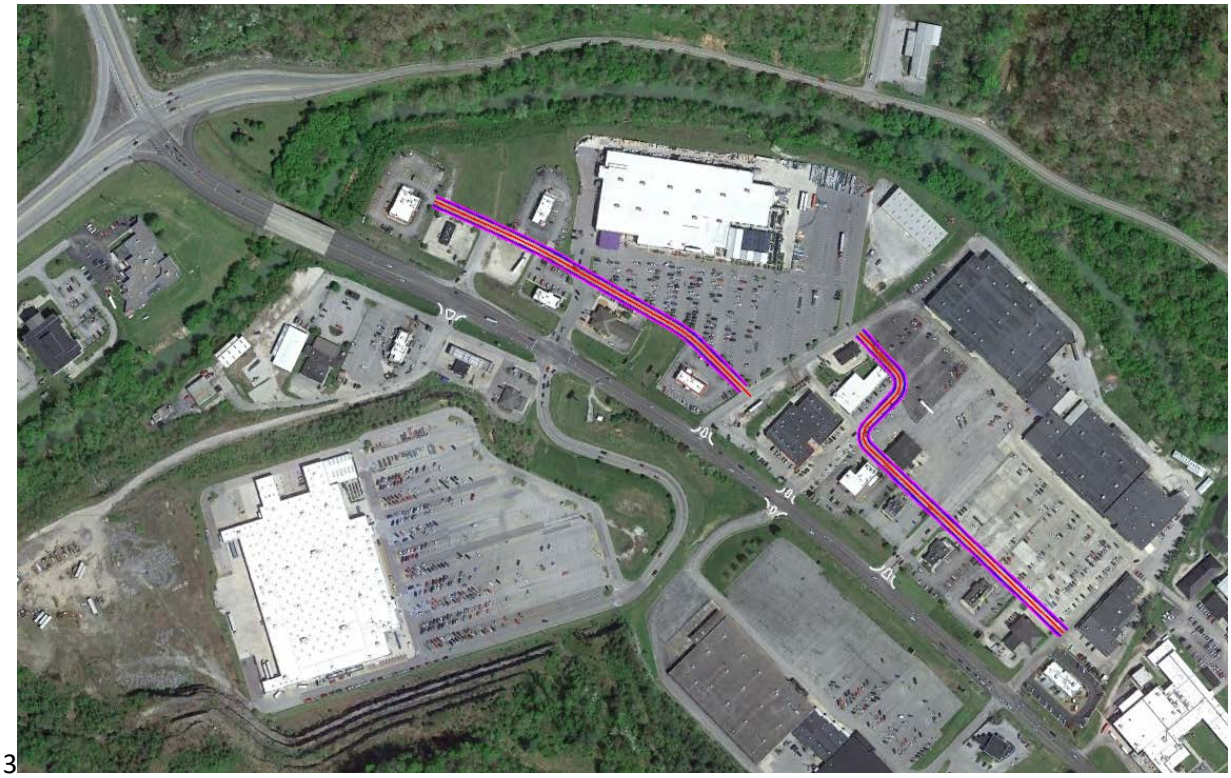

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Figure 11: Build 2 – Frontage Road

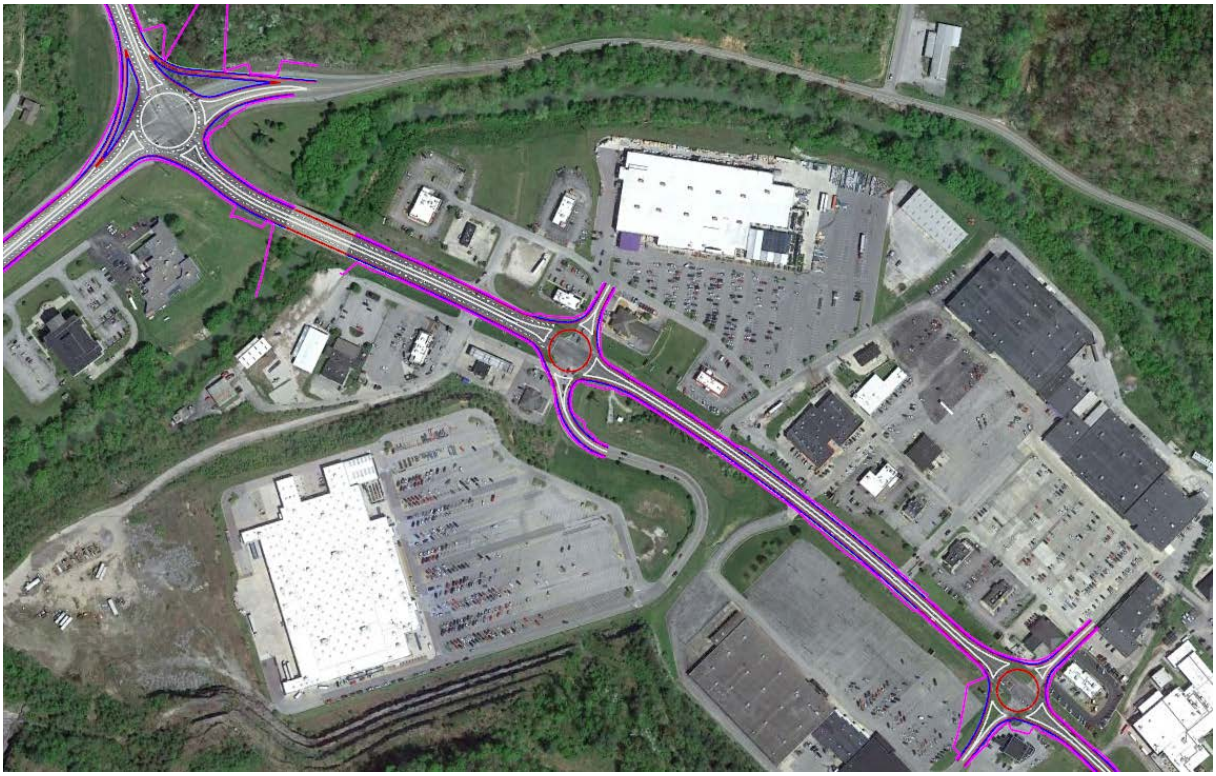


Figure 12: Build 3 - Roundabouts

5.5 BUILD PERFORMANCE

2045 Build scenarios were coded for simulation in Vissim with optimized signal timing parameters transferred from Synchro where applicable. Simulation intersection results, taken as the average of five model runs, are provided in **Table 9** for AM Peak and **Table 10** for PM Peak hours.

For Build 1, the additional capacity provided with additional lanes improves both queues and delay. Three signalized intersections (USPS, Food City, Walmart) improve to LOS A compared to the optimized No-Build.

With Build 2, queues and delays at signalized intersections increase, as right-in/right-out traffic at unsignalized intersections is consolidated. Overall, intersection LOS matches that of the No-Build with increasing delays at KY 40, Walmart, and McDonalds.

In Build 3, roundabouts reduce delay at KY 40, Walmart, and McDonalds. Some increases to queues and delay are observed as a result of right-in/right-out intersections.

Table 9: Vissim Intersection Results for KY 321 Intersections – AM Peak

KY 321 Intersection	AM No-Build			AM Build 1: 5 Lanes			AM Build 2: Frontage Road			AM Build 3: Roundabouts		
	Max Queue	LOS	Delay	Max Queue	LOS	Delay	Max Queue	LOS	Delay	Max Queue	LOS	Delay
KY 321 & Trimble	304	A	6.2	177	A	4.7	408	A	6.4	474	A	7.8
KY 321 & Save-a-Lot	269	A	2.0	97	A	1.1	275	A	2.0	433	A	2.8
KY 321 & USPS	604[5]	B	10.7	222	A	7.8	586[5]	B	10.6	529[5]	B	11.7
KY 321 & Food City / McDonalds	503	B	10.5	199	A	9.6	684	B	14.4	326	A	5.7
KY 321 & Walmart	527[5]	B	13.9	80	A	7.6	538[5]	B	19.5	427[5]	A	10.0
KY 321 & KY 40	343	C	26.0	334	C	26.3	393	C	33.4	511	C	17.5

Table 10: Vissim Intersection Results for KY 321 Intersections – PM Peak

KY 321 Intersection	PM No-Build			PM Build 1: 5 Lanes			PM Build 2: Frontage Road			PM Build 3: Roundabouts		
	Max Queue	LOS	Delay	Max Queue	LOS	Delay	Max Queue	LOS	Delay	Max Queue	LOS	Delay
KY 321 & Trimble	313	A	6.9	217	A	5.8	366	A	6.7	588	A	8.8
KY 321 & Save-a-Lot	313	A	2.1	116	A	1.1	220	A	2.0	376	A	2.6
KY 321 & USPS	498[5]	A	7.8	227	A	6.2	519[5]	A	8.5	569[5]	B	11.1
KY 321 & Food City / McDonalds	579	B	13.9	231	B	11.1	645	B	16.6	427	A	8.3
KY 321 & Walmart	543[5]	C	23.6	353[5]	B	19.1	551[5]	C	29.6	537[5]	C	22.9
KY 321 & KY 40	394	C	26.4	366	C	24.0	383	C	22.9	283	B	11.0

[5] Max queue exceeds available storage

Appendix A

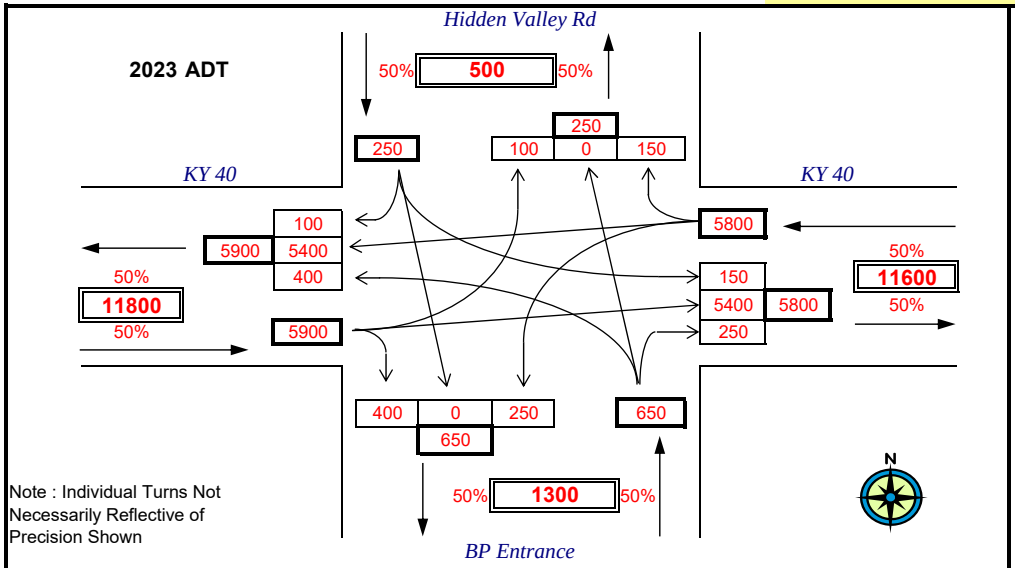
2023 Existing Turning Movement Sheets

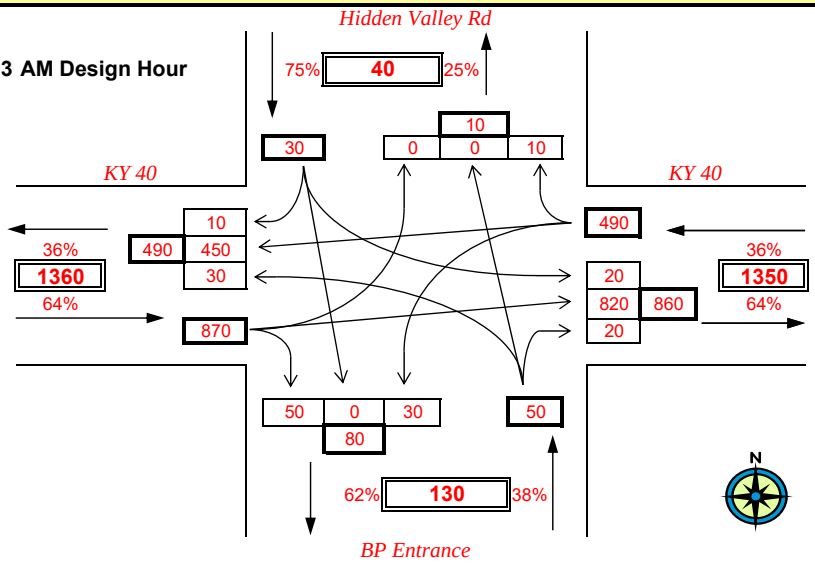
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & BP Entrance

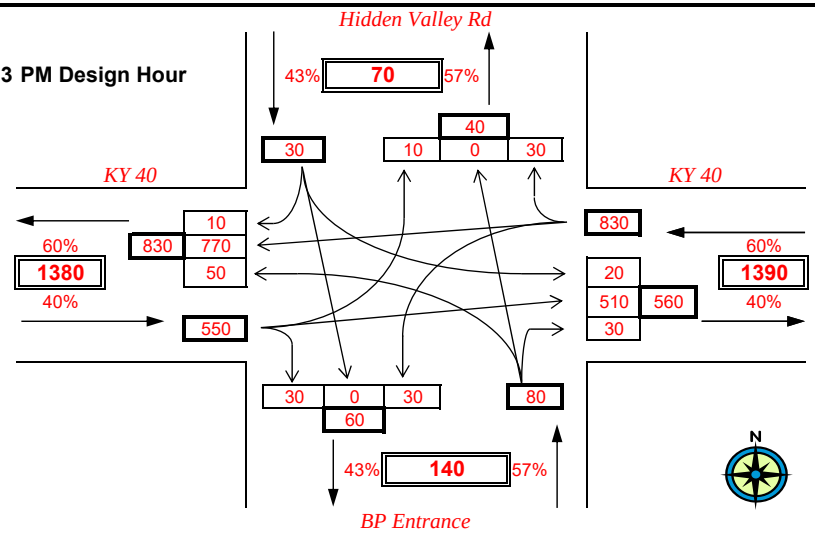
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 1 (2023)

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







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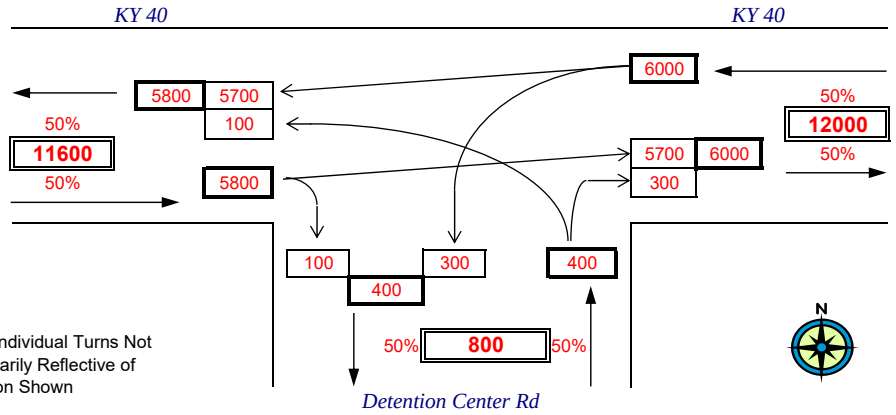
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & Detention Center Rd

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 2 (2023)

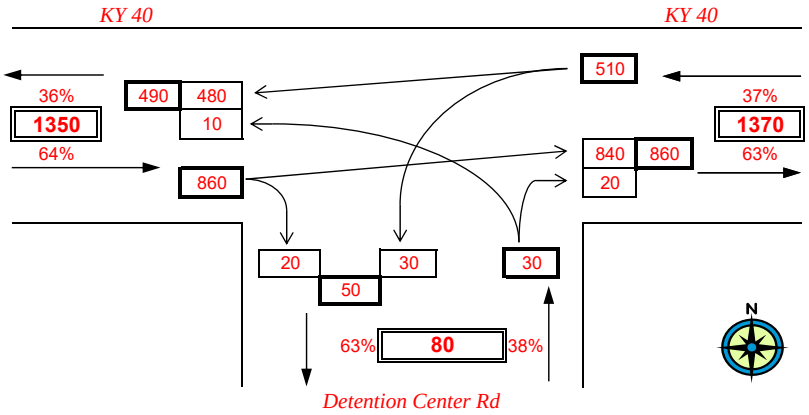
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



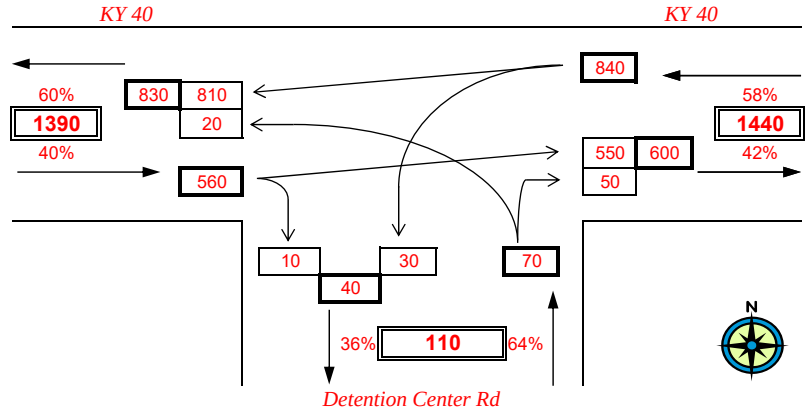
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour



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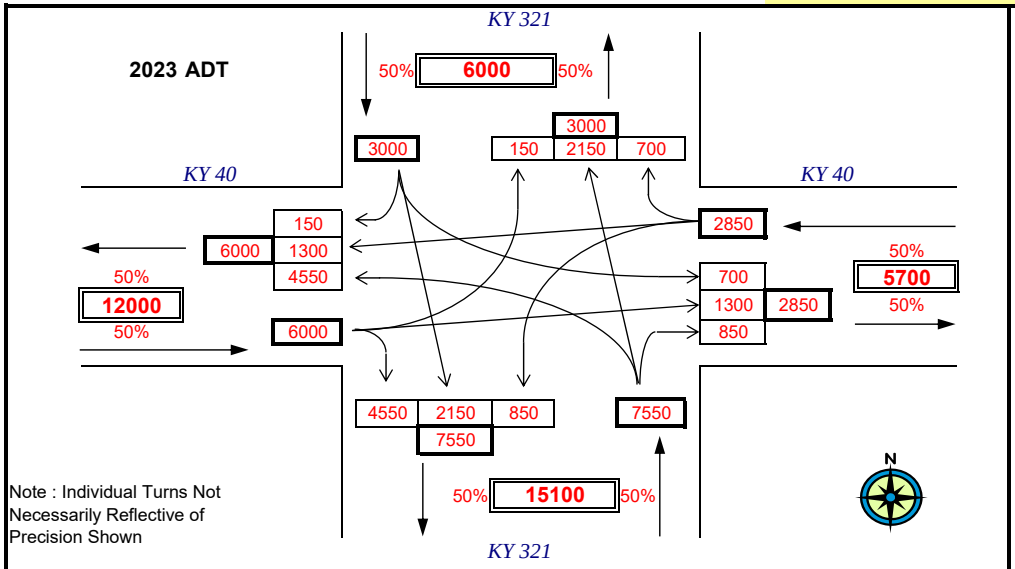
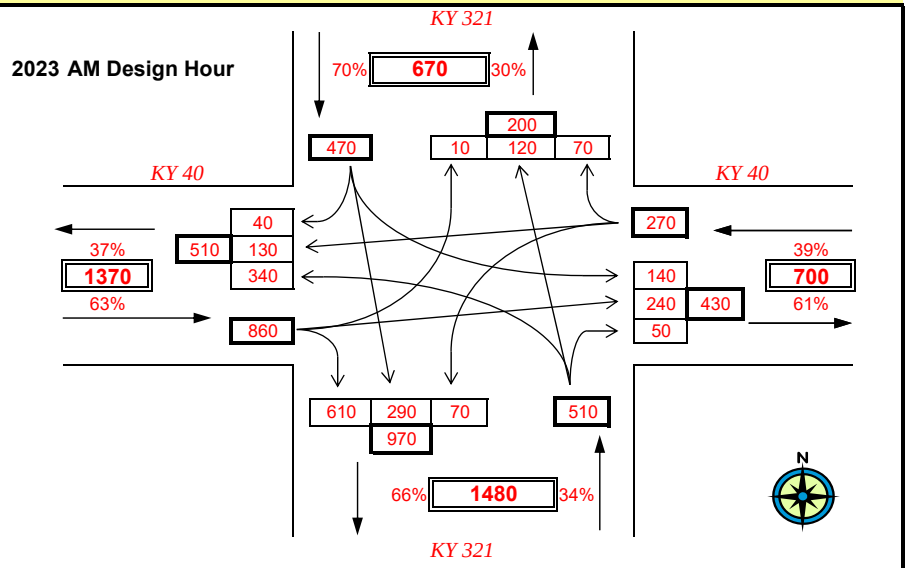
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & KY 321

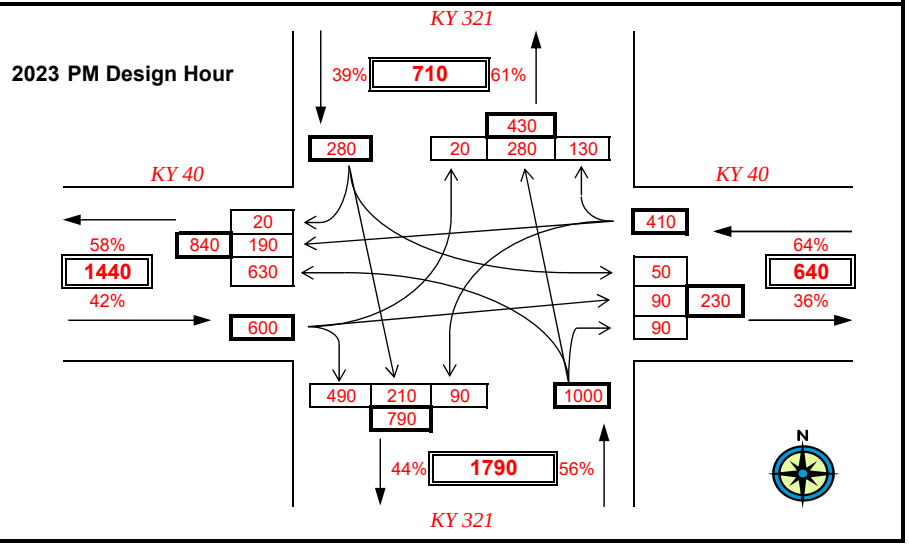
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 3 (2023)

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





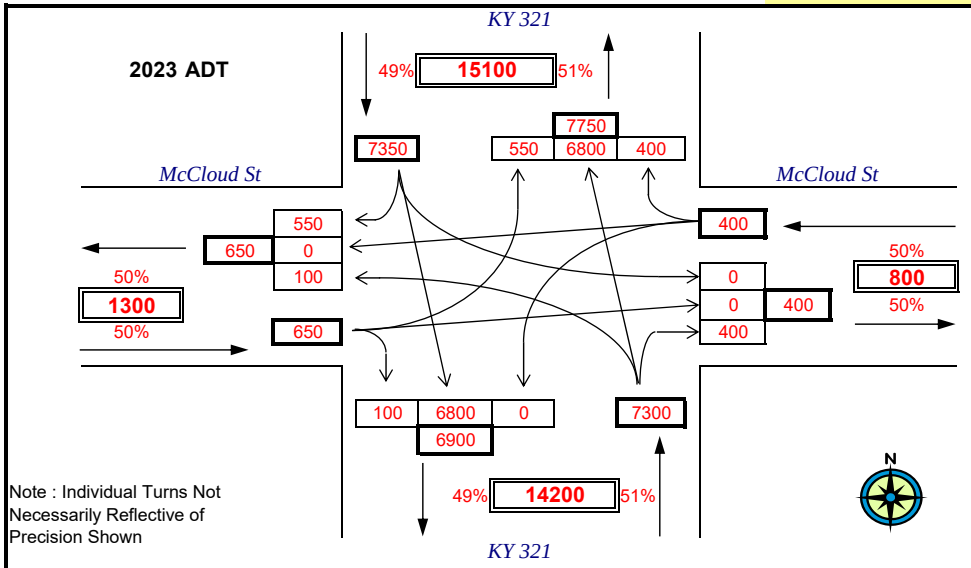


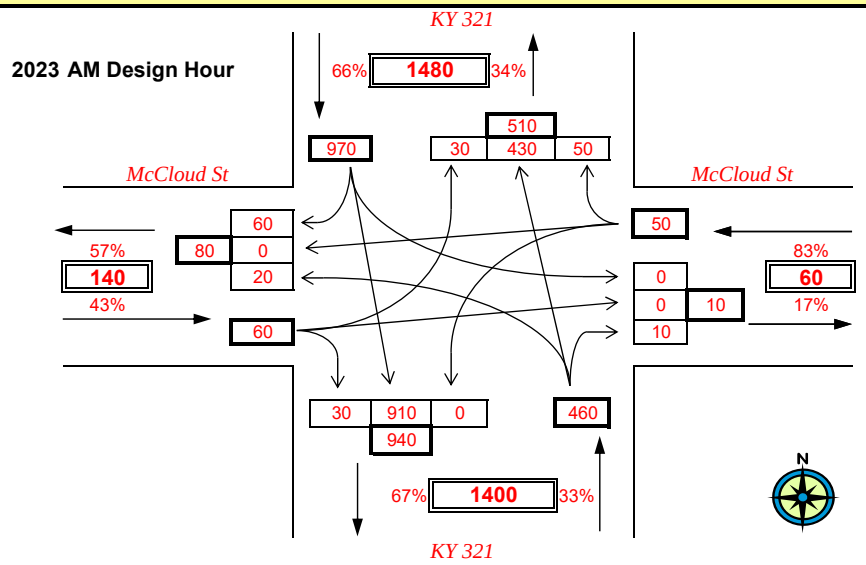
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & McCloud

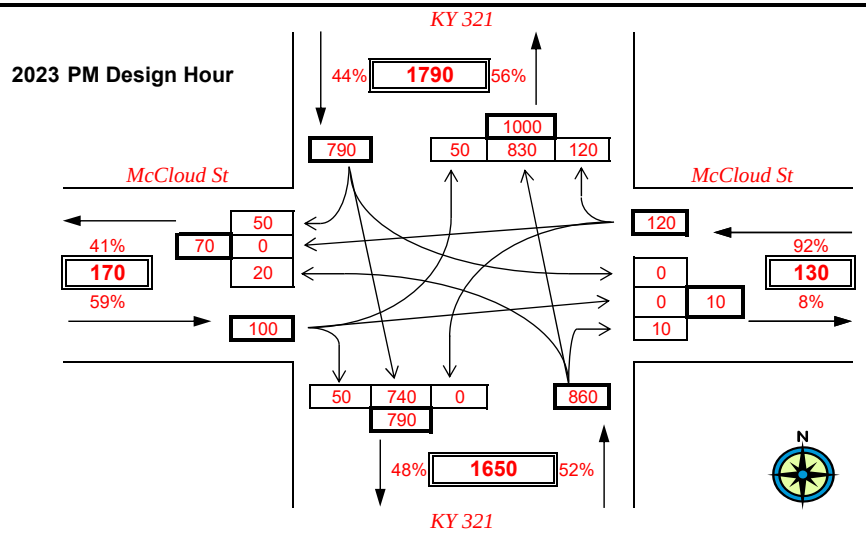
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 4 (2023)

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





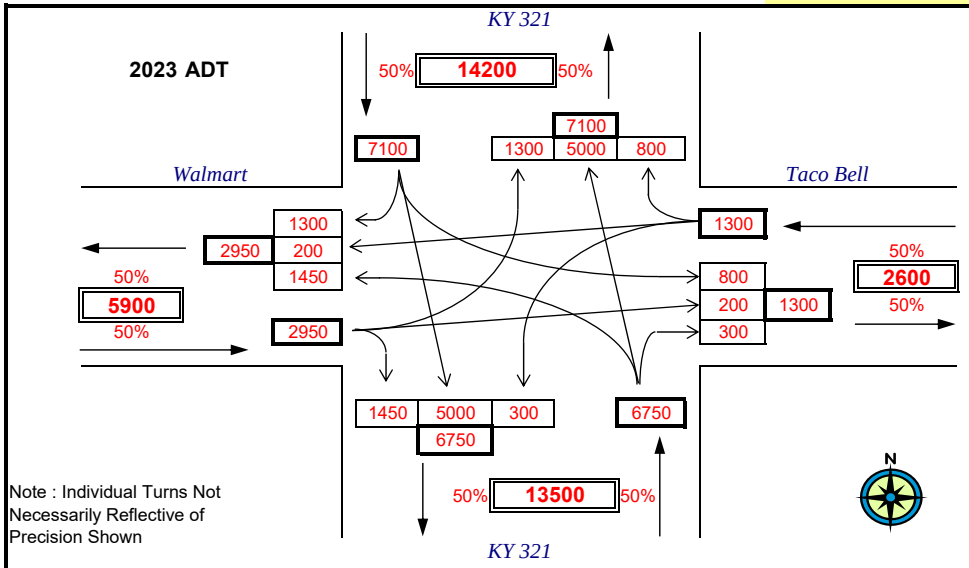


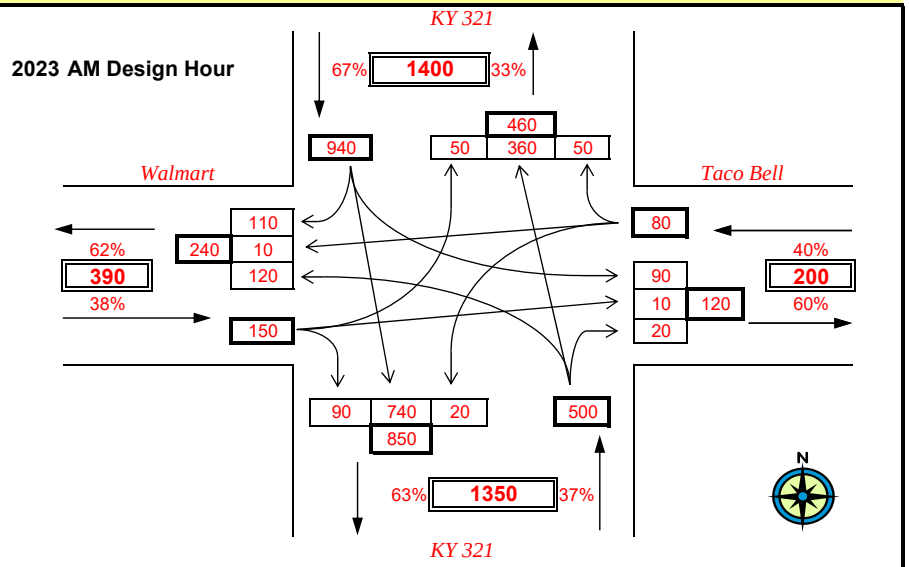
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Walmart Entrance

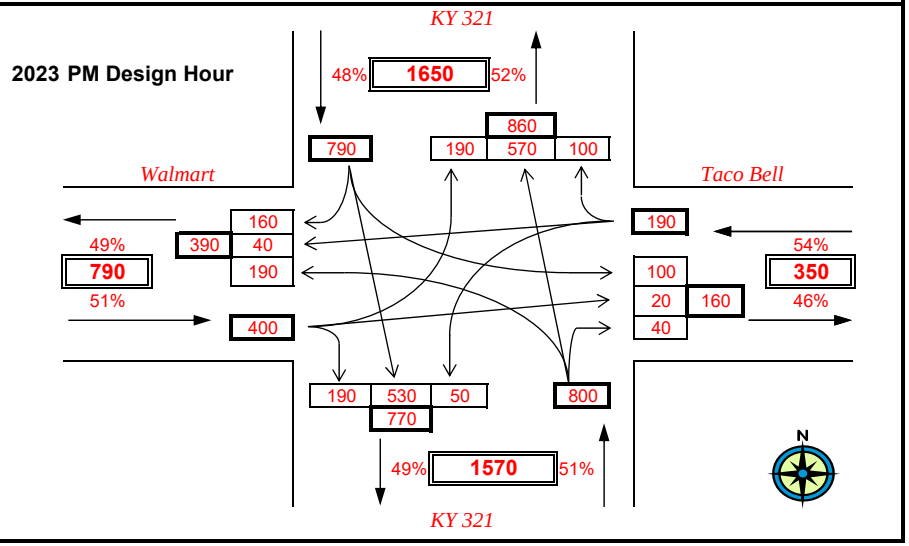
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 5 (2023)

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







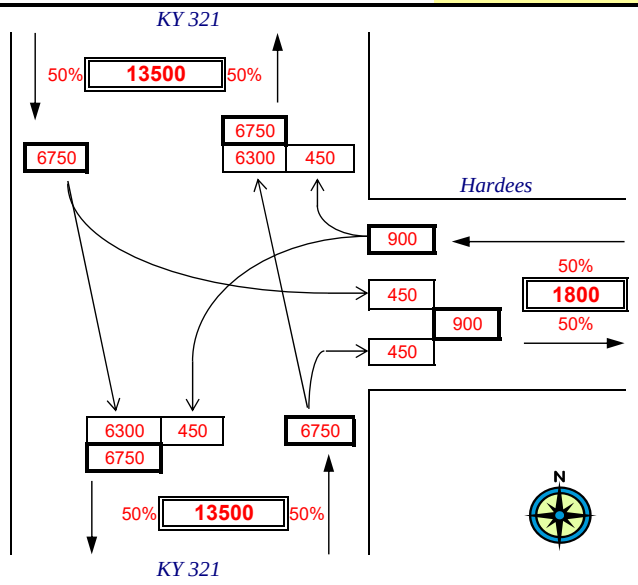
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: 2023 **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Walmart Entrance

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 6 (2023)

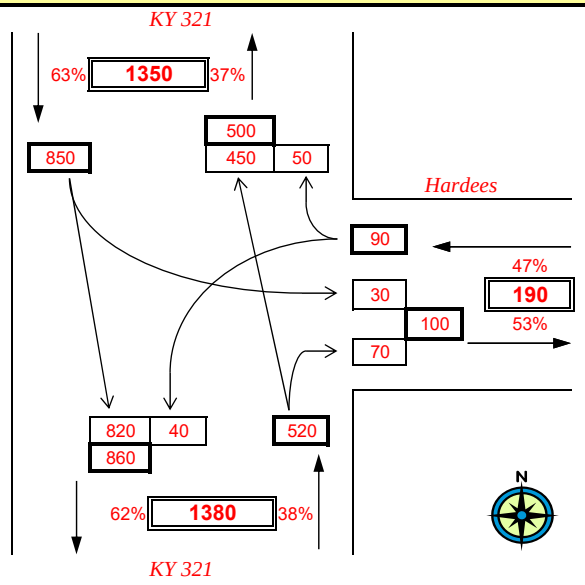
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



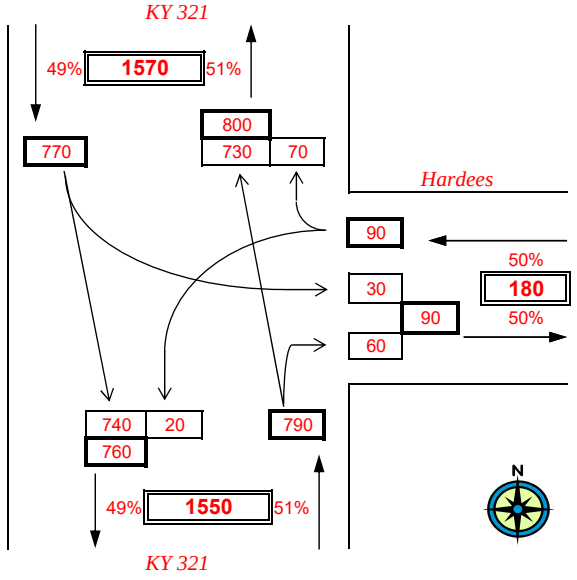
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour

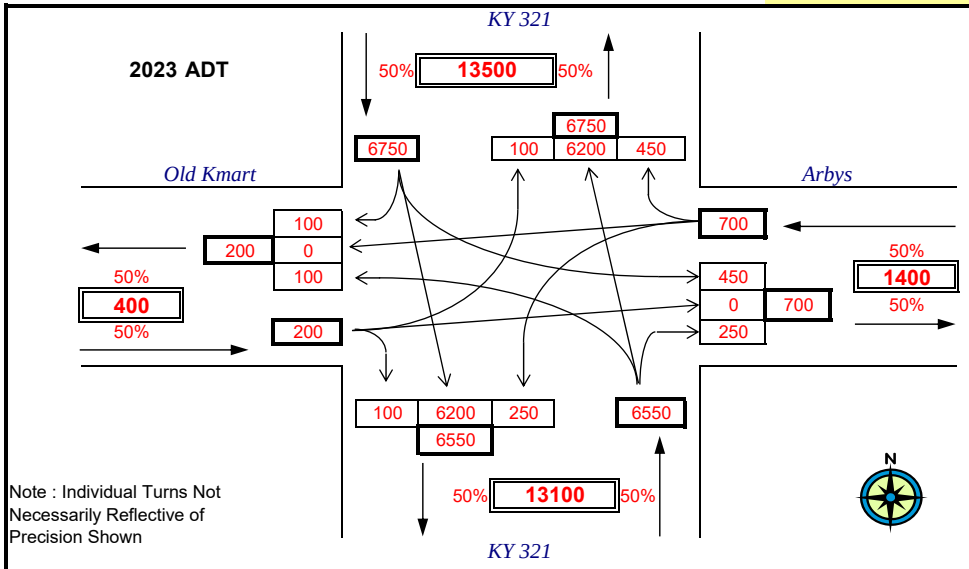


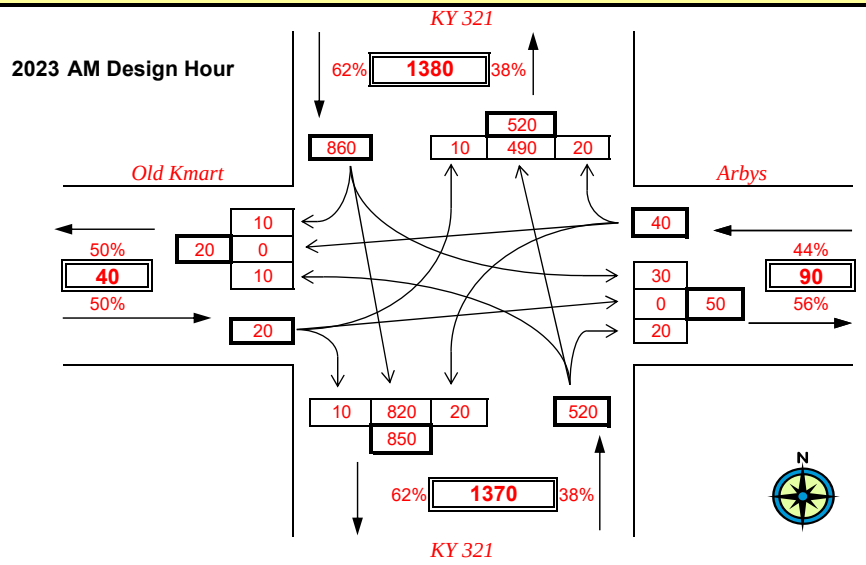
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Arbys Entrance

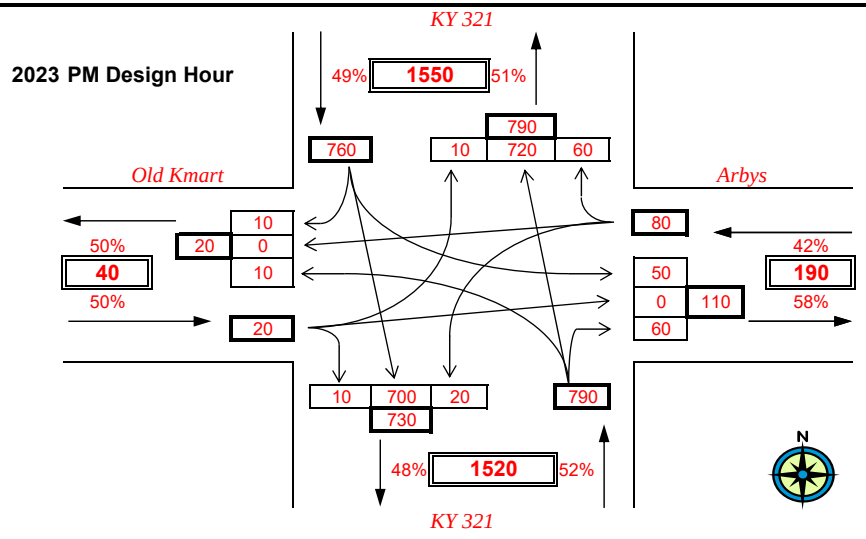
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 7 (2023)

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







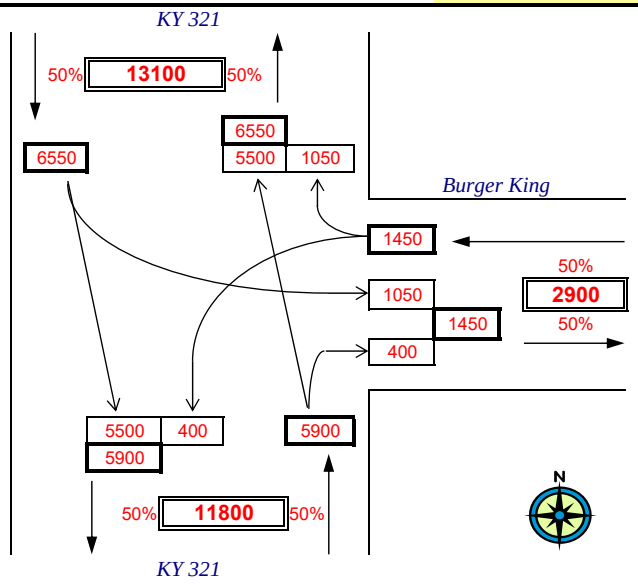
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: 2023 **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Burger King Entrance

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 8 (2023)

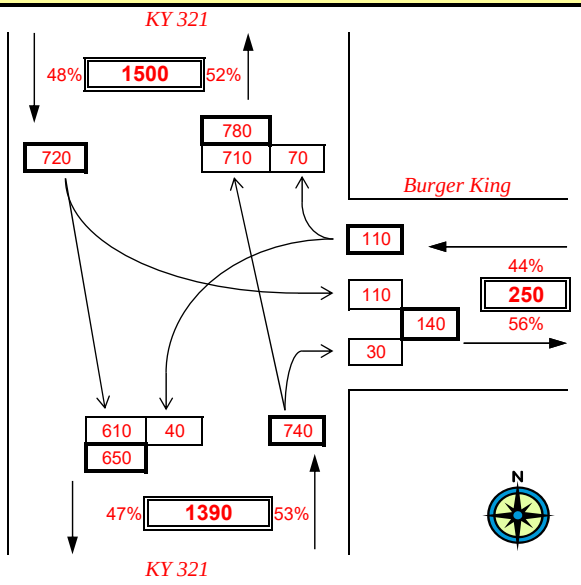
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



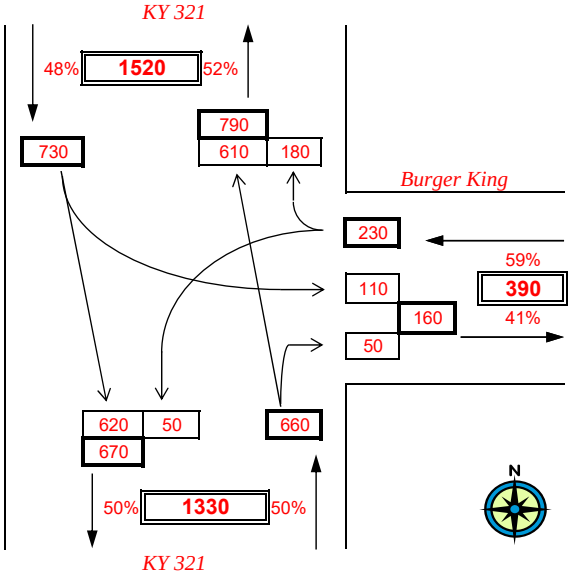
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour

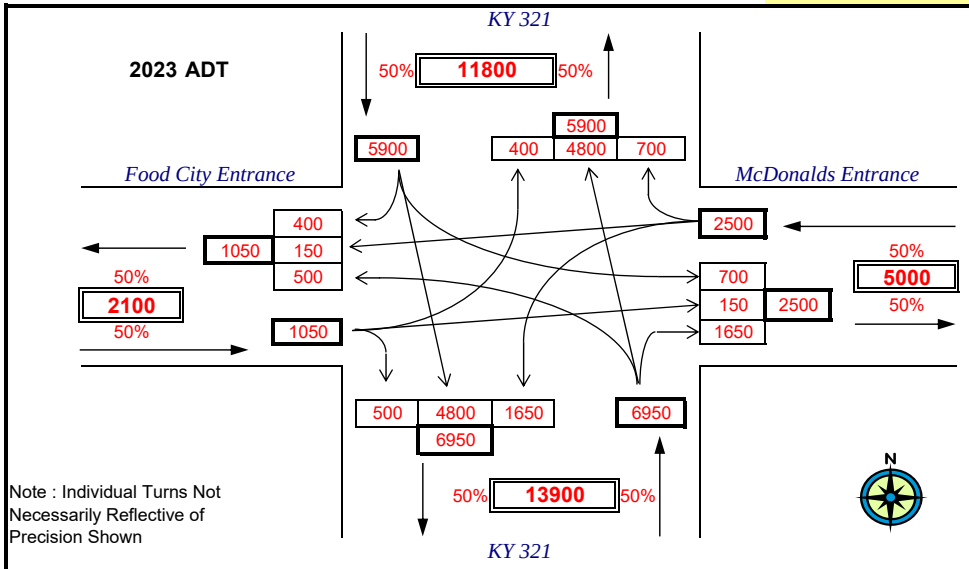


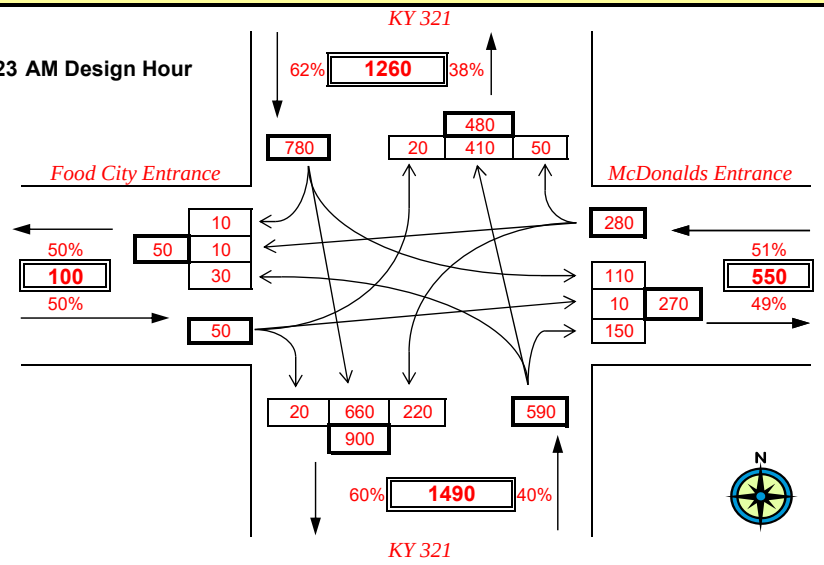
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & McDonalds Entrance

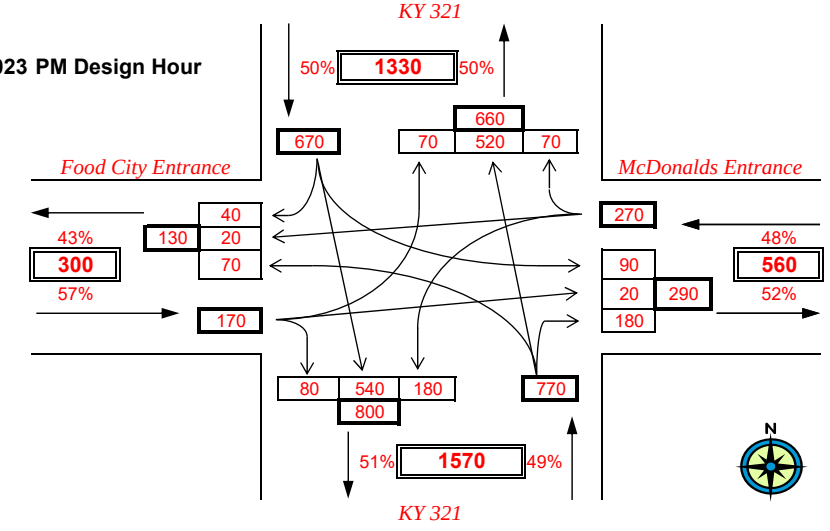
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 9 (2023)

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







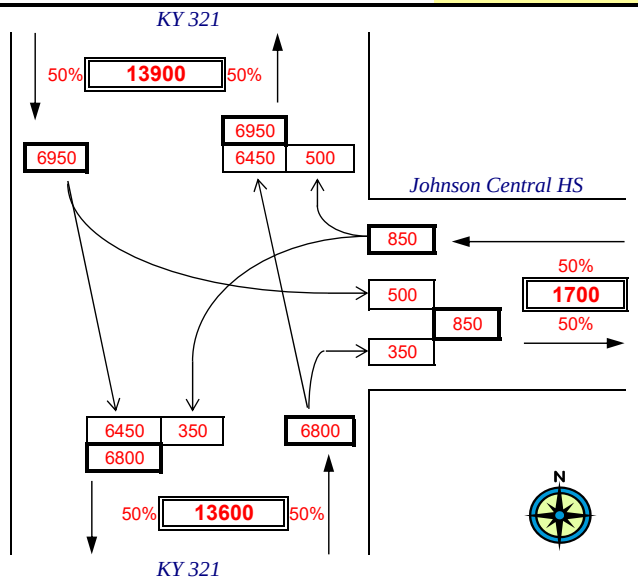
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: 2023 **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Central HS Entrance

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 10 (2023)

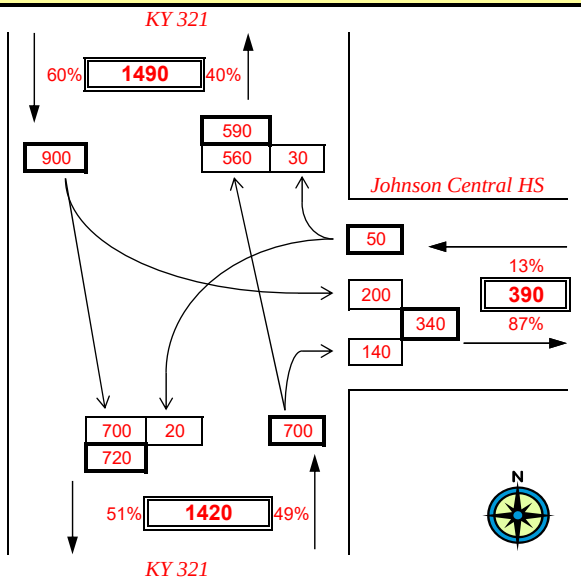
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



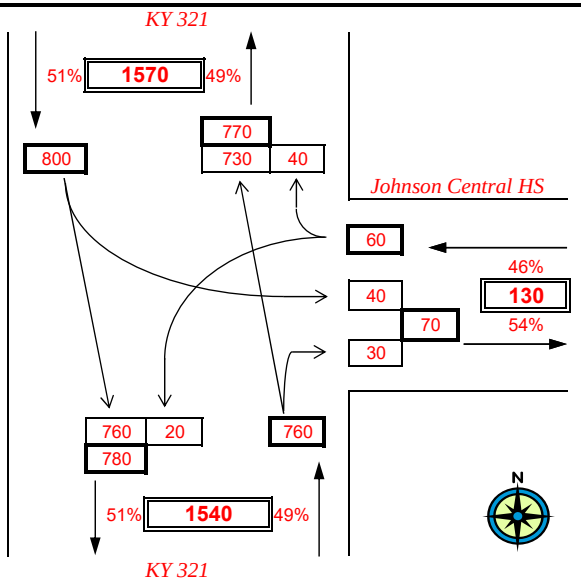
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour

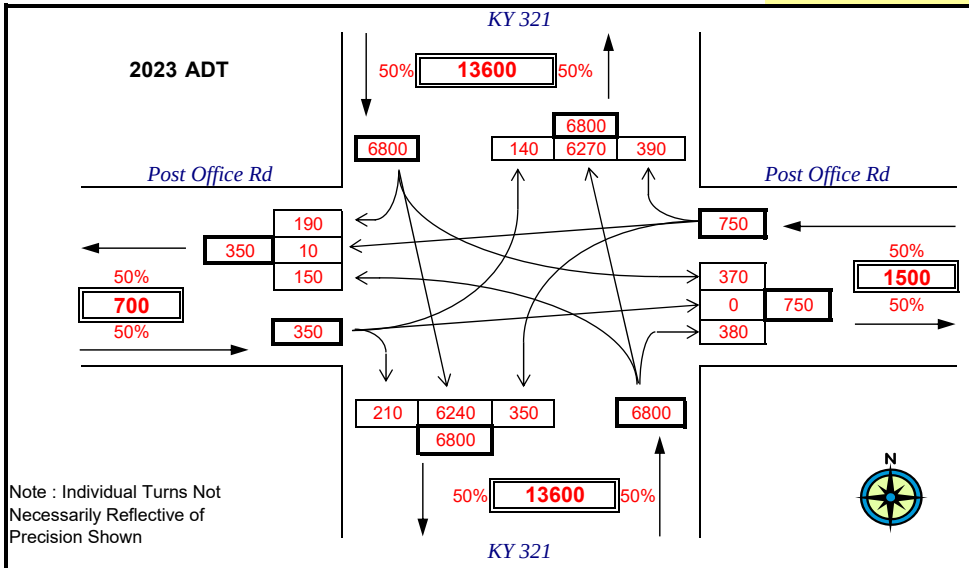


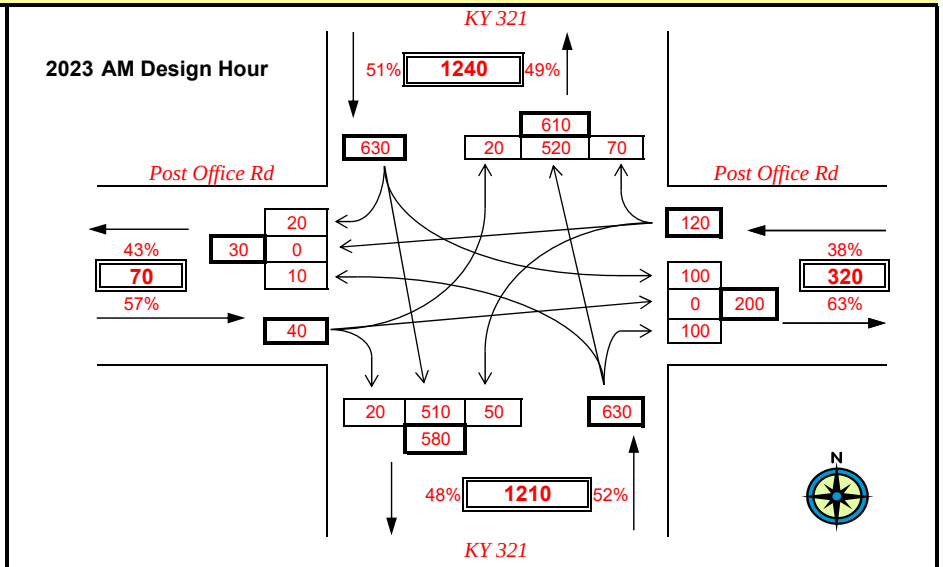
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & USPS

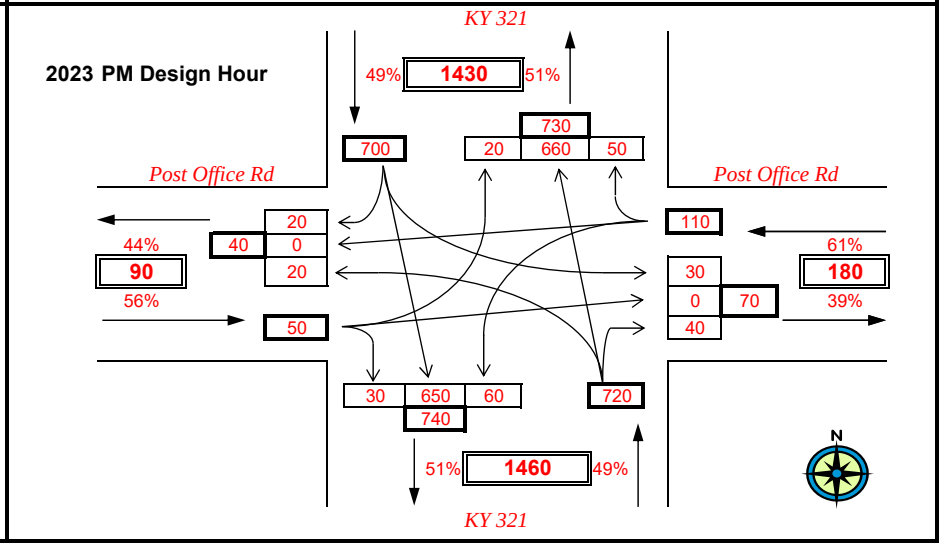
NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 11 (2023)

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







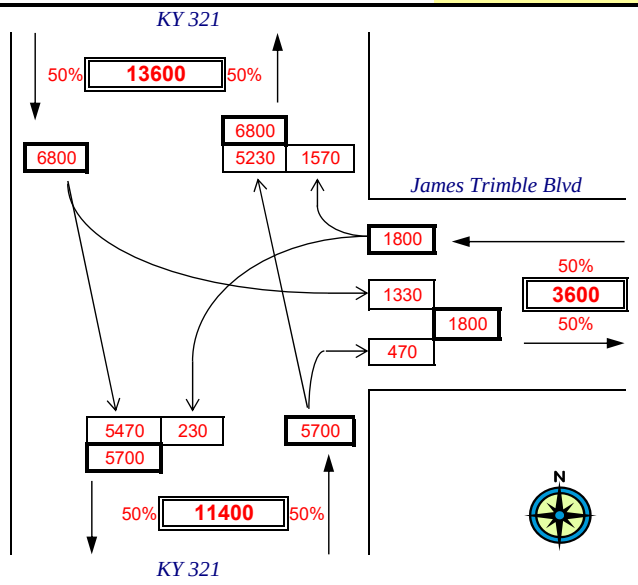
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & James Trimble Blvd

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT 12 (2023)

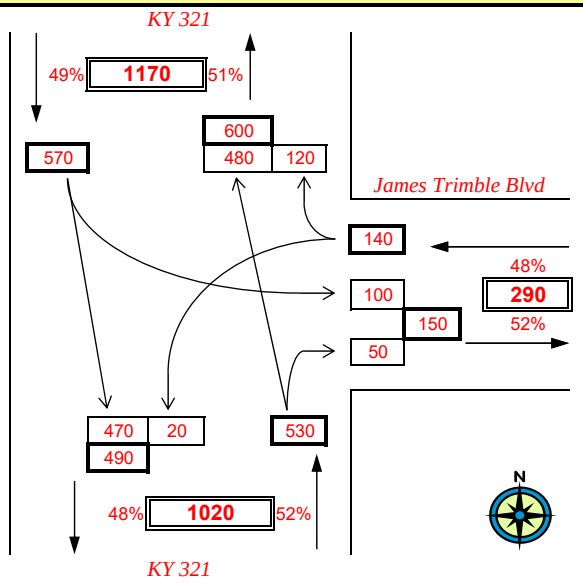
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



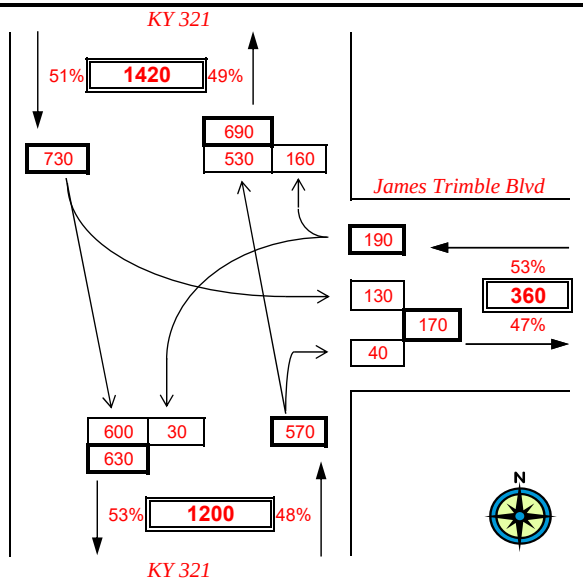
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour



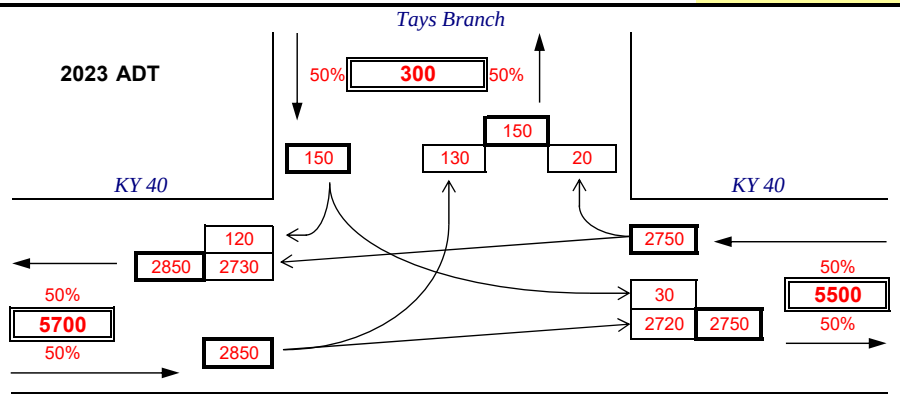
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: 2023 **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & Tays Branch

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT (2023)

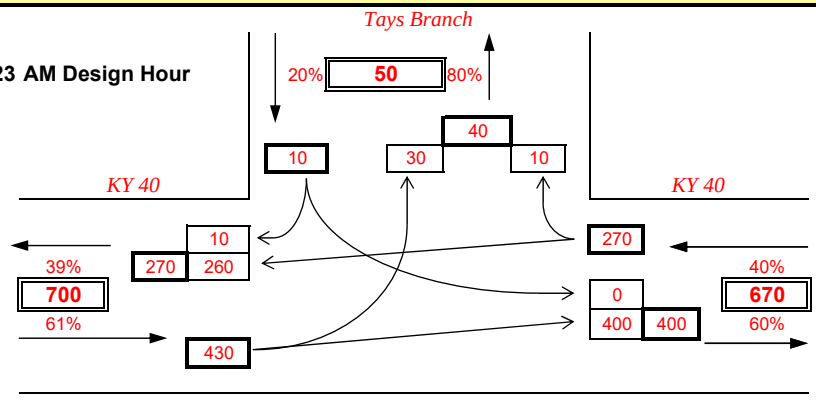
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



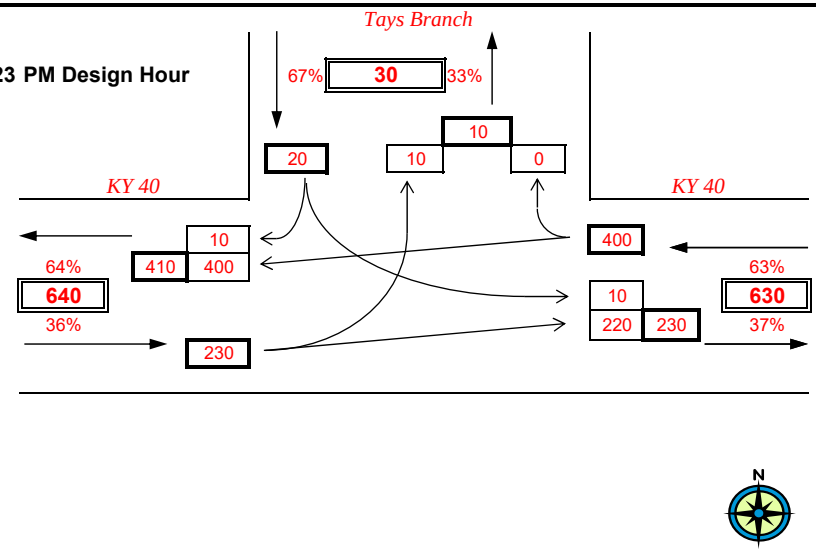
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour



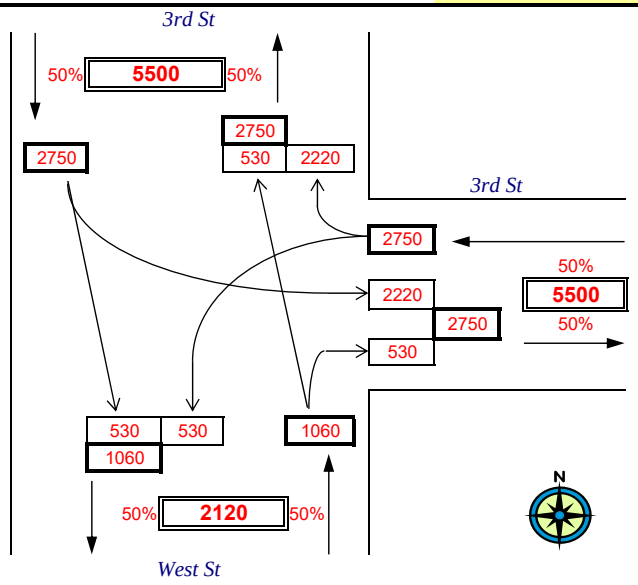
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2023** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & West St

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT (2023)

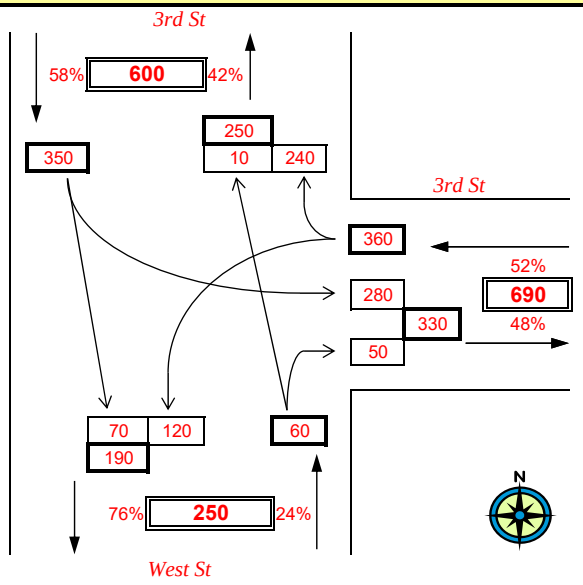
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



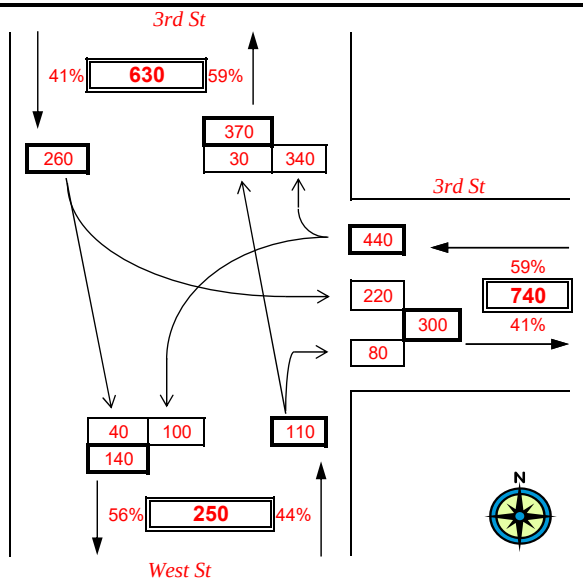
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour



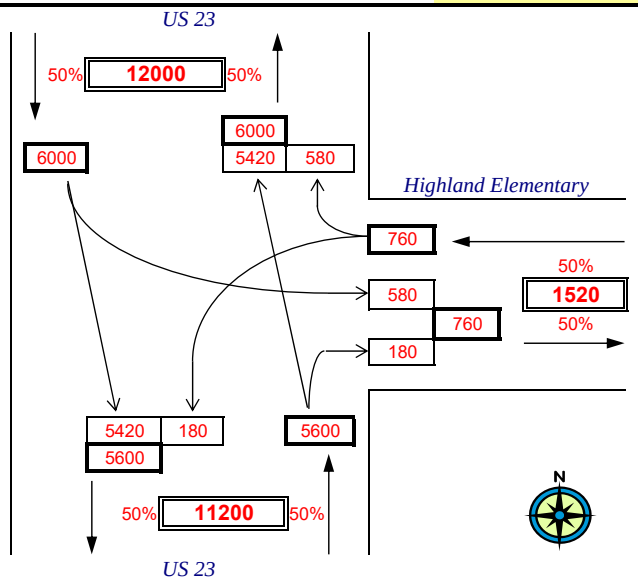
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: 2023 **ADT and Design Hour Volumes**
INTERSECTION: US 23 & Highland Elementary

NOTE: Directional distributions were determined from a 2023 turning movement count.

TURN MOVEMENT (2023)

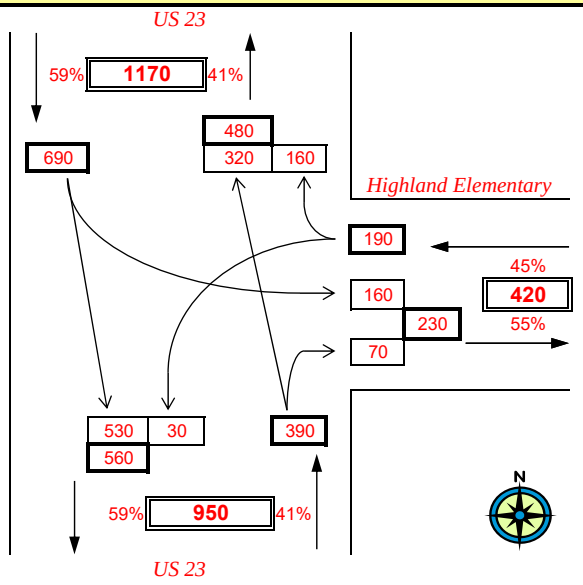
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2023 ADT



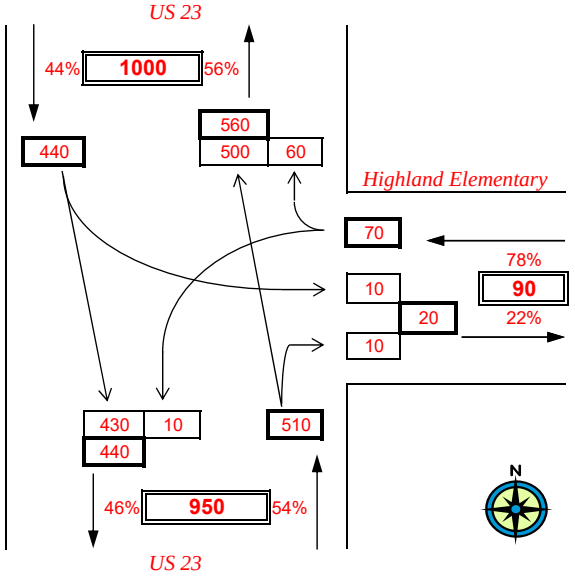
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2023 AM Design Hour



Location Map

2023 PM Design Hour



Appendix B

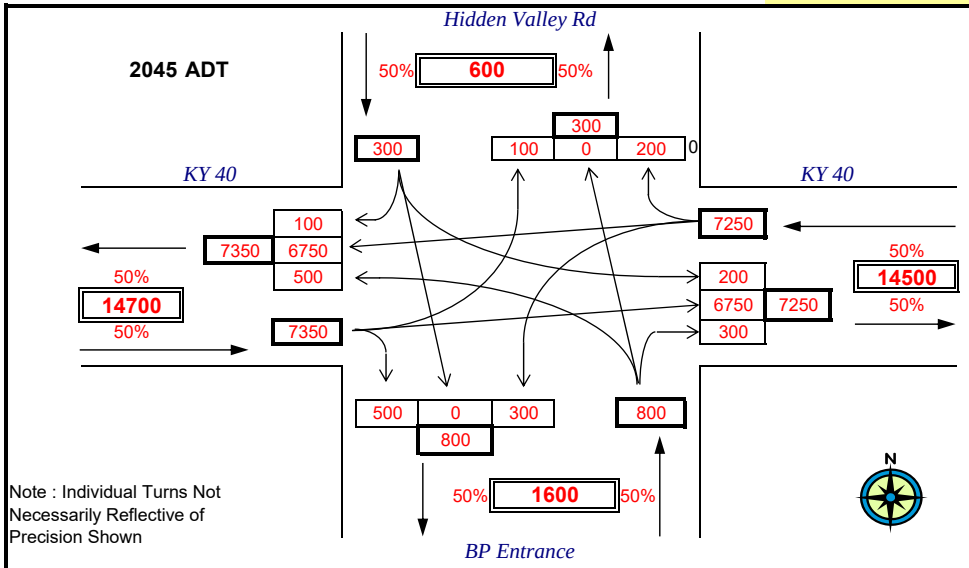
2045 No Build Turning Movement Sheets

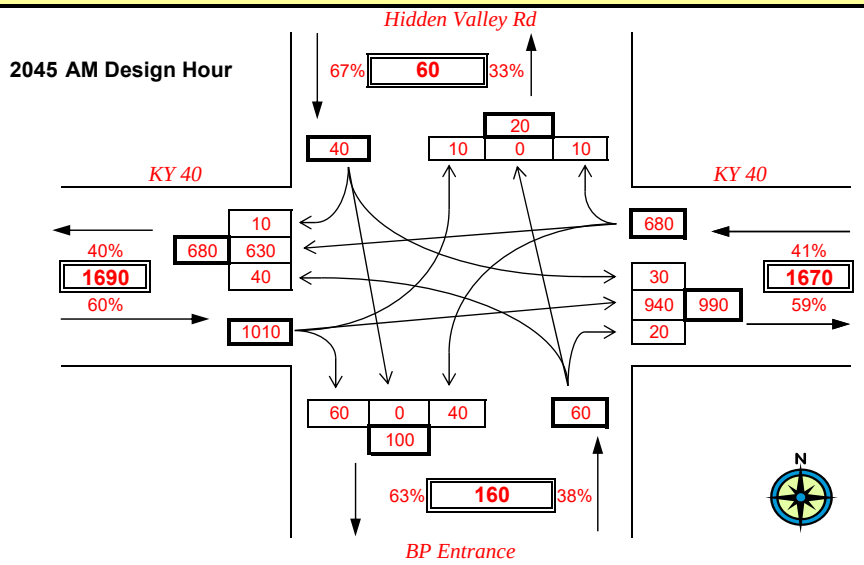
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & BP Entrance

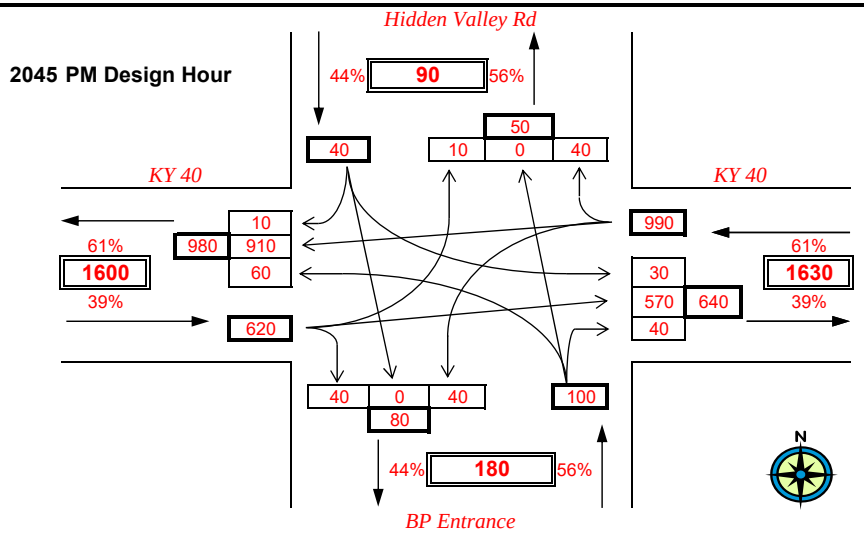
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 1 (2045)

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







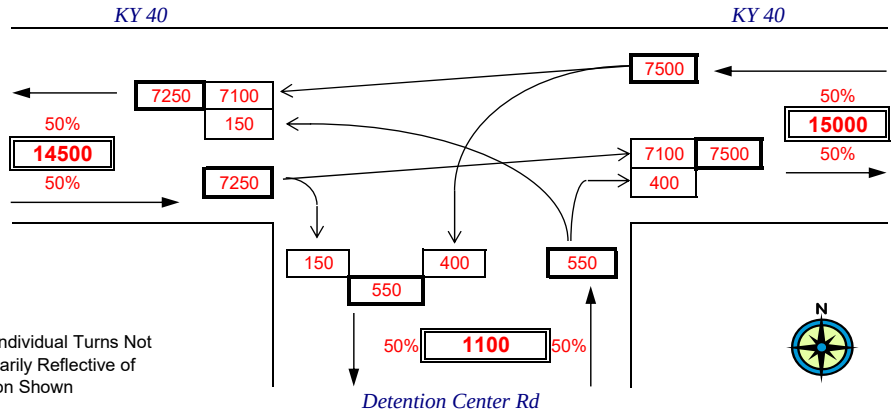
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & Detention Center Rd

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 2 (2045)

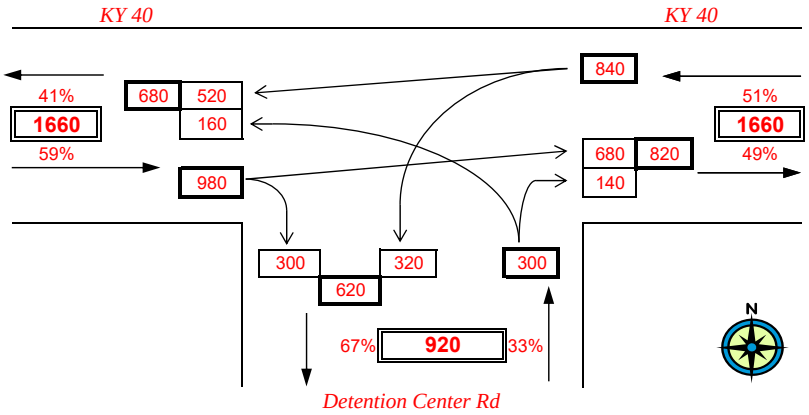
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



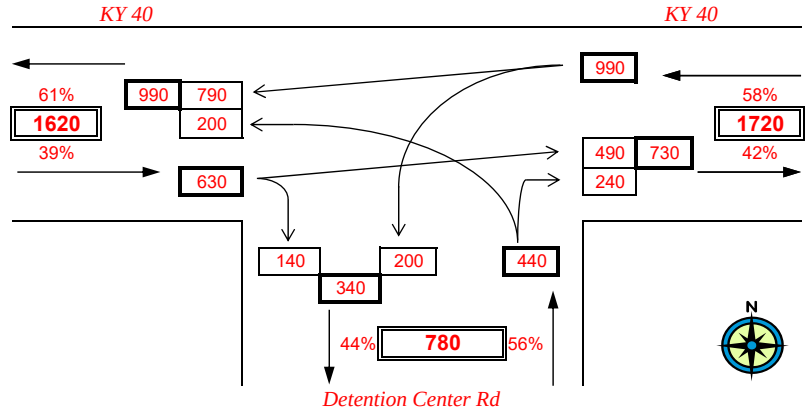
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour

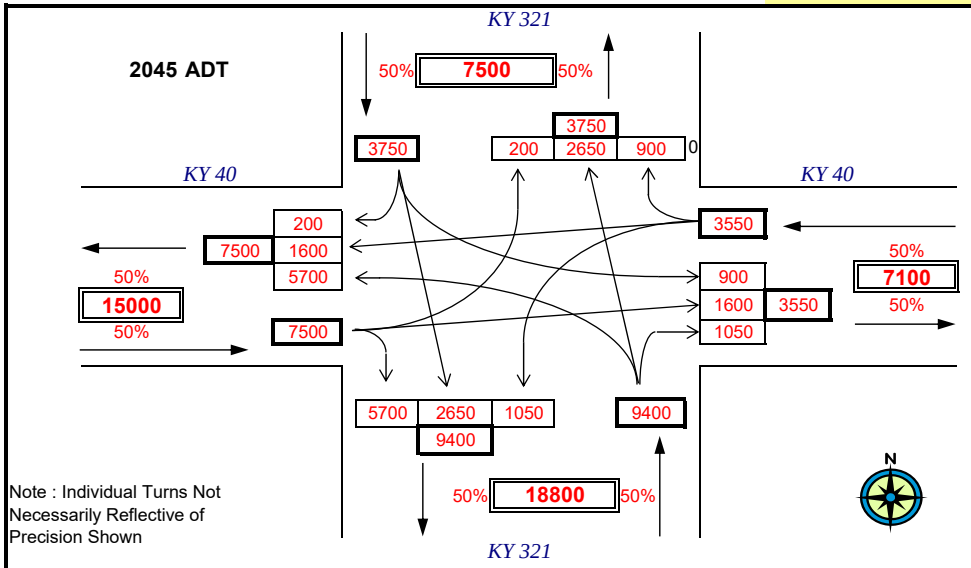


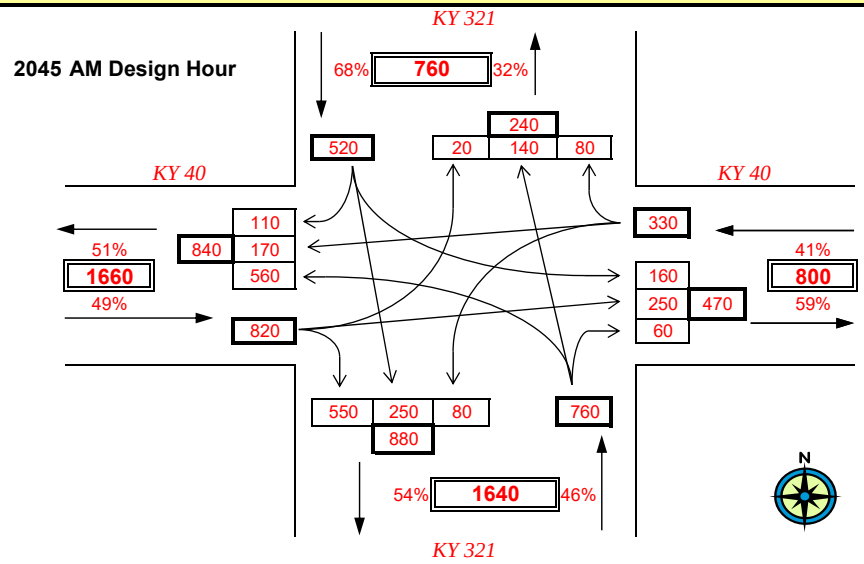
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & KY 321

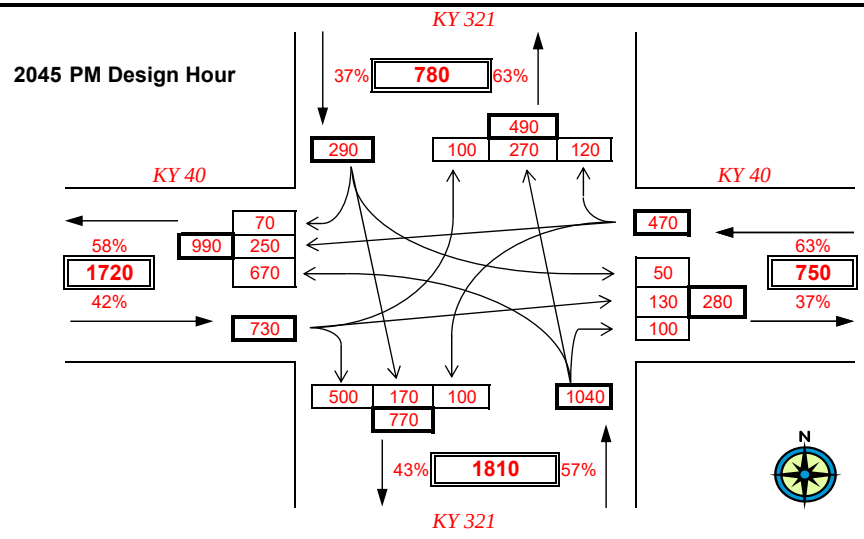
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 3 (2045)

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





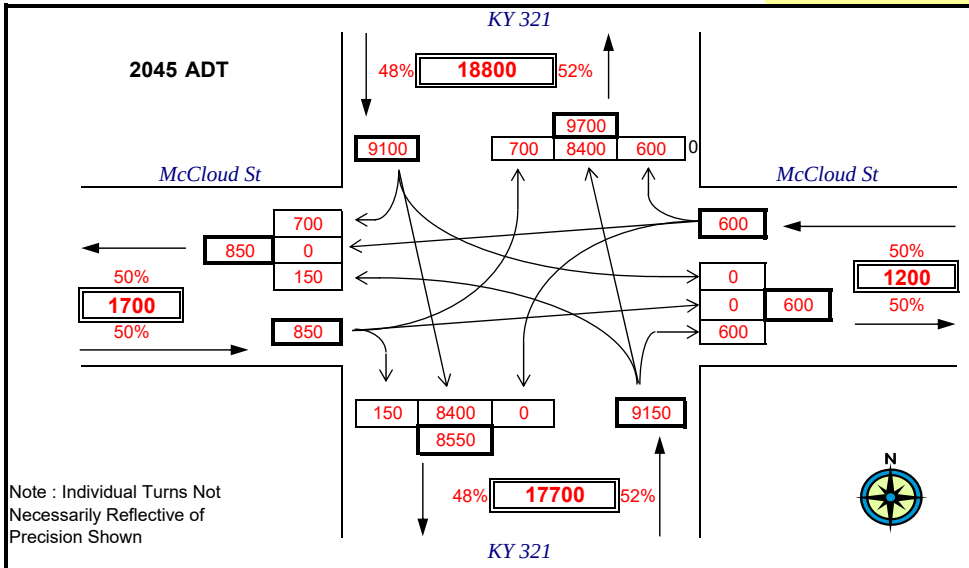


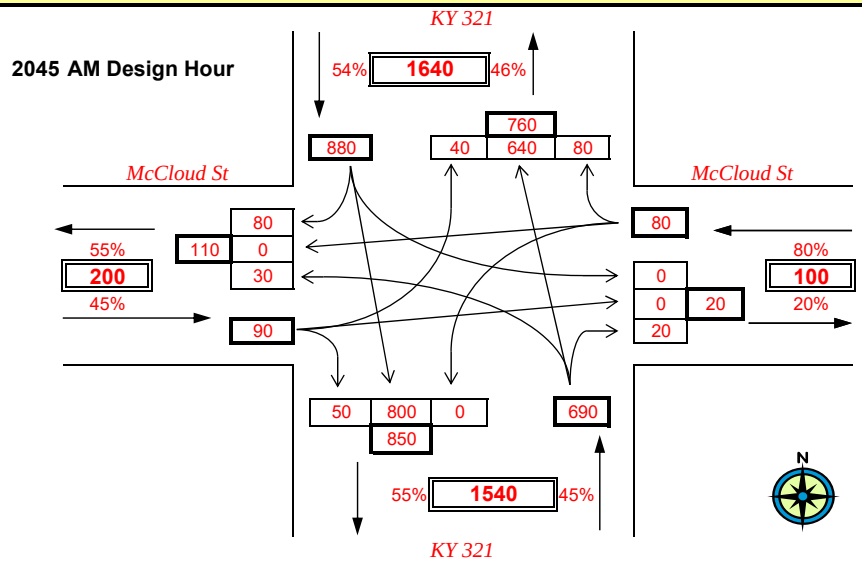
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & McCloud

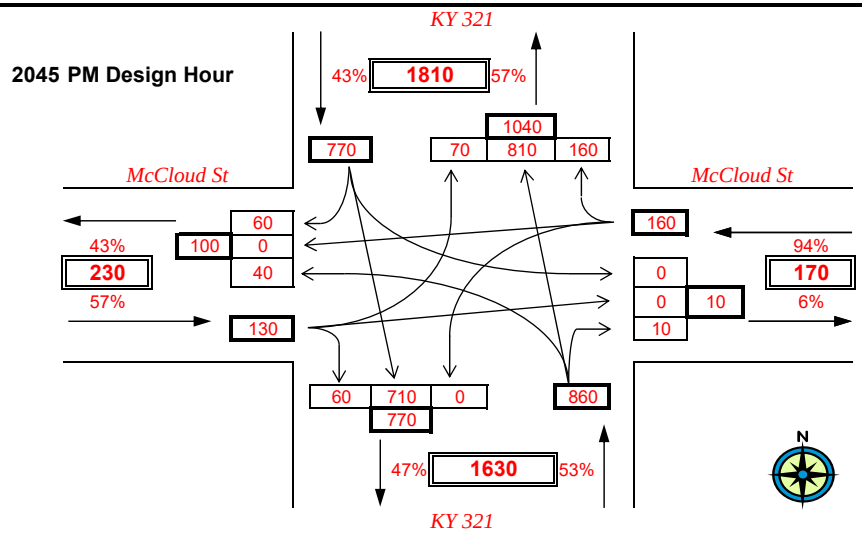
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 4 (2045)

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





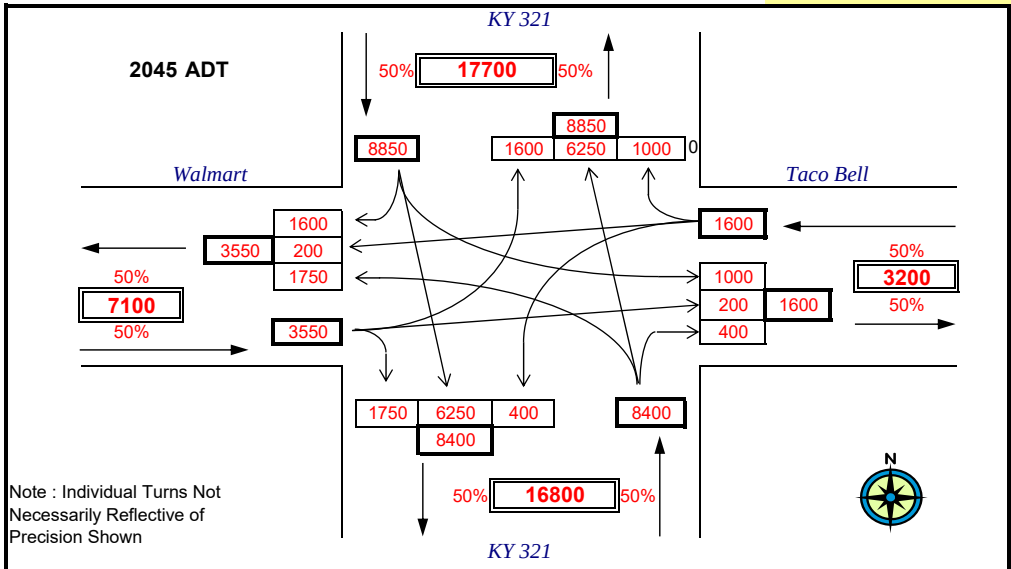


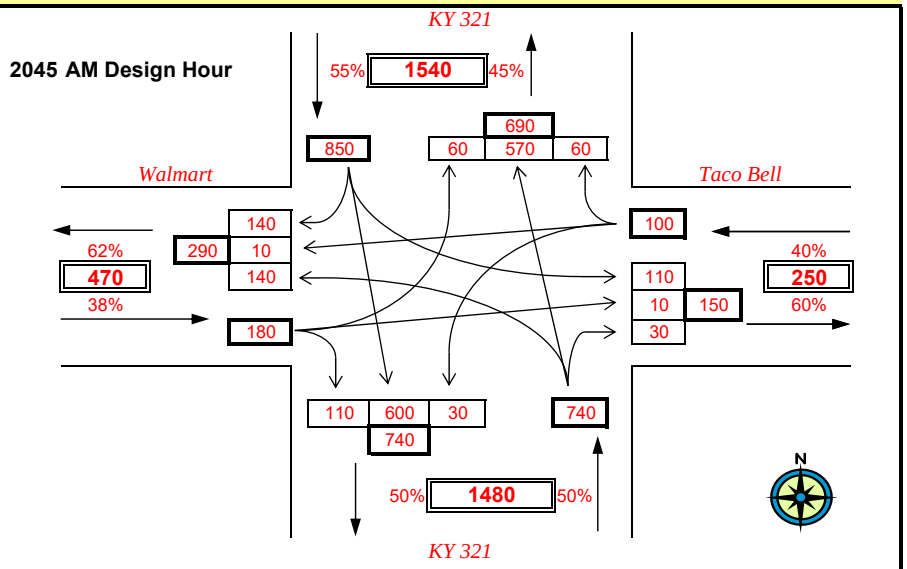
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Walmart Entrance

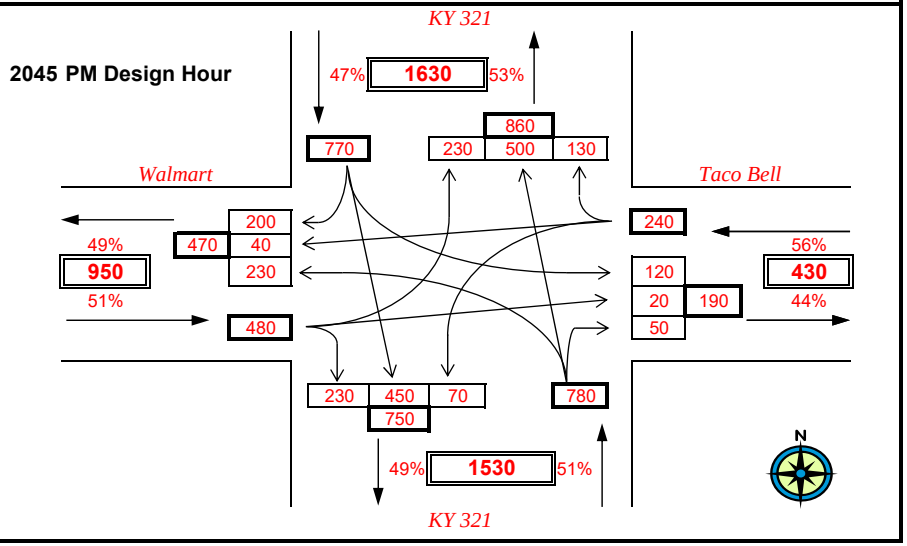
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 5 (2045)

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







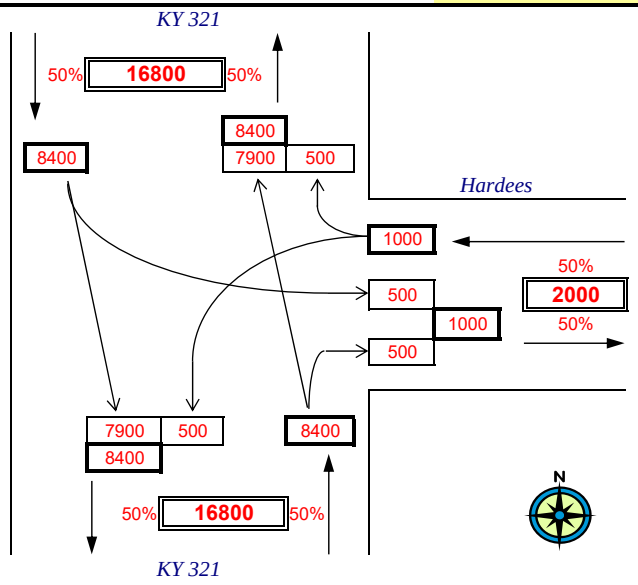
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Hardees Entrance

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 6 (2045)

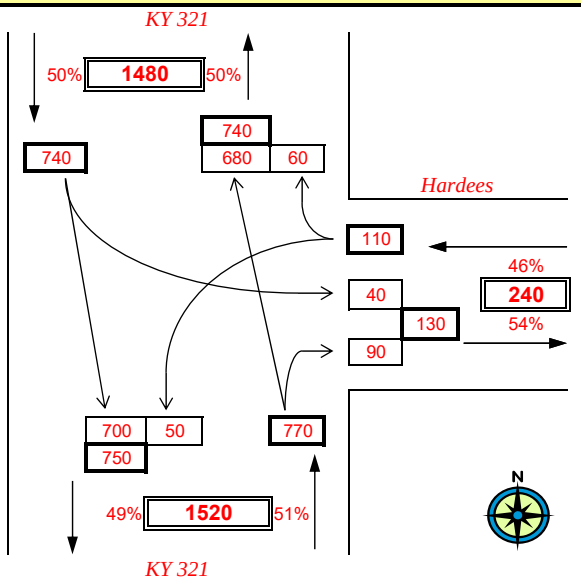
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



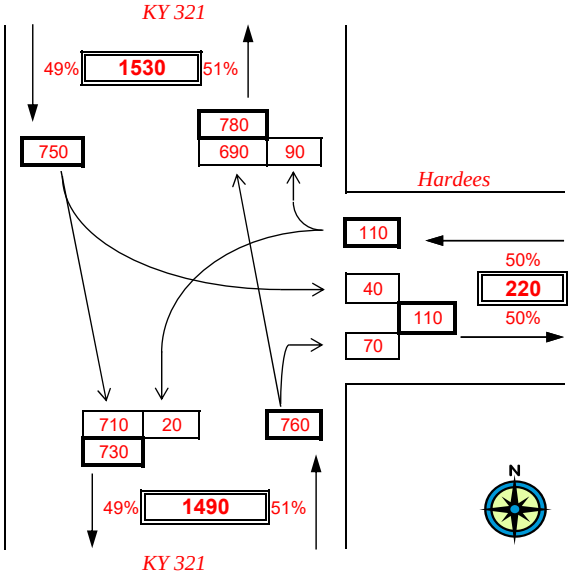
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour

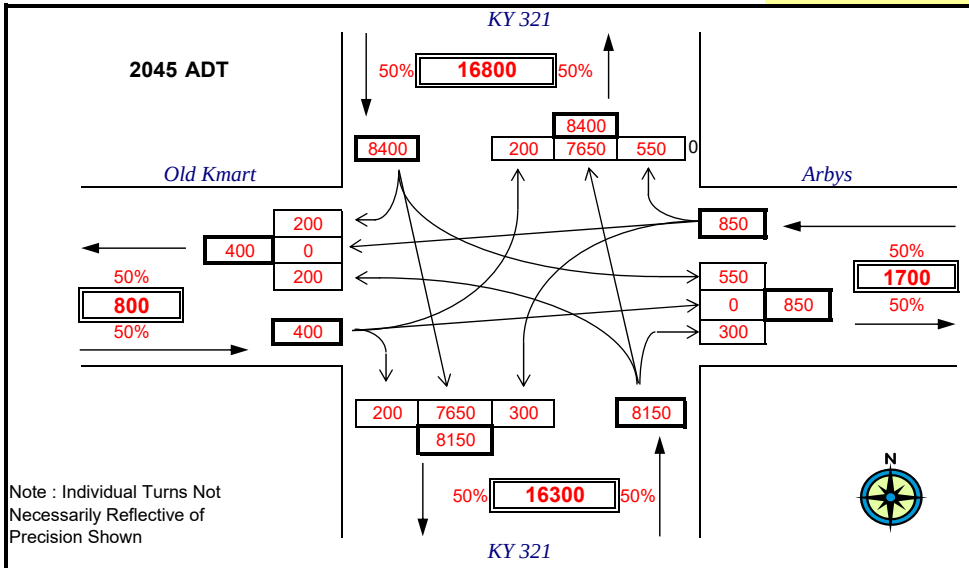


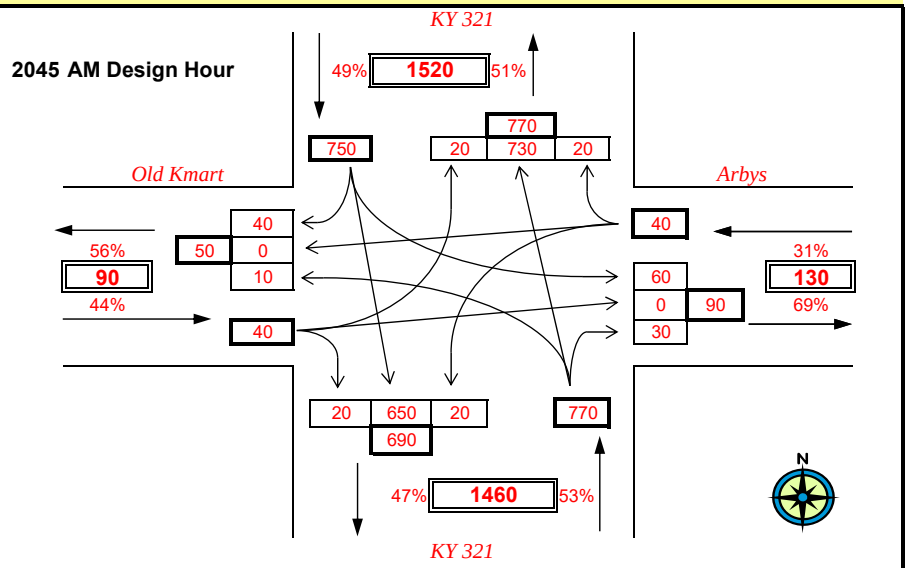
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Arbys Entrance

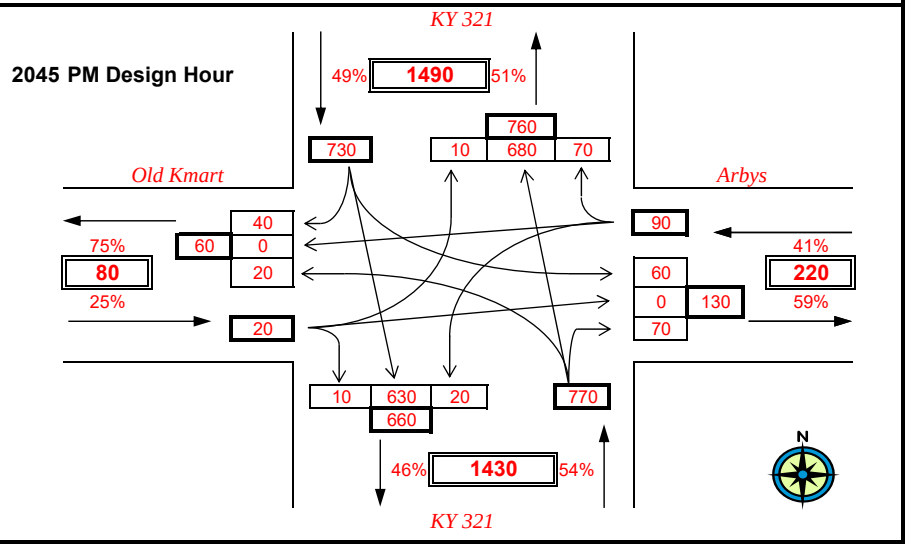
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 7 (2045)

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







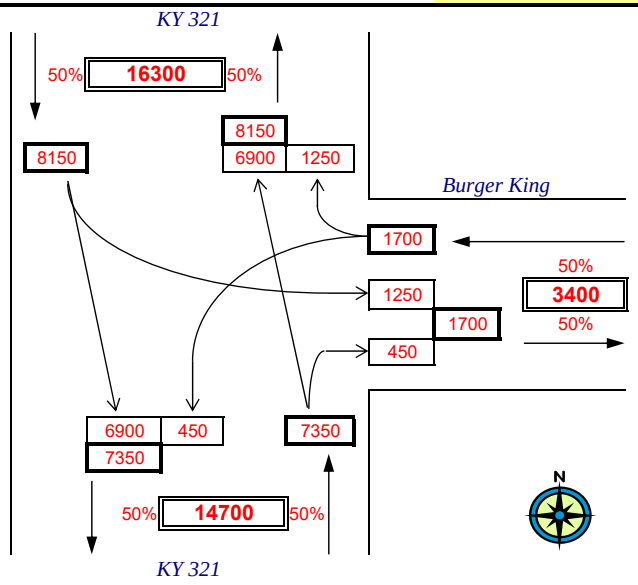
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Burger King Entrance

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 8 (2045)

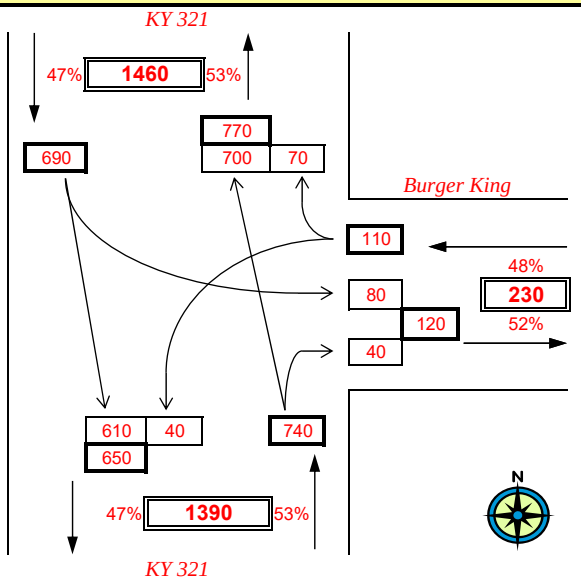
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



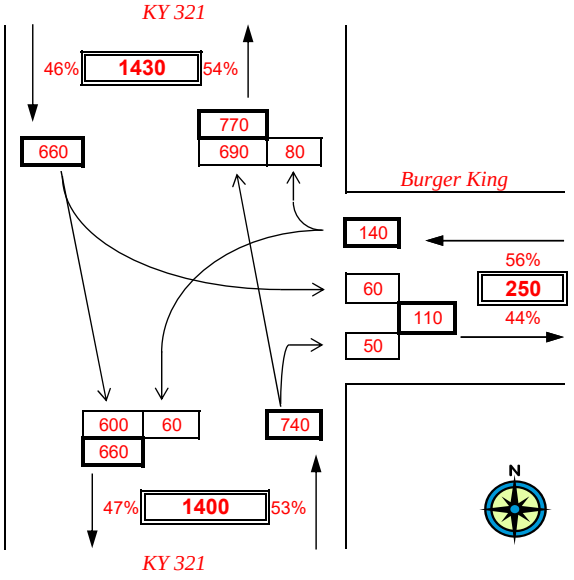
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour

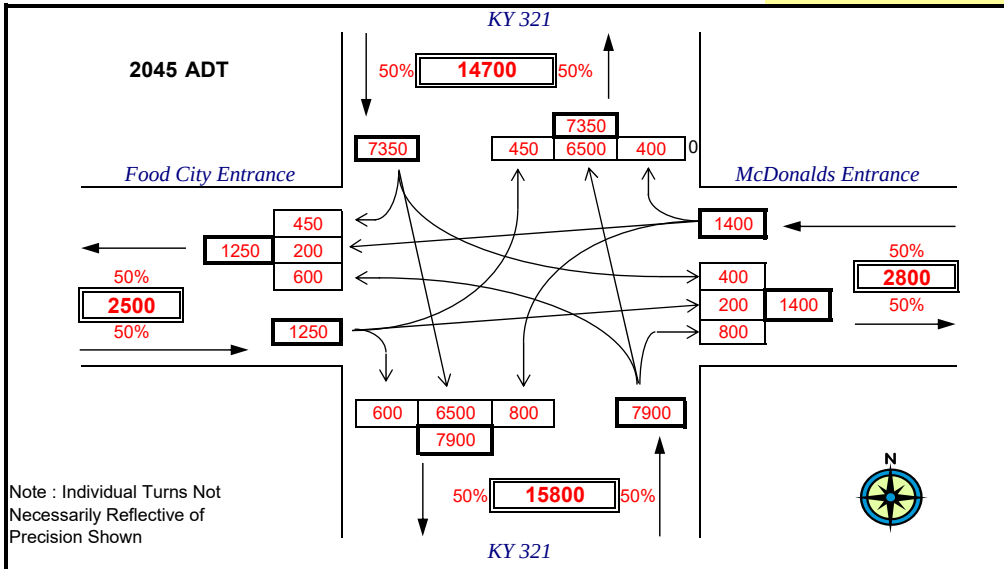


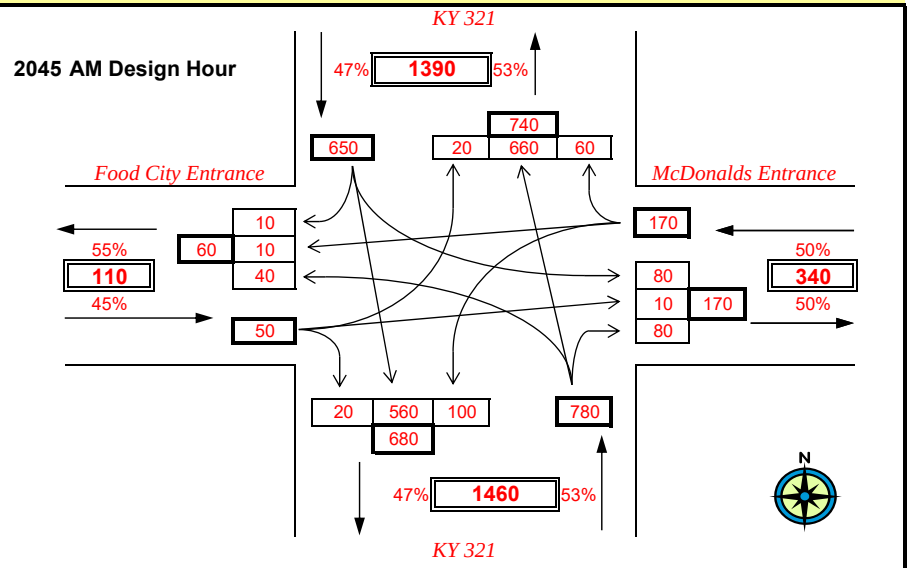
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & McDonalds Entrance

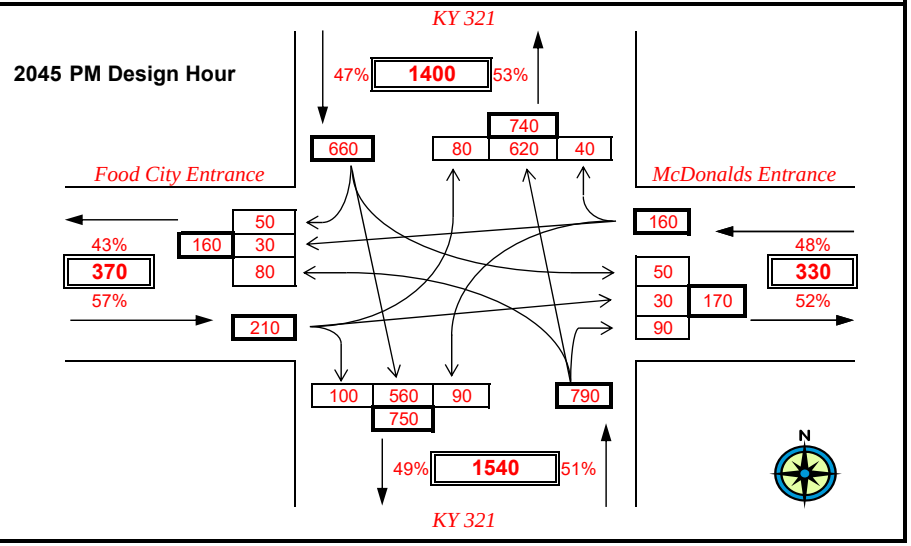
NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 9 (2045)

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







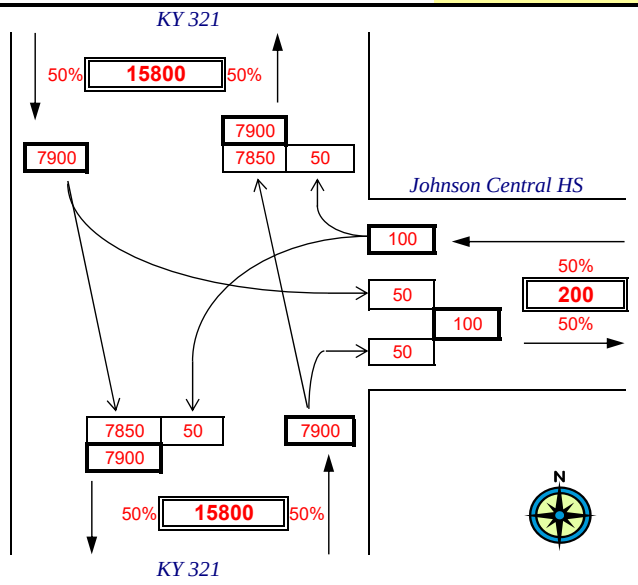
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & Central HS Entrance

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 10 (2045)

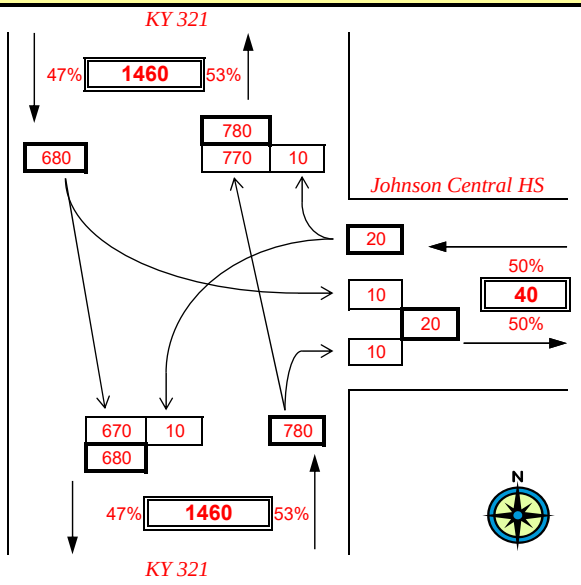
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



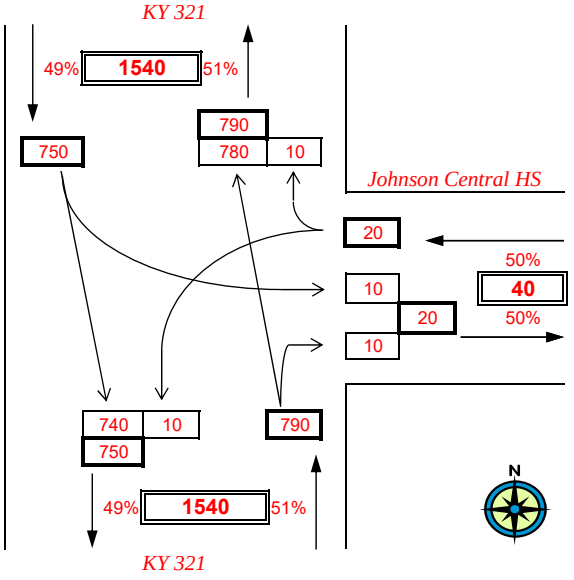
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour

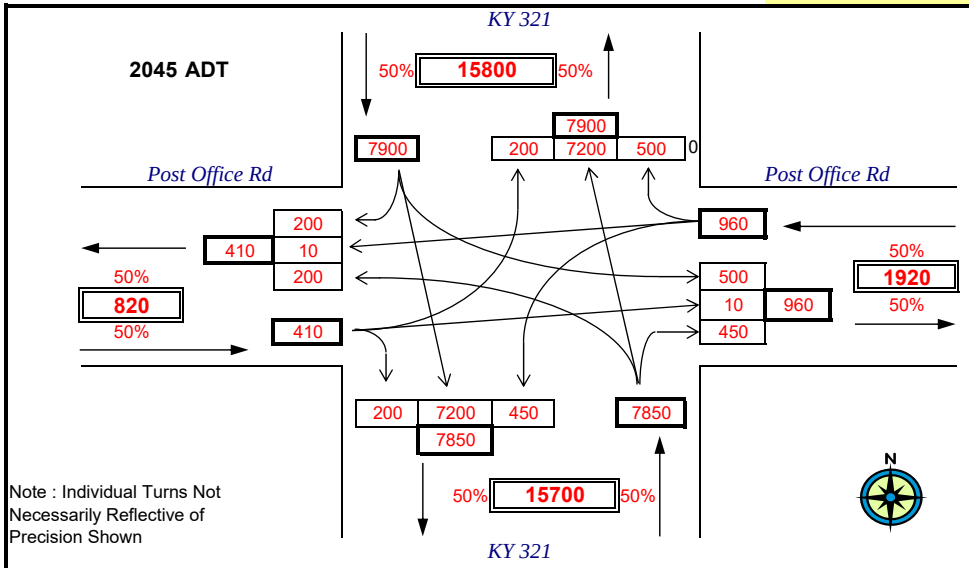


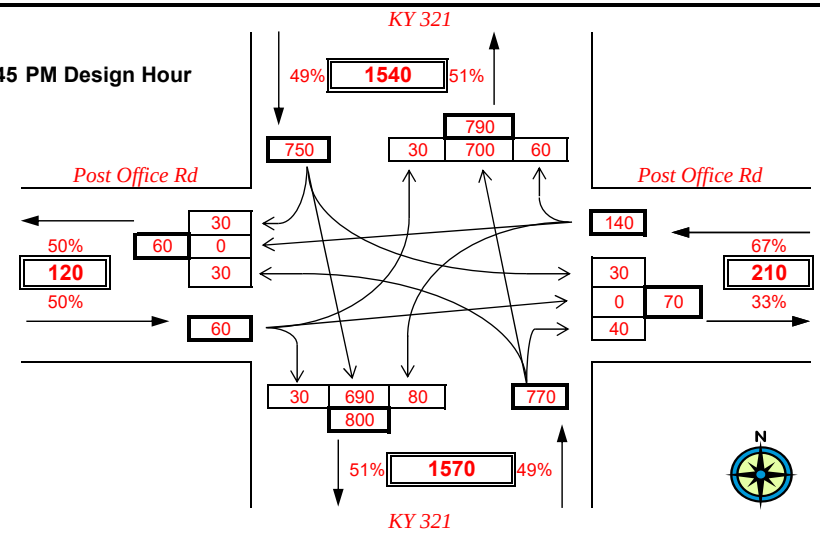
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & USPS

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 11 (2045)

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





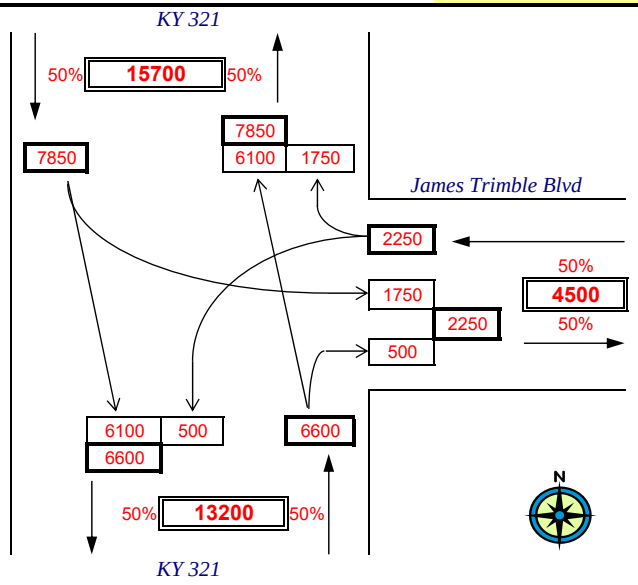
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 321 & James Trimble Blvd

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT 12 (2045)

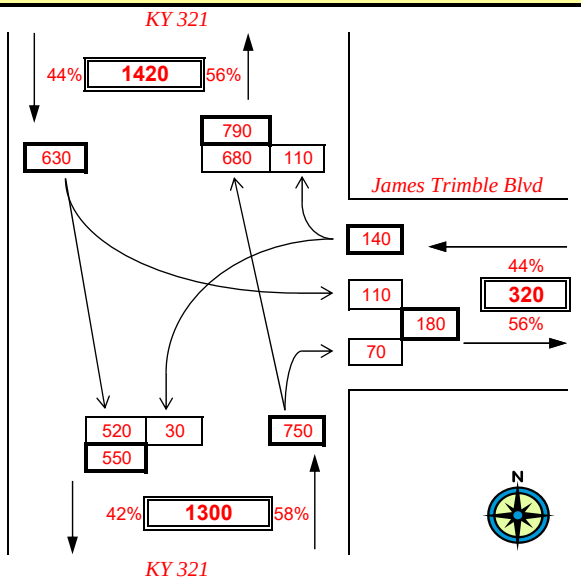
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



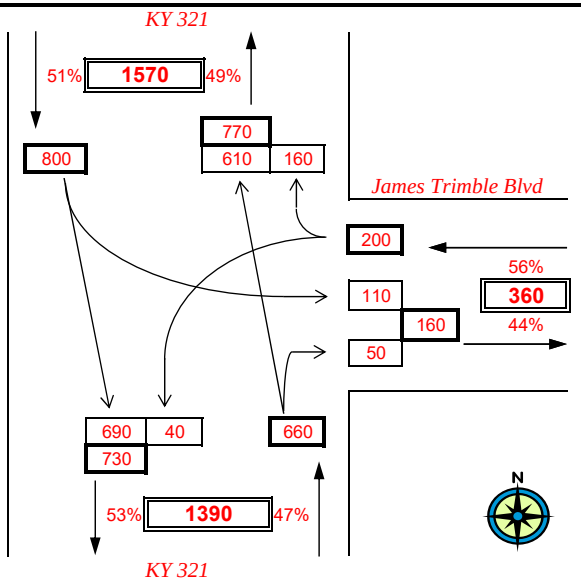
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour



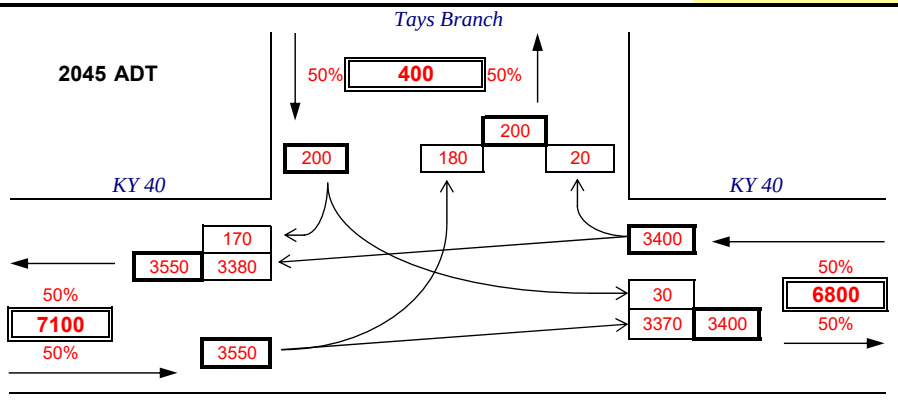
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & Tays Branch

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT (2045)

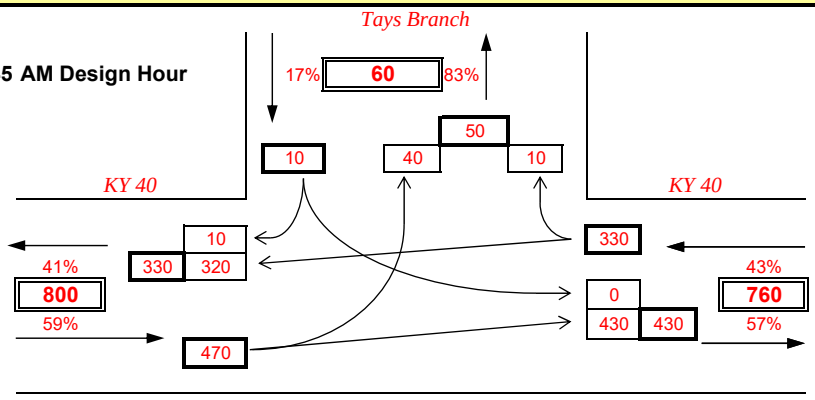
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



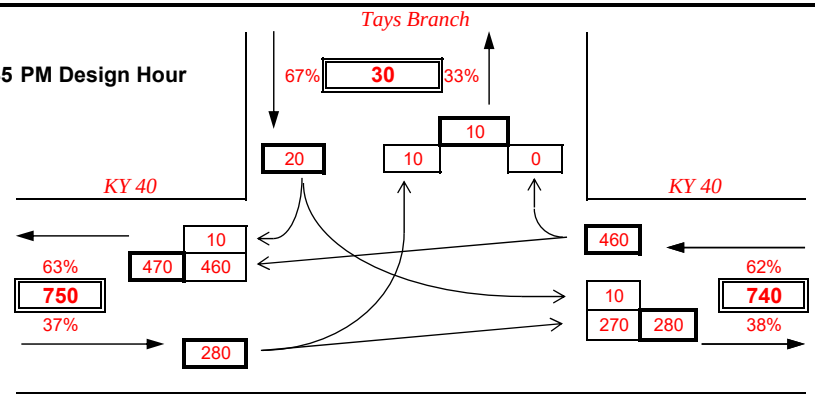
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour



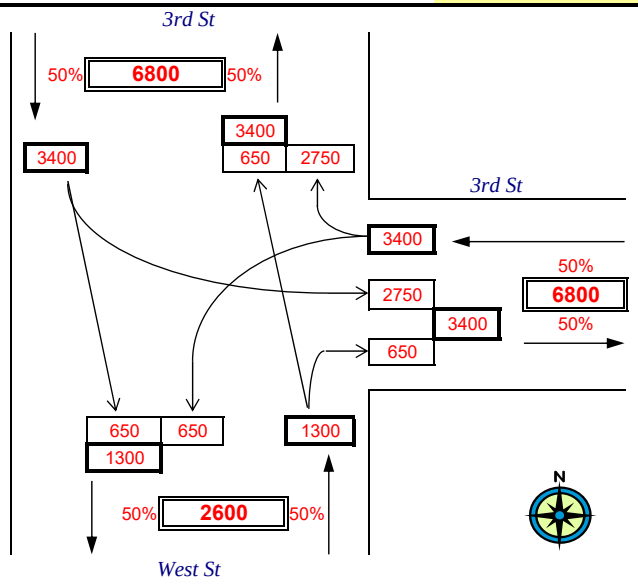
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: KY 40 & West St

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT (2045)

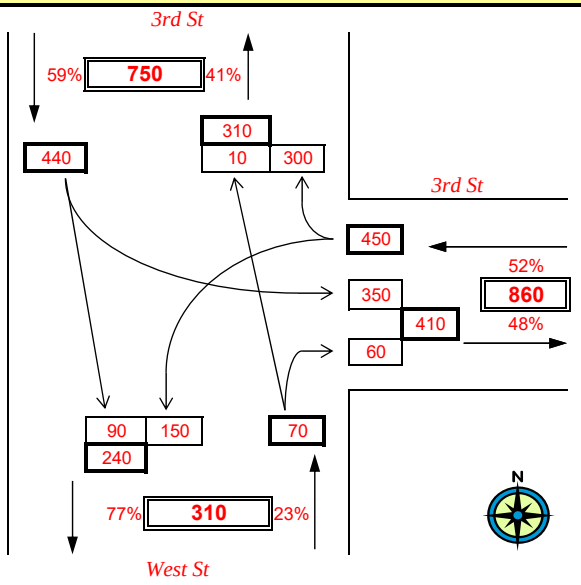
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



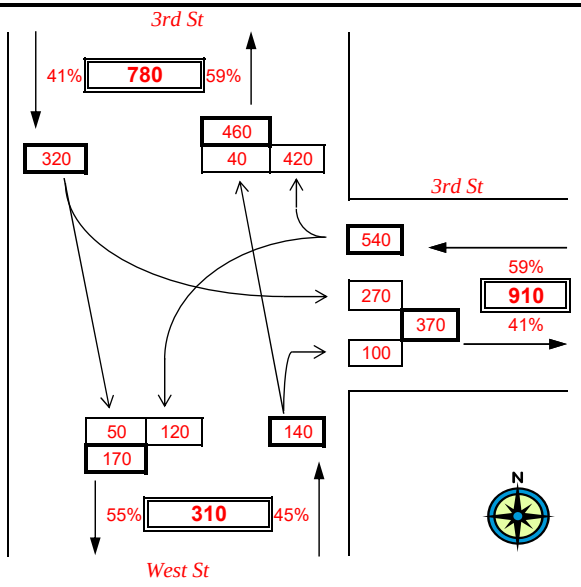
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour



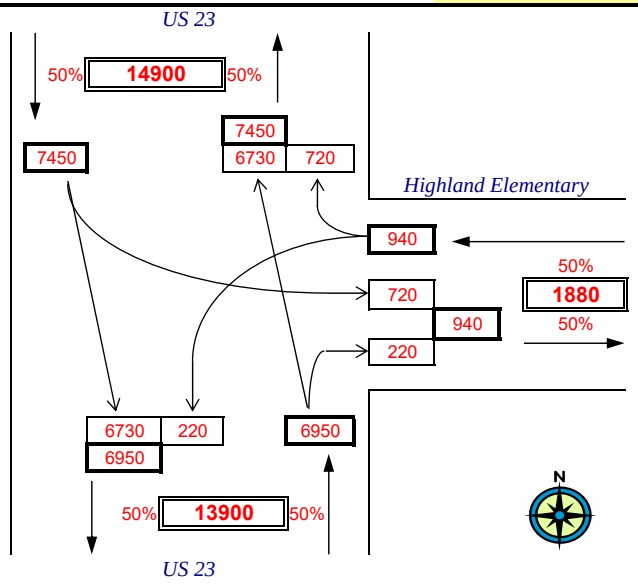
PROJECT: KY 321 Corridor Study
ITEM NUMBER: 12-80116
MARS NUMBER: 0
REQUEST DATE: Thursday, February 1, 2024
ANALYST: 0
YEAR: **2045** **ADT and Design Hour Volumes**
INTERSECTION: US 23 & Highland Elementary

NOTE: Directional distributions were determined from a calculated turning movement count.

TURN MOVEMENT (2045)

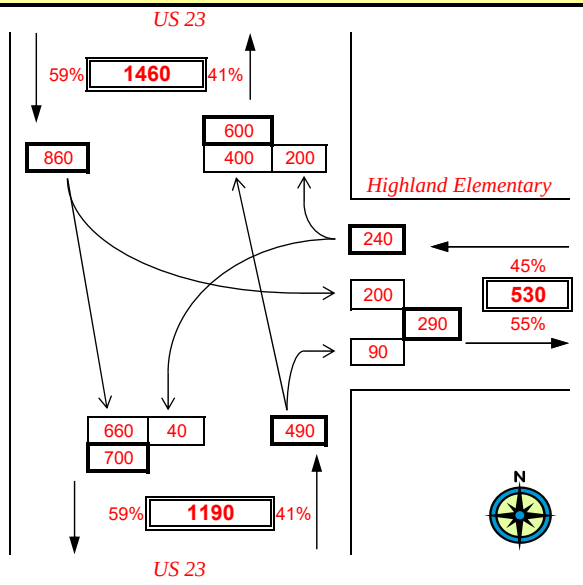
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2045 ADT



Note : Individual Turns Not Necessarily Reflective of Precision Shown

2045 AM Design Hour



Location Map

2045 PM Design Hour