APPENDIX D: TRAFFIC FORECASTING TECHNICAL MEMORANDUM

Stantec

Memo

To:	Jayalakshmi Balaji, PE KYTC Division of Planning	From:	Graham Winchester, PE Stantec Consulting Services
File:	US 68 Corridor Study Traffic Forecasting Tech Memo	Date:	August 21, 2024

Reference: US 68 Corridor Study - Traffic Forecasting Technical Memorandum

PROJECT DESCRIPTION

As part of the US 68 Corridor Study, Stantec was asked to identify and evaluate potential concepts to improve safety, truck mobility, and driver expectations (geometrics) on US 68 in Jessamine and Mercer Counties and to determine the need and optimal location for a replacement Kentucky River crossing. Historical traffic data, population trends, and results from the Kentucky Statewide Traffic Model (KYSTMv19) were used to develop the forecasts.

This memorandum presents the methodology and assumptions used in the development of the traffic forecasts for the corridor.

STUDY AREA

Figure 1 displays the study corridor highlighted in red, which includes US 68 from milepoint (MP) 14.450 to MP 20.058 in Mercer County and MP 0.000 to MP 1.380 in Jessamine County.

HISTORICAL DAILY TRAFFIC

Historical KYTC traffic count data on study area roadways were analyzed to determine traffic growth patterns over the past 20 years. As shown in **Figure 2**, daily traffic on US 68 ranges from 2,900 vehicles per day (VPD) in Mercer County to 3,200 VPD in Jessamine County in the study area. KY 33 carries 1,300 VPD south of US 68 in Mercer County and 800 VPD north of US 68 in Jessamine County.

Compound annual growth rates (CAGR) for medium-term (around 10 years) and long-term (around 20 years) periods were calculated to determine historical growth trends in the study area. Historical trends for study area KYTC count stations between 2004 and 2024 are presented in **Table 1** and shown graphically in **Figure 3**. The US 68 study area count stations show a slight increase over the past 18 years. The red text in Table 1 represents traffic counts from 2020 and early 2021, which are not an accurate representation of recent traffic patterns due to COVID shutdowns. The 2020 / early 2021 traffic counts are provided for reference but were not used to calculate the compound annual growth rates.

While the annualized average daily traffic (AADT) on study area roadways have remained relatively flat over the past 20 years, individual June 2024 counts on US 68 in Mercer County (Sta. 001) show daily traffic around 3,200 VPD. Using this count without seasonal adjustment factors would result in a long-term CAGR of 0.7 percent per year.

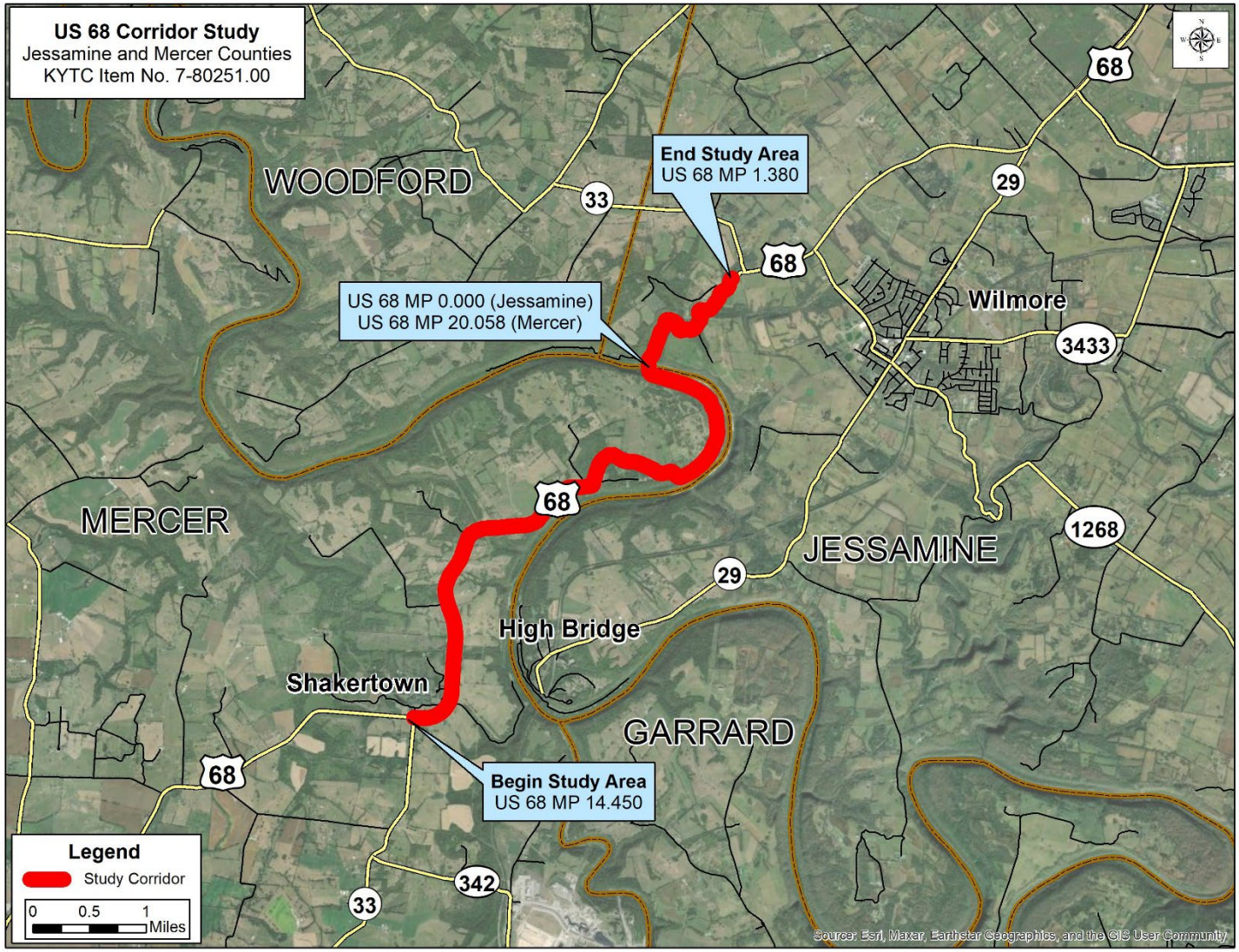

Figure 1: US 68 Corridor Study Area

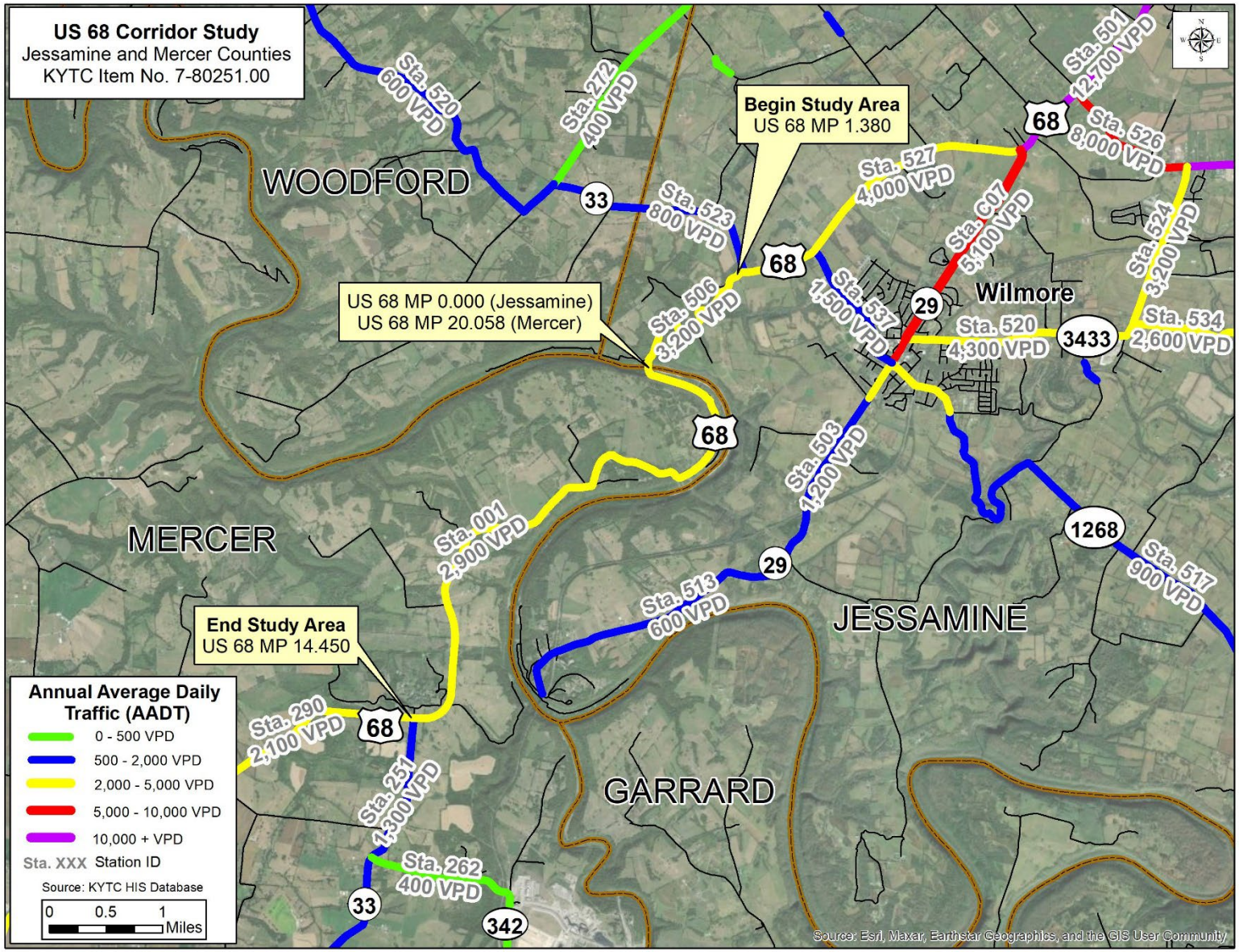

Figure 2: US 68 Study Area AADT

Table 1: Historical KYTC Traffic Counts

Year	US 68		KY 33	
	Sta. 001	Sta. 506	Sta. 251	Sta. 523
2004				
2005				919
2006	2,860	2,980	1,300	
2007				
2008				993
2009	2,850	3,060	1,240	
2010				
2011				956
2012	2,942	2,886	1,228	
2013				
2014				884
2015	2,741		1,206	
2016				
2017				787
2018	3,175	3,177	1,318	
2019				
2020				946
2021	2,641	2,811	1,047	
2022				
2023				
2024	2,905		1,256	
Long Term GR	0.09%	0.53%	-0.19%	-1.28%
Medium Term GR	-0.11%	0.42%	0.19%	-2.55%

Source: Kentucky Transportation Cabinet (KYTC)

*2020 / early 2021 counts not used in growth rate calculations

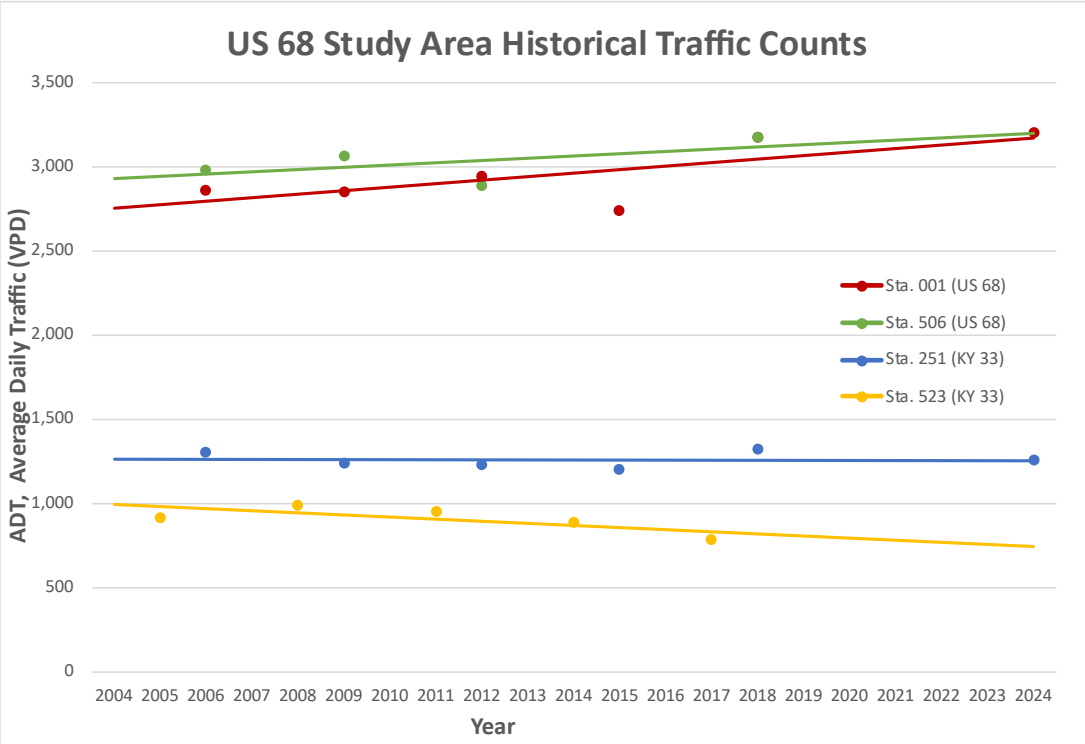

Figure 3: Historical KYTC Traffic Counts

POPULATION GROWTH

Population estimates and projections for Jessamine and Mercer Counties and the state of Kentucky were obtained from the Kentucky State Data Center (KSDC), as shown in **Table 2.** Between 2010 and 2020, both Jessamine and Mercer Counties grew at a higher rate than the rest of the state. The KSDC projects this growth to continue to 2050, with Jessamine and Mercer Counties expecting annual population growths of 0.64 percent per year and 0.25 percent per year, respectively, as shown in **Figure 4**.

Table 2: KSDC Population Estimates and Projections

Area	Census Estimates		Annual Growth	2050 Projection	Annual Growth
	2010	2020	2010-2020		2020-2050
Kentucky	4,339,367	4,505,836	0.38%	4,785,233	0.20%
Jessamine County	48,586	52,987	0.87%	64,162	0.64%
Mercer County	21,331	22,643	0.60%	24,430	0.25%

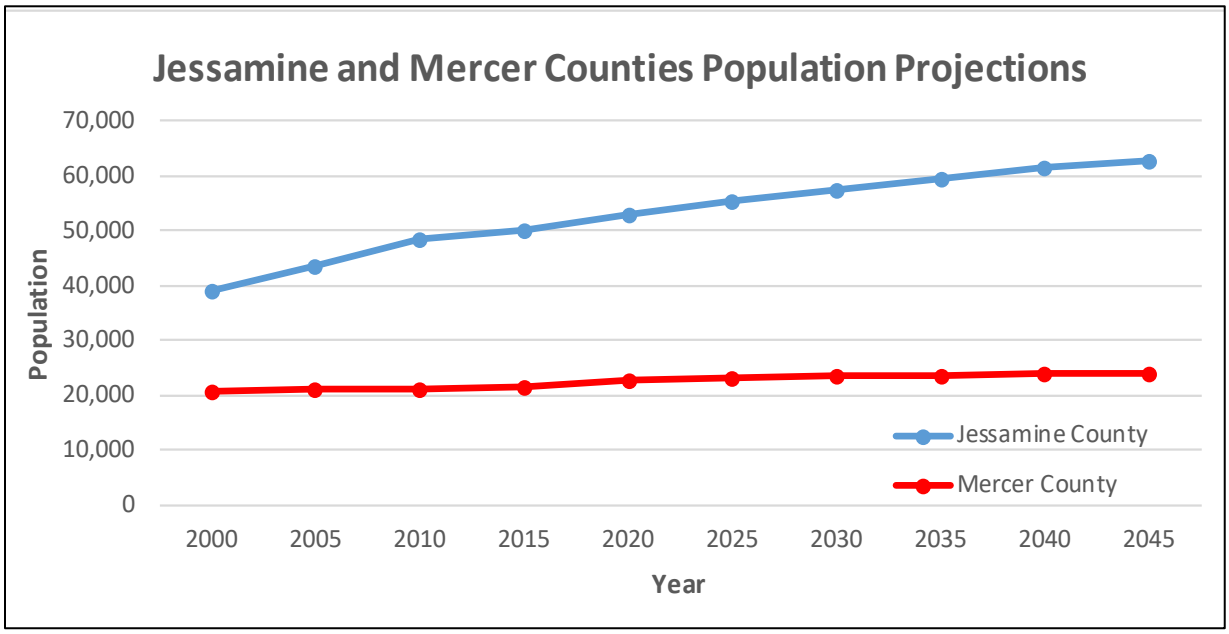

Figure 4: Population Projections

KENTUCKY STATEWIDE TRAVEL MODEL (KYSTM)

As an additional data source, study area growth rates from the Kentucky Statewide Travel Model (KYSTM) were reviewed. **Figure 5** presents the No-Build annual growth rates on the study corridor and adjacent roadways between 2019 and 2045. Daily traffic on US 68 in both Jessamine and Mercer Counties along the study corridor is expected to increase at an annual rate of 1.6 percent per year under a No-Build scenario. Adjacent roadways show similar growth, with annual growth rates in Wilmore at nearly three percent. This growth in the model is due to expected employment and household growth in the area.

2045 TRAFFIC FORECASTS

Because the existing US 68 bridge will eventually need to be replaced, there is no true "No-Build" option for the *US 68 Corridor Study*. Growth scenarios were instead developed for on- and off-alignment concepts. The On-Alignment scenario assumes safety improvements to the existing US 68 corridor that will not increase capacity or speed and a bridge replacement at the existing Kentucky River crossing. The Off-Alignment scenario includes new Kentucky River crossings and the potential for travel time savings.

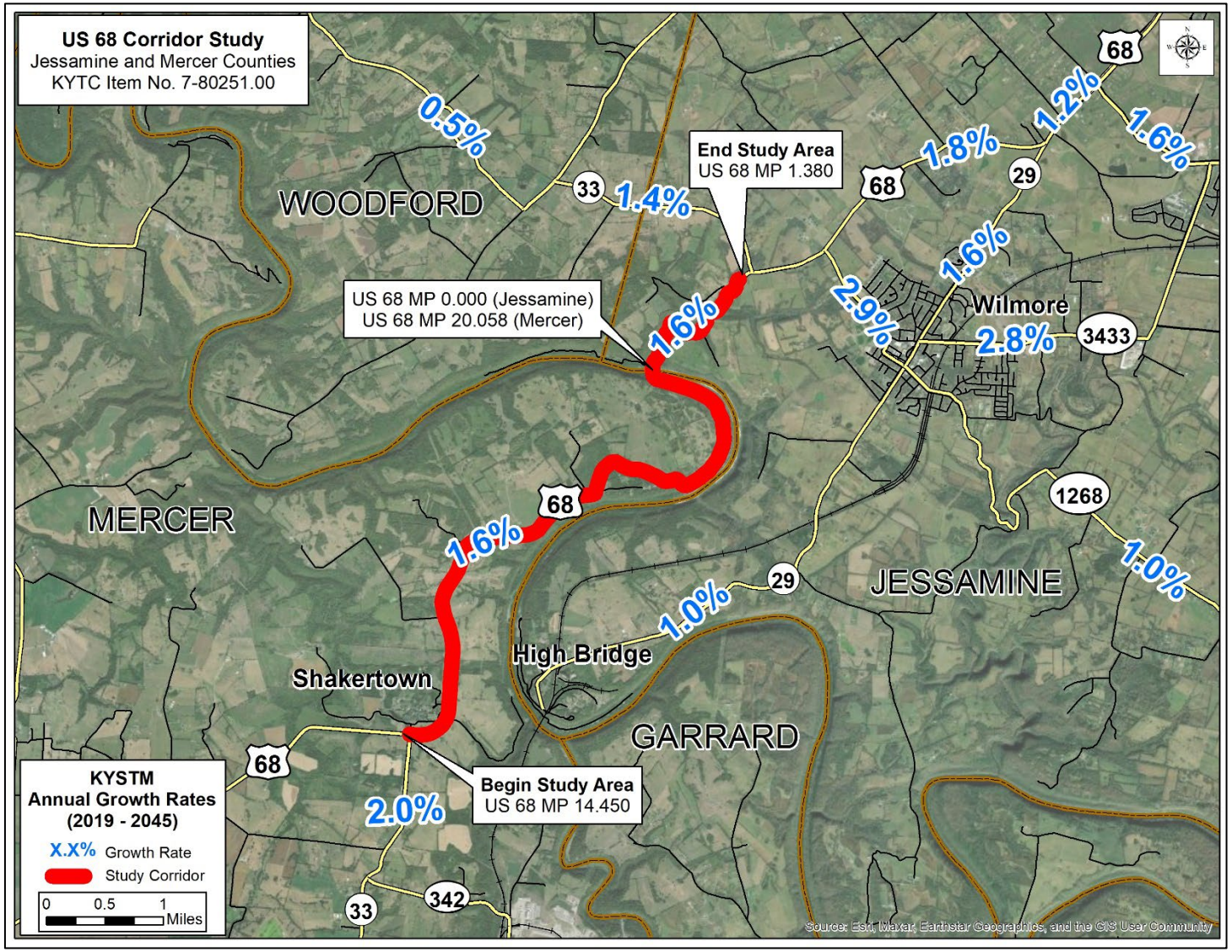

Figure 5: KYSTM Annual Growth Rates (2019 - 2045)

2045 ON-ALIGNMENT TRAFFIC FORECASTS

Based on the KYTC historical traffic count data, population estimates and projections, and results from the KYSTM, an annual growth rate of one percent was selected to grow On-Alignment scenario traffic through the year 2045. While historical traffic has remained relatively flat over the past 20 years, individual daily counts and results from the model show that the area has grown and is expected to continue growing. The US 68 bridge is also regionally important, as it is the only Kentucky River crossing in the area, with the nearest crossings 16 miles (US 27) to 21 miles (Bluegrass Parkway) away. The annual growth rate was used to forecast daily traffic to 2045, as shown in **Figure 6**.

2045 OFF-ALIGNMENT TRAFFIC FORECASTS

2045 Off-Alignment daily traffic forecasts were developed through multiple KYSTM runs assuming various new Kentucky River crossings. 2045 traffic across the Kentucky River is shown as a range, as shown in **Figure 7**, to capture the traffic possibilities resulting from travel time savings of different river crossing locations. Daily assignments from the model were used to forecast traffic on the potential new and upgraded roadways. All potential new Kentucky River crossings and updated routes were assumed to have two 11-foot lanes with four foot shoulders, a 55-mph speed limit, and a TLCLASS of two.

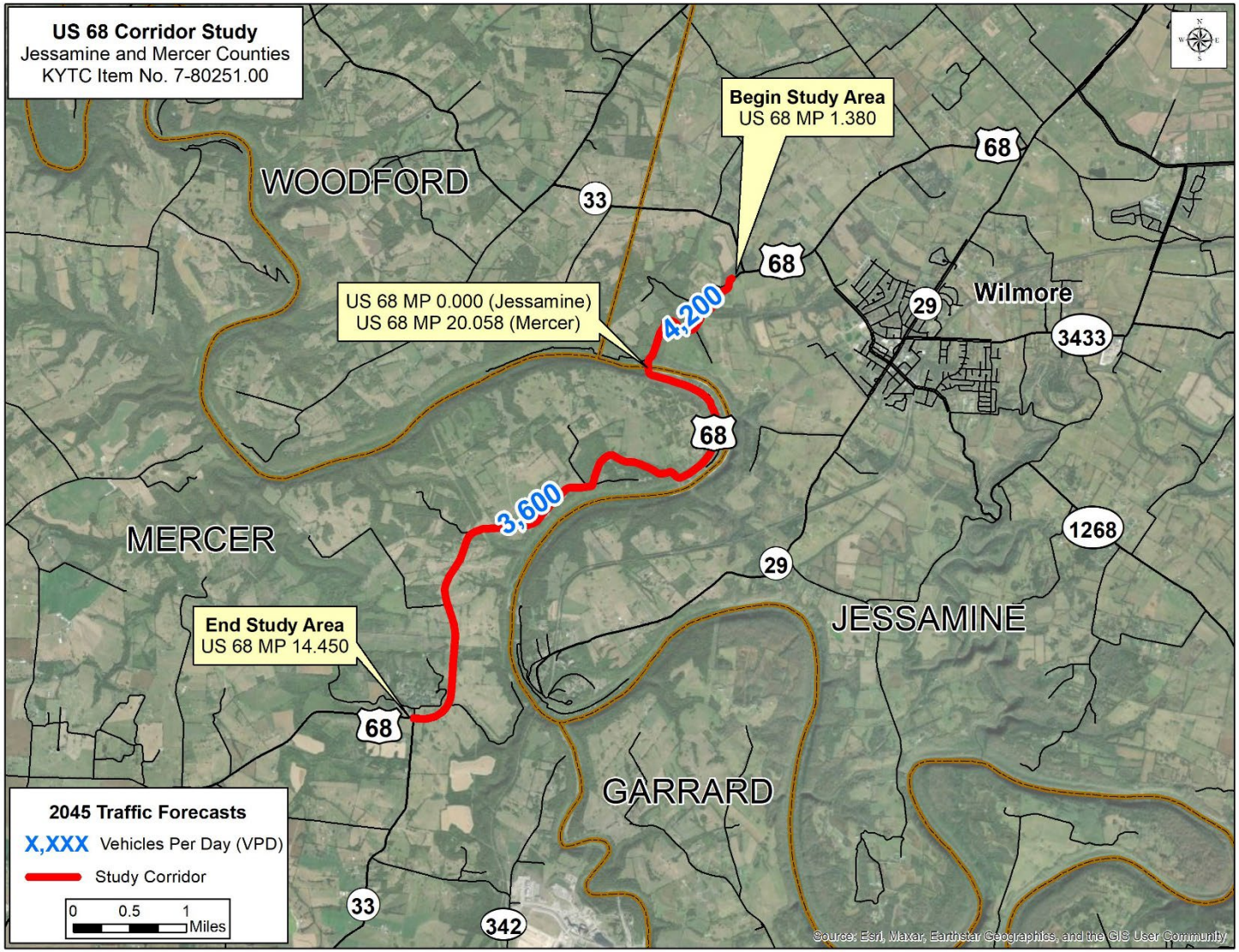

Figure 6: 2045 On-Alignment Daily Traffic Forecasts

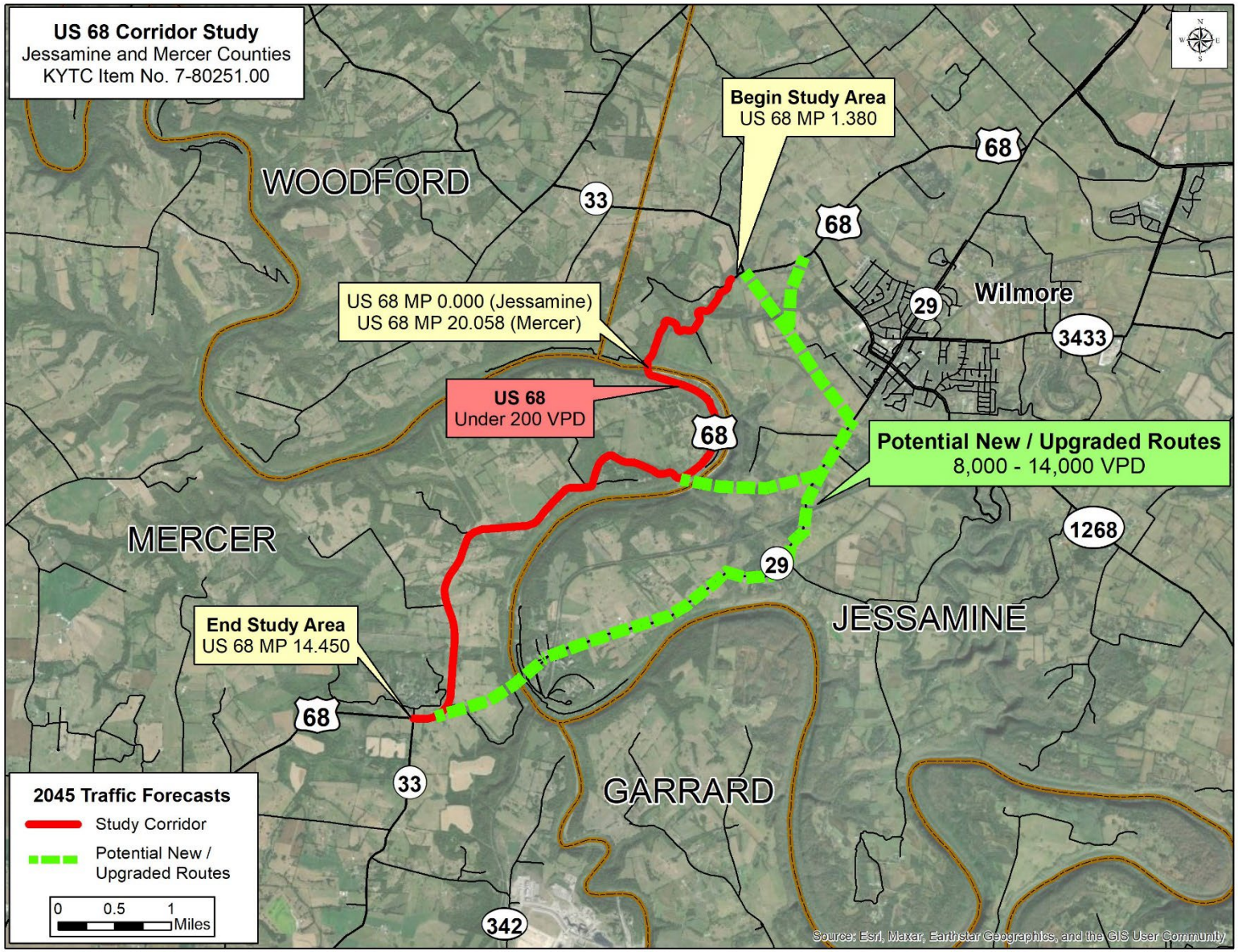

Figure 7: 2045 Off-Alignment Daily Traffic Forecasts

NEXT STEPS

The next step is to analyze the preliminary improvement concepts using the traffic forecasts.

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