

# **APPENDIX D**

## **Traffic Forecast Technical Memorandum**

|       |   |       |  |
|-------|---|-------|--|
| To:   | Scott Thomson<br>Model Team Lead<br>KYTC Division of Planning | From: | Len Harper<br>Graham Winchester<br>Stantec |
| File: | Lone Oak Road (US 45) Reversible Lanes Feasibility Study      | Date: | May 13, 2020                               |

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memorandum**

## Introduction

As a part of the Lone Oak Road (US 45) Reversible Lanes Feasibility Study, Stantec is tasked with developing future year 2030 traffic forecasts for the study portion of US 45. Growth rates from the McCracken County Travel Demand Model, historical traffic counts from Kentucky Transportation Cabinet (KYTC) count stations, and forecasts from Existing plus Committed (E+C) projects were used to develop the forecasts. Additionally, a second set of traffic forecasts was developed to replicate the reversible lanes concept. **Figure 1** presents the study area, which includes US 45 from south of Clinton Road to the Jackson Street (US 62) intersection.

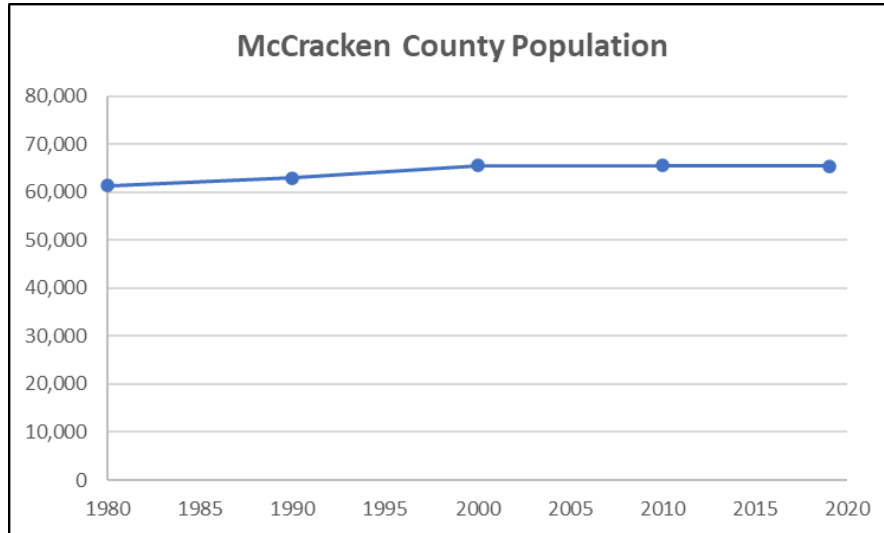


**Figure 1: Lone Oak Road (US 45) Study Area**

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memo**

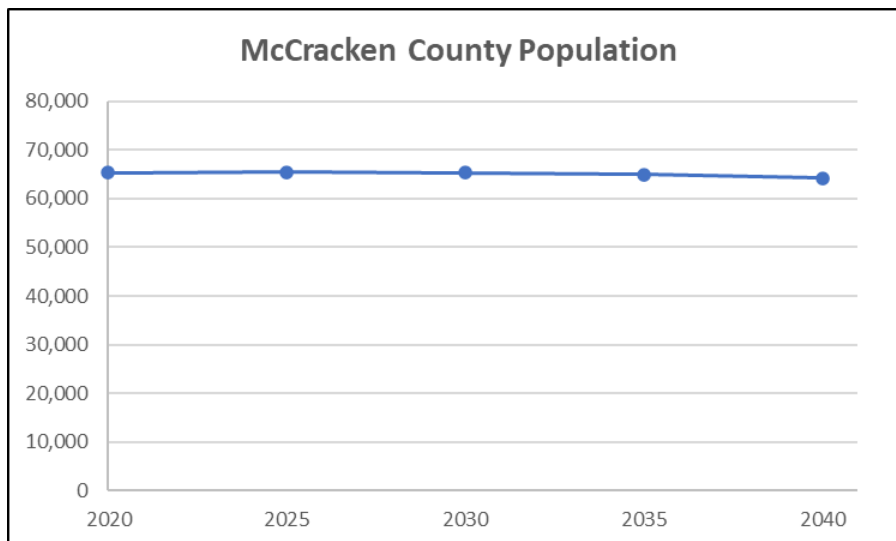
## McCracken County Growth

In the 20 years between 1980 and 2000, McCracken County experienced slight population growth, growing from 61,000 to 65,500 residents. However, in the 20 years since 2000, this growth has leveled off, as shown in **Figure 2**.



**Figure 2: McCracken County Population Growth (1980 – 2020)**  
(Source: KY State Data Center)

Based on projections from the Kentucky State Data Center, McCracken County's population is expected to decline slightly over the next 20 years, as shown in **Figure 3**.

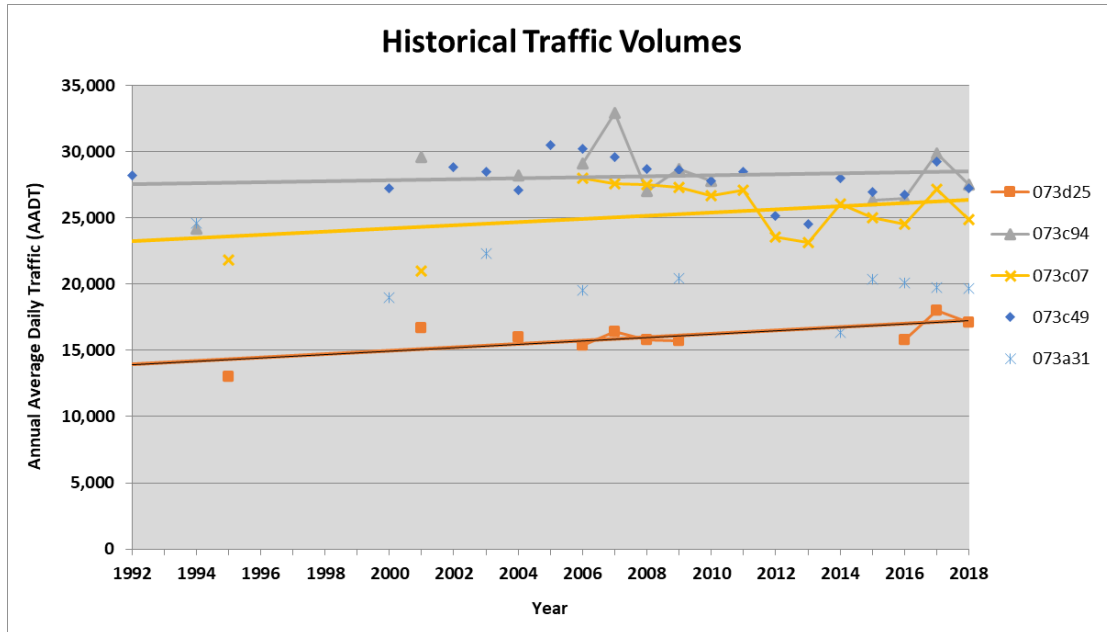


**Figure 3: McCracken County Population Projections (2020 – 2040)**  
(Source: KY State Data Center)

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memo**

## Historical Traffic Volumes

Historical KYTC traffic volumes on Lone Oak Road have grown slightly over the past 30 years, as shown in **Figure 4**. Annual growth rates on Lone Oak Road range between from 1.2 percent south of Lovelaceville Road to 0.15 percent north of I-24.



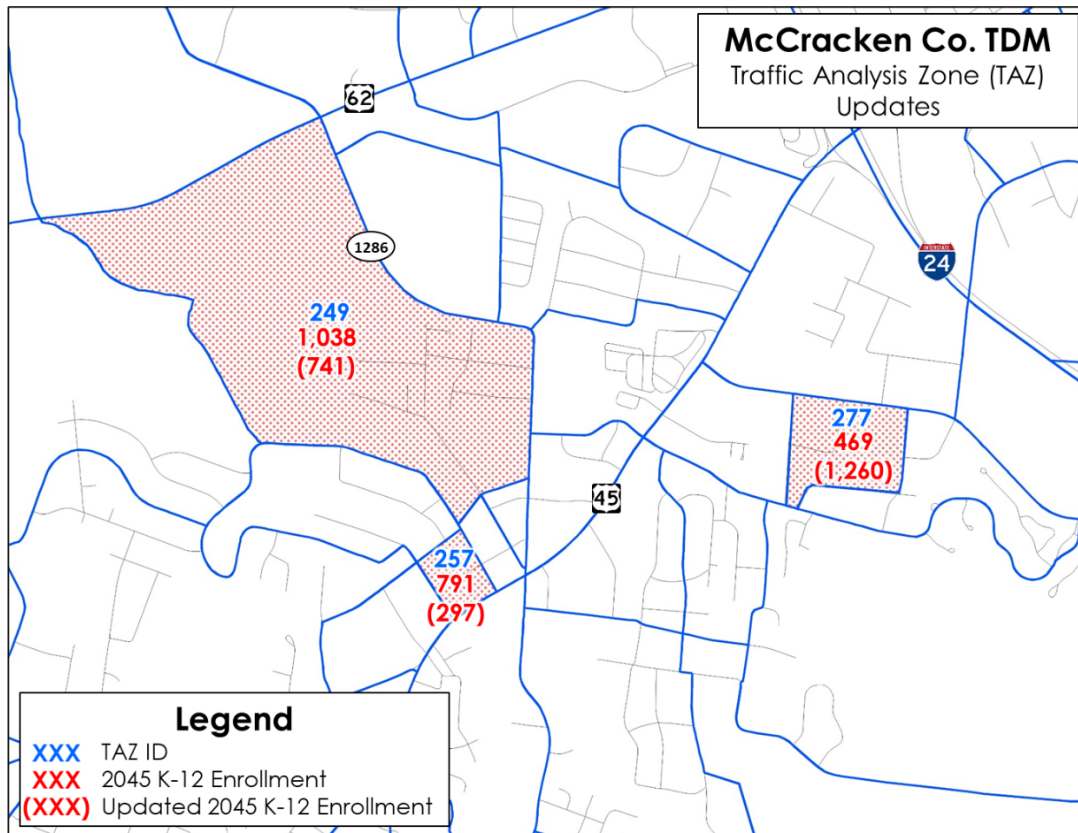
**Figure 4: KYTC Historical Traffic Growth**

## Existing plus Committed (E+C) Projects

The 2030 Lone Oak Road forecasts include the following E+C projects:

- KY 1286 (Friendship Road) Relocation Project
  - Friendship Road will be relocated from its existing alignment north of the Lone Oak Road intersection to Lakeview Drive
  - 30 percent of traffic will remain at the existing Friendship Road intersection
  - 70 percent of traffic will be diverted to the relocated intersection at Lakeview Drive
- Relocation of Lone Oak Middle School to Bleich Road and relocation of Lone Oak Intermediate School to Lone Oak Middle School (shown in **Figure 5**)
  - K-12 enrollment, or the number of students enrolled in kindergarten through 12<sup>th</sup> grade, for Lone Oak Middle School shifted from TAZ 257 to TAZ 277
  - K-12 enrollment for Lone Oak Intermediate School shifted from TAZ 249 to TAZ 257

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memo**



**Figure 5: Updates to McCracken County TDM TAZs**

- Highway Safety Improvement Program (HSIP) project at the US 45 intersection with McCauley Drive/Kennedy Road
  - This intersection improvement project does not increase capacity and did not directly affect the development of growth rates. It was, however, included in the simulation model.

### **McCracken County Travel Demand Model Growth**

Although McCracken County's population is expected to experience a slight downward trend over the next 20 years, there are certain portions of the county where growth is anticipated. The Lone Oak Road (US 45) corridor is one of the locations expected to experience growth. With the downtown Paducah area mostly built-out, the community of Lone Oak and rural areas to the south continue to see residential growth. These residents use Lone Oak Road to access I-24, downtown Paducah, hospitals and other attractions to the north.

The McCracken County Travel Demand Model (TDM) reflects these growth trends, with higher growth on the study portion Lone Oak Road, particularly south of I-24, between 2015 and 2045. Annual growth rates range from just under 1 percent per year near Friendship Road to zero to the north, as shown in **Figure 6**.

Reference: Lone Oak Road (US 45) Traffic Forecasting Memo

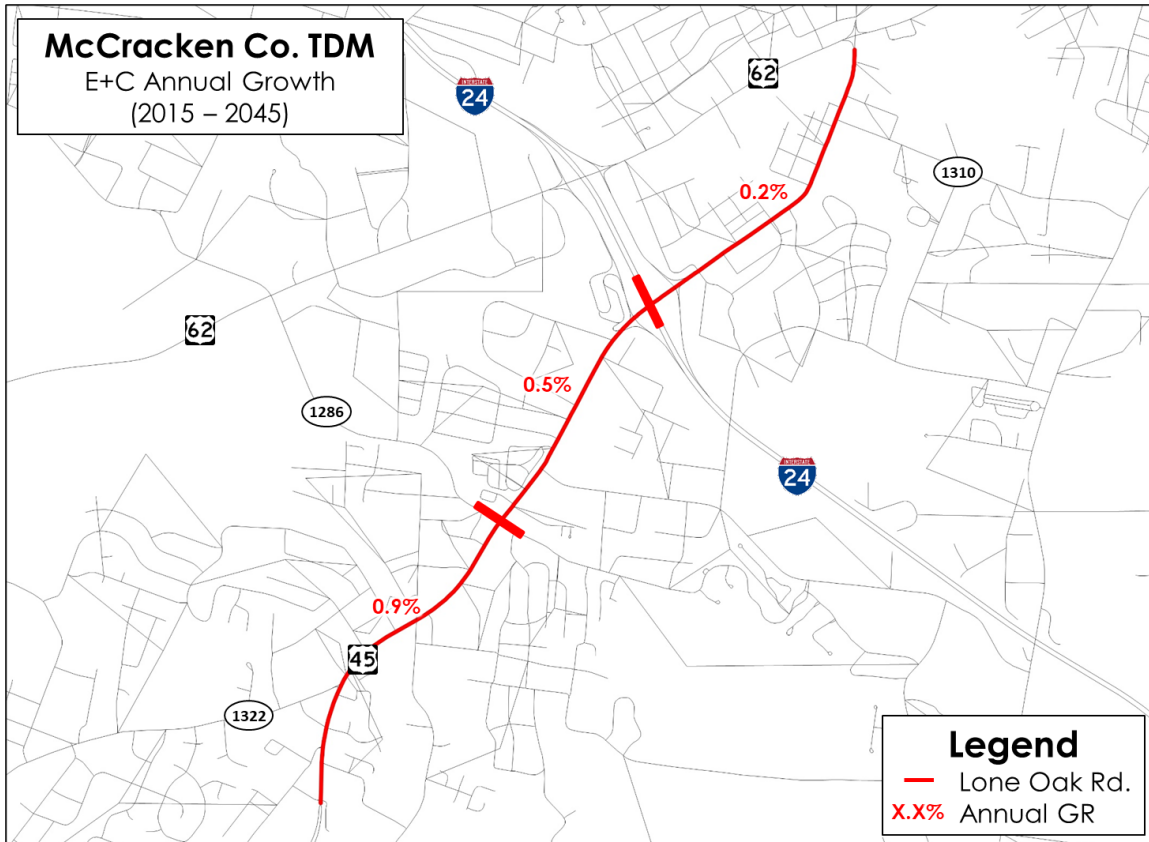


Figure 6: McCracken TDM Annual Growth

### Traffic Forecasts

Using the McCracken County Travel Demand Model, historical KYTC traffic counts, and forecasts from the relocation of Friendship Road, variable growth rates were established for the Lone Oak Road corridor, as shown in **Table 2**. The portion of Lone Oak road south of Friendship Road is expected to grow at a faster rate than the northern portion of the corridor. This is reflected in the variability of the annual growth rates by section.

Table 2: E+C Annual Growth Rates

| Lone Oak Road (US 45) Segment | KYTC Historical Annual GR | McCracken County TDM Annual GR | Friendship Rd. Relocation Project Annual GR | Lone Oak Rd. Reversible Lanes Study Annual GR |
|-------------------------------|---------------------------|--------------------------------|---|---|
| South of Friendship Rd.       | 1.20%                     | 0.90%                          | 1.5%*                                       | 1.50%   |
| Between Friendship & I-24     | 0.58%                     | 0.50%                          |   | 0.75%   |
| Between I-24 & Jackson        | 0.19%                     | 0.20%                          | N/A   | 0.50%   |

\* Growth rate for Lone Oak Rd. intersections with Friendship Rd. & Lakeview Dr.

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memo**

Future year (2030) peak hour and daily traffic forecasts were developed based on the variable growth rates, as shown in **Table 3**. The peak hour volumes, shown in vehicles per hour (vph), correspond to the AM (7:00 a.m. – 8:00 a.m.) and PM (4:30 p.m. – 5:30 p.m.) peak hours on Lone Oak Road based on existing traffic counts.

**Table 3: Lone Oak Road Forecasted Traffic Volumes**

| Lone Oak Road (US 45) Segment | 2020 ADT (vpd) | 2020 AM Peak (vph) | 2020 PM Peak (vph) | Annual GR | 2030 ADT (vpd) | 2030 AM Peak (vph) | 2030 PM Peak (vph) |
|-------------------------------|----------------|--------------------|--------------------|-----------|----------------|--------------------|--------------------|
| South of Friendship Rd.       | 17,600         | 2,300              | 2,600              | 1.50%     | 20,700         | 2,700              | 3,000              |
| Between Friendship Rd. & I-24 | 25,300         | 2,100              | 2,300              | 0.75%     | 27,400         | 2,300              | 2,500              |
| Between I-24 & Jackson        | 19,900         | 1,400              | 1,800              | 0.50%     | 21,000         | 1,500              | 1,800              |

**Expected Diversion from Reversible Lanes Concept**

One of the improvement concepts analyzed for this study is a reversible lanes concept, which includes allowing three lanes northbound, a two-way left-turn lane (TWLTL), and one southbound lane during the AM peak and three lanes southbound, a TWLTL, and one northbound lane during the PM peak. Since this concept increases capacity in the peak direction, traffic is expected to be diverted to northbound Lone Oak Road during the AM peak hour and southbound during the PM peak hour. Similarly, traffic will be diverted from Lone Oak Road to alternate routes in the off-peak direction.

**Figure 5** presents the McCracken County TDM diversion for Lone Oak Road and alternate routes during the AM peak hour. There is an expected 15 percent increase on northbound Lone Oak Road and a 20 percent decrease southbound. Alternate routes such as US 60, US 62, and KY 1954 are expected to see a decrease in traffic in the peak direction and an increase in traffic in the off-peak direction. The opposite is expected during the PM peak, with a 15 percent increase on southbound Lone Oak Road and a 20 percent decrease northbound, as shown in **Figure 6**. Once again, alternate routes are expected to experience a decrease in traffic in the peak direction and an increase in traffic in the off-peak direction.

Reference: Lone Oak Road (US 45) Traffic Forecasting Memo

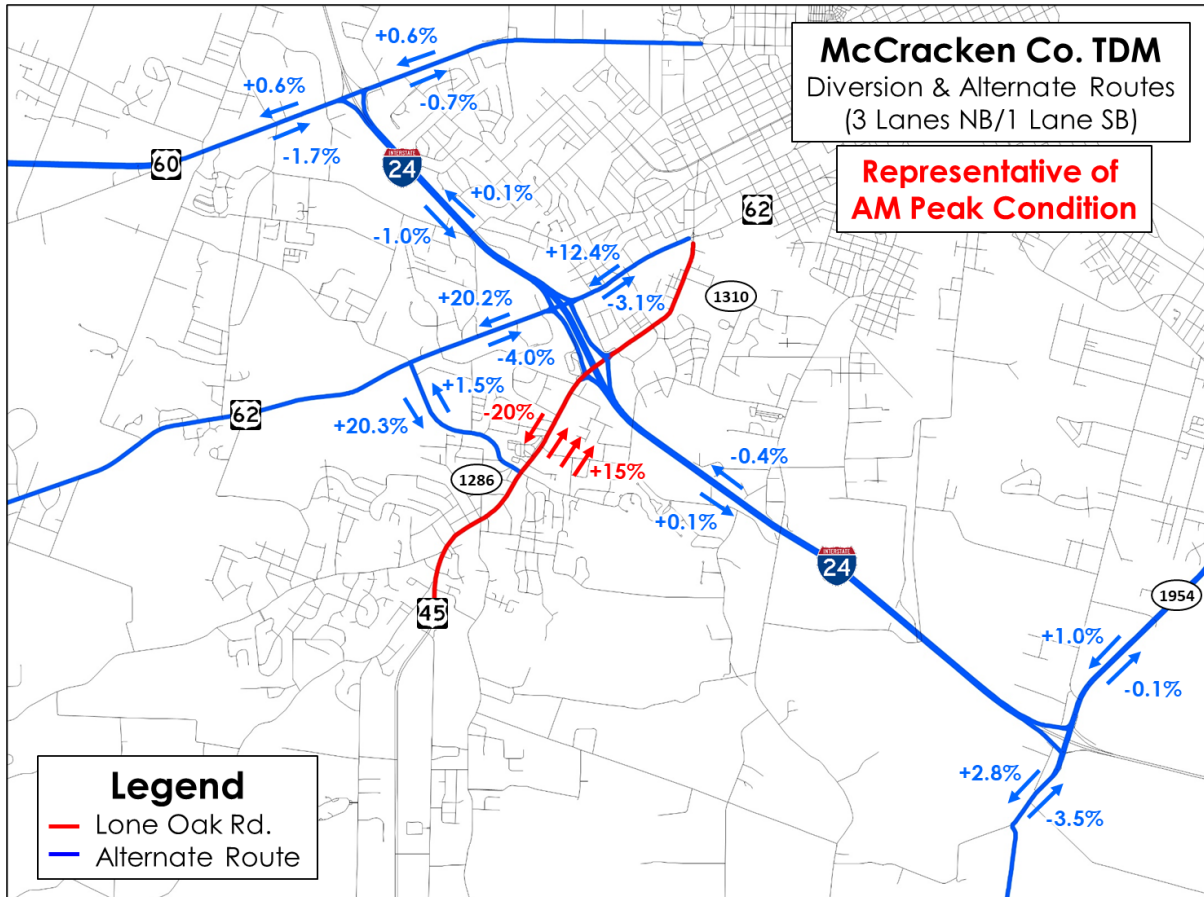


Figure 5: AM Peak Hour Reversible Lanes Diversion



Reference: Lone Oak Road (US 45) Traffic Forecasting Memo

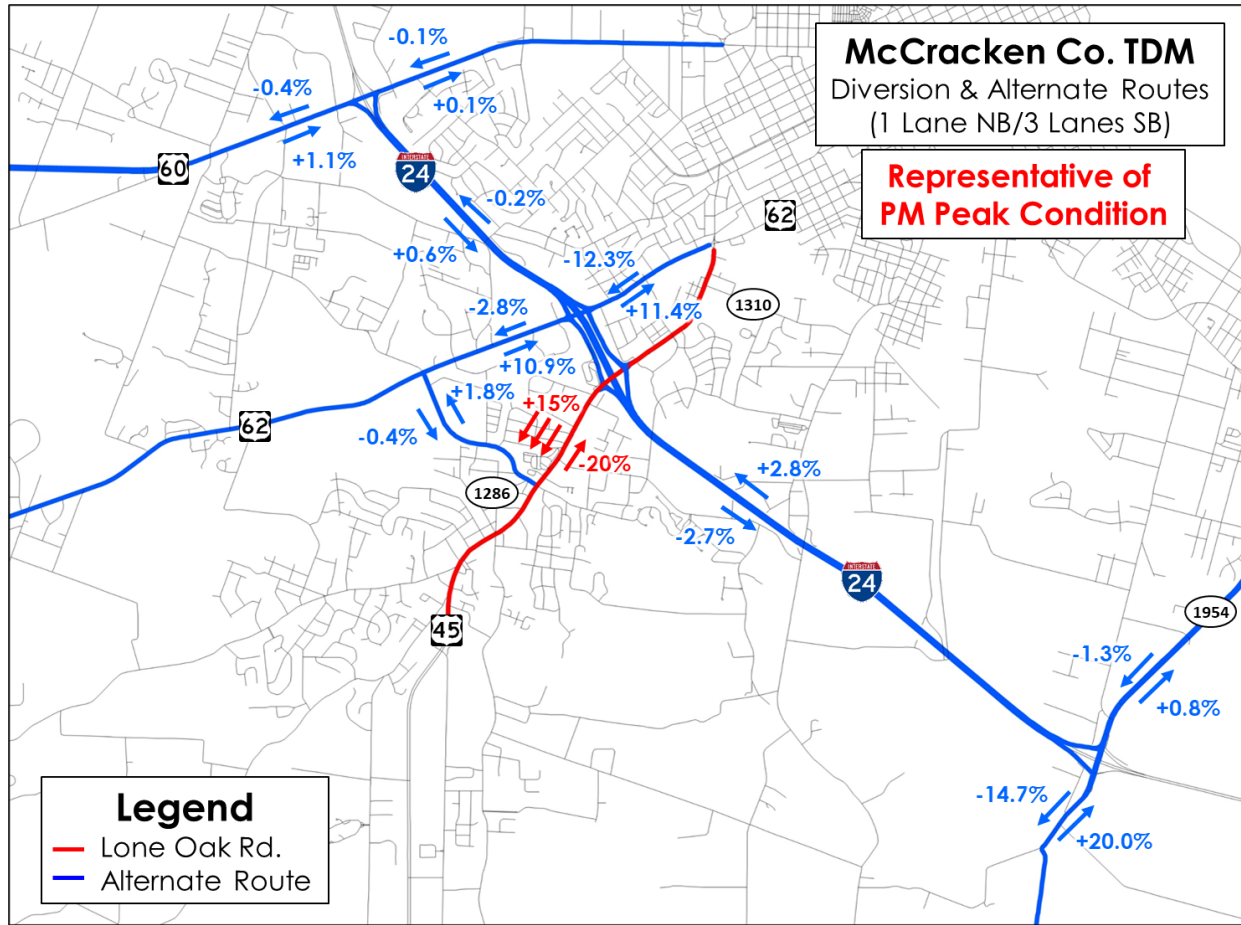


Figure 6: PM Peak Hour Reversible Lanes Diversion

### Reversible Lanes Forecasts

Additional forecasts were developed using the growth rates in Table 2 and the expected diversion from the reversible lanes concept. **Table 4** presents a summary of the reversible lanes concept forecasts by direction.

**Table 4: Lone Oak Road Reversible Lanes Forecasted Traffic Volumes**

| Lone Oak Road (US 45) Segment | 2020 AM Volumes |     | 2030 AM Build |     | 2020 PM Volumes |       | 2030 PM Build |       |
|-------------------------------|-----------------|-----|---------------|-----|-----------------|-------|---------------|-------|
|                               | NB              | SB  | NB            | SB  | NB              | SB    | NB            | SB    |
| South of Friendship Rd.       | 1,550           | 750 | 2,100         | 700 | 1,000           | 1,600 | 950           | 2,100 |
| Between Friendship Rd. & I-24 | 1,300           | 800 | 1,700         | 700 | 1,000           | 1,300 | 850           | 1,700 |
| Between I-24 & Jackson St.    | 1,000           | 400 | 1,300         | 350 | 700             | 1,100 | 600           | 1,300 |



May 13, 2020  
Page 9 of 9

**Reference: Lone Oak Road (US 45) Traffic Forecasting Memo**

**STANTEC CONSULTING SERVICES INC.**

A handwritten signature in cursive script that reads "Leonard Harper".

Len Harper, PE  
Senior Associate  
Phone: (859) 422-1846  
Len.Harper@stantec.com