



US 231 SCOTTSVILLE ROAD SCOPING AND TRAFFIC OPERATIONS STUDY

From I-65 to Lovers Lane
Warren County, Kentucky
March 2015

Submitted To: Kentucky Transportation Cabinet, Division of Planning
Prepared By: CDM Smith

Executive Summary

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KYTC Item No. 3-8702.00

The Kentucky Transportation Cabinet (KYTC), in partnership with CDM Smith and its sub-consultant AEI, undertook a study for US 231, known locally as Scottsville Road, from the newly-constructed single-point interchange at I-65 to US 231 Business/KY 880 (Campbell Lane/Lovers Lane) in Bowling Green.

Purpose & Need

The purpose of the proposed US 231 project is to improve safety and mobility along this route between KY 884 (Three Springs Road)/Ken Bale Boulevard and KY 880 (Campbell Lane)/Lovers Lane, while providing reasonable access along the corridor. Any improvements made should tie-in to the existing interchange. The need is expressed through above average crash rates, congested traffic operations, and close proximity to a frontage road system with numerous conflict points.

Other project goals include accommodating pedestrians and transit where appropriate, minimizing impacts to the human and natural environment, and ensuring any proposed improvement complements other planned projects or roadway improvements.

Existing Conditions

US 231 is classified as an Urban Minor Arterial with a posted speed limit of 45 mph in the study area. It is a six-lane facility from the I-65 interchange, transitioning to a four-lane facility at Three Springs Road and continuing through Campbell Lane. US 231 has 12-foot lanes and 10-foot shoulders. Six signalized and three un-signalized intersections are located along the 1.4 mile-long corridor. A frontage road (24-26 feet wide) provides the primary

commercial driveway access on both sides of the corridor.

One bus route operated by GO bg Transit travels the corridor: Green Line (Route 3).



The US 231 corridor and frontage road system near Cave Mill Road.

Existing traffic volumes range from 29,300 to 31,600 vehicles per day, with the heavier volumes in the middle section between Cave Mill Road and Greenwood Square Shopping Center. Existing volume-to-capacity (V/C) ranges from 0.67 to 0.87, indicating busier sections are nearing their theoretical capacity. Spillback from downstream signals may exacerbate existing congestion, which is not reflected in V/C.

Level of Service (LOS), a qualitative measure of highway traffic conditions was calculated at major study intersections. Cross-street approaches at the six signalized intersections operate at an unacceptable LOS (E or F) during the PM peak hour.

Crashes are very prevalent along US 231, with 881 crashes occurring over a five year analysis period (November 1, 2008 through October 31, 2013), with 157 causing injury and two

resulting in fatalities. The entire corridor experiences a Critical Rate Factor (CRF) greater than 1.00, indicating that crashes may be occurring more often than can be attributed to random occurrence. CRFs range from 2.18 to 4.48, with higher crash concentrations located between Pascoe Boulevard and Three Springs Road. Rear end collisions accounted for 67% of all crashes, which is indicative of a congested roadway with many traffic signals. Ten 0.10-mile long spots along the route also exhibit above average crash rates, representing the majority of the corridor.



Scottsville Road at Three Springs Road. The majority of the corridor does not adequately accommodate pedestrians; for example, the push button location pictured above without sidewalks or crosswalks.

Alternatives Considered

To improve safety and mobility, the project team considered a selection of potential alternatives:

- **No Build** Alternative;
- **Alternative 1**, which would widen US 231 to six lanes and integrate select intersection spot improvements;
- **Alternative 2**, which would maintain four lanes and convert select intersections to right-in/right-out with an additional left-in from US 231 while installing a 32-foot to 42-foot median;
- **Alternative 3**, which would widen US 231 to six lanes and convert select intersections to right-in/right-out with an additional left-in from US 231 while installing a 30-foot median;
- **Alternative 4**, which would widen US 231 to six lanes while installing a 59-foot to 69-foot median;
- **Alternative 5**, which would maintain four lanes and integrate intersection spot improvements.

Pedestrian improvements would be incorporated into all alternatives.

Throughout the study, the project team met with local officials and stakeholders to discuss alternatives and understand local perspectives on improvement concepts. During these discussions, Alternatives 2 and 4 were eliminated from consideration as they did not meet the purpose and need by failing to address future capacity.

Alternative Analysis

The project team developed more detailed conceptual designs and planning-level cost estimates for Alternatives 1 and 3, and the short term improvements (initially evaluated as Alternative 5). Analysts examined future traffic in both the 2026 and 2040 years. In 2026, traffic along the corridor is forecasted to range from 33,400 to 36,000 vehicles per day, with V/C increasing to a maximum of 0.99, indicating additional capacity will be needed by 2026. Volumes in 2040 are forecasted to range from 38,400 to 41,400, which further increases the V/C ratio. The No Build, Spot Improvements, and Alternatives 1 and 3 were simulated using the micro-simulation software package VISSIM. Based on 2040 traffic, the simulation model showed heavy congestion in the No Build and Spot

Improvements scenarios, with improvement shown in Alternatives 1 and 3.

Recommendation

To provide low-cost, short-term improvements while funding is secured for the long term recommendation, spot improvements are recommended. These show short-term benefits help address existing constraints along the corridor. The spot improvements were developed to complement the recommended long-term improvement. The spot improvements are noted below and shown in **Figure ES-1** through **Figure ES-3** (shown on the following pages):

- **Spot Improvement 1:** Add left turn lane at Greenwood Mall entrance (opposite Bryant Way) onto northbound US 231 (estimated construction cost = \$250,000)
- **Spot Improvement 2:** Widen median to 30 feet between Cave Mill Road and Pascoe Boulevard. Provide dual lefts from eastbound Cave Mill Road onto US 231. Replace signal at Greenwood Square Shopping Center, allow signalized left turn into Greenwood Square. Add a lane on Shive Lane between frontage road and US 231. Install bollards on Shive Lane to restrict left turns and through traffic from the frontage road. (estimated construction cost = \$820,000)
- **Spot Improvement 3:** Add an additional left turn lane on eastbound Pascoe Boulevard onto northbound US 231 (estimated construction cost = \$230,000)
- **Spot Improvement 4:** Extend US 231 southbound left turn lane at Ken Bale

Boulevard and close median access to Red Roof Inn/Motel Six (estimated construction cost = \$45,000)

In light of technical analyses and local input, the project team recommends that Alternative 3 be moved forward for future phases to address anticipated capacity constraints and existing safety concerns. Alternative 1 should only be considered if Alternative 3 is right-of-way constrained and low-cost elements of Alternative 3 can be incorporated into the design. Both an urban and rural typical section should be considered in the design phase. **Table ES-1** provides summary information about costs for Alternative 3. If spot improvements are implemented in advance, as described above, this estimate would be reduced. **Figure ES-4** through **Figure ES-6** shows the conceptual design for Alternative 3 and represents a rural typical section. **Figure ES-7** shows both the urban and rural typical sections for Alternative 3.

Table ES-1: Alternative 3 Planning-Level Cost Estimates

Project Phase	Cost (Millions)
Design	\$1.3
Right-of-Way	\$4.7
Utilities	\$9.9
Construction	\$12.9-\$13.0 ¹
Total	\$28.8-\$28.9 ¹

¹Rural vs. Urban typical section.

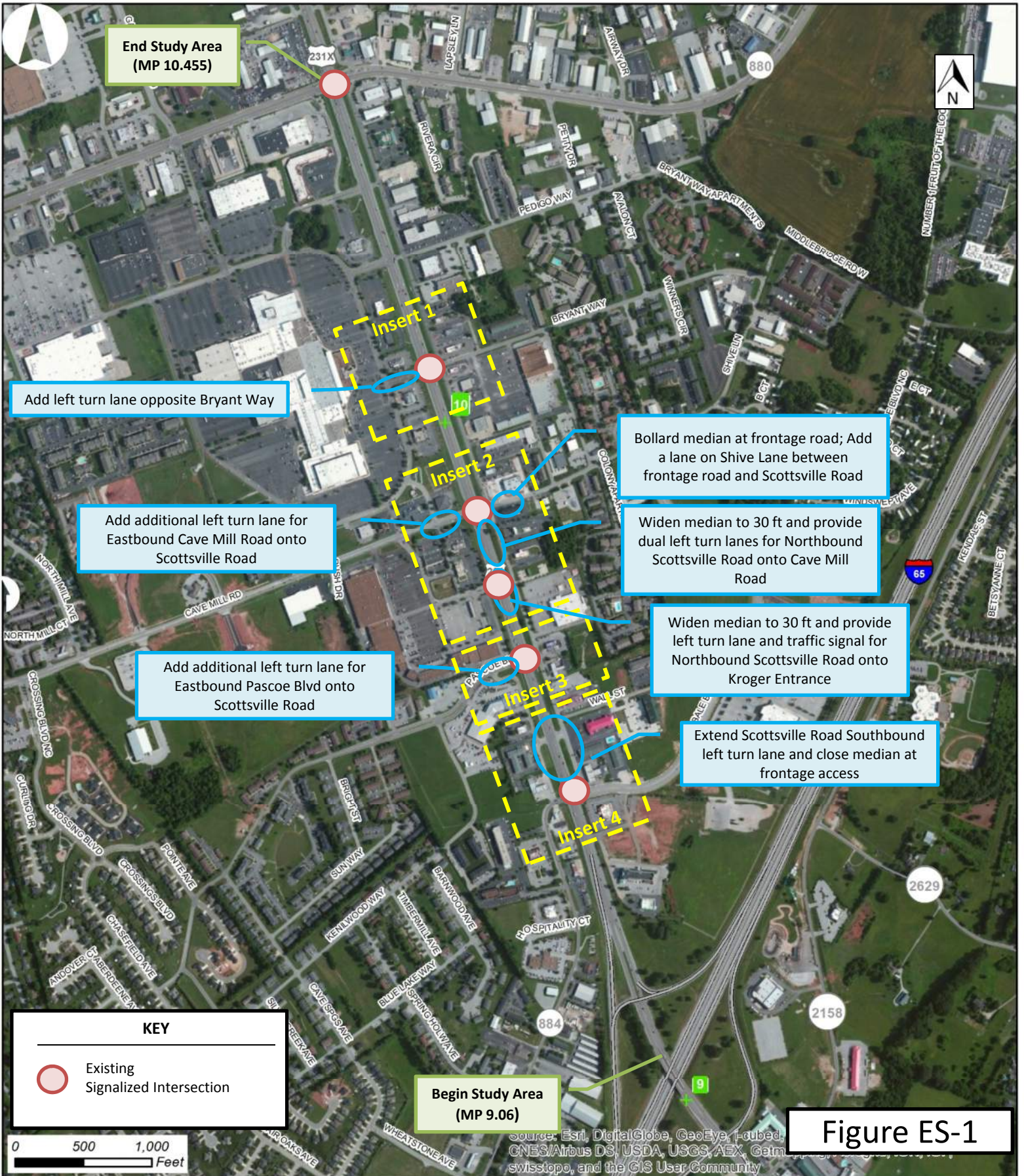


Figure ES-1

**US 231 – Scottsville Rd
From I-65 to Lovers Lane
KYTC Item No 3-8702
Intersection Spot Improvements**



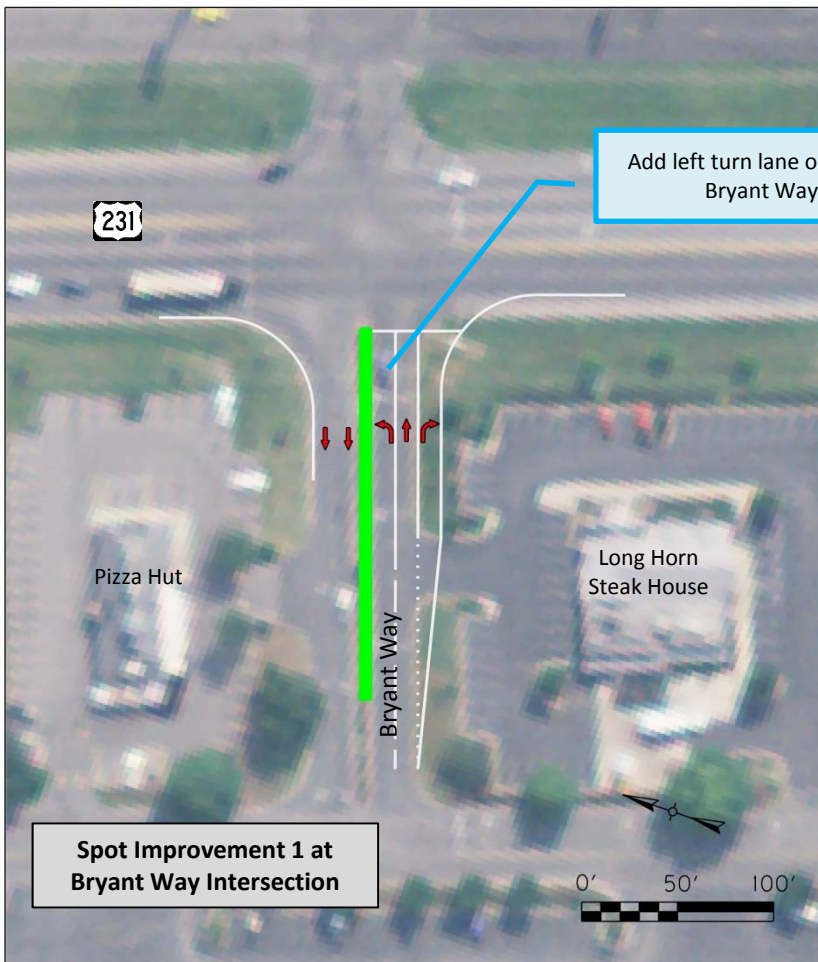
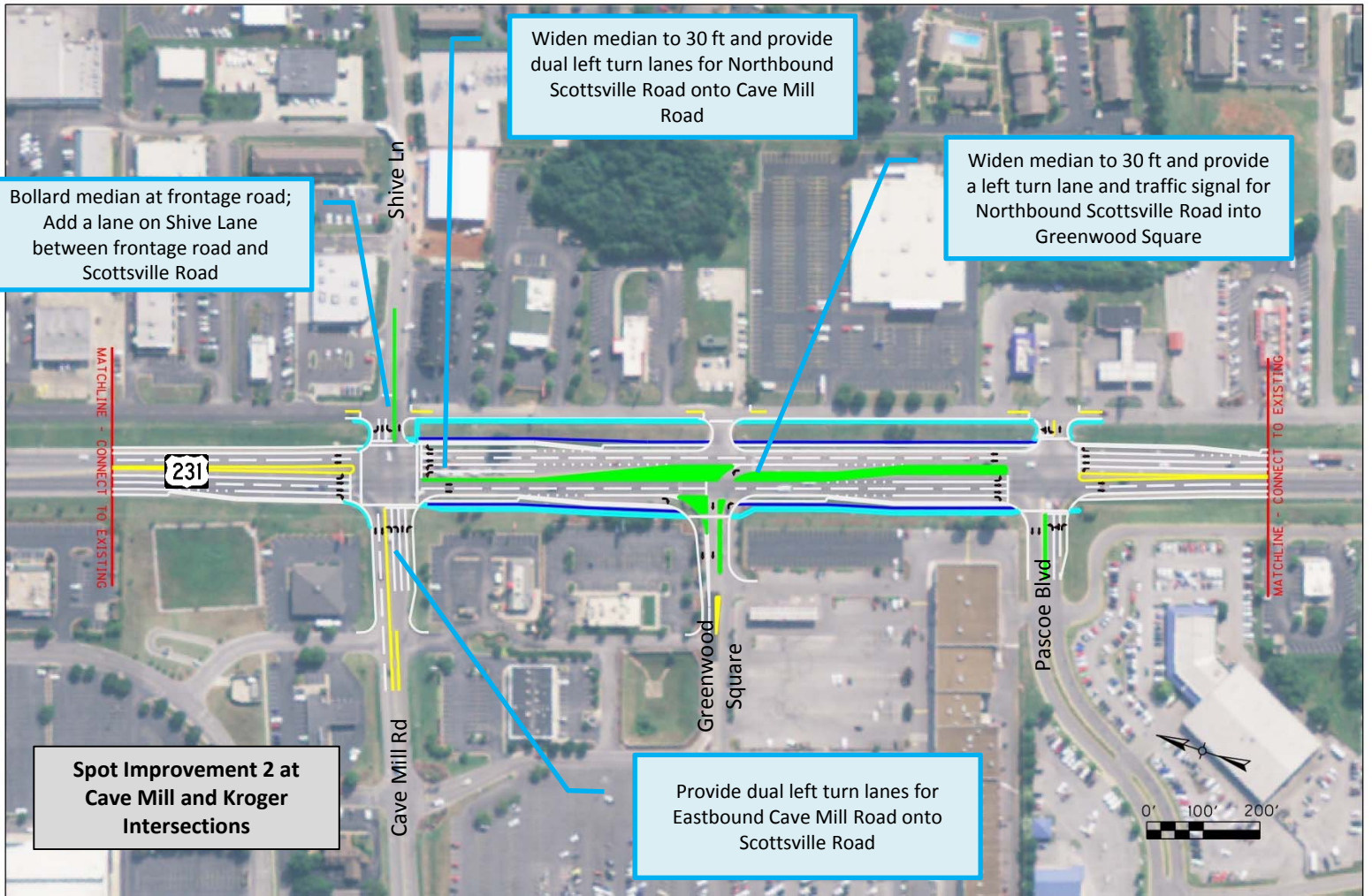


Figure ES -2

**US 231 – Scottsville Rd
From I-65 to Lovers Lane
KYTC Item No 3-8702
Spot Improvements 1 and 2**

ES-5

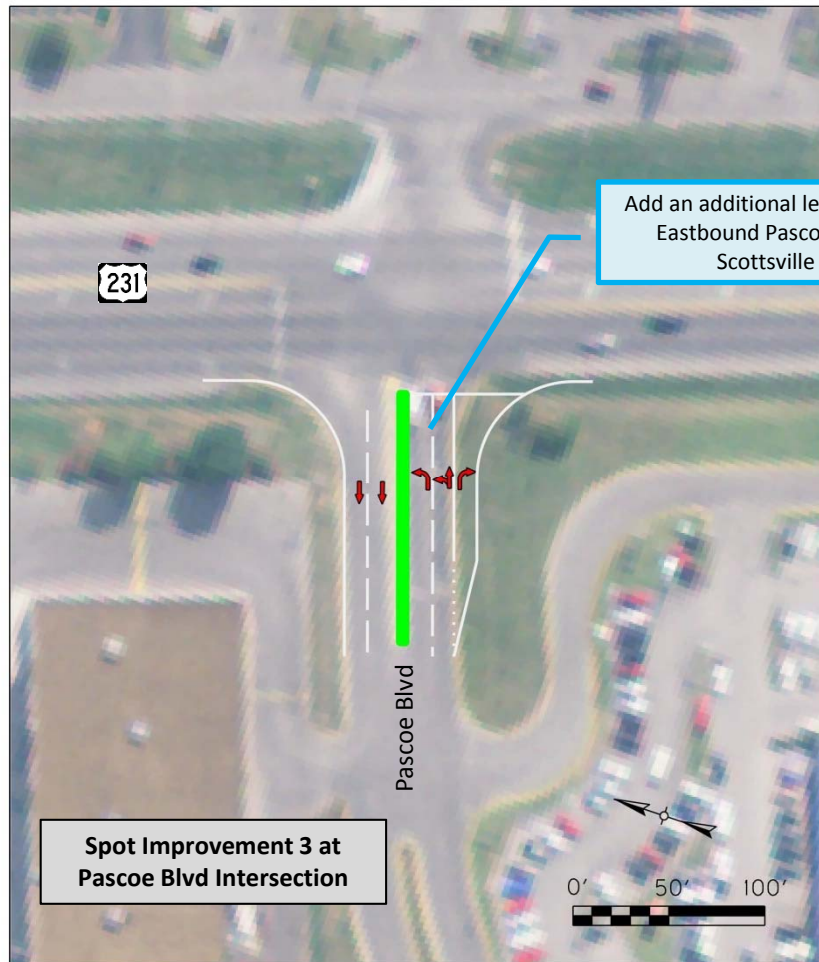
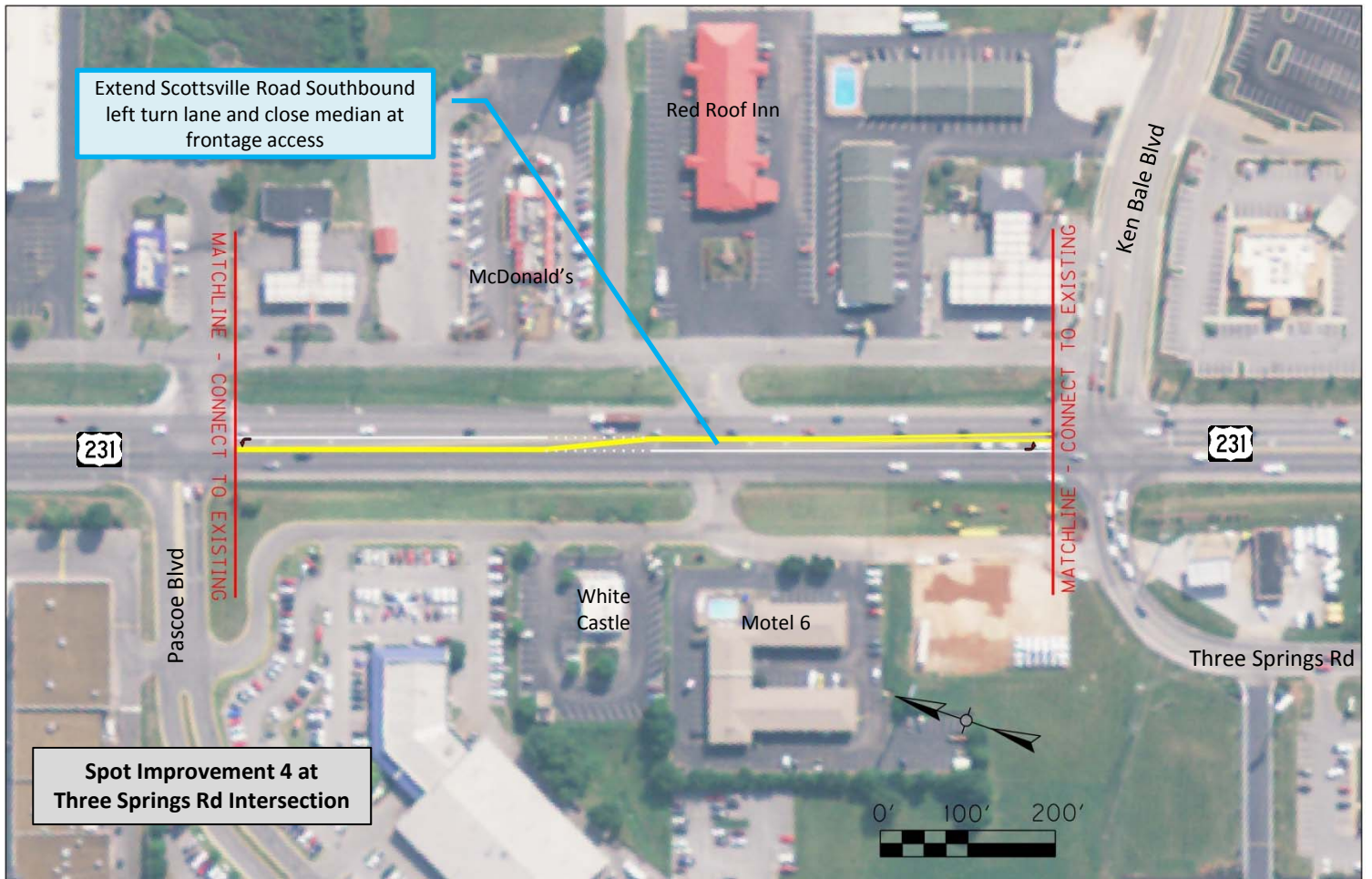
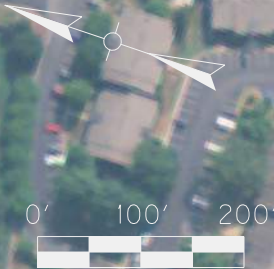


Figure ES-3

US 231 – Scottsville Rd
 From I-65 to Lovers Lane
 KYTC Item No 3-8702
 Spot Improvements 3 and 4

ES-6



MATCHLINE - SEE SHEET NO. 2

KROGER ENTRANCE

PASCOE BLVD

SCOTTSVILLE RD

KEN BAILE BLVD

THREE SPRINGS RD

MATCHLINE - CONNECT TO EXISTING

Figure ES-4

US 231 - SCOTTSVILLE ROAD
FROM I-65 TO LOVERS LANE
KYTC ITEM NO. 3-8702
ALTERNATIVE 3B - SHEET NO. 1



MATCHLINE - SEE SHEET NO. 3

PEDIGO WAY

BRYANT WAY

SHIVE LN

CAVE MILL RD

SCOTTSDALE RD

MATCHLINE - SEE SHEET NO. 1

Figure ES-5

US 231 - SCOTTSDALE ROAD
FROM I-65 TO LOVERS LANE
KYTC ITEM NO. 3-8702
ALTERNATIVE 3B - SHEET NO. 2



SCOTTSVILLE RD

LOVERS LN

CAMPBELL LN

SCOTTSVILLE RD

GREENWOOD COURTYARD
ENTRANCE

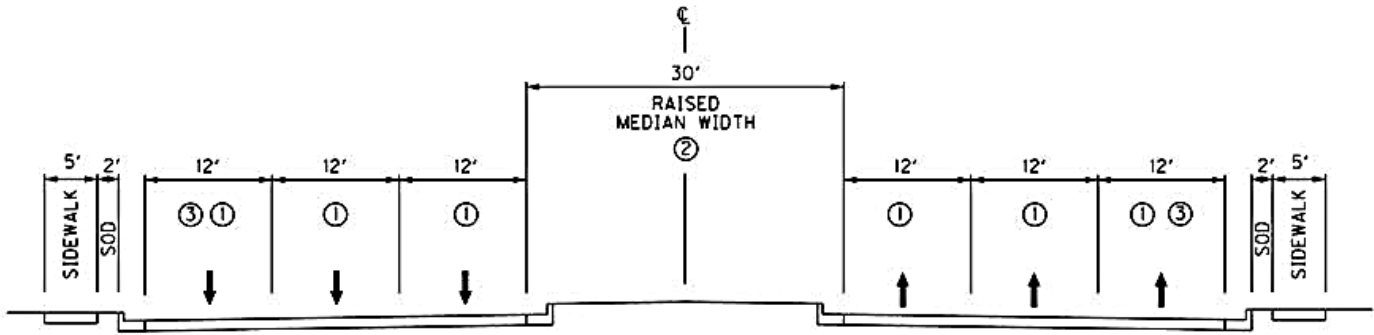
MATCHLINE - CONNECT TO EXISTING

MATCHLINE - SEE SHEET NO. 2

Figure ES-6

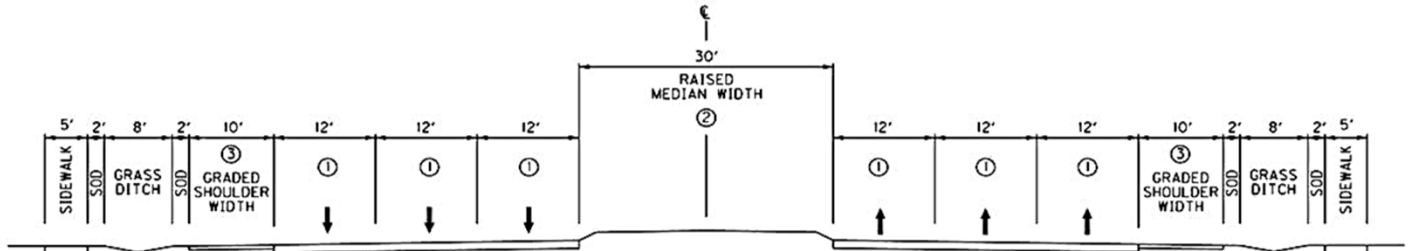
US 231 - SCOTTSVILLE ROAD
FROM I-65 TO LOVERS LANE
KYTC ITEM NO. 3-8702
ALTERNATIVE 3B - SHEET NO. 3

Alternative 3 Urban Typical Section



- ① LANE WIDTHS MAY VARY BETWEEN 12 FEET AND 11 FEET.
- ② MEDIAN WIDTH ACCOMMODATES DUAL LEFT TURN LANES, U-TURNS FOR PASSENGER VEHICLES, AND CHANNELIZATION AT LEFT-IN RIGHT-IN RIGHT-OUT ONLY INTERSECTIONS.
- ③ RIGHT TURN LANES REQUIRE ADDITIONAL WIDTH

Alternative 3 Rural Typical Section



- ① LANE WIDTHS MAY VARY BETWEEN 12 FEET AND 11 FEET.
- ② MEDIAN WIDTH ACCOMMODATES DUAL LEFT TURN LANES, U-TURNS FOR PASSENGER VEHICLES, AND CHANNELIZATION AT LEFT-IN RIGHT-IN RIGHT-OUT ONLY INTERSECTIONS.
- ③ SHOULDER WIDTHS VARY WHERE TURNING LANES EXIST.

Figure ES-7

**US 231 – Scottsville Rd
 From I-65 to Lovers Lane
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 Alternative 3 Typical Section**