APPENDIX F – MEETING SUMMARIES

APPENDIX E – MEETING SUMMARIES

Meeting Minutes

TO:	Steve De Witte, PE Co-Project Manager KYTC Central Office 200 Mero Street Frankfort, KY 40622	Casey Smith, PE Co-Project Manager KYTC District Office #7 763 West New Circle Road Lexington, KY 40512

FROM: Brian Aldridge, PE
Project Manager
Stantec Consulting Services Inc.

DATE: February 25, 2020

SUBJECT: KY 151 Corridor Scoping Study
Between US 127 in Anderson County and I-64 in Franklin County
KYTC Item No. 5-806.00
Project Team Meeting No. 1

A project team meeting for the subject project was held at the KYTC District 7 Office in Lexington, Kentucky on February 19, 2020 at 1:30 p.m. EST. The following individuals were in attendance:

Jay Balaji*	KYTC – Central Office Planning
Kelly Baker	KYTC – District 7
Steve De Witte	KYTC – Central Office Planning
Natalie Flores	KYTC – Bluegrass Area Development District
Tony McGaha	KYTC – District 7
Lauren Meighan	KYTC – District 7
Mikael Pelfrey	KYTC – Central Office Planning
Tyler Reynolds	KYTC – District 7
Steve Ross	KYTC – Central Office Planning
Joshua Samples	KYTC – District 7
David Souleyrette*	KYTC – Central Office Planning
Brian Smith*	KYTC – Central Office
Casey Smith	KYTC – District 7
Rob Sprague	KYTC – District 7
Travis Thompson*	KYTC – Central Office
Scott Thomson	KYTC – Central Office Planning
Shane Tucker	KYTC – District 7
Michael Weitlauf	KYTC – District 7
Brian Aldridge	Stantec Consulting Services Inc.
Steve Farmer	Stantec Consulting Services Inc.
Len Harper	Stantec Consulting Services Inc.
Graham Winchester	Stantec Consulting Services Inc.

Steve De Witte welcomed everyone and said the purpose of the meeting was to discuss the progress to date for the KY 151 Planning Study. An agenda was handed out and Brian Aldridge delivered a presentation. The following enumerated items were discussed.

1. Casey Smith, PE will serve as the Project Manager representing KYTC District 7. Steve De Witte, PE will serve as the KYTC Central Office Project Manager. Brian Aldridge, PE will serve as Stantec's Project Manager.

2. The purpose of the meeting is to present the results of the existing conditions analysis and to get feedback from the project team on potential improvement concepts.

3. This project is listed in Kentucky's FY 2018 – 2024 Enacted Highway Plan as Item No. 05-806.0: *Reconstruct KY 151 from US 127 at Lawrenceburg to I-64 in Franklin County.* This study is being performed utilizing State Highway Priority Projects (SPP) funds allocated towards planning ($250,000 authorized). Future design, right-of-way, utility, and construction phases are not included in the Highway Plan.

4. Brian introduced the draft Purpose and Need Statement:

   The purpose of the KY 151 project is to enhance regional mobility and to provide a safer north/south corridor between US 127 and I-64.

   KY 151 provides the most direct regional connection for areas south of the US 127 intersection and areas west of the I-64 interchange. I-64 is a major east-west interstate highway that travels through Central Kentucky from Huntington, West Virginia in the east to Louisville, Kentucky in the west.

5. In 2015, there were five commercial vehicle (CMV) collisions reported along KY 151 between MP 0.0 in Anderson County and MP 2.3 in Franklin County. In response to local residents' concerns about the CMV crashes, KYTC submitted an April 2016 request to FHWA to remove KY 151 from the National Truck Network. On April 26, 2016, on an emergency basis, the FHWA granted contingent authorization to remove the study area portion of KY 151 from the Kentucky National Truck Network and ban through STAA vehicles (increased dimension CMVs). Civil Action No. 16-CL-440 was filed in May of 2016, requesting the ban of all non-local trucks with three or more axles. The plaintiffs are local residents representing "Group 151."

   In 2016, KYTC conducted a safety study on KY 151 from US 127 in Anderson County to I-64 in Franklin County as a special case study to address the safety concerns voiced by local residents and to analyze the Commercial Motor Vehicle (CMV) crashes between January 1, 2010 and December 31, 2015. The purpose of this study was to review the existing roadway characteristics, traffic volumes, geometries, speeds, and crashes; determine which size vehicles can be safely accommodated within the existing roadway geometry; and identify and examine the CMV-specific issues. The safety study concluded that STAA vehicles have difficulty

tracking the 11-foot lanes but did not necessarily indicate that STAA vehicles should be banned. However, KYTC continues to support the deletion of KY 151 from the National Truck Network.

In September 2017, the KY 151 Corridor Study was assigned to Stantec under the Statewide Planning Contract. On March 8, 2018, the Study was placed on hold in consideration of the legal negotiations. In July 2019, the Franklin County Circuit Court dismissed the appeal citing that KYTC "cannot alter the status of KY 151 until its application to the FHWA to have the highway removed from the NN is resolved."

- Differences in travel times to/from I-64 using US 127 and KY 151 should be noted at the first Local Officials/Stakeholder meeting.
- Using US 127 – SB= 9 minutes, NB= 8 minutes
- Using KY 151 – SB= 13 minutes, NB= 14minutes

6. Stantec is currently working with KYTC to examine current regulations affecting Kentucky's truck network and to recommend criteria and procedures that should be undertaken when considering including or excluding a route from the truck network. Based on recommendations from the study, KY 151 meets criteria to be a part of the National Truck Network.

7. Historical KYTC traffic volumes show an Annual Average Daily Traffic (AADT) on the study portion of KY 151 between 5,000 vehicles per day (vpd) near the county border and 8,700 vpd near the US 127 intersection. Existing and future capacity analyses were performed using the Highway Capacity Software (HCS) freeway facilities module. Level of service (LOS), a qualitative measure describing operational conditions, was used to evaluate the adequacy of the existing roadway. In rural areas, LOS C or better is desirable and in urban areas, LOS D or better is desirable. All study area portions of KY 151 operate at an acceptable LOS during the AM and PM peak hours except for the US 127 intersection. During the PM peak hour, the westbound approach operates at LOS E and all other approaches operate at LOS D, as shown in **Table 1**.
    - Question: Are there available truck counts before/after the ban?

      Answer: Yes, there is a count class station on KY 151. The last count was taken during the summer of 2019.

Table 1: 2018 KY 151 Intersection Operations Summary

2018 Existing AM (PM)					
Intersection	LOS	Delay (s/veh)	Approach	Approach LOS	Approach Delay (sec/veh)
KY 151 at Old Frankfort Rd. (KY 512)	N/A	N/A	Northbound (KY 151)	N/A	N/A
			Southbound (KY 151)	N/A	0.5 (0.5)
			Westbound (Old Frankfort Rd.)	B (C)	12.9 (23.3)
KY 151 at Alton Station Rd. (KY 512)	N/A	N/A	Northbound (KY 151)	N/A	N/A
			Southbound (KY 151)	N/A	1.8 (4.2)
			Eastbound (Alton Station Rd.)	B (B)	12.0 (11.1)
KY 151 at US 127	C (D)	32.9 (49.2)	Northbound (US 127)	C (D)	32.2 (48.7)
			Southbound (US 127)	C (D)	33.8 (48.4)
			Westbound (KY 151)	C (E)	20.7 (57.0)
			Eastbound (KY 151)	D (D)	40.1 (42.1)
KY 151 at US 127 EB & WB Right-Turn Overlap Allowed	C (D)	25.2 (38.9)	Northbound (US 127)	C (D)	30.3 (43.6)
			Southbound (US 127)	C (D)	31.9 (42.1)
			Westbound (KY 151)	B (C)	16.8 (29.4)
			Eastbound (KY 151)	B (C)	18.6 (33.2)

8. KYTC forecasts show 2040 ADTs between 6,200 vpd and 10,800 vpd. Based on these forecasts, KY 151 is expected to operate at a LOS C or better except for the approaches at the US 127 intersection. During the PM peak hour, the westbound approach operates at LOS F and all other approaches operate at LOS E., as shown in **Figure 1** and **Figure 2**.

9. Crash data from the Kentucky State Police database indicate 158 crashes were reported between 2015 and 2019. This includes 34 (22 percent) injury collisions and no fatal collisions. Of the 158 reported crashes, 60 (38 percent) were single vehicle collisions and 55 (35 percent) were rear end collisions. Critical crash rate factors (CRF) were calculated for the five-year period. A CRF greater than 1.0 suggests crashes are likely not occurring at random. There are no high crash segments and six 0.3-mile long high crash spots with CRF values greater than 1.0.

    i. It was noted that there were 21 animal collisions over the five-year period. Removing these crashes would result in only two high CRF spots, at the US 127 intersection and just south of the I-64 interchange. However, animal collisions must be included for an accurate CRF analysis.

    ii. It was also noted that most of the collisions at the US127 intersection were in the right-turn lane of the eastbound KY 151 approach.

    An Excess Expected Crashes (EEC) analysis was also performed using safety performance functions (SPF) developed by the Kentucky Transportation Center (KTC). EEC is a measure of the crash frequency at a given site compared to what is

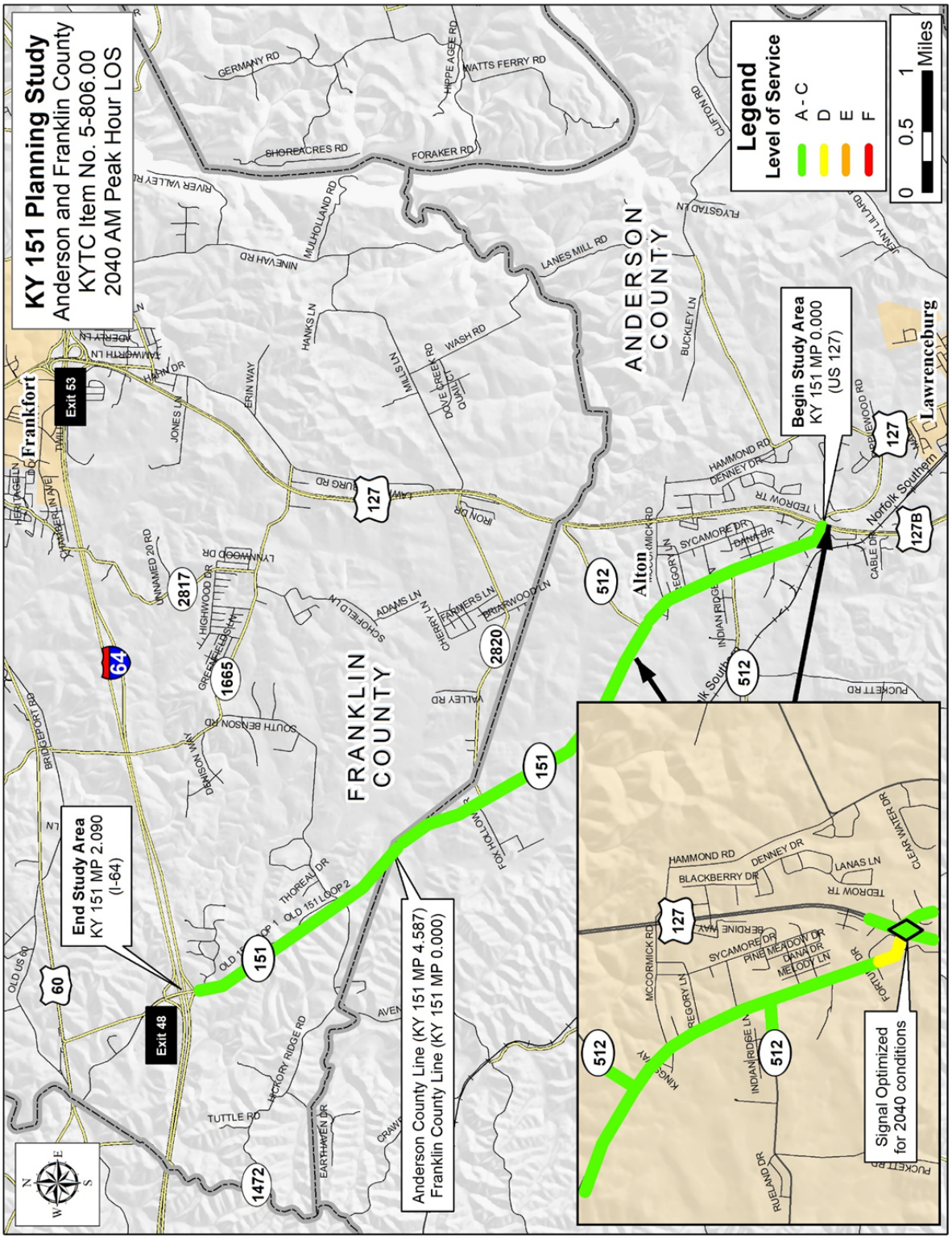

Figure 1: AM Peak Hour Level of Service

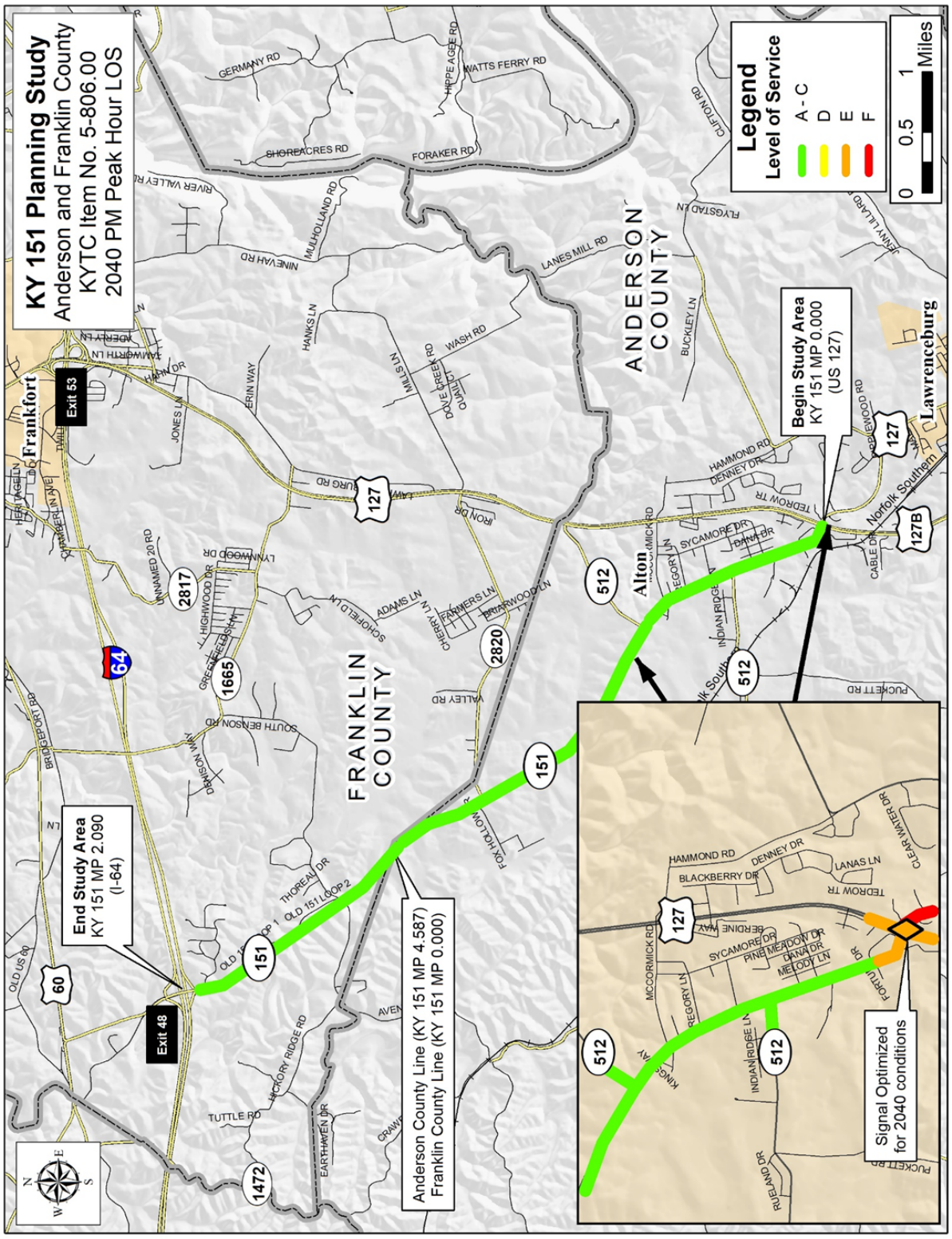

Figure 2: PM Peak Hour Level of Service

expected based on current conditions (geometrics, traffic, etc.). A positive EEC indicates more crashes are occurring than should be expected. Results from this analysis show the section of KY 151 near the US 127 intersection and the portion in Franklin County have EEC values greater than one. **Table 2** presents the results from the EEC analysis.

Table 2: Excess Expected Crashes Analysis

County	Route	Beginning Milepoint	Ending Milepoint	SPF Route Type	ADT	Actual Crash Rate	Average Crash Rate*	Critical Crash Rate	CRF	Predicted Crashes	EEC	Confidence +/-
Anderson	KY 151	0.000	1.761	Urban 2 Lane	7,960	320.5	507	623.6	0.51	50.5	23.6	7
Anderson	KY 151	1.761	4.587	Rural 2 Lane	4,974	128.6	267	352.1	0.37	41.7	-5.2	6.1
Franklin	KY 151	0.000	2.090	Rural 2 Lane	5,006	225.2	267	365.9	0.62	31.8	14.7	5.4

* Source: KTC Analysis of Traffic Crash Data in Kentucky (2013-2017): Table 2 for Rural and Table 3 for Urban

10. Over the five-year period between 2015 and 2019, there were fifteen CMV collisions, four (27 percent) of which involved an injury. The most common type of CMV crash was single vehicle (54 percent) with sideswipe (13 percent), rear end (13 percent), and head on (13 percent) next most common. Seven of these collisions were due to the truck dropping off the side of the pavement.

    Since the April 2016 STAA ban, there have been nine CMV collisions, none of which involved an injury and only one of which involved a truck dropping off the side of the pavement.

    - It was noted that there have been improvements since 2015 that would stop run off the road crashes.
    - There was a question of what should be shown at the first Local Officials/Stakeholder meeting. Truck crashes will be analyzed four years prior to the ban and four years after the ban to remain consistent.

11. A geometric analysis revealed the only horizontal curve with an inadequate radius is near the US 127 intersection. Additionally, there are nine deficient crest vertical curves and 12 deficient sag vertical curves that do not meet the minimum stopping sight distance requirements. The vehicle offtracking analysis from the KYTC safety study revealed two location where pavement widening is needed to accommodate STAA vehicles, as shown in **Table 3**.

Table 3: KY 151 Vehicle Offtracking Summary (KYTC)

		Required Pavement Widening (ft.)									
		Allowed Vehicles						STAA Vehicles			
		84" Wide	96" Wide					96" Wide		102" Wide	
County	Milepoint	P	S-BUS-36	SU-30	SU-40	WB-40	WB-50	WB-62	WB-67	WB-62	WB-67
Anderson	0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.70	1.04
	3.0	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.74	1.40	1.74
	3.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Franklin	0.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

12. Stantec presented the following preliminary improvement concepts for discussion:

    i. **No-Build**

    ii. **Minor Widening** – This improvement concept involves widening shoulders, as needed, along the entire study area. Several widening alternatives were entered into the Interactive Highway Safety Design Model (IHSDM) including a full build with 12-foot lanes and 10-foot shoulders, a performance-based flexible solutions (PBFS) which includes 11-foot lanes and 8-foot shoulders (four-foot paved), and a Highway Safety Improvement Program (HSIP) alternative which includes 11-foot lanes and four-foot paved shoulders. Results from the analysis are shown in **Table 4**.

    - The current IHSDM analysis was performed using the existing alignment. Stantec will re-do the analysis with new alignments (fixing vertical curves, etc.).

Table 4: IHSDM Summary of Minor Widening Concepts

	Existing Safety Performance Functions	Alternative 1 (Full Build)	Alternative 2 (PBFS)	Alternative 3 (HSIP)
KY 151 Widening Alternatives				
Alignment	HA from Aerial and VA from LiDAR	Keep Existing Alignment	Keep Existing Alignment	Keep Existing Alignment
Lane Width	Varies	12 ft	11 ft	11 ft
Shoulder Width	Varies	10 ft (8 ft Paved)	8 ft (4 ft Paved)	4 ft Paved
Roadside Hazard Rating	Varies	1	2	4
IHDSM Crash Prediction				
Time Period	2018-2022	2018-2022	2018-2022	2018-2022
Time Period (years)	5	5	5	5
Length (miles)	6.7803	6.7803	6.7803	6.7803
Total Crashes	130	120	123	127
Fatal and Injury Crashes	33	29	30	32
PDO Crashes	97	91	93	95
Crash Rate (crash/mi/yr)	3.8346	3.5397	3.6282	3.7461
F/I Rate (crash/mi/yr)	0.9734	0.8554	0.8849	0.9439
PDO Rate (crash/mi/yr)	2.8612	2.6842	2.7432	2.8022
Expected Percent Crash Reduction		7.69%	5.38%	2.31%

iii. **Spot Improvements**

- Spot Improvement 1 – KY 151 intersection with US 127
  - Improvement options include reducing the right-turn lane radius on the eastbound approach, optimizing signal timing to allow EB and WB right-turn overlap, place 35-mph warning signs before the horizontal signs, restricting entrances from Alton Road and Eagle Lake Drive near US 127, and adding left-turn lanes at Alton Road and Fortune Drive.
- Spot Improvement 2 – KY 151 near Alton Station Road
  - Improvement options include adding turn lanes at the KY 512 intersection and installing a center two-way left-turn lane.
- Spot Improvement 3 – KY 151 north of KY 512
  - Improvement options include adding a reduced speed limit ahead warning sign, widening shoulders, improving the clear zone, and vertical realignment.
- Spot Improvement 4 – KY 151 at Lin Moore Road
  - Improvement options include widening shoulders, improving the clear zone, widening the curve to accommodate the offtracking of STAA vehicles within the travel lane, and vertical realignment.
- Spot Improvement 5 – KY 151 south of KY 2820
  - Improvement options include widening shoulders, improving the clear zone, and vertical realignment.
- Spot Improvement 6 – KY 151 north of KY 2820
  - Improvement options include widening shoulders, improving the clear zone, and vertical realignment.
- Spot Improvement 7 – KY 151 south of Huntington Woods Road
  - Improvement options include widening the eastern shoulders between MP 1.6 and 1.8, access management and clear zone improvements in front of Valero, and vertical realignment.

iv. **New Alignment Alternatives** – This concept involves the construction of alternate routes around the city of Alton and/or other constrained areas.

13. Brian ended the meeting with a discussion of the project schedule and next steps. The first Local Officials/Stakeholder meeting will be held in March 2020 to present existing conditions. Stantec will develop a survey for the meeting to ask big picture questions about study area needs.
    - It was noted that clickers may help to solicit anonymous input.
    - Question: Should there be one meeting or two meetings to discuss existing conditions with the local officials (one smaller, more focused)?

      Question: What type of public involvement should this study have? Should an online Storymap with a link to the survey be created?
      Answer: The project team will discuss with John Moore.

The meeting ended at approximately 3:00 p.m. EST.

Meeting Minutes

TO:	Steve De Witte, PE Co-Project Manager KYTC Central Office 200 Mero Street Frankfort, KY 40622	Casey Smith, PE Co-Project Manager KYTC District Office #7 763 West New Circle Road Lexington, KY 40512
FROM:	Brian Aldridge, PE Project Manager Stantec Consulting Services Inc.	
DATE:	April 30, 2021	
SUBJECT:	KY 151 Corridor Scoping Study Between US 127 in Anderson County and I-64 in Franklin County KYTC Item No. 5-806.00 Project Team Meeting No. 2	

A project team meeting for the subject project was held virtually with Microsoft Teams on Tuesday April 27, 2021 at 2:30 p.m. EDT. The following individuals were in attendance:

Jay Balaji	KYTC – Central Office Planning
Steve De Witte	KYTC – Central Office Planning
Natalie Flores	KYTC – Bluegrass Area Development District
John Moore	KYTC – Central Office Planning
Mikael Pelfrey	KYTC – Central Office Planning
Steve Ross	KYTC – Central Office Planning
Joshua Samples	KYTC – District 7
David Souleyrette	KYTC – Central Office Planning
Casey Smith	KYTC – District 7
Rob Sprague	KYTC – District 7
Jonathan Taylor	KYTC – District 7
Scott Thomson	KYTC – Central Office Planning
Shane Tucker	KYTC – District 7
Michael Weitlauf	KYTC – District 7
Brian Aldridge	Stantec Consulting Services Inc.
Len Harper	Stantec Consulting Services Inc.
Graham Winchester	Stantec Consulting Services Inc.

John Moore welcomed everyone and briefly discussed the background of the KY 151 Planning Study. Brian Aldridge then delivered a presentation. The following enumerated items were discussed.

1. The purpose of the meeting is to get feedback from the project team on potential improvement concepts.

2. This project was not listed in Kentucky's FY 2020 – 2026 Recommended Highway Plan but is listed in the Enacted Plan as Item No. 05-806.0: *Reconstruct KY 151 from US 127 at Lawrenceburg to I-64 in Franklin County.*

3. This study is being performed utilizing State Highway Priority Projects (SPP) funds allocated towards planning ($250,000 authorized). Future design, right-of-way, utility, and construction phases are not included in the Highway Plan.

4. Brian introduced the draft Purpose and Need Statement:

   The purpose of the KY 151 project is to enhance regional mobility and to provide a safer north/south corridor between US 127 and I-64.

   KY 151 provides the most direct regional connection for areas south of the KY 151/US 127 intersection and areas west of the I-64 interchange. I-64 is a major east-west interstate highway that travels through Central Kentucky from Huntington, West Virginia in the east to Louisville, Kentucky in the west.

5. As part of the *Truck Network Procedures Study*, Stantec worked with KYTC to examine current regulations affecting Kentucky's truck network and to recommend criteria and procedures that should be undertaken when considering including or excluding a route from the truck network. Based on recommendations from the study, KY 151 meets criteria to be a part of the National Truck Network.

6. Historical KYTC traffic volumes show an Annual Average Daily Traffic (AADT) on the study portion of KY 151 between 5,000 vehicles per day (vpd) near the county border and 8,700 vpd near the US 127 intersection.

   Based on a comparison of traffic count data from KYTC station 003002, the percentage of multi-unit trucks on KY 151 has decreased from 2014 (6.7 percent) to 2019 (2.26 percent). Truck percentages have remained stable between 2016 (2.0 percent) and 2019 (2.26 percent).

   Differences in travel times to/from I-64 using US 127 and KY 151 were discussed. Based on Google Maps estimates, eastbound I-64 trips using US 127 instead of KY 151 are five miles longer and take four additional minutes on average, as shown in **Figure 1**.
   i. Using US 127 – SB= 12 minutes, NB= 13 minutes
   ii. Using KY 151 – SB= 8 minutes, NB= 9 minutes

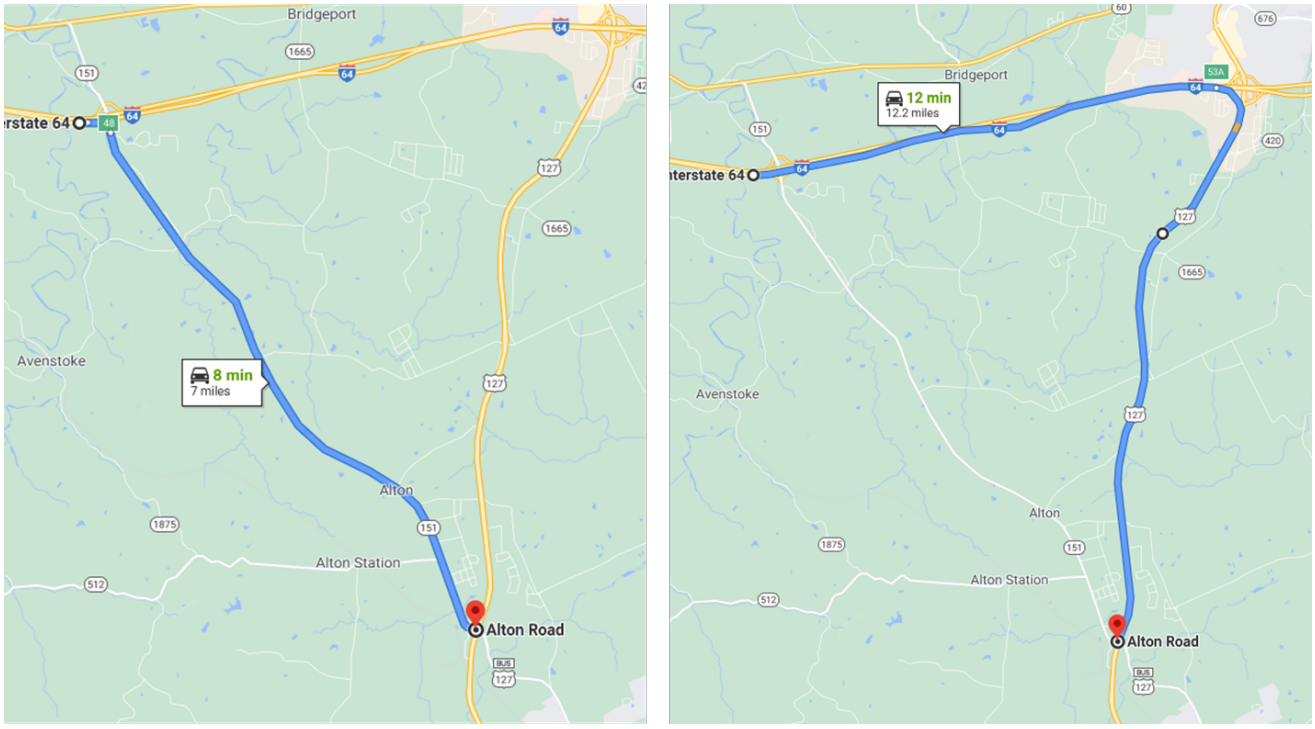

Figure 1: Travel Time Differences on KY 151 and US 127

7. Existing and future capacity analyses were performed using Highway Capacity Software (HCS). Level of service (LOS), a qualitative measure describing operational conditions, was used to evaluate the adequacy of the existing roadway. In rural areas, LOS C or better is desirable and in urban areas, LOS D or better is desirable. All study area portions of KY 151 operate at an acceptable LOS during the AM and PM peak hours except for the US 127 intersection. During the PM peak hour, the westbound approach operates at LOS E and all other approaches operate at LOS D.

8. KYTC forecasts show 2040 ADTs between 6,200 vpd and 10,800 vpd. Based on these forecasts, KY 151 is expected to operate at a LOS C or better except for the approaches at the US 127 intersection during the AM peak hour. During the PM peak hour, the westbound approach operates at LOS F and all other approaches operate at LOS E.

9. Crash data from the Kentucky State Police database indicate 158 crashes were reported between 2015 and 2019. This includes 34 (22 percent) injury collisions and no fatal collisions. Of the 158 reported crashes, 60 (38 percent) were single vehicle collisions and 55 (35 percent) were rear end collisions. Critical crash rate factors (CRF) were calculated for the five-year period. A CRF greater than 1.0 suggests crashes are likely not occurring at random. There are no high crash segments and six 0.3-mile-long high crash spots with CRF values greater than 1.0.

   An Excess Expected Crashes (EEC) analysis was also performed using the Crash Data Analysis Tool (CDAT). EEC is a measure of the crash frequency at a given site compared to what is expected based on current conditions (geometrics, traffic, etc.).

A positive EEC indicates more crashes are occurring than should be expected. Results from this analysis show the section of KY 151 near the US 127 intersection, near Alton, and near the I-64 interchange have EEC values greater than one.

10. Over the five-year period between 2015 and 2019, there were fifteen CMV collisions, four (27 percent) of which involved an injury. The most common type of CMV crash was single vehicle (54 percent) with sideswipe (13 percent), rear end (13 percent), and head on (13 percent) next most common. Seven of these collisions were due to the truck dropping off the side of the pavement.

    Since the April 2016 STAA ban, there have been nine CMV collisions, none of which involved an injury and only one of which involved a truck dropping off the side of the pavement.

11. A geometric analysis revealed the only horizontal curve with an inadequate radius is near the US 127 intersection. Additionally, there are nine deficient crest vertical curves and 12 deficient sag vertical curves that do not meet the minimum stopping sight distance requirements. The vehicle offtracking analysis from the KYTC safety study revealed two location where pavement widening is needed to accommodate STAA vehicles.

12. Stantec presented the following improvement concepts for discussion:

Spot Improvement 1 (KY 151 intersection with US 127) – Improvement options at this location, shown in **Figure 2**, include reducing the eastbound KY 151 right-turn radius, optimizing the signal timing to allow EB and WB right-turn overlaps, installing a 35-mph speed warning sign at the horizontal curve, and converting the Tile Village Circle entrance to a right-in right-out.

- Construction Cost Estimate = $200,000
- Question: There is a right-turn lane on US 127 just south of the KY 151 intersection. Should we consider providing a free-flow right-turn lane from KY 151 ending at the entrance to the south?

  Answer: Since there is low demand for right-turning vehicles onto US 127 to again turn right at the entrance on US 12, this is not a preferred alternative. This would create a new weaving section on US 127.
- Question: Allowing right-turn overlaps will require U-turn restrictions on US 127. Will this restrict access to any entrances?

  Answer: No, restricting U-turns is not expected to be an issue.

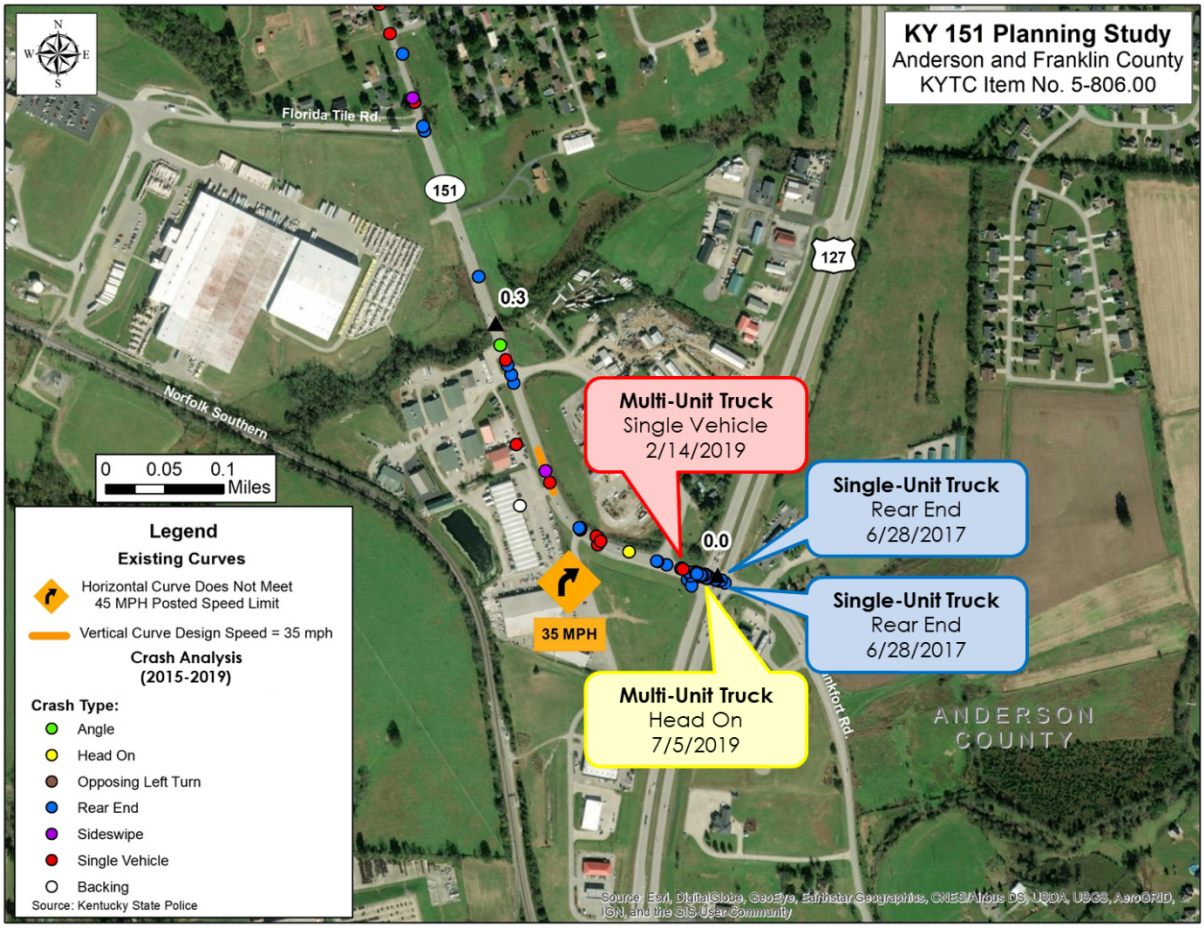

Figure 2: Spot Improvement 1

Spot Improvement 2 (KY 151 near Alton Station Road (KY 512)) – An improvement option at this location, shown in **Figure 3**, includes constructing a left-turn lane on northbound KY 151 onto Alton Station Road.

- Construction Cost Estimate = $400,000
- It was noted that there is a new residential development on Alton Station Road.

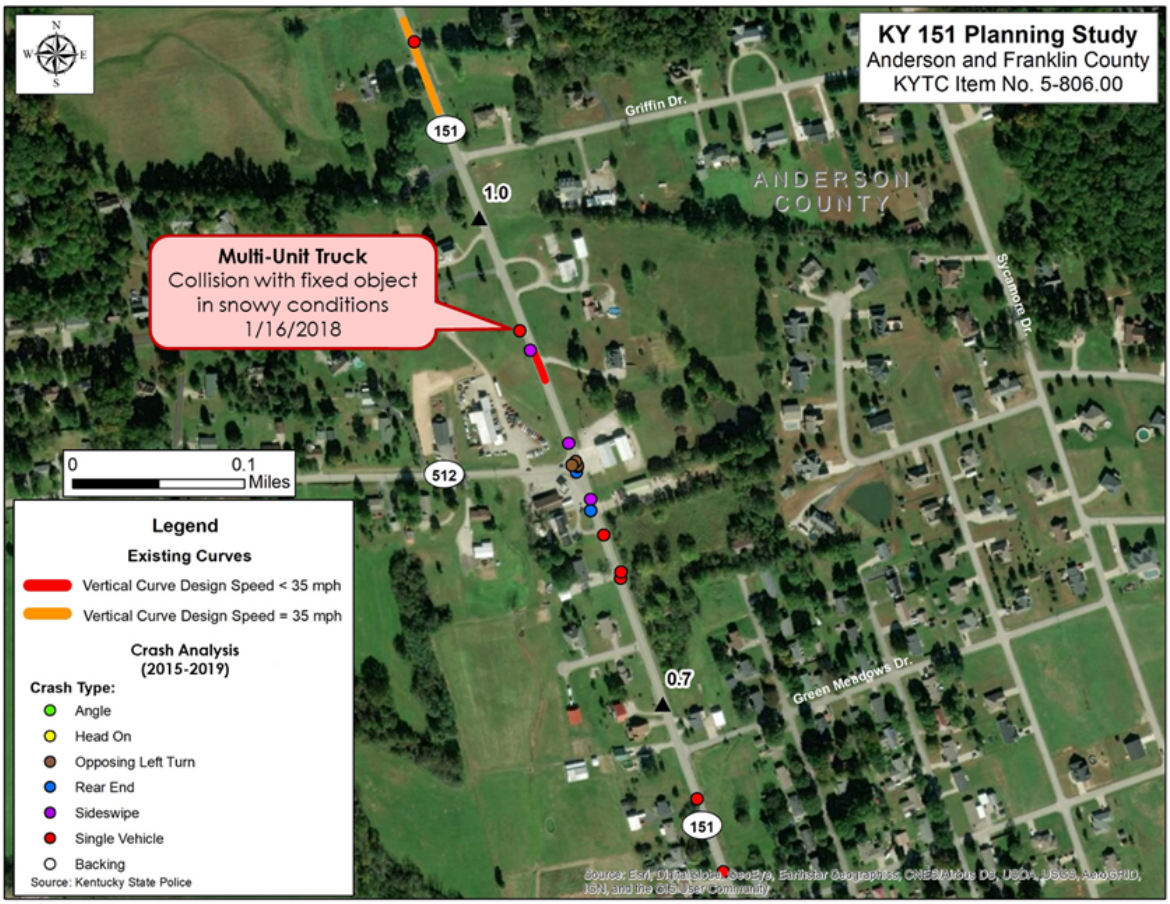

Figure 3: Spot Improvement 2

Spot Improvement 3 (KY 151 north of Old Frankfort Rd. (KY 512)) – Improvement options at this location, shown in **Figure 4**, include cutting trees away from the roadway to improve sign visibility, installing a flashing speed warning sign, and improving the clear zone by stabilizing the slope and widening the shoulder.

- Construction Cost Estimate = $330,000
- The project team decided to remove the transverse rumble strips due to the noise.

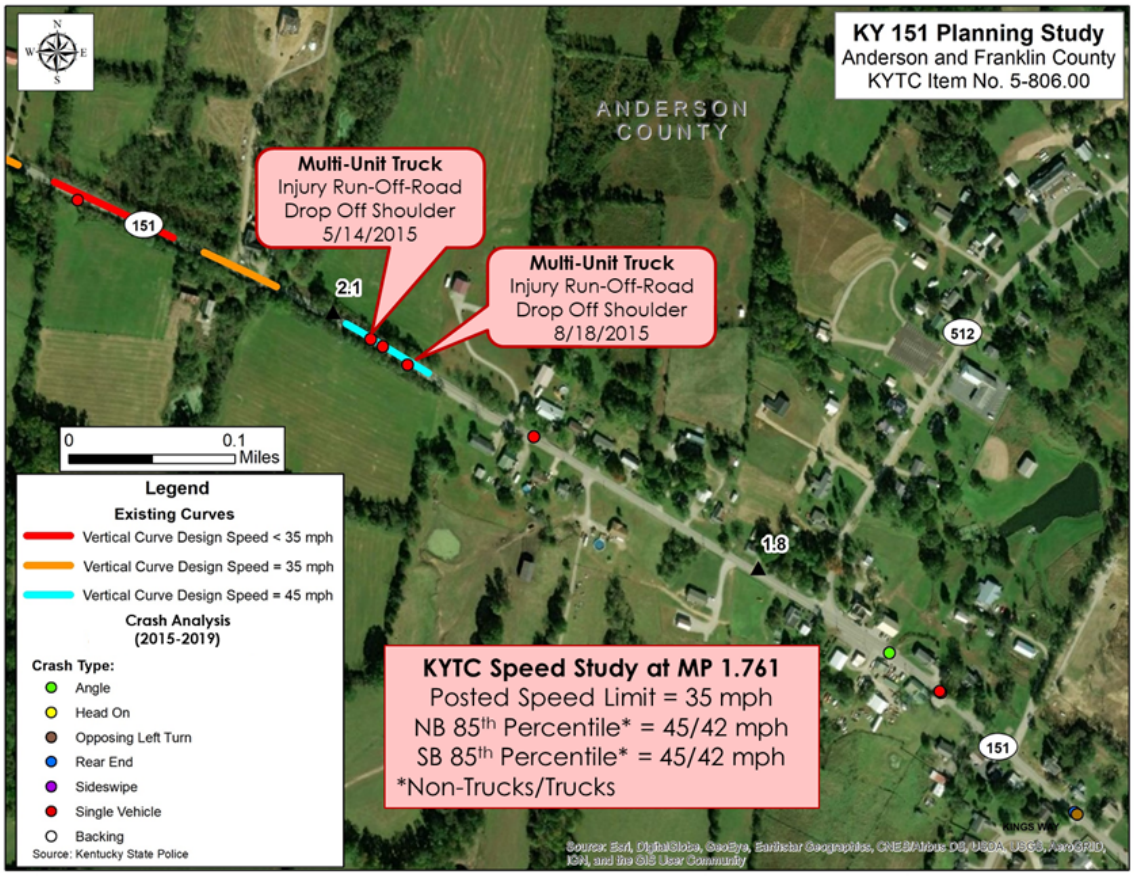

Figure 4: Spot Improvement 3

Spot Improvement 4 (KY 151 at Lin Moore Road) – An improvement option includes widening through the two horizontal curves, shown in **Figure 5**.

- Construction cost estimate = $600,000

Figure 5: Horizontal Curves near Lin Moore Rd.

Spot Improvement 5 (KY 151 south of KY 2820 (Green Wilson Rd.)) – Improvement options include stabilizing the steep slope, shown in **Figure 6**, and widening the shoulder.

- Construction cost estimate = $200,000

Figure 6: Steep slopes south of KY 2820

Spot Improvement 6 (KY 151 south of the I-64 interchange) – An option to improve safety is to realign the I-64 eastbound off ramps and remove the free-flow right-turn onto southbound KY 151, as shown in **Figure 7**.

- Construction cost estimate = $400,000
- The project team decided to remove the improvement option to relocate Huntington Woods Road.
- Question: Would it be beneficial to convert the Huntington Woods Rd. intersection to a right-in right-out?
  Answer: No, the EB ramps would still need to be realigned.

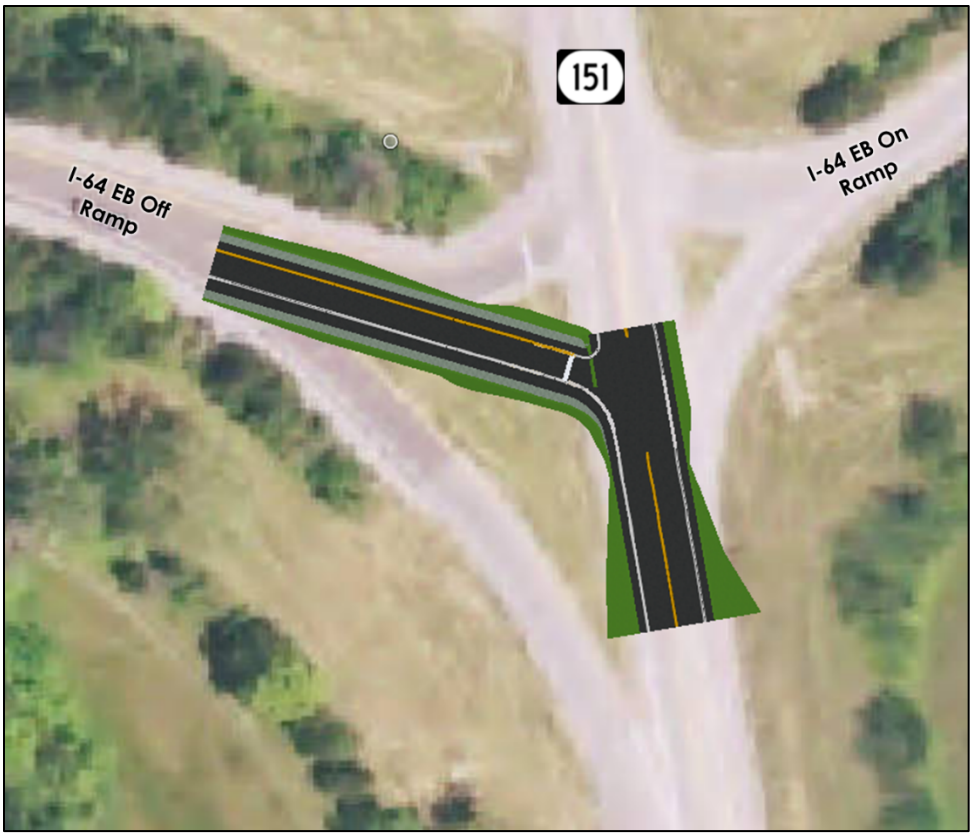

Figure 7: Realignment of I-64 EB off ramps

Minor Widening – This improvement concept involves widening shoulders, as needed, along the entire study area. This option was analyzed two different ways. The first included crash modification factors (CMFs) from the CMF Clearinghouse. CMFs indicate the proportion of crashes that would be expected after implementing a countermeasure. For this analysis, a CMF for widening shoulders was assumed to reduce 18 percent of crashes.

Another analysis included the Interactive Highway Safety Design Model (IHSDM). The IHSDM is a tool used to evaluate the safety and operational effects of geometric design on highways.

The analyses were performed for several concepts including, the no-build, a full build with 12-foot lanes and 10-foot shoulders, a performance-based flexible solution (PBFS) which includes 11-foot lanes and 8-foot shoulders (four-foot paved), and a Highway Safety Improvement Program (HSIP) alternative which includes 11-foot lanes and four-foot paved shoulders. Benefit-to-cost ratios were then calculated based on the resulting crash savings and the construction costs, as shown in **Table 1** and **Table 2**. Both analyses showed benefit-to-cost ratios well below 1 for all concepts. The minor widening concepts were removed from further evaluation.

Table 1: CMF Analysis

Concept	Lane Width	Shoulder Width	Construction Cost	CMF					
				Injury crashes	Injury crashes reduced	PDO crashes	PDO crashes reduced	Crash Savings Benefit	B/C Ratio
No-Build	11'	varies	N/A					N/A	N/A
Full-Build	12'	10' (8' paved)	$13,100,000	22	4	70	13	$1,181,340	0.09
PBFS	11'	8' (4' paved)	$4,500,000	22	4	70	13	$1,181,340	0.26
HSIP	11'	4' paved	$3,100,000	22	4	70	13	$1,181,340	0.38

Table 2: IHSDM Analysis

Concept	Lane Width	Shoulder Width	Construction Cost	IHSDM					
				Injury crashes	Injury crashes reduced	PDO crashes	PDO crashes reduced	Crash Savings Benefit	B/C Ratio
No-Build	11'	varies	N/A	81	0	172	0	N/A	N/A
Full-Build	12'	10' (8' paved)	$13,100,000	78	3	166	6	$879,000	0.07
PBFS	11'	8' (4' paved)	$4,500,000	79	2	167	5	$590,500	0.13
HSIP	11'	4' paved	$3,100,000	81	0	171	1	$4,500	0.00

New Route – This concept involves the construction of a new route to bypass the city of Alton. Due to the high cost and low benefit of this project, it was removed from further evaluation.

- Construction cost estimate = $9.3 Million

13. The Project Team then prioritized the improvement concepts, as shown in **Table 3**.

Table 3: Improvement Concept Prioritization

Concept	Project Length (miles)	Improvement Option	Prioritization
Spot 1	0.3	Reduce right-turn radius	High
		Optimize signal timing	
		Install curve/speed warning sign	
		Convert Village Circle entrance to a right-in right-out	
Spot 2	0.6	Construct left-turn lane	High
Spot 3	0.2	Cut trees away from roadway	High
		Minor Widening with Slope Corrections	
Spot 4	0.6	Curve Widening	High
Spot 5	0.3	Minor Widening with Slope Corrections	High
Spot 6	0.3	Access Management	High
		Improve clear zone	
New Route	1.6	Construct a new route around Alton	Not Recommended
Minor Widening	5.9	Widen shoulders to 4' paved	Not Recommended
		Widen shoulders to 8' (4' paved)	
		Widen shoulders to 10' (8' paved)	

14. Brian ended the meeting with a discussion of the next steps. Stantec will refine the improvement concepts based on project team input and provide KYTC with project sheets for the high priority concepts. Stantec will develop design and construction cost estimates and work with District 7 on right-of-way and utility estimates.

The meeting ended at approximately 4:00 p.m. EDT.