CHAPTER 2 – PURPOSE AND NEED

Substantive changes to Chapter 2 since the publication of the DEIS

- Section 2.2.2 – Added operation and maintenance costs for the existing US 41 bridges

This chapter describes the need for the project based on I-69 system linkage, maintenance costs of the existing US 41 bridges, existing and future traffic levels of service (LOS), and crash rates. It then presents the project purpose based on the project needs and the performance measures that were used to evaluate project alternatives.

2.1 INTRODUCTION

The project's purpose and need statement sets the foundation for the project development process. The statement identifies specific transportation problems (needs) that the project will address and describes the desired outcomes or goals (purpose) of the project. The purpose and need statement that was developed for the 2004 *Interstate 69 Henderson, Kentucky to Evansville, Indiana Draft Environmental Impact Statement* (DEIS) was reviewed and revised accordingly based on updated information, policies, and guidelines.

The project area used in the evaluation of the purpose and need for the I-69 Ohio River Crossing (ORX) project extends from I-69 (formerly I-164) in Indiana on the south side of Evansville (i.e., northern terminus) across the Ohio River to I-69 (formerly Edward T. Breathitt Pennyrile Parkway) southeast of Henderson, KY (i.e., southern terminus) (**Figure 2.1-1**). The section of Edward T. Breathitt Pennyrile Parkway between KY 351 and KY 425 that was not re-designated as I-69 has been recently re-designated as US 41. The project area generally encompasses a triangular area that extends from approximately 0.5 mile west of the I-69/US 41/Veterans Memorial Parkway interchange to 0.5 mile east of the I-69/SR 662 interchange in Indiana, and south into Kentucky to I-69 near KY 136. The project area includes I-69 and US 41 and an area approximately 0.5 mile to their west. Within the project area, US 41, a four-lane National Highway System (NHS) facility classified as an urban principal arterial, provides the only crossing of the Ohio River for the Evansville – Henderson area via two two-lane bridges. Outside the project area, the nearest Ohio River crossings are approximately 30 miles east and 70 miles west of the US 41 river crossing.

Note that the project area for evaluating the project's purpose and need covers a larger area than the project area defined in **Chapter 1** and shown in **Figure 1.1-1** because it was used to help identify transportation needs in a broader area based on the general project termini. The project area shown in **Figure 1.1-1** represents a smaller area because it was based on the development and screening of corridors that were derived from the project's purpose and need, some of which were screened out.

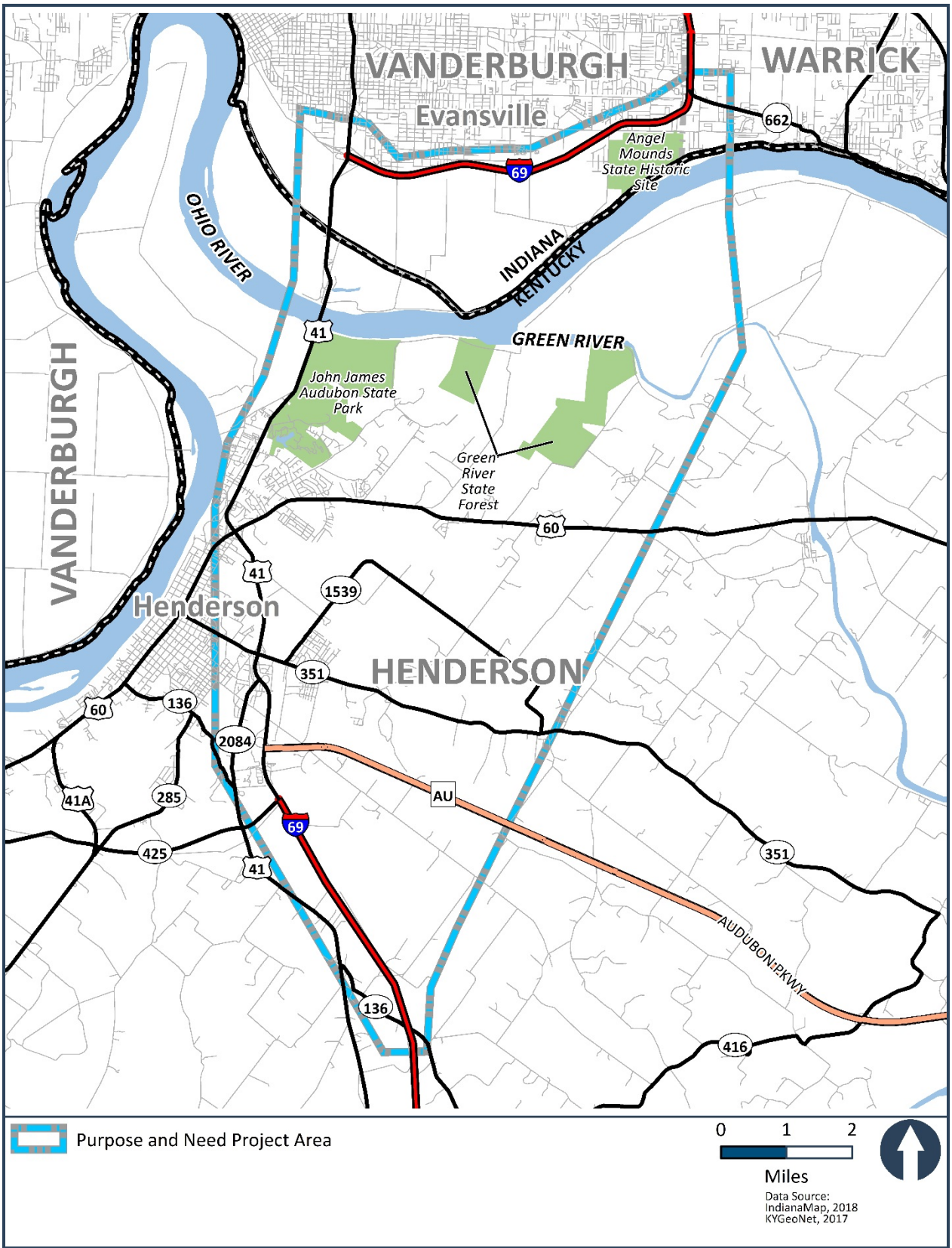

Figure 2.1-1. Purpose and Need Project Area

2.2 PROJECT NEEDS

Four primary needs have been identified for the project:

- Lack of National I-69 Corridor system linkage
- High cost of maintaining cross-river mobility on existing facilities
- Unacceptable levels of service for cross-river traffic
- High-crash locations in the I-69/US 41 corridor

A more detailed discussion of how these project needs were determined is provided in the following sections.

2.2.1 LACK OF NATIONAL I-69 CORRIDOR SYSTEM LINKAGE

Federal legislation has designated the Evansville – Henderson area as part of the National I-69 Corridor. No interstate facility currently exists between the southern terminus of I-69 in Evansville, IN, and the northern terminus of I-69 in Henderson, KY. The only interstate facilities connecting Indiana and Kentucky are in Louisville, more than 120 roadway miles away (i.e., I-64 and I-65). The nearest interstate crossing of the Ohio River west of the Evansville – Henderson area is I-24 west of Paducah, KY, approximately 110 roadway miles away. As I-69 nears completion in Kentucky and Indiana, the importance of this corridor will increase. The existing facilities in the region do not provide the interstate-quality system linkage that is required to support the continued development of the National I-69 Corridor.

US 41 represents the only cross-river access between Evansville and Henderson and the only connection between I-69 in Indiana and I-69 in Kentucky. US 41 is a four-lane highway throughout this corridor; however, most of it does not meet current interstate standards for the following reasons:

- In Indiana, I-69 connects to US 41 via a full cloverleaf interchange with substandard merging and weaving areas.
- Between I-69 in Indiana and Wolf Hills Road in Kentucky, US 41 is a divided principal arterial with two unsignalized intersections. Within this section, the two existing two-lane bridges that cross the Ohio River have narrow lanes and shoulders that do not meet current interstate standards.
- From Wolf Hills Road to US 60, US 41 is a principal arterial with numerous at-grade intersections, three of which are signalized, and numerous commercial driveways.
- From US 60 to KY 425, where I-69 begins in Kentucky, US 41 provides freeway-type service with interchanges at KY 351, KY 2084 (formerly US 41), Audubon Parkway, and KY 425. However, certain elements of this section do not meet interstate design standards such as the distance between the KY 351 and KY 2084 interchanges and associated ramps and the lengths of the on-ramps of the Audubon Parkway interchange.

US 41 does not provide sufficient system linkage and connectivity between I-69 in Indiana and I-69 in Kentucky for the following reasons:

- Most of the route is not designed to interstate standards.
- It is functionally classified as a principal arterial with full access or partially controlled access.
- The Ohio River bridges have inadequate lane and shoulder widths.

2.2.2 High Cost of Maintaining Cross-River Mobility on Existing Facilities

Existing US 41 Bridges

The current US 41 Ohio River crossing consists of two bridges, each of which carries two lanes of traffic. Each bridge is approximately 5,400 feet long and features a 2,300--foot steel through truss structure over the Ohio River. The northbound bridge was built in 1932 and the southbound bridge was built in 1965. Indiana and Kentucky share responsibility for maintaining the bridges in a safe structural condition. Since 2007, the states have spent approximately $54 million on the bridges, including $25 million for the "Fix for 41" project that started in Spring 2017. The work has included painting, minor steel repairs, expansion joint replacement, improvements to navigational lighting, and a bridge deck overlay for the southbound bridge, which is expected to improve its load rating. However, the Fix for 41 project addresses only the immediate needs on the bridges. As of 2021, the US 41 bridges are 56 and 89 years old. While neither bridge is currently posted with a load limit, and neither is expected to be posted in the near future, as these bridges continue to age, their maintenance and repairs will become increasingly more expensive. According to the *US 41 Existing Bridges Evaluation Report* (INDOT and KYTC 2018g) (**Appendix O-1**), from 2018 to 2060, the total operation and maintenance costs for the southbound and northbound US 41 bridges are estimated to be similar at $145 million and $148 million, respectively.

The states are committed to maintaining cross-river mobility for the area. Major rehabilitation of both US 41 bridges is reasonably anticipated to be necessary within the next 25 to 30 years. The future of these structures must be considered when assessing the long-term need to maintain cross-river mobility. With the additional need to provide a connection for I-69 in the area, a long-term plan for cross-river mobility, including the future of the US 41 bridges, is needed.

2.2.3 Unacceptable Level of Service for Cross-River Traffic

Traffic conditions in the corridor were evaluated to determine both the existing (2015) and projected (2045) levels of cross-river traffic congestion using Level of Service (LOS), which is a performance measure used to quantify the efficiency of a roadway. LOS is defined in categories from A to F. LOS A represents the highest quality of service, with free-flowing conditions; LOS F represents heavy congestion or traffic flow breakdown conditions.

The Evansville Metropolitan Planning Organization (EMPO) travel demand model assesses a roadway's LOS based on its volume-to-capacity (V/C) ratio. A facility's capacity is the maximum amount of traffic that it can carry at a given time based on roadway, geometric, and other conditions. The V/C ratio ranges from a low of 0, indicating free flow (i.e., LOS A), to 1.0, indicating severely congested conditions (i.e., LOS F). In urban areas, such as where this project is located, LOS D is considered acceptable.

US 41 Traffic

Figure 2.2-1 illustrates the LOS for roadways in the project area for 2015 and 2045. For year 2015, most of US 41 functioned at LOS E between the I-69/US 41/Veterans Memorial Parkway interchange in Indiana and the US 60 interchange in Kentucky. In addition, a small section of US 41 north of the US 60 interchange functioned at LOS F. In 2045, all of US 41 between the I-69/US 41/Veterans Memorial Parkway interchange in Indiana and the US 60 interchange in Kentucky is predicted to function at LOS F.

Travel time, the time required to travel between two locations, provides another measure of operational performance. The highest volumes in the corridor are experienced in the northbound direction during the morning (i.e., AM) peak period and southbound during the evening (i.e., PM) peak period. It currently takes a vehicle traveling northbound from KY 425 to the I-69/Green River Road interchange during the AM peak period approximately 16 minutes to travel the 13-mile corridor; by 2045, the travel time is expected to increase by about 1 minute. During the PM peak period, it currently takes approximately 20 minutes to make the same trip in the southbound direction; by 2045, the travel time is expected to increase to 27 minutes.

2.2.4 High Crash Locations in the I-69/US 41 Corridor

Crash statistics for existing sections of US 41 and I-69 within the project area were analyzed to identify roadway sections that exhibit higher than expected crash rates. The Indiana Department of Transportation (INDOT) and Kentucky Transportation Cabinet (KYTC) use different methods to identify high-crash locations. Both methods compare observed crash rates to expected crash rates based on roadway type and traffic volumes. Using the Index of Crash Frequency (ICF), INDOT identifies any location with a calculated ICF greater than 0 as a high-crash location. Using the Critical Rate Factor (CRF), KYTC identifies any location with a calculated CRF greater than 1.0 as a high-crash location. As shown in **Table 2.2-1**, based on data from 2014 to 2016, several high-crash locations (indicated in orange) were identified in the project area. In Indiana, I-69 from SR 662 to the I-69/ US 41/Veterans Memorial Parkway interchange and US 41 from the I-69/US 41/Veterans Memorial Parkway interchange to the state line had an ICF greater than 0. In Kentucky, US 41 from the state line to Wolf Hills Road and from Watson Lane to Barret Boulevard had a CRF greater than 1.

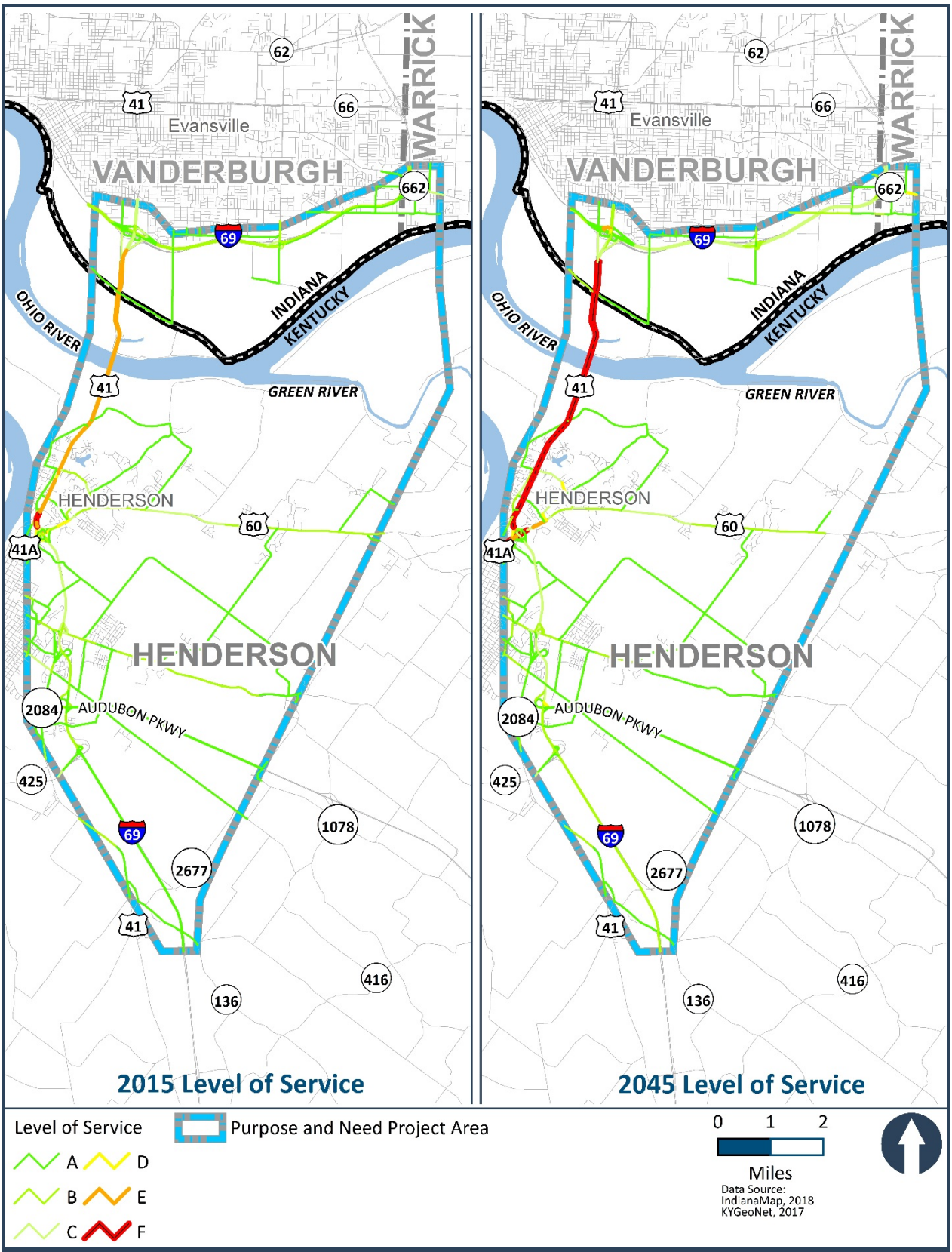

Figure 2.2-1. Level of Service

Table 2.2-1. Indiana and Kentucky Crash Rates (2014 – 2016)

INDIANA							
ROUTE	TERMINI		LENGTH (MILES)	NUMBER OF CRASHES	NUMBER OF INJURY CRASHES	NUMBER OF FATAL CRASHES	ICF[1]
I-69	SR 662	Green River Road	2.71	28	5	0	0.84
	Green River Road	US 41	2.85	40	22	1	1.33
I-69 SB exit ramp to US 41 SB[3]	I-69	US 41	0.37	3	0	1	–0.15
US 41 NB exit ramp to I-69 NB[4]	US 41	I-69	0.73	5	1	0	–0.07
US 41	I-69	Indiana/ Kentucky State Line	1.20	55	21	2	0.45
KENTUCKY							
ROUTE	TERMINI		LENGTH (MILES)	NUMBER OF CRASHES	NUMBER OF INJURY CRASHES	NUMBER OF FATAL CRASHES	CRF[2]
US 41	Indiana/Kentucky State Line	Wolf Hills Road	2.50	194	52	1	1.12
	Wolf Hills Road	Watson Lane	1.13	178	47	0	0.72
	Watson Lane	Audubon Village Shopping Center	0.28	91	19	0	1.39
	Audubon Village Shopping Center	Rettig Road/ Marywood Drive	0.32	94	23	0	1.31
	Rettig Road/ Marywood Drive	Barret Boulevard	0.23	70	19	0	1.33
	Barret Boulevard	US 60	0.54	91	25	0	0.82
	US 60	KY 351/KY 2084	1.97	69	12	0	0.72
	KY 351	Audubon Parkway	1.49	39	9	0	0.84
	Audubon Parkway	KY 425	1.00	26	4	0	0.74
I-69	KY 425	KY 416	7.89	78	12	1	0.94

Sources: Indiana State Police crash data from 1/1/2014 to 12/31/2016; Kentucky State Police crash data from 1/1/2014 to 12/31/2016

[1] ICF greater than 0 indicates high crash location

[2] CRF greater than 1 indicates high crash location

[3] SB = southbound

[4] NB = northbound

2.3 PROJECT PURPOSES

Based on the project's needs, the project's purpose is to:

- Provide cross-river system linkage and connectivity between I-69 in Indiana and I-69 in Kentucky that is compatible with the National I-69 Corridor
- Develop a solution to address long-term cross-river mobility
- Provide a cross-river connection that reduces traffic congestion and delay
- Improve safety for cross-river traffic

2.4 PERFORMANCE MEASURES FOR SATISFYING PURPOSE AND NEED

Project alternatives have been developed and evaluated for their ability to satisfy the project's purpose and need using the following criteria. See **Chapter 3** for the development of project alternatives.

- Provide a roadway facility for the Section of Independent Utility (SIU) #4 that can be designated as I-69: An alternative must meet interstate design standards.
- Identify a cost-effective and affordable plan for long-term cross-river mobility: Taking into consideration all cross-river capacity (i.e., new I-69 bridge and any existing US 41 bridge that remains in service), construction costs, long-term operation and maintenance costs, and potential toll revenue, an alternative must be financially feasible based on anticipated funding availability.
- Provide a river crossing for I-69 operating at a minimum LOS D at its most congested condition (LOS C is preferable).
- Provide a river crossing that improves safety: An alternative must be able to shift traffic from existing US 41, which is classified as a principal arterial and has multiple high crash locations, to the new I-69 facility.