# Louisville-Southern Indiana Ohio River Bridges Project
# SEIS Purpose and Need White Paper

On February 15, 2011, a Notice of Intent to prepare a Supplemental Environmental Impact Statement (SEIS) for the Louisville-Southern Indiana Ohio River Bridges Project was published in the *Federal Register*. The SEIS is being prepared as result of proposed design changes to the Selected Two Bridges/Highway Alternative that was presented in the 2003 Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). As part of the SEIS process and due to the passage of time since the FEIS and ROD were completed, the original Purpose and Need of the project is being reevaluated and updated, as needed, in order to confirm whether or not it is still applicable for the SEIS.

The following is the original Purpose and Need of the project as presented in the FEIS and ROD.

"The purpose of this proposed action is to improve cross-river mobility between Jefferson County, Kentucky and Clark County, Indiana. Several specific factors demonstrate the need for action, including:

- Inefficient mobility for existing and planned growth in population and employment in the Downtown area and in eastern Jefferson and southeastern Clark Counties;
- Traffic congestion on the Kennedy Bridge and within the Kennedy Interchange;
- Traffic safety problems within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways;
- Inadequate cross-river transportation system linkage and freeway rerouting opportunities in the Eastern portion of the LMA; and
- Locally adopted transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange."

This White Paper presents the methods and results of updating the information associated with these five specific factors listed to determine if these factors are still applicable.

## 1. Inefficient mobility for existing and planned growth in population and employment in the Downtown area and in eastern Jefferson and southeastern Clark Counties

This project need was defined in the FEIS based on the determination of Vehicle Miles of Travel (VMT), Vehicle Hours of Travel (VHT), and Vehicle Hours of Delay (VHD) within the Louisville Metropolitan Area (LMA) for the years 1990 and 2025 using the Kentucky and Indiana Planning and Development Agency (KIPDA) travel demand computer model. The projects that were incorporated into the model were based on KIDPA's 2025 Metropolitan Transportation Plan titled *Horizon 2025*. See Table 2.2-1 and Figure 2.2-1 in the FEIS for the results of this original analysis.

In addition, cross-river traffic volumes and capacity were also evaluated for the three existing bridges within the LMA: Sherman Minton Bridge (I-64), Clark Memorial Bridge (U.S. 31), and Kennedy Memorial Bridge (I-65). (See Table 2.2-2 in the FEIS)

As part of the reevaluation of this project need, the aforementioned FEIS traffic information has been updated based on the most recent KIPDA 2030 Metropolitan Transportation Plan (i.e., *Horizon 2030*) and project time of day travel demand model. The time of day travel demand model was developed for the project to provide more detailed traffic forecasts which includes KIPDA's 2030 population and employment projections (See Tables 1 thru 4, and Figure 1). The updated traffic data in these tables confirms that significant percent increases in Daily Trips, VMTs, VHTs, and especially VHDs are still projected within the LMA by the year 2030. The same is true for cross-river trips, VMTs, and VHTs between eastern Clark County and eastern Jefferson/Oldham Counties. In addition, the total cross-river Demand as Percent of Capacity for all the bridges within the LMA and for just the Kennedy Bridge is still projected to exceed 100 percent by the year 2030. The Kennedy Bridge was already within three percentage points of being at capacity in 2010. As a result, this project need remains applicable for the SEIS.

**TABLE 1**
**UPDATED WEEKDAY TRAVEL SUMMARIES**

| | 2007** | 2030 No-Action Alternative | Percent Change 2007 to 2030 |
|---|---|---|---|
| Daily Trips | 2,970,000 | 3,522,000 | 19% |
| Vehicle Miles of Travel | 28,010,000 | 35,297,000 | 26% |
| Vehicle Hours of Travel | 703,000 | 1,069,000 | 52% |
| Vehicle Hours of Delay* | 152,000 | 397,000 | 161% |

* Additional hours of travel time caused by traffic congestion
** The year 2007 is used as the base year for this forecast because it is the base year in the KIPDA model

**TABLE 2**
**UPDATED DAILY OHIO RIVER CROSSINGS WEEKDAY TRAFFIC VOLUMES**

| Bridge | 2010** | 2030 No-Action Alternative | Percent Change 2007 to 2030 |
|---|---|---|---|
| Sherman Minton Bridge (I-64) | 82,000 | 112,000 | 37% |
| Clark Memorial Bridge (U.S. 31) | 21,900 | 25,000 | 14% |
| Kennedy Memorial Bridge (I-65) | 122,300 | 155,000 | 27% |
| Total Daily Ohio River Crossings | | | |
| Weekday Traffic Volume | 226,200 | 292,000 | 29% |

** The year 2010 is used as the base year for this forecast because it represents actual traffic count volumes

**TABLE 3**
**UPDATED DAILY OHIO RIVER CROSSING DEMAND AS PERCENT OF CAPACITY***

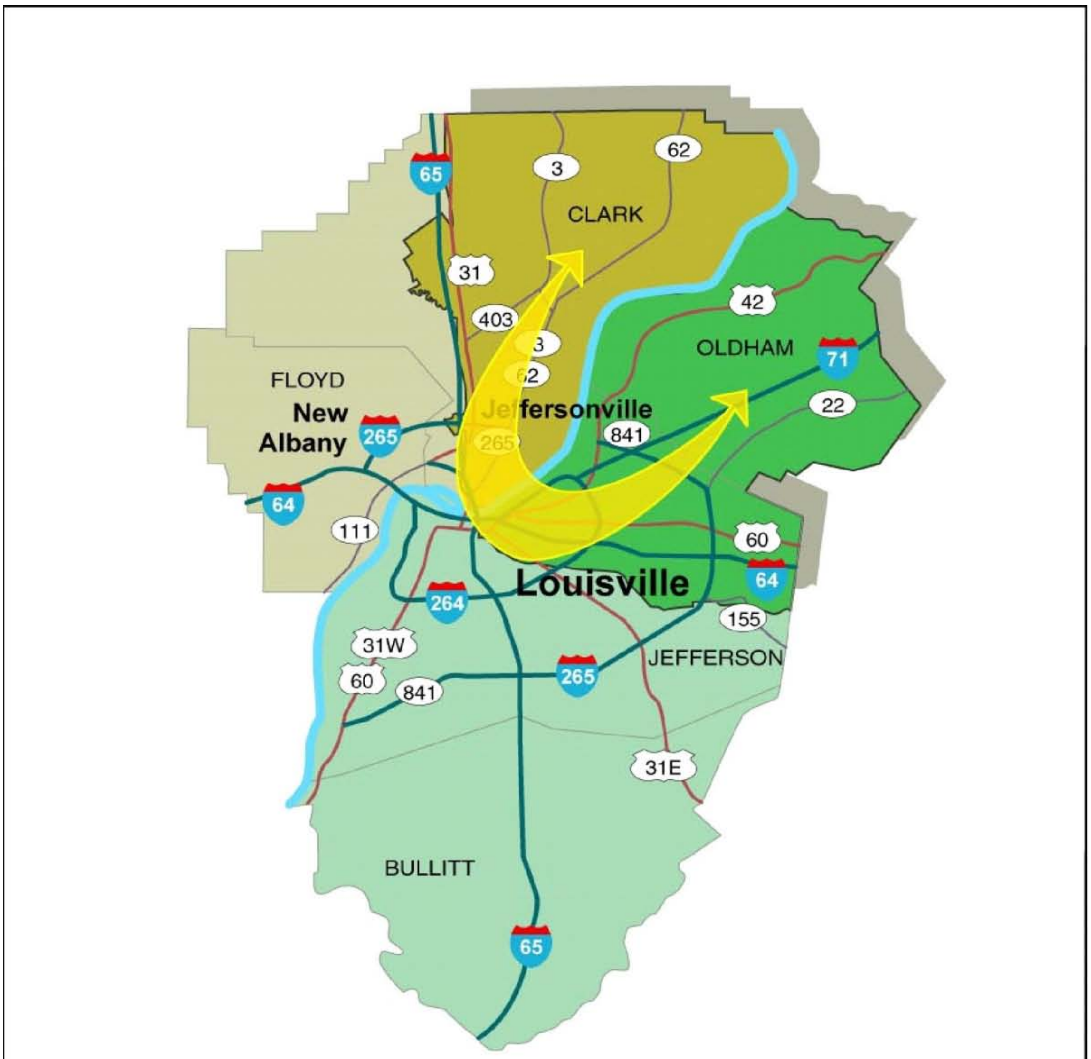
| | 2010 | 2030 No-Action Alternative |
|---|---|---|
| Sherman Minton Bridge (I-64) | 76% | 104% |
| Clark Memorial Bridge (U.S. 31) | 73% | 83% |
| Kennedy Memorial Bridge (I-65) Bridge | 97% | 123% |
| Total Daily Ohio River Crossings | | |
| Demand as Percent of Capacity | 86% | 111% |

- Bridge capacities are daily capacities derived from peak-hour lane capacities. The existence of excess capacity over the course of an entire day (e.g., on Clark Memorial Bridge in 2030) does not necessarily mean there is excess capacity in the peak hour.

**TABLE 4**
**UPDATED CROSS-RIVER DAILY VEHICLE TRAVEL BETWEEN EASTERN CLARK COUNTY AND EASTERN JEFFERSON/OLDHAM COUNTIES**

| | 2007** | 2030 No-Action Alternative | Percent Change (2007 to 2030) |
|---|---|---|---|
| Daily Trips | 31,000 | 41,000 | 32% |
| Vehicle Miles of Travel | 776,000 | 1,092,000 | 41% |
| Vehicle Hours of Travel | 16,000 | 26,000 | 63% |

** KIPDA base year model




DAILY VEHICLE TRAVEL SUMMARY BETWEEN
EASTERN CLARK COUNTY AND EASTERN JEFFERSON/OLDHAM COUNTY

| DAILY TRAVEL | YEAR 2007 | YEAR 2030 | % Change |
|---|---|---|---|
| Vehicle Trips | 31,000 | 41,000 | 32% |
| Vehicle Miles of Travel | 776,000 | 1,092,000 | 41% |
| Vehicle Hours of Travel | 16,000 | 26,000 | 63% |

Source: KIPDA Model Projection

LEGEND
- EASTERN CLARK COUNTY
- EASTERN JEFFERSON / OLDHAM COUNTY

*Figure* 1
*CROSS-RIVER VEHICLE TRAVEL BETWEEN EASTERN CLARK COUNTY AND EASTERN JEFFERSON COUNTY*

## 2. Traffic congestion on the Kennedy Bridge and within the Kennedy Interchange

In the 2003 FEIS, this project need was determined based on the analysis of existing (1999) and projected (2025) traffic volumes and congestion for the Kennedy Interchange and Bridge that were generated from the KIPDA 2025 travel demand model. Using the Highway Capacity

Software (HCS), 1999 and 2025 AM and PM Peak Levels of Service (LOS) were generated for the interchange and bridge. As documented in the FEIS, "Currently, levels of service are fair to poor (generally LOS C through F) on most of the roadway segments in the Kennedy Interchange and on its interstate approaches (See Figure 2.2-9 in the FEIS). LOS is especially poor on roadway segments where traffic flows cross (known as "weaving movements"). Without any improvements to cross-river mobility, the LOS is predicted to worsen by the year 2025. For example, most roadway segments on the existing facility that are currently operating at better than LOS F are expected to degrade by at least one LOS "grade level" by 2025."

As part of the reevaluation of this project need, levels of service within the Kennedy Interchange were generated for 2010 and 2030 AM and PM peak periods based on current traffic information and the updated 2030 traffic forecasts. See Figure 2. The updated levels of service confirm that existing levels of service are fair to poor (39 of the 46 existing levels of serve are C or worse.) Additionally, without improvements to cross-river mobility, levels of service are predicted to deteriorate. Most roadway segments (i.e., 42 of 45 locations) that currently operate better than level of service F are expected to degrade by at least one grade level by 2030.

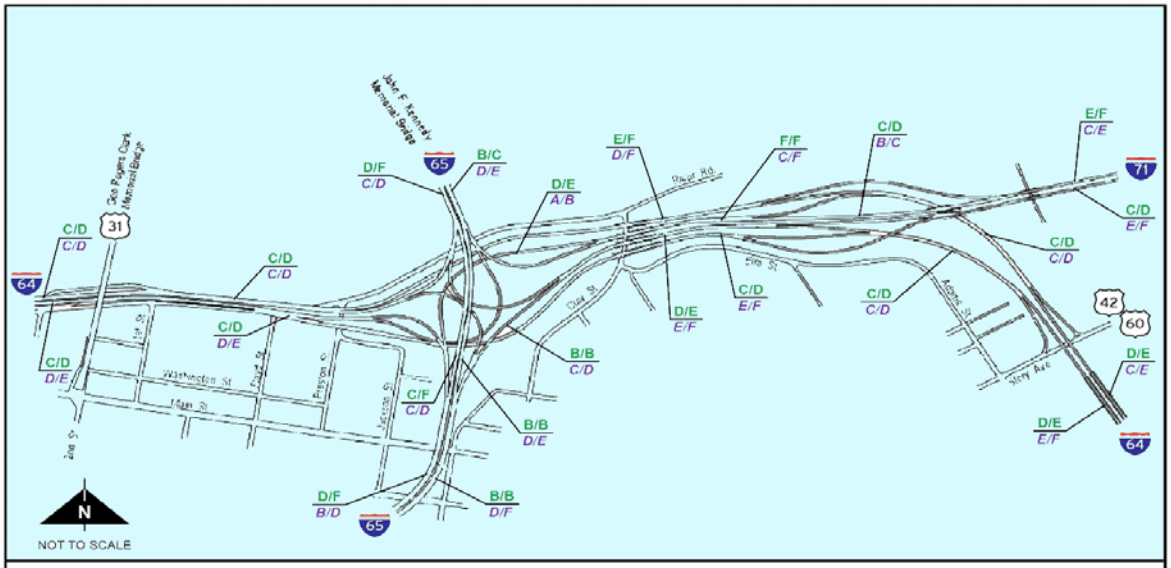



*Figure 2*
*A.M./P.M. LEVELS OF SERVICE*
*KENNEDY INTERCHANGE*

In addition to the LOS, other measures of traffic congestion within the Kennedy Interchange were also presented in the 2003 FEIS using the FHWA freeway operations computer simulation model, CORSIM. See Table 2.2-3 in the FEIS for this analysis.

For the SEIS, the existing and future No-Action conditions were reevaluated with the CORSIM model using existing 2010 traffic data and updated 2030 traffic forecasts. The updated results for weekday traffic operation in the Kennedy Interchange are listed in Table 5, and 6. The measures presented in these tables further demonstrate that traffic congestion in the Kennedy interchange will worsen without improvements to cross-river mobility. Review of the updated

level of service and CORSIM analyses indicate this project need remains applicable for the SEIS.

**TABLE 5**
**KENNEDY INTERCHANGE AREA WEEKDAY OPERATIONS AVERAGE SPEED**

| Measure | | 2010 | 2030 No-Action |
|---|---|---|---|
| Average Peak-Hour Speed: | A.M. Peak Hour | 32 mph | 28 mph |
| | P.M. Peak Hour | 23 mph | 20 mph |
| Total Vehicle Hours of Delay: | A.M. Peak Hour | 482 | 535 |
| | P.M. Peak Hour | 916 | 1,240 |
| Throughput as Percent of Demand*: | A.M. Peak Hour | 89% | 71% |
| | P.M. Peak Hour | 85% | 74% |

*Throughput is the amount of traffic passing through a roadway system. If throughput is less than 100 percent of demand, traffic backups and diversions result. The lower the throughput, as a percent of demand, the worse the congestion and diversion.

**TABLE 6**
**WORST LANE SPEEDS WITHIN THE KENNEDY INTERCHANGE**

| Measure* | | 2010 | 2030 No-Action |
|---|---|---|---|
| WB I-64 (West of Story) Speeds: | A.M. Peak Hour | 32 mph | 34 mph |
| | P.M. Peak Hour | 10 mph | 11 mph |
| SB I-71 (East of I-64) Speeds: | A.M. Peak Hour | 13 mph | 13mph |
| | P.M. Peak Hour | 2 mph | 3 mph |
| SB I-65 (Kennedy Bridge) Speeds: | A.M. Peak Hour | 11 mph | 10 mph |
| | P.M. Peak Hour | 10 mph | 10 mph |

- The negligible changes in speeds between 2010 and 2030 are likely due to these links already being constrained by nearby bottlenecks. Even with increased demand in the future, these local bottlenecks are at capacity and do not reflect worsening conditions.

### 3. Traffic safety problems within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways

This project need was based on crash data from 1996-1998 and the design geometry of the Kennedy Interchange at the time of the FEIS. Due to the age of this crash data, an updated crash analysis was performed to reflect the most recent crash data, which is for the years 2005 through

2009. The crash analysis included the following roadway sections within the project area, referred to as the Kennedy Interchange Corridors.

- I-65 from Broadway to the Indiana side of the Kennedy Bridge
- I-64 from Cochran Tunnel to 9th Street
- I-71 from Zorn Avenue to I-65

For comparison, a crash analysis was also conducted for the following similar adjacent roadway sections, referred to as Adjacent Corridors.

- I-65 from the Indiana side of the Kennedy Bridge to the I-265 interchange
- I-64 from 9th Street to I-265 in Indiana
- I-265 in Indiana from I-64 to I-65

Crash rates were calculated for these corridors based on the number of crashes per 100 million vehicle-miles (100 MVM). The crash analysis for the Kennedy Interchange Corridors found that the total crash rate (230.8 per 100 MVM) was 138% (or nearly 2.4 times) higher than the statewide average rate of 97 crashes per 100 MVM for similar roadway classifications. For general comparison, the total crash rate within the Kennedy Interchange from the FEIS was 261 crashes per 100 MVM which was 172% higher than the statewide average. Regarding the updated fatal and injury crash rates, the Kennedy Interchange Corridor crash rates were 23% (0.49 per 100 MVM) and 113% (40.4 per 100 MVM) higher than the statewide averages of 0.40 and 19 crashes per 100 MVM, respectively. The FEIS did not include fatal and injury crash rates because the information was not readily available.

When compared to the total crash rate (116.4 per 100 MVM), fatal crash rate (0.16 per 100 MVM), and injury crash rate (21.9 per 100 MVM) for the Adjacent Corridors, the Kennedy Interchange Corridors rates were 98%, 206%, and 85% higher, respectively and are listed in Table 7. The Adjacent Corridor I-65 from the Indiana side of the Kennedy Bridge to the I-265 interchange had a total crash rate of 170.7 crashes per 100 MVM. For general comparison, the total crash rate from the FEIS for I-65 north of the Kennedy Bridge was 203 crashes per 100 MVM.

**TABLE 7**
KENNEDY INTERCHANGE CORRIDORS CRASH RATES COMPARISON TO TOTAL CRASH RATES FOR ADJACENT CORRIDORS

| | Crash Rate Increase |
|---|---|
| I-65 from Broadway to the Indiana side of the Kennedy Bridge | 98% |
| I-64 from Cochran Tunnel to 9th Street | 206% |
| I-71 from Zorn Avenue to I-65 | 85% |

The geometric deficiencies of the Kennedy Bridge and Interchange that were described in the FEIS remain unchanged. The concerns for the deficiencies are increased by the amount of traffic

traveling through the Kennedy Interchange today, which is far greater than was anticipated in the original design. Many elements of the current interchange design including curve radii, superelevation on the curves, and weaving between ramps do not meet modern-day standards.

Based on the results of the updated crash analysis and the continuing geometric deficiencies of the Kennedy Bridge and Interchange, this project need remains applicable for the SEIS.

**4. Inadequate cross-river transportation system linkage and freeway rerouting opportunities in the Eastern portion of the LMA.**

Since the FEIS was completed in 2003, there have been no significant changes to the cross-river transportation system in the LMA. Thus, there continues to be a lack of alternate river crossings upstream from downtown Louisville, making the cross-river transportation system vulnerable to incidents, maintenance, and other activities that may foreclose or impair travel on the existing bridges. Also, as the number of cross-river trips with an eastern orientation increases (see Table 3 above), the inefficiencies associated with the lack of any cross-river system linkage east (upstream) of the downtown area will increase. No projects have been added to KIPDA's *Horizon 2030* Metropolitan Transportation Plan that would address this issue other than the Ohio River Bridges Project. As a result, this project need remains applicable for the SEIS.

**5. Locally adopted transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange.**

On October 7, 2010, KIPDA adopted a new Metropolitan Transportation Plan titled *Horizon 2030*. The plan includes the Selected Two Bridges/Highway Alternative identified in the FEIS and ROD, and identifies the need for tolls as an alternative funding source. *Horizon 2030* states that the purpose of the Ohio River Bridges Project is to "provide better access across the Ohio River, improve safety, and reduce congestion." As a result, this project need remains applicable for the SEIS.