# Louisville-Southern Indiana Ohio River Bridges Project
# Technical Memorandum
# One Bridge/Highway Alternatives:
# Downtown Only
# East End Only

The One Bridge/Highway Alternatives include either a new Downtown Bridge or a new East End Bridge. Both of these One Bridge/Highway Alternatives also include the reconstruction of the Kennedy Interchange. These alternatives were evaluated as non-tolled facilities for VHD, LOS, and percent capacity using the same travel demand model and population and employment data that were used for the FEIS Selected Alternative and the Modified Selected Alternative. Additionally, although VMT and VHT are not being evaluated as performance measures for satisfying purpose and need, they have been taken into consideration for the purpose of comparing project alternatives. A summary of the key findings for these alternatives are presented in the following paragraphs.

For purposes of this analysis, it was assumed that the One Bridge/Highway alternatives would not be tolled. In general, any build alternative would tend to perform better (in terms of its ability to meet purpose and need) if it is not tolled, because there would be less traffic diversion than under a tolled scenario. Thus, if the non-tolled version of the alternative does not meet the purpose and need, it can be inferred that the tolled version of the same alternative also would not meet purpose and need

As explained below, this analysis showed that the One Bridge/Highway Alternatives do not meet purpose and need. Because these alternatives do not meet the purpose and need, an in-depth financial feasibility analysis was not conducted. As with any non-tolled alternative, a One Bridge/Highway Alternative would be financially feasible only if the project sponsors are willing and able to cover the full cost of the project with public (non-toll) funding sources. No determination has been made regarding the amount of public funding that would be available for a non-tolled alternative.

***Downtown Bridge Only***

As shown in Table 1, the Downtown Bridge Only Alternative would not decrease VHD. In fact, this alternative shows an *increase* of 1% for VHD over the No-Action Alternative. This alternative would also result in a slight increase (1% or less) in VHT, VMT, and daily trips compared to the No-Action Alternative.

Projected daily Ohio River vehicle crossings are shown in Table 2. Under the Downtown Bridge Only Alternative, the Kennedy Bridge would include the existing Kennedy Bridge and a new downtown/I-65 bridge. The combined downtown I-65 crossing (i.e. the Kennedy Bridge along with the new downtown bridge) is projected to experience a percent capacity[1] of 81%, compared to 123% for the No-Action Alternative. This improvement over the No-Action Alternative is due to additional lanes being added with the construction of a new downtown bridge. The percent capacity for total daily river crossings is projected to be 87% under this alternative. Period volumes are shown in Table 3. The downtown I-65 crossing (Kennedy Bridge and new bridge) is projected to experience a percent capacity of 82% in the southbound direction during the AM peak-period and 94% in the northbound direction during the PM peak-period.

[1] "Percent capacity" in this context refers to demand as a percentage of the bridge's capacity. Thus, if the "percent capacity" is below 100%, the demand is less than capacity – i.e., there is some unused capacity. If the percent capacity is above 100%, the demand exceeds the capacity, resulting in traffic congestion.

Table 4 shows that the downtown I-65 crossing (Kennedy Bridge along with the new downtown bridge) would operate at a peak-hour LOS D under this alternative. Again, this improvement over the No-Action Alternative, under which the Kennedy Bridge would operate at LOS F, is because of the additional capacity provided by the new downtown bridge.

Because the Downtown Bridge Only Alternative would not reduce the VHD within the LMA, it would not meet the project's purpose and need with regard to improving cross-river mobility. In addition, because this alternative would not provide a cross-river connection in the east end, it would also not meet the project's purpose and need with regard to improving system linkage.

***East End Bridge Only***

On a regional level, the East End Bridge Only Alternative would reduce VHD by 11% compared to the No-Action Alternative. This projected decrease in VHD is comparable, albeit less, than that projected for the FEIS Selected Alternative and the Modified Selected Alternative. VHT would decrease by 4%, daily trips would increase less than 1%, and VMT would increase by 1% -- all comparable to the FEIS Selected Alternative and the Modified Selected Alternative.

With the East End Bridge Only Alternative, the percent capacity for the total daily Ohio River vehicle crossings is projected to be 86%, meaning that there would be sufficient capacity overall to accommodate cross-river demand. However, the percent capacity for the Kennedy Bridge, a critical traffic congestion performance metric identified in Ch. 2 (Purpose and Need) of the 2003 FEIS and the SDEIS , is projected to be 106% under this alternative (primarily because it does not include a new downtown bridge, which would increase capacity). This would result in congestion on the Kennedy Bridge. Further, looking at traffic congestion on the Kennedy Bridge during the critical morning and afternoon peak periods shows that the Kennedy Bridge would experience a percent capacity of 133% in the southbound direction during the AM peak-period and 121% in the northbound direction during the PM peak-period. This indicates that the I-65 demand would be well over capacity during peak-periods of the day, resulting in severe congestion on this critical downtown river crossing. Under this alternative, the Kennedy Bridge is projected to operate at an unacceptable peak-hour LOS F. Because the East End Bridge Only Alternative would not improve the level of service to LOS D or better on the Kennedy Bridge and would result in a daily percent capacity of 106% and peak period percent capacities of 133% (AM southbound) and 121% (PM northbound), on the Kennedy Bridge, this alternative would not meet the project's purpose and need with regard to reducing traffic congestion on the Kennedy Bridge.The East End Bridge Only Alternative also only partially addresses traffic congestion associated with the Kennedy Interchange because this alternative would not provide a new I-65 bridge (i.e. additional travel lanes) across the Ohio River adjacent to the Kennedy Interchange. The Kennedy Bridge effectively serves as a leg of the Kennedy Interchange, with the two facilities operating interdependently. Deficiencies in the Kennedy Bridge (i.e. inadequate number of travel lanes, resulting in severe traffic congestion) can adversely affect the performance of the adjacent Kennedy Interchange, particularly during heavy congestion or as a result of incidents (crashes) on the bridge..

The East End Bridge Only Alternative also would not satisfy the need to improve safety within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways, which have experienced historically high crash rates. Although this alternative would improve the geometrics of the Kennedy Interchange, it would not remedy the geometric deficiencies of the Kennedy Bridge in order to bring that facility into conformance with current roadway design standards. Thus, although this alternative would provide some improvement to the Kennedy Interchange, it would not meet the identified need for improved safety on the Kennedy Bridge.

**Table 1**
**Regional Daily Trips, VHD, VMT, and VHT and Percent Change from No-Action Alternative**

| Total KIPDA Region | No-Action | FEIS Selected | | East End Only | | Downtown Only | | Modified Selected (with tolls) | |
|---|---|---|---|---|---|---|---|---|---|
| Daily Trips | 3,522,000 | 3,525,000 | <1% | 3,523,000 | <1% | 3,523,000 | <1% | 3,523,000 | <1% |
| VHD | 397,000 | 346,000 | -13% | 353,000 | -11% | 402,000 | 1% | 349,000 | -12% |
| VMT | 35,297,000 | 35,826,000 | 1% | 35,705,000 | 1% | 35,427,000 | <1% | 35,740,000 | 1% |
| VHT | 1,069,000 | 1,023,000 | -4% | 1,030,000 | -4% | 1,075,000 | 1% | 1,022,000 | -4% |

**Table 2**
**Daily Ohio River Vehicle Crossings and Percent Capacity**

| Bridge | Sherman Minton (I-64) | Clark Memorial (US 31) | Kennedy (I-65) | East End | TOTAL |
|---|---|---|---|---|---|
| **No-Action** | 112,000<br>104% | 25,000<br>83% | 155,000<br>123% | ---<br>--- | 292,000<br>111% |
| **FEIS Selected** | 100,000<br>93% | 28,000<br>93% | 136,000<br>63% | 60,000<br>56% | 324,000<br>70% |
| **East End Only** | 100,000<br>93% | 25,000<br>83% | 134,000<br>106% | 62,000<br>57% | 321,000<br>86% |
| **Downtown Only** | 108,000<br>100% | 25,000<br>83% | 174,000<br>81% | ---<br>--- | 307,000<br>87% |
| **Modified Selected (with tolls)** | 122,000<br>113% | 35,000<br>117% | 104,000<br>48% | 52,000<br>72% | 313,000<br>73% |

**Table 3**
**Period Ohio River Vehicle Crossings and Percent Capacity**

| | Period | Kennedy (I-65) | | Sherman Minton (I-64) | | Clark Memorial (US 31) | | East End | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NB | SB | NB | SB | NB | SB | NB | SB | NB | SB |
| **No-Action** | AM | 63% | **139%** | 60% | **119%** | 20% | 76% | --- | --- | 57% | **121%** |
| | Midday | 65% | 93% | 64% | 67% | 30% | 58% | --- | --- | 60% | 77% |
| | PM | **120%** | **113%** | **126%** | 81% | 93% | 64% | --- | --- | **119%** | 92% |
| | Night | 29% | 34% | 25% | 20% | 20% | 12% | --- | --- | 27% | 22% |
| **FEIS Selected** | AM | 32% | 76% | 54% | **105%** | 22% | 82% | 70% | 39% | 45% | 75% |
| | Midday | 35% | 39% | 57% | 61% | 47% | 56% | 30% | 30% | 40% | 43% |
| | PM | 85% | 46% | **113%** | 72% | 91% | 60% | 43% | 75% | 82% | 59% |
| | Night | 16% | 13% | 22% | 18% | 24% | 16% | 12% | 12% | 17% | 14% |
| **East End Only** | AM | 48% | **133%** | 51% | **112%** | 20% | 80% | 69% | 45% | 52% | 95% |
| | Midday | 53% | 80% | 57% | 60% | 40% | 51% | 32% | 30% | 47% | 56% |
| | PM | **121%** | 92% | **115%** | 70% | 89% | 53% | 47% | 74% | 96% | 76% |
| | Night | 24% | 28% | 23% | 17% | 21% | 12% | 12% | 12% | 20% | 18% |
| **Downtown Only** | AM | 50% | 82% | 59% | **107%** | 22% | 78% | --- | --- | 42% | 74% |
| | Midday | 47% | 51% | 63% | 66% | 47% | 43% | --- | --- | 43% | 46% |
| | PM | 94% | 65% | **116%** | 80% | 96% | 47% | --- | --- | 84% | 56% |
| | Night | 21% | 18% | 25% | 20% | 24% | 9% | --- | --- | 19% | 15% |
| **Modified Selected (with tolls)** | AM | 18% | 65% | 66% | **119%** | 71% | 78% | 88% | 51% | 46% | 77% |
| | Midday | 26% | 30% | 71% | 76% | 62% | 62% | 41% | 40% | 43% | 46% |
| | PM | 74% | 33% | **125%** | 86% | 80% | 76% | 58% | 94% | 85% | 60% |
| | Night | 12% | 8% | 29% | 24% | 28% | 28% | 16% | 16% | 18% | 15% |

**Table 4**
**Projected 2030 Peak-Hour Bridge Level of Service**

| Bridge | No-Action | FEIS Selected | East End Only | Downtown Only | Modified Selected (with tolls) |
|---|---|---|---|---|---|
| Sherman Minton (I-64) | F | E | E | E | E |
| Clark Memorial (US 31) | C | C | C | C | C |
| Kennedy (I-65) | F | D | F | D | D |
| East End | --- | C | D | --- | D |