EXECUTIVE SUMMARY
Brent Spence Bridge Strategic Corridor Study

The following is a summary of key findings of the Kentucky Transportation Cabinet's *Brent Spence Bridge Strategic Corridor Study* (KYTC Item 6-431).

Study Purpose

The *Brent Spence Bridge Strategic Corridor Study* included:

1) Development and evaluation of Brent Spence Bridge bypass concepts, including the proposed Cincinnati Eastern Bypass (CEB);

2) A review and update of the traffic analysis and cost estimate for the *Brent Spence Bridge Replacement/ Rehabilitation Project* (KYTC Item 6-17)[1] for which the preliminary engineering and environmental phase was completed in 2012; and

3) Further evaluation of the I-71/I-75 corridor from the I-71/I-75 split in Walton to the Ohio River, including congestion mitigation strategies.

Study Methods

State-of-the-practice tools and methods for analysis and design were applied throughout the study and all analyses underwent intensive quality review.

An extensive data collection effort was undertaken, including updating traffic counts (over 70 locations were counted), speed data, vehicle classification data, and origin-destination (O-D) data from multiple sources.

Cost estimates were prepared by estimating quantities and applying current unit prices.

Study findings are often presented in terms of the "level of service" (LOS) that would result with or without a proposed improvement. LOS is a measure of the quality of the flow of traffic with LOS A being the best (free flow) and LOS F being the worst (severe congestion). LOS D is considered acceptable in urban environments like the I-71/I-75 corridor.

Bypass Concepts Considered

The bypass concepts described below and shown in **Figure 1** were developed to determine the degree to which any could potentially reduce congestion along I-71/I-75 in Northern Kentucky and improve cross-river mobility.

- **Concept 1: Cincinnati Eastern Bypass (CEB)** - approximately 75 miles of new freeway, with new bridges over the Licking River, Ohio River, East Fork of the Little Miami River, and the Little Miami River.

[1] http://www.brentspencebridgecorridor.com/documents/

- **Concept 2: I-71/I-75 Connector to I-471** - approximately 17.5 miles of new freeway with a new bridge over the Licking River.
- **Concept 3: I-71/I-75 to I-275 Connector Extended** - approximately 23 miles of new freeway with new bridges over the Licking River and the Ohio River.
- **Concept 4: I-71 diversion near Sparta eastward with connections to I-71 and I-75 north of Cincinnati** - approximately 93 miles of new freeway with new bridges over Eagle Creek, Licking River, Ohio River, East Fork Little Miami River and Little Miami River.
- **Concept 5: A western corridor to cross the Ohio River near or at the Anderson Ferry location** - approximately 2-3 miles of new freeway with a new bridge over the Ohio River.

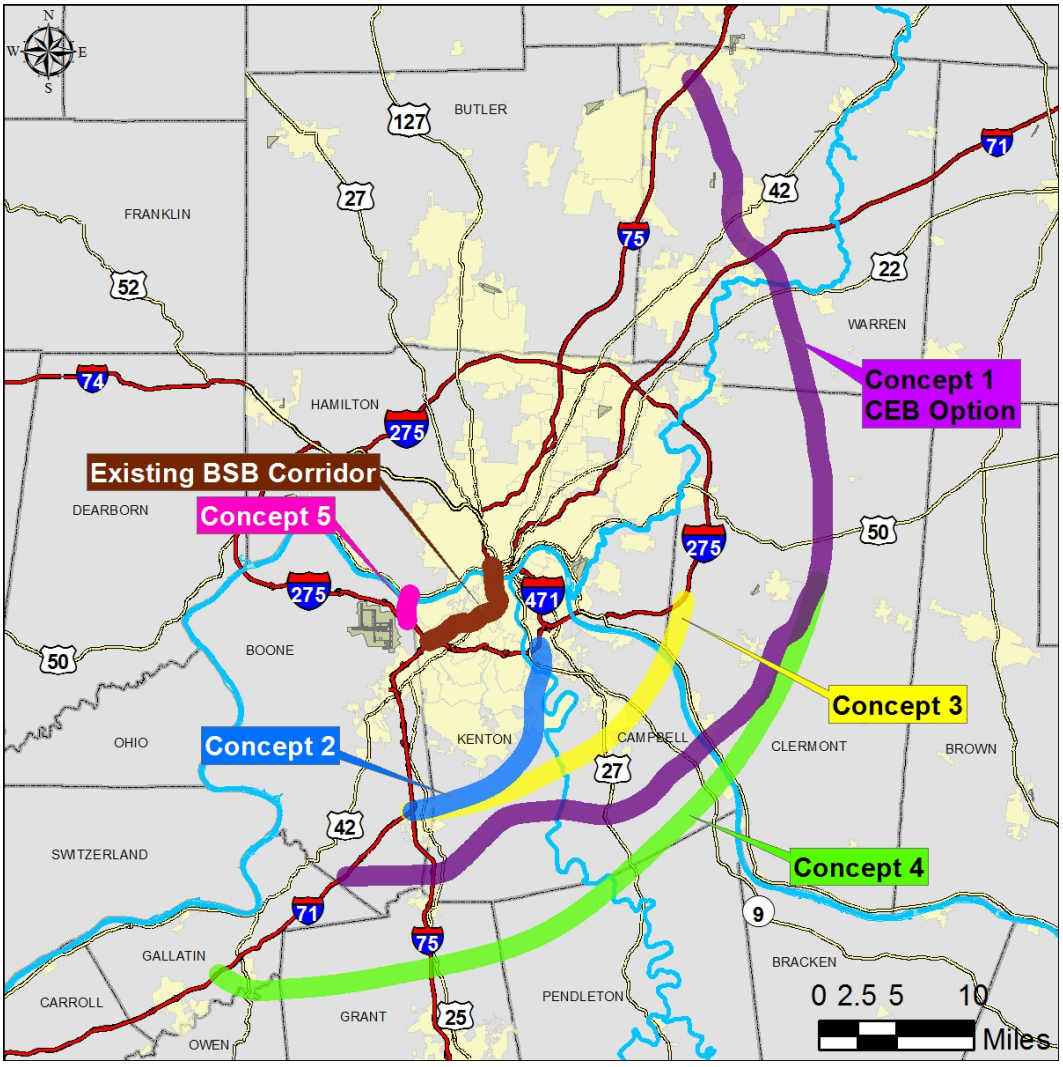


Figure 1. Level 1 Bypass Concepts

Level 1 Evaluation of Bypass Concepts

A Level 1 Evaluation of the five bypass concepts was performed to examine potential traffic diversion from the I-71/I-75 Brent Spence Bridge and other river-crossings, probable cost, and likely impacts, with potential traffic diversion from the Brent Spence Bridge being the most

important consideration. As a result, Concept 1 (CEB) and Concept 3 (I-71/I-75 to I-275 Connector Extended) were selected for more detailed study (Level 2 Evaluation) given the following Level 1 findings:

- Concepts 1 and 4 suggest the greatest possible reduction to I-71/I-75 Brent Spence Bridge traffic.
- Concepts 1 and 3 would provide the most reductions to traffic on the I-471 (Daniel Carter Beard) and I-275 East (Combs-Hehl) bridges.
- Concepts 1 and 4 have the highest cost, due to their length and anticipated number of interchanges.
- Three concepts (1, 3 and 5) suggest significant increases in the total number of daily Ohio River crossings (considering all bridges in the region).
- Concepts 1 and 4 present the greatest number of environmental considerations that must be addressed, primarily because they are the longest and therefore are exposed to the greatest number of environmental resources.
- Concepts 1 and 4 are too similar to discern meaningful differences at the planning-level. It would be reasonable for similar concepts like these to be evaluated against one another as alternatives in a project-specific preliminary engineering phase.

Level 2 Evaluation of Bypass Concepts 1 and 3

The Level 2 Evaluation of Concepts 1 and 3 included:

- Preliminary design - development/refinement of roadway alignments (horizontal and vertical).
- Development of cost estimate by building digital models of the concepts and calculating accurate quantities for over 60 potential bid items. Unit prices were applied using the KYTC estimator program as is done on all KYTC construction projects.
- Refinement of traffic forecasts (developed using the OKI RTDM) for Concepts 1 and 3 and re-examination of the impacts they would have on the I-71/I-75 corridor.
- An overview of environmental features.
- An economic analysis to determine induced traffic – the additional traffic anticipated to be generated by new development in the corridor.

The Level 2 Evaluation of Concept 1 (CEB) revealed:

- The proposed bypass would enhance economic development and cross-river capacity. While it would not bring I-71/I-75 to acceptable levels of service, this concept is worthy of further exploration.
- Forecast year (2040) average daily traffic volumes are expected to range from about 25,000 to 46,000 vehicles.

- Traffic crossing a new CEB Ohio River Bridge is estimated to be about 36,000 vehicles per day (Year 2040). This includes about 12,000 trips diverted from the Brent Spence Bridge and 8,100 new trips per day. The remainder would be diverted from other existing river crossings.

- Currently, regional through traffic on the Brent Spence Bridge is estimated to be 12 to 20 percent of daily traffic. Regional through traffic percentages were found to be lower during peak commuting traffic periods than during off-peak periods, weekends and holidays. The amount of traffic that would likely divert to the CEB from the Brent Spence Bridge was estimated at 7 to 10 percent (Year 2040).

- A four-lane, median-divided cross-section would provide an acceptable level of service (LOS).

- Significant congestion and poor levels of service will remain between Kyles Lane and downtown Cincinnati, even if Concept 1 is built.

- The cost estimate is $3.6 Billion in current year dollars and $5.3 Billion in year of expenditure (YOE) dollars, assuming an optimistic/aggressive schedule with construction beginning in 2029 and the project being open to traffic in 2032 (schedule assumes funding is in place).

- As with any major new corridor project, there are a number of challenges that would need to be resolved in a future design phase. This includes proposed interchanges that are not compliant with federal spacing requirements, avoidance of impacts to Section 4f properties such as A.J. Jolly Park, and KYTC/ODOT decisions on whether or not to dead-end some county roads that would be severed by the new route. Another key environmental concern is the process to gain approvals necessary to build a new bridge over the Little Miami River, which may require elimination of an existing crossing before a new crossing is allowed.

The Level 2 Evaluation of Concept 3 (I-71/I-75 to I-275 Connector Extended) revealed:

- Forecast year (2040) average daily traffic volumes are expected to range from about 22,000 at the southern terminus in Kentucky to about 36,000 across a new Ohio River bridge, near its northern terminus with I-275.

- Regional through traffic on the Brent Spence Bridge was estimated at 12 to 20 percent of daily traffic. The amount of traffic that would likely divert to Concept 3 from the Brent Spence Bridge was estimated at 4 percent (Year 2040).

- A four-lane median-divided cross-section would provide an acceptable level of service.

- Concept 3 would not solve the congestion issues along I-71/I-75.

- The cost estimate is $1.5 Billion in current year dollars and $2.2 Billion in year of expenditure (YOE) dollars, assuming an optimistic/aggressive schedule with construction beginning in 2029 and the project being open to traffic in 2032 (schedule assumes funding is in place).

- This concept utilizes the existing I-275 alignment in Ohio, reducing cost and coordination efforts between the two states.
- As with any major new corridor project, there are design challenges and environmental considerations associated with this project.

Because Concept 1 and Concept 3 did not show the potential to divert enough traffic from the I-71/I-75 corridor to improve operating conditions, the following theoretical question was analyzed: *What if a bypass project could divert 20 percent of traffic away from I-71/I-75?* Twenty percent represents the high end of the range of estimated regional through traffic on the Brent Spence Bridge so the assumption here is that all of the regional through traffic would be diverted. It was determined that while diverting 20 percent of the traffic away from I-71/I-75 would have a significant impact, it would not completely solve congestion issues in the corridor. A bypass would have to divert 40,000 – 50,000 vehicles per day or more away from the I-71/I-75 corridor simply to keep sections of the study corridor at the level of service (LOS) E/F threshold.

A summary of the level 2 findings for Concept 1 (CEB), Concept 3, and the theoretical 20 percent reduction discussed in this section are shown in **Table 1 – Summary of Traffic and Cost Findings** under **Summary of Key Study Findings**.

Review and Update of the *Brent Spence Bridge Replacement/Rehabilitation Project*

A review and update of the traffic analysis and cost estimate elements of the Brent Spence Bridge Replacement/ *Rehabilitation Project* (KYTC Item 6-17) was performed. Evaluation of the I-71/I-75 corridor was also performed beyond what was completed for KYTC Item 6-17.

TRAFFIC

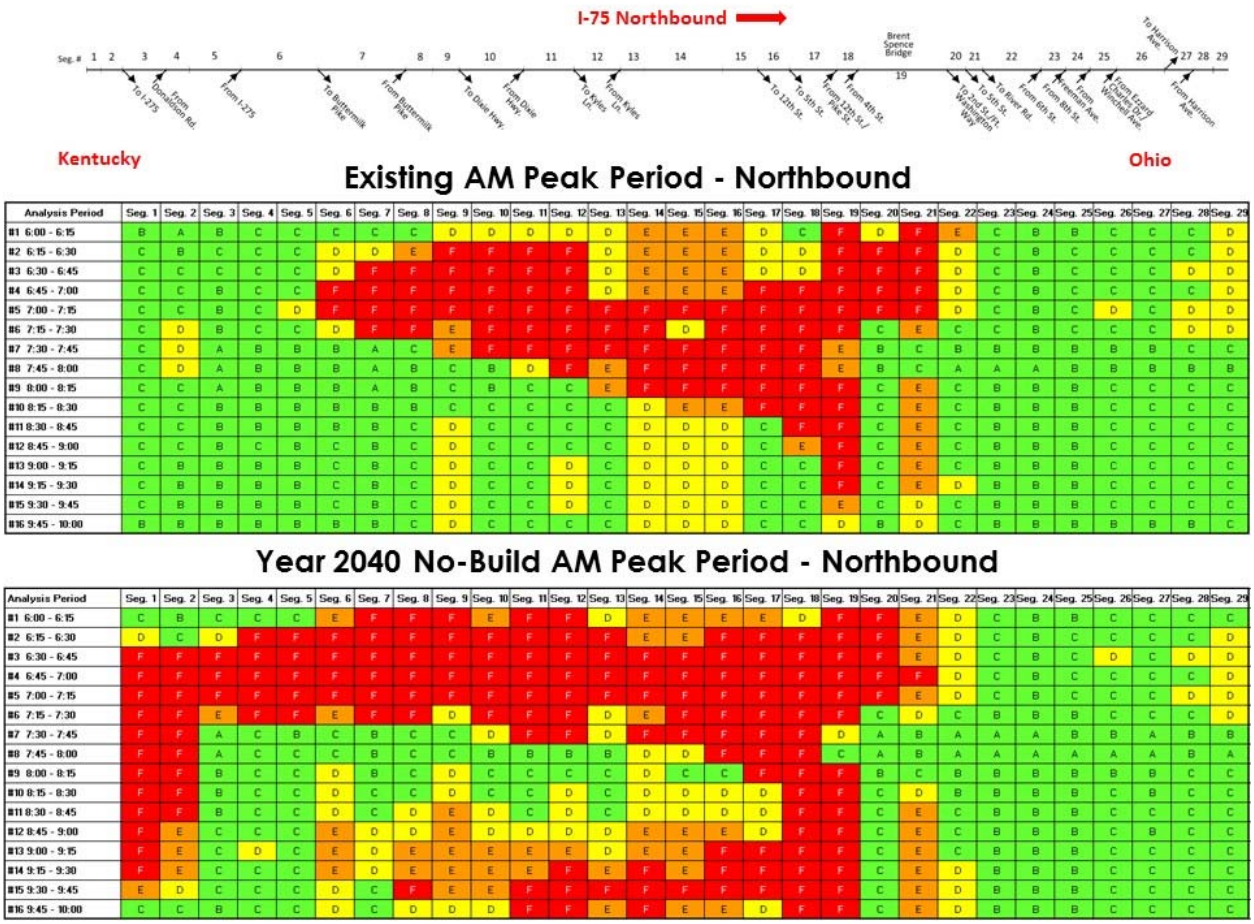
Using the data collected for this study and current state-of-the-practice methodologies, the KYTC Item 6-17 traffic analysis was updated to a current base year (from 2005 previous base year) and new forecast year of 2040 (from previous forecast year of 2035).

The 11-mile area from the I-275 interchange in Kenton County to the Western Hills Viaduct (Harrison Avenue exit) north of downtown Cincinnati was the focus of the analysis for the *Brent Spence Strategic Corridor Study* (KYTC Item 6-431). The need for additional capacity south of this area was also addressed, as discussed in later sections of this document.

Segment levels of service were determined for the following:

- Existing condition (what we have today);
- Future No-Build condition (what we will have in 2040 if no improvements are made); and
- Future 6-17 Build condition (what we will have in 2040 if the *Brent Spence Bridge Replacement/Rehabilitation Project* is constructed*).*

The "heat maps" in **Figure 2** and **Figure 3** illustrate AM peak (morning rush) levels of service by segment for the existing condition and for the future no-build condition for the northbound and southbound directions, respectively.



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Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29
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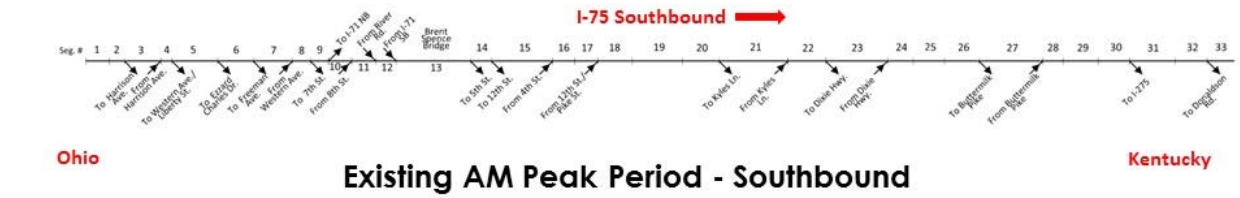
Figure 2 – Northbound I-71/I-75 AM Peak Existing Condition compared to Future No-Build Condition

As shown, in the existing condition, the northbound direction begins backing up in downtown Cincinnati, extends across the Brent Spence, and backs up all the way to Buttermilk Pike during the middle of the morning peak. As shown in the future no-build, conditions will worsen if no improvements are made, both in terms of the length and duration of the backups.

Congestion in the southbound direction is not as prevalent during the AM peak periods and generally begins north of the Brent Spence Bridge and extends through Harrison Avenue. The future no-build concept shows only a slight deterioration in traffic conditions with one section in Kentucky projected to operate at LOS D (still acceptable) and a modest increase in congestion north of the Brent Spence Bridge.



Existing AM Peak Period - Southbound

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Year 2040 No-Build AM Peak Period - Southbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29	Seg. 30	Seg. 31	Seg. 32	Seg. 33
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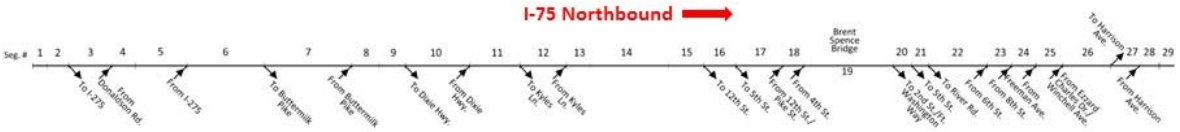
#14 9:15 - 9:30	C	B	C	C	B	B	B	B	B	B	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B
#15 9:30 - 9:45	C	B	C	C	B	B	B	B	B	C	C	C	C	B	B	B	B	B	C	C	C	B	B	B	B	A	B	B	B	A	C	C	B
#16 9:45 - 10:00	C	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B

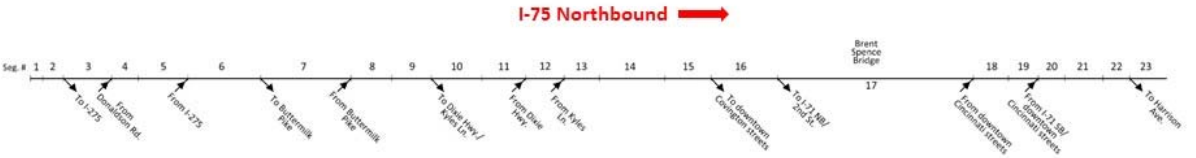
Figure 3 – Southbound I-71/I-75 AM Peak Existing Condition compared to Future No-Build Condition

The "heat maps" in **Figure 4** and **Figure 5** illustrate AM peak (morning rush) levels of service by segment for the future no-build condition and for the future 6-17 build condition in the northbound direction and southbound direction, respectively. Note the segmentation varies by time period as the analyses reflect the modifications proposed to the corridor. The figures illustrate that 6-17 would significantly improve conditions. Without the proposed improvements, congestion will worsen considerably. Peak periods will be extended beyond the current timeframes and congestion will be extended throughout the corridor.



Year 2040 No-Build AM Peak Period - Northbound

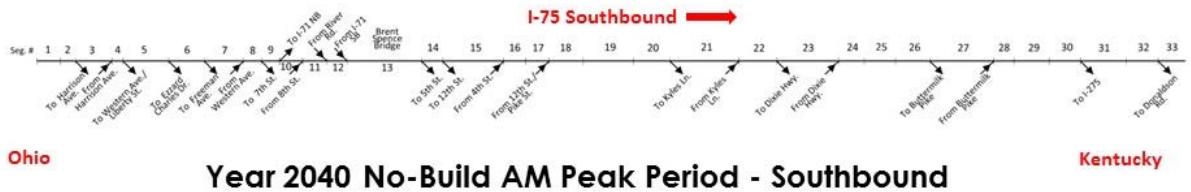
Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29
#1 6:00 - 6:15	C	B	C	C	C	E	F	F	F	E	F	F	D	E	E	E	E	D	F	F	E	D	C	B	B	C	C	C	C
#2 6:15 - 6:30	D	C	D	F	F	F	F	F	F	F	F	F	F	E	E	F	F	F	F	F	E	D	C	B	C	C	C	C	D
#3 6:30 - 6:45	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	C	B	C	D	C	D	D
#4 6:45 - 7:00	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	D	C	B	C	C	C	C	D
#5 7:00 - 7:15	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	C	B	C	C	C	D	D
#6 7:15 - 7:30	F	F	E	F	F	E	F	F	D	F	F	F	D	E	F	F	F	F	F	C	D	C	B	B	B	C	C	C	D
#7 7:30 - 7:45	F	F	A	C	B	C	B	C	C	D	F	F	D	F	F	F	F	F	D	A	B	A	A	A	B	B	A	B	B
#8 7:45 - 8:00	F	F	A	C	C	C	B	C	C	B	B	B	B	D	D	F	F	F	C	A	B	A	A	A	A	A	A	B	A
#9 8:00 - 8:15	F	F	B	C	C	D	B	C	D	C	C	C	C	D	C	C	F	F	F	B	C	B	B	B	B	B	B	C	C
#10 8:15 - 8:30	F	F	B	C	C	D	C	C	D	C	C	C	C	D	D	D	D	F	F	C	D	B	B	B	B	C	B	C	C
#11 8:30 - 8:45	F	F	B	C	C	D	C	D	E	D	C	D	C	D	D	D	D	F	F	C	E	C	B	B	B	C	C	C	C
#12 8:45 - 9:00	F	E	C	C	C	E	D	D	E	D	D	D	D	E	E	E	D	F	F	C	E	C	B	B	B	C	B	C	C
#13 9:00 - 9:15	F	E	C	D	C	E	D	E	E	E	E	E	D	E	E	F	F	F	F	C	E	C	B	B	B	C	C	C	C
#14 9:15 - 9:30	F	E	C	C	C	E	D	E	E	E	E	F	E	F	E	F	F	F	F	C	E	D	B	B	B	C	C	C	C
#15 9:30 - 9:45	E	D	C	C	C	D	C	F	E	E	F	F	F	F	F	F	F	F	F	C	E	D	B	B	B	C	C	C	C
#16 9:45 - 10:00	C	C	B	C	C	D	C	D	D	D	F	F	E	F	E	E	D	F	F	C	E	D	B	B	B	C	C	C	C



Year 2040 With 6-17 AM Peak Period - Northbound

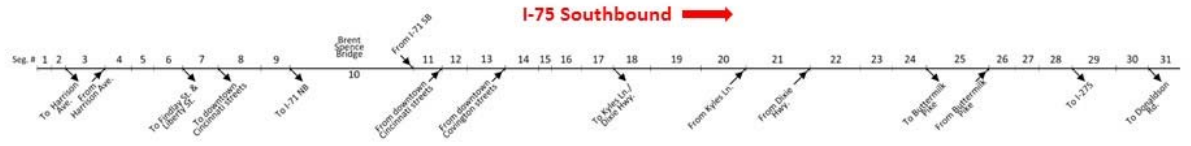
Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23
#1 6:00 - 6:15	C	B	C	C	C	E	E	D	E	E	C	C	C	C	C	D	D	D	D	C	C	C	C
#2 6:15 - 6:30	D	C	C	D	D	F	F	D	E	E	C	C	C	C	C	D	D	D	D	C	C	C	C
#3 6:30 - 6:45	E	E	D	F	F	F	F	D	E	E	C	C	C	C	C	E	D	D	E	C	C	C	C
#4 6:45 - 7:00	F	F	F	F	F	F	F	D	E	D	C	C	C	C	C	E	C	D	D	C	C	C	C
#5 7:00 - 7:15	F	E	C	D	D	F	F	D	E	D	C	C	C	C	C	F	C	D	D	C	C	C	C
#6 7:15 - 7:30	F	F	B	C	C	E	C	D	D	C	B	B	B	B	B	E	B	C	C	B	B	B	B
#7 7:30 - 7:45	F	F	A	C	B	C	B	C	C	B	A	A	A	A	A	D	A	B	B	B	B	B	B
#8 7:45 - 8:00	D	F	A	C	B	C	B	C	C	A	A	A	A	A	A	D	A	B	B	A	A	B	A
#9 8:00 - 8:15	D	E	B	C	B	D	B	C	C	B	A	B	B	B	B	E	A	C	B	B	B	B	B
#10 8:15 - 8:30	D	E	B	C	C	D	C	C	D	C	B	B	B	B	B	E	A	C	C	B	B	B	B
#11 8:30 - 8:45	D	E	B	C	C	D	D	D	E	C	B	B	B	B	B	E	B	C	C	B	B	B	B
#12 8:45 - 9:00	D	D	B	C	C	E	D	D	E	D	B	B	B	B	B	E	B	C	C	B	B	B	B
#13 9:00 - 9:15	C	C	B	C	C	E	D	D	E	D	C	B	B	B	B	E	B	C	C	B	B	B	B
#14 9:15 - 9:30	C	C	B	C	C	E	D	D	E	D	C	B	B	B	B	D	B	C	C	B	B	B	B
#15 9:30 - 9:45	C	C	B	C	C	D	D	D	E	D	C	B	B	B	B	D	B	C	C	B	B	B	B
#16 9:45 - 10:00	C	C	B	C	C	D	C	D	D	C	B	B	B	B	B	D	B	C	C	B	B	B	B

Figure 4 – Northbound I-71/I-75 AM Peak Future No-Build Condition compared to KYTC Item 6-17



Year 2040 No-Build AM Peak Period - Southbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29	Seg. 30	Seg. 31	Seg. 32	Seg. 33
#1 6:00 - 6:15	B	A	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	A	B	B	B	A	A	B	A
#2 6:15 - 6:30	C	B	B	C	B	B	B	B	B	C	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B
#3 6:30 - 6:45	C	C	C	C	C	C	B	B	C	C	C	B	C	B	B	B	C	B	B	C	C	C	B	B	B	C	A	B	B	C	B	B	C	B
#4 6:45 - 7:00	C	C	C	D	C	C	C	C	C	C	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	B	B	B	A
#5 7:00 - 7:15	D	C	C	D	C	C	C	C	C	C	C	C	B	C	B	B	B	B	C	C	C	B	B	B	B	A	B	B	C	B	B	C	B
#6 7:15 - 7:30	D	C	C	D	C	C	C	C	C	C	B	C	B	C	B	B	B	B	C	C	C	B	B	B	B	A	B	B	C	B	B	C	B
#7 7:30 - 7:45	D	C	C	E	D	C	C	D	C	C	C	C	C	C	B	B	C	B	D	C	C	B	C	B	C	A	C	C	C	B	C	C	B
#8 7:45 - 8:00	D	C	D	F	D	D	D	D	C	C	C	C	C	C	B	B	C	B	D	C	C	B	C	B	C	A	B	C	C	B	B	C	B
#9 8:00 - 8:15	D	C	D	E	D	D	D	D	C	C	C	C	C	C	B	B	C	B	C	C	C	B	B	B	C	A	B	B	C	B	B	C	B
#10 8:15 - 8:30	D	C	D	E	D	C	C	D	C	C	C	C	C	C	B	B	C	B	C	C	C	B	B	B	B	A	B	B	B	B	B	C	B
#11 8:30 - 8:45	D	C	D	E	D	C	C	D	C	C	C	C	C	C	B	B	C	B	C	C	C	B	B	B	C	A	B	B	C	B	B	C	B
#12 8:45 - 9:00	D	C	D	E	D	C	C	C	C	C	B	C	B	C	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B
#13 9:00 - 9:15	C	C	C	C	C	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B
#14 9:15 - 9:30	C	B	C	C	B	B	B	B	B	B	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B
#15 9:30 - 9:45	C	B	C	C	B	B	B	B	B	C	C	C	C	C	B	B	C	B	C	C	C	B	B	B	C	A	B	B	C	A	C	C	B
#16 9:45 - 10:00	C	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	C	C	B	B	B	B	B	A	B	B	B	A	B	C	B

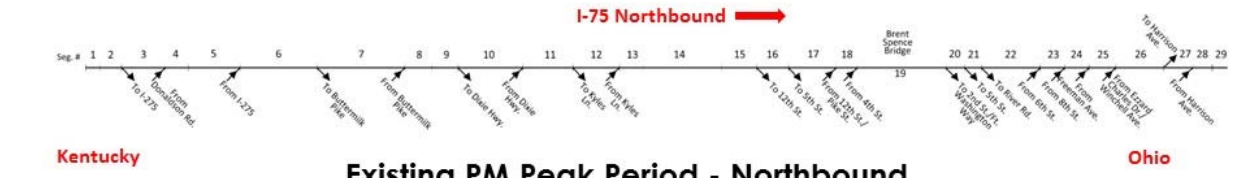


Year 2040 With 6-17 AM Peak Period - Southbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29	Seg. 30	Seg. 31
#1 6:00 - 6:15	A	A	A	A	A	A	A	B	B	A	A	A	A	A	A	A	A	A	A	B	A	A	A	A	B	B	B	B	B	B	B
#2 6:15 - 6:30	B	A	B	B	B	B	B	C	C	B	B	A	B	A	B	B	B	A	B	B	B	A	B	B	B	B	B	C	B	C	B
#3 6:30 - 6:45	B	A	B	B	B	B	B	D	D	B	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	B	C	B
#4 6:45 - 7:00	B	B	B	B	B	B	B	D	D	B	B	A	B	B	B	B	B	B	B	B	B	A	B	B	B	C	C	C	B	B	B
#5 7:00 - 7:15	C	B	B	B	B	B	B	D	E	B	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#6 7:15 - 7:30	C	B	B	B	B	B	B	D	E	B	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#7 7:30 - 7:45	C	B	C	B	C	B	B	E	E	B	B	A	B	B	B	C	C	B	B	C	B	B	C	C	C	C	D	D	C	D	C
#8 7:45 - 8:00	C	B	C	C	C	F	F	E	E	B	B	A	B	B	B	C	B	B	B	C	B	B	C	C	C	C	D	D	C	C	C
#9 8:00 - 8:15	C	B	C	F	F	F	F	E	E	C	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#10 8:15 - 8:30	C	B	C	F	F	F	F	E	E	C	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#11 8:30 - 8:45	C	B	C	F	F	F	F	E	E	C	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#12 8:45 - 9:00	C	B	C	F	F	F	F	E	E	C	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#13 9:00 - 9:15	B	A	B	D	F	F	F	E	E	B	B	A	B	B	B	B	B	B	B	C	B	B	B	B	C	C	C	C	C	C	C
#14 9:15 - 9:30	B	A	B	B	B	B	B	C	C	B	B	A	B	B	B	B	B	A	B	B	B	B	B	B	B	B	C	B	C	C	B
#15 9:30 - 9:45	B	A	B	B	B	B	B	C	C	B	B	A	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C
#16 9:45 - 10:00	B	A	B	A	B	B	A	C	C	B	B	A	B	A	B	B	B	A	B	B	B	A	B	B	B	B	B	B	B	C	B

Figure 5 – Southbound I-71/I-75 AM Peak Future No-Build Condition compared to KYTC Item 6-17

The existing and future no-build afternoon peak "heat maps" for the northbound and southbound directions are shown in **Figure 6** and **Figure 7,** respectively. Slowdowns are observed in the existing condition in the southbound direction in the downtown Cincinnati area and on the Brent Spence Bridge, as well as on the uphill grade approaching Kyles Lane. Slowdowns are present in the northbound direction as well, from I-275 all the way to the Brent Spence Bridge. In the southbound direction during the PM peak, the results imply conditions overall are slightly below capacity today, but predicted future growth will result in extensive congestion beginning at the I-275 interchange and extending to the Brent Spence Bridge.



Existing PM Peak Period - Northbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29
#1 14:00 - 14:15	C	B	B	B	B	C	C	C	D	C	C	C	C	D	D	D	C	C	E	C	E	C	C	B	B	C	C	C	C
#2 14:15 - 14:30	C	C	B	C	C	C	C	C	D	D	D	D	C	D	D	D	D	C	E	C	E	C	B	B	B	C	C	C	C
#3 14:30 - 14:45	C	C	B	C	B	C	C	D	D	D	D	D	C	D	D	D	D	C	F	C	E	D	C	B	C	C	C	D	D
#4 14:45 - 15:00	C	C	B	C	C	C	C	C	D	D	D	D	C	D	D	D	C	C	F	C	E	C	C	B	B	C	C	C	D
#5 15:00 - 15:15	D	C	B	C	C	C	C	D	D	D	D	D	D	D	E	E	D	C	F	D	E	D	C	C	C	D	D	D	D
#6 15:15 - 15:30	C	C	B	C	C	C	C	D	D	D	D	D	C	D	E	E	D	C	F	C	E	C	C	B	C	D	C	C	D
#7 15:30 - 15:45	D	C	B	C	C	D	C	D	E	D	D	E	D	E	E	E	D	C	F	F	E	D	C	C	C	D	D	D	D
#8 15:45 - 16:00	C	C	B	C	B	C	C	C	D	D	D	D	C	D	D	D	C	C	E	E	E	D	C	B	C	D	C	C	D
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#10 16:15 - 16:30	C	C	B	C	B	C	B	C	D	C	C	C	C	D	D	D	C	C	E	C	D	B	C	B	C	C	C	C	D
#11 16:30 - 16:45	D	D	B	C	C	D	C	D	E	D	D	D	D	E	E	E	D	D	F	D	F	D	C	C	C	E	D	D	E
#12 16:45 - 17:00	D	C	B	C	C	D	C	D	E	D	E	D	D	E	E	E	D	D	F	F	E	D	C	C	C	D	D	D	D
#13 17:00 - 17:15	D	D	C	D	D	E	F	F	E	E	F	F	D	E	E	E	E	F	F	F	E	D	D	C	D	E	D	D	E
#14 17:15 - 17:30	D	C	B	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	C	C	E	D	D	E
#15 17:30 - 17:45	C	C	B	C	C	D	F	F	D	E	F	F	F	F	E	E	D	D	E	F	E	C	C	C	C	D	C	C	D
#16 17:45 - 18:00	C	C	B	C	B	C	C	E	D	D	F	F	F	F	E	E	D	C	F	C	E	C	C	C	C	D	C	C	D

Year 2040 No-Build PM Peak Period - Northbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29
#1 14:00 - 14:15	C	C	B	B	B	C	C	C	D	C	C	D	C	D	D	D	C	C	E	C	E	D	C	B	C	C	C	C	D
#2 14:15 - 14:30	D	C	B	C	C	C	C	C	D	D	D	D	C	D	E	E	D	C	F	C	E	C	C	B	B	C	C	C	D
#3 14:30 - 14:45	D	C	B	C	B	C	C	D	D	D	D	D	C	D	E	E	D	C	F	C	E	D	C	B	C	D	C	D	D
#4 14:45 - 15:00	D	D	B	C	C	C	C	C	D	D	D	D	C	D	E	E	D	C	F	C	E	D	C	B	C	C	C	C	D
#5 15:00 - 15:15	D	D	B	C	C	C	C	D	D	D	D	D	D	E	E	E	D	C	F	D	F	D	C	C	C	D	D	D	D
#6 15:15 - 15:30	D	D	B	C	C	C	C	D	D	D	D	D	D	E	E	E	D	C	F	C	E	D	C	B	C	D	C	D	D
#7 15:30 - 15:45	D	D	B	C	C	D	C	D	E	E	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	D	D	D	D
#8 15:45 - 16:00	D	D	B	C	B	C	C	D	D	D	D	D	C	D	E	E	D	C	F	F	E	D	C	C	C	D	C	D	D
#9 16:00 - 16:15	D	D	B	C	C	D	C	D	E	D	D	D	D	E	E	E	D	C	F	E	E	D	C	C	C	D	D	D	E
#10 16:15 - 16:30	D	D	B	C	B	C	B	C	D	C	D	D	C	D	D	D	C	C	F	C	D	C	C	C	C	D	C	C	D
#11 16:30 - 16:45	D	E	B	C	C	D	C	D	E	D	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	E	D	D	E
#12 16:45 - 17:00	D	D	B	C	C	D	C	D	E	E	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	D	D	D	E
#13 17:00 - 17:15	E	E	C	D	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	C	D	E	D	D	E
#14 17:15 - 17:30	D	D	C	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	C	D	E	D	D	E
#15 17:30 - 17:45	D	D	B	C	E	F	F	F	E	F	F	F	D	E	E	E	E	D	F	F	E	C	C	C	C	D	C	C	D
#16 17:45 - 18:00	D	D	B	C	B	C	D	F	E	F	F	F	D	E	E	E	D	C	F	D	E	D	C	C	C	D	C	C	D

Figure 6 – Northbound I-71/I-75 PM Peak Existing Condition compared to Future No-Build Condition

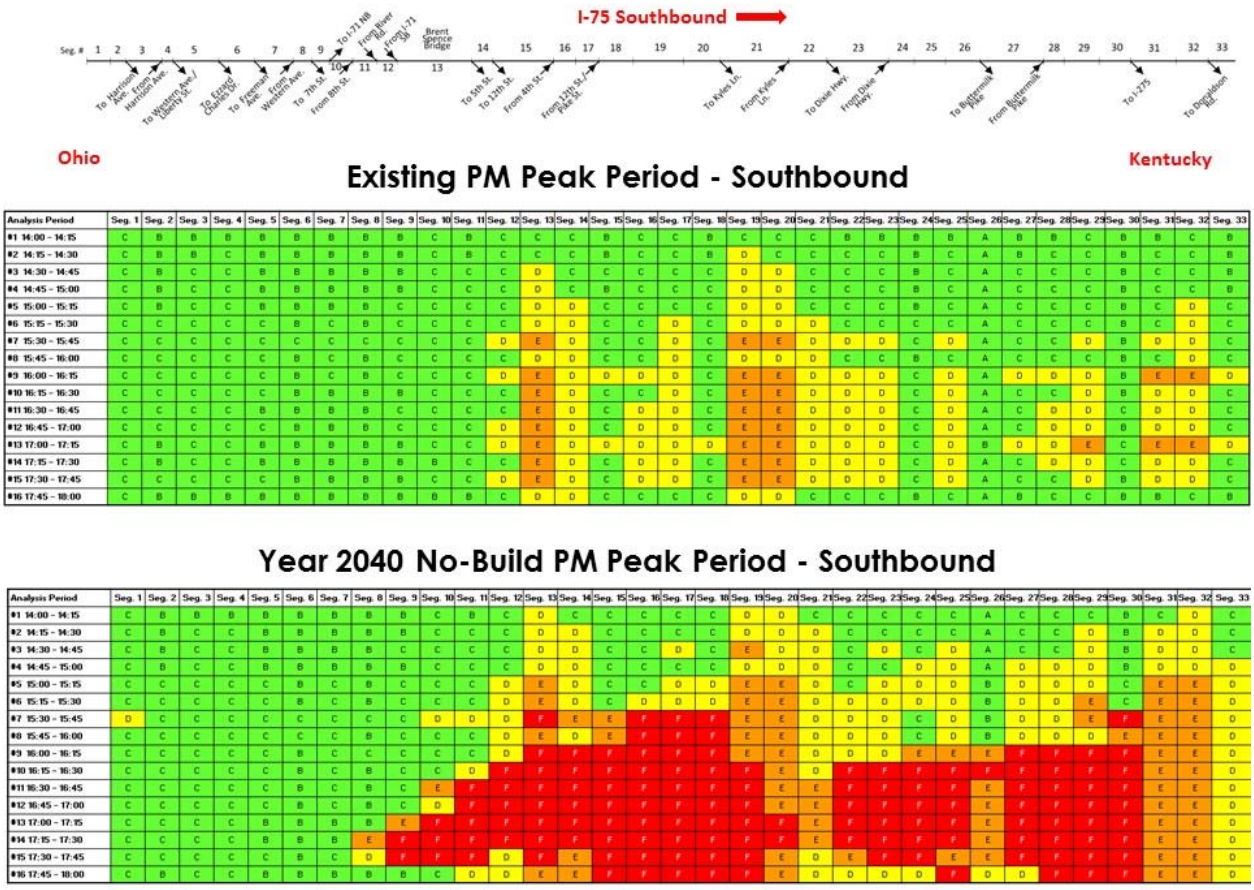
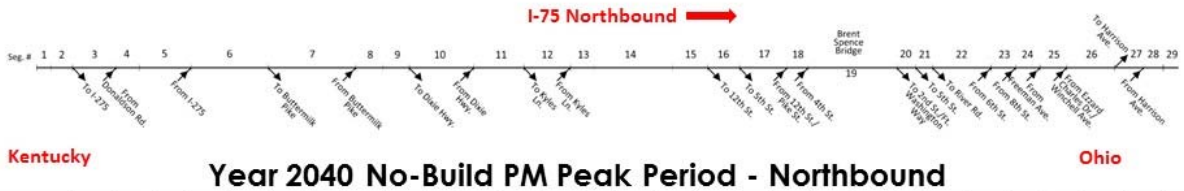


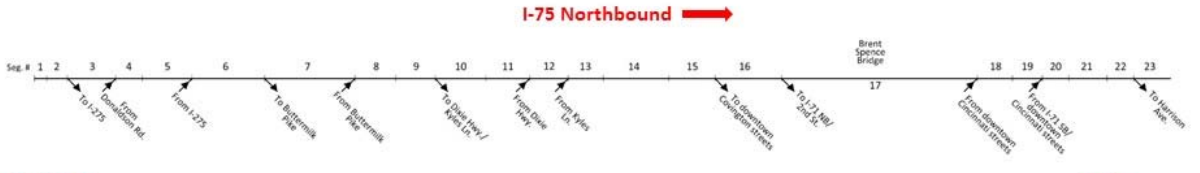
Figure 7 – Southbound I-71/I-75 PM Peak Existing Condition compared to Future No-Build Condition

The "heat maps" in **Figure 8** and **Figure 9** illustrate PM peak (afternoon rush) levels of service by segment for the future no-build condition and for the future 6-17 build condition in the northbound direction and southbound direction, respectively. As with the AM Peak, this exercise illustrated that KYTC Item 6-17 would significantly improve conditions. However, KYTC Item 6-17 will not completely eliminate congestion in the I-71/I-75 corridor, particularly in the downtown Cincinnati area and near the I-275 interchange in Kentucky. The Ohio Department of Transportation has other planned projects beyond 6-17 that will improve congestion on the Cincinnati side of the bridge. These results point to the additional need for capacity improvements of the I-275 interchange with I-71/I-75. For maximum benefit, the needed improvements should be scheduled as closely as possible to KYTC Item 6-17. The I-275 interchange reconstruction would include widening of I-71/I-75 from Turfway Road north through the I-275 interchange to KYTC Item 6-17.



Year 2040 No-Build PM Peak Period - Northbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23	Seg. 24	Seg. 25	Seg. 26	Seg. 27	Seg. 28	Seg. 29
#1 14:00 - 14:15	C	C	B	B	B	C	C	C	D	C	C	D	C	D	D	D	C	C	E	C	E	D	C	B	C	C	C	C	D
#2 14:15 - 14:30	D	C	B	C	C	C	C	C	D	D	D	D	C	D	E	E	D	C	F	C	E	C	C	B	B	C	C	C	D
#3 14:30 - 14:45	D	C	B	C	B	C	C	D	D	D	D	D	C	D	E	E	D	C	F	C	E	D	C	B	C	D	C	D	D
#4 14:45 - 15:00	D	D	B	C	C	C	C	C	D	D	D	D	C	D	E	E	D	C	F	C	E	D	C	B	C	C	C	C	D
#5 15:00 - 15:15	D	D	B	C	C	C	C	D	D	D	D	D	D	E	E	E	D	C	F	D	F	D	C	C	C	D	D	D	D
#6 15:15 - 15:30	D	D	B	C	C	C	C	D	D	D	D	D	D	E	E	E	D	C	F	C	E	D	C	B	C	D	C	D	D
#7 15:30 - 15:45	D	D	B	C	C	D	C	D	E	E	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	D	D	D	D
#8 15:45 - 16:00	D	D	B	C	B	C	C	D	D	D	D	D	C	D	E	E	D	C	F	F	E	D	C	C	C	D	C	D	D
#9 16:00 - 16:15	D	D	B	C	C	D	C	D	E	D	D	D	D	E	E	E	D	C	F	E	E	D	C	C	C	D	D	D	E
#10 16:15 - 16:30	D	D	B	C	B	C	B	C	D	C	D	D	C	D	D	D	C	C	F	C	D	C	C	C	C	D	C	C	D
#11 16:30 - 16:45	D	E	B	C	C	D	C	D	E	D	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	E	D	D	E
#12 16:45 - 17:00	D	D	B	C	C	D	C	D	E	E	E	E	D	E	E	E	D	D	F	F	E	D	C	C	C	D	D	D	E
#13 17:00 - 17:15	E	E	C	D	D	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	C	D	E	D	D	E
#14 17:15 - 17:30	D	D	C	E	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	D	D	C	D	E	D	D	E
#15 17:30 - 17:45	D	D	B	C	E	F	F	F	E	F	F	F	D	E	E	E	E	D	F	F	E	C	C	C	C	D	C	C	D
#16 17:45 - 18:00	D	D	B	C	B	C	D	F	E	F	F	F	D	E	E	E	D	C	F	D	E	D	C	C	C	D	C	C	D



Year 2040 With 6-17 PM Peak Period - Northbound

Analysis Period	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	Seg. 8	Seg. 9	Seg. 10	Seg. 11	Seg. 12	Seg. 13	Seg. 14	Seg. 15	Seg. 16	Seg. 17	Seg. 18	Seg. 19	Seg. 20	Seg. 21	Seg. 22	Seg. 23
#1 14:00 - 14:15	C	C	B	B	B	C	C	C	D	C	B	B	B	B	B	C	B	B	C	B	B	B	B
#2 14:15 - 14:30	C	C	B	C	C	D	C	C	D	D	B	B	B	B	B	D	B	B	C	B	B	B	B
#3 14:30 - 14:45	C	C	B	C	C	D	C	D	D	D	B	B	B	B	B	D	B	B	C	B	B	C	C
#4 14:45 - 15:00	D	D	B	C	C	D	C	C	D	D	B	B	B	B	B	D	B	B	C	B	B	C	B
#5 15:00 - 15:15	D	D	B	C	C	D	C	D	D	D	B	C	B	B	B	D	B	B	C	C	B	C	C
#6 15:15 - 15:30	D	D	B	C	C	D	C	D	D	D	B	B	B	B	B	D	B	B	C	B	B	C	B
#7 15:30 - 15:45	D	D	B	C	C	E	D	D	E	D	C	C	B	B	B	D	B	C	C	C	C	C	C
#8 15:45 - 16:00	D	D	B	C	C	D	C	C	D	C	B	B	B	B	B	D	B	B	B	B	B	C	B
#9 16:00 - 16:15	D	D	B	C	C	D	C	D	D	D	B	C	B	B	B	D	B	B	C	C	B	C	C
#10 16:15 - 16:30	D	D	B	B	B	C	C	C	D	C	B	B	B	B	B	D	A	B	B	B	B	B	B
#11 16:30 - 16:45	D	E	B	C	C	E	C	D	E	D	B	C	B	B	B	D	B	B	C	C	B	C	C
#12 16:45 - 17:00	D	D	B	C	C	E	C	D	E	D	B	C	B	B	B	D	B	B	C	C	B	C	C
#13 17:00 - 17:15	D	E	C	D	D	F	D	E	E	E	C	C	C	C	C	D	C	C	D	C	C	D	C
#14 17:15 - 17:30	D	D	B	C	C	F	D	E	E	D	C	C	C	C	C	E	B	B	C	C	B	C	C
#15 17:30 - 17:45	D	D	A	C	B	D	C	C	D	C	B	B	B	B	B	D	A	B	B	B	B	B	B
#16 17:45 - 18:00	C	D	B	C	B	D	C	C	D	C	B	B	B	B	B	D	A	B	B	B	B	B	B

Figure 8 – Northbound I-71/I-75 PM Peak Existing Condition compared to Future No-Build Condition

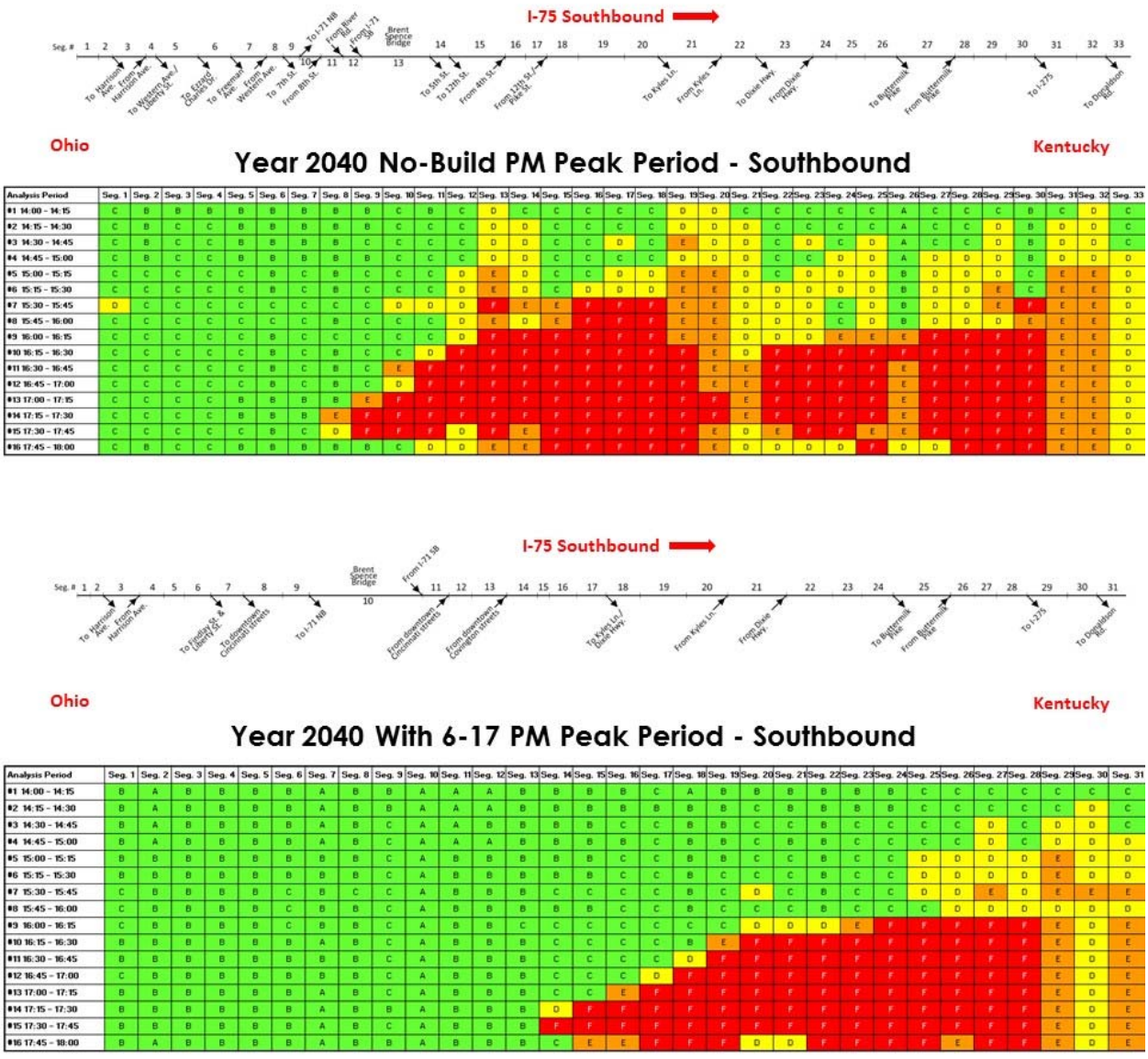


Figure 9 – Southbound I-71/I-75 PM Peak Period Future No-Build Condition compared to KYTC Item 6-17

A "high level" analysis of the I-71/I-75 corridor from I-275 to the I-71/I-75 split in Boone County was performed as a first step in determining potential future capacity needs beyond construction of the *Brent Spence Bridge Replacement/ Rehabilitation Project* (KYTC Item 6-17). The analysis indicates that additional through-lane capacity – one lane in each direction - will be needed from the I-71/I-75 split north to KYTC Item 6-17. As previously mentioned, the I-275 interchange reconstruction would include widening of I-71/I-75 from Turfway Road north through the I-275 interchange to KYTC Item 6-17. The widening south of this location to the I-71/I-75 split is not needed immediately but will likely be needed sometime after 2030 and by the year 2040 if the objective is to provide an acceptable LOS for the section. A planning-level cost estimate for this widening is shown in **Table 1 – Summary of Traffic and Cost Findings** under **Summary of Key Study Findings**. This widening need would be in addition to the construction of three projects currently in the design phase:

- I-71/I-75 interchange reconstruction at KY 338 (KYTC Item 6-18.00)
- I-71/I-75 interchange reconstruction at KY 536 (KYTC Item 6-14.00)
- I-71/I-75 auxiliary lanes between KY 536 and US 42 (KYTC Item 6-14.50)

The locations of these projects are identified on **Figure 10** along with the *Brent Spence Bridge Replacement/ Rehabilitation Project* (KYTC Item 6-17) and the I-275 Interchange.

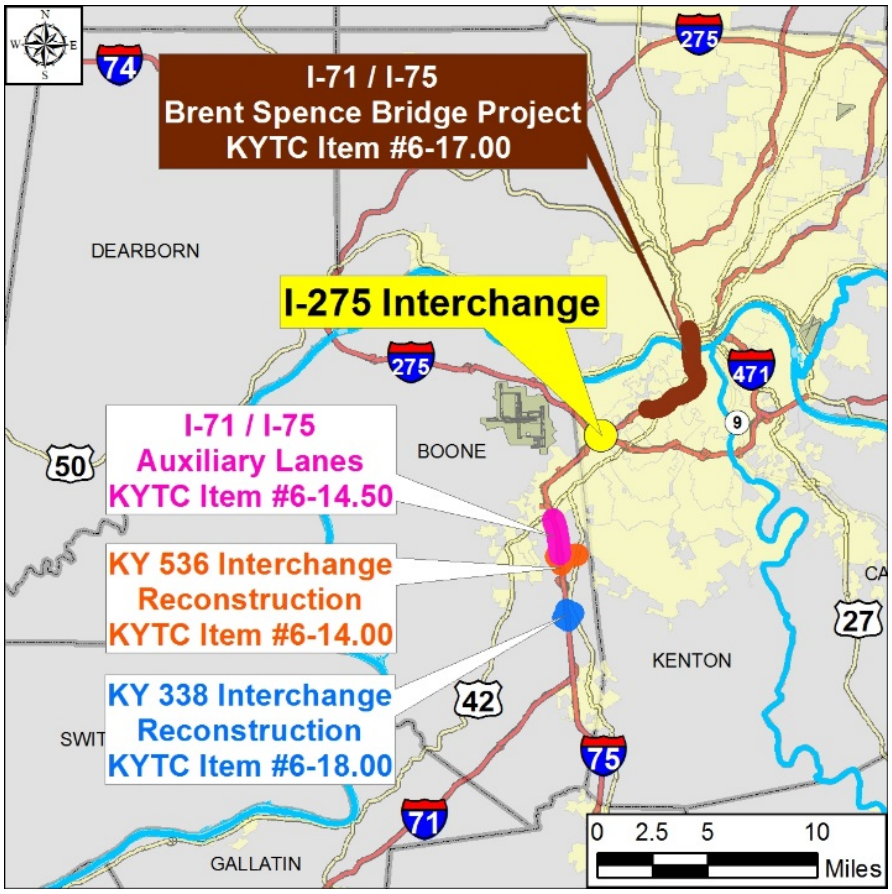


Figure 10 – I-71/I-75 Proposed Projects

COST

Upon review, it was determined that no change should be made from the phases costs presented in the KYTC Item 6-17 Initial Financial Plan (2013). The total estimated cost for KYTC Item 6-17 is $2.3 Billion in current year dollars and $2.6 Billion in year of expenditure dollars, assuming the project would be open to traffic in 2024. With the addition of the I-275 interchange, the cost estimate rises to $3.0 Billion in year of expenditure dollars. Kentucky's share would be approximately $1.6 Billion**.**

Summary of Key Study Findings

A summary of key traffic and cost findings explained in this document is shown in **Table 1 – Summary of Key Traffic and Cost Findings**.

Table 1. SUMMARY OF KEY TRAFFIC AND COST FINDINGS

I-71/I-75 Segment	Begin MP - End MP	Existing Lanes Total (Mainline)**	Existing		2040 No Build		2040 with 6-17			2040 w/Concept 1*		2040 w/Concept 3*		2040 No Build with 20% Less Traffic on I-75	
			Daily Traffic (OKI RTDM)***	LOS	Daily Traffic (OKI RTDM)***	LOS	No. Lanes Total (Mainline)**	Daily Traffic (OKI RTDM)***	LOS	Daily Traffic (OKI RTDM)***	LOS	Daily Traffic (OKI RTDM)***	LOS	Daily Traffic (OKI RTDM)***	LOS
OH: Harrison Ave. - Western Ave./Liberty St.	2.5-2.1	9(8)	139,800	E	143,500	E	9(8)	149,500	E	134,600	E	138,300	E	114,800	E
OH: Western Ave./Liberty St. - Ezzard Charles St.	2.1-1.8	8	131,600	E	135,500	E	8	144,100	F	120,000	E	123,900	E	108,400	E
OH: Ezzard Charles St. - Freeman Ave.	1.8-1.6	8	116,000	E	120,800	E	8	127,300	E	108,100	E	115,000	E	96,600	D
OH: Freeman Ave. - 7th St.	1.6-0.9	9(8)	112,900	D/E	117,900	E	8	122,800	E	107,100	D	112,200	D/E	94,300	D
OH: 7th St. - I-71 (FWW) /5th St./2nd St.	0.9-0.5	4	95,800	F	113,500	F	4	115,900	E	107,100	F	111,100	F	90,800	F
[OH] I-71 (FWW) /5th St./2nd St. - [KY] 5th St./4th St.	KY (191.2-191.777) OH (0.0-0.5)	8	159,300	F	174,400	F	16	174,200	D	164,700	F	167,800	F	139,500	E/F
KY: 5th St./4th St. - 12th St./Pike St.	190.5-191.2	7	132,000	F	134,300	F	10	151,500	E	139,000	F	142,500	F	107,400	E
KY: 12thSt./Pike St. - Kyles Ln.	188.6-190.5	7	131,000	F	152,100	F	10	151,900	E	141,700	F	145,300	F	121,700	E/F
KY: Kyles Ln. - Dixie Hwy.	187.7-188.6	9(7)	115,400	E	136,300	E	9(7)	135,300	E	125,900	E	129,200	E	109,000	D
KY: Dixie Hwy. - Buttermilk Pk.	186.3-187.7	7	99,500	E	121,872	E/F	7	121,000	E/F	110,400	E	114,100	E	97,500	E
KY: Buttermillk Pk. - I-275	184.7-186.3	8(7)	102,900	E	127,900	E	8(7)	127,900	E	116,000	E	119,600	E	102,300	E
KY: I-275 - Donaldson Rd.	183.7-184.7	6	93,000	E	99,100	E	6	118,300	F	104,000	E/F	107,800	F	79,300	E
KY: Donaldson Rd. - Turfway Rd.	182.4-183.7	10 (8)	125,500	D/E	167,900	E	10(8)	166,000	E	150,100	E	152,800	E	134,300	E
KY: Turfway Rd. - Burlington Pk. (KY 18)	181.2-182.4	10 (8)	123,200	D/E	171,600	E	10(8)	169,100	E	154,000	E	156,500	E	137,300	E
KY: Burlington Pk. (KY 18) - Mall Rd. Ramps	180.8-181.2	8	100,900	D/E	147,700	F	8	144,500	F	128,900	E	121,800	E	118,200	E
KY: Mall Rd. Ramps - US 42	180.0-180.8	8	108,400	E	146,900	F	8	146,300	F	132,000	E	134,300	E	117,500	E
KY: US 42 - Mt. Zion Rd. (KY 536)	178.0-180.0	8	103,700	E	140,900	E/F	8	148,100	F	122,300	E	124,500	E	112,700	E
KY: Mt. Zion Rd. (KY 536) - Richwood Rd. (KY 338)	175.4-178.0	8	94,300	D	135,000	E	8	137,000	E	116,600	E	118,900	E	108,000	E
KY: Richwood Rd. (KY 338) - I-71/I-75 Split	172.9-175.4	8	90,300	D	123,200	E	8	124,400	E	105,600	E	114,900	E	98,600	D

** Traffic forecasts include induced traffic from new development in the corridor*
*** Total lanes includes mainline lanes plus auxiliary lanes*
**** Traffic volumes shown are based on OKI Regional Travel Demand Model (RTDM) Assignments*

Estimated Traffic Impact to Ohio River Crossings

Ohio River Crossing	Bridge Name	Existing Daily Traffic (OKI RTDM)	2040 No Build Daily Traffic (OKI RTDM)	2040 with 6-17 Daily Traffic (OKI RTDM)	2040 with 6-17 % Change**	2040 w/Concept 1* Daily Traffic (OKI RTDM)	2040 w/Concept 1* % Change**	2040 w/Concept 3* Daily Traffic (OKI RTDM)	2040 w/Concept 3* % Change**
I-71/I-75	Brent Spence	159,300	174,400	174,200	-0.1%	164,700	-5.6%***	167,800	-3.8%
I-471	Daniel Carter Beard	123,389	126,000	127,000	0.8%	118,300	-6.1%	119,600	-5.1%
I-275 East	Combs Hehl	56,698	58,700	58,500	-0.3%	50,800	-13.5%	49,900	-15.0%
I-275 West	Carol Cropper	32,907	40,200	38,800	-3.5%	40,000	-0.5%	40,700	1.2%
New Crossing	N/A	N/A	N/A	N/A	N/A	35,900	N/A	36,200	N/A
Daily Crossings of 4 Major Bridges		*372,294*	*399,300*	*398,500*	*-0.2%*	*409,700*	*2.6%*	*414,200*	*3.7%*

** Traffic forecasts include induced traffic from new development in the corridor*
*** Percent change as compared to 2040 No Build*
***** Applying the OKI model results in a range of diverson from 5.6% to 6.9%

Opinion of Probable Cost

Project	Year Open to Traffic	Cost (2017 Dollars)							Kentucky's share of cost (2017 Dollars)	Estimated Total Cost based on Year of Expenditure (YOE)	Kentucky's Share of Estimated Total Cost (YOE Dollars)
		Preliminary Engineering & Environmental	Design	Right-of-Way	Utilties	Construction	CEI	Total Cost			
KYTC Item 6-17 [1]	2024	--	$106,900,000	$76,000,000	$149,700,000	$1,793,000,000	$163,700,000	$2,289,300,000	$1,018,800,000	$2,612,000,000	$1,162,500,000
Reconstruction of I-275 Interchange	2030 [3]	$2,000,000	$21,200,000	$25,000,000	$12,000,000	$212,000,000	$17,000,000	$289,200,000	$289,200,000	$398,830,000	$398,830,000
KYTC Item 6-17 + Reconstruction of I-275 Interchange	2030	$2,000,000	$128,100,000	$101,000,000	$161,700,000	$2,005,000,000	$180,700,000	$2,578,500,000	$1,308,000,000	$3,010,830,000	$1,561,330,000
I-75 additional lane from I-275 to I-71/75 Split [2]	2040	$15,120,000	$40,320,000	$12,600,000	$100,800,000	$504,000,000	$50,400,000	$723,240,000	$723,240,000	$1,236,070,000	$1,236,070,000
Concept 1 (CEB)	2032	$73,420,000	$195,790,000	$106,570,000	$83,590,000	$2,924,490,000	$244,730,000	$3,628,590,000	$1,490,349,000	$5,313,200,000	$2,182,300,000
Concept 3	2032	$29,160,000	$77,740,000	$68,250,000	$38,630,000	$1,161,240,000	$97,180,000	$1,472,200,000	$1,345,165,000	$2,150,090,000	$1,964,600,000

[1] Source: 2013 Brent Spence Bridge Initial Financial Plan
[2] High-level construction estimate of $42 million per mile was used
[3] The I-275 Interchange should be completed as near as possible to the completion of KYTC Item 6-17

In summary, key study findings include:

- The study confirmed that the *Brent Spence Bridge Replacement/ Rehabilitation Project* (KYTC Item 6-17) is needed. Along with reconstruction of the I-275 interchange, this project clearly demonstrates travel congestion relief in the corridor through the year 2040 with acceptable levels of service.

- The I-275 interchange reconstruction should be accomplished concurrently, or nearly concurrently, with KYTC Item 6-17. This would include the widening of I-71/I-75 from Turfway Road north to KYTC Item 6-17. Widening further south of Turfway Road to the I-71/I-75 split is not needed currently but should be evaluated periodically as traffic volumes increase. The study indicates that widening in this area would be needed between 2030 and 2040 to provide an acceptable level of service in this section.

- Regional through traffic on the Brent Spence Bridge is estimated to be 12 to 20 percent of the average daily traffic. If the CEB were constructed, it is estimated that traffic volume on the Brent Spence Bridge would be reduced by 7 to 10 percent in Year 2040 (compared to 2040 traffic volume on the Brent Spence Bridge) and that most of the reduction would be regional through traffic. If Concept 3 were constructed, the reduction would be approximately 4 percent. In either case, significant congestion and poor levels of service would remain between Kyles Lane and downtown Cincinnati.

- The study examined a number of short-term improvements not mentioned in this document, including potential Active Traffic and Demand Management strategies. The relocation of the 4th Street Ramp in Covington was also examined and found to show some promise as an interim improvement. However, no short-term strategies evaluated would provide adequate traffic operations improvements to eliminate or defer the need for *the Brent Spence Bridge Replacement/ Rehabilitation Project* (KYTC Item 6-17) nor would the combination of short-term improvement strategies with either Concepts 1(CEB) or 3 eliminate or defer the need for KYTC Item 6-17.

- Costs are estimated as follows (each assumes funding is in place):
    - **KYTC Item 6-17** - $2.3 Billion in current year dollars and $2.6 Billion in year of expenditure (YOE) dollars, assuming the project would be open to traffic in 2024. Kentucky's share is estimated at $1.0 Billion in current year dollars and $1.2 Billion in YOE dollars. With the addition of the I-275 interchange, the cost estimate rises to $2.6 Billion in current year dollars and $3.0 Billion in YOE dollars. Kentucky's share is estimated at $1.3 Billion in current year dollars and $1.6 Billion in YOE dollars.
    - **Concept 1 (CEB)** - $3.6 Billion in current year dollars and $5.3 Billion in YOE dollars, assuming construction beginning in 2029 and the project being open to traffic in 2032. Kentucky's share is about $2.2 Billion in YOE dollars.
    - **Concept 3** - $1.5 Billion in current year dollars and $2.2 Billion in YOE dollars, assuming construction beginning in 2029 and the project being open to traffic in 2032. Kentucky's share is about $2.0 Billion in YOE dollars.

- By 2040, the CEB is estimated to carry 25,000 to 46,000 vehicles per day, with approximately 36,000 vehicles per day at the new Ohio River Crossing. The bypass would enhance economic development and cross-river capacity. While it does not defer the need for the *Brent Spence Bridge Replacement/ Rehabilitation Project,* this concept is worthy of further exploration.