

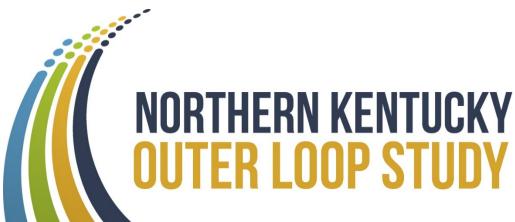
EXECUTIVE SUMMARY



Boone, Bracken, Campbell, Gallatin, Grant, Kenton, Owen, & Pendleton Counties, Kentucky



KYTC ITEM NO. 6-458 SEPTEMBER 2021



KYTC Item No. 6-458

September 2021



Kentucky Transportation Cabinet

In partnership with:

Stantec Consulting Services Inc.

In association with:

AECOM Qk4 Rasor Marketing Dunrobin Associates, LLC Civil Design, Inc. Corn Island Archaeology





EXECUTIVE SUMMARY

The Northern Kentucky Outer Loop Study (KYTC Item No. 6-458) was initiated by the Kentucky Transportation Cabinet (KYTC) to examine new conceptual transportation connections in the southern portions of Boone, Kenton, and Campbell Counties and northern portions of Gallatin, Owen, Grant, Pendleton, and Bracken Counties. Such connections would serve the growing need for east-west travel within the region, connecting communities to resources along the I-71 and I-75 corridors and providing local opportunities for growth within the counties served.

The Northern Kentucky Outer Loop Study is in the planning phase. This means that no decisions regarding specific roadway alignments were made during this study, but local input is being used to help shape next steps.

PURPOSE AND NEED

Northern Kentucky is one of the fastest growing regions in the Commonwealth. Significant commercial and residential development is occurring in Boone, Kenton, and Campbell Counties. The region has excellent interstate access through I-71, I-75, I-275, and I-471. Major north-south routes such as US 27, US 127, and the AA Highway (KY 9) are also present. Missing, though, is adequate east-west access south of I-275. This hampers future economic growth outside of the three northernmost counties. Access from the AA Highway to I-71 and I-75 is essential to this growth.

The Purpose and Need Statement describes what the project should accomplish. It forms the basis for the decision-making process: each alternative must meet the purpose and address the identified needs to be considered a viable solution.

The purpose of the Northern Kentucky Outer Loop project is to stimulate economic opportunities through regional mobility by providing a safer and more efficient east-west corridor between I-71 and the AA Highway (KY 9).

DEVELOPMENT OF ALTERNATIVES

Preliminary corridor concepts were developed and presented to project stakeholders. The preliminary concepts included six 2,000-foot-wide corridor bands within which a freeway-type facility could be constructed. These concepts were developed based on a multi-faceted approach that included considerations such as satisfying interchange spacing requirements, avoidance of known environmental resources, avoidance of heavily developed areas, and identification of more desirable locations to cross major streams such as the Licking River (i.e. locations with narrower floodplain widths). For comparison purposes, each concept is assumed to be a high-speed, four-lane divided facility with interchanges at interstates (fully-directional system interchanges) and major state routes (service interchanges). The eastern terminus options along the AA Highway were selected to allow a feasible future connection to the Ohio portion of the Cincinnati Eastern Bypass (CEB). The CEB concept was previously studied in the Brent Spence Strategic Corridor Study (KYTC Item No. 6-431); it is approximately 75 miles long and extends from I-71 in Boone County, Kentucky to I-75 just south of Lebanon, Ohio.



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In response to feedback obtained from the stakeholders and the general public, seven alternatives (shown in **Figure ES-1**) were ultimately identified for preliminary screening, referred to as the level one evaluation. All conceptual corridors begin at one of three locations along I-71 and end at one of three locations along KY 9 (AA Highway).

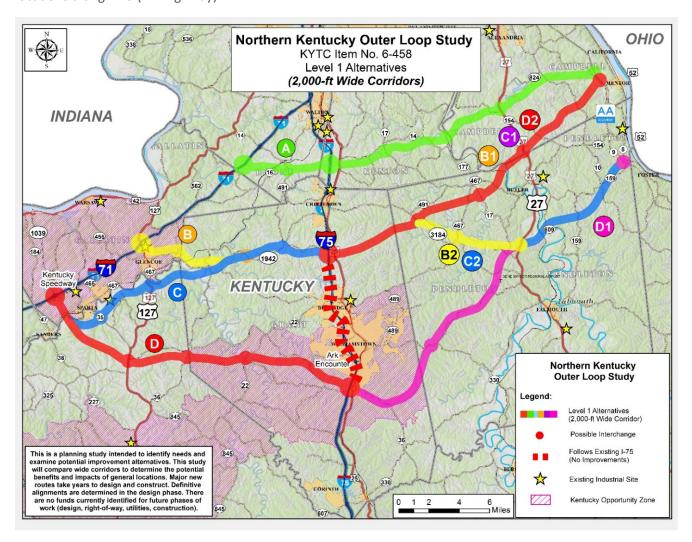


Figure ES-1: Level One Alternatives

PROJECT GOALS AND LEVEL ONE EVALUATION OF ALTERNATIVES

The costs, impacts, and benefits of the Level One Alternatives were evaluated to determine whether a concept merits advancement. To facilitate the evaluation, a two-tier screening process was developed. To facilitate the screening process, stakeholders helped identify the primary objectives of the Northern Kentucky Outer Loop Study. This effort resulted in six project goals. Evaluation criteria were then developed to assess how well each alternative satisfies the project goals as part of the Level One Evaluation of Alternatives. The six project goals are listed below.

- Provide for economic development opportunities
- Enhance regional mobility
- Improve safety





- Provide a cost-effective, constructible solution
- Provide the Kentucky portion of a future CEB
- Remain sensitive to local resources

As a result of the level one screening and the feedback received at the two stakeholder meetings held over the course of the level one screening process, Alternatives A, B1, D1, and D2 were advanced for more detailed evaluation. The following narrative illustrates why these four alternatives were selected from the seven considered to advance for more detailed level two evaluation.

Alternative A: Performed best in the project goals for enhancing regional mobility and providing a cost-effective, constructible solution. In addition, Alternative A showed one of largest potential increases in workforce accessibility, provided access to 18 existing industrial parks, had the largest projected traffic volumes between I-71 and I-75, showed the greatest potential for crash reduction, and had the lowest construction cost estimate.

Alternative B1: Out of the seven alternatives, Alternative B1 performed fourth best overall in the measures of effectiveness. In addition, Alternative B1 showed one of largest potential increases in workforce accessibility, had one of the largest increases in employment opportunities, passed through one Opportunity Zone and one Enhanced Incentive County, had the largest projected traffic volumes between US 27 and the AA Highway, and had one of the lower construction cost estimates.

Alternative D1: Performed best in the project goal for Economic Development. Additionally, Alternative D1 showed one of largest potential increases in workforce accessibility, showed one of the largest increases in employment opportunities, provided access to 18 existing industrial parks and 1,700 acres of shovel-ready sites, passed through two Opportunity Zones and one Enhanced Incentive County, and had the

second largest projected traffic volumes between I-71 and I-75. This alternative did have the second highest construction cost estimate.

Alternative D2: Performed best in the project goal for Improve Safety and second best in the project goal for Economic Development. In addition, Alternative D2 provided access to 17 existing industries and 2,000 acres of shovel-ready sites, passed through two Opportunity Zones and one Enhanced Incentive County, and had the second largest projected traffic volumes between I-75 and US 27. This alternative did have the highest construction cost estimate.

LEVEL TWO EVALUATION OF ALTERNATIVES

For the four alternatives that advanced beyond the level one screening, additional engineering details were developed. This included more refined roadway alignments; preliminary bridge concepts and span arrangements; more detailed cost estimates for design, construction, right-way, and utility relocations; potential land use changes and economic development opportunities; and more detailed traffic forecasts.

The level two evaluation matrix, shown below in **Table ES-1**, summarizes each alternative's ability to satisfy the Draft Purpose & Need Statement and Project Goals. To help quantify the economic impacts,

Opportunity Zones:

Economically distressed communities where certain types of private investment may be eligible for tax incentives.

Enhanced Incentive County: County eligible for enhanced tax

incentives through the Kentucky
Cabinet for Economic
Development.





KYTC ran each alternative through the Transportation Economic Development Impact System (TREDIS). This tool estimates employment growth over a ten-year period (2030 to 2040) as well as the value added. This is the same program that is used in KYTC's Strategic Highway Investment Formula for Tomorrow (SHIFT) prioritization process for projects of Statewide importance.

Table ES-1: Level Two Evaluation Matrix

Concept		Alternative A	Alternative B1	Alternative D1	Alternative D2				
Economic Development									
Additional 2030-2040 Employment Growth with New Freeway (number of new jobs) ¹		443	163	221	182				
Additional 2030-2040 Value Added with New Freeway (2019 \$Millions) 1		\$32	\$17	\$16	\$13				
Industrial Sites (within a 6-mile-w	ride corridor r	epresenting each	alternative)						
Existing Sites		18	15	18	17				
Shovel-Ready (total site acreage)		617	1,403	1,711	1,951				
Enhance Regional Mobility									
Travel Time Savings (minutes)		26	24	21	14				
2040 Average Daily Traffic (No Ohio River Connection to Cincinnati Eastern Bypass)	I-71 to	13,600	5,700	8,700	8,400				
	I-75 to US 27	19,300	12,400	7,800	11,800				
	US 27 to AA	2,800	6,000	5,300	5,500				
2040 Average Daily Traffic (Includes New Ohio River Connection to Cincinnati Eastern Bypass)	I-71 to	19,800	10,300	10,100	9,600				
	I-75 to US 27	36,200	30,900	24,000	28,900				
	US 27 to AA	27,100	29,700	26,300	27,900				





Concept	Alternative A	Alternative B1	Alternative D1	Alternative D2			
Cost-Effective Constructible Solution							
Total Cost (2019 \$Millions)	\$1,235	\$1,713	\$2,033	\$2,076			
2030-2040 Benefit Related to Crash Reduction (2019 \$Millions)	\$7	\$2	\$7	\$4			
2030-2040 Benefit Related to Travel Time Savings (2019 \$Millions)	\$475	\$309	\$233	\$184			
Performs High in How Many Categories? (Cells Highlighted in Green)	11	3	5	4			
Performs Medium in How Many Categories? (Cells Highlighted in Blue)	1	9	5	5			
Performs Low in How Many Categories? (Cells Highlighted in Orange)	2	2	4	5			

¹ Source: Transportation Economic Development Impact System (TREDIS)

CONCLUSIONS

The Northern Kentucky Outer Loop Study examined the benefits of building a new, multi-county freeway facility to improve east-west mobility and to provide economic development opportunities within the counties served. This study was not intended to select a preferred corridor for future implementation. Instead, the study undertook a tiered screening process to identify conceptually feasible corridors within which a freeway facility could be constructed, to perform a high-level evaluation of those concepts to arrive at a more manageable set of four potential options for more detailed evaluation, further study those four options to better understand the costs, benefits and opportunities, and to explore opportunities to advance segments of independent utility. Therefore, additional variations of the level one and level two alternatives could be considered in future project phases.

Longer term, the selected corridor could provide the Kentucky portion of a future CEB. An Ohio Department of Transportation (ODOT) report on the proposed CEB was submitted to Ohio lawmakers on December 31, 2019¹. That agency concluded that "when the costs and time associated delivery of the CEB are evaluated with the known benefits identified in the KYTC [Brent Spence Strategic Corridor] study, it is ODOT's opinion that no further expenditures of funding and staff time be put toward the CEB." The report stated that "completion of the Brent Spence Bridge Corridor project [KYTC Item No. 6-17] should be the priority."

¹ https://2050.oki.org/wp-content/uploads/2020/04/ODOT-2019-Report-to-Legislature_w_attach-Final.pdf





Given ODOT's current position on the CEB, the effect the Ohio connection has on the projected traffic volumes, the stakeholder feedback noting how critical the Ohio connection is to the project, the cost to construct the entire project, and that there are no future phases of this project funded in *Kentucky's FY 2020 – FY 2026 Highway Plan* or included in the *Ohio-Kentucky-Indiana Regional Council of Governments (OKI) 2040 Regional Transportation Plan –* any future development of this project could shift to the priority sections of independent utility. **Table ES-2** summarizes the cost estimate for the level two alternatives as well as the projected traffic and cost for the segment of the corridor with the highest traffic volume.

By utilizing the strategy of usable construction sections, this project could be built over time while improving east-west connectivity where traffic volumes warrant the improvement without the Ohio portion of the CEB. Should economic growth occur, the timeframe for completion of the entire project could be accelerated, but in the meantime, enough traffic will utilize these priority sections to provide independent utility.

Priority Section Priority Section Priority Section 2040 VPD **Total Project Total Project** with Highest **Cost Estimate Alternative** Cost (YOE) Cost (\$2019) **Traffic Volume** (\$2019) (No CEB) Α \$1.5 billion \$1.2 billion I-75 to US 27 19,300 \$599 million В1 \$2.1 billion \$1.7 billion I-75 to US 27 12,400 \$793 million D1 \$2.4 billion \$2.0 billion I-71 to I-75 8,700 \$1.1 billion D2 \$2.5 billion \$2.1 billion I-75 to US 27 11,800 \$791 million

Table ES-2: Priority Section Cost Estimates

Figure ES-2 through Figure ES-4 summarize the projected traffic volumes for all level two alternatives.

Seeing the effect the Ohio connection has on the projected traffic volumes, future phases of the project should also consider a two-lane initial/four-lane ultimate typical section. The initial two-lane roadway would provide one direction of travel for the ultimate four-lane freeway facility.

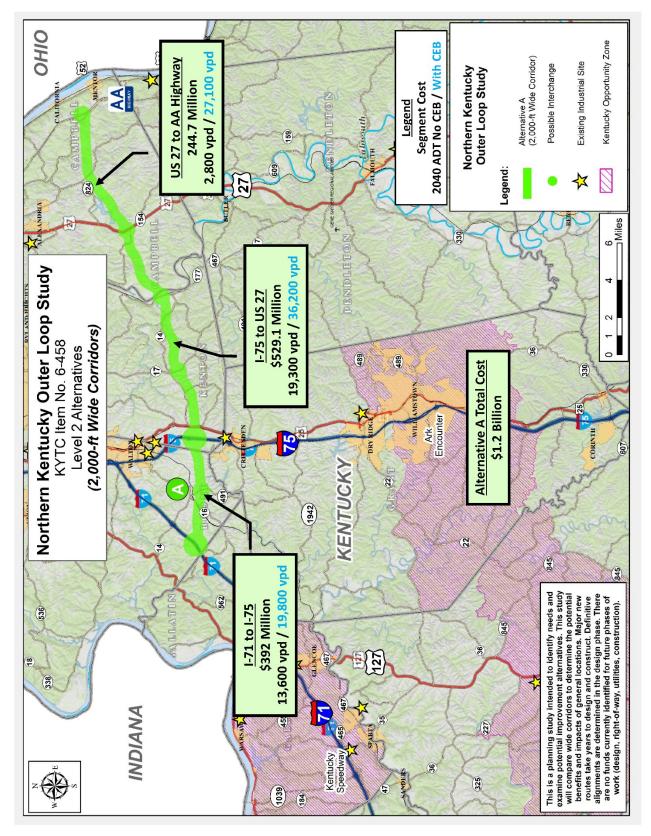
Even if the initial two-lane typical section is considered, it would be prudent to purchase right-of-way and relocate utilities needed to accommodate a future four-lane ultimate typical section in case large industries locate along the new connector and/or ODOT advances the Ohio portion of the CEB. For that reason, it is assumed this approach would not reduce the right-of-way or utility cost estimates. However, the two-lane initial typical section is estimated to reduce the initial construction cost estimate by approximately 35 percent, saving KYTC millions of dollars.

NEXT STEPS

If a build alternative or priority section advances for future consideration, the next step would be Preliminary Engineering and Environmental Analysis. Further funding will be necessary to advance an improvement concept to the design phase. No future phases of this project were funded in *Kentucky's FY 2020 – FY 2026 Highway Plan*.







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Figure ES-2: Alternative 2 Cost Estimate (\$2019) and Projected Traffic Volumes (Year 2040)



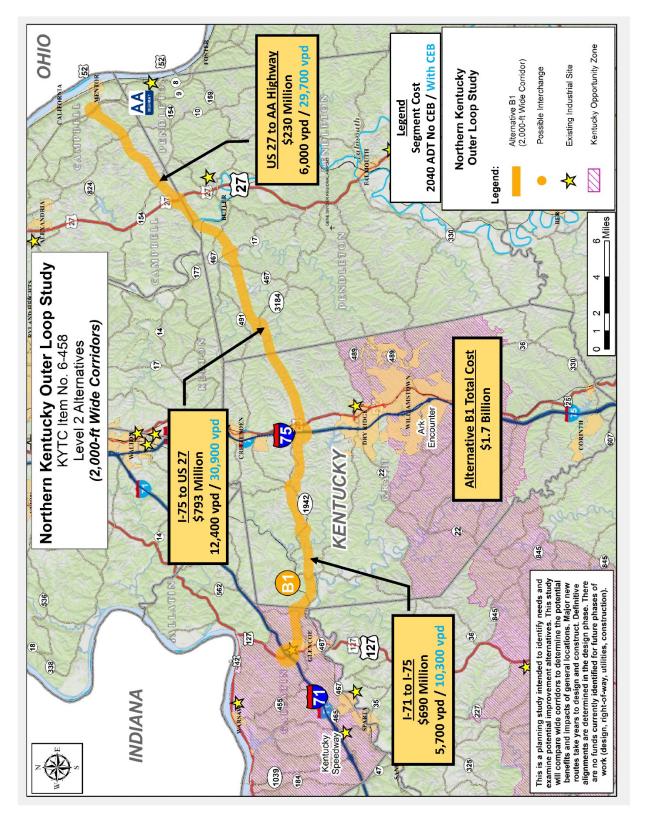


Figure ES-3: Alternative B1 Cost Estimate (\$2019) and Projected Traffic Volumes (Year 2040)





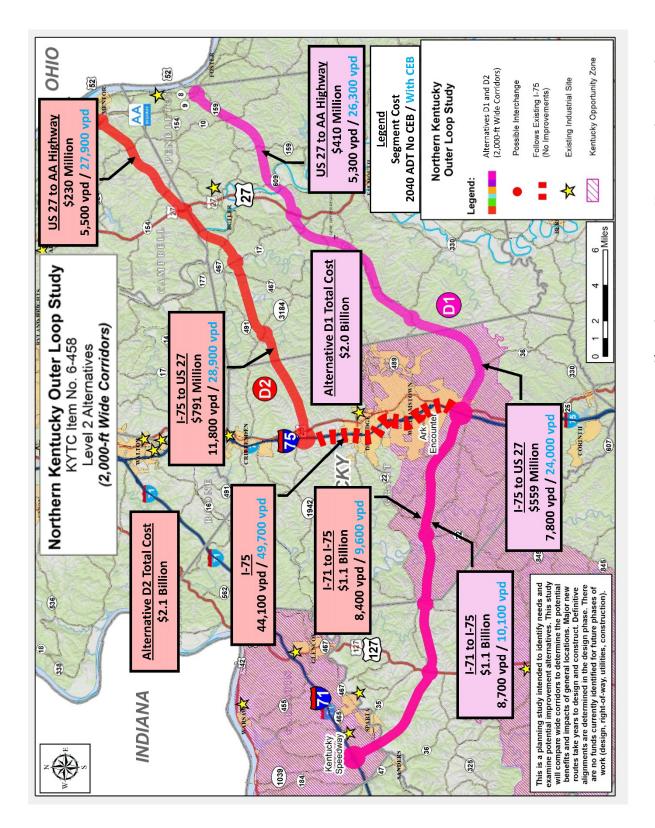


Figure ES-4: Alternatives D1 & D2 Cost Estimates (\$2019) and Projected Traffic Volumes (Year 2040)

