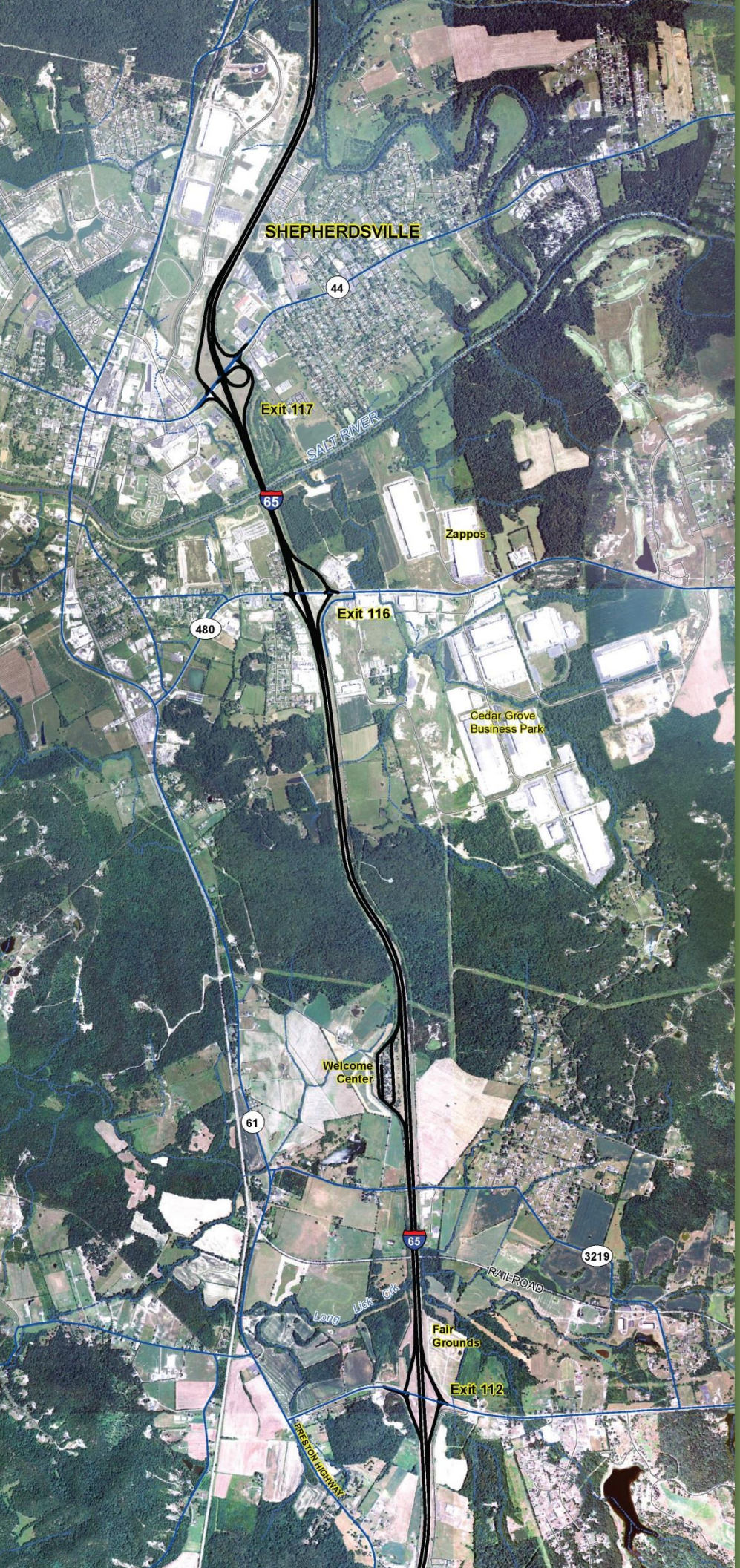

I-65

Between Exit 112 (KY 245) and Exit 116 (KY 480)

Abbreviated Feasibility Study

Bullitt County | October 2014

prepared for:

KENTUCKY TRANSPORTATION CABINET

prepared by:

QK4

Engineering Planning

Groundbreaking by Design.

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I-65 between Exit 112 (KY 245) and Exit 116 (KY 480)

Bullitt County

Abbreviated Feasibility Study

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Executive Summary

The Kentucky Transportation Cabinet (KYTC) initiated this feasibility study to evaluate a new I-65 interchange between Exit 112 (KY 245) and Exit 116 (KY 480) (Figure ES1, p.ES5) given expected significant employment growth provided by Bullitt County and KYTC and shown in Figure ES2 (p.ES6). The general purpose of the project is to increase access and/or mobility and provide relief to a congested I-65 / KY 480 interchange. The new interchange would require a new access road to the east and west of the interchange.

BACKGROUND

Currently KY 480 and the existing I-65 ramp terminals operate at LOS E and F in the peak design hour. Love's Truck Stop adds to that congestion issue. Its entrance is approximately 500 feet from the northbound ramp terminals. As with any truck stop, multiple semi-tractor trailers exit and enter I-65 destined for the truck stop. Because of the short distance between the NB ramp terminals and the Love's entrance, and the limited room for left-turn storage, trucks and other motorists begin queuing on the NB exit ramp and block the sight distance of motorists on KY 480. During the PM peak hours this problem exacerbates, backing up vehicles onto the interstate. KYTC requested that the intersection be moved eastward to alleviate this safety problem and improve mobility on KY 480 and at the ramp terminals. That request is addressed in this feasibility study.

Within the project area east of I-65 on KY 480 is a major traffic generator—Salt River Park with Amazon/Zappos on the north side of KY 480. Across KY 480 is the Cedar Grove Business Park with industry and distribution centers such as, Chegg, Best Buy, eBay, and Gordon Food Service. Current permanent employment is approximately 8,500 jobs, with over 6 million square feet occupied. Employment for 2014 is expected to grow to approximately 18,000. Additional development is expected in the Cedar Grove Business Park. Along KY 61 west of I-65, there is also existing and planned residential and light industrial development.

ALTERNATIVES

In an effort to reduce congestion at the ramp terminals at KY 480, provide connectivity to KY 61, and improve the current congestion with the Love's Truck stop east of KY 480, the No-Build Alternative, and three build alternatives with a connection to KY 480 and KY 61 were considered—Alternatives 1, 1a, and 2. The No-Build Alternative would involve no new construction.

Each Build Alternative has a KY 480-KY 61 connector road that begins with relocating the Love's Truck Stop entrance 835 feet eastward. From KY 480, the connector to KY 61 was analyzed as a 3-lane rural template. Plan and profiles were developed to ensure compatibility with the interstate system, and the existing roadway network and new connections. Cost estimates that include Design, Right-of-Way, Utility, and Construction phases were developed. All cost estimates were segmented in such a way that if any right-of-way is donated, those estimates can be subtracted from the total.

ALTERNATIVE 1 (Figure ES3, p.ES7) would be a diamond interchange on I-65 approximately 1.25 miles south of the existing KY 480 interchange (Exit 116) in Bullitt County. The gore-to-gore ramp spacing from KY 480 to the new interchange SB off ramp would be 4,400 feet. The gore-to-gore spacing from the new SB on ramp to the existing off ramp to the Welcome Center/rest area would be 2,800 feet. Both distances exceed the minimum ramp terminal spacing of 1,600 feet for an entrance to exit ramp identified in the 2011 AASHTO Green Book. The service or approach road would be a 45-mph, 3-lane rural arterial road with 12-foot-wide lanes and 8-foot-wide paved shoulders.

The approach road would connect to KY 61 to the west and to existing Buffalo Run Road (CS 1196) in the Cedar Grove Business Park to the east. The proposed Business Park Road begins at the intersection of the approach road and Buffalo Run Road and runs northward through the business park to KY 480, approximately 1,300 feet east of the existing NB off-ramp terminus, and approximately 800 feet east of the existing entrance to Love's Truck Stop.

The Business Park Road would be a 35-mph, 3-lane road with 12-foot-wide lanes and curb and gutter. The proposed Love's Access Road would begin at the Business Park Road intersection with KY 480 and tie to the existing entrance pavement at the Love's Truck Stop. Love's Access Road would be 36 feet wide and traverse a wetland area over Buffalo Run Creek to Love's. Alternative 1's I-65 interchange and approach, Business Park Road, and Love's Access Road are estimated to cost approximately $39 million.

ALTERNATIVE 1A (Figure ES3, p.ES7) would be the same as Alternative 1 with the exception of eliminating the Business Park Road and extending the approach road eastward to tie to the existing Omega Parkway in the Cedar Grove Business Park. This alternative also includes relocating Love's Truck Stop eastward. Omega Parkway would provide access to I-65 to the south. By eliminating the Business Park Road, Alternative 1's cost would be reduced $8.2 million to approximately $30.5 million.

ALTERNATIVE 2 (Figure ES4, p. ES8) would be the same as Alternative 1 with the exception of an added Collector-Distributor (C-D) system on I-65 SB between KY 480 and just south of the Chapeze Lane Bridge over I-65. The C-D would begin just south of the I-65 Bridge over KY 480 and merge with the existing SB on ramp from KY 480, thus creating a 2-lane C-D southward to the new interchange. The C-D would serve and carry traffic from the new approach road and existing rest area until its tie back to I-65. The estimated cost for Alternative 2 is approximately $53 million.

TRAFFIC OPERATIONS

KIPDA's travel model was used, and modified for this study to reflect conditions during the seasonal peak. The Traffic Analysis Zones (TAZ) within the study area are quite large and traffic model results are affected by placement of centroids within these zones. Therefore, the northern TAZ was divided in half to reflect the study area consideration. The KIPDA travel demand model was modified using square footage and employment numbers provided by KYTC. Model results were provided by KIPDA for both the existing and future year "seasonal traffic" scenario.

In 2035, the new connector road to I-65 is expected to carry 19,300 vehicles per day (vpd) east of I-65, with ramp volumes to and from the north that range from 6,700 to 8,100 vpd. This connector and new interchange are expected to reduce KY 480 traffic volumes east of I-65 by nearly 12,000 vpd and also reduce KY 480 ramp volumes between 1,000 to 3,000 vpd. The 2035 Build Traffic for the KY 480 and KY 245 ramp terminals would still operate at LOS F, however, the delay would be significantly improved. With additional study, the delay could possibly improve even more.

Alternative 1 is expected to have minimal impact on the operation of I-65. Between KY 480 and the proposed new interchange, traffic is expected to increase approximately 2,000 vpd; however, it would still operate at LOS E, just as without the interchange. This is a result of northbound and southbound traffic now exiting at the new connector instead of KY480.

Alternative 2 with the southbound C-D road does improve the mainline traffic on I-65; however, the merge south of the rest area is expected to operate at LOS D and the merge area of influence would exceed capacity. This alternative is also estimated at nearly $14M more than Alternative 1.

In addition to Alternatives 1 and 2, another option was investigated that would add an auxiliary lane from KY 480 southbound to the new interchange. A capacity analysis shows an improvement in LOS of mainline I-65; however, the resultant weave between the two interchanges would operate at LOS E. An auxiliary lane between KY 480 and the connector has a construction cost estimate of approximately $1,500,000.

Alternative 1 appears to have minimal effect on I-65, improves the KY 480 ramp terminals' congestion, and is the least expensive. All Build traffic for Alternative 1 is illustrated in detail in Figures ES5 and ES6 (pp.ES9 – ES10).

Before such an investment is made, with several closely spaced interchanges in progression, any further study of the proposed interchange should include a microsimulation model to determine the impacts of each interchange in relationship to the other in the study area (and even including the KY 44 interchange, Exit 116 north of KY 480).

SIGNING

A cursory review of existing and new I-65 signs between KY 44 and KY 245 was conducted to ensure that signing for each alternative along I-65 could be accomplished with each alternative.

FHWA EIGHT POLICY POINTS FOR INTERSTATE ACCESS

FHWA provides Interchange Justification Study guidance in the *Interstate System Access Informational Guide* (*Guide*) dated August 2010, which details eight (8) policy requirements the States must follow when seeking FHWA approval for access to the interstate for a new interchange. A high-level review of these points concluded that a proposed new I-65 interchange and connector in this portion of Bullitt County would not have an adverse effect

on the engineering and operational acceptability of I-65 in the project area. Due in part to the expected low usage of the interchange, the project would not be in conflict with the goals of Policy Point Requirement No. 3, which are designed to protect the existing and projected traffic operations. This determination was one of the primary goals of this Abbreviated Feasibility Study was to make that determination.

Regarding Policy Requirement No. 1, which requires consideration of improving the existing interchanges rather than constructing a new interchange to meet the needs, it was found through coordination with local officials and KYTC that improvement to the existing road have been made and are planned; however, they will not meet the demands from the future growth planed in the area, and would not meet the purpose and need of the project.

ENVIRONMENTAL OVERVIEW

The key environmental impacts to be considered are associated with the access roads from the interchange. The western access road would traverse forested land and the associated habitat. The eastern access road would be through an area that is largely disturbed, but would have the following known impacts: use of a potential hazmat site south of the Cedar Grove Business Park, and use of a large wetland north of KY 480, at the proposed realigned access to the Love's Truck Stop. There are no known historic, archaeology, social, economic or other environmental impacts. Overall, no significant environmental impacts are expected, and it is anticipated a CE-Level 3 would satisfy the required NEPA documentation. That determination and the resulting analysis would be made as part of that second step, and are beyond the scope of this report.

SUMMARY

In summary, as shown in Figures ES5 and ES6 (pp.ES9 – ES10), Alternative 1 is expected to have minimal impact on the operation of I-65. Between KY 480 and the proposed new interchange, traffic is expected to increase approximately 2,000 vpd; however, it would still operate at LOS E, just as without the interchange. This increase is a result of northbound and southbound traffic now exiting at the new connector instead of KY480.

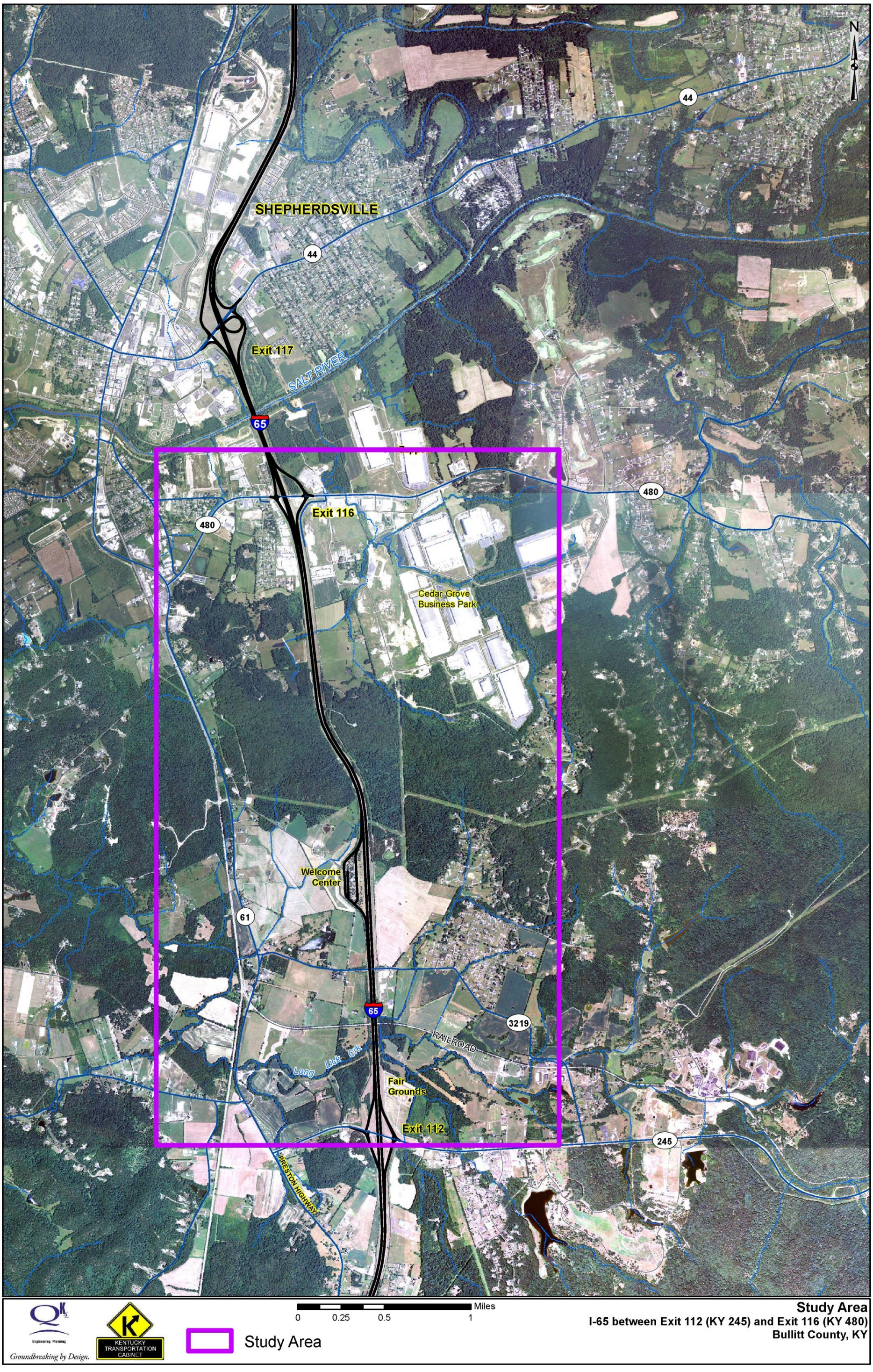

Figure ES1: Study Area

CEDAR GROVE I-65 EXIT

CURRENT PERMANENT EMPLOYMENT	APPROXIMATELY	8,500 JOBS
XMAS 2014 EMPLOYMENT	APPROXIMATELY	18,000 JOBS
APPROXIMATE 2014 JOB ANNOUNCEMNTS		678 JOBS
CURRENT SPACE OCCUPIED		6,465,303 SQ.FT.
SPECULATIVE BUILDING SPACE AVAILABLE TO LEASE		1,037,410 SQ.FT.
SPECULATIVE BUILDING EMPLOYMENT		518 JOBS
PAD READY SITES		800,000 SQ. FT.
PAD READY SITES EMPLOYMENT		400 JOBS
ADDITIONAL PROPERTY AVAILABLE FOR BUILDINGS		4.5 PLUS MILLION SQ.FT.
ESTIMATED EMPLOYMENT FROM BOURBON PATHWAY		2,250 JOBS
ESTIMATED EMPLOYMENT XMAS 2014		18,000 JOBS
ESTIMATED EMPLOYMENT XMAS 2015		25,000 JOBS

THIS DOES NOT COUNT JOBS OR BUILDINGS AT THE CLERMONT, SHEPHERDSVILLE OR HILLVIEW EXIT OF I 65

Updated August 4, 2014

Figure ES2: Employment Figures from KYTC

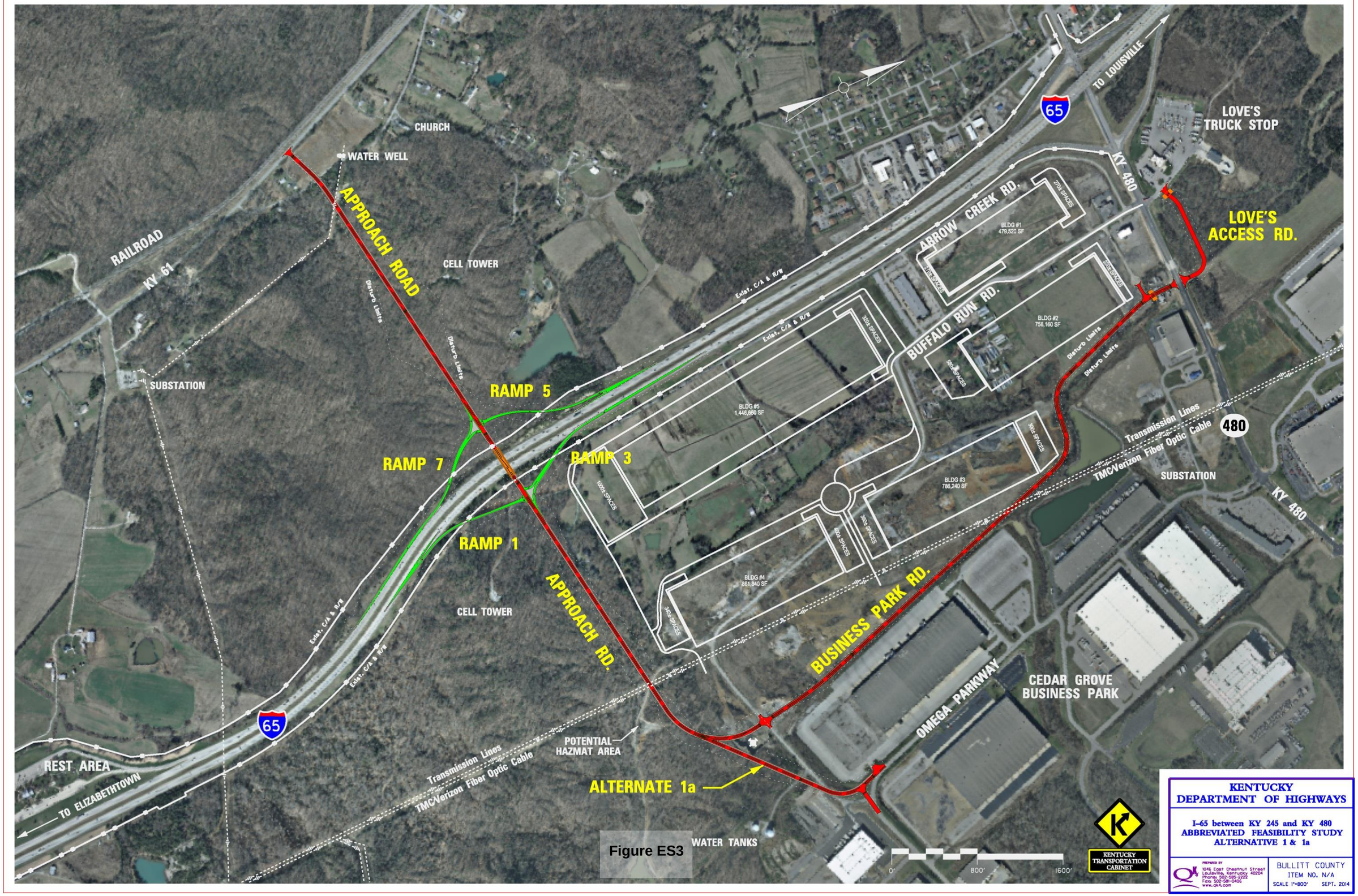

Figure ES3

KENTUCKY
DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 1 & 1a

PREPARED BY
1045 East Chestnut Street
Louisville, Kentucky 40204
Phone: 502-585-2222
Fax: 502-581-0408
www.qk4.com

BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=800' SEPT. 2014

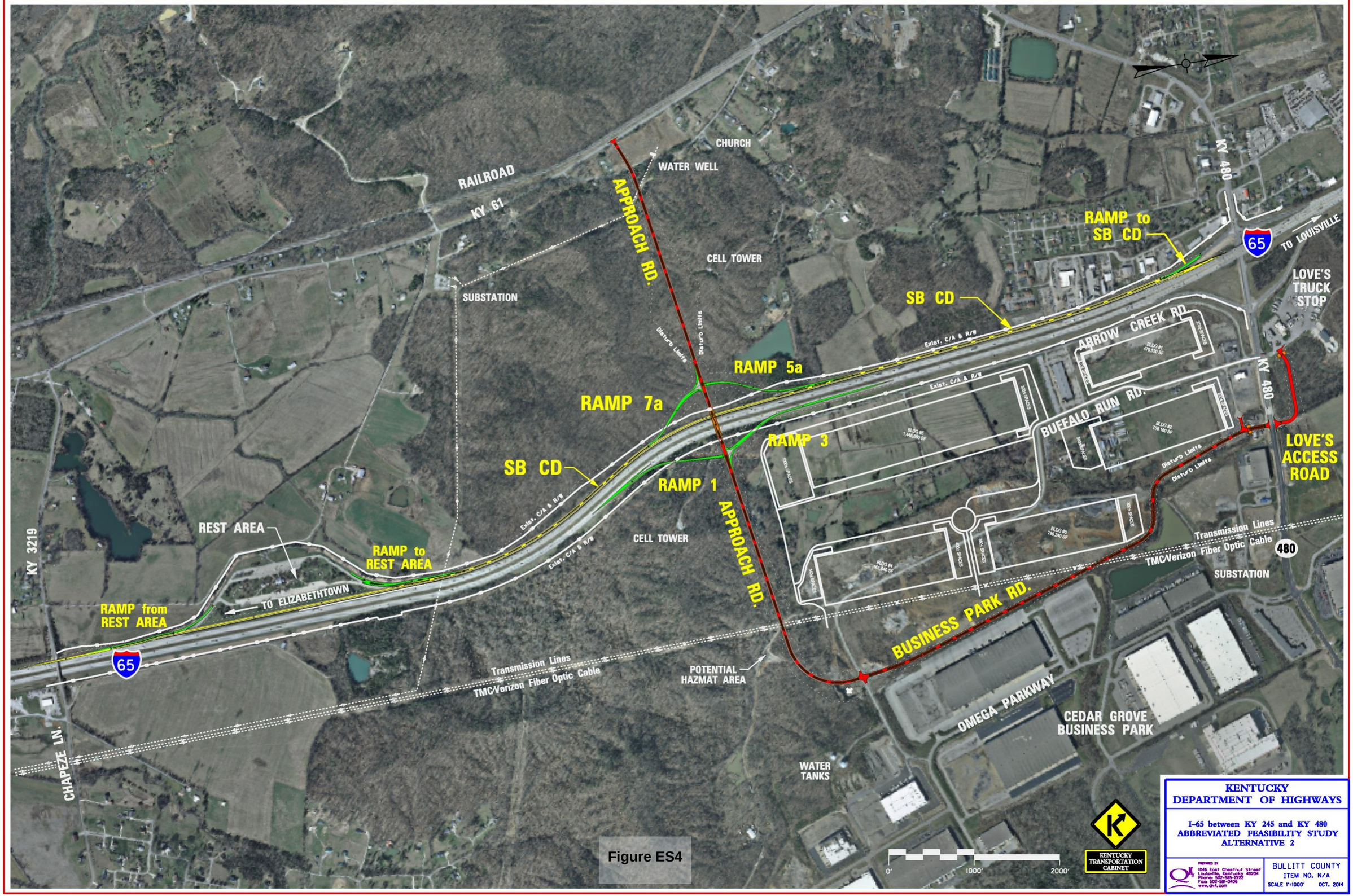

Figure ES4

KENTUCKY DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 2

PREPARED BY
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BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=1000' OCT. 2014

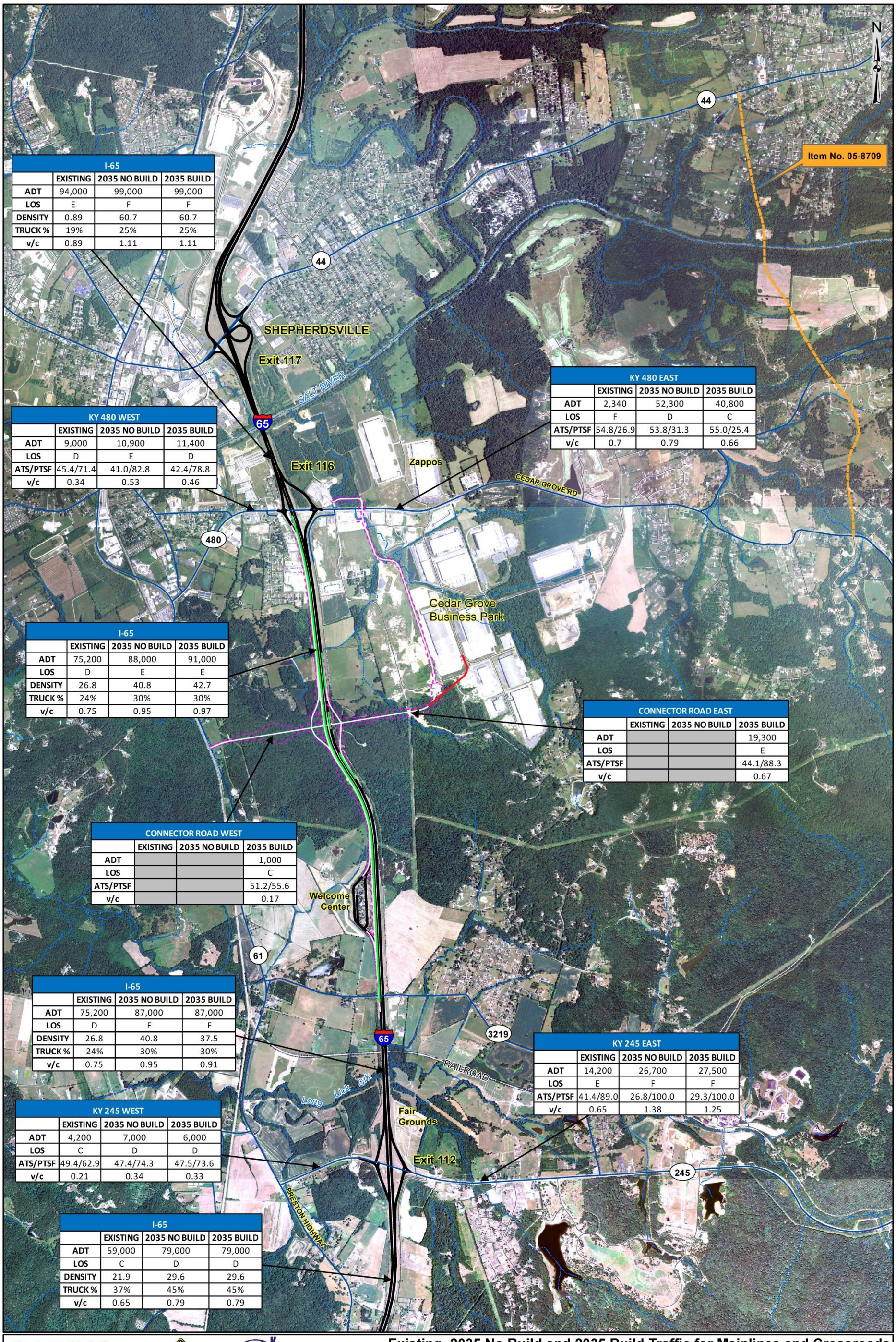


Figure ES5: Mainline and Crossroads Existing, 2035 No Build and 2035 Build Traffic

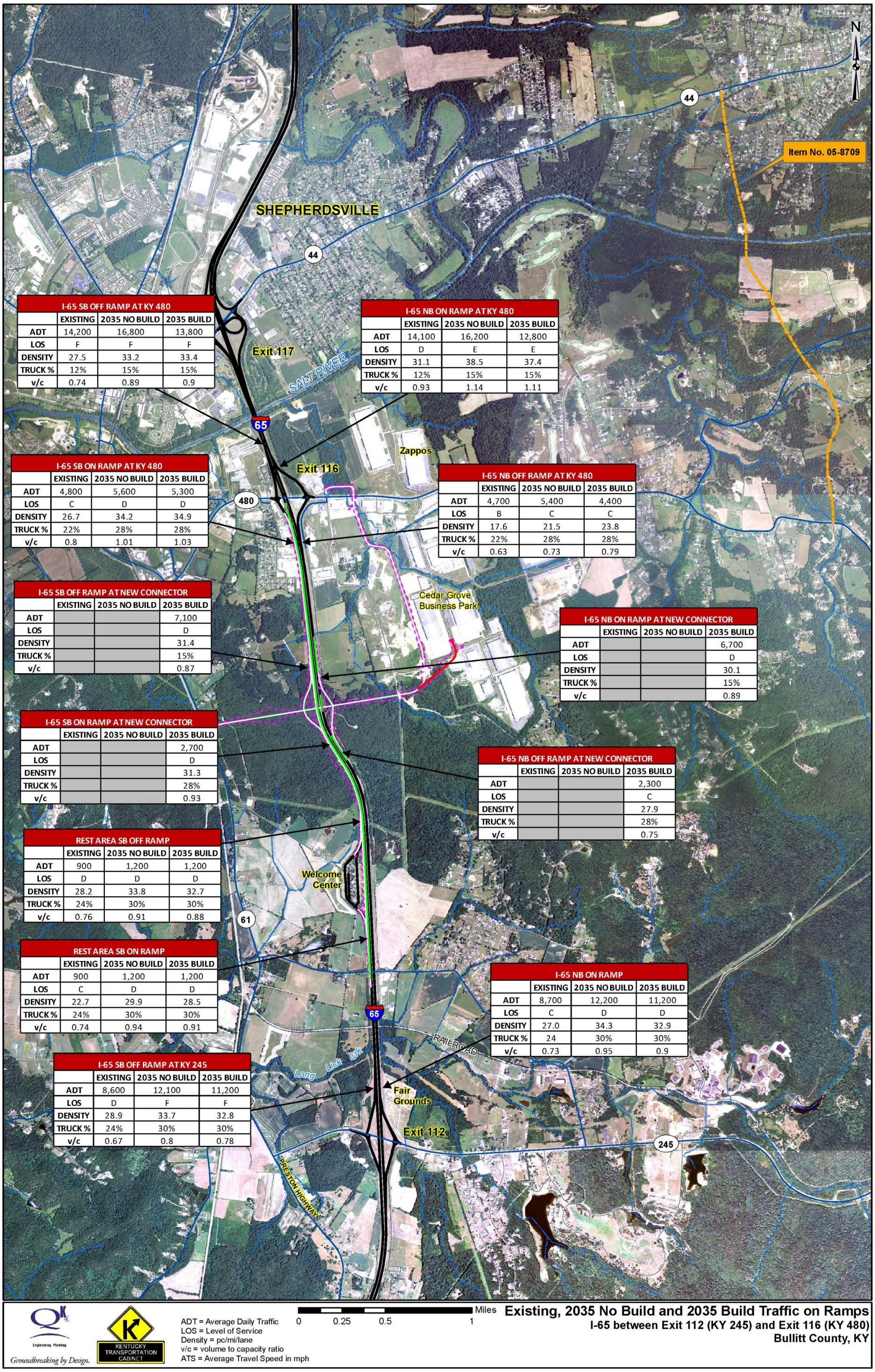


Figure ES6: Ramps Existing, 2035 No Build and 2035 Build Traffic

I. PROJECT OVERVIEW

Home to a large portion of the Fort Knox Military Reservation and the Bernheim Arboretum and Research Forest, 76,854 people resided in Bullitt County in 2013, making it the 10th most populous county in Kentucky.

The Bullitt County seat of Shepherdsville had 11,696 residents in 2013, ranking it as Kentucky's 33rd largest city. The city of Mt. Washington, located in northeastern Bullitt County, ranks one place ahead of Shepherdsville (32nd) with a 2013 population of 12,083. I-65 is the major highway through Bullitt County. Other arterial routes include KY 44, KY 61, KY 245, KY 480, and US 31E (see Exhibit 1, p.33). CSX Transportation operates two major rail lines in Bullitt County for freight transportation, while both the Bluegrass Railroad Museum and the Kentucky Railroad Museum operate tourist-oriented rail lines. Relatively low labor and energy costs contribute to a favorable business climate in Bullitt County. Sixty percent of those persons holding jobs in Bullitt County commute from other counties.

Within the project area east of I-65 on KY 480 is a major traffic generator—Salt River Park with Amazon/Zappos on the north side of KY 480. Across KY 480 is the Cedar Grove Business Park with industry and distribution centers such as, Chegg, Best Buy, eBay, and Gordon Food Service (Exhibit 2, p.34). Current permanent employment is approximately 8,500 jobs, with over 6 million square feet occupied. Seasonal employment for 2014 is expected to grow to approximately 18,000. Shown in that same Exhibit, is additional development expected for the Cedar Grove Business Park. Along KY 61 west of I-65, there is also existing and planned residential and light industrial development.

II. STUDY PURPOSE

The Kentucky Transportation Cabinet (KYTC) initiated this feasibility study to evaluate a new I-65 interchange between Exit 112 (KY 245) and Exit 116 (KY 480) (Exhibit 1, p.33) given expected significant employment growth provided by Bullitt County and shown in Exhibit 2 (p.34).

A. Project Purpose

The general purpose of the project is to increase access and/or mobility and provide relief to a congested I-65 / KY 480 interchange. The new interchange would required a new access road to the east and west of the interchange.

B. Scope of Work

The Abbreviated Feasibility Study activities include:

- Determining if an I-65 interchange between KY 480 and KY 245 is geometrically feasible and will work with the existing southbound (SB) Welcome Center/rest area.
- Analyzing viable connectivity to I-65 and KY 61 from KY 480.

- Providing for more spacing between the northbound (NB) ramp terminals and Love's Truck Stop in the northeast quadrant of the KY 480 interchange.
- Developing and providing costs estimates that include design, right-of-way, utilities, and construction.
- Documenting potential impacts of the new interchange, such as major known environmental issues, utilities, and right-of-way.
- Providing a high level assessment of the project utilizing guidance provided by Federal Highway Administration's (FHWA) 8 policy points (though this analysis will not be submitted to FHWA for review and comment during the current Abbreviated Feasibility Study).
- Performing any traffic counts necessary, projecting current and future traffic volumes of such an interchange and any connecting roads.
- Providing for traffic modeling and operational analysis.
- Documenting the results.

C. Existing Conditions

As shown in Exhibit 3 (p.35), KY 480 and KY 245 are state maintained roads and functionally classified as Minor Arterials. Buffalo Run and Omega Parkway are classified as City Streets CS 1196 and CS 1227, respectively. Arrow Road is also known as KY 6318.

Currently KY 480 and the existing ramp terminals operate at LOS E and F in the peak design hour. Love's Truck Stop adds to that congestion issue. Its entrance is approximately 500 feet from the northbound ramp terminals. As with any truck stop, multiple semi-tractor trailers exit and enter I-65 destined for the truck stop. Because of the short distance between the NB ramp terminals and the Love's entrance, and the limited room for left-turn storage, trucks and other motorists begin queuing on the NB exit ramp and block the sight distance of motorists on KY 480. During the PM peak hours this problem exacerbates, backing up vehicles onto the interstate. KYTC requested that the intersection be moved eastward to alleviate this safety problem and improve mobility on KY 480 and at the ramp terminals. That request is addressed in this feasibility study.

Currently, all Cedar Grove Business Park employees and delivery trucks use the main entrance at Omega Parkway, causing additional congestion on KY 480. Employment figures are expected to climb due to the expected expansion for the Cedar Grove Business Park (Exhibit 2, p.34); congestion on KY 480 will worsen.

According to existing traffic counts, approximately 25% of the traffic generated by the Cedar Grove Business Park and industry north of KY 480 originates from the south. Therefore, providing another connection to the southern portion of the Cedar Grove Business Park seems a viable option to relieve traffic on KY 480. This connection could either be made to KY 245 to the south or turn west toward KY 61. This study only addresses the logical connection from KY 480 to KY 61 and provides for a new interchange

at I-65. The new connector road from KY 480 to KY 61 was to be analyzed first as a three-lane rural template and then, if capacity is exceeded, as a five-lane connection.

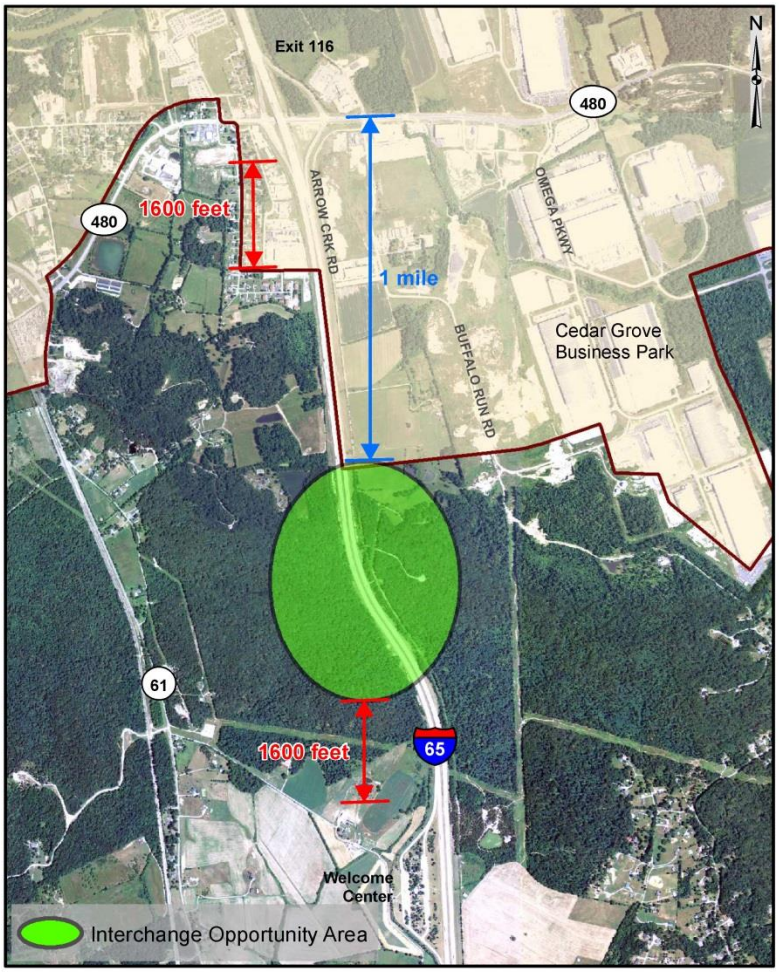


Figure 1: New I-65 Interchange Opportunity Area

The Louisville, Kentucky–Indiana federal urban boundary terminates at MP 114.547 on I-65, and encompasses the KY 480 interchange and the majority of the Cedar Grove Business Park. As a rule, minimum spacing of interchanges should be one (1) mile in urban areas and three (3) miles in rural areas based on crossroad-to-crossroad spacing [1]. In urban areas, spacing of less than 1 mile may be developed by grade-separated ramps or by collector-distributor roads.

The current I-65 crossroad-to-crossroad spacing from KY 480 (MP 115.558) to KY 245 (MP 111.798) is 3.76 miles. However, there is a Southbound Welcome Center located near MP 113.5, that has an entrance and exit ramp that must be taken into consideration. The recommended minimum ramp terminal spacing for and entrance ramp followed by an exit ramp is 1,600 feet gore to gore[2]. Based on the minimum crossroad-to-crossroad spacing and the minimum ramp spacing, the opportunity window for a new interchange between KY 480 and the southbound rest area is shown in Figure 1.

III. ABBREVIATED ENVIRONMENTAL OVERVIEW

A. Environmental Overview

This environmental overview (see Exhibit 4, p.36) was performed to assess potential key environmental resources, potential impacts, and issues that would be important during the future environmental documentation stage of the proposed new I-65 interchange and connector roads in Bullitt County. The study area includes the general interchange location;

[1] *A Policy on Design Standards Interstate System* January 2005.
[2] According to *A Policy on Geometric Design of Highways and Streets,* 2011 6th Edition, Figure 10-68.

and a new road west to KY 61 and east to Business Park Access Road, and north across KY 480 to include the propose new Love's Access Road.

B. Environmental Policy and Documentation

Because the project involves a new interchange on an Interstate Highway, environmental laws and policies that apply to FHWA should be addressed. Namely, the process outlined in the National Environmental Policy Act (NEPA) should be followed. The federal process will document the project setting and history; the purpose and need for the project; and the affected environment; compare alternatives, including the No-Build option; document environmental impacts of the build options and the No-Build option; address other relevant laws; and identify required mitigation. This process will be documented in one of the following three types of documents: a Categorical Exclusion Level-3 (CE-3), an Environmental Assessment/Finding of No Significant Impact (EA/FONSI), or an Environmental Impact Statement (EIS). Per FHWA policy, the NEPA document must be prepared in coordination with and provided to FHWA along with the Interchange Justification Study (IJS) before federal approval of the interchange can be given.

Based on the initial field work and literature search conducted for this planning study, and previous NEPA documents prepared for similar projects in Kentucky, it is anticipated the environmental approval for the proposed new I-65 interchange and connector roads could be processed as a CE-3. However, coordination with FHWA will be required before finalizing the level of documentation needed.

C. Environmental Considerations

Regardless of the level of documentation, environmental analysis (including direct, indirect, and cumulative impacts) of the following key areas, and possibly others, would be warranted. The future analysis would also warrant coordination with various local, regional, and federal resources agencies. The following components address key areas of concern.

1. Air Quality

Of the six major air quality pollutants—particulate matter (PM), sulfur dioxide (SO2), carbon monoxide (CO), ozone (O3), nitrogen dioxide (NO2) and lead (Pb)—Bullitt County is compliant with all National Ambient Air Quality Standards (NAAQS) except PM2.5[3].

Because Bullitt County is out of compliance with PM2.5, a Project Level Checklist and Interagency Consultation must be completed and added to the NEPA document. Based on the traffic forecasts, the volumes and mix of types of vehicles would fall under the allowable limits, and the project would not increasing PM2.5 levels, and is therefore not an air quality concern.

[3] PM2.5 refers to fine particulates less than 2.5 micrometers in diameter. Sources include all types of combustion, including motor vehicles, power plants, residential wood burning, other fires, and some industrial processes.

To comply with the Clean Air Act, the project must be included in the Statewide Transportation Improvement Plan (STIP) and the Louisville Metropolitan Planning Organization's (KIPDA) Transportation Improvement Plan (TIP) prior to NEPA approval.

2. Highway Noise

As a new interchange and road on new alignment, the project would have highway related noise pollution concerns. Per the July 2011 KYTC noise abatement policy; a detailed alternative-specific traffic noise model would need to be developed for this project to forecast future noise levels. The model would determine if future noise levels approach or exceed the Kentucky adopted FHWA National Abatement Criteria (NAC).

Based on the current rural nature of the corridor, it is very unlikely mitigation, in the form of noise barriers or another option would be warranted for this project.

3. Natural Resources

As can be seen on the Environmental Footprint (Exhibit 4, p.36), the land use in the study area is primarily wooded or industrial. There are several natural resources in the study area that will need to be addressed. These include the following:

a. Threatened and Endangered Species

To comply with the Section 7 of Endangered Species Act, coordination with the U.S. Fish and Wildlife Service (USFWS) would need to be conducted and a Biological Assessment (BA) could be required. The current (April 2014) list of federally listed threatened and endangered species in Bullitt County is shown in Table 1.

Table 1: Threatened and Endangered Species

Group	Name	Scientific Name
Plants	Kentucky Gladecress	Leavenworthia exigua var. laciniata
Mussels	Pink Mucket	Lampsilis abrupta
Mussels	Ring Pink	Obovaria retusa
Mussels	Orangefoot Pimpleback	Plethobasus cooperianus
Mussels	Sheepnose	Plethobasus cyphyus
Mussels	Rough Pigtoe	Pleurobema plenum
Mammals	Gray Bat	Myotis grisescens
Mammals	Indiana Bat	Myotis sodalis
Mammals	Northern Long-eared Bat	Myotis septentrionalis

Based on the initial field visit only, no habitat for the Kentucky Gladecress was observed and none of the streams in the study area would likely support habitat for the listed mussel species. However, the wooded area both east and west of I-65 would support summer foraging for the listed bat species, and would need to be surveyed for potential winter habitat.

b. Bald Eagle

While no longer a listed species, a bald eagle nest is known to be located along the Salt River, northeast of the study area. Protection of that nest, and possibly other nesting or migratory areas, would be required under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

4. Water Resources

a. Streams

There is one perennial stream—Buffalo Run Creek—in the study area that would be impacted by the proposed project. The Business Park Access Road would cross this stream twice, as well as two unnamed tributaries to Buffalo Run Creek. West of I-65 the access road to KY 61 crosses the divide between the Buffalo Run Creek drainage basin and Long Lick Creek drainage basin. Both streams flow north and enter into Salt River. The proposed road project would not cross Long Lick Creek, but it would cross an unnamed tributary to it. Undoubtedly, ephemeral streams are located in the corridor and would be impacted. A U.S. Army Corps of Engineers (USACE) Section 404 and a Kentucky Division of Water Section 401 permit would be required for impacts to all streams determined to be under the agency's jurisdiction.

b. Wetlands

A review of the National Wetland Inventory illustrates one known wetland would be a concern in the northern corridor of the Business Park Access Road/new Love's Access Road, north of KY 480. The area is a jurisdictional wetland and approximately 4.5 acres of it would be impacted. It is a forested wetland, which would require a higher level of mitigation. The mitigation requirements would be determined during the 404 and 401 permitting process. Because the total acres of impact to waters of the U.S. would be less than 7.0 acres, the USACE permit would most likely be processed under the current Letter of Permission (LOP) process between KYTC and USACE.

c. Floodplains

While the interchange and approach road would avoid floodplains, the Business Park Access Road and Love's Access Road would cross mapped 100-year floodplains.

d. Groundwater

The area is not known to be within a wellhead protection area, as Bullitt Water District obtains water from the Salt River northeast of the study area.

5. Geology

As shown in Exhibit 5, (p.37), New Albany shale is prominent in the study area, which can cause construction issues. The shale can be acidic, which requires special disposal of the waste materials and possible treatment of slopes.

6. Socioeconomic

The corridors being studied in this Abbreviated Feasibility Study are both urban and rural and have varying social and economic considerations, both direct and indirect. Following are a few key areas that would warrant specific analysis:

a. Environmental Justice

Executive Order 12898, Environmental Justice, provides protection to low-income and minority populations. There are between two and five isolated residential relocations that could occur with this project. Based on a field visit none of them appear to be occupied by environmental justice populations or to be part of an environmental justice community.

b. Land Use

The land use to be impacted by the project is mostly forested (east and west of I-65) or industrial (northeast of the interchange). There is one small area of potential farmland near the western terminus at KY 61 (see Exhibit 4, p.36), and there are a few rural residential homes in the area. The industrial park planners, including the local government, are fully supportive of the project, and have planned for the road and interchange.

c. Population

Over the past 30 years, Bullitt County has grown from a population of 43,346 in the 1980 Census to 74,319 in the 2010 Census. Per the Kentucky State Data Center, the population is projected to continue to grow at a steady rate.

Table 2: Bullitt County Population

	YEAR					
	1980	1990	2000	2010	2020	2030
Kentucky	3,665,364	3,692,550	4,041,769	4,339,367	4,672,754	4,951,178
Number Change	429,243	27,186	349,219	297,598	333,387	278,424
% Change	13.3	0.7	9.5	7.4	7.7	6.0
Bullitt County	43,346	47,567	61,236	74,319	88,508	102,461
Number Change	17,256	4,221	13,669	13,083	14,189	13,953
% Change	66.0	9.7	28.7	21.3	19.1	15.8

Table 3: Forecasted Employment in the Study Area

Current Employment	Estimated Christmas 2014 Employment	Estimated Christmas 2015 Employment	Current Space Occupied	Speculative Space Available to Lease	PAD Ready Sites	Additional Property Available for Buildings
8,500	18,000	25,000	6,465,303 Square Feet	1,037,410 Square Feet	800,000 Square Feet	4.5 million Square Feet

The estimated 2014 and 2015 seasonal employment at the Cedar Grove Exit is approximately 18,000 and 25,000 respectively (refer to Table 3 and Exhibit 6, [p.38], for more detail).

7. Cultural Historic and Archaeological Resources

One listed historic resource is located southwest of the study area. Based on a literature search and site visit, no historic sites appear to be located within the immediate study area. Therefore, impacts and use of historic sites, which are protected under Section 106 of the National Historic Preservation Act and Section 4(f) of the U.S. Department of Transportation Act, are not anticipated.

Archaeological resources, due to their sensitive nature, are not disclosed in this Abbreviated Feasibility Study. However, cemeteries are known to occur throughout the county and the larger study area, but none have been identified within or near the footprint of the proposed project.

8. Hazardous Materials

Based on a field visit, only one area of potentially contaminated materials is located in the study area. It is south of the industrial park, east of I-65 within the alignment of the approach to the proposed interchange. The area has been used to store materials, including used 55-gallon tanks and dumpsters. There do not appear to be any underground storage tanks, landfills, or other major hazardous materials within the area. A database search for this area has not yet been conducted.

9. Section 4(f)

No properties that would be protected under Section 4(f) are known to occur in the study area.

IV. TRAFFIC OPERATIONS

A. Methodology

KIPDA's travel model was used, and modified for this study to reflect conditions during the seasonal peak. As shown in Exhibit 7, (p.39) the Traffic Analysis Zones (TAZ) within the

study area are quite large and traffic model results are affected by placement of centroids within these zones. Therefore, the northern TAZ was divided in half to reflect the study area consideration (Exhibit 8, p.40). There are only two warehouses north of KY 480 and east of I-65; therefore, square footage from the "current space occupied" was provided by KYTC (Exhibit 2, p.34) to generate the existing square footage south of KY 480. The additional 4.5 million square feet originated from the development shown adjacent to the interstate. The KIPDA travel demand model was modified using square footage and employment numbers provided by KYTC. Model results were provided by KIPDA for both the existing and future year "seasonal traffic" scenario.

"Seasonal traffic" was modeled for both existing and future year scenarios since it includes the 30th highest hourly volume, and would represent the highest volume/most congested time of the year. Traffic in the study area is greatly affected by the holiday season during which employment levels are double those of the rest of the year. This allowed the Project Team to better understand the impacts to the existing KY 480 ramp terminals and I-65 under the total build out of Cedar Grove Park and during its most congested times of the year. KIDPA's travel demand model showed a high degree of accuracy during the non-peak period of the year based on recently collected traffic counts. Therefore, since no "seasonal" traffic counts were available in the study area this model was modified using employment figures received from KYTC to determine existing "seasonal traffic" volumes. The design year of 2035 was used because it was readily available in KIPDA's model without having to interpolate. KIPDA's forecast year had been previously interpolated from Year 2025; therefore, to minimize error, 2035 was used.

The following jobs were added to the KIPDA model based on information provided to Qk4 by KYTC, as a result of a meeting with a major landowner in the project area, and Qk4 traffic studies west of the KY 245 interchange.

- North and west of the interchange there is a recently constructed and unoccupied warehouse. 630 jobs were added in that zone.
- North and east of the interchange 2,200 jobs were added to the existing scenario to account for the "seasonal" scenario. 3,800 jobs were added to the future year scenario for new development.
- South and east of the interchange 5,900 jobs were added to the existing scenario to account for the "seasonal" scenario. 8,300 jobs were added to the future year scenario for new development.
- West of the KY 245 interchange 4,400 jobs were added to the future year scenario for two planned industrial developments in that area. One development has been approved by the state and one is in the process of being approved.

Consequently, a higher volume is shown on KY 480 than KYTC data because Love's and Buffalo Run Road traffic is included. KYTC's KY 480 count is east of the intersection.

In 2035, the new connector road to I-65 is expected to carry 19,300 vehicles per day (vpd) east of I-65, with ramp volumes to and from the north that range from 6,700 to 8,100 vpd.

This connector and new interchange are expected to reduce KY 480 traffic volumes east of I-65 by nearly 12,000 vpd and also reduce KY 480 ramp volumes between 1,000 to 3,000 vpd.

B. Performance Measures

Level of Service (LOS) is a qualitative measure that is used to describe the operational performance of a roadway. The performance measure upon which the LOS is based varies depending upon the type of facility. For freeway or interstate facilities, LOS is evaluated based on the density of vehicles in the area of analysis, usually measured in terms of passenger cars per mile per lane (pc/mi/ln). In the case of ramp merge and diverge movements, LOS is typically based upon the density of vehicles in the area of the movement considering upstream and downstream ramps. LOS for unsignalized and signalized intersections is measured in delay (seconds per vehicle). The ramp terminals, crossroads, I-65 mainline, and merge and diverge movements in each direction with AM and PM peak design hours are shown in Figures 2 and 3 (pp. 22-23) and Exhibits 9-12 (pp. 41-44) in the Appendix.

LOS as defined in the 2010 Highway Capacity Manual (HCM)[4] as an index of the quality of flow in terms of factors such as speed, travel time and delay. LOS is expressed in letters ranging from "A" to "F," where each LOS represents a range of operating conditions. LOS A represents the best operating conditions and LOS F represents the worst condition (i.e. severe congestion). LOS D is generally considered the minimum acceptable LOS in urban areas. The LOS criteria used to evaluate interstate or freeway facilities, merge and diverge movements, signalized and unsignalized intersections, and KY 480, KY 245 and the new connector road are shown in Table 4 (p.11).

The volume to capacity (v/c) ratio is another measure that reflects mobility and quality of travel of a facility or a section of a facility. The v/c ratio compares traffic volumes with the available capacity of the roadway. KYTC recommends a targeted v/c ratio of 1.00 in urban areas and 0.90 in rural areas based on design hour volumes; and has adopted a related design policy memorandum (03-11) dated November 2, 2011, regarding the traffic analysis of multi-lane freeways.

[4] Transportation Research Board HCM 2010 Highway Capacity Manual.

Table 4: Level of Service Criteria Use to Evaluate Operating Conditions

LOS	Freeway and Muli-Lane Highways	Merge /Diverge	Signalized Intersections	Unsignalized Intersections	Two- Lane Roadways (Class I Highways)	
	Density (pc/mi/ln)		Delay (seconds/vehicle)		Percent Time Spent Following (%)	Average Travel Speed (mph)
A	≤ 11	≤ 10	≤ 10	≤ 10	≤35	>55
B	11 to 18	10 to 20	10 to 20	10 - 15	>35-50	>50-55
C	18 to 26	20 to 28	20 to 35	15 - 25	>50-65	>45-50
D	26 to 35	28 to 35	35 to 55	25 - 35	>65-80	>40-45
E	35 to 45	>35	55 to 80	35 - 50	>80	≤40
F	>45	Demand Exceeds Capacity	> 80	>50	N/A	N/A

C. Existing No-Build

Usually within an urban area LOS D is an acceptable operation; however, LOS C is desirable. Within the study area, the ramp terminals, merge and diverge influence areas of each interchange and the Welcome Center, and mainlines KY 480 and KY 245 were analyzed to determine their operations for the existing year (2013). The results are shown in Tables 5 through 8 (pp.11-12). Red shading illustrates facilities or movements that exceed the acceptable operation (LOS E and F for rural areas, and LOS D, E or F for urban areas). The PM peak hour is the critical period.

Table 5: Existing No Build Ramp Terminals

Ramp Terminals	LOS	Intersection or Approach Delay	Issue	Control Delay
KY 480				
NB Ramps	F	275.4	EBT NBR	373.4 339.3
SB Ramps	F	155.3	WBL SBL	207.8 186.8
KY 245				
NB Ramps	C	21.6	NBL	29.0
SB Ramps	E	64.4	SBL	90.2

Table 6: No Build Crossroads

Crossroads	ADT	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio
KY 480 West of I-65	9,000	460	D	585	71.4	45.4	0.34
KY 480 East of I-65*	43,000	2340	F	1,475	26.9	54.8	0.70
KY 245 West of I-65	4,200	220	C	350	62.9	49.4	0.21
KY 245 East of I-65	14,200	969	E	611	89.0	41.4	0.65

PTSF – Percent Time Spent Following; ATS – Average Travel Speed; APCS – Average Passenger Car Speed

Table 7: Existing I-65 No Build Mainline

I-65 Mainline	ADT	Volume*	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS
NORTH OF KY 480								
NB	47,000	4,120	D	1,961	2,420	31.0	0.81	63.3
SB	47,000	4,520	E	2,151	2,420	36.1	0.89	59.5
KY 480 TO NEW INTERCHANGE								
NB	37,600	3,100	C	1,561	2,420	21.8	0.65	71.5
SB	37,600	3,600	D	1,813	2,420	26.8	0.75	67.7
NEW INTERCHANGE TO KY 245								
NB	37,600	3,100	C	1,561	2,420	21.8	0.65	71.5
SB	37,600	3,600	D	1,813	2,420	26.8	0.75	67.7
SOUTH OF KY 245								
NB	29,900	2,500	C	1,440	2,420	19.8	0.60	72.9
SB	29,900	2,720	C	1,567	2,420	21.9	0.65	71.4

Table 8: Existing No Build Interchange Ramps

Ramps	ADT	Freeway Volume	Ramp Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments
KY 245 & I-65									
NB On	8,700	2,170	930	C	3,357	4,600	27.0	0.73	
SB Off	8,600	2,640	960	D	2,957	4,400	28.9	0.67	
KY 480 & I-65									
NB Off	4,700	2,620	480	B	2,751	4,400	17.6	0.63	
NB On	14,100	2,500	1,620	D	4,295	4,600	31.1	0.93	
SB Off	14,200	2,960	1,560	F	3,267	4,400	27.5	0.74	Ramp**
SB On	4,800	2,960	640	C	3,667	4,600	26.7	0.80	
Rest Area									
SB Off	900	3,510	90	D	3,346	4,400	28.2	0.76	
SB On	900	3,510	90	C	3,422	4,600	22.7	0.74	

****** The capacity analysis shows that the KY 245 and KY 480 SB off ramps will exceed their available capacity during seasonal months.

D. 2035 No-Build

In the study area, using KIPDA's traffic model, the traffic volumes are forecasted to operate in 2035 as illustrated in Tables 9-12 (pp.13-14). These tables are shown in more detail in Exhibits 9-12 (pp.41-44) in the Appendix. Red shading illustrates facilities or movements

that exceed the acceptable operation (LOS E and F for rural areas, and LOS D, E or F for urban areas).

Table 9: 2035 No Build Ramp Terminals

Ramp Terminals	LOS	Intersection or Approach Delay	Issue	Control Delay
KY 480				
NB Ramps	F	384.6	EBT	474.3
SB Ramps	F	249.0	EBT	524.3
KY 245				
NB Ramps	F	1678.0	NBR	1773
SB Ramps	F	323.1	SBL	515.9

Table 10: 2035 No Build Crossroads

Crossroads	ADT	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio
KY 480 West of I-65	10,900	780	E	897	82.8	41.0	0.53
KY 480 East of I-65	52,300	2,670	D	1,683	31.3	53.8	0.79
KY 245 West of I-65	7,000	450	D	573	74.3	47.4	0.34
KY 245 East of I-65	26,700	2,040	F	2,342	100.0	26.8	1.38

Table 11: 2035 No Build I-65 Mainline

I-65 Mainline	ADT	Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS
NORTH OF KY 480								
NB	49,500	4,800	F	2,444	2,420	52.0	1.01	52.0
SB	49,500	5,280	F	2,689	2,420	60.7	1.11	44.3
KY 480 TO NEW INTERCHANGE								
NB	43,500	3,520	D	1,890	2,430	28.5	0.78	66.2
SB	43,500	4,280	E	2,299	2,430	40.8	0.95	56.3
NEW INTERCHANGE TO KY 245								
NB	43,500	3,520	D	1,890	2,420	28.5	0.78	66.2
SB	43,500	4,280	E	2,299	2,420	40.8	0.95	56.3
SOUTH OF KY 245								
NB	39,500	3,050	D	1,892	2,440	28.6	0.78	66.2
SB	39,500	3,120	D	1,936	2,440	29.6	0.79	65.3

Table 12: 2035 No Build Interchange Ramps

Interchange Ramps	ADT	LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments
KY 480 & I-65							
NB Off	5,400	C	3,206	4,400	21.5	0.73	
NB On	16,200	E	5,264	4,600	38.5	1.14	
SB Off	16,800	F	3,934	4,400	33.2	0.89	Ramp**
SB On	5,600	D	4,642	4,600	34.2	1.01	
Rest Area							
SB Off	1,300	D	4,002	4,400	33.8	0.91	
KY 245 & I-65							
NB On	12,200	D	4,354	4,600	34.3	0.95	
SB Off	12,100	F	3,516	4,400	33.7	0.80	Ramp**

**Ramp indicates the ramp is expected to exceed capacity

V. ALTERNATIVE CONCEPTS

In an effort to reduce congestion at the ramp terminals at KY 480, provide connectivity to KY 61, and improve the current congestion with the Love's Truck stop east of KY 480, three alternatives with a connection to KY 480 and KY 61 were considered—Alternatives 1, 1a, and 2.

Each KY 480-KY 61 connector road begins with relocating the Love's Truck Stop entrance 835 feet eastward. From KY 480, the connector to KY 61 was analyzed as a 3-lane rural template. Plan and profiles were developed to ensure compatibility with the interstate system, and the existing roadway network and new connections. Cost estimates that include Design, Right-of-Way, Utility, and Construction phases were developed. All cost estimates were segmented in such a way that if any right-of-way is donated, those estimates can be subtracted from the total. The following is a detailed description of each alternative.

A. "Do-Nothing" Alternative

The Do-Nothing Alternative would have no construction disruption or associated cost with the exception of routine maintenance.

B. Alternative 1

Alternative 1 (Exhibit 13, p.45) would be a diamond service interchange on I-65 approximately 1.25 miles south of the existing KY 480 interchange (Exit 116) in Bullitt County. The gore-to-gore ramp spacing from KY 480 to the new interchange SB off ramp would be 4,400 feet. The gore-to-gore spacing from the new SB on ramp to the existing off ramp to the Welcome Center/rest area would be 2,800 feet. Both distances exceed the

minimum ramp terminal spacing of 1,600 feet for an entrance to exit ramp identified in the 2011 Green Book. The service or approach road would be a 45-mph, 3-lane rural arterial road with 12-foot-wide lanes and 8-foot-wide paved shoulders.

The approach road would connect to KY 61 to the west and to existing Buffalo Run Road (CS 1196) in the Cedar Grove Business Park to the east. The proposed Business Park Road begins at the intersection of the approach road and Buffalo Run Road and runs northward through the business park to KY 480, approximately 1,300 feet east of the existing NB off-ramp terminus, and approximately 800 feet east of the existing entrance to Love's Truck Stop.

The Business Park Road would be a 35-mph, 3-lane road with 12-foot-wide lanes and curb and gutter. The proposed Love's Access Road would begin at the Business Park Road intersection with KY 480 and tie to the existing entrance pavement at the Love's Truck Stop. Love's Access Road would be 36 feet wide and traverse a wetland area over Buffalo Run Creek to Love's. There is a MCI/Verizon fiber optic cable on the existing LG&E towers within the business park that would not be disturbed with this alternative. Alternative 1's I-65 interchange and approach, Business Park Road, and Love's Access Road are estimated to cost approximately $39 million. The components of the alternative are as follows:

- 2.73 miles (excluding I-65 ramps).
- Diamond interchange 1.25 miles south of the KY 480 Interchange.
- 3-lane approach road from KY 61 to the west (0.67 mile), over I-65 with a 300 linear foot (LF) bridge, then east (0.73 mile) to the existing Buffalo Run Road in the Cedar Grove Business Park.
  - 3 12-foot-wide lanes, 10-foot-wide shoulders (8 feet paved).
    - 45-mph design speed.
    - 2H:1V rock cut slopes.
- 3-lane Business Park Road with curb and gutter (1.12 miles).
  - 35-mph design speed.
- Proposed culvert south of KY 480 in Buffalo Run Creek.
- 36-foot-wide access road to Love's Truck Stop (0.21 mile) with proposed culvert in Buffalo Run Creek near the existing access.
- Steepest grade 6% on Business Park Road just north of Buffalo Run Road crossing.
- Excavation 1,462,000 cubic yards (CY).
- **Estimated Cost: $38,782,000** (right-of-way 23%, earthwork 20%, pavement 18%).

A Right-In/Right Out should be considered at Arrow Parkway and the existing Love's truck stop.

C. Alternative 1a

Alternative 1a (Exhibit 13, p.45) would be the same as Alternative 1 with the exception of eliminating the Business Park Road and extending the approach road eastward to tie to the existing Omega Parkway in the Cedar Grove Business Park. This alternative also includes relocating Loves Truck Stop eastward. Omega Parkway would provide access to I-65 to the south. By eliminating the Business Park Road, Alternative 1's cost would be reduced $8.2 million to approximately $30.5 million. The components of the alternative are as follows:

- 1.85 miles (excluding I-65 ramps) in rolling terrain.
- Diamond interchange 1.25 miles south of the KY 480 Interchange.
- 3-lane approach road from KY 61 to the west (0.67 mile), over I-65 with a 300 LF bridge, then east (0.96 mile) to the existing Omega Parkway in the Cedar Grove Business Park. Omega Parkway would provide connectivity from KY 480 to the proposed new I-65 interchange.
  - 3 12-foot-wide lanes, 10-foot-wide shoulders (8 feet paved).
  - 45-mph design speed.
  - 2H:1V rock cut slopes.
- 36-foot-wide access road to Love's Truck Stop (0.21 mile) with proposed culvert in Buffalo Run Creek near the existing access.
- Steepest grade 5% on the Approach Road from KY 61.
- Excavation 1,538,600 CY.
- **Estimated Cost: $30,500,000** (27% earthwork, 19% pavement, 14% right-of-way).

A Right-In/Right Out should be considered at Arrow Parkway and the existing Love's truck stop.

D. Alternative 2

Alternative 2 (Exhibit 14, p.46) would be the same as Alternative 1 with the exception of an added Collector-Distributor (C-D) system on I-65 SB between KY 480 and just south of the Chapeze Lane Bridge over I-65. The C-D would begin just south of the I-65 Bridge over KY 480 and merge with the existing SB on ramp from KY 480, thus creating a 2-lane C-D southward to the new interchange. The C-D would serve and carry traffic from the new approach road and existing rest area until its tie back to I-65. The estimated cost for Alternative 2 is approximately $53 million. With the mapping that was used for this study, it appears the SB C-D taper will not require widening of the Chapeze Lane Bridge, saving $900,000. The components of the alternative are as follows:

- 5.59 miles (excluding I-65 ramps)
- Diamond interchange 1.25 miles south of the KY 480 Interchange.

- 3-lane approach road from KY 61 to the west (0.67 mile), over I-65 and proposed SB CD with a 360 LF bridge, then east (0.73 mile) to the existing Buffalo Run Road in the Cedar Grove Business Park.
  - 3 12-foot-wide lanes, 10-foot-wide shoulders (8 foot paved).
  - 45-mph design speed.
  - 2H:1V rock cut slopes.
- 3-lane Business Park Road with curb and gutter (1.12 miles).
  - 35-mph design speed.
- Proposed culvert south of KY 480 in Buffalo Run Creek.
- 36-foot-wide access road to Love's Truck Stop (0.21 mile) with proposed culvert in Buffalo Run Creek near the existing access.
- Steepest grade 6% on the Business Park Road just north of Buffalo Run Road crossing.
- Excavation 1,603,000 CY.
- **Estimated Cost: $52,919,000** (17% right-of-way, 24% pavement, 16% earthwork).

A Right-In/Right Out should be considered at Arrow Parkway and the existing Love's truck stop.

E. 2035 Build Traffic

As with the Tables 5-12, the following tables have red shading that illustrates facilities or movements that exceed the acceptable traffic operation (LOS E and F for rural areas, and LOS D, E or F for urban areas). Although movements for the build scenario still operate at a low LOS, green shading has been added to Tables 13-16 (pp.18-20) that show areas of improvement over the 2035 No-Build scenario.

The 2035 Build Traffic for the KY 480 and KY 245 ramp terminals would still operate at LOS F, however, the delay would be improved at both ramp terminals. With additional study, the delay could possibly improve even more.

The new interchange ramps were analyzed as a two-way stop. The results are shown in Table 13 (p.18). More study will be needed to determine whether signalization or additional turn lanes for the new connector road ramp terminals will be necessary; however, this task was beyond the scope of this study and is considered negligible to the overall cost of the project. Also, the new connector road east of I-65 is expected to operate near capacity in the PM design hour during the seasonal months.

As shown in Table 15 (p.19), Alternative 1, a new interchange south of KY 480, is expected to have minimal impact on the operation of I-65. Between KY 480 and the proposed new interchange, traffic is expected to increase approximately 2,000 vpd; however, it would still

operate at LOS E, just as without the interchange. This increase is a result of northbound and southbound traffic now exiting at the new connector instead of KY480.

Alternative 2 is the same as Alternative 1, with the exception of a southbound C-D road to carry southbound traffic entering I-65 from KY 480, and the southbound traffic entering and exiting the southbound rest area. All C-D road traffic would re-enter I-65 south of the rest area. As shown in Tables 15 and 16 (pp.19-20), although the mainline traffic on I-65 does improve, the merge south of the rest area is expected to operate at LOS D and the merge area of influence would exceed capacity. In addition, the capacity for a single lane ramp (C-D road) at 50 mph is 2,200 vehicles per hour (vph). The flow rate for the Alternative 2 C-D road is just over 2,100 vph, hence the v/c ratio of the C-D would be near 0.95 in the design year 2035 i.e. approaching capacity. The cost estimates for Alternative 2 in this abbreviated feasibility study are for a single lane C-D.

Table 13: 2035 Build Ramp Terminals

Ramp Terminals	LOS	Intersection or Approach Delay	Issue	Control Delay
KY 480				
NB Ramps (signalized)	F	304.8	EBT/NBR	397.4/251.9
SB Ramps (signalized)	F	202.7	EBT	374.6
NEW INTERCHANGE				
NB Ramps	E	48.7	NBL	108.0
SB Ramps	F	1198.0	SBL	1257.0
KY 245				
NB Ramps	F	1126.0	NBR	1208.0
SB Ramps	F	248.1	SBL	401.0

In addition to Alternatives 1 and 2, another option was investigated that would add an auxiliary lane from KY 480 southbound to the new interchange. As shown in Table 16 (p.20), a capacity analysis shows an improvement in LOS of mainline I-65; however, the resultant weave between the two interchanges would operate at LOS E. An auxiliary lane between KY 480 and the connector has a construction cost estimate of approximately $1,500,000. Before such an investment is made, with several closely spaced interchanges in progression, any further study of the proposed interchange should include a microsimulation model to determine the impacts of each interchange in relationship to the others in the study area (and even including the KY 44 interchange, Exit 116 north of KY 480).

Table 14: 2035 Build Crossroads

Crossroads	ADT	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio
KY 480 West of I-65	11,400	660	D	790	78.8	42.4	0.46
KY 480 East of I-65*	40,800	2,220	C	1,399	25.4	55.0	0.66
Connector Road West of I-65	1,000	170	D	288	55.6	41.9	0.17
Connector Road East of I-65	19,300	990	E	1,133	88.3	31.4	0.67
KY 245 West of I-65	6,000	430	D	553	73.6	47.5	0.33
KY 245 East of I-65	27,500	1,850	F	2,124	100.0	29.3	1.25

Table 15: 2035 Build I-65 Mainline

I-65 Mainline	ADT	Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS
ALTERNATIVE 1 and 1a								
NORTH OF KY 480								
NB	49,500	4,800	F	2,444	2,420	52.0	1.01	52.0
SB	49,500	5,280	F	2,689	2,420	60.7	1.11	44.3
KY 480 TO NEW INTERCHANGE								
NB	45,500	3,810	D	2,046	2,430	32.5	0.84	62.9
SB	45,500	4,370	E	2,347	2,430	42.7	0.97	54.9
NEW INTERCHANGE TO KY 245								
NB	43,500	3,450	D	1,853	2,420	27.7	0.77	66.9
SB	43,500	4,110	E	2,207	2,420	37.5	0.91	58.9
SOUTH OF KY 245								
NB	39,500	3,050	D	1,892	2,440	28.6	0.78	66.2
SB	39,500	3120	D	1,936	2440	29.6	0.79	65.3
ALTERNATIVE 2								
SOUTHBOUND FROM CD ROAD DIVERGE SOUTH OF KY 480 OVERPASS TO CD MERGE SOUTH OF REST AREA								
SB	26,900	2,890	C	1,552	2,420	21.7	0.64	71.6
ADDITIONAL OPTION – AUXILIARY LANE FROM KY 480 TO NEW INTERCHANGE								
SOUTHBOUND ADDITION OF AUXILIARY LANE FROM KY 480 TO NEW INTERCHANGE								
SB	45,500	4,370	C	1,760	2,420	25.7	0.73	68.6

Table 16: 2035 Build Interchange Ramps

Ramp Movement	ADT	LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	Weaving Speed
ALTERNATIVE 1 AND 1a								
KY 480 / I-65								
NB Off	4,400	C	3,481	4,400	23.8	0.79		
NB On	12,800	E	5,095	4,600	37.4	1.11		
SB Off	13,800	F	3,957	4,400	33.4	0.90	Ramp**	
SB On	5,300	D	4,719	4,600	34.9	1.03		
Connector Road / I-65								
NB Off	2,300	C	3,313	4,400	27.9	0.75		
NB On	6,700	D	4,098	4,600	30.1	0.89		
SB Off	7,100	D	3,811	4,400	31.4	0.87		
SB On	2,700	D	4,256	4,600	31.3	0.93		
KY 245 / I-65								
NB On	11,200	D	4,160	4,600	32.9	0.90		
SB Off	11,200	F	3,417	4,400	32.8	0.78	Ramp**	
Rest Area / I-65								
SB Off	1,200	D	3,874	4,400	32.7	0.88		
SB On	1,200	D	4,175	4,600	28.5	0.91		
ALTERNATIVE 2								
ALTERNATIVE 2 CD ROAD								
SB Off Ramp South of KY 480 Overpass	14,100	C	3,229	4,400	27.2	0.73		
SB On Ramp South of Rest Area	9,700	D	4,757	4,400	34.8	1.03		
ADDITIONAL OPTION – AUXILIARY LANE FROM KY 480 TO NEW INTERCHANGE								
SOUTHBOUND WEAVE BETWEEN KY 480 AND THE NEW INTERCHANGE								
Weave Analysis	12,400	E	4,825	5,395	35.5	0.89		49.3

** The capacity analysis shows that the KY 245 and KY 480 SB off ramps will exceed their available capacity during seasonal months.

2035 Build traffic for all alternatives are illustrated in detail in Exhibits 9-12 (pp.41-44). Alternative 1 appears to have minimal effect on I-65, improves the KY 480 ramp terminals' congestion, and is the least expensive. All Build traffic for Alternative 1 is illustrated in detail in Figures 2 and 3 (pp. 22-23).

F. Signing

Signing for drivers unfamiliar with a roadway is important along an urban interstate. A preliminary signing plan is required prior to interstate access approval by FHWA. A cursory review of existing and new I-65 signs between KY 44 and KY 245 was conducted to ensure that signing for each alternative along I-65 could be accomplished with each alternative. Prior to FHWA approval signage along the crossroads will have to be evaluated. A

preliminary I-65 signing plan was developed and is located in Exhibits 15 and 16, (pp. 47-48). The following summarizes that review:

- Alternatives 1 and 1a would require the removal of 3 ground-mounted panel signs (2 SB and 1 NB) and the addition of 3 overhead trusses (2 SB and 1 NB).
- Alternative 2 would require the removal of 3 ground mounted panel signs (1 SB and 2 NB) and the addition of 3 overhead trusses (2 SB and 1 NB).

VI. COST ESTIMATES

Cost estimates for each alternative are summarized above and shown in Exhibits 17, 18 and 19 (pp.49-51). Initially, utility estimates were prepared using a percentage of the construction cost. The utility estimates were again reviewed after receiving information from each utility company in the area. There are utilities along KY 480 near in the project area, and a high power overhead transmission line and fiber optic line through the Cedar Grove Business Park. The alternatives were developed to avoid impacts to the overhead utilities through the park; therefore, the estimate was left at 2% of the construction cost, which is comparable to other projects of similar size and scope.

Right-of-way estimates were prepared utilizing Property Valuation Administration (PVA) information. As with most PVA information, there were some gaps in the information. For industrial sites, the PVA information did not split the values between the building and the land. If a commercial value for the property was shown, the value was used. An estimate of the right of way needed for this project was developed and then multiplied by the price per acre of the affected property utilizing the value of both the building and the land. That value was then tripled. As another check, these estimates were then double-checked against Think Kentucky's web site, which has general land values in the neighborhood of $125,000/acre. This value was confirmed by a major landowner in much of the project area. Consequently, the right-of-way estimate methodology as deemed to be reasonable.

Signing was considered as part of the 25% contingency cost rather than as a separate line item. The signing would most likely not exceed $200,000.

VII. PROJECT TEAM MEETINGS

Two project team meetings (September 15, 2014, and September 25, 2014) were held for this project. The first meeting was an initial alignment review and the second a final alignment review. An environmental overview, Alternatives 1, 1a and 2, preliminary phase cost estimates, and traffic forecasts for 2035, with and without the new interchange were presented at the first meeting. At the second meeting, discussion resulted in the adjustment of slopes for the presence of New Albany Shale; and the results of the capacity analysis for the mainline, crossroads, and ramp terminals were presented.

Since this is an Abbreviated Feasibility Study, it was decided that all three alternatives would remain viable. The minutes are located in Exhibits 20 and 21 (pp.52-55).

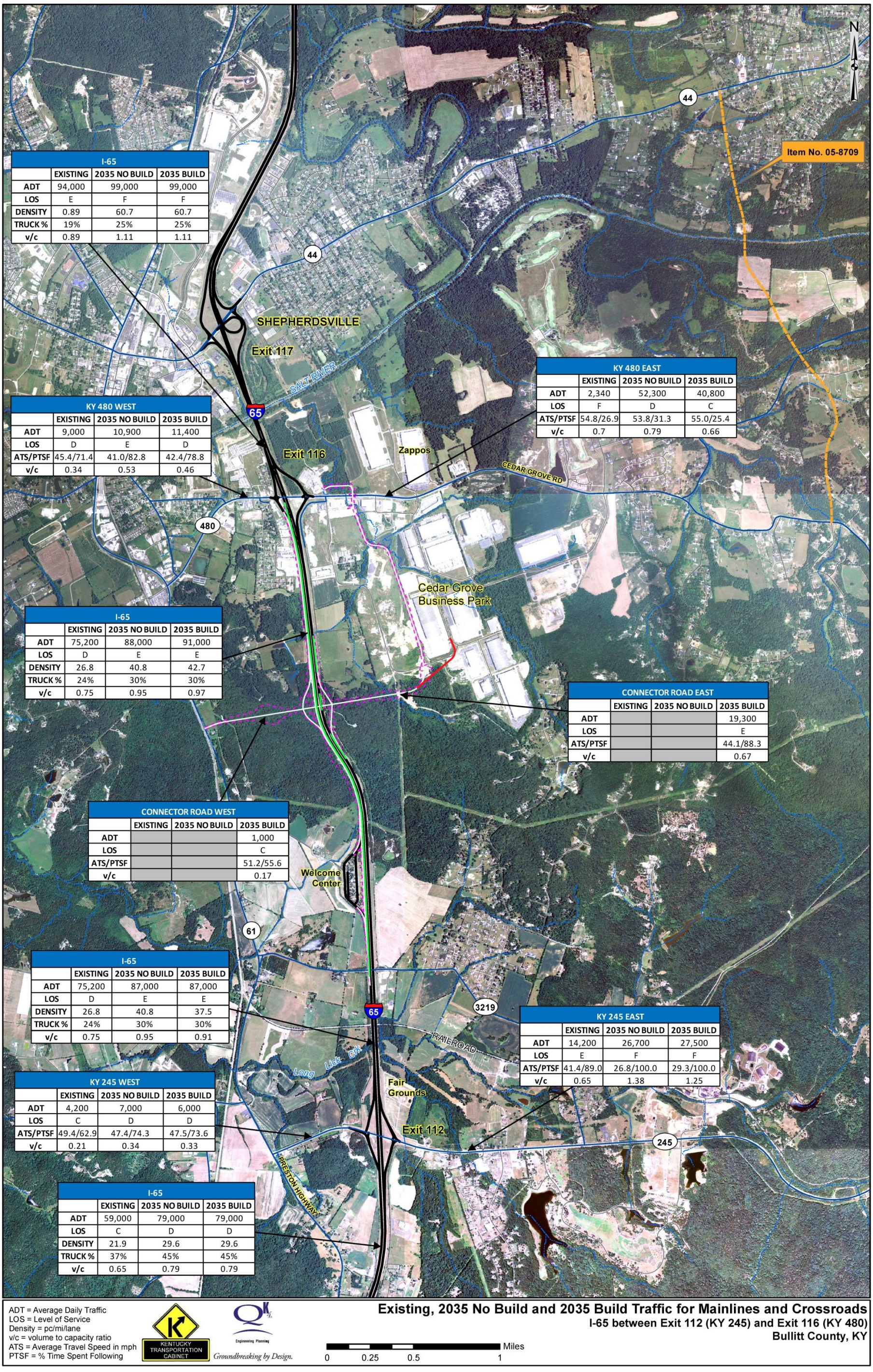


Figure 2: Existing, 2035 No Build and 2035 Build Traffic for Mainlines and Crossroads

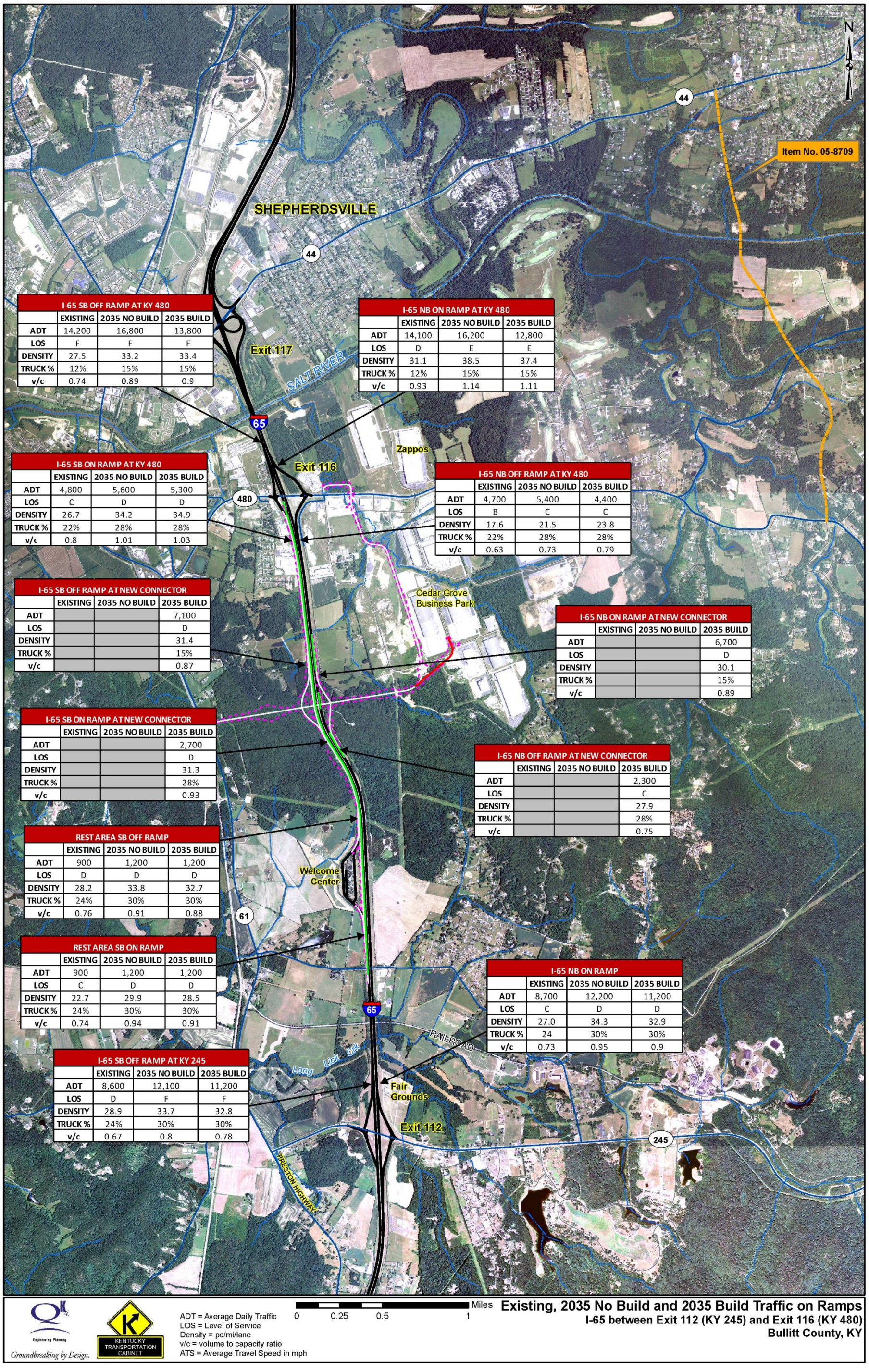


Figure 3: Existing, 2035 No Build and 2035 Build Traffic on Ramps

VIII. FHWA IJS EIGHT POLICY POINT REQUIREMENTS

FHWA provides IJS guidance in the *Interstate System Access Informational Guide* (*Guide*) dated August 2010, which details eight policy requirements the States must follow when seeking FHWA approval for access to the interstate for a new interchange.

On page 8 of the *Guide*, it is stated: "…access approval may be a two-step process to help the State manage risk and provide flexibility….The first step is a finding of operational and engineering acceptability...." The *Guide* further states: "The second step is the final FHWA approval which constitutes a Federal Action, and as such, requires that the National Environmental Policy Act (NEPA) procedures are followed. Compliance with the NEPA procedures need not precede the determination of engineering and operational acceptability; however, final approval of access cannot precede the completion of NEPA."

The purpose of the Abbreviated Feasibility Study is to address only the operation and engineering acceptability. It is not intended to be a complete IJS.

The *Guide* contains eight policy requirements that FHWA must take into consideration before it will allow construction of a new interchange. This section first states each policy requirement, and then discusses each of these policy points as they relate to this project.

A. Policy Requirement No. 1: Existing Facilities Capability

The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).

KYTC has either implemented or has programmed improvements to the existing roadway network to relieve congestion, yet the existing volumes and future demands exceed the existing and future capacity.

The general purpose and need for the project is to reduce delay and congestion, and to improve system connectivity for the existing and future substantial employment and freight trips expected to travel to and from the Cedar Grove Business Park and other adjacent industrial site along KY 480 (shown in the blue area on the map below). Options to rebuild the existing roads to meet these needs have been explored, implemented, and others are planned. None of those options would adequately address the substantial traffic, both existing and planned.

1. KY 480

The only access to I-65 from this industrial area is from KY 480, which is an east-west road that bisects the industrial area before continuing east into the rural portions of Bullitt County.

In November 2011, as a result of growing congestion from the industrial park traffic, KYTC widened KY 480 from a 2-lane road to a 5-lane road from I-65 east approximately 1.2 miles (shown as the green solid line in Figure 4). Since then growth has continued in the area and today KY 480 remains congested in peak hours.

2. Planned Improvements

The following other improvements to the existing roads and road network are under consideration by KYTC (as shown on Figure 4). Each of these planned improvements was taken into consideration when modeling the future Build and No-Build scenarios. Even so, for the 2035 No-Build scenario, the northern ramps at KY 480 operate at LOS E and F in the PM peak design hours:

- KYTC is investigating adding a dual left turn on westbound KY 480 to enter SB I-65 (shown as the yellow rectangle) This project is part of KYTC Item No. 5-391.2.
- Another feature of KYTC Item 5-391.2 is to extend the 5-lane section of KY 480 east approximately 0.8 mile (shown as the dashed green line)
- KYTC is studying the construction of a new north-south road (KYTC Item No. 5-8709) that would be east of and parallel to I-65, linking KY 480 and KY 44 (shown as the orange dashed line). This new route would improve connectivity and provide another crossing of the Salt River.

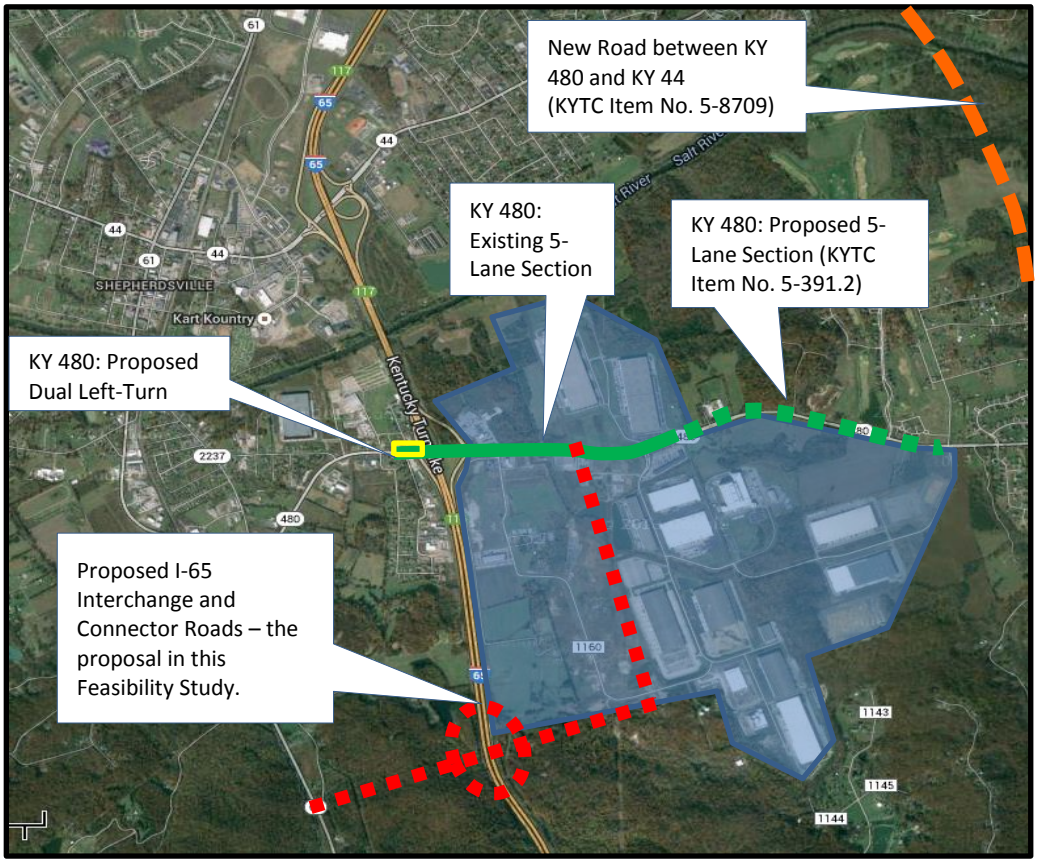


Figure 4: Planned improvements under consideration by KYTC

In conclusion, because KY 480 is the only state road in the area providing access to I-65, and since it has already been widened and improved, other than the proposed interchange and connector road (shown as a red dashed line in Figure 4, p.25) there are no improvements to existing roads that could be considered to reduce congestion and delays to an acceptable level.

B. Policy Requirement No. 2: Transportation System Management

The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).

There are no Transportation System Management (TSM) options available that would reduce traffic congestion and delays to meet the purpose and need of the project.

1. Transit

There are two transit services in Bullitt County, Transit Authority of River city (TARC) and WHEELS, described below:

a. TARC

According to the 2014 TARC System Map, TARC provides two routes to Bullitt County—Express Route 66X on I-65 from KY 44 north to/from Louisville, and Route 66 on KY 44 linking Shepherdsville, Mt. Washington, and Louisville. No TARC service extends south to KY 480, or to the interchange study area, or the Cedar Grove Business Park and adjacent industrial areas south of the Salt River. Therefore, transit is not a viable option to address the congestion in the study area.

b. WHEELS

Bullitt County, in cooperation with KYTC's Office of Transportation Delivery and Louisville WHEELS, offers a para-transit service in on weekdays from Mt. Washington to Shepherdsville to downtown Louisville. The goal of the service is to connect residents of Bullitt County to services and other transportation options in Louisville. This route stops daily on weekdays at the Louisville International Airport, the Greyhound Bus Depot, as well as downtown Louisville for connection to TARC service. This program does not provide service for this study area.

2. Special Purpose Lanes and Geometric Designs

I-65 consists of only general purpose lanes—three in each direction—throughout Bullitt County. No special use lanes, such as High Occupancy Vehicle (HOV) or High Occupancy (HOT) lanes, exist within the study area, the encompassing Louisville Metropolitan Area, or any portion of I-65 in Kentucky. No geometric designs to I-65, such as horizontal or vertical shifts, or reconstruction of the KY 480 interchange would improve access and system connectivity, which is a key element in the project purpose and need.

Metered ramps, per say, are not allowable traffic control devices in Kentucky, as no state enabling legislation exists to permit their use. Other such devices, including workplace time shift management, are not feasible options to address the traffic needs, as they are governed by market demands and, per coordination with local officials, are already in use at some of the industrial sites.

C. Policy Requirement No. 3: Operational Analysis

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2 (a), 655.603 (d) and 771.111 (f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2 (a) and 655.603 (d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and the local street network (23 CFR 625.2 (a) and 655.603 (d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109 (d) and 23 CFR 655.603 (d)).

The traffic analysis conducted for this project concludes that no significant adverse impact to safety or operations of I-65, nor the interchanges to the north (KY 480) or south (KY 245), would occur in the design year of 2035 as a result of the proposed new interchange. The traffic analysis also concludes that no significant impacts to the local roads (including KY 480, KY 61, and Industrial Park Road) would occur due to this project.

The traffic analysis includes a detailed investigation of the traffic movements, including merge and diverge operations on I-65, turning movements at the ramp terminals with the crossroad, and the local street network in the study area. With no adjustments in signal timings, a significant improvement in delay at the ramp terminals would be experienced with any of the build alternatives, although they will still have poor Levels of Service for both Build and No-Build conditions.

Three conceptual plans were analyzed: a traditional diamond interchange (Alternatives 1 and 1a, Exhibit 13, p.45) and a traditional diamond interchange with a C-D system (Alternative 2, Exhibit 14, p.46). Both were developed per current AASHTO geometric design criteria. The analysis showed the I-65 future peak hour traffic under Alternative 1 / 1a would have minimal effect on I-65, thus avoiding the costly implementation of a C-D system (see Table 15, p.19, Exhibit 11, p.43 and Exhibit 14, p.46).

The preliminary signing plan for I-65 (Exhibits 15-16, pp.47-48) illustrates adequate signing can be placed along the interstate in accordance with MUTCD guidelines without adverse impacts to other signs or drivers' expectations. Adequate signage for either concept (either with or without a C-D system) could be achieved without major issues. Two overhead trusses would be needed for each alternative SB and one NB and panel signs removed in each direction for each alternative.

D. Policy Requirement No. 4: Access Connections and Design

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.4 (a) (2), and 655.603 (d)).

The proposed interchange would be a full interchange; would provide for all traffic movements; and would connect with KY 61 to the west, a state-owned roadway and KY 480 to the north, a state-maintained facility. The new interchange and connector roads would be designed in accordance with current standards for Federal-Aid projects, and would meet AASHTO and KYTC highway design standards.

E. Policy Requirement No. 5: Transportation and Land Use Plans

The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

1. Transportation Plan

At present, this project is not included in any local (April 2010 Go Bullitt County Transportation Plan or 2013 Bullitt County Comprehensive Plan), regional, or state transportation plans. This Feasibility Study is the first planning effort for the proposed interchange. If found to be feasible, prudent, and desirable, at a minimum, the Louisville Metropolitan Planning Organization (MPO) must include the plan in the Transportation Improvement Program (TIP) via an amendment voted on by the MPO Policy Committee. The project must also be included in the State TIP (STIP), and a future KYTC Six Year Highway Plan.

2. Land Use Plans

The 2013 Bullitt County Comprehensive Plan includes existing land use and proposed future land use maps and analyses. Images of the study area from both maps are shown in Figures 5 and 6, (p.31). The future land use analysis identifies the study area as

appropriate for future industrial and commercial uses (purple and red, respectively on Figures 5 and 6, p.31). The plan text states:

"There is room for additional industrial development in or adjacent to the existing Cedar Grove Business Park. If demand for industrial land grows beyond these development sites, the most appropriate location would be just south of the city along I-65 where there will be close access to the interstate and where industrial development will act as a buffer between the interstate and residential land uses (p. 8-24)."

This text documents the County's desire to continue industrial land use development within the study area, not just in the Cedar Grove Business Park, but also along the west side of I-65 and east of KY 61. Per the Comprehensive Plan, the interchange and connector road would be in concert with the future land use plans.

F. Policy Requirement No. 6: Comprehensive Interstate Network Study

In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109 (d), 23 CFR 625.2 (a), 655.603 (d), and 771.111)

No new interchanges with I-65 are proposed within proximity to the study area. A new interchange with I-65 and KY 61 north of Shepherdsville is included in the Louisville MPO's Long Range Plan, KIPDA's traffic model and Bullitt County's 2010 Go Bullitt Transportation Plan, but it is not included in the KYTC 2014 Six Year Highway Plan. No other additional interchanges are planned along I-65 in Bullitt County. The interchange north of Shepherdsville is approximately 5 miles north of the proposed interchange, would serve a different portion of the county, and would have a different purpose and need. It would not be anticipated to have any affect, positive or negative, on the interchange proposed south of KY 480 addressed in this Feasibility Study.

G. Policy Requirement No. 7: Coordination with Transportation System Improvements

When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2 (a) and 655.603 (d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2 (a) and 655.603 (d)).

This proposal has been and would continue to be coordinated with local officials prior to and after FHWA approval and during future project development phases. The proposed interchange is supported by local plans, local officials and representatives, and the developers of the Cedar Grove Business Park. The project is seen as a critical element to

facilitate traffic that will be generated by the expanded industrial employment sector in this portion of the county. The study area is planned to support industrial growth, per the Bullitt County 2013 Comprehensive Plan, and the development plans are in concert with the interchange and access roads. It should be noted that the developments are not dependent on the interchange or access roads, but would benefit from them as would the overall traveling public, in terms of additional route choices, travel time efficiencies, reduced congestion, and improved emergency access.

At the time of this Abbreviated Feasibility Study the development plans for expanding Cedar Grove Business Park are undergoing approval by the local government, the area is being rezoned, and plans to annex the land into the City.

Regarding interstate spacing requirements, it is the general guideline that within urban areas, 1-mile spacing is required, while 3-mile spacing is required in rural areas. With the proposed future land use map, the current development plans, and the proposed annexation into the City, the study area is transitioning from rural to urban, and will be eligible to be a Federal Urbanized Area in the near future.

H. Policy Requirement No. 8: Status of Planning and NEPA

The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

Because this interchange is a federal action, an analysis and document(s) per NEPA will be required. Based on other similar projects throughout the Commonwealth of Kentucky, it is anticipated a CE-3 would need to be developed and approved by FHWA. Under NEPA, each element of the social, economic, and natural environment must be taken into account, and documented per various federal laws and policies. The Build and No-Build scenarios would need to be analyses, and input from resource agencies would be necessary, including the Kentucky Heritage Council, USFWS, and the Kentucky Division of Water.

An abbreviated Environmental Overview was conducted as part of this Abbreviated Feasibility Study. No element of the social, economic, or natural environment that would cause significant concern was found.

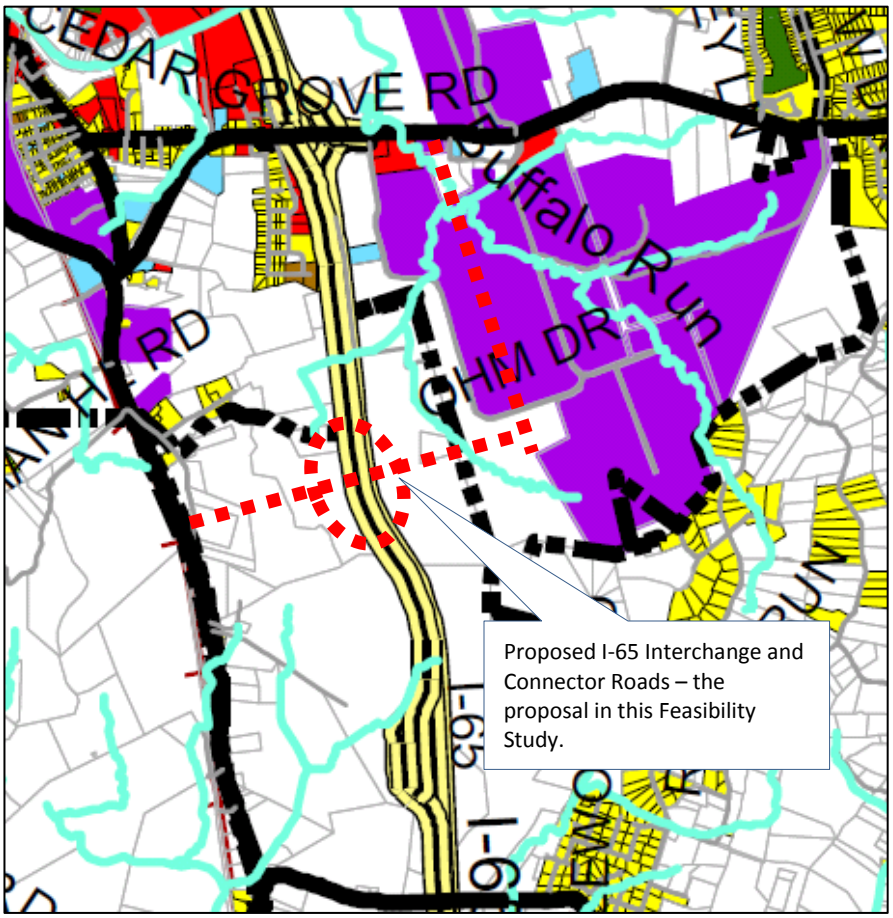


Figure 5: Existing Land Use

Agriculture
Low Density Residential
Commercial
Industrial
Parks and Recreation

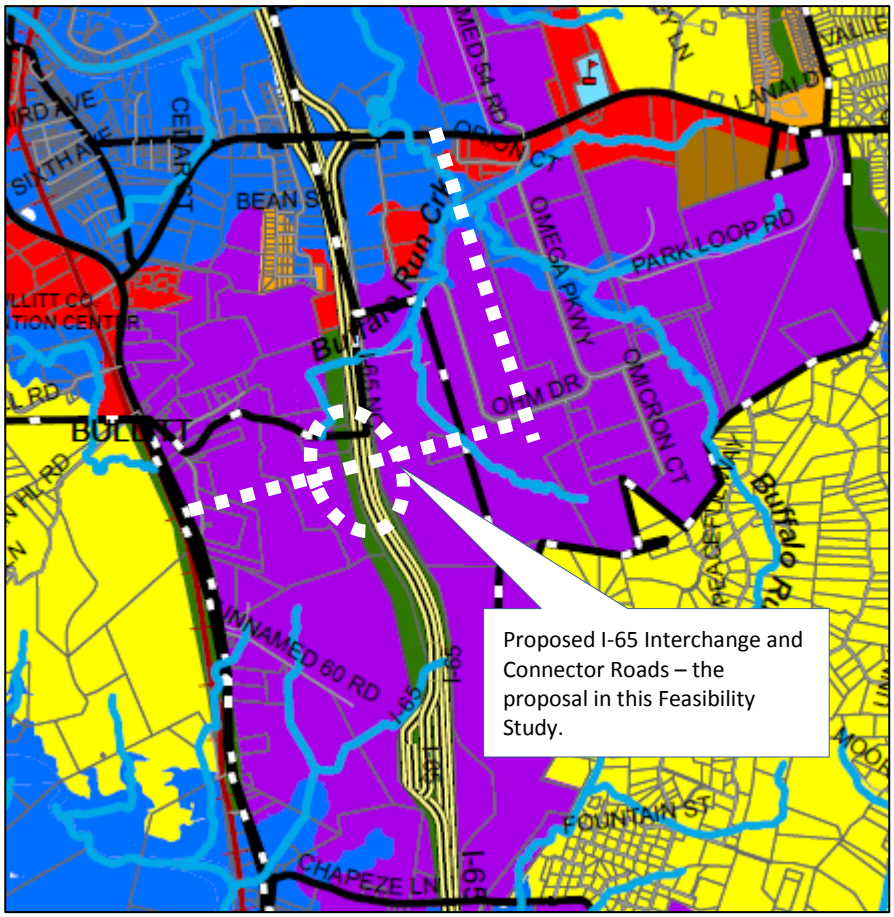


Figure 6: Future Land Use

Low Density Residential
Medium Density Residential
Commercial
Industrial
Environmentally Sensitive

IX. EIGHT POLICY POINT CONCLUSIONS

Based on the analysis conducted for this Abbreviated Feasibility Study, it is concluded that a proposed new I-65 interchange and connector in this portion of Bullitt County would not have an adverse effect on the engineering and operational acceptability of I-65 in the project area. Due in part to the expected low usage of the interchange, the project would not be in conflict with the goals of Policy Point Requirement No. 3, which are designed to protect the existing and projected traffic operations. This determination was one of the primary goals of this Abbreviated Feasibility Study was to make that determination.

Regarding Policy Requirement No. 1, which requires consideration of improving the existing interchanges rather than constructing a new interchange to meet the needs, it was found through coordination with local officials and KYTC that improvement to the existing road have been made and are planned; however, they will not meet the demands from the future growth planed in the area, and would not meet the purpose and need of the project.

The second and final step in this process would be compliance with NEPA and related environmental requirements. If a detailed investigation concludes this project would not have significant environmental impacts, it would likely be processed as a CE-3. That determination and the resulting analysis would be made as part of that second step, and are beyond the scope of this report.

X. OVERALL SUMMARY

Given the employment information that was provided and a geometric and traffic operations analysis, it is concluded that a Love's entrance realignment, the KY 480–KY 61 connection, and a new interchange with I-65 at this location are feasible and would cost between $29 million and $59 million. The connector would carry over 18,000 vpd considering the seasonal employment. It appears the traffic impact on I-65 would be negligible with Alternative 1, and the project would achieve the goal of reducing congestion at the KY 480 ramp terminals. From a brief environmental overview and windshield survey, it appears that there are also no major environmental issues that would affect that feasibility.

APPENDIX

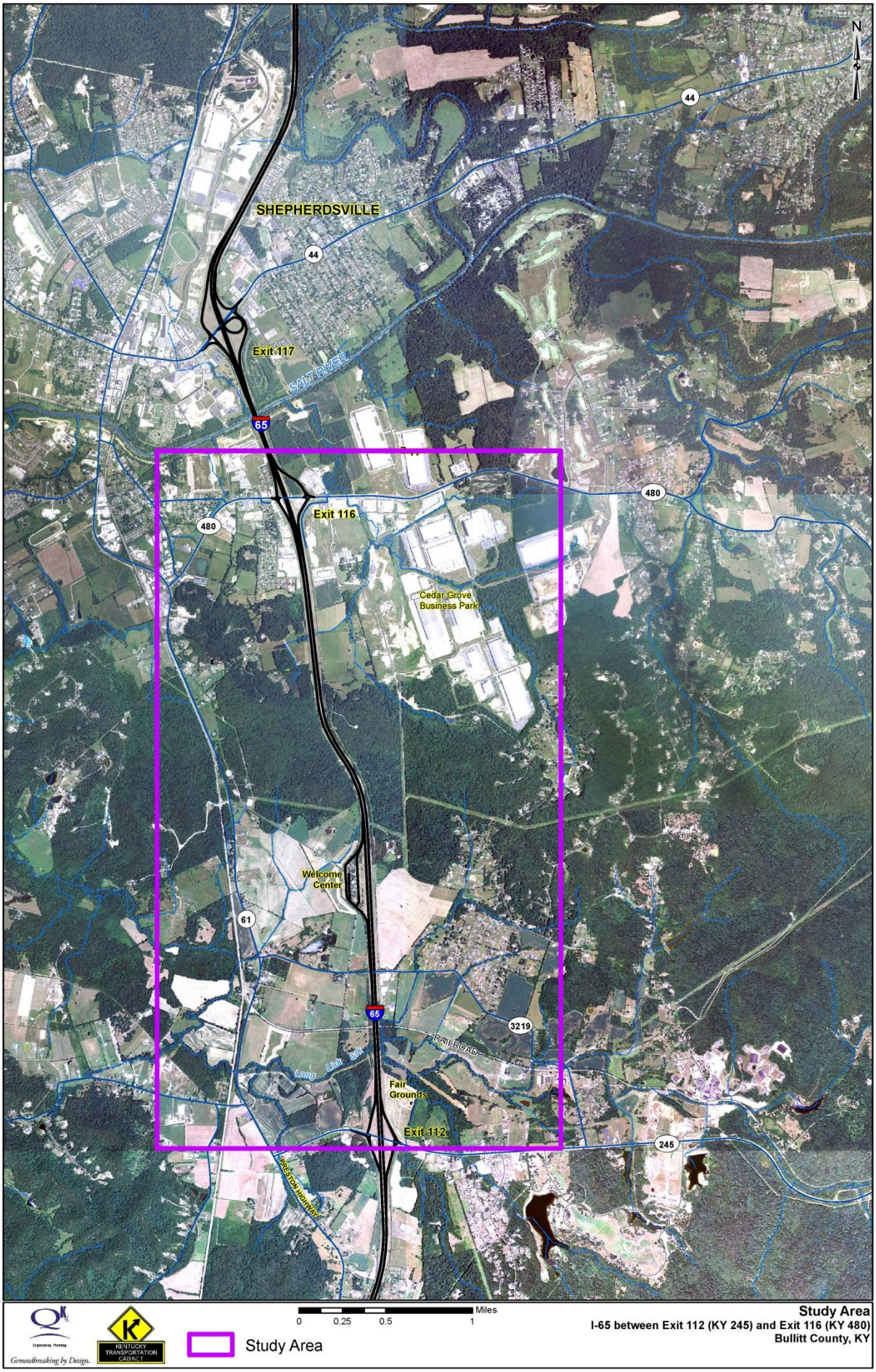

N
SHEPHERDSVILLE
44
Exit 117
SALT RIVER
65
480
Exit 116
Cedar Grove
Business Park
Welcome
Center
61
3219
RAILROAD
Long Lick Cr.
Fair
Grounds
Exit 112
245
BARDSTOWN HIGHWAY
Miles
0
0.25
0.5
1
Study Area
Study Area
I-65 between Exit 112 (KY 245) and Exit 116 (KY 480)
Bullitt County, KY
KENTUCKY
TRANSPORTATION
CABINET
Groundbreaking by Design.

Exhibit 1

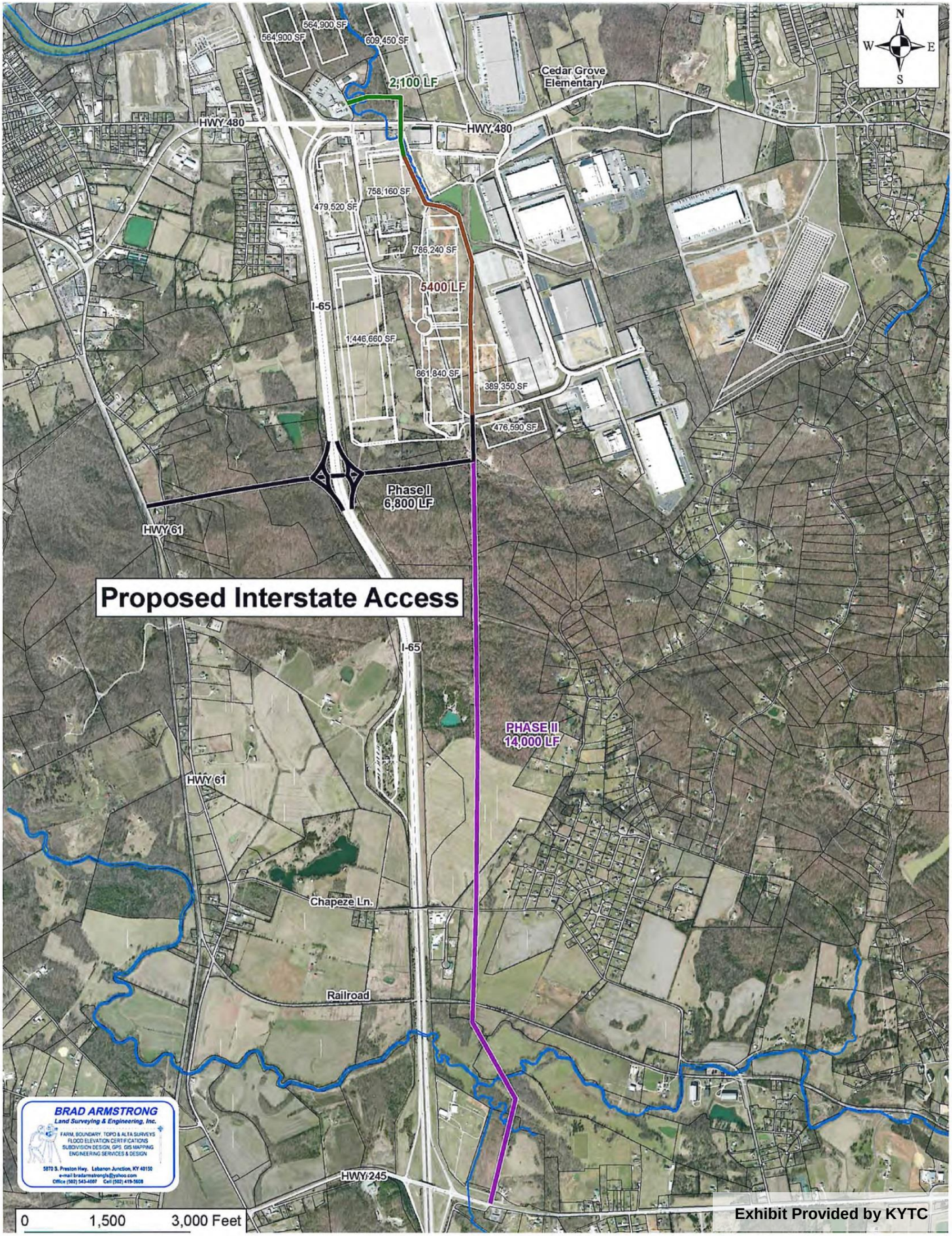

N
W
E
S
564,900 SF
564,900 SF
609,450 SF
2,100 LF
Cedar Grove Elementary
HWY 480
HWY 480
758,160 SF
479,520 SF
786,240 SF
5400 LF
I-65
1,446,660 SF
861,840 SF
389,350 SF
476,590 SF
Phase I
6,800 LF
HWY 61
Proposed Interstate Access
I-65
PHASE II
14,000 LF
HWY 61
Chapeze Ln.
Railroad
HWY 245
BRAD ARMSTRONG
Land Surveying & Engineering, Inc.
FARM, BOUNDARY, TOPO & ALTA SURVEYS
FLOOD ELEVATION CERTIFICATIONS
SUBDIVISION DESIGN, GPS, GIS MAPPING
ENGINEERING SERVICES & DESIGN
5870 S. Preston Hwy. Lebanon Junction, KY 40150
e-mail bradarmstrongls@yahoo.com
Office (502) 543-4087 Cell (502) 419-5608
0
1,500
3,000 Feet
Exhibit Provided by KYTC

Exhibit 2

EXISTING CONDITIONS INVENTORY

Route	Beginning MP	Beginning Feature	Ending MP	Ending Feature	Length	Lane Width	Right Side Shoulder Width	Median Width	Auxiliary Lane Breaks	Posted Speed	Percent Passing Sight Distance	Left Turn Lanes, Cardinal Direction, MP	Left Turn Lanes, Non-Cardinal Direction, MP	Continuous Center Left-Turn Lane, MP	Right Turn Lanes, Cardinal Direction, MP	Right Turn Lanes, Non-Cardinal Direction, MP	HIS ADT	Percent Combination Trucks (Does not include single unit trucks)	Functional Classification	State Maintenance Classification	Truck Weight Limit	National Truck Network (Yes/No)	Number of Access Points-Cardinal Direction
I-65	110.793	One Mile South of KY 245	111.793	KY 245	1.000	12	10	54		70	100						58,479	33.9	Rural Interstate	State Primary	AAA	Federally Designated	N/A
	111.793	KY 245	114.547	Urbanized Area Boundary	2.754												67,805	19.7					
	114.547	Urbanized Area Boundary	115.332	Change from depressed to barrier median	0.785														Urban Interstate				
	115.332	Change from depressed to barrier median	115.558	KY 480	0.226			23															
	115.558	KY 480	116.558	One Mile North of KY 480	1.000												76,900	15.9					
KY 61	9.420	KY 245	9.780	KY 1494	0.360	10	6	0		55	35						3,890	1.1	Rural Minor Arterial	State Secondary	AAA	No	2
	9.780	KY 1494	10.371	RR Crossing	0.591		6/2										3,646						1
	10.371	RR Crossing	10.650	KY 3219	0.279		2/10																7
	10.650	KY 3219	11.882	Cooper Run Rd South	1.232		10/5																14
	11.882	Cooper Run Rd South	12.391	Cooper Run Rd North	0.509		5										4,548						3
	12.391	Cooper Run Rd North	12.397	Newman Hill Road	0.006																		1
	12.397	Newman Hill Road	12.575	Forest Hill Road	0.178																		1
	12.575	Forest Hill Road	12.928	KY 480	0.353		5/2/10				25	12.91-12.978	12.928-12.978				5,222		Urban Minor Arterial				6
KY 245	4.263	Half Mile East of Jim Beam	4.690	Begin Mountable Median	0.427	12	10	0	Merging Lane Eastbound	55	40						12,213	5.3	Rural Minor Arterial	State Primary	AAA	State Designated	2
	4.690	Begin Mountable Median	4.763	Happy Hollow Rd	0.073			10															1
	4.763	Happy Hollow Rd	4.919	End Mountable Median	0.566								4.763-4.790										0
	4.919	End Mountable Median	5.329	KY 3219	0.410			0															7
	5.329	KY 3219	5.392	Begin Mountable Median	0.472																		0
	5.392	Begin Mountable Median	5.646	End Mountable Median	0.254			16				5.503-5.553				5.553-5.588							1
	5.646	End Mountable Median	5.801	Plenmar Dr	0.155												14,153						4
	5.801	Plenmar Dr	5.902	Old KY 245 East	0.101			0		55													5
	5.902	Old KY 245 East	6.297	Audubon Dr	0.395																		5
	6.297	Audubon Dr	6.498	I-65 Overpass	0.201		8	16			0		6.441-6.471										1
	6.498	I-65 Overpass	6.703	End Mountable Median	0.245							6.553-6.585											1
	6.703	End Non-Mountable Median	6.743	Old KY 245 West Eastern Access	0.040		10	0									4,574					No	0
	6.743	Old KY 245 West Eastern Access	7.002	Old KY 245 West Center Access	0.259																		2
	7.002	Old KY 245 West Center Access	7.089	Old KY 245 West Western Access	0.087																		0
	7.089	Old KY 245 West Western Access	7.178	KY 61	0.089																		0
KY 480	0.000	KY 61	0.075	KY 2237	0.075	11	10	0		45	50	0.060-0.075				0.000-0.042	4,281	3.5	Rural Minor Arterial	State Secondary	44000 lbs	No	2
	0.075	KY 2237	0.185	End of Divided Highway	0.110			12															1
	0.185	End of Divided Highway	0.589	KY 480C	0.404			0															2
	0.589	KY 480C	0.784	Dawson Drive	0.195			0			45	0.561-0.589					8,411	3.5					5
	0.784	Dawson Drive	0.823	KY 6317	0.039			0															1
	0.823	KY 6317	0.906	Number of Lanes: 2 to 3	0.083			0															1
	0.906	Number of Lanes: 2 to 3	0.944	I-65 Underpass	0.038	12		0					0.926-0.987						Urban Minor Arterial				0
	0.944	I-65 Underpass	1.077	Number of Lanes: 3 to 4	0.133			0															1
	1.077	Number of Lanes: 3 to 4	1.164	KY 6318	0.087			0															1
	1.164	KY 6318	1.698	Omega Pkway/Zappos.com Blvd	0.534		Curb	0								1.528-1.698							5
	1.698	Omega Pkway/Zappos.com Blvd	1.755	Number of Lanes: 4 to 3	0.057			0	Merging Lane Eastbound		30	1.014-2.020					8,217	1.3	Urban Major Collector				0
	1.755	Number of Lanes: 4 to 3	2.030	Number of Lanes: 3 to 2	0.275			0															3
	2.030	Number of Lanes: 3 to 2	2.262	Mooney Lane	0.232			0		45/55													2
	2.262	Mooney Lane	2.626	Heritage Hill Parkway	0.364	10	3	0		55		2.545-2.616											2
	2.626	Heritage Hill Parkway	2.834	Park Loop Road	0.208			0						2.616-2.834									2
KY 6318	0.000	Begin State Maintenance	0.380	KY 480	0.380	9	3-4	0		35							35		Urban Local	Supplemental*	44000 lbs	No	1

* KY 6318 is reported in HIS database as "proposed for removal from State Maintenace System."

Exhibit 3

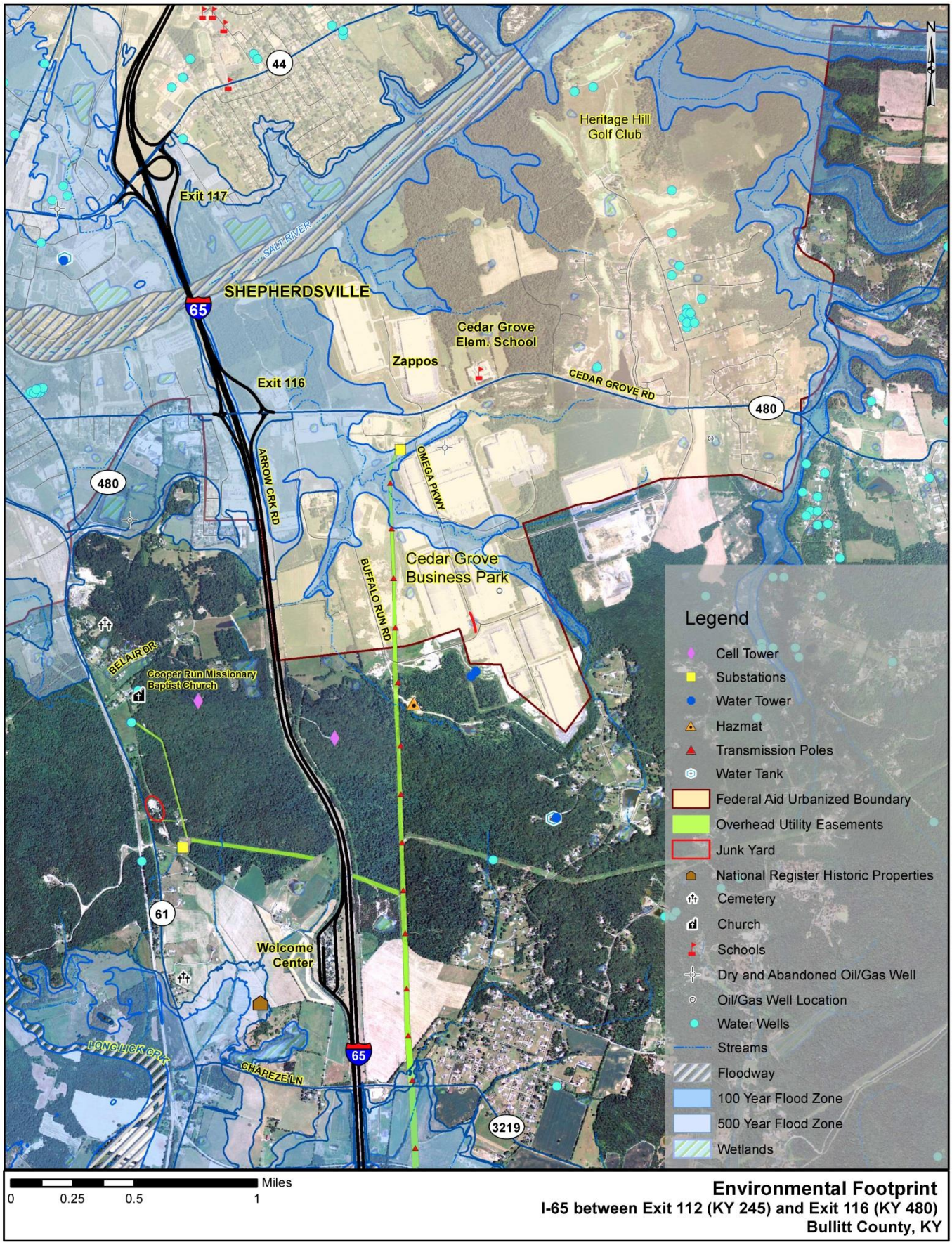

44
Heritage Hill
Golf Club
Exit 117
SALT RIVER
SHEPHERDSVILLE
65
Cedar Grove
Elem. School
Zappos
Exit 116
CEDAR GROVE RD
480
ARROW CRK RD
OMEGA PKWY
480
Cedar Grove
Business Park
BUFFALO RUN RD
BELAIR DR
Cooper Run Missionary
Baptist Church
61
Welcome
Center
LONG LICK CR
CHAPEZE LN
65
3219
N
Legend
Cell Tower
Substations
Water Tower
Hazmat
Transmission Poles
Water Tank
Federal Aid Urbanized Boundary
Overhead Utility Easements
Junk Yard
National Register Historic Properties
Cemetery
Church
Schools
Dry and Abandoned Oil/Gas Well
Oil/Gas Well Location
Water Wells
Streams
Floodway
100 Year Flood Zone
500 Year Flood Zone
Wetlands
Miles
0
0.25
0.5
1
Environmental Footprint
I-65 between Exit 112 (KY 245) and Exit 116 (KY 480)
Bullitt County, KY

Exhibit 4

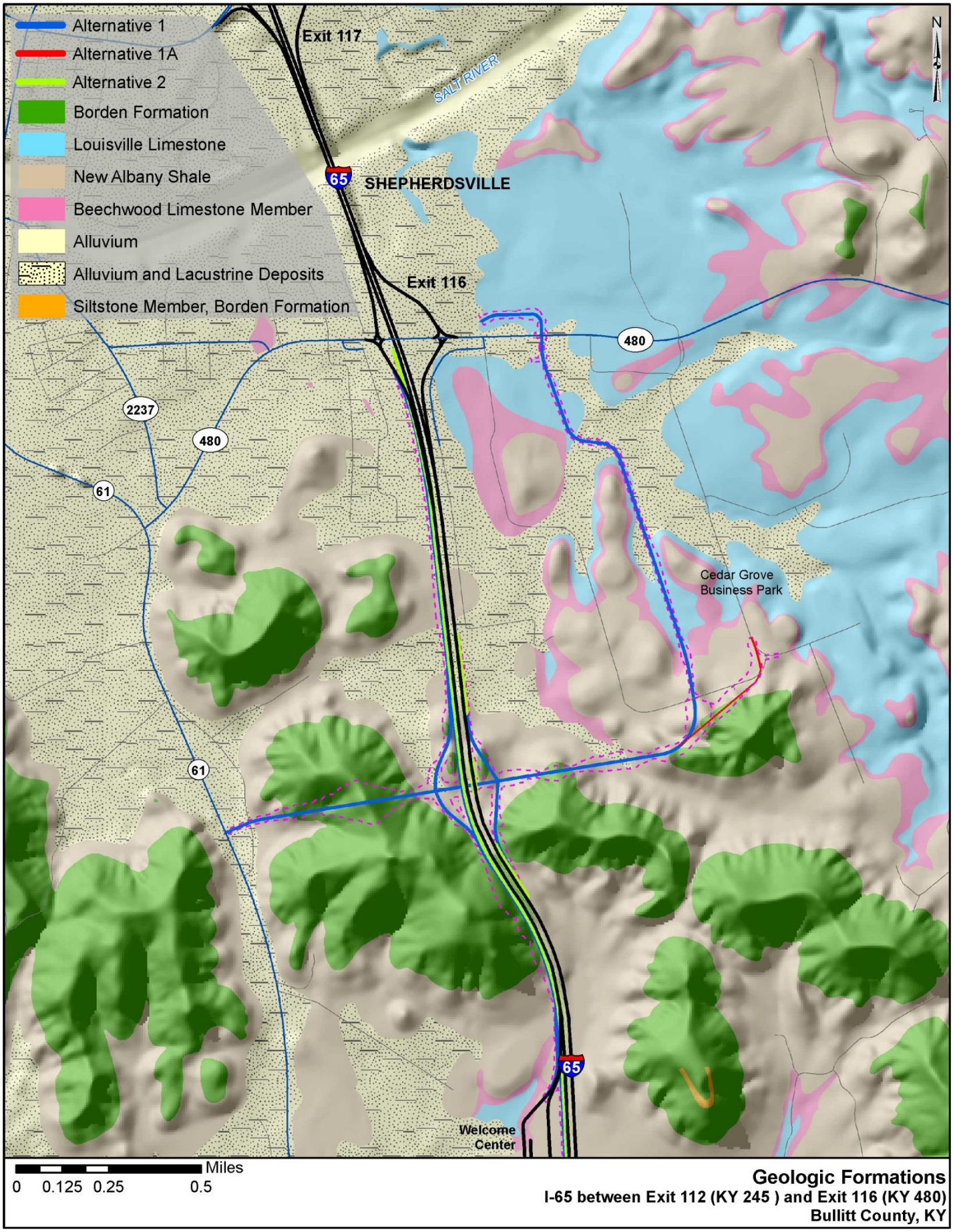

Alternative 1
Alternative 1A
Alternative 2
Borden Formation
Louisville Limestone
New Albany Shale
Beechwood Limestone Member
Alluvium
Alluvium and Lacustrine Deposits
Siltstone Member, Borden Formation
Exit 117
SALT RIVER
65
SHEPHERDSVILLE
Exit 116
480
2237
480
61
61
Cedar Grove
Business Park
65
Welcome
Center
N
Miles
0 0.125 0.25 0.5
Geologic Formations
I-65 between Exit 112 (KY 245) and Exit 116 (KY 480)
Bullitt County, KY

Exhibit 5

CEDAR GROVE I-65 EXIT

CURRENT PERMANENT EMPLOYMENT	APPROXIMATELY	8,500 JOBS
XMAS 2014 EMPLOYMENT	APPROXIMATELY	18,000 JOBS
APPROXIMATE 2014 JOB ANNOUNCEMNTS		678 JOBS
CURRENT SPACE OCCUPIED		6,465,303 SQ.FT.
SPECULATIVE BUILDING SPACE AVAILABLE TO LEASE		1,037,410 SQ.FT.
SPECULATIVE BUILDING EMPLOYMENT		518 JOBS
PAD READY SITES		800,000 SQ. FT.
PAD READY SITES EMPLOYMENT		400 JOBS
ADDITIONAL PROPERTY AVAILABLE FOR BUILDINGS		4.5 PLUS MILLION SQ.FT.
ESTIMATED EMPLOYMENT FROM BOURBON PATHWAY		2,250 JOBS
ESTIMATED EMPLOYMENT XMAS 2014		18,000 JOBS
ESTIMATED EMPLOYMENT XMAS 2015		25,000 JOBS

THIS DOES NOT COUNT JOBS OR BUILDINGS AT THE CLERMONT, SHEPHERDSVILLE OR HILLVIEW EXIT OF I 65

Updated August 4, 2014

Exhibit 6

Exhibit Provided by KYTC

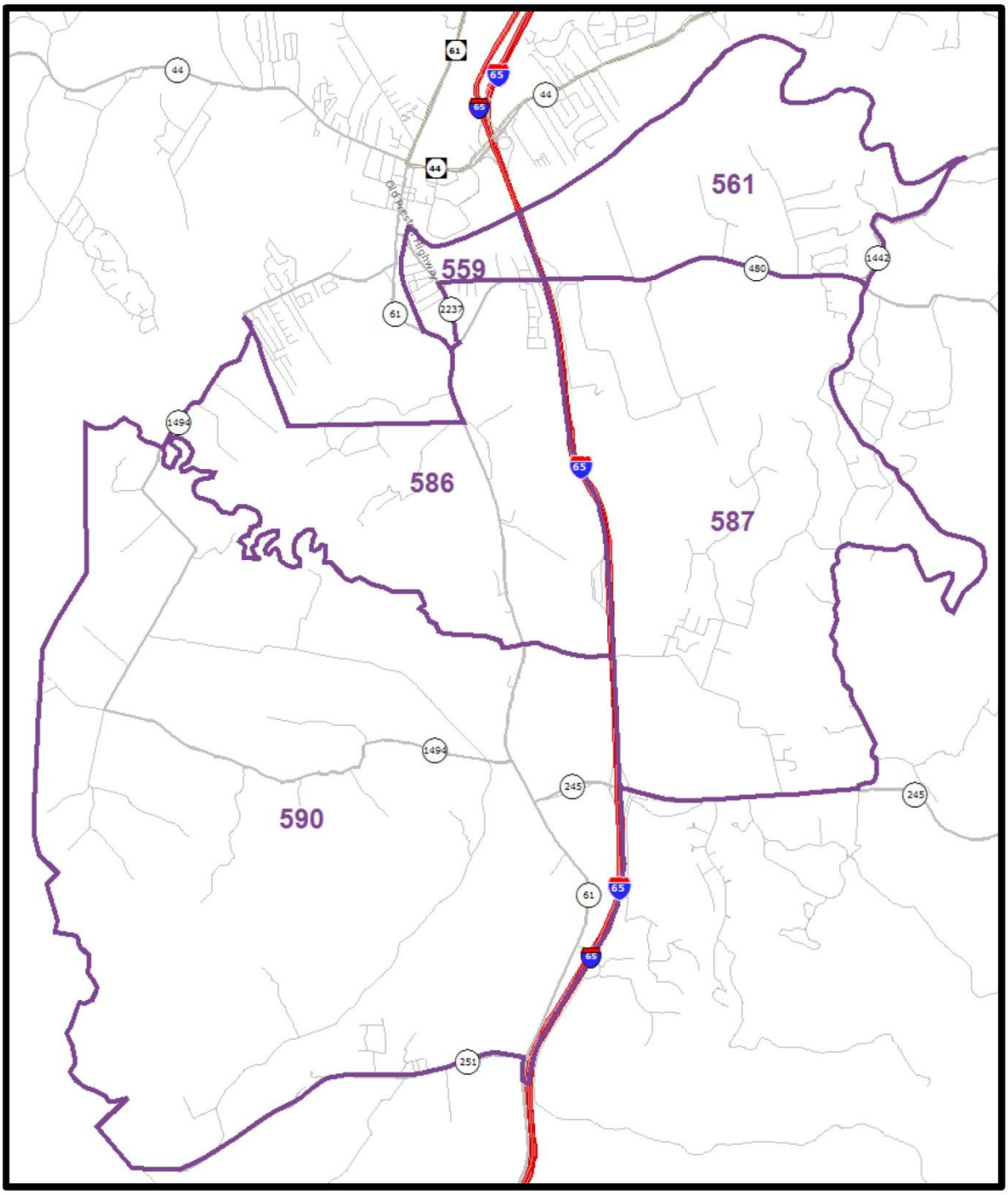


Exhibit 7

SOCIOECONOMIC DATA FOR TRAFFIC MODEL

	Population	Households	Total Employment	Retail Employment	Service Employment	Other Employment	Comments
TAZ 559							
2007 KIPDA Model	498	191	159	64	6	89	*Proposed: 500,000 sf of warehousing (existing but unoccupied)
2030 KIPDA Model	492	199	199	80	7	112	
TAZ 561							
2007 KIPDA Model	1,095	483	860	12	47	802	*Existing: 1,768,000 sf of warehousing *Proposed: 3,000,000 sf of warehousing (two buildings)
2030 KIPDA Model	4,102	1,654	3,544	50	59	3,435	
TAZ 586							
2007 KIPDA Model	1,124	411	127	65	16	46	*No existing or proposed warehousing
2030 KIPDA Model	2,334	882	159	82	20	57	
TAZ 587							
2007 KIPDA Model	1,746	577	1,299	22	32	1,245	*Existing 4,697,303 sf of warehousing (based off of current space occupied minus the two existing warehouses north of KY 480 *Proposed: 4,500,000 sf of warehousing (site plan shown on KYTC info) *Proposed: 2,100,000 sf of warehousing (2 additional sites pointed out by landowner)
2030 KIPDA Model	3,952	1,346	5,132	62	41	5,029	
TAZ 590							
2007 KIPDA Model	1,742	634	303	14	38	251	*No existing warehousing *Proposed: 3,500,000 sf of warehousing (Red Rock development west of KY 61, 2,000,000 sf and Flynn Brothers east of KY 61 1,500,000 sf)
2030 KIPDA Model	2,195	835	1,088	18	48	1,022	

Exhibit 8

RAMP TERMINALS

Section	EXISTING NO BUILD							
	AM				PM			
	LOS	Intersection or Approach Delay	Issue	Control Delay	LOS	Intersection or Approach Delay	Issue	Control Delay
KY 480								
NB Ramps	F	203	EBT NBR	254.0 275.8	F	275.4	EBT NBR	373.4 339.3
SB Ramps	E	58.6	SBL	75.8	F	155.3	WBL SBL	207.8 186.8
NEW INTERCHANGE								
NB Ramps								
SB Ramps								
KY 245								
NB Ramps	B	12.30	NBL	17.1	C	21.6	NBL	29
SB Ramps	C	23.70	SBL	38.5	E	64.4	SBL	90.2

Notes
Delay - seconds/vehicle
LOS - Level of Service
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.

RAMP TERMINALS

Section	2035 NO BUILD								2035 BUILD							
	AM				PM				AM				PM			
	LOS	Intersection or Approach Delay	Issue	Control Delay	LOS	Intersection or Approach Delay	Issue	Control Delay	LOS	Intersection or Approach Delay	Issue	Control Delay	LOS	Intersection or Approach Delay	Issue	Control Delay
KY 480																
NB Ramps	F	233.9	EBT	345.2	F	384.6	EBT	474.3	F	140.9	EBT NBR	215.2 150.0	F	304.8	EBT NBR	397.4 251.9
SB Ramps	F	134.1	SBL	191.8	F	249.0	EBT	524.3	E	67.6	SBL	91.1	F	202.7	EBT	374.6
NEW INTERCHANGE																
NB Ramps									D	27.8	NBL	45.7	E	48.7	NBL	108.0
SB Ramps									F	197.0	SBL	207.3	F	1198.0	SBL	1257.0
KY 245																
NB Ramps	F	154.20	NBL	261.3	F	1678.0	NBR	1773	F	83.4	NBL	209.7	F	1126.0	NBR	1208.0
SB Ramps	F	88.70	WBL	153.2	F	323.1	SBL	515.9	E	60.7	WBL	141.0	F	248.1	SBL	401.0

Notes
Delay - seconds/vehicle
LOS - Level of Service
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.
Green Shading shows areas of improvement for the poor LOS with the build conditions.

Exhibit 9

EXISTING CROSSROADS

Section	2013 ADT No Build	NO BUILD											
		AM Design Hour						PM Design Hour					
		Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio
KY 480 West of I-65	9,000	290	C	425	64.7	47.4	0.25	460	D	585	71.4	45.4	0.34
KY 480 East of I-65*	43,000	1,750	F	1,103	20.1	55.0	0.52	2,340	F	1,475	26.9	54.8	0.70
Connector Road West of I-65													
Connector Road East of I-65													
KY 245 West of I-65	4,200	220	C	350	64.2	49.9	0.21	220	C	350	62.9	49.4	0.21
KY 245 East of I-65	14,200	915	E	1,050	88.1	42.5	0.62	969	E	112	89.0	41.4	0.65

Notes

LOS - Level of Service

Density - passenger cars/mile/lane

Flow Rate - passenger cars/hour/lane (directional)

v/c Ratio - volume to Capacity Ratio

APCS - Average Passenger Car Speed/direction of travel

Volume - directional vehicles per hour

PTSF - Percent Time Spent Following

Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.

2035 CROSSROADS

Section	2035 ADT No Build	2035 NO BUILD												2035 ADT (Build)	2035 BUILD										
		AM Design Hour						PM Design Hour							AM						PM					
		Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio		Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio	Volume	LOS	Flow Rate	PTSF or Density	ATS or APCS	v/c Ratio
KY 480 West of I-65	10,900	670	D	801	78.7	43.1	0.47	780	E	897	82.8	41.0	0.53	11,400	560	D	690	76.5	44.4	0.41	660	D	790	78.8	42.4	0.46
KY 480 East of I-65*	52,300	1,930	C	1216	22.1	55.0	0.57	2,670	D	1,683	31.3	53.8	0.79	40,800	1,580	C	996	18.1	55.0	0.47	2,220	C	1,399	25.4	55.0	0.66
Connector Road West of I-65														1,000	190	D	314	49.1	41.5	0.16	170	D	288	55.6	41.9	0.17
Connector Road East of I-65														19,300	770	E	881	82.9	34.4	0.52	990	E	1,133	88.3	31.4	0.67
KY 245 West of I-65	7,000	440	D	556	73.4	47.4	0.33	450	D	573	74.3	47.4	0.34	6,000	430	D	553	73.6	47.5	0.33	410	D	538	71.7	47.7	0.32
KY 245 East of I-65	26,700	1,980	F	2,273	100.0	28.1	1.34	2,040	F	2,342	100.0	26.8	1.38	27,500*	1,800	F	2,066	100.0	30.8	1.22	1,850	F	2,124	100.0	29.3	1.25

Notes

LOS - Level of Service

Flow Rate - passenger cars/hour/lane (directional)

Density - passenger cars/mile/lane

v/c Ratio - volume to Capacity Ratio

APCS - Average Passenger Car Speed/direction of travel

Volume - directional vehicles per hour

PTSF - Percent Time Spent Following

Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.

Green Shading shows areas of improvement over the No-Build for any movement that has a less than desirable LOS (E and F for KY 480 and the new connector, and D, E, or F for KY 245) .

*KIPDA model shows an increase on KY 245 east in the Build scenario, however it is negligible and not completely logical.

I-65 MAINLINE

Section	EXISTING NO BUILD														
	ADT	AM							PM						
		Volume*	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS	Volume*	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS
NORTH OF KY 480															
NB	47,000	3,510	C	1,671	2,420	24.8	0.69	67.4	4,120	D	1,961	2,420	31.0	0.81	63.3
SB	47,000	3,170	C	1,509	2,420	21.9	0.62	68.9	4,520	E	2,151	2,420	36.1	0.89	59.5
KY 480 TO NEW INTERCHANGE															
NB	37,600	3,100	C	1,561	2,420	21.8	0.65	71.5	3,000	C	1,511	2,420	21.0	0.62	72.1
SB	37,600	2,060	B	1,038	2,420	13.8	0.43	75.0	3,600	D	1,813	2,420	26.8	0.75	67.7
NEW INTERCHANGE TO KY245															
NB	37,600	3,100	C	1,561	2,420	21.8	0.65	71.5	3,000	C	1,511	2,420	21.0	0.62	72.1
SB	37,600	2,060	B	1,038	2,420	13.8	0.43	75.0	3,600	D	1,813	2,420	26.8	0.75	67.7
SOUTH OF KY 245															
NB	29,900	2,240	B	1,290	2,420	17.4	0.53	74.1	2,500	C	1,440	2,420	19.8	0.60	72.9
SB	29,900	1,970	B	1,135	2,420	15.2	0.47	74.8	2,720	C	1,567	2,420	21.9	0.65	71.4

Notes
LOS - Level of Service
*Volume - vehicles per hour per direction
Density - passenger cars/mile/lane
Flow Rate - vehicles/hour
v/c Ratio - volume to Capacity Ratio
APCS - Average Passenger Car Speed
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.

I-65 MAINLINE

Section	2035 NO BUILD														2035 BUILD														
	ADT	AM							PM							ADT	AM							PM						
		Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS	Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS		Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS	Volume	LOS	Flow Rate	Capacity	Density	v/c Ratio	APCS
ALTERNATIVE 1																													
NORTH OF KY 480																													
NB	49,500	4,120	D	2,098	2,420	34.6	0.87	60.6	4,800	F	2,444	2,420	52.0	1.01	52.0	49,500	4,120	D	2,098	2,420	34.6	0.87	60.6	4,800	F	2,444	2,420	52.0	1.01	52.0
SB	49,500	3,670	D	1,869	2,420	28.8	0.77	64.8	5,280	F	2,689	2,420	60.7	1.11	44.3	49,500	3,670	D	1,869	2,420	28.8	0.77	64.8	5,280	F	2,689	2,420	60.7	1.11	44.3
KY 480 TO NEW INTERCHANGE																													
NB	44,000	3,520	D	1,890	2,430	28.5	0.78	66.2	3,520	D	1,890	2,430	28.5	0.78	66.2	45,500	3,640	D	1,955	2,430	30.1	0.80	64.9	3,810	D	2,046	2,430	32.5	0.84	62.9
SB	44,000	2,380	B	1,278	2,430	17.2	0.53	74.1	4,280	E	2,299	2,430	40.8	0.95	56.3	45,500	2,560	C	1,375	2,430	18.7	0.57	73.4	4,370	E	2,347	2,430	42.7	0.97	54.9
NEW INTERCHANGE TO KY 245																													
NB	43,500	3,520	D	1,890	2,420	28.5	0.78	66.2	3,520	D	1,890	2,420	28.5	0.78	66.2	43,500	3,400	D	1,826	2,420	27.1	0.75	67.4	3,450	D	1,853	2,420	27.7	0.77	66.9
SB	43,500	2,380	B	1,278	2,420	17.2	0.53	74.1	4,280	E	2,299	2,420	40.8	0.95	56.3	43,500	2,230	B	1,198	2,420	16.1	0.50	74.6	4,110	E	2,207	2,420	37.5	0.91	58.9
SOUTH OF KY 245																													
NB	39,500	2,380	C	1,476	2,440	20.4	0.60	72.5	3,050	D	1,892	2,440	28.6	0.78	66.2	39,500	2,380	C	1,476	2,440	20.4	0.60	72.5	3,050	D	1,892	2,440	28.6	0.78	66.2
SB	39,500	2,070	B	1,284	2,440	17.3	0.53	74.1	3,120	D	1,936	2,440	29.6	0.79	65.3	39,500	2,070	B	1,284	2,440	17.3	0.53	74.1	3,120	D	1,936	2,440	29.6	0.79	65.3
ALTERNATIVE 2																													
ALTERNATIVE 2- I-65 FROM CD ROAD DIVERGE JUST SOUTH OF KY 480 OVERPASS TO CD ROAD MERGE JUST SOUTH OF SOUTHBOUND REST AREA																													
SB	43,500	2,380	B	1,278	2,420	17.2	0.53	74.1	4,280	E	2,299	2,420	40.8	0.95	56.3	26,900	1,670	B	897	2,430	12	0.54	75.0	2,890	C	1,552	2,420	21.7	0.64	71.6
ADDITIONAL OPTION - AUXILIARY LANE FROM KY 480 TO NEW INTERCHANGE																													
I-65 SOUTHBOUND ADDITION OF AUXILIARY LANE BETWEEN KY 480 AND THE NEW CONNECTOR ROAD*																													
SB	43,500	2,380	B	1,278	2,430	17.2	0.53	74.1	4,280	E	2,299	2,430	40.8	0.95	56.3	45,500	2,560	B	1,031	2,430	13.7	0.40	75.0	4,370	C	1,760	2,420	25.7	0.73	68.6

Notes
Capacity - is in passenger cars/hour per lane
LOS - Level of Service
Volume - vehicles per hour
Density - passenger cars/mile/lane
Flow Rate - passenger car/hour/lane
v/c Ratio - volume to Capacity Ratio
APCS - Average Passenger Car Speed - miles per hour
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.
Green Shading shows areas of improvement for the poor LOS with the build conditions.

Exhibit 11

RAMPS MERGE AND DIVERGE

Ramp Movements	ADT	EXISTING NO BUILD AM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	PM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments
Connector Road & I-65													
Southbound Weave													
NB Off													
NB On													
SB Off													
SB On													
KY 245 & I-65													
NB On	8,700	C	3,357	4,600	27.0	0.73		C	3,047	4,600	24.8	0.66	
SB Off	8,600	B	1,885	4,400	19.7	0.43		D	2,957	4,400	28.9	0.67	
KY 480 & I-65													
NB Off	4,700	B	2,751	4,400	17.6	0.63		B	2,658	4,400	16.8	0.60	
NB On	14,100	C	3,443	4,600	24.9	0.75		D	4,295	4,600	31.1	0.93	
SB Off	14,200	B	2,372	4,400	19.8	0.54		F	3,267	4,400	27.5	0.74	Ramp*
SB On	4,800	B	2,254	4,600	16.0	0.49		C	3,667	4,600	26.7	0.80	
Rest Area													
SB Off	900	B	2,066	4,400	17.2	0.47		D	3,346	4,400	28.2	0.76	
SB On	900	B	1,980	4,600	11.5	0.43		C	3,422	4,600	22.7	0.74	

Notes

Capacity - is in passenger cars/hour per lane
LOS - Level of Service of merge or diverge influence area
Density - pc/mi/ln ramp freeway junction areas
Density - passenger cars/mile/lane for merge or diverge influence area
Flow Rate - vehicles/hour entering the merge or diverge influence area
v/c Ratio - volume to Capacity Ratio of ramp-freeway junction areas ofiInfluence
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.
*The SB off ramp at KY 480 shows exceeding capacity even though the area of influence does not.

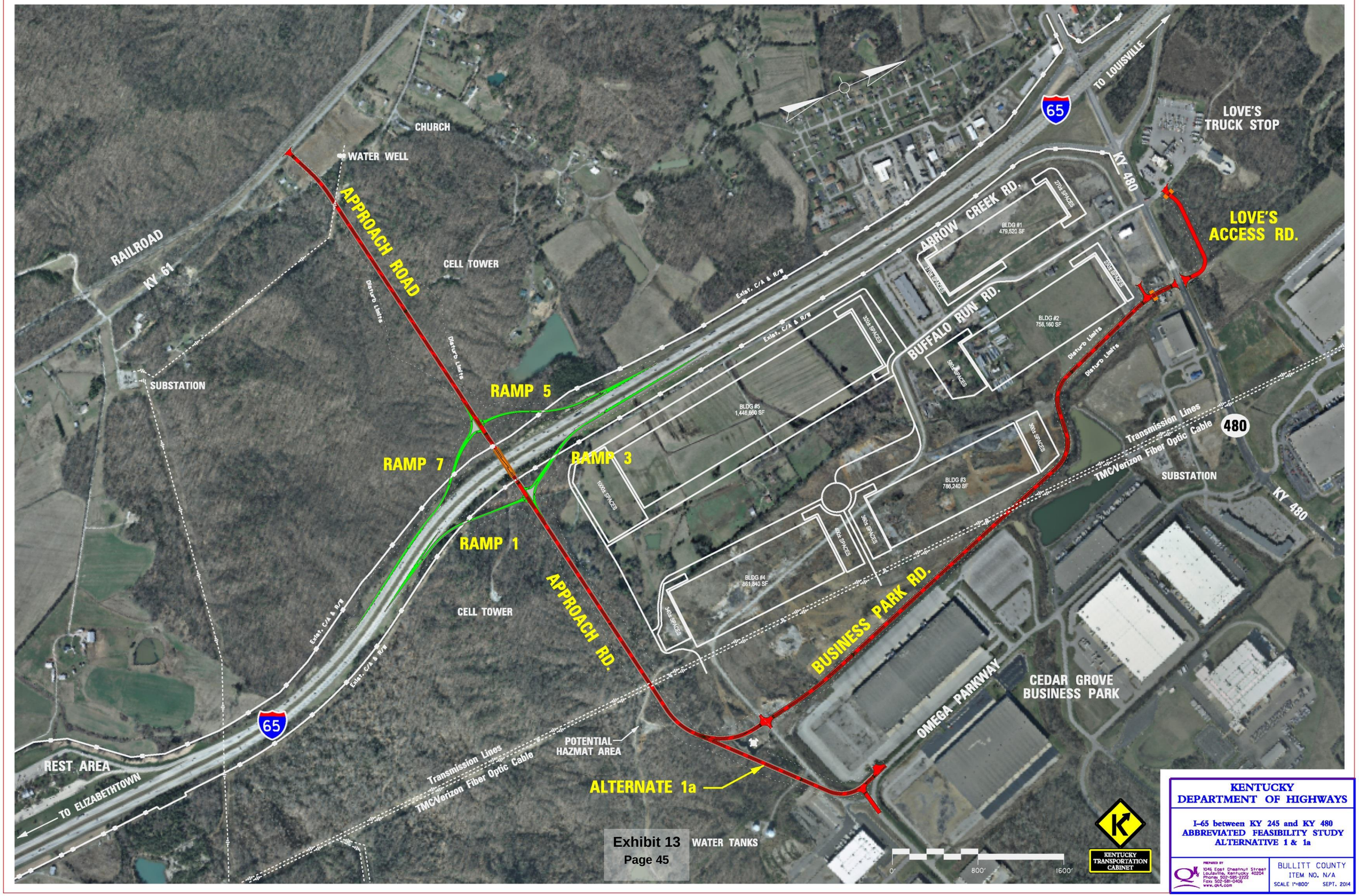
RAMPS MERGE AND DIVERGE

Ramp Movements	2035 NO BUILD ADT	AM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	PM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	2035 BUILD ADT	AM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	Weaving Speed	PM LOS	Flow Rate	Capacity	Density	v/c Ratio	Comments	Weaving Speed
ALTERNATIVE 1																											
KY 480 / I-65																											
NB Off	5,400	C	3,162	4,400	21.1	0.72		C	3,206	4,400	21.5	0.73		4,400	C	3,316	4,400	22.4	0.75			C	3,481	4,400	23.8	0.79		
NB On	16,200	D	4,381	4,600	31.9	0.95		E	5,264	4,600	38.5	1.14		12,800	D	4,274	4,600	31.3	0.93			E	5,095	4,600	37.4	1.11		
SB Off	16,800	F	2,749	4,400	23.0	0.62	Ramp	F	3,934	4,400	33.2	0.89	Ramp*	13,800	C	2,855	4,400	23.9	0.65			F	3,957	4,400	33.4	0.90	Ramp*	
SB On	5,600	B	2,518	4,600	18.0	0.55		D	4,642	4,600	34.2	1.01		5,300	B	2,771	4,600	20.0	0.60			D	4,719	4,600	34.9	1.03		
Connector Road / I-65																											
NB Off														2,300	C	3,252	4,400	27.4	0.74			C	3,313	4,400	27.9	0.75		
NB On														6,700	D	3,884	4,600	28.5	0.84			D	4,098	4,600	30.1	0.89		
SB Off														7,100	C	2,456	4,400	20.5	0.56			D	3,811	4,400	31.4	0.87		
SB On														2,700	B	2,279	4,600	16.0	0.50			D	4,256	4,600	31.3	0.93		
KY 245 / I-65																											
NB On	12,200	D	4,354	4,600	34.3	0.95		D	3,950	4,600	31.6	0.86		11,200	D	4,160	4,600	32.9	0.90			D	3,837	4,600	30.8	0.83		
SB Off	12,100	C	2,104	4,400	21.5	0.48		F	3,516	4,400	33.7	0.80	Ramp*	11,200	C	2,034	4,400	20.9	0.46			F	3,417	4,400	32.8	0.78	Ramp*	
Rest Area / I-65																											
SB Off	1,200	C	2,469	4,400	20.6	0.56		D	4,002	4,400	33.8	0.91		1,200	B	2,329	4,400	19.4	0.53			D	3,874	4,400	32.7	0.88		
SB On	1,200	B	2,449	4,600	15.1	0.53		D	4,345	4,600	29.9	0.94		1,200	B	2,299	4,600	13.9	0.50			D	4,175	4,600	28.5	0.91		
ALTERNATIVE 2																											
Alternative 2 CD road																											
SB Off South of KY 480 Overpass														14,100	B	2,118	4,400	17.6	0.48			C	3,229	4,400	27.2	0.73		
SB On Ramp South of Rest Area														9,700	B	2,521	4,600	17.8	0.55			D	4,757	4,600	34.8	1.03		
ADDITIONAL OPTION - AUXILIARY LANE FROM KY 480 TO NEW INTERCHANGE																											
SOUTHBOUND WEAVE BETWEEN KY 480 AND THE NEW CONNECTOR ROAD**																											
Weave Analyis														12,400	B	2,925	5,173	18.7	0.57		56.6	E	4,825	5,395	35.5	0.89		49.3

Notes

Capacity - is in passenger cars/hour per lane
LOS - Level of Service of merge or diverge influence area
Density - pc/mi/ln ramp freeway junction areas
Density - passenger cars/mile/lane for merge or diverge influence area
Flow Rate - passenger cars/hour entering the merge or diverge influence area
v/c Ratio - volume to Capacity Ratio of ramp-freeway junction areas of influence
Red Shading is LOS E or F for Urban areas and LOS D, E, or F for Rural areas.
Green Shading shows areas of improvement for the poor LOS with the build conditions.
*The SB off ramps at KY 480 and KY 245 show exceeding capacity even though the area of influence does not.
**If an auxiliary lane was built, this represents its weave operation.

Exhibit 12

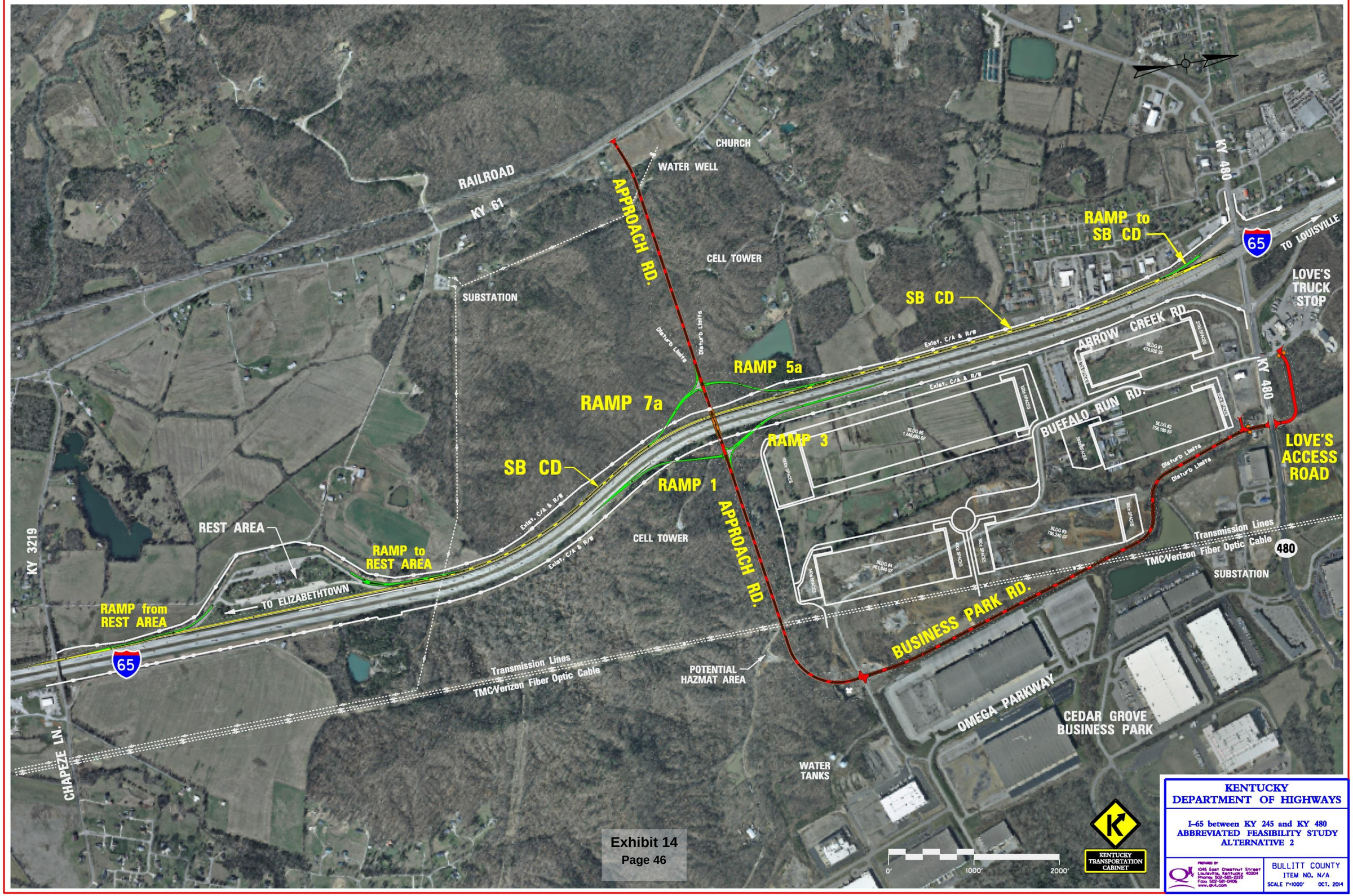


KENTUCKY
DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 1 & 1a

PREPARED BY
1045 East Chestnut Street
Louisville, Kentucky 40204
Phone: 502-585-2222
Fax: 502-581-0408
www.qk4.com

BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=800' SEPT. 2014



KENTUCKY DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 2

PREPARED BY
1045 East Chestnut Street
Louisville, Kentucky 40204
Phone: 502-585-2225
Fax: 502-581-0106
www.gk4.com

BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=1000' OCT. 2014

RAILROAD

KY 61

APPROACH ROAD

EXIT 114
TO 61
BPR

EXIT 112
TO 61
245
Clermont
Bardstown
2½ MILES

EXIT 114
TO 61
BPR
½ MILE

EXIT 116
TO 61
480

EXIT 114
TO 61
BPR
1¼ MILES

TO LOUISVILLE

KY 480

BUFFALO RUN RD.

REST AREA

TO ELIZABETHTOWN

BPR
1 MILE
TO 61
EXIT 114

BPR
½ MILE
TO 61
EXIT 114

480
11/4 MILES
TO 61
EXIT 116

BPR
61
EXIT 114

APPROACH RD.

BUSINESS PARK RD.

Exhibit 15
Page 47

LEGEND

BPR = BUSINESS PARK ROAD
"REPRESENTS STATE ROUTE NUMBER"

ALL SIGNS SHOWN ARE NEW SIGNS

KENTUCKY TRANSPORTATION CABINET

KENTUCKY DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 1

BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=600' SEPT. 2014

RAILROAD

KY 61

APPROACH ROAD

TO 61 BPR

I-65 Nashville Bardstown

REST AREA WELCOME CENTER 1 MILE

EXIT 116 TO 61 480

EXIT 114 TO 61 BPR REST AREA

EXIT 114 TO 61 BPR REST AREA 1/4 MILE

SB CD

TO LOUISVILLE

KY 480

BUFFALO RUN RD.

REST AREA

TO ELIZABETHTOWN

REST AREA

REST AREA WELCOME CENTER

BPR 1 MILE TO 61 EXIT 114

BPR 1/2 MILE TO 61 EXIT 114

480 1 1/4 MILES TO 61 EXIT 116

BPR 61 EXIT 114

APPROACH RD.

BUSINESS PARK RD.

OMEGA PARKWAY

Exhibit 16
Page 48

LEGEND

BPR = BUSINESS PARK ROAD
"REPRESENTS STATE ROUTE NUMBER"

ALL SIGNS SHOWN ARE NEW SIGNS

KENTUCKY TRANSPORTATION CABINET

KENTUCKY DEPARTMENT OF HIGHWAYS

I-65 between KY 245 and KY 480
ABBREVIATED FEASIBILITY STUDY
ALTERNATIVE 2

BULLITT COUNTY
ITEM NO. N/A
SCALE 1"=800' SEPT. 2014

COST ESTIMATE - ALTERNATE 1 - I-65 Interchange without CD

I-65 between KY 245 (Exit 112) and KY 480 (Exit 116) Abbreviated Feasibility Study

Mainline Length (miles)			I-65 IC & APPROACH to BUSINESS PARK ROAD		BUSINESS PARK ROAD		LOVE'S ACCESS ROAD		ALTERNATE 1 TOTALS	
			1.40 (Approach only)		1.12		0.21			
	Unit	Unit Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Design		10%		$1,565,000		$255,000		$89,000		$1,909,000
Right of Way				$637,000		$8,065,000		$174,000		$8,876,000
Utilities		2%		$313,000		$51,000		$18,000		$382,000
Construction				$15,650,000		$2,547,000		$891,000		$19,088,000
MOT		1.5%		$225,000		$37,000		$13,000		$275,000
Drainage		3.0%		$449,000		$73,000		$26,000		$548,000
Earthwork										
Cut (CY)	CY	$5	1,442,043	$7,210,000	12,196	$61,000	7,946	$40,000		$7,311,000
*New Albany Shale	LS	$500,000	1	$500,000		$0		$0		$500,000
Roadway	SY	$70	67,799	$4,746,000	27,087	$1,896,000	4,748	$332,000		$6,974,000
Structures										
Bridges	SF	$150	16,800	$2,520,000						$2,520,000
Culvert	CF	$15		$0	32,000	$480,000	32,000	$480,000		$960,000
Environmental In-Lieu Fees				$243,000		$299,000	0	$229,000		$771,000
Wetlands	Acre	$15,000	0	$0	0.4	$6,000	3.5	$53,000		$59,000
Wooded areas	Acre	$3,150	42.8	$135,000	0.7	$2,000	3.5	$11,000		$148,000
Streams	LF	$300	359	$108,000	968	$291,000	549	$165,000		$564,000
Subtotal				**$18,408,000**		**$11,217,000**		**$1,401,000**		$31,026,000
Contingency 25%				$4,602,000		$2,804,000		$350,000		$7,756,000
TOTAL				**$23,010,000**		**$14,021,000**		**$1,751,000**		$38,782,000

* Potential New Albany Shale Excavation - Estimated cost for removal, hauling, and encapsulation.

ALT 1 – 2.73 miles (excluding I-65 ramps) - I-65 diamond interchange with 3-lane approach from KY 61 to the west to existing Buffalo Run Road in the Business Park. New 3-lane curb and gutter road through the Business Park to KY 480 across from proposed access road to Love's Truck Stop north of KY 480.

COST ESTIMATE - ALTERNATE 1a - I-65 Interchange without CD

I-65 between KY 245 (Exit 112) and KY 480 (Exit 116) Abbreviated Feasibility Study

Mainline Length (miles)			I-65 IC & APPROACH to existing OMEGA PARKWAY		LOVE'S ACCESS ROAD		ALTERNATE 1a TOTALS	
			1.64 (Approach only)		0.21			
	Unit	Unit Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Design		10%		$1,672,000		$89,000		$1,761,000
Right of Way				$3,979,000		$174,000		$4,153,000
Utilities		2%		$334,000		$18,000		$352,000
Construction				$16,723,000		$891,000		$17,614,000
MOT		1.5%		$240,000		$13,000		$253,000
Drainage		3.0%		$480,000		$26,000		$506,000
Earthwork								
Cut (CY)	CY	$5	1,530,658	$7,653,000	7,946	$40,000		$7,693,000
*New Albany Shale	LS	$500,000	1	$500,000		$0		$500,000
Roadway	SY	$70	76,139	$5,330,000	4,748	$332,000		$5,662,000
Structures								
Bridges	SF	$150	16,800	$2,520,000		$0		$2,520,000
Culvert	CF	$15		$0	32,000	$480,000		$480,000
Environmental In-Lieu Fees				$250,000		$229,000		$479,000
Wetlands	Acre	$15,000	0	$0	3.5	$53,000		$53,000
Wooded areas	Acre	$3,150	45.1	$142,000	3.5	$11,000		$153,000
Streams	LF	$300	359	$108,000	549	$165,000		$273,000
Subtotal				**$22,958,000**		**$1,401,000**		$24,359,000
Contingency 25%				$5,740,000		$350,000		$6,090,000
TOTAL				**$28,698,000**		**$1,751,000**		$30,449,000

* Potential New Albany Shale Excavation - Estimated cost for removal, hauling, and encapsulation.

ALT 1a – 1.85 miles (excluding I-65 ramps) - I-65 diamond interchange with 3-lane approach from KY 61 to the west to existing Omega Parkway in the Business Park.
Utilizes existing Omega Parkway as connectivity between KY 480 and new I-65 interchange. Alt 1 Includes revised access road to Love's Truck Stop north of KY 480.

COST ESTIMATE - ALTERNATE 2 - I-65 Interchange with CD

I-65 between KY 245 (Exit 112) and KY 480 (Exit 116) Abbreviated Feasibility Study

Mainline Length (miles)			I-65 IC & APPROACH to BUSINESS PARK ROAD		**SOUTHBOUND CD		BUSINESS PARK ROAD		LOVE'S ACCESS ROAD		ALTERNATE 2 TOTALS	
			1.40 (Approach only)		2.86		1.12		0.21			
	Unit	Unit Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost	Quantity	Cost
Design		10%		$1,572,000		$992,000		$255,000		$89,000		$2,908,000
Right of Way				$638,000		$96,000		$8,065,000		$174,000		$8,973,000
Utilities		2%		$314,000		$198,000		$51,000		$18,000		$581,000
Construction				$15,723,000		$9,924,000		$2,547,000		$891,000		$29,085,000
MOT		1.5%		$226,000		$281,000		$37,000		$13,000		$557,000
Drainage		3.0%		$451,000		$281,000		$73,000		$26,000		$831,000
Earthwork												
Cut (CY)	CY	$5	1,430,816	$7,154,000	152,000	$760,000	12,196	$61,000	7,946	$40,000		$8,015,000
*New Albany Shale	LS	$500,000	1	$500,000		$0		$0		$0		$500,000
Roadway	SY	$70	63,605	$4,452,000	86,689	$6,068,000	27,087	$1,896,000	4,748	$332,000		$12,748,000
Structures												
Bridges	SF	$150	19,600	$2,940,000								$2,940,000
Culvert	CF	$15		$0			32,000	$480,000	32,000	$480,000		$960,000
Concrete Barrier Wall	LF	$200			12,672	$2,534,000						$2,534,000
Environmental In-Lieu Fees				$247,000		$13,000		$299,000		$229,000		$788,000
Wetlands	Acre	$15,000		$0		$0	0.4	$6,000	3.5	$53,000		$59,000
Wooded areas	Acre	$3,150	44	$139,000	2	$6,000	0.7	$2,000	3.5	$11,000		$158,000
Streams	LF	$300	359	$108,000	24	$7,000	968	$291,000	549	$165,000		$571,000
Subtotal				**$18,494,000**		**$11,223,000**		**$11,217,000**		**$1,401,000**		$42,335,000
Contingency 25%				$4,624,000		$2,806,000		$2,804,000		$350,000		$10,584,000
TOTAL				**$23,118,000**		**$14,029,000**		**$14,021,000**		**$1,751,000**		$52,919,000

* Potential New Albany Shale Excavation - Estimated cost for removal, hauling, and encapsulation.

** Southbound CD Includes SB ramp from KY 480, SB ramp to Rest Area, SB ramp from Rest Area (MOT is 3% of construction costs)

ALT 2 – 5.59 miles (excluding all ramps) - I-65 diamond interchange with 3-lane approach from KY 61 to the west to the proposed 3-lane Business Park Road.
A southbound CD from south of KY 480 through the proposed I-65 IC, through the existing Rest Area, tying back to SB I-65 south of Chapeze Lane. Alt 2 Includes revised access road to Love's Truck Stop north of KY 480.

Exhibit 19

MEETING MINUTES

Engineering Planning

Groundbreaking by Design.

Project: I-65 between Exit 112 (KY245) & Exit 116 (KY 480)
Bullitt County
Abbreviated Feasibility Study
Item No. N/A

Purpose: Project Team Meeting #1 (9:00AM)

Place: KYTC District 5 - Louisville

Meeting Date: September 15, 2014

Prepared By: Tom Springer

Attendees:

Matt Bullock	KYTC District-5	matt.bullock@ky.gov
Gary Valentine*	KYTC Central Office	gary.valentine@ky.gov
Mikael Pelfrey	KYTC CO Planning	mikael.pelfrey@ky.gov
John West	KYTC District-5	jonathan.west@ky.gov
Tom Hall	KYTC District-5	tom.hall@ky.gov
Caroline Justice	KYTC District-5	carolinem.justice@ky.gov
Kim Irwin	KYTC District-5	kim.irwin@louisville.edu
John Moore	KYTC CO Planning	john.moore@ky.gov
Albert Zimmerman	Qk4, Inc.	azimmerman@qk4.com
Larry Ginthum	Qk4, Inc.	lgintham@qk4.com
Jeremy Lukat	Qk4, Inc.	jlukat@qk4.com
Annette Coffey	Qk4, Inc.	acoffey@qk4.com
Tom Springer	Qk4, Inc.	tspringer@qk4.com

*Conference call

Following introductions, Annette Coffey provided an overview of the agenda, scope, and purpose of the meeting, which is to review the traffic forecasts, existing conditions, and conceptual alternatives for the subject project. Ms. Coffey mentioned that Qk4 had meetings with John Schneider and Gary McGruder early to better understand the commitments for development and the flexibility of the proposed buildings. The following summarizes the presentation and subsequent discussions. Each participant was provided the following: 1) an agenda, 2) Environmental overview with alternatives depicted, 3) and cost estimates. The alternative exhibits were displayed on the wall.

Traffic: Jeremy Lukat provided an overview of the traffic forecast, noting that KIPDA's travel model was used, and modified for this study by dividing the northern Traffic Analysis Zone in half to reflect the study area consideration. It was decided to model future "holiday traffic" since it includes the 30th highest hourly volume, and would represent the highest volume/most congested time of the year. A design year of 2035 was used. In 2035, the new connector road to I-65 is expected to carry 19,300 vehicles per day (vpd) east of I-65, with ramp volumes to and from the north that range from 6,700 to

Exhibit 20

8,100 vpd. This connector and new interchange is expected to reduce KY 480 traffic volumes east of I-65 by nearly 12,000 vpd and also reduces KY 480 ramp volumes between 1,000 to 3,000 vpd. As a summary, the following jobs were added to the KIPDA model based on information provided to Qk4 by KYTC, and a meeting with Gary McGruder, and a couple of Qk4 traffic studies west of the KY 245 interchange.

- North and west of the interchange there is a recently constructed and unoccupied warehouse. 630 jobs were added in that zone.
- North and east of the interchange 2,200 jobs were added to the existing scenario to account for the "holiday" scenario. 3,800 jobs were added to the future year scenario for new development.
- South and east of the interchange 5,900 jobs were added to the existing scenario to account for the "holiday" scenario. 8,300 jobs were added to the future year scenario for new development.
- West of the KY 245 interchange 4,400 jobs were added to the future year scenario for two planned industrial developments in that area. One has been approved by the state and one is in the process of being approved.

These will show a higher volume on KY 480 than what KYTC has because they include the Love's and Buffalo Run Road traffic. KYTC's KY 480 count is east of that intersection.

Environmental: Tom Springer provided an overview of the environmental conditions, noting the following key issues in the study area: a potential hazmat area south of the existing industrial park, where the access road to the interchange is currently located; a wetland north of KY 480, where the realignment would be aligned; a historic house south in the southwest quadrant, but several hundred feet away and should not be an issue with the project; most of the corridor is wooded, and is endangered bat summer habitat. It was noted that that at the time of the environmental scope verification meeting with FHWA, it is important to show documentation that the development has been approved by the local government, rezoned, and annexed into the City. These items illustrate that the development will happen regardless of the interchange, thereby determining that the impacts of the development would not be indirect effects of the interchange. Because this interchange is a federal action, a CE-3 would need to be developed and approved by FHWA.

Alternatives: Larry Ginthum provided an overview of the alternatives. Alternative 1 includes the realignment of the Love's entrance to KY 480 840 feet farther east from the existing entrance, a Business Park Road Connector through the Cedar Grove Business Park to a new KY 61 connector with a new interchange with I-65. The Business Park Road alignment was based on a preliminary development plan layout provided by KYTC. The gore to gore ramp spacing from KY 480 southbound on-ramp to the new I-65 southbound off-ramp is 4,500 feet and 2,800 feet from the new I-65 southbound on-ramp and off-ramp to the welcome center/rest area. Alternative 1a eliminates the Business Park Road Connector in Alt 1 and extends the I-65 interchange approach eastward to the existing Omega Parkway in the Cedar Grove Business Park. Alternative 2 is the same as Alternative 1 with a southbound collector/distributor (C/D) road from south of KY 480 to south of the welcome center/rest area.

Discussion: A considerable amount of discussion focused on the alignment of a new connector through the industrial park, whether to use Omega Parkway, develop a new alternative west of the proposed

alternative alignment, or provide some type of connection to Arrow Creek Road. It was decided that while other options for locating Business Park Road exists, it is not the objective of this study to find the best alignment. That decision could be made in the preliminary engineering phase of the project.

Alternative 1 includes a traditional diamond interchange with I-65. The overall preliminary cost estimate is $36.2M. The only difference between Alt 1 and Alt 1a is the elimination of the Business Park Road of approximately $14M. The total cost estimate for Alternative 1a is $27.9M.

With Alternative 2, signage would be more complicated due to the C/D road. It appears that the C/D road could reconnect to I-65 south of the rest area, without rebuilding the Chapeze Lane bridge over I-65, by protecting the outside piers with guardrail. If this option does not prove feasible, it would add $900,000 to the total cost. The total cost estimate for Alternative 2 is $50.4M for which $14M is the southbound C/D road (without Chapeze Lane bridge).

There are several items in the cost estimates that should be considered. For example, the Business Park Access Road could have all of the right-of-way donated, which would reduce the cost estimate for Alt 1 and 2 by approximately $8M. The geotechnical information could include New Albany shale, which has required notably higher construction cost than anticipated in past projects. Qk4 will investigate whether that shale is present and increase the excavation costs where if necessary. Matt Bullock relayed that a project close to this one yielded no shale involvement.

At the initiation of this study, Bullitt County provided KYTC a $20M construction cost estimate to build a new road over I-65 to KY 61. It did not appear to include an interchange.

Next Steps: Qk4 will continue to analyze traffic, including merge/diverge analyses, to make a recommendation about whether a C/D system is or is not needed. A preliminary signage concept was requested for the C/D system. The next schedule meeting is September 25, 2014 at 9:00 a.m. at the District 5 Louisville office.

MEETING MINUTES

Engineering Planning

Groundbreaking by Design.

Project: I-65 Bullitt County Interchange
Item No. N/A

Purpose: Scoping Meeting (9:00AM)

Place: KYTC District -5
Design Conference Room

Meeting Date: September 25, 2014

Prepared By: Tom Springer

Attendees:

John West	KYTC District 5	jonathan.west@ky.gov
Tom Hall	KYTC District 5	tom.hall@ky.gov
Caroline Justice	KYTC District 5	carolinem.justice@ky.gov
Jill Asher	KYTC CO Design	jill.asher@ky.gov
Eileen Vaughn	KYTC CO Planning	Eileen.vaughn@ky.gov
Mikael Pelfrey	KYTC CO Planning	mikael.pelfrey@ky.gov
Matt Bullock	KYTC District 5	matt.bullock@ky.gov
Albert Zimmerman	Qk4	azimmerman@qk4.com
Larry Ginthum	Qk4	lgintham@qk4.com
Jeremy Lukat	Qk4	jlukat@qk4.com
Tom Springer	Qk4	tspringer@qk4.com
Annette Coffey	Qk4	acoffey@qk4.com

Following introductions, Annette Coffey provided an overview of the agenda, scope, and an update since the last (September 15, 2014) Project Team Meeting. The purpose of today's meeting is to present updated traffic, geological information, signage, updated design and cost estimates.

Geological. New Albany shale is prominent in the study area, which can cause construction issues. The shale is can be acidic, which requires special disposal of the waste materials and possible treatment of slopes.

Utilities. Larry Ginthum provided an overview of the utilities in the corridor. The alignments avoid the major overhead fiber optic lines in the Cedar Grove Business Park corridor. There are several other utilities along KY 480, but do not pose major construction issues therefore, the cost estimate did not change from Project Team Meeting 1.

Signage. Adequate signage for either alternative (with a collector/distributer system or not) could be achieved without major issues. In summary, two overhead trusses will be needed for each alternative southbound and one northbound and at least two panel signs removed in each direction for each alternative.

Exhibit 21

Traffic. Jeremy Lukat provided an overview of the traffic analysis. The analysis addressed future "holiday traffic" since it includes the 30th peak hour, and would represent the three highest volume/most congested times of the year.

In summary, the traffic would be redistributed from KY 480 to the new interchange. Some SB I-65 traffic headed to the industrial park would pass KY 480 and add volume to I-65 and exit at the new interchange. Likewise, NB I-65 traffic would first head south through the park to the new interchange and enter I-65 NB to avoid the KY 480 interchange area. A lot of the distribution could change depending on what types of developments locate in either the north or south portion of the study area. A significant improvement in delay at the ramp terminals would be experienced with any of the build alternatives, although they will still have poor Levels of Service for both Build and No Build conditions.

The traffic analysis shows that the collector/distributor system with Alternative 2 is not needed from a traffic perspective. The merge and diverge would operate at acceptable levels with a traditional interchange as proposed with Alternative 1.

Existing conditions analysis will available and illustrated in the draft report.

Environmental. Because the Kentucky Gladecress has been listed in Bullitt County, and has become an issue with the nearby KY 61 widening project, Qk4 will conduct an overview on the likelihood of the species in this study area. The species does not bloom, and is not detectable, until the Spring.

Alternatives. Three build alternatives were presented:

- Alternative 1 is a traditional diamond interchange and provides a connection with KY 61 to the west and KY 480 to the east with a realignment of the Love's entrance on KY 480, with a total cost estimate of $38.8 million.
- Alternative 1A provides a connection to existing Omega Parkway rather than a new connector (Business Park Road) to KY 480, but it also includes a realignment of the Love's entrance on KY 480. Alternative 1A removes the Business Park Road, and is estimated to cost about $30.5 million.
- Alternative 2 is the same interchange and connector road through the business park as Alternative 1, but would include a collector/distributor (C/D) system with the KY 480 interchange and the I-65 Rest Area to the south, with a total cost estimate of $52.9 million.

For the Abbreviated Feasibility Study, Alternatives 1, 1A, and 2 will remain viable options although the traffic analysis show that the C/D lanes are not needed.

Cost Estimates. Due to the presence of New Albany shale throughout the project area, the slopes through any cut areas were flattened to 2H:1V and new earthwork quantities were provided. Also a line item to encapsulate and bury any waste material was added at $500,000. There may be a possibility that special concrete is necessary for the structure, however, $150/cubic feet was used to estimate any structures which should adequate to account for any increase due to special materials.

Next Steps. Qk4 will submit a Draft Report by October 6, 2014.