

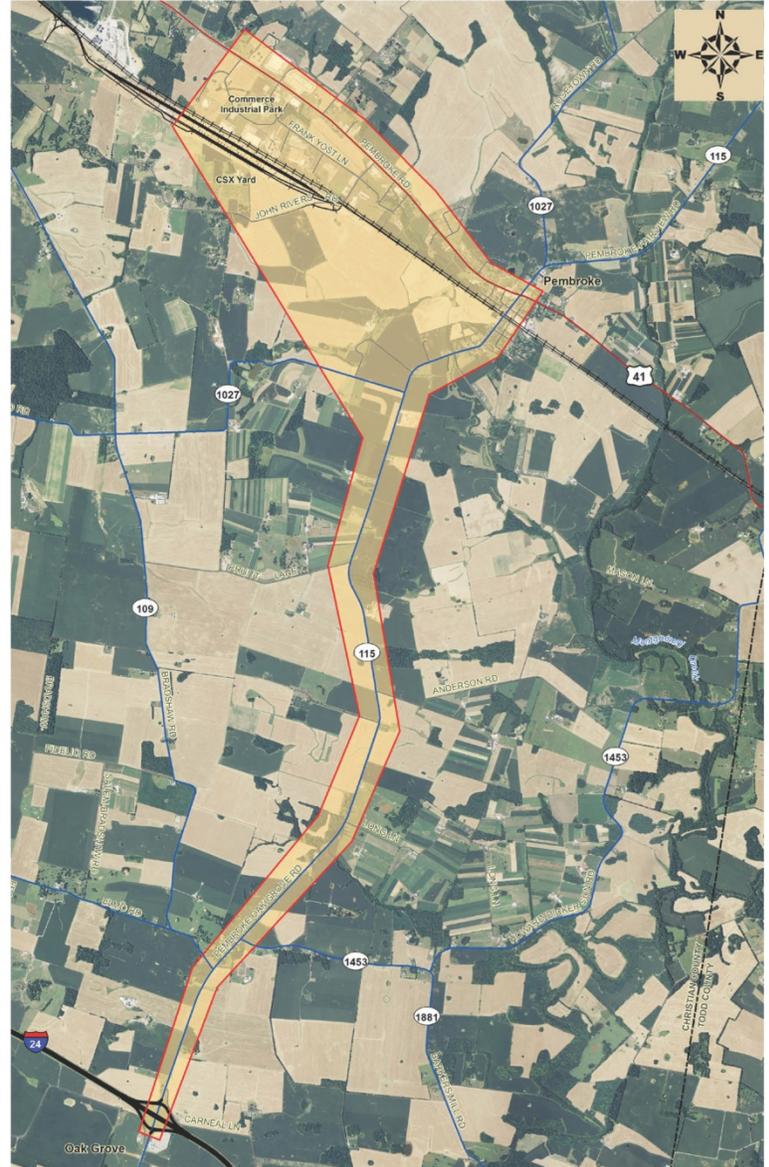
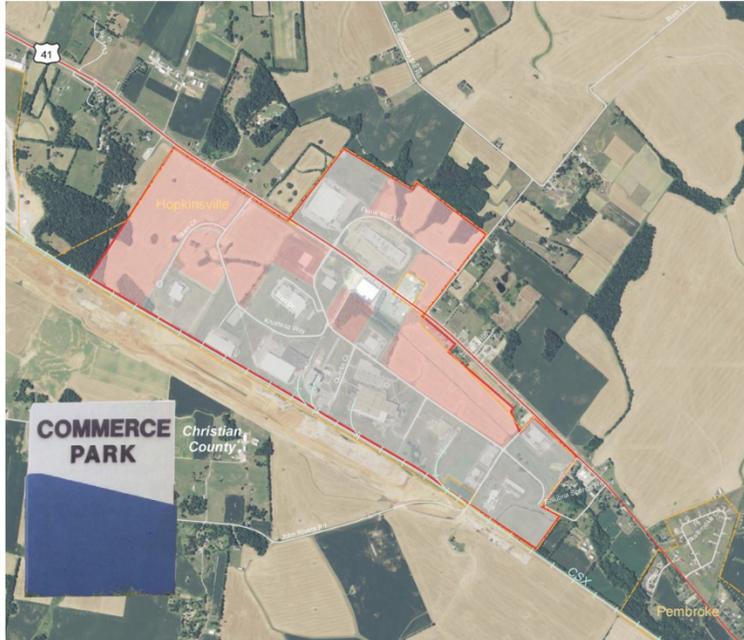
# Pembroke Corridor Study

Christian County

Item Number: 2-381.00

March 2018

# FINAL EXECUTIVE SUMMARY

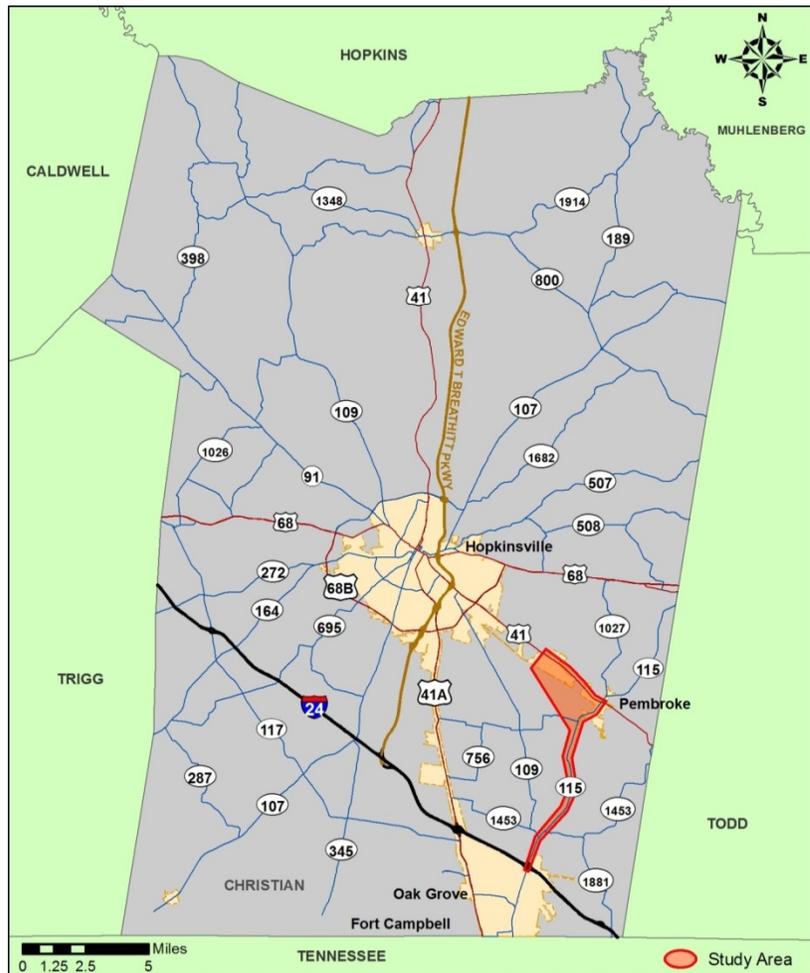


## EXECUTIVE SUMMARY

The Kentucky Transportation Cabinet (KYTC) initiated a corridor planning study in June 2016 to analyze access from Interstate 24 (I-24) in Christian County to the Industrial Park (Commerce Park) located northwest of the city of Pembroke, Kentucky on US 41 (**Figure ES 1**).

This planning study is not the first effort by the KYTC to address transportation needs in the area. The Pembroke Corridor Study is identified in Kentucky's Fiscal Year (FY) 2016–FY 2022 Highway Plan as three projects with SPP or SP funding: Item Numbers 2-381.00 (SPP), 2-8953.00 (SP), and 2-8954.00 (SP).

However, as a result of state spending exceeding revenues since FY 2014, KYTC has introduced the “Pause-50 Plan,” designed to slow or delay the start of new projects in order to pay current expenditures, recuperate lost revenue and rebuild KYTC's funding base. Item Number 2-381.00 currently has (SPP) funding and is delayed as a result of “Pause-50.” Item Numbers 2-8953.00 and 2-8954.00 currently have State Project (SP) funding. SP is unavailable in the current Highway Plan.



**Figure ES 1: Study Area Location in Christian County**

Five KYTC PIF projects are within or partially within the study area but not listed in the 2016-2022 Highway Plan, each taken into account during this study.

The project team was composed of KYTC Central Office and District 2 staff, the Pennyriple Area Development District (PADD), and Qk4 consultants. The team studied existing conditions, developed a Purpose and Need Statement, engaged the local officials/ stakeholders and public, completed traffic analyses, conducted an environmental overview, and studied various concepts.

## Purpose and Need

The **purpose** of this project is to improve safety and mobility of traffic, especially freight traffic, to and from I-24 and Commerce Park.

In recent years Christian County and Hopkinsville have been successful in recruiting new industries to the Hopkinsville Industrial Park and the newly expanded Commerce Park, both on US 41 (Pembroke Road) northwest of Pembroke. According to 2016 data from the Kentucky Cabinet for Economic Development, larger industries in the Commerce Park include Martinrea, T. RAD North America, Continental Mills Inc., and PTC Seamless Tube Corporation, for a combined total of over 1,500 employees. Currently, the Commerce Park has 10 or more active industrial facilities and 766 acres available for industrial expansion. *The Hopkinsville – Christian County Comprehensive Plan (HCCCP) Draft Land Use Element* identifies the Pembroke industrial area as “accounting for a large percentage of (Hopkinsville’s) industrial land,” and calls for expanded industrial growth in the Pembroke area.

The **need** for the project is based on the following existing conditions and future plans:

- 1) Commerce Park is expanding.
- 2) KY 115 is a narrow, two-lane road assigned truck weight classification “A,” 44,000 pounds maximum allowable gross weight, on the Kentucky Highway Freight Network. KY 115 connects I-24 and US 41, both of which are classified “AAA,” 80,000 pounds maximum. Consequently, KY 115 experiences a high volume of heavy truck traffic it is not designed to accommodate.
- 3) The US 41/KY 115 intersection in Pembroke is skewed and has substandard turning radii, especially for large vehicles, as shown in **Figure ES 2**.



**Figure ES 2: US 41/KY 115 Intersection Looking North**

- 4) During off-peak times with no train disruptions, the average field-measured travel time for the most direct connection from Commerce Park to I-24 (Exit 89 at KY 115) is 12.7 minutes. The Christian County Travel Demand Model study corridor travel time is similar at 11.9 minutes. However, day-to-day predictability of travel time in the study corridor is inconsistent due to large farm equipment, semi-tractor trailers carrying agriculture

products, school buses, slow moving Amish buggies, and limited passing opportunities result in lower travel speeds, platooning.

- 5) CSX operated a railyard south of the Commerce Park until it was abruptly closed in May 2017. Prior to closure, the at-grade railroad crossing on KY 115 posed geometric challenges and travel time delays. In an observed 48-hour period, 51 trains crossed KY 115, blocking traffic from 1:51 to 15:23 minutes in peak hours. The average disruption was 3:43 minutes per train, with the maximum disruption lasting nearly 38 minutes (off-peak hours).
- 6) KY 115 bridge over Montgomery Branch (MP 9.910) is narrow, functionally obsolete, and a high-crash location.

Study goals are twofold: (1) where feasible improve traveling safety, to include Amish horse and buggy and large farm equipment; and (2) advance relevant HCCCP transportation elements that support continued growth for the area.

### Development of Concepts

Community outreach helped guide the study, particularly in identifying potential issues and developing concepts. Over the course of the study, the project team held three project team meetings, two local officials/stakeholders meetings, and one public meeting.

While some concepts were removed from further consideration during the planning process, this document concludes by presenting and comparing information on a set of viable concepts to be carried forward—no prioritized recommendations are made.

Improvement concepts were developed within two corridors that meet the study's purpose and need. **Corridor 1** begins on KY 115 at I-24, heads north to Mason Lane (MP 10.000) and the intersection of KY 115 with US 41, then continues west along US 41 to Salubria Springs Road (MP 4.000) to the Commerce Park. **Corridor 2** also starts on KY 115 at I-24, heads north to near KY 1027, before transitioning northwest on a new connector between KY 115 and US 41 southwest of Pembroke, to US 41 turning northwest to end near the Commerce Park. Two long-term and two short-term improvement concepts are in Corridor 1, and three long-term concepts are in Corridor 2. The short-term concepts were developed as standalone, low cost spot improvements to geometric deficiencies at three high-crash spots. These locations are illustrated on **Figure ES 3** and described below:

**Corridor 1 Concepts**—Improve existing routes US 41 and KY 115 in the study area.

- ➡ **Concept A (Long-Term):** Improve/Widen US 41 from the KY 115 intersection westward to northwest of Salubria Springs Road near the Commerce Park.
- ➡ **Concept C (Long-term):** Improve/Widen KY 115 from near I-24 to near Mason Lane (north of the KY 115 bridge) in Pembroke. This project also includes replacing the KY 115 bridge over Montgomery Branch (**Spot Concept D**).

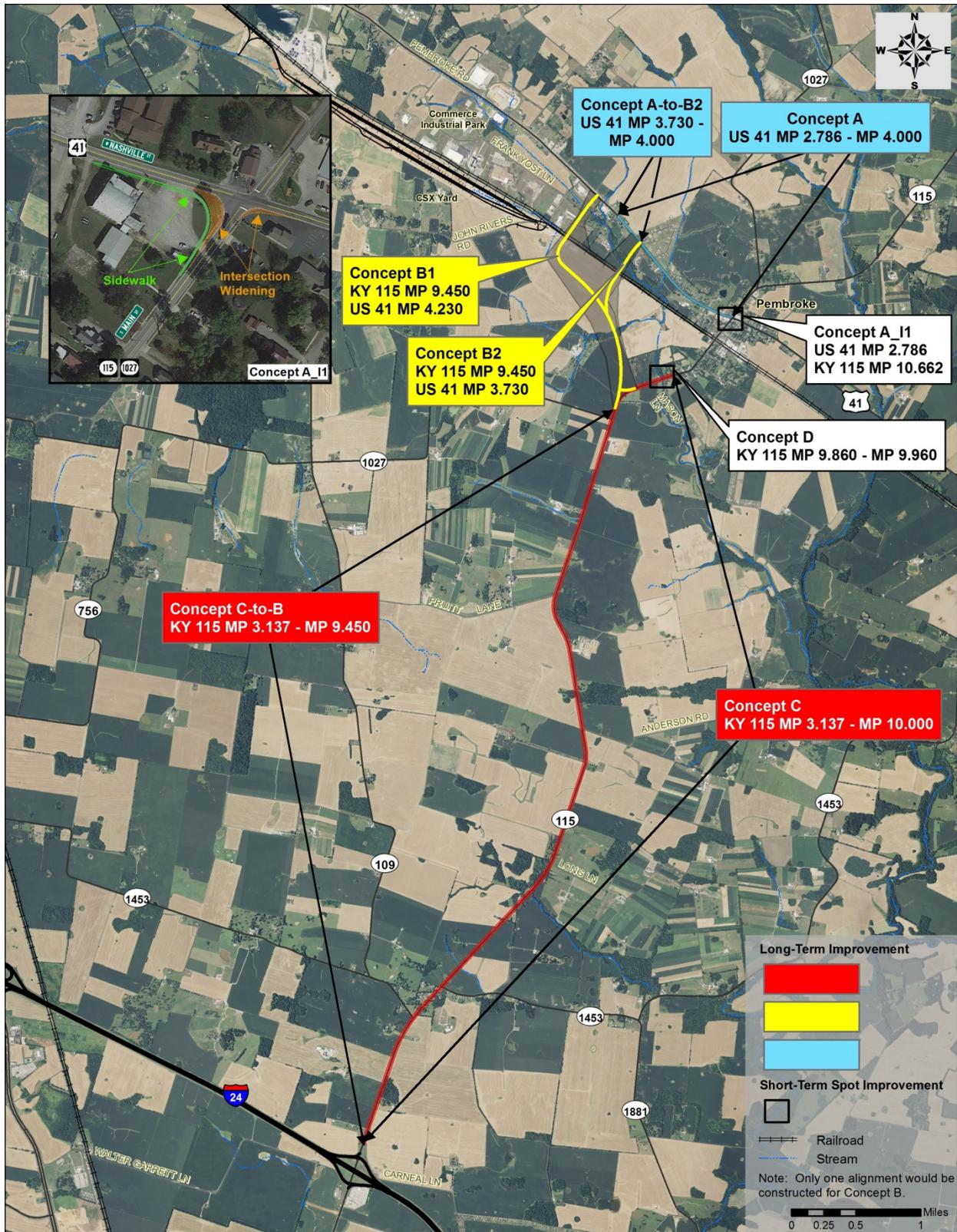


Figure ES 3: Final Improvement Concepts

**Corridor 2 Concepts**—Construct a new connector between KY 115 and US 41 northwest of Pembroke that bridges over the CSX railroad; and, to and from the connector improve/widen KY 115 from I-24 north and US 41 west to Salubria Springs Road near the Commerce Park.

- ➡ **Concept A-to-B2 (Long-term):** Improve/Widen US 41 as it approaches Pembroke Connector Concept B2.
- ➡ **Concept B (B1 or B2) (Long-term):** Construct US 41/KY 115 Pembroke Connector on new alignment.
- ➡ **Concept C-to-B (Long-term):** Improve/Widen KY 115 from near I-24 north to Pembroke Connector.

**Spot Concepts**—Construct standalone, low cost spot improvements at high-crash locations.

- ➡ **Concept A\_I1 (Short-term):** Improve US 41/KY 115 intersection.
- ➡ **Concept D (Short-term):** Replace KY 115 bridge over Montgomery Branch.

## Cost Estimates

Phased cost estimates for each improvement concept are shown in **Table ES 1**. Open Roads Concept Station was used to create 3D conceptual road and bridge models of each corridor concept. A five foot digital elevation model, derived from LiDAR collected as part of Kentucky's Aerial Photography and Elevation Data, was used as existing terrain. Conceptual design models generated quantities of high-cost construction items including earthwork, pavement, and structures. Construction costs were tabulated using the KYTC District 2 average unit bid prices. The KYTC District 2 assisted with right-of-way and utility cost estimates based on conceptual model disturb limits. Cost estimates for widening KY 115 (Concept C) are based on the best-fit alignment.

**Table ES 1: Cost Estimates for Final Improvement Concepts**

Type	Corridor	Improvement Concept (Description)	Length (miles)	Design	Right-of-Way	Utilities	Construction	Total	
				Dollars					
Long-Term	(1)	A (Widen US 41)	1.214	\$300,000	\$2,750,000	\$1,750,000	\$3,000,000	\$7,800,000	
		C (Widen KY 115 and Bridge Replacement)	6.863	\$1,500,000	\$2,500,000	\$4,250,000	\$14,900,000	\$23,150,000	
	(2)	A-to-B2 (Widen US 41 to Pembroke Connector B2)		0.270	\$70,000	\$600,000	\$400,000	\$630,000	\$1,700,000
		B (Pembroke Connector)	B1*	1.909	\$1,100,000	\$1,000,000	\$500,000	\$11,000,000	\$13,600,000
			B2*	1.365	\$900,000	\$500,000	\$500,000	\$8,500,000	\$10,400,000
		B1** (Shared-Use Path)		1.909	\$370,000	\$140,000	\$70,000	\$3,620,000	\$4,200,000
		B2** (Shared-Use Path)		1.365	\$260,000	\$70,000	\$70,000	\$2,600,000	\$3,000,000
		C-to-B (Widen KY 115 to Pembroke Connector)		6.313	\$1,400,000	\$2,300,000	\$3,900,000	\$13,400,000	\$21,000,000
Short-Term	Spot	A_11 (US 41/KY 115 Intersection)	0.100	\$25,000	\$100,000	\$150,000	\$100,000	\$375,000	
		D (KY 115 Bridge Replacement)	0.100	\$100,000	\$40,000	\$70,000	\$900,000	\$1,110,000	

\* Does not include cost associated with optional Shared Use Path (SUP).

\*\* Assumes widening bridge over railroad for SUP and not reducing bridge shoulders to accommodate.