EXECUTIVE SUMMARY

Western Bardstown
Connectivity
Study

WESTERN BARDSTOWN
CONNECTIVITY STUDY

NELSON COUNTY

ITEM NO. 4-8809.00

IN PARTNERSHIP WITH

KENTUCKY TRANSPORTATION CABINET

Kimley»Horn

cdp

APRIL 2019

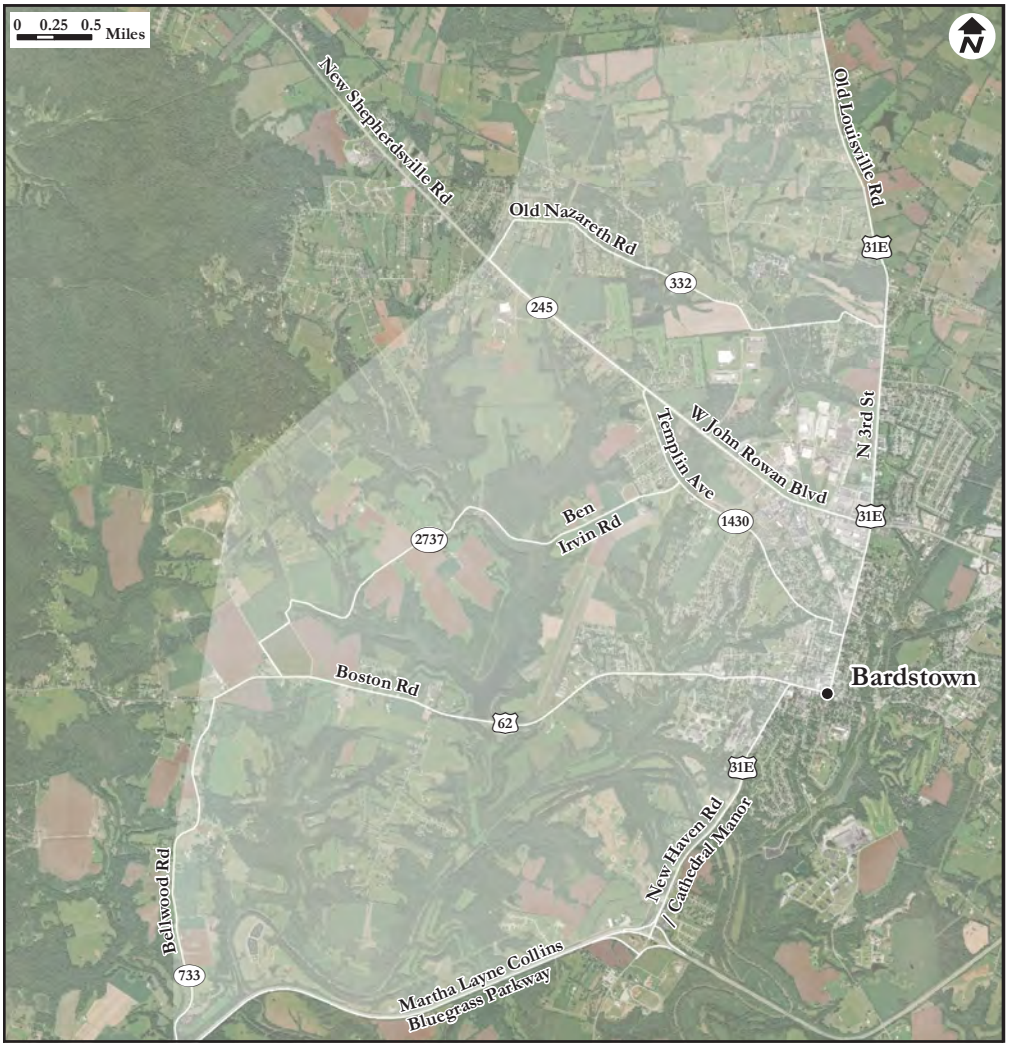
EXECUTIVE SUMMARY

Project Introduction

The *Western Bardstown Connectivity Study* was initiated by the Kentucky Transportation Cabinet (KYTC) to examine needs and identify potential alternatives that will improve connectivity and accessibility on the west side of Bardstown. Currently the east side of Bardstown is well developed with little room for expansion. The west side, however, has available land zoned for future development and lacks north-south connectivity.

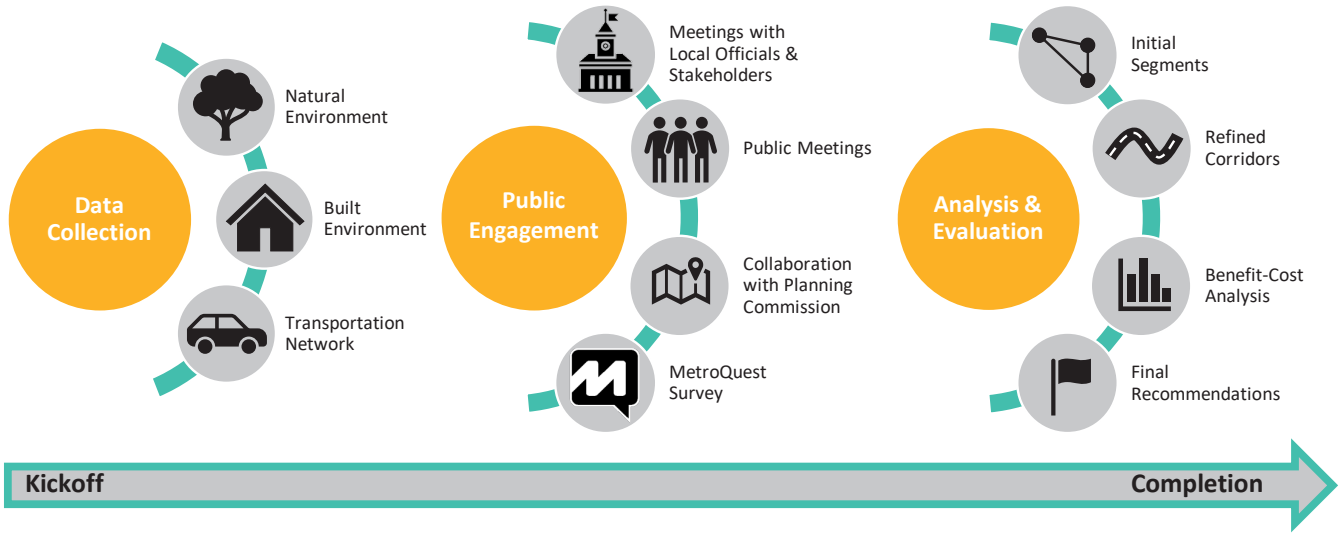
The study area is located in Nelson County, Kentucky, with a focus on the western portion of Bardstown. The boundaries are US 31E to the east and Martha Layne Collins Bluegrass Parkway (unsigned as BG 9002) to the south, and include the following state-maintained routes: US 62, KY 245, KY 332, KY 733, KY 1430, and KY 2737. The shading in the figure identifies the boundary and the major routes are highlighted within this area.

Study Area Map



Planning Process

The purpose of the *Western Bardstown Connectivity Study* is to determine transportation needs of today and establish a vision of transportation needs in western Bardstown for the future. The planning process embraced a grassroots approach that allowed the community's vision to be heard alongside support from data-driven procedures. Beginning with an assessment of existing conditions that involved an in-depth compilation of data for the study area, the study process weaved in key public engagement opportunities that fed into the analysis and evaluation of alternatives. The Draft Purpose and Need of the Project was identified through the process and provided the framework for the eventual selection of project recommendations.



Draft Purpose and Need

According to the Federal Highway Administration (FHWA), the purpose and need of a project is essential in establishing a basis for the development of the range of reasonable alternatives and assist with the identification and eventual selection of a preferred alternative. This important step helps ensure that potential alternatives are focused, efficient, practical, and best serve the transportation needs of the study area. The purpose and need of this project were molded over the course of the study to reflect changing needs as discovered through technical evaluation and public engagement. Drafts of the purpose and need were presented to the project team and the public throughout the study with the refined version presented in this report.

PURPOSE

To improve transportation network connectivity to the west of Bardstown and reduce congestion as well as improve safety by reducing crash rates in the downtown area.

NEED

The City of Bardstown has experienced growth in vehicular traffic and local truck traffic that affects safety and mobility within the study area. The project need is revealed in the areas of system linkage, capacity, and safety.

System Linkage: There are few north-to-south routes in western Bardstown that provide an alternative to traveling through downtown for passenger car and local freight traffic. The existing route (KY 2737) exhibits poor horizontal and vertical geometry. An analysis of future land use by the Joint City-County Planning Commission of Nelson County (JCCPC) determined that at least 800 acres of industrial land will be required to provide employment for the population over the next 50 years. Existing locations along US 62 and KY 245 do not currently have access to transportation infrastructure capable of supporting this growth.

Capacity: Congestion is already prevalent in the study area, and traffic forecasts suggest that volumes will continue to increase in downtown Bardstown. Additionally, local and regional truck traffic will shift due to the relocation of a nearby quarry, asphalt plant, and concrete plant and may increase if the industrial growth cited in the Nelson County Land Use Plan is realized.

Specific areas of concern include:

- US 31E (North Third Street) between KY 1430 (Templin Avenue) and KY 245 (John Rowan Boulevard) operates at Level of Service (LOS) E in the current year (2017).
- US 62 (Stephen Foster Avenue) between Elm Grove Street and US 31E (Cathedral Road) operates at LOS E in the current year (2017).
- The initial traffic forecast completed in July 2017 shows No-Build ADT on KY 245 (John Rowan Boulevard) between US 62 (Bloomfield Road) and US 31E (North Third Street) increasing from 29,900 vehicles per day to 37,600 vehicles per day in 2040. Under the build scenario, volumes increase to 42,000 vehicles per day in 2040. As such, this forecast suggests that congestion at the intersection of KY 245 (John Rowan Boulevard) and US 31E (North Third Street) will continue to increase.

Safety: Multiple high crash locations have been identified in the study area through safety analysis, including:

- East Beall Street at US 31E (North Third Street)
- KY 245 (John Rowan Boulevard) at US 31E (North Third Street)
- US 31E (North Third Street) at US 62 (Stephen Foster Avenue)
- The segment of US 31E from US 62 (Stephen Foster Avenue) to KY 245 (John Rowan Boulevard)

GOALS AND OBJECTIVES

To support the purpose and need of this project, a chief goal and objective was identified:

PROVIDE IMPROVEMENT ALTERNATIVES THAT MINIMIZE IMPACTS TO THE NATURAL AND BUILT ENVIRONMENT.

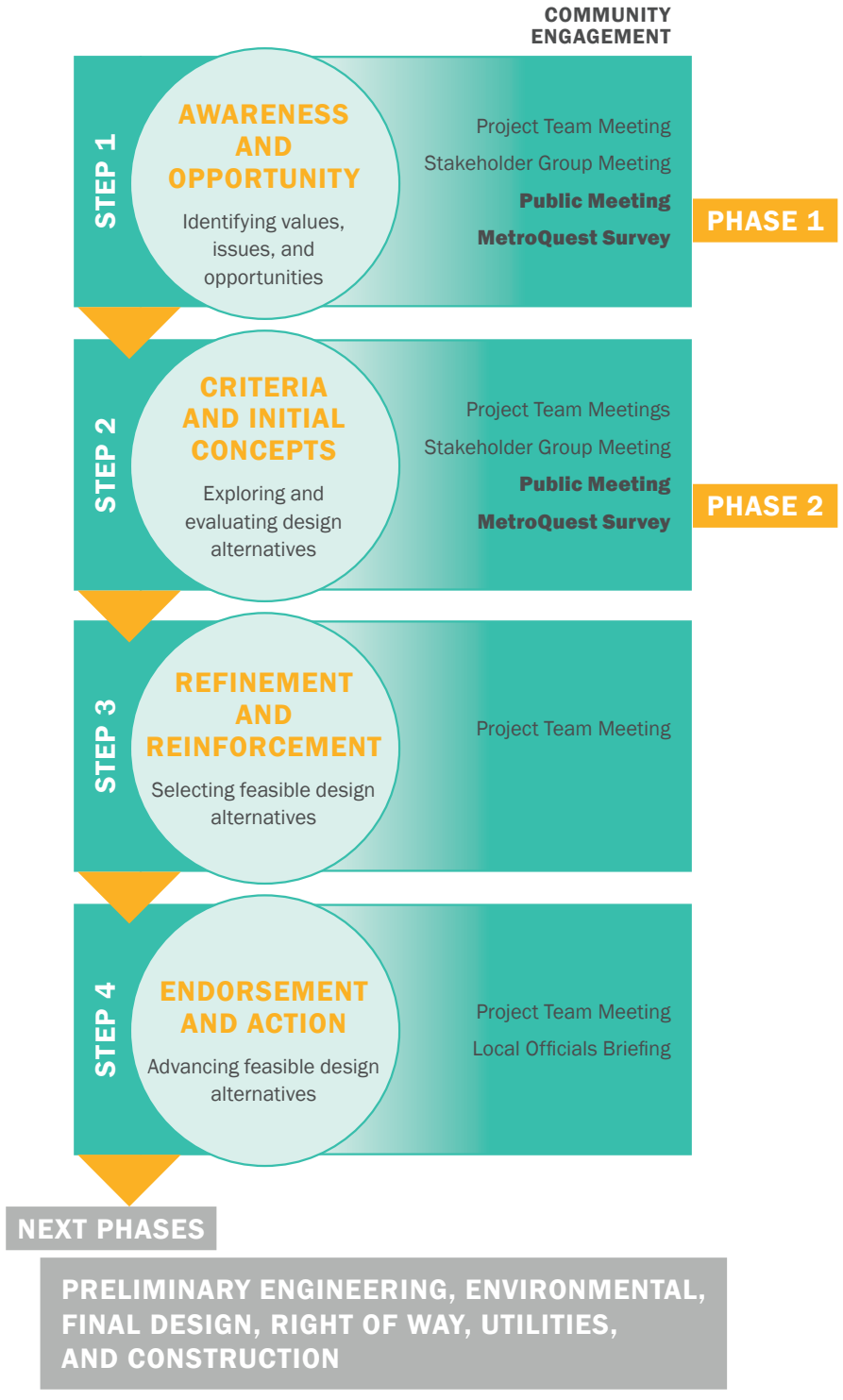
Public Engagement

The Public Engagement Plan developed specifically for this study identifies key activities, objectives, and a schedule for critical path milestones. Emphasis was placed on striking a balance between communicating project information and gathering community input for consideration as incremental decisions are made.

A heightened level of coordination ensued between the public, the JCCPC, KYTC, the Lincoln Trail Area Development District (LTADD), and the consultant team. Communication with the public occurred through the following channels:

Social Media – Promotion of study activities through KYTC Facebook and Twitter accounts.

Public Meetings – Two meetings were held during the study phase; one after completion of the existing conditions review and the second to present refined corridors and associated impacts and analysis of each. More than 200 people attended each meeting.



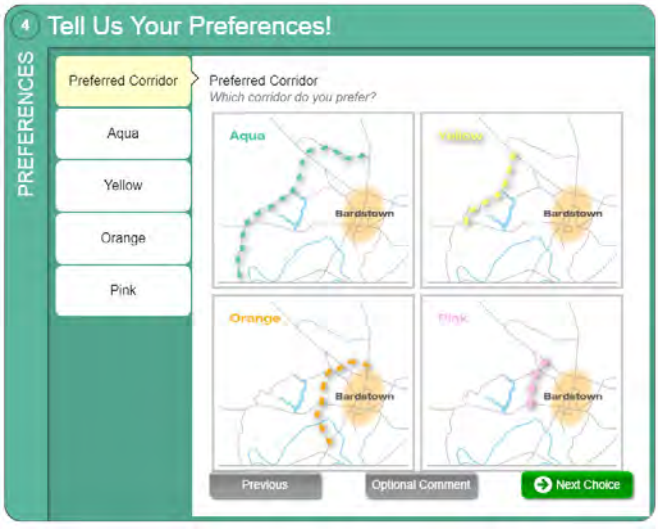
Online Engagement – Highly interactive survey formats were employed with screens designed to mirror information collected at the first and second public meetings. The first survey had 357 participants during a two-week window. The second survey achieved 426 participants during a four-week window.

Local Officials/Stakeholder Meetings – Meetings were conducted with representatives from various agencies in the study area to solicit more targeted feedback and project information.

Through these activities, the public's top-rated priority was safety, followed by connectivity, minimizing disruptions, and travel time.

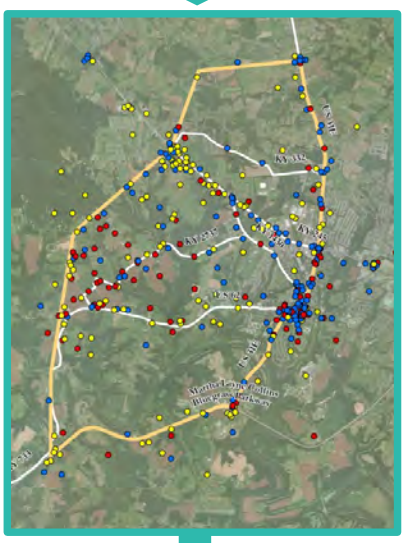
Alternatives Development and Evaluation

A process was initially used that connected individual places based on travel desires identified from the existing conditions analysis, identified issues, and input from the public and local officials/stakeholders. These connections were linked to form new roadway segments, and the segments were consolidated to form corridors. The graphics on the following page illustrate the process. To be as comparative as possible, a ranking system was applied to the segments based on rankings of the Natural Environment Impact, Built Environment Impact, and Community and Traffic Benefits.



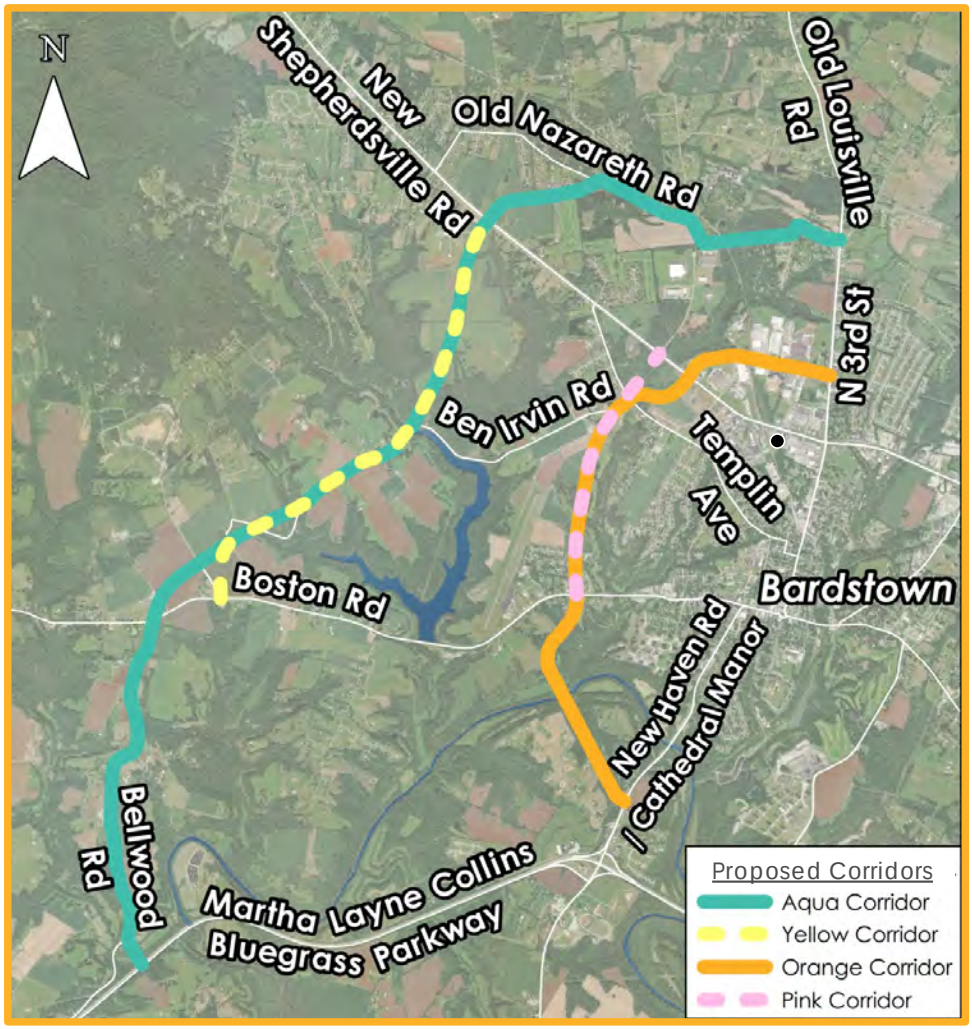
From this development process, four corridors emerged as potential options to meet the study purpose and identified needs. The Aqua Corridor represents a regional connection in the outer portion of western Bardstown. The Yellow Corridor represents a local connection between US 62 and KY 245. It aligns with the Aqua Corridor from US 62 to KY 245. The Orange Corridor represents a regional connection in western Bardstown closer to the city center, connecting to US 31E both north and south of Bardstown. The Pink Corridor represents a local connection between US 62 and KY 245 that aligns for the most part with the inner segment of the Orange Corridor.

Analyzed Public Input



Developed Segments

Evaluated Segments and Developed Corridors



Initial cost estimates were prepared prior to the second public meeting and refined following additional corridor evaluation. Based on projected 2040 traffic volumes, estimates for all corridors are based on a two-lane typical section. Orange and Pink are assumed to be urban (curb and gutter) with Aqua an Yellow rural (shoulder). The typical sections will be further refined in the next phase of design. Average KYTC unit cost information, property information from the Nelson County Property Valuation Administrator (PVA), and an analysis of utility impacts were used to determine potential costs.

Final Planning-Level Cost Estimates

Phase	Alternative			
	Aqua	Yellow	Orange	Pink
Design	$4,500,000	$1,600,000	$2,400,000	$600,000
Right-of-Way	$4,600,000	$1,910,000	$4,830,000	$1,100,000
Utilities	$5,300,000	$900,000	$4,100,000	$400,000
Construction	$45,100,000	$16,100,000	$24,300,000	$5,200,000
Total	$59,500,000	$20,510,000	$35,630,000	$7,300,000

Benefit-Cost Analysis

To assist with the decision-making process, a benefit-cost (B/C) analysis was conducted for each of the four corridors. Benefits included an assessment of travel time savings and vehicle operating costs as well as safety benefits that were determined through application of Highway Safety Manual (HSM) procedures. Costs included design, right-of-way, utilities, and construction estimates for each corridor. The results are shown in the following table:

Benefit-Cost Ratio Summary

	Aqua	Yellow	Orange	Pink
Estimated Cost (Total)	$59,500,000	$20,510,000	$35,630,000	$7,300,000
20 Year Travel Time Savings (VHT)	$0	$0	$16,778,112	$12,672,608
B/C Ratio	N/A	N/A	0.5	1.7
20 Year Cost Savings Associated with Crash Reduction	$45,253,992	$28,145,375	$56,575,618	$26,765,588
B/C Ratio	0.8	1.4	1.6	3.7
Combined Benefit	$45,253,992	$28,145,375	$73,353,730	$39,438,196
Combined B/C Ratio	0.8	1.4	2.1	5.4

Note: No travel time savings were calculated for the Aqua and Yellow corridors as the Hardin-Meade County MPO Travel Demand Model did not show appreciable differences in travel time between the No-Build and these Build corridors.

Summary of Corridor Evaluation Information

Information compiled that compares and contrasts the four corridors that were carried through to the final evaluation stage is summarized in the following table:

Corridor	Environmental Rankings		2040 Projected Traffic Volumes			# Reduction in Crashes Per Year (Compared to No-Build)	Meet Purpose and Need	Public Input (Ranked 1st)	Cost Estimate	B/C Ratio
	Natural Env.	Built Env.	Auto ADT	Truck ADT	% Reduction of Downtown ADT					
Aqua	2	3	4,200	500	20%	-24	Yes	152	$59,500,000	0.8
Yellow	1	1	3,200	400	20%	-15	Yes	57	$20,510,000	1.4
Orange	2	3	7,500	1,100	23%	-30	Yes	90	$35,630,000	2.1
Pink	1	2	5,100	650	22%	-14	Yes	70	$7,300,000	5.4

Note: Environmental Rankings are shown for the entire corridor by a ranking of 1-4; a lower number = less impacts

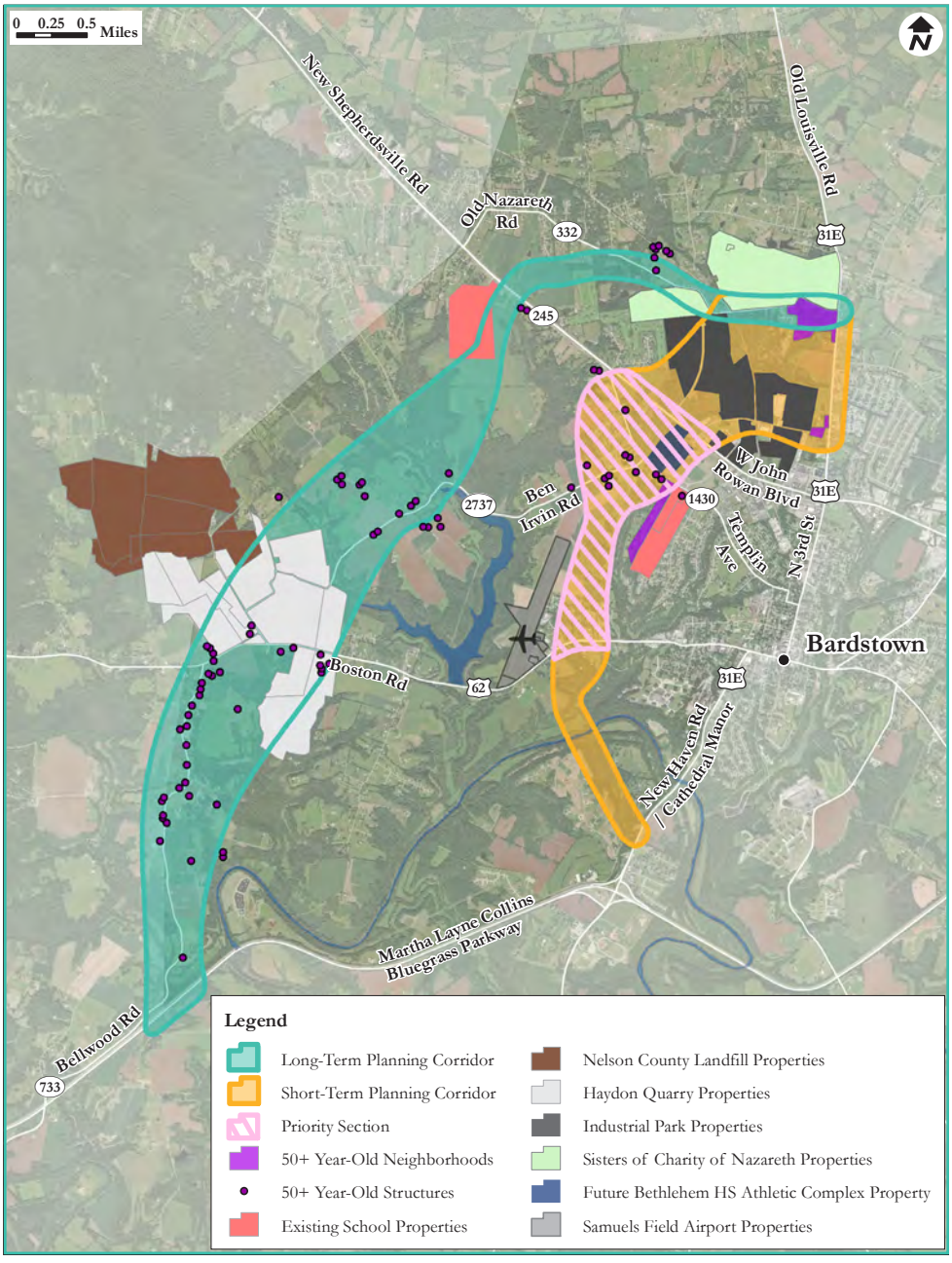
All corridors meet the purpose and need of the project to varying degrees as all improve network connectivity, reduce congestion, and have identified the potential for safety improvements in the downtown area of Bardstown. All public information meetings were well attended (200+ attendees) which helps provide an indication of the community interest in the project. The final component of this study focused on using available tools to provide a comparative look at quantifiable benefits relative to overall cost. The results of this analysis show the greatest benefit for the cost is the Pink Corridor.

Based on this information, the following are recommendations from this study:

SHORT-TERM CORRIDOR: ORANGE CORRIDOR WITH A PHASED APPROACH FOCUSING ON THE PINK CORRIDOR AS A SUBSET OF THE OVERALL CONNECTIVITY PLAN

LONG-TERM CORRIDOR: AQUA CORRIDOR

In the context of this study, the nomenclature of short-term indicates a more immediate need with long-term referring to future need in a larger-scale regional perspective. The map below displays these recommendations in context with community features/resources. For flexibility in transitioning to the next phase of project development, the corridor bands have been widened. The larger areas will allow for future design decisions to be made for known areas identified as part of the additional corridor information and allow flexibility for design decisions to be made that are the most beneficial with least impact.



SHORT-TERM

The Orange Corridor provides a full connection from US 31E south of Bardstown to north of Bardstown on the west side. Within this corridor, the Pink Corridor is identified as the highest priority. This section connects US 62 and KY 245. The estimated planning-level cost estimates for both the Orange and Pink Corridor subset are given in the table below.

Short-Term Planning Corridor Cost Estimates

Phase	Alternative	
	Orange	Pink
Design	$2,400,000	$600,000
Right-of-Way	$4,830,000	$1,100,000
Utilities	$4,100,000	$400,000
Construction	$24,300,000	$5,200,000
Total	$35,630,000	$7,300,000

Additional considerations for future development of this recommendation include:

- Development of Phase I design plans related to initial termini at US 62 and KY 245 that enable the continuation of the corridor to the north and south.
- Evaluation of the connection/initial termini at US 62 as it relates to minimizing impacts to the identified Environmental Justice Area.
- Evaluation of the connection/initial termini at KY 245 as it relates to the identified Bethlehem High School Athletic Complex.
- Evaluation of potential adjustment of the northern Orange segment between KY 245 and US 31E using Wilson Parkway to Old Nazareth Road through further review of the Bardstown Industrial Development Corporation Trust.

LONG-TERM

The Aqua Corridor provides a far western connection from Martha Layne Collins Bluegrass Parkway to US 31E to the north. The estimated planning-level cost estimate for the Aqua Corridor is given in the table below.

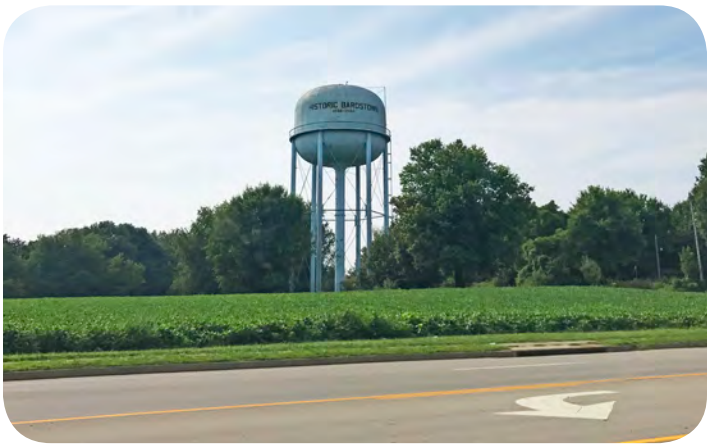
Long-Term Planning Corridor Cost Estimates

Phase	Alternative
	Aqua
Design	$4,500,000
Right-of-Way	$4,600,000
Utilities	$5,300,000
Construction	$45,100,000
Total	$59,500,000

Current growth patterns and associated projected use does not justify the cost at this time. If needs change in the future or growth outpaces current projections, re-evaluation of this as a near-term need may be warranted. At this time, it remains a viable long-range plan transportation element.

NEXT STEPS

The next phase for the project would be Phase 1 Design (Preliminary Engineering and Environmental Analysis) to further define the Orange Corridor and provide design plans for the Pink Corridor priority section. Kentucky's FY 2018 - FY 2024 Highway Plan has $500,000 identified for the design phase in the year 2020. Subsequent project phases will be evaluated by Kentucky's Strategic Highway Investment Formula for Tomorrow (SHIFT) program which is a data-driven, objective approach to compare capital improvement projects and prioritize transportation spending.




HISTORIC BARDSTOWN
1780-1980