

# Improved Access Road Study

## Executive Summary

### Bluegrass Crossings Regional Business Centre Ohio County, Kentucky

The Bluegrass Crossings Regional Business Centre Improved Access Road Study looks at ways to improve accessibility, safety, and mobility for the Bluegrass Crossings Regional Business Centre traffic. The business center is located in Ohio County, Kentucky.



Bluegrass Crossings Regional Business Centre entrance at Old Liberty Church Road intersection with US 231

#### Existing Conditions

Old Liberty Church Road serves two purposes today: it is the only access to the Bluegrass Crossings Regional Business Centre and provides sole access to approximately thirty residential homes. Aside from direct access to these properties, Old Liberty Church Road does not provide a through-connection to other highways. The road's dual nature creates a safety concern due to the high number of trucks that use the entrance to access the business center. As a result the Kentucky Transportation Cabinet (KYTC) initiated this study to determine if there are ways to improve the access road to the business center. A map of the study area is shown on page ES-4.

Old Liberty Church Road is classified as a Rural Local Road with a 35 mph posted speed limit. It is a two lane facility with 11-foot wide lanes and 6-foot wide shoulders. It has an average daily traffic of 1,800 vehicles. Of the 1,800 vehicles, 180 are trucks (10.0%).

US 231 is classified as a Rural Major Collector with a 55 mph posted speed limit. It is a two lane facility with 10-foot wide lanes and 4-foot wide shoulders in the study area (between milepoint 2.900 and milepoint 6.648). US 231 connects Old Liberty Church Road to the Western Kentucky Parkway. Daily traffic volumes

range from 5,400 to 6,100 vehicles along US 231 with 6.5% to 10.2% of that being truck traffic. The lane and shoulder widths along this portion of US 231 are deficient. The 2006 KYTC Highway Design Manual recommends a minimum of 12-foot wide lanes and 8-foot wide graded shoulders for Rural Collector Roads with an Average Daily Traffic (ADT) volume greater than 2,000 vehicles.

A review of as-built plans for US 231 between the Western Kentucky Parkway and Old Liberty Church Road showed one crest vertical curve at the US 231/Old Liberty Church Road intersection did not meet current standards for stopping sight distance. Based on the 2006 KYTC Highway Design Manual for 55 mph Rural Collector Roads, 495 feet of stopping distance is recommended but only 368 feet is available at this vertical curve. There are no horizontal curve deficiencies along this portion of US 231.

Traffic volumes were forecast along US 231 and Old Liberty Church Road for two scenarios: (1) 2040 No-Build and (2) 2040 Build. The 2040 No-Build scenario assumes Old Liberty Church Road would remain the only entrance to the Bluegrass Crossings Regional Business Centre. The 2040 Build scenario assumes a new entrance will be built for the business center without a connection to Old Liberty Church Road. Both scenarios assume new tenants will move into the business center over time. The growth rates for each scenario vary significantly.<sup>1</sup> The existing mix of large trucks and residential traffic is perceived as an impediment to attracting industrial tenants.

The Bluegrass Crossings Regional Business Centre has 1,134 acres of land available for industrial development. Currently, there are three industrial

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<sup>1</sup> The forecast analysis assumes that no dedicated entrance exists for the business park in the No Build scenario, resulting in a lower growth rate. The Build scenario assumes a dedicated entrance, increasing the attractiveness of the site, and resulting in a higher growth rate. This represents a conservative approach to capture a broad range of potential development outcomes.

buildings with a total employment of 700 people. The *ITE Trip Generation Manual (8th edition)* was used to arrive at trip generation rates based on several factors such as employment, area available for industrial development, and likely development based on the presence of the residential zone. Population and historical traffic growth rates were also considered. Capacity analysis indicates each segment operates well below its design capacity. Looking to the future, both the 2040 No-Build and 2040 Build scenarios found the need for a southbound left turn lane on US 231 to improve intersection operations. A traffic signal would likely be warranted at the US 231/business center entrance intersection if the area fully builds out.

Over a four year analysis period from February 2010 to January 2014, there were six reported crashes along the Old Liberty Church Road. All six were property damage only crashes and none involved a semi-truck or school bus. Four were single vehicle collisions, one was a rear end collision and one was a sideswipe. Along the study corridor, one spot was found to have a critical rate factor (CRF) greater than 1.00. This spot, located at the US 231/Old Liberty Church Road intersection, had a CRF of 1.68. This is likely due to the deficient vertical curve at this location and the skew of the intersection. At this high crash spot there were nine total crashes; three were injury crashes and six were property damage only crashes. Six were single vehicle collisions, two were rear end collisions and one was a sideswipe collision.



Old Liberty Church Road approaching the business center

### Purpose & Need

As a result of the existing conditions analysis, project team input and stakeholder input, a purpose and need statement for the proposed project was developed to guide future project development efforts, including design and environmental activities. The purpose and need statement explains why an expenditure of public

funds is warranted and provides the foundation for the development and evaluation of reasonable improvement options.

The purpose of the proposed project is to improve safety, traffic operations, and the existing accessibility to the Bluegrass Crossings Regional Business Centre. The need is demonstrated by close proximity of mismatched land uses (i.e., residential and industrial), which both rely on Old Liberty Church Road for access. This is complicated by projected growth of the business center if access is improved and the existing high crash spot at the US 231/Old Liberty Church Road intersection.

### Initial Alternative Screening Process

Following the existing conditions review and first round of consultation with local officials, three potential improvement alternatives were developed. These were based on an analysis of existing conditions and on input received from early discussions with local officials and staff.

- Alternative 1 (shown on page 6-2) includes a new industrial road entrance north of Old Liberty Church Road. A southbound left turn lane on US 231 is proposed to allow adequate storage length without impeding through traffic on US 231 or the Western Kentucky Parkway Ramps. Proper intersection sight distance is provided between Old Liberty Church Road and the new entrance road. An emergency access is provided at the eastern end of the new entrance roadway. As part of this alternative, there are no improvements at the existing Old Liberty Church Road intersection.
- Alternative 2 (shown on page 6-3) includes a new entrance north of Old Liberty Church Road and a southbound left turn lane on US 231 similar to Alternative 1. As part of this alternative, the deficient vertical alignment on US 231 and the skew along Old Liberty Church Road would be corrected.
- Alternative 3 (shown on page 6-4) includes a new entrance north of Old Liberty Church Road but still ties back to US 231 at the existing Old Liberty Church Road entrance. A southbound left turn lane on US 231 is proposed to allow adequate storage length without impeding through traffic on US 231. The deficient vertical alignment on US 231 and the

skew along Old Liberty Church Road would also be corrected. A new connector road is proposed between the new business center entrance and Old Liberty Church Road which would require the residential traffic along Old Liberty Church Road to use the new business center entrance.

In addition to the three build alternatives, the No-Build Alternative was evaluated relative to the Purpose and Need. The No-Build Alternative would not improve safety, traffic operations, or improve the existing accessibility to the Bluegrass Crossings Regional Business Centre. Likewise, a series of conceptual alternatives were considered but dismissed as they resulted in significantly greater costs or impacts; these included potential connections to the business center further south along US 231 and buying out existing homes along Old Liberty Church Road.

An evaluation process was undertaken to determine a preferred alternative. All three build alternatives require two home relocations, have low impacts to farmlands, require one stream crossing, and have no known impacts to community resources, historic properties, archaeology sites, or wetlands. Even though all three build alternatives meet the purpose and need of the project, Alternative 2 does the best job addressing safety, traffic operations, and accessibility. The No-Build option does not meet the purpose and need of the project.

The three alternatives were also presented to the project team, local officials and key stakeholders. Local officials and stakeholders were asked: "Of the Initial Alternatives presented today, which do you prefer?" Two respondents preferred Alternative 1 (22%) and seven preferred Alternative 2 (78%). No other options were selected as preferred.

### Recommendations

Alternative 2 was preferred by the project team, local officials and stakeholders as it best met the project purpose and need within the target budget. Alternative 2 will improve safety by separating the residential and truck traffic and fixing the existing geometric deficiencies at the US 231/Old Liberty Church Road intersection, will improve traffic operations by adding left turn lanes, and will improve accessibility by

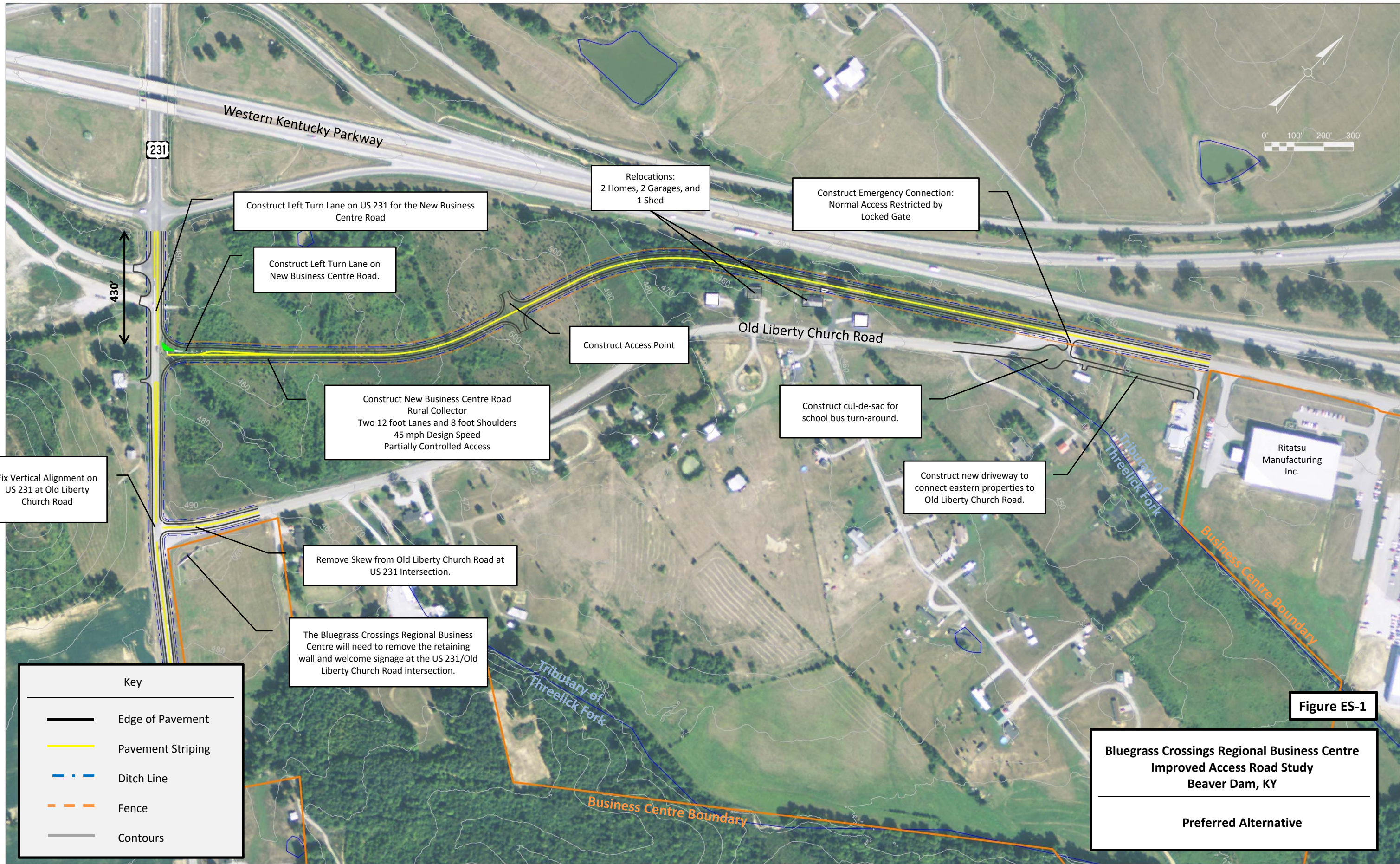
building a new business center entrance. Improvements include a new entrance for the Bluegrass Crossings Regional Business Centre and left turn lanes for movements to and from the new business center entrance. Additionally, the existing US 231/Old Liberty Church Road intersection would be reconstructed to correct the deficient vertical alignment on US 231 and the skew along Old Liberty Church Road.

Based on subsequent feedback from the project team, local officials and stakeholders, changes to the initial Alternative 2 layout include: making the proposed business center entrance partially-controlled access with a fence along the road restricting all future access to one designated access point, adding a driveway connection off Old Liberty Church Road to the eastern private property next to Ritatsu, adding a cul-de-sac so school buses can turn around, and removing the left turn lanes at Old Liberty Church Road. **Figure ES-1** shows the preferred alternative layout in more detail.

Alternative 1 could also be considered if costs become an issue during the design phase. Right-of-way concerns in the northern parcel between the new business center entrance and the Western Kentucky Parkway could increase project costs above those shown in preliminary cost estimates of this report. Ultimately the design phase will determine whether or not Alternative 2 can be constructed within the *Kentucky's FY 2014 – FY 2020 Highway Plan* budget, which currently includes \$400,000 for design, \$700,000 for right-of-way, \$300,000 for utilities, and \$3 million for Construction. If Alternative 2 cannot be constructed within budget, Alternative 1 is a viable alternative that also meets the project purpose and need. The improvements to Old Liberty Church Road described in the previous paragraph could be incorporated into Alternative 1.

The estimated total cost for the Preferred Alternative is \$4,400,000. Cost estimates for each project development phase are summarized below:

- Design – \$300,000
- Right-of-Way – \$700,000
- Utilities – \$300,000
- Construction – \$3,100,000



Construct Left Turn Lane on US 231 for the New Business Centre Road

Construct Left Turn Lane on New Business Centre Road.

Relocations:  
2 Homes, 2 Garages, and  
1 Shed

Construct Emergency Connection:  
Normal Access Restricted by  
Locked Gate

Construct Access Point

Old Liberty Church Road

Construct New Business Centre Road  
Rural Collector  
Two 12 foot Lanes and 8 foot Shoulders  
45 mph Design Speed  
Partially Controlled Access

Construct cul-de-sac for  
school bus turn-around.

Construct new driveway to  
connect eastern properties to  
Old Liberty Church Road.

Fix Vertical Alignment on  
US 231 at Old Liberty  
Church Road

Remove Skew from Old Liberty Church Road at  
US 231 Intersection.

The Bluegrass Crossings Regional Business  
Centre will need to remove the retaining  
wall and welcome signage at the US 231/Old  
Liberty Church Road intersection.



Key	
	Edge of Pavement
	Pavement Striping
	Ditch Line
	Fence
	Contours

**Figure ES-1**

**Bluegrass Crossings Regional Business Centre  
Improved Access Road Study  
Beaver Dam, KY**

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**Preferred Alternative**