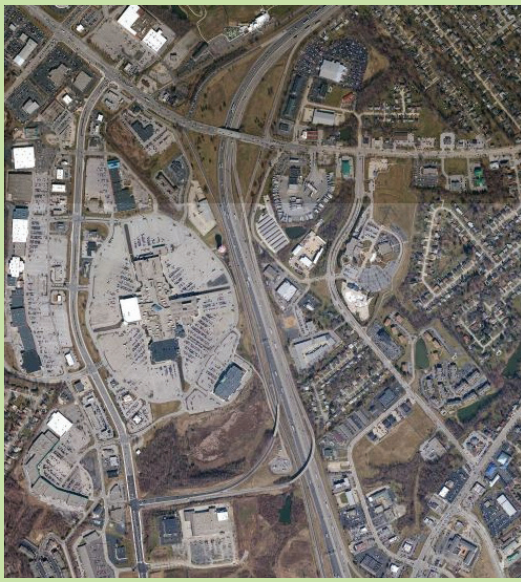
Interchange Modification Report (IMR)

Mall Road/I-75 (Exit 180-A)
Boone County, Kentucky
KYTC Item No.: 6-409.00

April 2014



Prepared For:

KENTUCKY TRANSPORTATION CABINET

Prepared By:

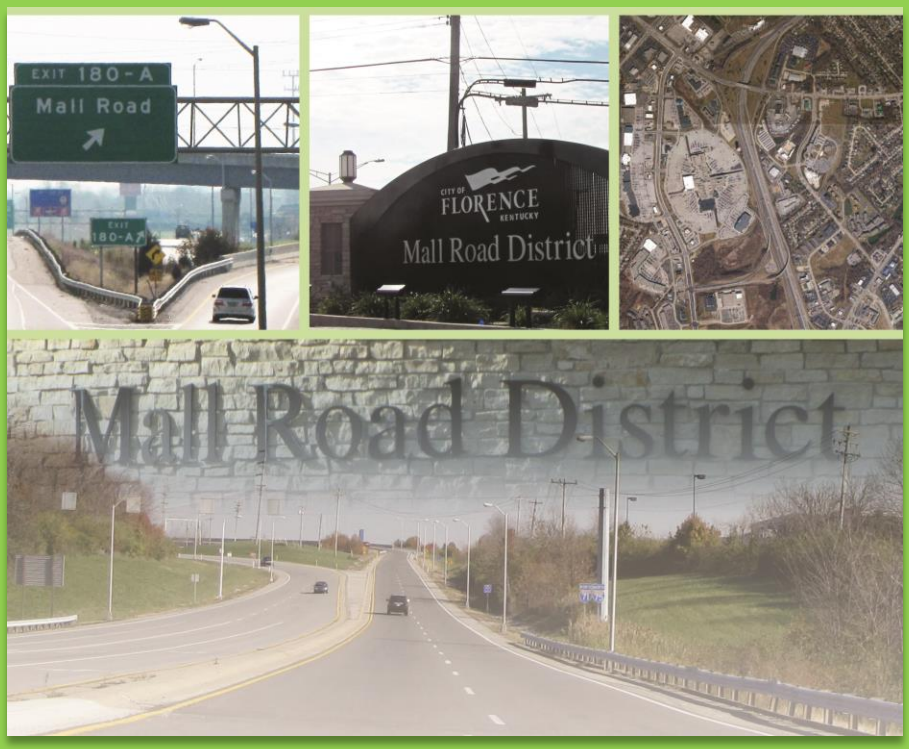
QK4
Engineering Planning

INTERCHANGE MODIFICATION REPORT (IMR)

MALL ROAD/I-75 (EXIT 180-A)

BOONE COUNTY, KENTUCKY

KYTC ITEM NO. 6-409.00



Prepared for:

KENTUCKY TRANSPORTATION CABINET

Kentucky Transportation Cabinet

April 2014

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EXECUTIVE SUMMARY

The purpose of this interchange modification is to improve connectivity and safety between the major regional commercial development areas in Florence, Kentucky, and the Interstate System.

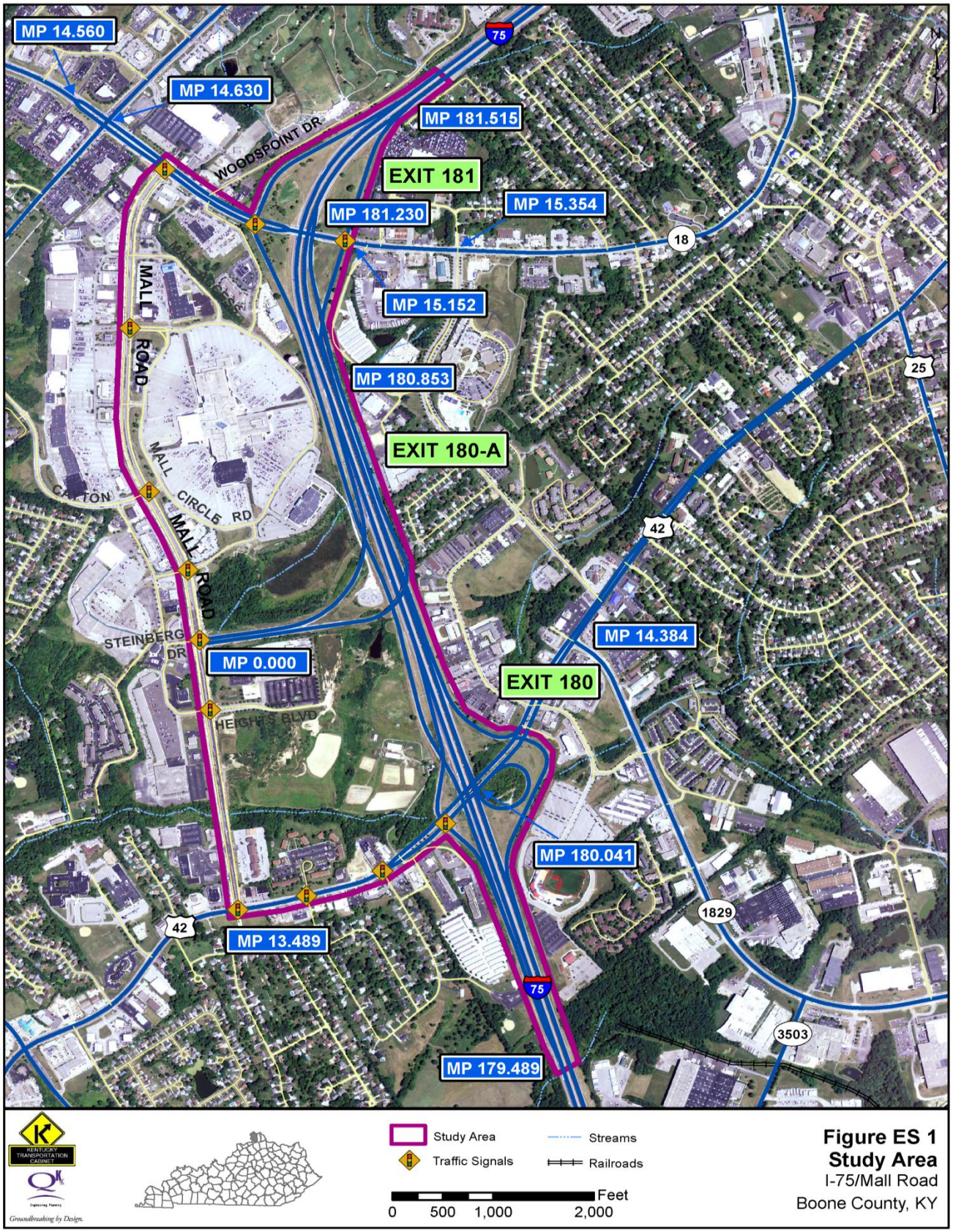
As shown in Figure ES1, the I-75 interchange with Mall Road is currently a partial interchange. Motorists traveling Mall Road have access only to northbound I-75 via Exit 180-A (MP 180.853). For I-75 northbound motorists, there is not a northbound exit ramp at Exit 180-A to Mall Road. Motorists on Mall Road wishing to travel south on I-75 currently have two options:

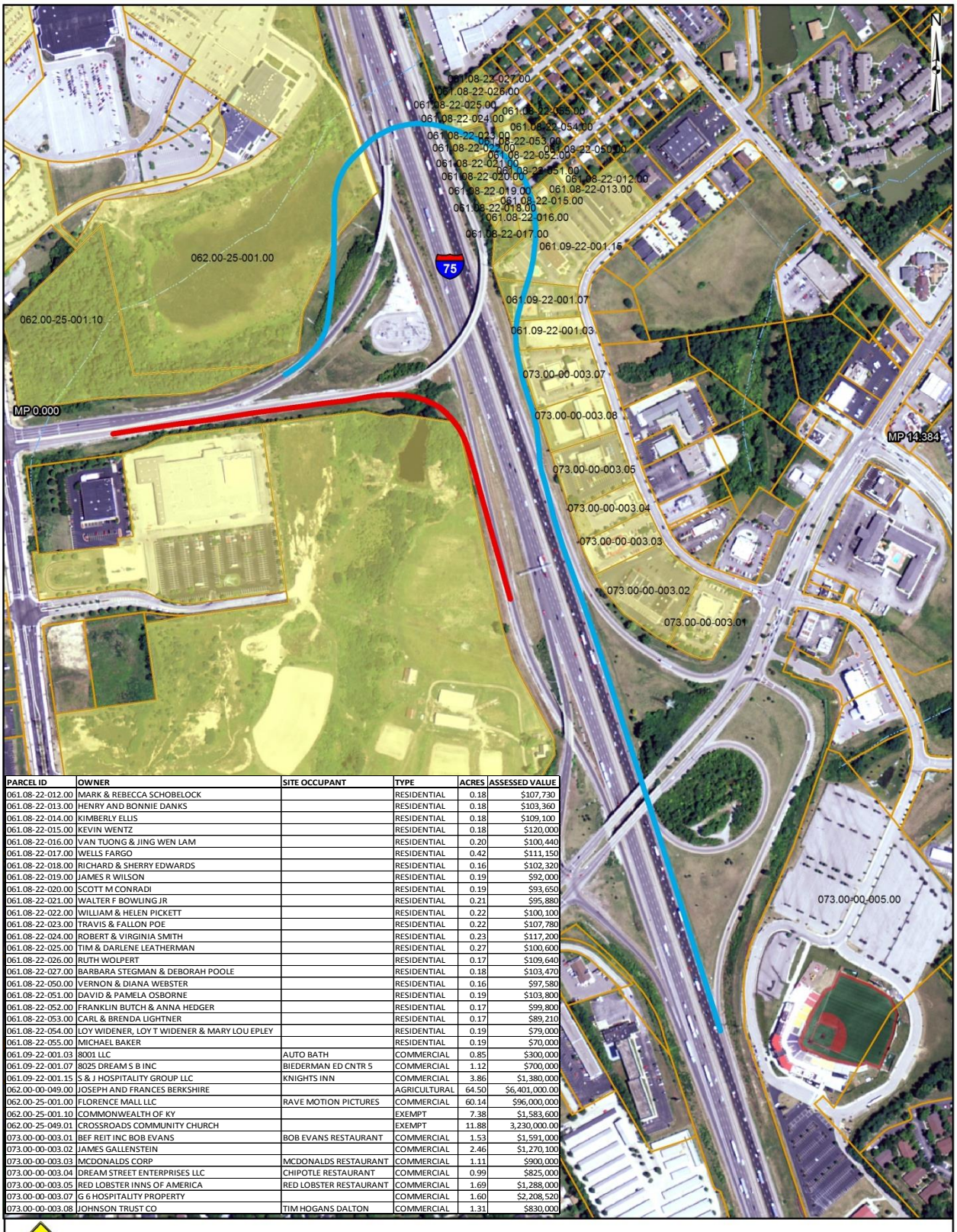
- Travel south on Mall Road to US 42, then travel east on US 42 to either the southbound or northbound I-75 ramps via Exit 180 (MP 180.041).
- Travel north on Mall Road, turn east onto KY 18, and enter the northbound or southbound I-75 via Exit 181 (MP 181.230).

Travelers using either existing option encounter congested intersections and numerous traffic signals. There are seven traffic signals located along Mall Road within the project area. In addition, there are three signals located on US 42 east from Mall Road to the I-75/US 42 southbound ramps and one traffic signal located at the Mall Road and I-75/KY 18 southbound ramp intersection. Therefore, area traffic could travel through as many as five signalized intersections to reach I-75 to travel southbound. Each signalized intersection has a minimum of 32 potential conflict points. Additional conflict points occur at individual entrances between those signalized intersections. Existing intersection delays range from 15.5 seconds/vehicle for a level of service C (LOS C) in the AM Peak Hour to 237 seconds/vehicle (LOS F) in the PM Peak Hour. For KY 18, US 42, and Mall Road, crash rates are above the average for similar type roadways in Kentucky. The many access points along these roadway segments are contributing to the crashes and congestion.

Three build alternatives (with three northbound off ramp alternatives) at Mall Road and I-75 were studied for this Interchange Modification Report (IMR):

- Alternative 1 (Figure ES 2) – provides for a full interchange at Mall Road (Exit 180-A) by adding a northbound off ramp (Alternative 1, 1A, or 1B (Figures ES 2A, 2B, and 2C, respectively)) and a southbound on ramp via a collector distributor road;
- Alternative 2 (Figure ES 3) – provides a southbound on ramp via a collector distributor road with a design speed of 35 mph; and
- Alternative 3 (Figure ES 4) - provides a southbound on ramp via a collector distributor road with a design speed of 45 mph.


MP 14.560
MP 14.630
MP 181.515
EXIT 181
MP 181.230
MP 15.354
MP 15.152
MP 180.853
EXIT 180-A
MP 14.384
EXIT 180
MP 180.041
MP 0.000
MP 13.489
MP 179.489
WOODSPOINT DR
MALL ROAD
MALL CIRCLE RD
CAPTON
STEINBERG DR
HEIGHTS BLVD
75
18
25
42
1829
3503
Study Area
Traffic Signals
Streams
Railroads
Feet
0 500 1,000 2,000
Figure ES 1
Study Area
I-75/Mall Road
Boone County, KY



PARCEL ID	OWNER	SITE OCCUPANT	TYPE	ACRES	ASSESSED VALUE
061.08-22-012.00	MARK & REBECCA SCHOBELOCK		RESIDENTIAL	0.18	$107,730
061.08-22-013.00	HENRY AND BONNIE DANKS		RESIDENTIAL	0.18	$103,360
061.08-22-014.00	KIMBERLY ELLIS		RESIDENTIAL	0.18	$109,100
061.08-22-015.00	KEVIN WENTZ		RESIDENTIAL	0.18	$120,000
061.08-22-016.00	VAN TUONG & JING WEN LAM		RESIDENTIAL	0.20	$100,440
061.08-22-017.00	WELLS FARGO		RESIDENTIAL	0.42	$111,150
061.08-22-018.00	RICHARD & SHERRY EDWARDS		RESIDENTIAL	0.16	$102,320
061.08-22-019.00	JAMES R WILSON		RESIDENTIAL	0.19	$92,000
061.08-22-020.00	SCOTT M CONRADI		RESIDENTIAL	0.19	$93,650
061.08-22-021.00	WALTER F BOWLING JR		RESIDENTIAL	0.21	$95,880
061.08-22-022.00	WILLIAM & HELEN PICKETT		RESIDENTIAL	0.22	$100,100
061.08-22-023.00	TRAVIS & FALLON POE		RESIDENTIAL	0.22	$107,780
061.08-22-024.00	ROBERT & VIRGINIA SMITH		RESIDENTIAL	0.23	$117,200
061.08-22-025.00	TIM & DARLENE LEATHERMAN		RESIDENTIAL	0.27	$100,600
061.08-22-026.00	RUTH WOLPERT		RESIDENTIAL	0.17	$109,640
061.08-22-027.00	BARBARA STEGMAN & DEBORAH POOLE		RESIDENTIAL	0.18	$103,470
061.08-22-050.00	VERNON & DIANA WEBSTER		RESIDENTIAL	0.16	$97,580
061.08-22-051.00	DAVID & PAMELA OSBORNE		RESIDENTIAL	0.19	$103,800
061.08-22-052.00	FRANKLIN BUTCH & ANNA HEDGER		RESIDENTIAL	0.17	$99,800
061.08-22-053.00	CARL & BRENDA LIGHTNER		RESIDENTIAL	0.17	$89,210
061.08-22-054.00	LOY WIDENER, LOY T WIDENER & MARY LOU EPLEY		RESIDENTIAL	0.19	$79,000
061.08-22-055.00	MICHAEL BAKER		RESIDENTIAL	0.19	$70,000
061.09-22-001.03	8001 LLC	AUTO BATH	COMMERCIAL	0.85	$300,000
061.09-22-001.07	8025 DREAM S B INC	BIEDERMAN ED CNTR 5	COMMERCIAL	1.12	$700,000
061.09-22-001.15	S & J HOSPITALITY GROUP LLC	KNIGHTS INN	COMMERCIAL	3.86	$1,380,000
062.00-00-049.00	JOSEPH AND FRANCES BERKSHIRE		AGRICULTURAL	64.50	$6,401,000.00
062.00-25-001.00	FLORENCE MALL LLC	RAVE MOTION PICTURES	COMMERCIAL	60.14	$96,000,000
062.00-25-001.10	COMMONWEALTH OF KY		EXEMPT	7.38	$1,583,600
062.00-25-049.01	CROSSROADS COMMUNITY CHURCH		EXEMPT	11.88	3,230,000.00
073.00-00-003.01	BEF REIT INC BOB EVANS	BOB EVANS RESTAURANT	COMMERCIAL	1.53	$1,591,000
073.00-00-003.02	JAMES GALLENSTEIN		COMMERCIAL	2.46	$1,270,100
073.00-00-003.03	MCDONALDS CORP	MCDONALDS RESTAURANT	COMMERCIAL	1.11	$900,000
073.00-00-003.04	DREAM STREET ENTERPRISES LLC	CHIPOTLE RESTAURANT	COMMERCIAL	0.99	$825,000
073.00-00-003.05	RED LOBSTER INNS OF AMERICA	RED LOBSTER RESTAURANT	COMMERCIAL	1.69	$1,288,000
073.00-00-003.07	G 6 HOSPITALITY PROPERTY		COMMERCIAL	1.60	$2,208,520
073.00-00-003.08	JOHNSON TRUST CO	TIM HOGANS DALTON	COMMERCIAL	1.31	$830,000

KENTUCKY TRANSPORTATION CABINET

Groundbreaking by Design.

I-75 SB Entrance Ramp at Mall Road
I-75 NB Exit Ramp at Mall Road
Properties Potentially Impacted by I-75 NB Exit Ramp at Mall Road
Parcel Boundary

0 150 300 600 Feet

Figure ES2
Alternative 1
I-75/Mall Road
Boone County, KY

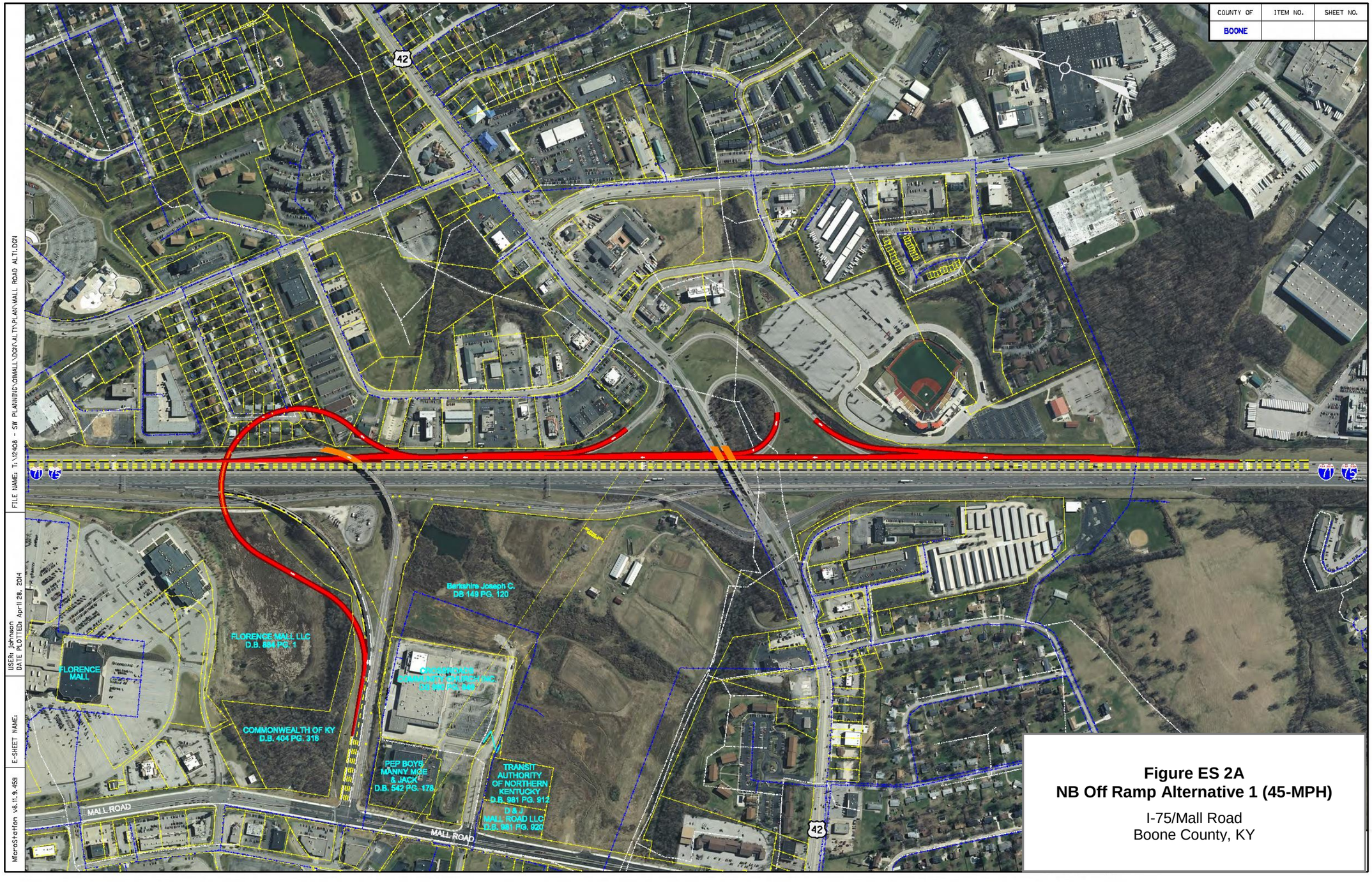


Figure ES 2A
NB Off Ramp Alternative 1 (45-MPH)

I-75/Mall Road
Boone County, KY

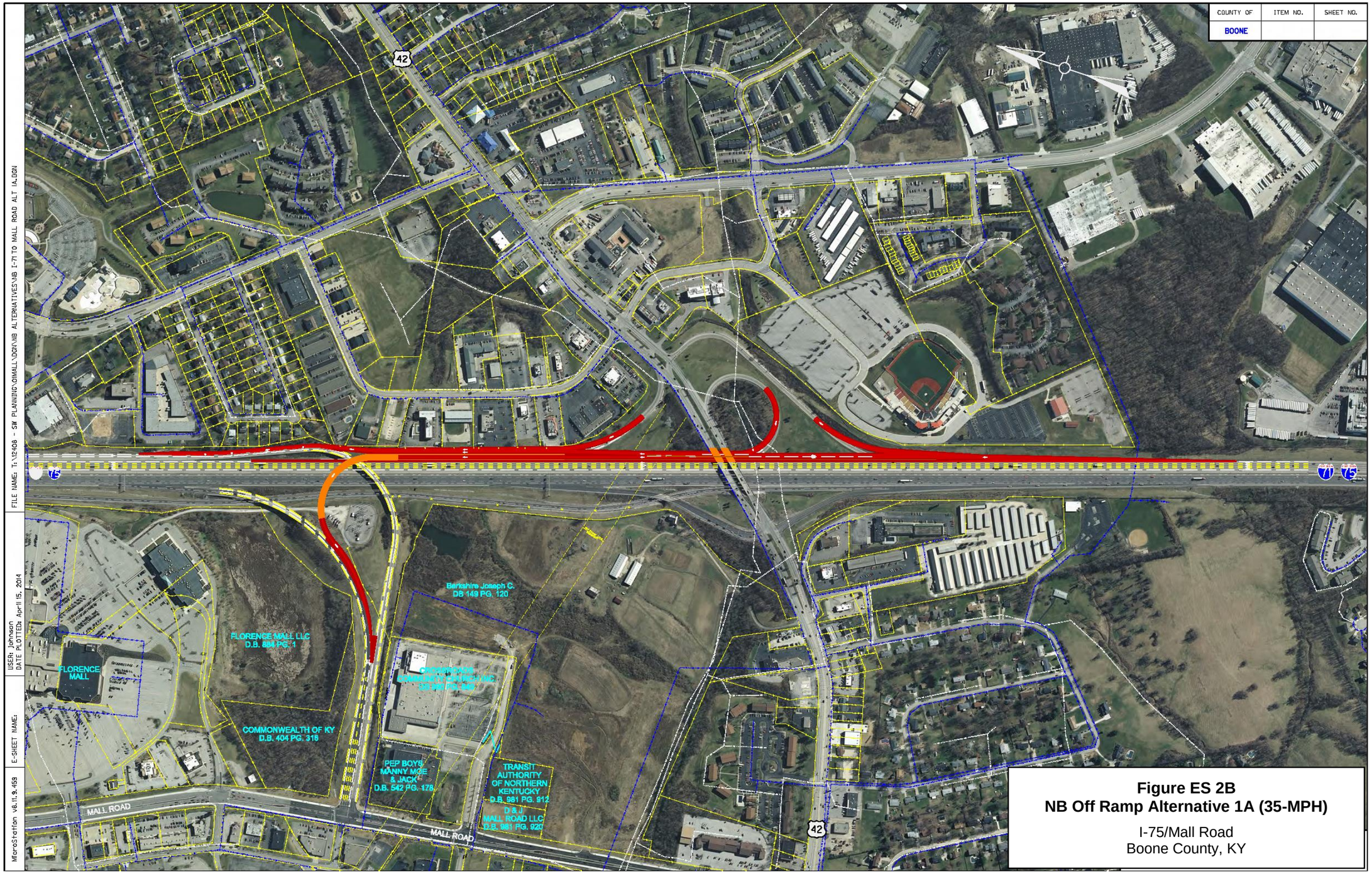


Figure ES 2B
NB Off Ramp Alternative 1A (35-MPH)

I-75/Mall Road
Boone County, KY

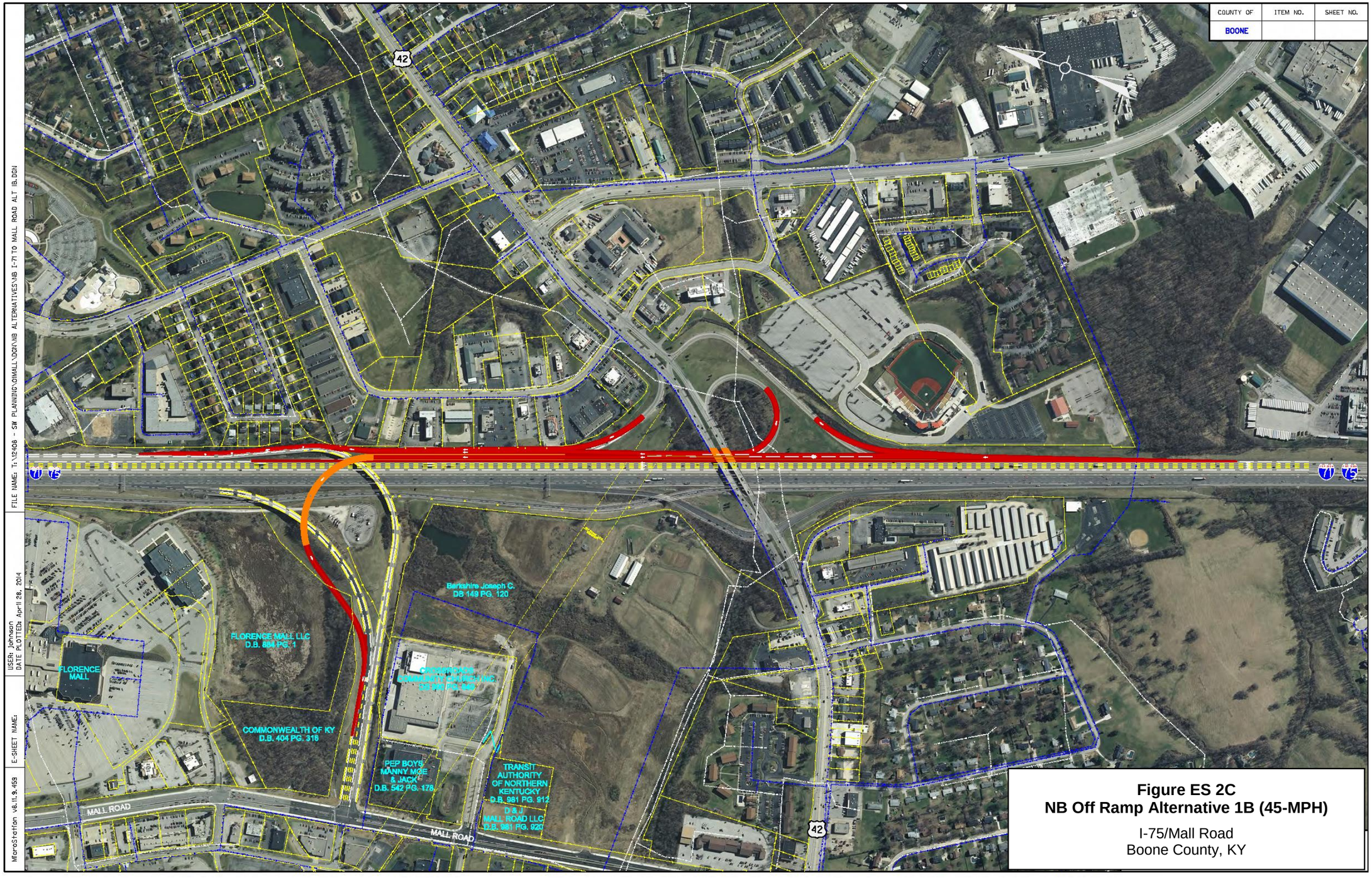


Figure ES 2C
NB Off Ramp Alternative 1B (45-MPH)

I-75/Mall Road
Boone County, KY

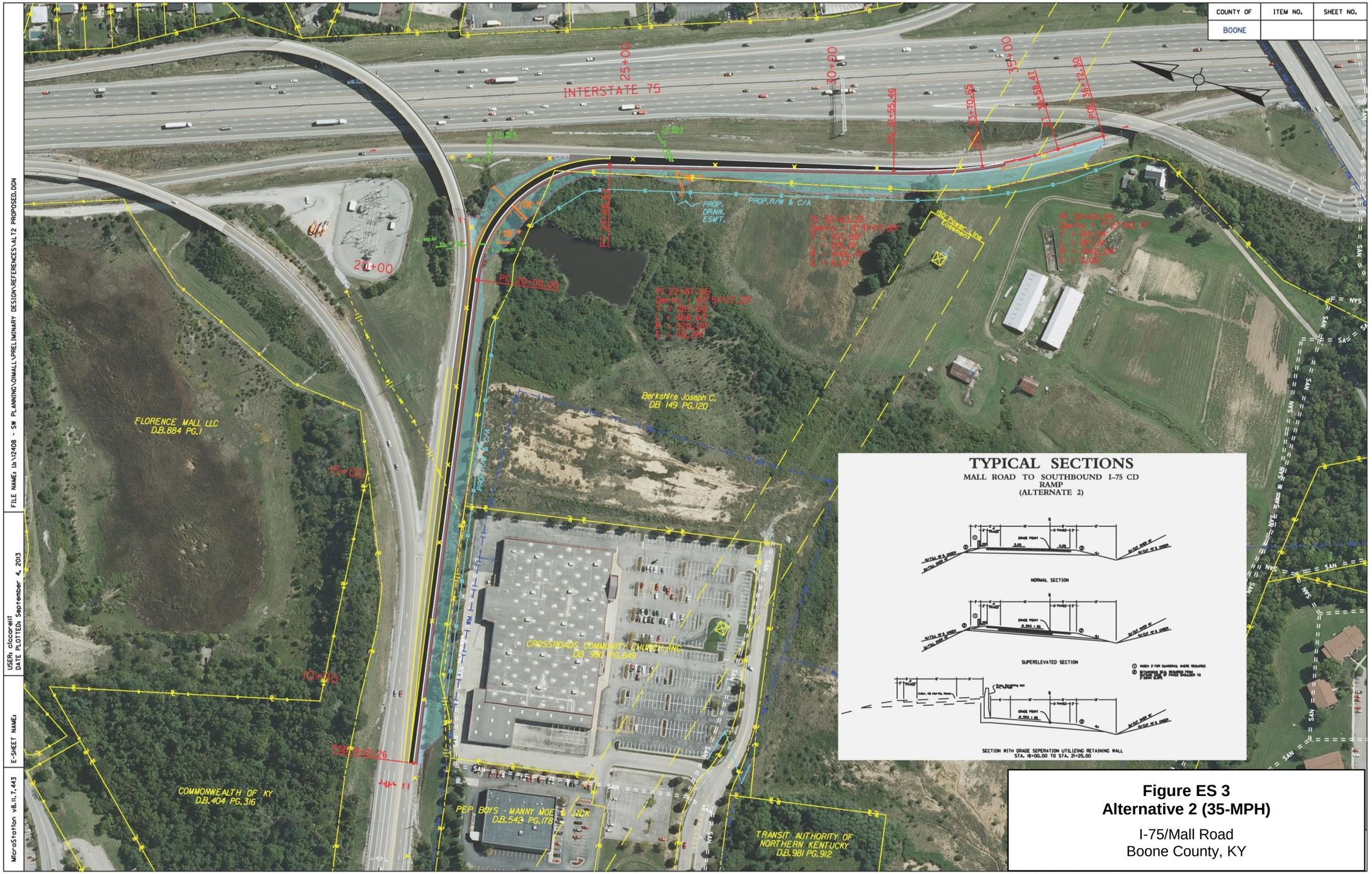


Figure ES 3
Alternative 2 (35-MPH)

I-75/Mall Road
Boone County, KY

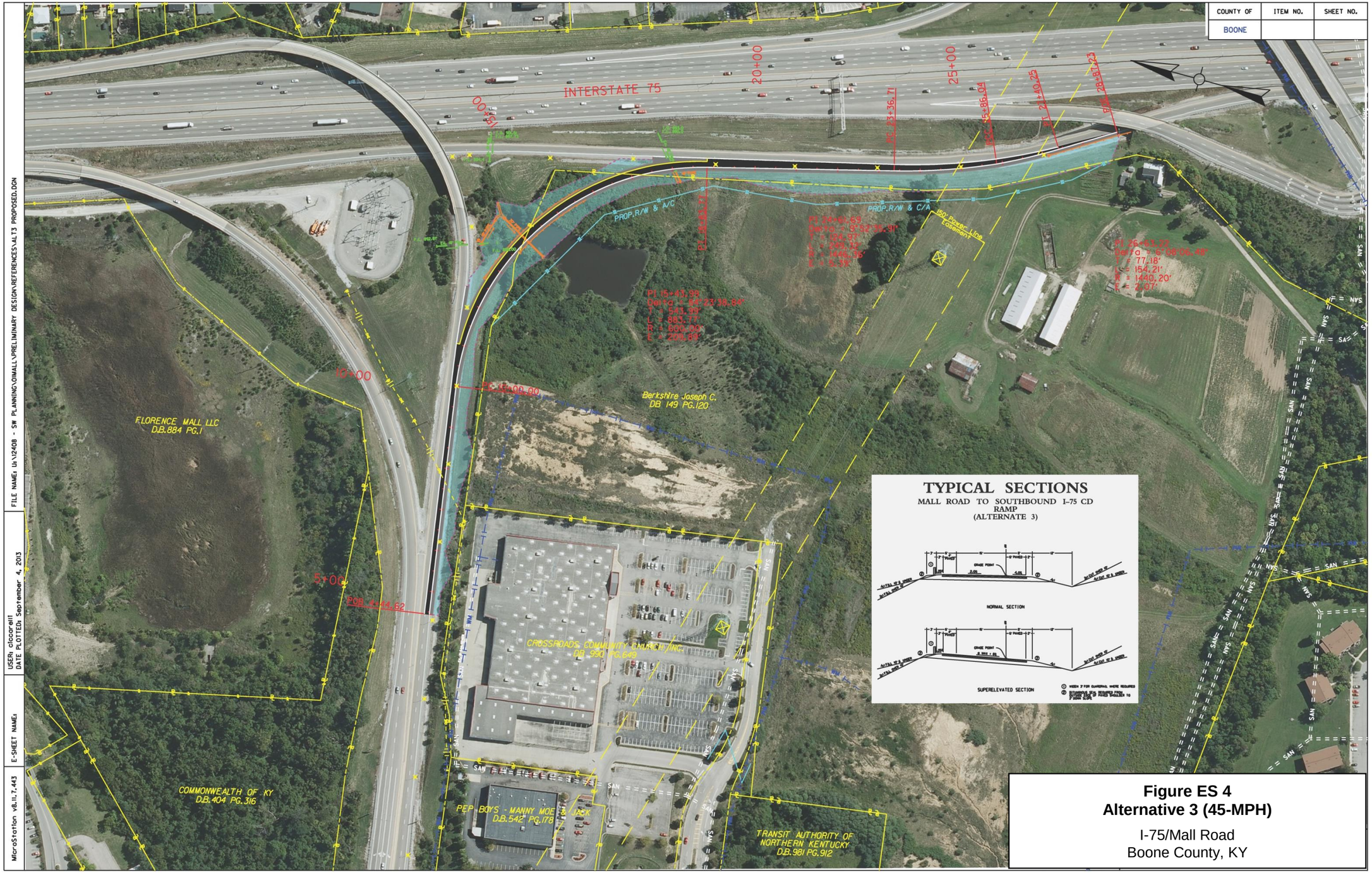


Figure ES 4
Alternative 3 (45-MPH)

I-75/Mall Road
Boone County, KY

A full interchange at Mall Road (Alternative 1) with any of the northbound off ramp alternatives (1, 1A and 1B) requires a northbound flyover exit ramp from I-75 to Mall Road. Extensive development along the east side of I-75 would be directly impacted by a northbound off-ramp to Mall Road from the south (between 21 and 27 parcels for a total value between $15M and $28M). Northbound Ramp Alternative 1 provides for a very short weave for the movement from I-75 NB from US 42 to I-75. Northbound ramp alternatives 1A and 1B also:

- enter existing Mall Road ramp on the left causing motorists traveling westbound to change multiple lanes to exit right to travel to Florence Mall (a major traffic generator);
- do not allow US 42 motorists entering I-75 to travel NB to exit at Mall Road;
- motorists entering I-75 N from US 42 will no longer be able to exit at KY 18.

And lastly the combination of full interchange alternatives has a total cost with all phases ranging from $44 and $55M. Due to the business and residential impacts, the impacts to I-75, current traffic patterns discussed above, and KYTC budget constraints, the northbound off ramp alternatives at Mall Road 1, 1A and 1B were eliminated from additional consideration and not carried forward. They are shown in Table ES1 for informational purposes only.

Table ES1: Preliminary Cost Estimates for Alternatives

Phases	Alternative No-Build	Full Interchange (NB Off Ramp Alternatives 1 & 3)	Alternative 1 NB Off Ramp	Alternative 1A NB Off Ramp	Alternative 1B NB Off Ramp	Alternative 2 (I-75 SB On Ramp at Mall Road) 35-mph	Alternative 3 (I-75 SB On Ramp at Mall Road) 45-mph
# of Affected Parcels	0	28	26	21	27	2	2
Design	$0	$1,527,000	$1,392,000	$1,866,000	$2,014,000	$150,000	$135,000
Right of Way	$0	$27,849,800	$27,425,000	$21,870,000	$14,700,000	$436,000	$424,800
Utilities	$0	$296,800	$232,000	$311,100	$355,700	$159,900	$64,800
Construction	$0	$12,654,400	$11,604,000	$15,554,100	$16,784,100	$706,600	$1,046,400*
Contingencies	$0	$12,300,500	$12,195,900	$11,880,400	$10,150,100	$435,800	$104,600
TOTAL	**$0**	**$54,624,500**	**$52,848,900**	**$51,481,600**	**$43,983,900**	**$1,888,300**	**$1,775,600**

provided by KYTC

The goals for the remaining Alternatives 2 and 3 designs were to minimize costly right-of-way impacts and provide a safe and efficient design, without encroaching upon the C/D road underpass of the I-75 southbound exit ramp to US 42. Because the 45 mph (Alternative 3) design provides a safer and more desirable design, is comparable to the design of the existing I-75 northbound on-ramp at Mall Road, avoids encroachment on the underpass, and considering all phases is actually less expensive (see Table ES1) than the 35-mph design, the project team selected Alternative 3 as the preferred alternative.

Before a change to the Interstate Highway network is advanced, the State must obtain approval from the Federal Highway Administration (FHWA). Such approval is gained through FHWA's positive review of an "Interstate System Access Change Request" hereinafter referred to as an Interchange Modification Report or IMR. The FHWA policy Interstate System Access Information Guide dated August, 2010 identified eight requirements to meet for new or revised access points to the existing Interstate System. Each of these requirements is briefly summarized in the following

- ***Policy Requirement 1: Existing Facilities Capability***

  Existing intersection delays along Mall Road range from 15.5 seconds/vehicle for a level of service C (LOS C) in the AM Peak Hour to 237 seconds/vehicle (LOS F) in the PM Peak Hour. US 42 and KY 18 are also very congested at present. KY 18 is six lanes in a highly developed area with each intersection having multiple existing turn lanes. The US 42 and KY 18 intersections in the study area are operating at a level of service at or near capacity with peak hour intersection delays at LOS E and LOS F in both years 2012 (current) and 2040 (design year).

- ***Policy Requirement 2: Transportation System Management***

  KY 18 is currently six lanes in the project area with multiple turn lanes at each intersection and the adjacent properties are nearly built out. There is little room for Transportation System Management (TSM) improvements, except for access management opportunities.

  Although the area around US 42 (a four-lane facility in the project area) is not completely built out, providing for six lanes on US 42 would be very costly and would likely attract additional vehicles to the I-75 ramps. There is a project in the Ohio Kentucky Indiana Regional Council of Governments (OKI) 2030 Regional Transportation Plan to widen US 42 to six lanes in the area of influence; however, this project is not currently funded.

  Neither ramp metering onto I-75 nor High Occupancy Vehicle (HOV) lanes on I-75 would satisfy the purpose of the project, which is to improve connectivity and safety between the major regional commercial development areas in Florence, Kentucky, and the Interstate System. The proposed improved connection to I-75 from the Mall Road development area would satisfy the project's purpose.

In the study area, I-75 consists of only general purpose lanes—four in each direction. No special use lanes, such as High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes, exist within the study area, the encompassing Northern Kentucky Area, or any portion of I-75 in Kentucky.

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.

- ***Policy Requirement 3: Operational Analysis***

I-75

Adding a southbound I-75 entrance ramp at Mall Road to the C/D road shows I-75 will continue to operate at the same level of service as the No-Build scenario in both the existing and design years.

Because I-75 is at or near capacity during peak hours, many of the merge and diverge movements are at LOS F in the design year for both the No-Build and Build scenarios. There are two changes in levels of service between the No-Build and Build scenarios in 2012.

- I-75 southbound to US 42 improves from LOS E to LOS D in both the AM and PM Peak Hours.
- The movement from I-75 southbound to KY 18 reduces from LOS A to LOS B in the AM Peak Hour.

Ramps

A new southbound ramp will tie into a C/D road that will have a flow rate of 1,989 vehicles per hour (vph) during the most congested 2040 PM peak hour. The capacity for a single lane ramp with a 45 mph design speed is 2,100 passenger cars per hour (pc/hr). This proposed ramp will not reach capacity until after Year 2040. It should also be noted that, with the addition of the southbound auxiliary lane between US 42 and KY 536, which is currently in the right of way acquisition phase, the existing KY18/US 42/new ramp merge will no longer exist.

The HCM analysis shows in the PM Peak Hour, the I-75 southbound ramp to Mall Road will reach capacity in year 2030. The Mall Road/I-75 intersection delay can be improved by adjusting the signal timing to provide additional green time for the I-75 Mall Road ramp.

All signals located on Mall Road are maintained by the city of Florence. KYTC will work with them to retime these signals to minimize delay and improve efficiency along this corridor at the completion of this project. Also, when US 42 is widened,

providing an additional right-turn lane at Mall Road would be beneficial to the overall operation of the route.

Collector / Distributor (C/D) Road - KY 18/US 42 to I-75 SB

With the addition of the proposed I-75 southbound on-ramp at Mall Road, the number of vehicles entering the existing C/D Road has not really changed, just the location at which those vehicles are entering the C/D Road. The capacity of a one-lane ramp roadway with a speed of over 50 mph is 2,200 pc/hr. In the design year 2040 PM Peak Hour (heaviest movement), this C/D Road will not reach capacity until after Year 2040. The proposed southbound on-ramp acceleration length provided in the proposed design is in accordance with the *2011 A Policy on Geometric Design of Highways and Streets* and KYTC policies and the movement will be a yield condition.

It should be noted that, with the addition of the southbound auxiliary lane between US 42 and KY 536, which is currently in the right of way acquisition phase, the existing C/D Road merge movement directly to I-75 will no longer exist because that traffic will have a "dedicated" lane (the new auxiliary lane). This KYTC project was implemented for design prior to this IMR.

Local

The local intersection network analysis shows that the overall delay (seconds per vehicle) 2012 Build scenario improves over the No-Build scenario in the AM Peak Hour by 0.4% and the PM Peak Hour by 3.4%. The overall 2040 Build scenario shows an improvement of 1.0% in the AM Peak, and a slight increase of 2.0% in the PM Peak. This increase was considered acceptable for the peak hour. Actual movement delays and the supporting HCM analyses are located on the enclosed C/D (Appendix D and E), respectively.

Safety

The merge length from US 42 to northbound I-75 is considered deficient. The current acceleration length is 1,200 feet. According to *A Policy on Geometric Design of Highways and Streets 2011*, the minimum acceleration length needed for accelerating from 30 m.p.h. to 70 m.p.h. is 1,350 feet. However, there is not a crash history at this location; therefore, this deficiency was not considered significant. I-75 did not have any CCRF greater than 1.0. Therefore, further analysis was not warranted. US 42, KY 18, and Mall Road exhibit crash issues with CCRFs greater than 1.0 for the 0.1-mile and 0.3-mile spots and the 1.0-mile segments.

That analysis showed that many of the crashes along KY 18, US 42, and Mall Road were attributed to access management related issues. In early 2012 Mall Road was converted to a divided facility with access points at strategic locations.

This access management improvement is expected to reduce the crash rates along this route. However, at the time of this request there were not enough data to make a statistically significant analysis to determine whether a reduction in crashes has occurred.

As shown in Appendix A, Exhibit 16, the additional ramp will require four new signs: one in each direction on Mall Road at the Mall Road/I-75 ramp intersection, and two signs on the I-75 ramp before the northbound/southbound split. No new signs are required on the I-75 mainline. Minor, additional yellow merge warning signs should be considered at the following locations:

- On the existing C/D Road prior to the proposed I-75 southbound on ramp via the C/D Road warning motorists of the pending merge;
- On the proposed I-75 southbound on ramp prior to it joining the existing C/D Road warning travelers from Mall Road of the impending merge;
- The existing merge warning should stay in place for the US 42 merge onto the existing C/D Road warning C/D motorists of the merge onto I-75;
- Where the C/D Road will eventually merge with the southbound auxiliary lane from KY 536 to US 42 that is currently in the right of way phase, informing motorists of the added lane (when constructed).

- ***Policy Requirement 4: Access Connections and Design***

Three alternatives were studied for this IMR: Alternative 1 – a full interchange with all moves considering three northbound off ramp alternatives (1, 1A, and 1B); Alternative 2 – a southbound on ramp designed at 35 mph; and Alternative 3 – a southbound on ramp designed at 45 mph. All southbound ramps would tie to an existing collector distributor road. Due to KYTC budget constraints, and the extensive development along the east side of I-75 that would be directly impacted by a northbound off-ramp to Mall Road from the south, a northbound exit ramp was eliminated from further consideration and the operational analysis. Alternatives 2 and 3 were advanced to the operational analysis.

Alternative 3 was selected as the preferred alternative and would involve constructing a southbound ramp in the southwest quadrant of the current partial interchange to I-75 via an existing C/D road. The proposed access would be designed and built to current KYTC and FHWA design standards.

- ***Policy Requirement 5: Transportation and Land Use Plans***

The addition of an I-75 southbound on-ramp at Mall Road (Alternative 2 or 3) was identified as a priority in the Boone County Transportation Plan 2030, was a recommended project in the County Planning Commission's 2012 Mall Road District Study, was identified in the OKI 2040 Regional Transportation Plan, and was ranked #5 in the Highway District-6 Transportation Plan (October 2011) and is

consistent with the Northern Kentucky Planning Commission's 2035 Land Use Plan.

- ***Policy Requirement 6: Comprehensive Interstate Network Study***

  No other interchange additions are foreseen by any long-range plan of OKI, the Northern Kentucky Area Development District, or KYTC.

- ***Policy Requirement 7: Coordination with Transportation System Improvements***

  During the planning processes, this interchange modification went through the Statewide Transportation Improvement Program (STIP) and the OKI TIP (# 6-409) public comment period. KYTC met with local elected officials as a part of the District-6 Transportation Plan. The 2012 Highway Plan also went through a public comment period.

- ***Policy Requirement 8: Status of Planning and NEPA***

  The preferred alternative recommended in this report will be included as an alternative in the required environmental evaluation, review, and processing. Currently this project is expected to be accomplished with state funds; however, because it will require Federal approval, an environmental document will be required by FHWA. The expected level of NEPA action is a CE-1 due to minimal right of way affected, no relocations, and overall minimal expected impacts.

In summary, a southbound on-ramp via the current C/D road to I-75 southbound is a low cost addition that will provide better connectivity to and from the Mall Road development area and will distribute the traffic to three separate interchanges. I-75 in the area of influence exhibits LOS E in the current year and LOS F in the design year 2040 for the No-Build scenario. Adding a southbound I-75 entrance ramp at Mall Road to the C/D road shows I-75 will continue to operate at the same level of service as the No-Build scenario. The overall average delay between Build and No-Build scenarios for the existing intersections in the area of influence, decreases in the year 2012 by 0.4% in the AM Peak Hour, and 3.4% in the PM Peak Hour.

Those same intersections' overall average delay between Build and No-Build scenarios for the existing intersections in the area of influence decreases in the year 2040 by 1.0% in the AM Peak Hour, and increases only 2.0% in the PM Peak Hour. This increase was considered acceptable and will not adversely impact I-75 in the project area.

1.0 INTRODUCTION

The proposed project is located in Florence, Kentucky, in eastern Boone County, and is the addition of a new ramp from the Mall Road development area to southbound I-75 via an existing collector/distributor (C/D) road. At present, there is a partial interchange on I-75 at Mall Road (Exit 180-A, MP 180.853) that provides for two movements (to and from the north) as follows: (1) from southbound I-75 to Mall Road, and (2) from Mall Road to I-75 northbound (Figure 1). This proposed interchange modification would provide for a third movement at this interchange via a new entrance ramp from Mall Road to a one-lane southbound C/D road that is part of the I-75 system.

The entrance ramp is recommended in the Boone County Planning Commission's 2012 *Mall Road District Study* (discussed in section 1.2), and the project is ranked as the fifth highest priority in the District-6 2011 District Transportation Plan. This project has been included in the *Enacted 2012 KYTC Highway Plan* as Item No. 6-409.00, which has identified SPP (state funds) for all phases - Design (2013), Right-of-Way (2014), Utilities (2014), and Construction (2015). It is also included in the *KYTC 2013 State Transportation Improvement Program* and in the Ohio Kentucky Indiana Regional Council of Governments *(OKI) FY 2014-2017 Transportation Improvement Program.*

1.1 Purpose of the Report

Before a change to the Interstate Highway network is advanced, the State must obtain approval from the Federal Highway Administration (FHWA). Such approval is gained through FHWA's positive review of an "Interstate System Access Change Request" hereinafter referred to as an Interchange Modification Report or IMR. The most recent FHWA guidance for requesting an Interstate System access change is the Interstate *System Access Informational Guide* (dated August 2010). The *Guide* states: "…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...." (p. 8). The purpose of this report is to document that first step. The *Guide* also explains the eight policy requirements the State must follow when seeking interchange modification approval. Each of the eight policy requirements is addressed at appropriate levels in this report; with the primary purpose of this IMR being to address the operational and engineering acceptability of the proposed southbound entrance ramp.

As Policy Requirement 8 states, FHWA cannot approve the Final IMR until an environmental document is prepared in accordance with the National Environmental Policy Act (NEPA). The required NEPA document will be developed during the next phase of this proposed project. At that time, the environmental document will be submitted for FHWA approval.

1.2 Background and Setting

Mall Road provides access to the Florence Mall, a multi-level mall with 120 retail stores, 1.1 million gross square feet of retail space, and approximately 5,200 parking spaces. In

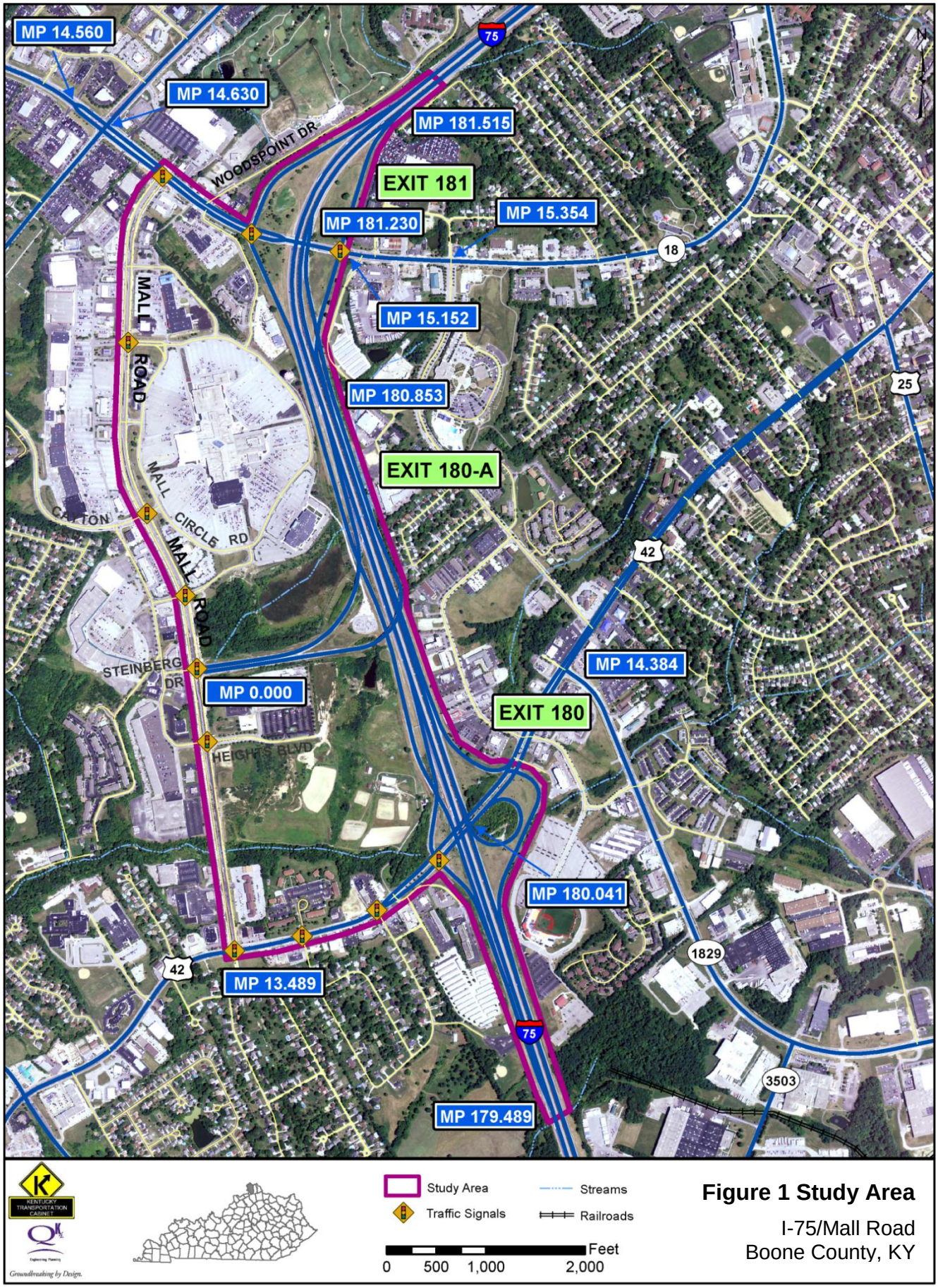


Figure 1 Study Area

I-75/Mall Road
Boone County, KY

addition, the entire corridor is comprised of several smaller strip shopping areas. Over the years, substantial development has occurred in the area surrounding the mall. The Boone County Planning Commission published the *Mall Road District Study* in March 2012 to assess the existing conditions and potential future land uses of the area. The *District Study* is composed of two documents—the "Existing Conditions Report" and the "Plan Recommendations Report" (combined in Appendix B and included on the CD in the back cover). The Mall Road District extends from KY 18 south to US 42, and is bisected by Mall Road. The area is 490 acres, and, according to the *District Study*:

> *The land use…is mostly comprised of varying types of commercial uses. Assorted types of retail uses are predominant, with restaurants and services uses making up a smaller yet still significant proportion of the whole. There are several larger single user retail buildings in the Area, several of which are currently vacant. Most uses in the Study Area are within multi-tenant and/or multi-building centers or clusters. The dominant commercial center is the Florence Mall itself. The one entertainment use of note is the movie theater that is located on the southeast part of the Mall property. ("Existing Conditions Report," p. 5.1)*

The study area is poised for even more growth. It is all zoned for high density commercial and mixed land uses. Figure 2, excerpted from the "Existing Conditions Report" (p. 5.2), illustrates the existing and planned development sites. Currently, motorists traveling I-75 in Boone County can access Mall Road from, and egress Mall Road to, the north. However, there is no direct access to or from the south to Mall Road. Motorists who are leaving Mall Road to travel south on I-75 must travel south on Mall Road and then east on US 42 to the I-75 southbound entrance ramp at the I-75/US 42 interchange. The second option is to travel north on Mall Road, turn east onto KY 18, and enter I-75 at the southbound entrance ramp. This proposed project would provide access to I-75 via the existing C/D road directly from Mall Road. Recognizing the need for congestion relief and access improvement to this development area, the *District Study* included the following entrance ramp recommendation:

> ***Construct New I-75 Southbound Entrance Ramp (Map ID 13)***
>
> *In order to alleviate traffic congestion during peak times at the KY 18 and US 42 intersections, it is recommended that an I-75 southbound entrance ramp from Mall Road be constructed. Such an improvement also allows for "mid-block" access to I-75 south from Mall Road without having to travel to KY 18 and US 42, thus preserving these intersections or corridors for more local traffic use. This improvement is also being recommended in the update of the State's Six Year Transportation Plan. ("Plan Recommendations Report," p. 6.4)*

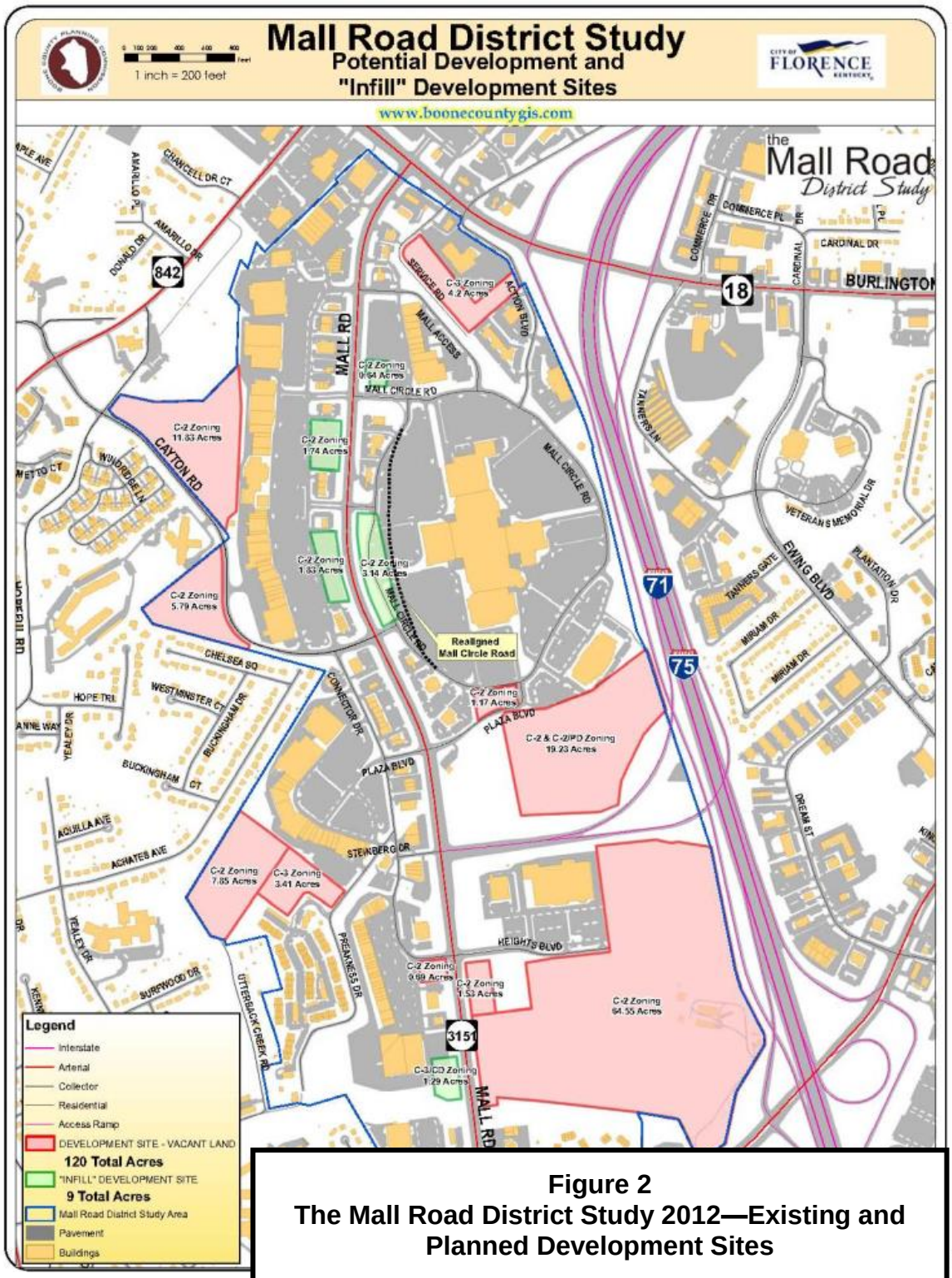


Figure 2
The Mall Road District Study 2012—Existing and Planned Development Sites

I-75/Mall Road
Boone County, KY

Figure 3, excerpted from the "Plan Recommendations Report" (p. 6.2), illustrates the Planning Commission's recommended transportation improvements, including the proposed southbound ramp, which is shown as ID #13.

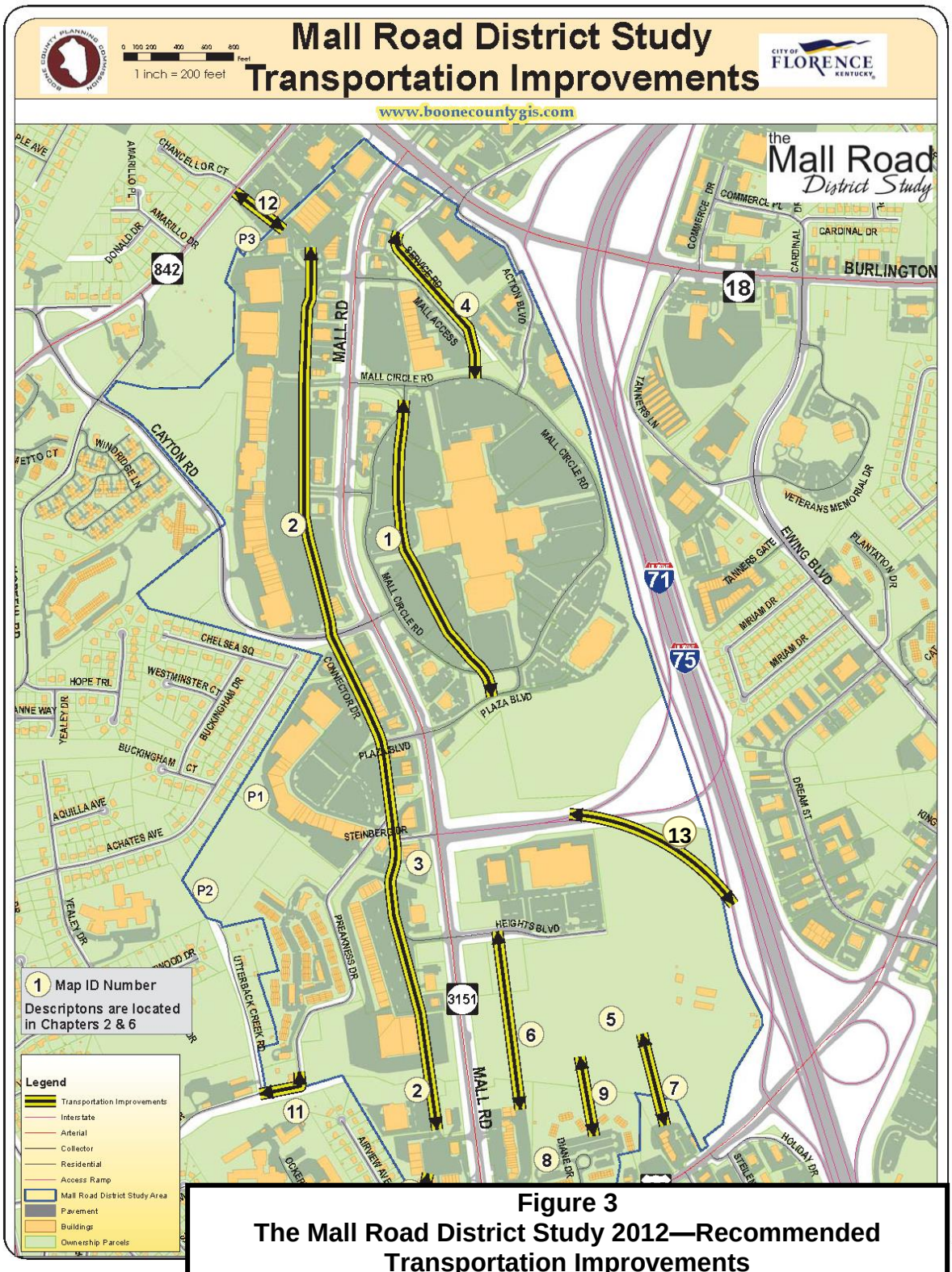


Figure 3
The Mall Road District Study 2012—Recommended Transportation Improvements

I-75/Mall Road; Boone County, KY

1.3 Area of Influence

The area of influence for the proposed southbound ramp (see Figure 4), as identified by the current KYTC/Consultant Project Team, is bound by Mall Road to the west, KY 18 to the north, US 42 to the south, and the I-75 northbound off/northbound on-ramps to the east. Each ramp for KY 18 and US 42 was analyzed to the point where it merges with or diverges from I-75, hence the irregular shape.

A critical issue for urban freeway operations is interchange and ramp spacing. In urban areas, spacing of less than one mile is handled by grade separated ramps or by collector distributor roads and ensuring proper ramp spacing is important for weaving. Appendix A, Exhibit 1 illustrates the current distances between successive ramps in the area of influence.

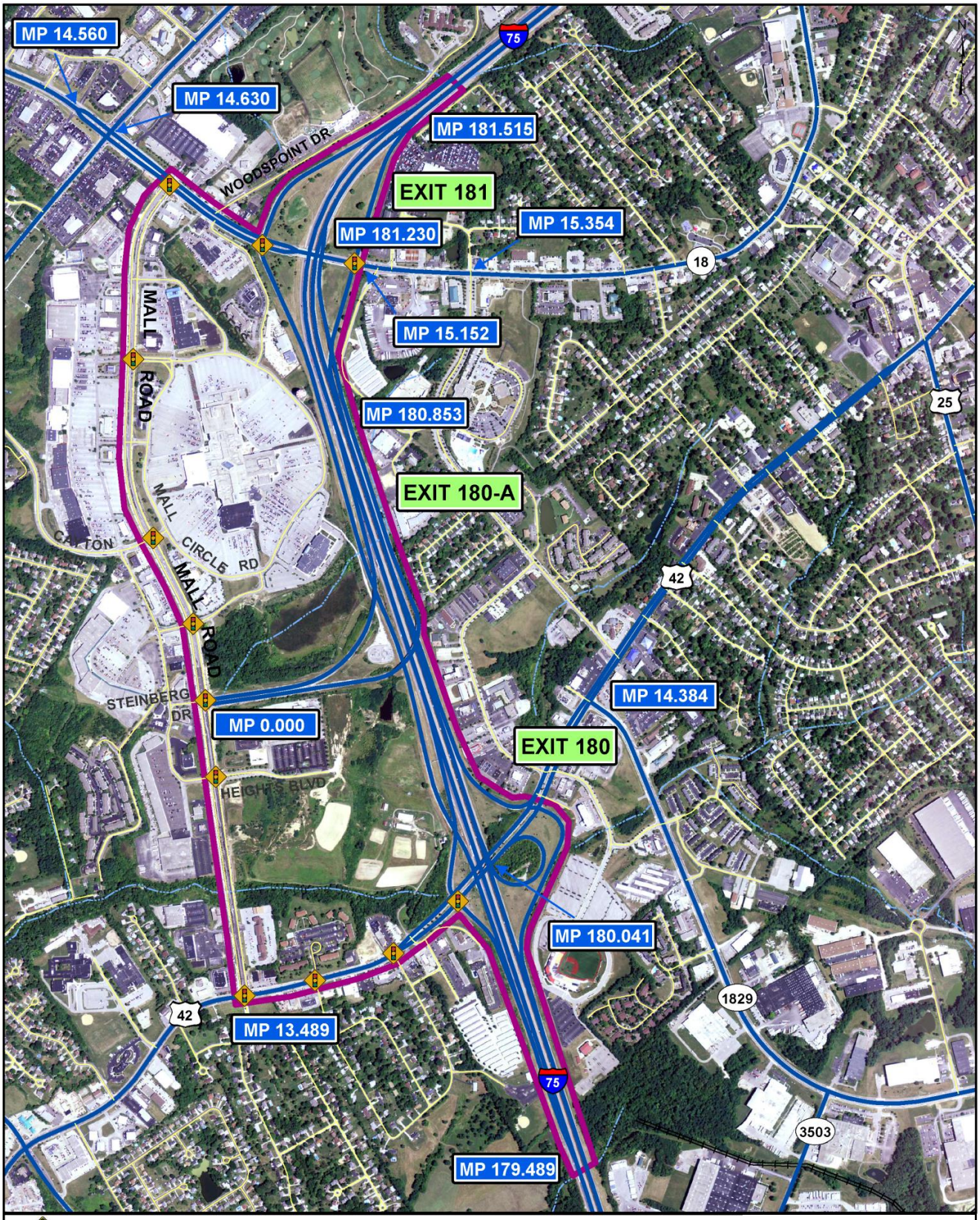
Focusing on the existing Mall Road ramps, the closest ramp to the I-75 NB on ramp at Mall Road is the KY 18 NB on ramp to the north at a distance of approximately 1,500 feet. The closest ramp to the south of the I-75 NB on ramp to I-75 is the US 42 on ramp to I-75 at a distance of over 6,700 feet. The I-75 southbound exit ramp to Mall Road is separated from the I-75 SB exit ramp to KY 18 SB exit by approximately 4,060 feet and the southbound entrance ramp from KY 18/US 42C/D road by 3,560 feet. As will be discussed later in this report, KYTC is beginning the right of way phase for adding auxiliary lanes between US 42 and KY 536 (next interchange south of US 42) both northbound and southbound in this area.

Through the area of influence, I-75 is an interstate highway that carries 125,700 vehicles per day (vpd) in the southern portion of the area of influence, and 168,350 vpd north toward Cincinnati. It is projected to carry from 163,100 to 221,300 vpd in year 2040. KY 18 is an urban arterial with six through driving lanes in each direction and multiple turn lanes at major intersections. KY 18 has an average daily traffic (ADT) ranging from 18,500 vpd east of I-75 to 49,000 vpd west of I-75. Those volumes are expected to grow to 27,100 and 64,600 vpd, respectively in design year 2040> US 42 is a four-lane urban arterial that currently carries between 31,800 and 36,000 vpd, and is expected to carry 42,700 to 47,600 vpd.

Mall Road was initially designed in the 1970s as an undivided five-lane section, with no sidewalks and limited access. Mall Road was recently reconstructed over two phases into a “boulevard-style” street with two lanes in each direction, a raised landscaped center median, and 10-foot-wide curb walks on each side of the road, along with landscaping and street furniture enhancements. It is now classified as a city street and currently carries between 14,800 to 16,800 vpd. It is projected to carry between 19,600 to 23,500 vpd in the design year 2040.

As shown in Figure 4 on page 7, there are seven signalized intersections along Mall Road:

- KY 18/Mall Road



Area of Influence
Streams
Traffic Signals
Railroads
Feet
0 500 1,000 2,000

Figure 4
Area of Influence

I-75/Mall Road
Boone County, KY

- Mall Circle Road/Mall Road
- Cayton Road/Mall Road
- Plaza Boulevard/Mall Road
- Steinberg Drive/I-75 Ramps/Mall Road
- Heights Boulevard /Mall Road
- US 42/Mall Road

1.4 Purpose and Need

The purpose of this proposed project is to improve connectivity and safety between the major regional commercial development areas in Florence, Kentucky, and the Interstate System.

Crash rates are above the average for KY 18, US 42, and Mall Road when compared to similar type roadways in Kentucky. The many access points along these roadway segments are contributing to congestion and crashes. Currently, motorists traveling Mall Road have access only to northbound I-75 via Exit 180-A (MP 180.853). For I-75 northbound motorists, there is not a northbound exit ramp at Exit 180-A to Mall Road. Motorists on Mall Road wishing to travel south on I-75 currently have two options:

- Travel south on Mall Road to US 42, then travel east on US 42 to the southbound I-75 ramp via Exit 180 (MP 180.041).
- Travel north on Mall Road, turn east onto KY 18, and enter the southbound I-75 ramp via Exit 181 (MP 181.230).

Travelers using either option encounter congested intersections and numerous traffic signals. There are seven traffic signals on Mall Road, three signals between Mall Road and the I-75/US 42 southbound ramps, and one traffic signal between Mall Road and the I-75/KY 18 southbound ramps. Development area traffic could travel through as many as five signalized intersections to reach I-75 to travel southbound. Each signalized intersection has 32 conflict points. Additional conflict points occur at individual entrances between those signalized intersections. Existing intersection delays range from 15.5 seconds/vehicle for a level of service C (LOS C) in the AM Peak Hour to 237 seconds/vehicle (LOS F) in the PM Peak Hour. Tables 1 and 2 (p.9) show the US 42 and KY 18 ramp terminal intersections with peak hour intersection delays at LOS E and LOS F in both years 2012 (current) and 2040 (design year).

Table 1: 2012 Build vs. No-Build Intersection Delay Summary

Intersection Number		TOTALS	No-Build AM Design Hour	Build AM Design Hour	No-Build PM Design Hour	Build PM Design Hour	PERCENT CHANGE IN BUILD VERSUS NO-BUILD DELAYS	
1	Mall Rd @ KY 18	Total Volume	3,881	3,882	6,680	6,532	INTERSECTION 1	
		Total Delay	60,112.2	60,642.6	827,211.5	760,896.3		
		Average Delay	15.5	15.6	123.8	116.5	AM	PM
		LOS	**B**	**B**	**F**	**F**	**0.9%**	**-5.9%**
2	I-75 SB Ramps @ KY 18	Total Volume	3,925	3,968	5,875	5,669	INTERSECTION 2	
		Total Delay	488,628.7	489,687.2	1,166,122.8	1,081,322.9		
		Average Delay	124.5	123.4	198.5	190.7	AM	PM
		LOS	**F**	**F**	**F**	**F**	**-0.9%**	**-3.9%**
3	I-75 NB Ramps @ KY 18	Total Volume	3,136	3,333	4,948	4,896	INTERSECTION 3	
		Total Delay	180,035.7	187,873.6	1,173,725.1	1,172,256.1		
		Average Delay	57.4	56.4	237.2	239.4	AM	PM
		LOS	**E**	**E**	**F**	**F**	**-1.8%**	**0.9%**
4	I-75 NB Ramps @ US 42	Total Volume	663	663	629	629	INTERSECTION 4	
		Total Delay	94,449.7	94,449.7	31,269.0	31,269.0		
		Average Delay	142.5	142.5	49.7	49.7	AM	PM
		LOS	**F**	**F**	**D**	**D**	**0.0%**	**0.0%**
5	I-75 SB Ramps @ US 42	Total Volume	3,388	3,410	3,968	3,968	INTERSECTION 5	
		Total Delay	147,457.8	150,347.8	648,589.9	648,589.9		
		Average Delay	43.5	44.1	163.5	163.5	AM	PM
		LOS	**D**	**D**	**F**	**F**	**1.3%**	**0.0%**
6	Mall Rd @ US 42	Total Volume	3,240	3,258	4,203	4,203	INTERSECTION 6	
		Total Delay	102,142.1	104,166.0	753,419.5	753,419.5		
		Average Delay	31.5	30.1	179.3	178.3	AM	PM
		LOS	**C**	**C**	**F**	**F**	**-4.4%**	**-0.5%**
7	Mall Rd @ I-75 Ramps	Total Volume	1,275	1,406	1,651	2,186	INTERSECTION 7	
		Total Delay	29,592.9	34,027.7	52,709.2	67,517.1		
		Average Delay	23.2	24.2	31.9	30.9	AM	PM
		LOS	**C**	**C**	**C**	**C**	**4.3%**	**-3.3%**
TOTALS	**All Intersections**	Total Volume	19,508	19,920	27,954	28,083	TOTAL INTERSECTION NETWORK DELAY	
		Total Delay	1,102,419.1	1,121,194.6	4,653,047.0	4,515,270.8		
		Average Delay	56.5	56.3	166.5	160.8	AM	PM
		LOS	**E**	**E**	**F**	**F**	**-0.4%**	**-3.4%**

Table 2: 2040 Build vs. No-Build Intersection Delay Summary

Intersection Number		TOTALS	No-Build AM Design Hour	Build AM Design Hour	No-Build PM Design Hour	Build PM Design Hour	PERCENT CHANGE IN BUILD VERSUS NO-BUILD DELAYS	
1	Mall Rd @ KY 18	Total Volume	4,692	4,702	8,084	8,084	INTERSECTION 1	
		Total Delay	85,403.7	85,949.5	1,815,587.3	1,815,587.3		
		Average Delay	18.2	18.	224.6	224.6	AM	PM
		LOS	**B**	**B**	**F**	**F**	**0.4%**	**0.0%**
2	I-75 SB Ramps @ KY 18	Total Volume	4,840	4,893	6,752	6,545	INTERSECTION 2	
		Total Delay	685,594.3	685,136.7	2,318,169.9	2,299,103.2		
		Average Delay	141.7	140.0	343.3	351.3	AM	PM
		LOS	**F**	**F**	**F**	**F**	**-1.1%**	**2.3%**
3	I-75 NB Ramps @ KY 18	Total Volume	3,750	4,166	5,051	5,312	INTERSECTION 3	
		Total Delay	905,158.2	917,280.8	1,159,031.0	1,172,881.4		
		Average Delay	241.4	220.2	229.5	220.8	AM	PM
		LOS	**F**	**F**	**F**	**F**	**-8.8%**	**-3.8%**
4	I-75 NB Ramps @ US 42	Total Volume	679	679	520	52	INTERSECTION 4	
		Total Delay	360,814.4	360,814.4	120,624.0	120,624.0		
		Average Delay	531.4	531.4	232.0	232.0	AM	PM
		LOS	**F**	**F**	**F**	**F**	**0.00%**	**0.00%**
5	I-75 SB Ramps @ US 42	Total Volume	4,445	4,412	9,753	9,753	INTERSECTION 5	
		Total Delay	479,948.8	479,046.4	6,221,059.0	6,221,059.0		
		Average Delay	108.0	108.6	637.9	637.9	AM	PM
		LOS	**F**	**F**	**F**	**F**	**0.6%**	**0.0%**
6	Mall Rd @ US 42	Total Volume	4,252	4,193	5,551	5,928	INTERSECTION 6	
		Total Delay	261,356.4	264,365.0	1,606,530.0	1,790,905.1		
		Average Delay	61.5	63.0	289.4	302.1	AM	PM
		LOS	**E**	**E**	**F**	**F**	**2.6%**	**4.4%**
7	Mall Rd @ I-75 Ramps	Total Volume	1,725	1,691	2,939	3,373	INTERSECTION 7	
		Total Delay	43,967.0	41,993.4	492,356.3	907,561.1		
		Average Delay	25.5	24.8	167.5	269.1	AM	PM
		LOS	**C**	**C**	**F**	**F**	**-2.6%**	**60.6%**
TOTALS	**All Intersections**	Total Volume	24,383	24,736	38,650	39,515	TOTAL INTERSECTION NETWORK DELAY	
		Total Delay	2,822,242.8	2,834,586.2	13,733,357.5	14,327,721.1		
		Average Delay	115.7	114.6	355.3	362.6	AM	PM
		LOS	**F**	**F**	**F**	**F**	**-1.0%**	**2.0%**

NOTES: Only movements that contribute to delay are included in these tables. Right Turns on Red are excluded from this analysis. Total Volume = vehicles/hour Total Delay = seconds/vehicle Average Delay = seconds/vehicle

2.0 PROPOSED INTERCHANGE MODIFICATION

The proposed I-75/Mall Road interchange modification would involve constructing a southbound ramp in the southwest quadrant of the current partial interchange to I-75 via an existing C/D road. This project would result in access to and/or from Mall Road from three separate I-75 interchanges. Such an improvement would allow for "mid-block" access to I-75 south from Mall Road without having to travel through congested KY 18 and US 42 intersections, thus preserving these intersections or corridors for more local traffic use.

A No-Build and three build alternatives (with three northbound off ramp alternatives) at Mall Road and I-75 were studied for this IMR:

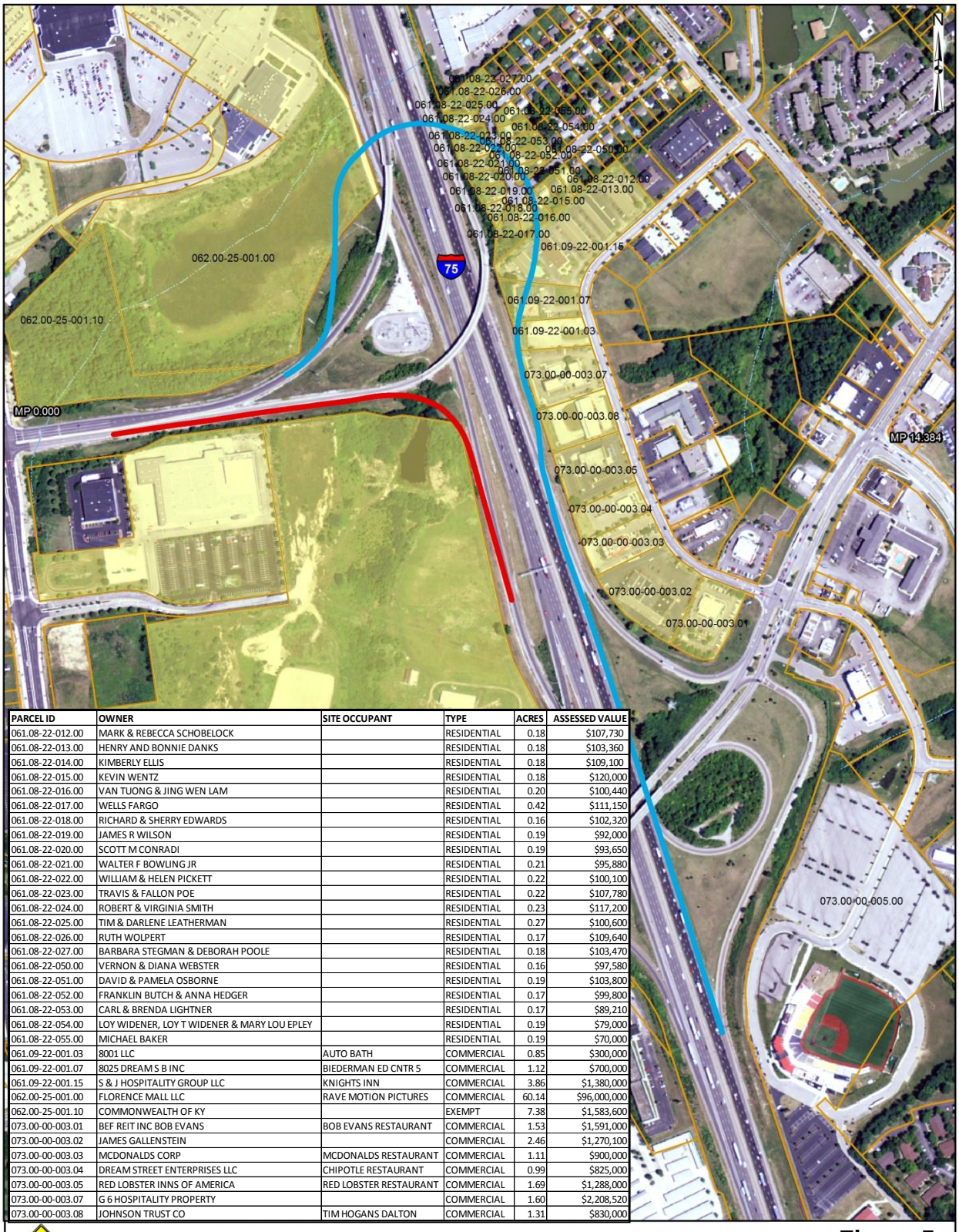
- Alternative 1 (Figure 5) – provides for a full interchange at Mall Road (Exit 180-A) by adding a northbound off ramp (Alternative 1, 1A 1B (Figures 5A, 5B and 5C, respectively)) and a southbound on ramp via a collector distributor road;
- Alternative 2 (Figure 6) – provides a southbound on ramp via a collector distributor road with a design speed of 35 mph; and
- Alternative 3 (Figure 7) - provides a southbound on ramp via a collector distributor road with a design speed of 45 mph.

The existing I-75 interchange with Mall Road is a partial interchange. To make this interchange a full interchange would require a northbound flyover exit ramp from I-75 to Mall Road, identified in Alternative 1. A direct access northbound off-ramp at Mall Road would affect between 19 and 26 properties, ranging in estimated value total between $15M and $28M. The commercial properties include Bob Evans, McDonald's, Motel 6, Knights Inn, Red Lobster, and the Florence Mall. A northbound off-ramp at Mall Road will most likely require a C/D road from the US 42 northbound off-ramp.

The Northbound Ramp Alternative 1 provides for a very short weave for the movement from I-75 NB from US 42 to I-75. Northbound ramp alternatives 1A and 1B also:

- enter existing Mall Road ramp on the left causing motorists traveling westbound to change multiple lanes to exit right to travel to Florence Mall (a major traffic generator);
- do not allow US 42 motorists entering I-75 to travel NB to exit at Mall Road;
- motorists entering I-75 N from US 42 will no longer be able to exit at KY 18.

And lastly the combination of full interchange alternatives has a total cost with all phases ranging from $44 and $55M. Due to the business and residential impacts, the impacts to I-75 current traffic patterns discussed above, and KYTC budget constraints, the northbound off ramp alternatives at Mall Road 1, 1A and 1B were eliminated from additional consideration and not carried forward. A northbound exit ramp is not included in this request or in the operational analysis.



PARCEL ID	OWNER	SITE OCCUPANT	TYPE	ACRES	ASSESSED VALUE
061.08-22-012.00	MARK & REBECCA SCHOBELOCK		RESIDENTIAL	0.18	$107,730
061.08-22-013.00	HENRY AND BONNIE DANKS		RESIDENTIAL	0.18	$103,360
061.08-22-014.00	KIMBERLY ELLIS		RESIDENTIAL	0.18	$109,100
061.08-22-015.00	KEVIN WENTZ		RESIDENTIAL	0.18	$120,000
061.08-22-016.00	VAN TUONG & JING WEN LAM		RESIDENTIAL	0.20	$100,440
061.08-22-017.00	WELLS FARGO		RESIDENTIAL	0.42	$111,150
061.08-22-018.00	RICHARD & SHERRY EDWARDS		RESIDENTIAL	0.16	$102,320
061.08-22-019.00	JAMES R WILSON		RESIDENTIAL	0.19	$92,000
061.08-22-020.00	SCOTT M CONRADI		RESIDENTIAL	0.19	$93,650
061.08-22-021.00	WALTER F BOWLING JR		RESIDENTIAL	0.21	$95,880
061.08-22-022.00	WILLIAM & HELEN PICKETT		RESIDENTIAL	0.22	$100,100
061.08-22-023.00	TRAVIS & FALLON POE		RESIDENTIAL	0.22	$107,780
061.08-22-024.00	ROBERT & VIRGINIA SMITH		RESIDENTIAL	0.23	$117,200
061.08-22-025.00	TIM & DARLENE LEATHERMAN		RESIDENTIAL	0.27	$100,600
061.08-22-026.00	RUTH WOLPERT		RESIDENTIAL	0.17	$109,640
061.08-22-027.00	BARBARA STEGMAN & DEBORAH POOLE		RESIDENTIAL	0.18	$103,470
061.08-22-050.00	VERNON & DIANA WEBSTER		RESIDENTIAL	0.16	$97,580
061.08-22-051.00	DAVID & PAMELA OSBORNE		RESIDENTIAL	0.19	$103,800
061.08-22-052.00	FRANKLIN BUTCH & ANNA HEDGER		RESIDENTIAL	0.17	$99,800
061.08-22-053.00	CARL & BRENDA LIGHTNER		RESIDENTIAL	0.17	$89,210
061.08-22-054.00	LOY WIDENER, LOY T WIDENER & MARY LOU EPLEY		RESIDENTIAL	0.19	$79,000
061.08-22-055.00	MICHAEL BAKER		RESIDENTIAL	0.19	$70,000
061.09-22-001.03	8001 LLC	AUTO BATH	COMMERCIAL	0.85	$300,000
061.09-22-001.07	8025 DREAM S B INC	BIEDERMAN ED CNTR 5	COMMERCIAL	1.12	$700,000
061.09-22-001.15	S & J HOSPITALITY GROUP LLC	KNIGHTS INN	COMMERCIAL	3.86	$1,380,000
062.00-25-001.00	FLORENCE MALL LLC	RAVE MOTION PICTURES	COMMERCIAL	60.14	$96,000,000
062.00-25-001.10	COMMONWEALTH OF KY		EXEMPT	7.38	$1,583,600
073.00-00-003.01	BEF REIT INC BOB EVANS	BOB EVANS RESTAURANT	COMMERCIAL	1.53	$1,591,000
073.00-00-003.02	JAMES GALLENSTEIN		COMMERCIAL	2.46	$1,270,100
073.00-00-003.03	MCDONALDS CORP	MCDONALDS RESTAURANT	COMMERCIAL	1.11	$900,000
073.00-00-003.04	DREAM STREET ENTERPRISES LLC	CHIPOTLE RESTAURANT	COMMERCIAL	0.99	$825,000
073.00-00-003.05	RED LOBSTER INNS OF AMERICA	RED LOBSTER RESTAURANT	COMMERCIAL	1.69	$1,288,000
073.00-00-003.07	G 6 HOSPITALITY PROPERTY		COMMERCIAL	1.60	$2,208,520
073.00-00-003.08	JOHNSON TRUST CO	TIM HOGANS DALTON	COMMERCIAL	1.31	$830,000

I-75 SB Entrance Ramp at Mall Road
I-75 NB Exit Ramp at Mall Road
Properties Potentially Impacted by I-75 NB Exit Ramp at Mall Road
Parcel Boundary
Feet
0 150 300 600

Figure 5
Alernative 1
I-75/Mall Road
Boone County, KY

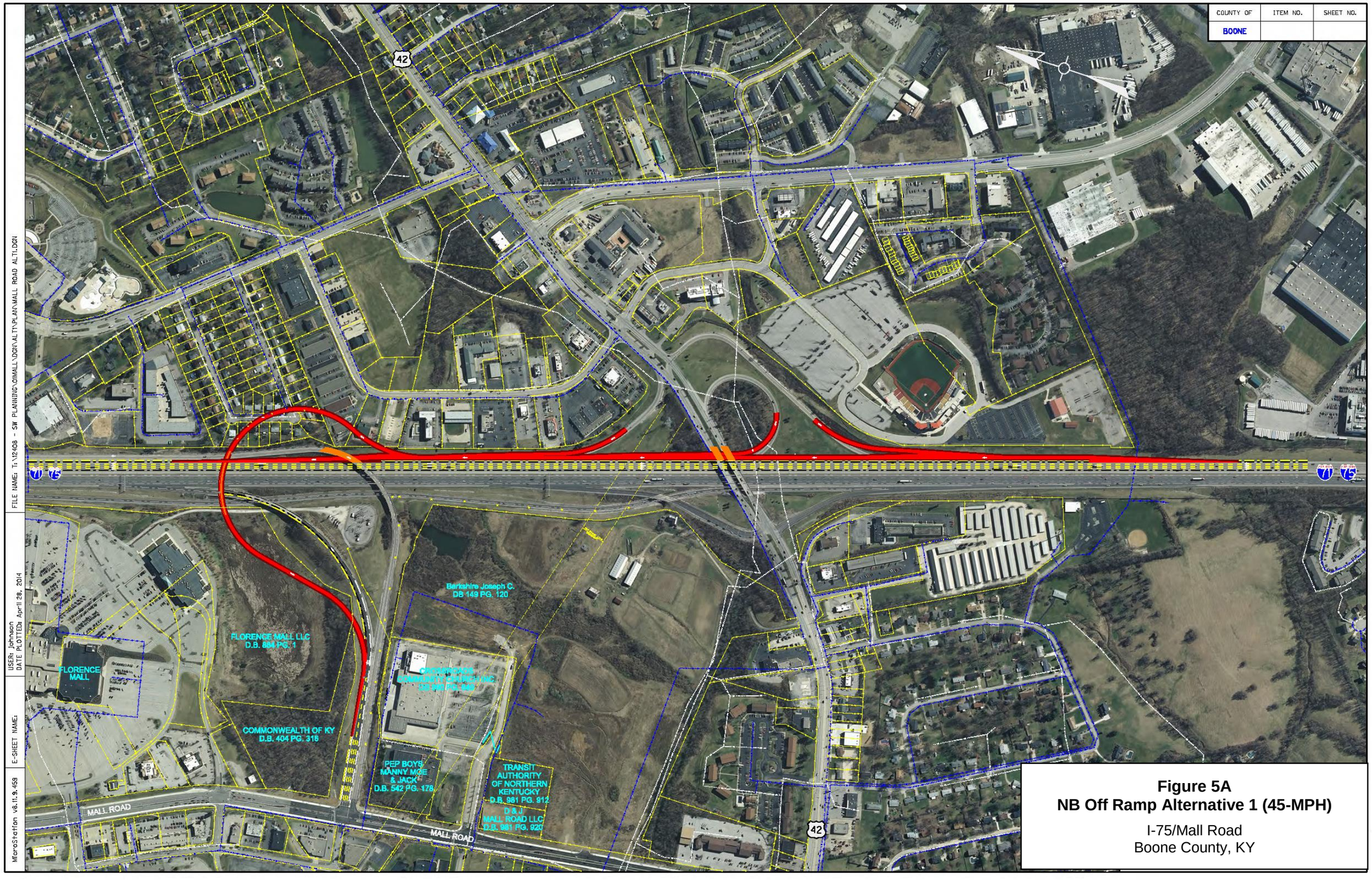


Figure 5A
NB Off Ramp Alternative 1 (45-MPH)

I-75/Mall Road
Boone County, KY

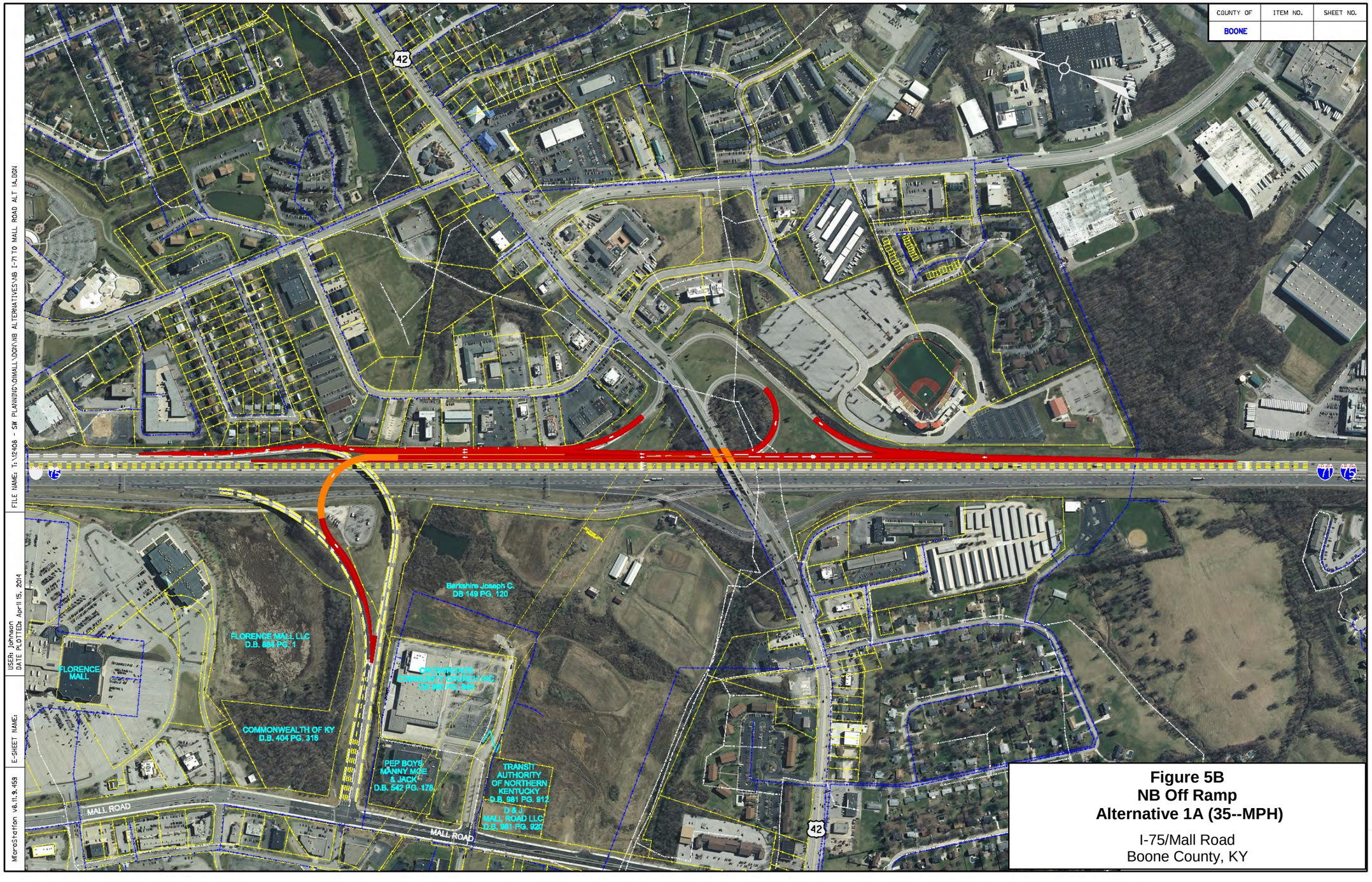


Figure 5B
NB Off Ramp
Alternative 1A (35--MPH)

I-75/Mall Road
Boone County, KY

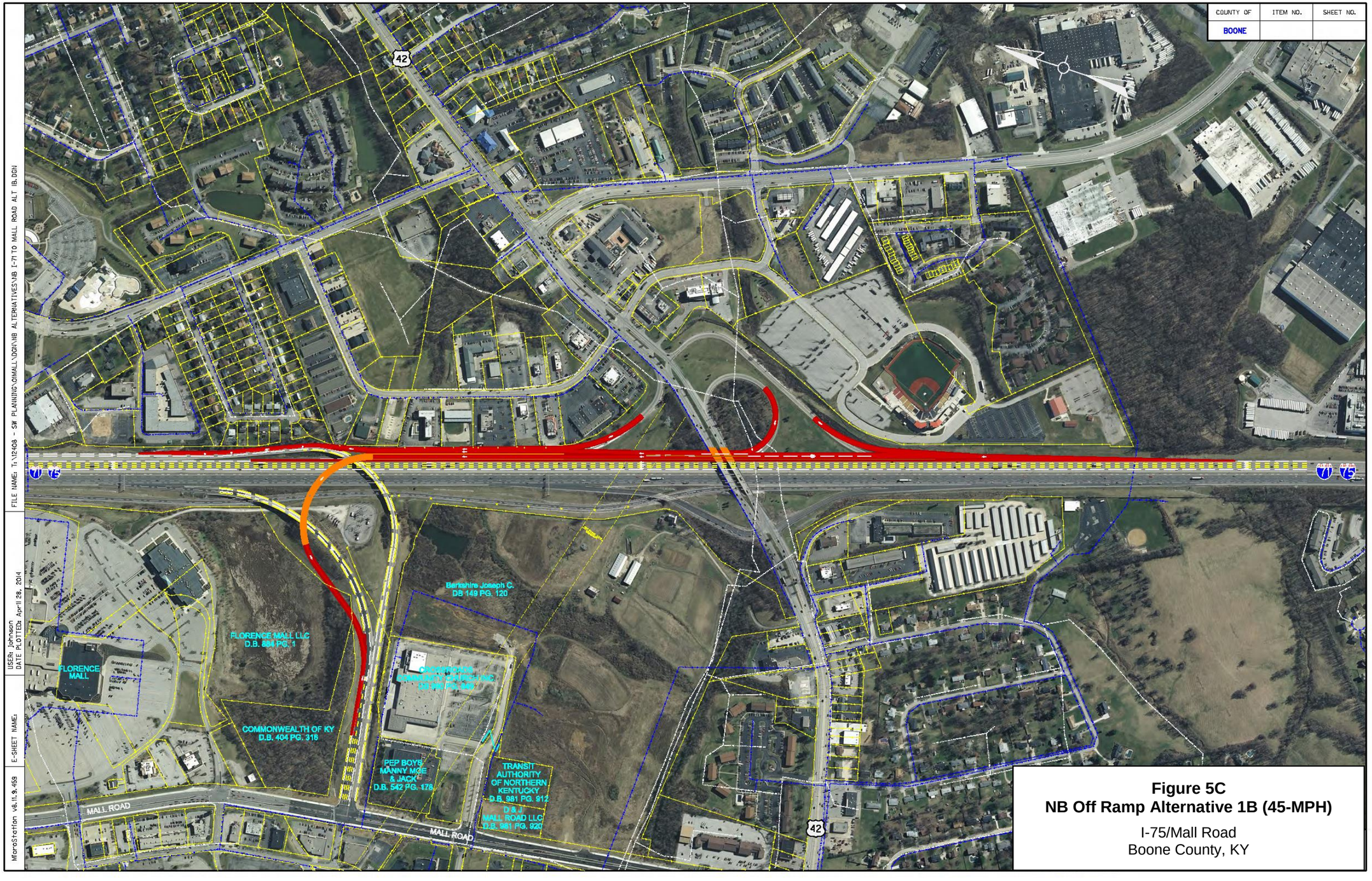


Figure 5C
NB Off Ramp Alternative 1B (45-MPH)

I-75/Mall Road
Boone County, KY

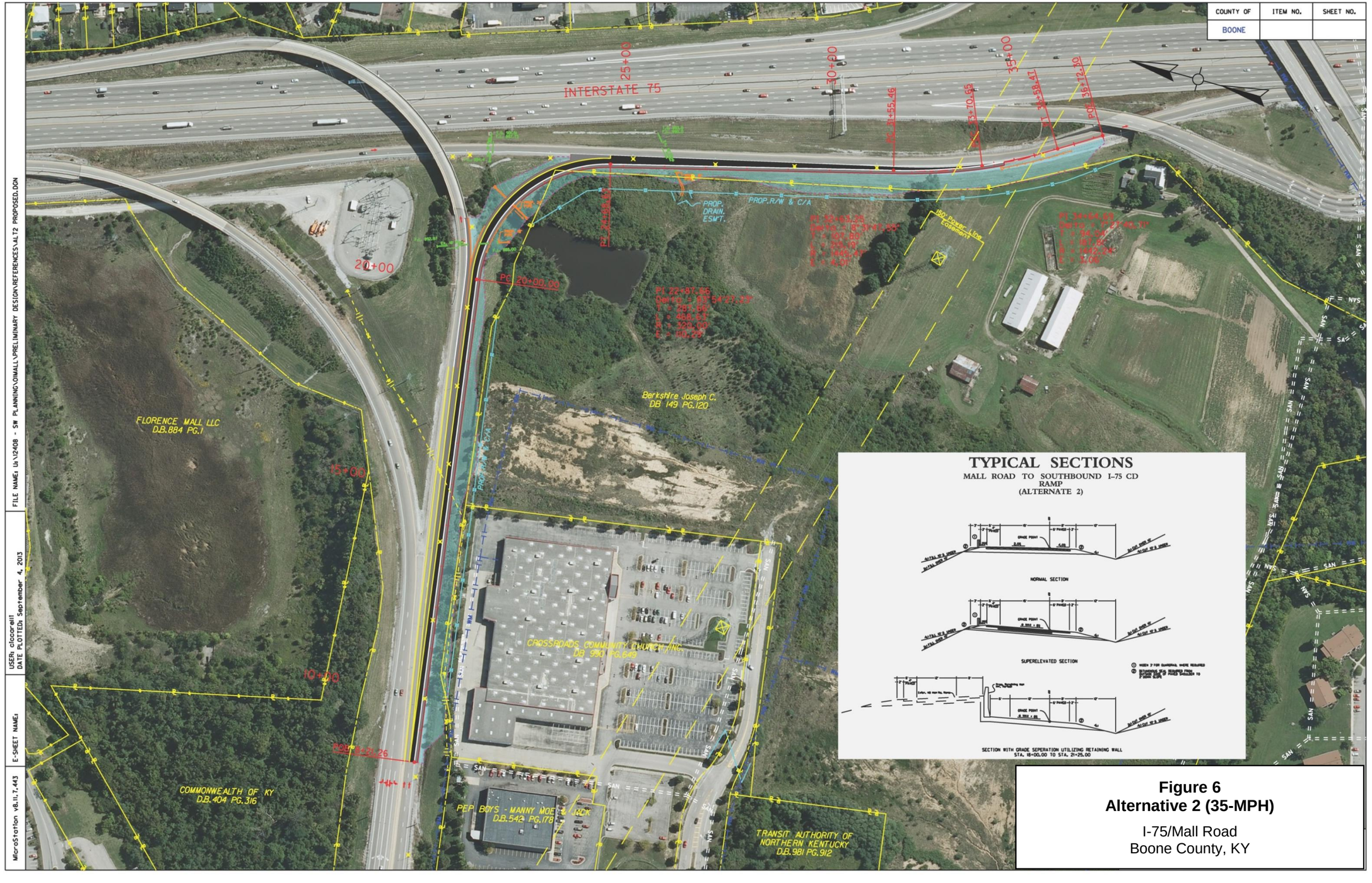


Figure 6
Alternative 2 (35-MPH)

I-75/Mall Road
Boone County, KY

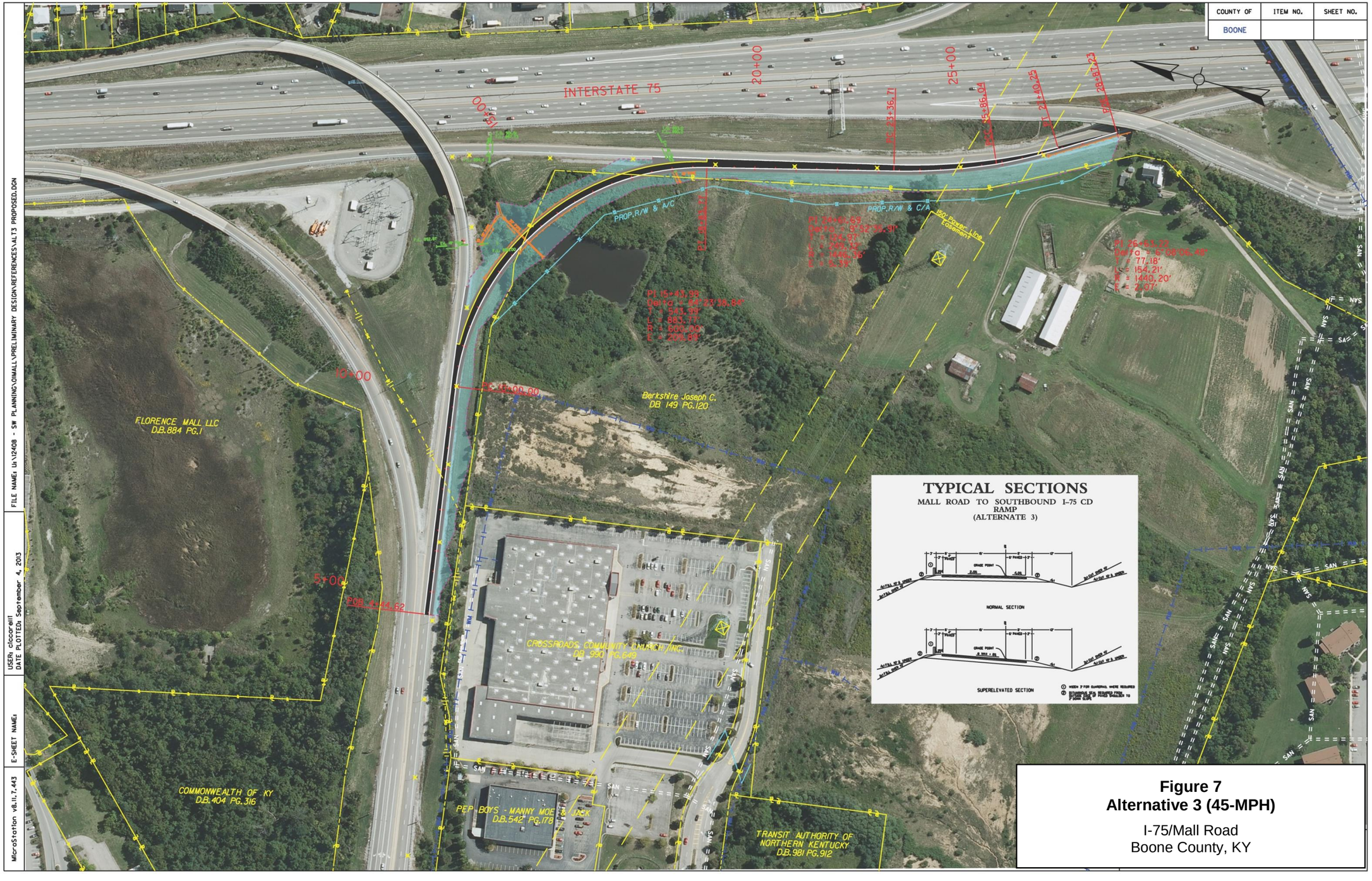


Figure 7
Alternative 3 (45-MPH)

I-75/Mall Road
Boone County, KY

The goals for the design of the southbound on ramp alternatives were to minimize costly right-of-way impacts and provide a safe and efficient design without encroaching upon the underpass as shown in Image 1 to the right. Because the 45-mph (Alternative 3) design provides a safer and more desirable design, avoids encroachment on the underpass, and is less expensive than the 35-mph design, the project team selected Alternative 3 as the preferred alternative (see Figure 8).

Image 1: I-75 SB Exit Ramp at US 42 Overpassing C/D Road to I-75

3.0 EIGHT POLICY REQUIREMENTS (Operational Analysis)

The following text was taken from the *Interstate System Access Informational Guide* published by the FHWA Office of Infrastructure in August 2010.

Title 23, United State Code, Highways Section 111 (23 U.S.C. 111) provides that all agreements between the Secretary of the U.S. Department of Transportation and the State DOTs for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project without the prior approval of the Secretary. The Secretary has delegated the authority to administer 23 U.S.C. 111 to the Federal Highway Administrator pursuant to 49 CFR 1.48(b) (10). A formal policy statement consolidating a series of policy memoranda, including guidance for justifying and documenting the need for additional access to the existing sections of the Interstate System, was published in the *Federal Register* on 4 October 22, 1990 (55 FR 42670) entitled “Access to the Interstate System,” and was then modified on February 11, 1998 (63 FR 7054) and on August 27, 2009 (74 FR 20679).

The revised FHWA policy on "additional interchanges to the Interstate System," effective February 11, 1998, emphasized the "national interest to maintain the Interstate System to provide the highest level of service in terms of safety and mobility," and identified eight requirements to meet for new or revised access points to the existing Interstate System. Each of these requirements is addressed in the body of this report.

Policy Requirement 1: Existing Facilities Capability

It is demonstrated that the existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access, nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

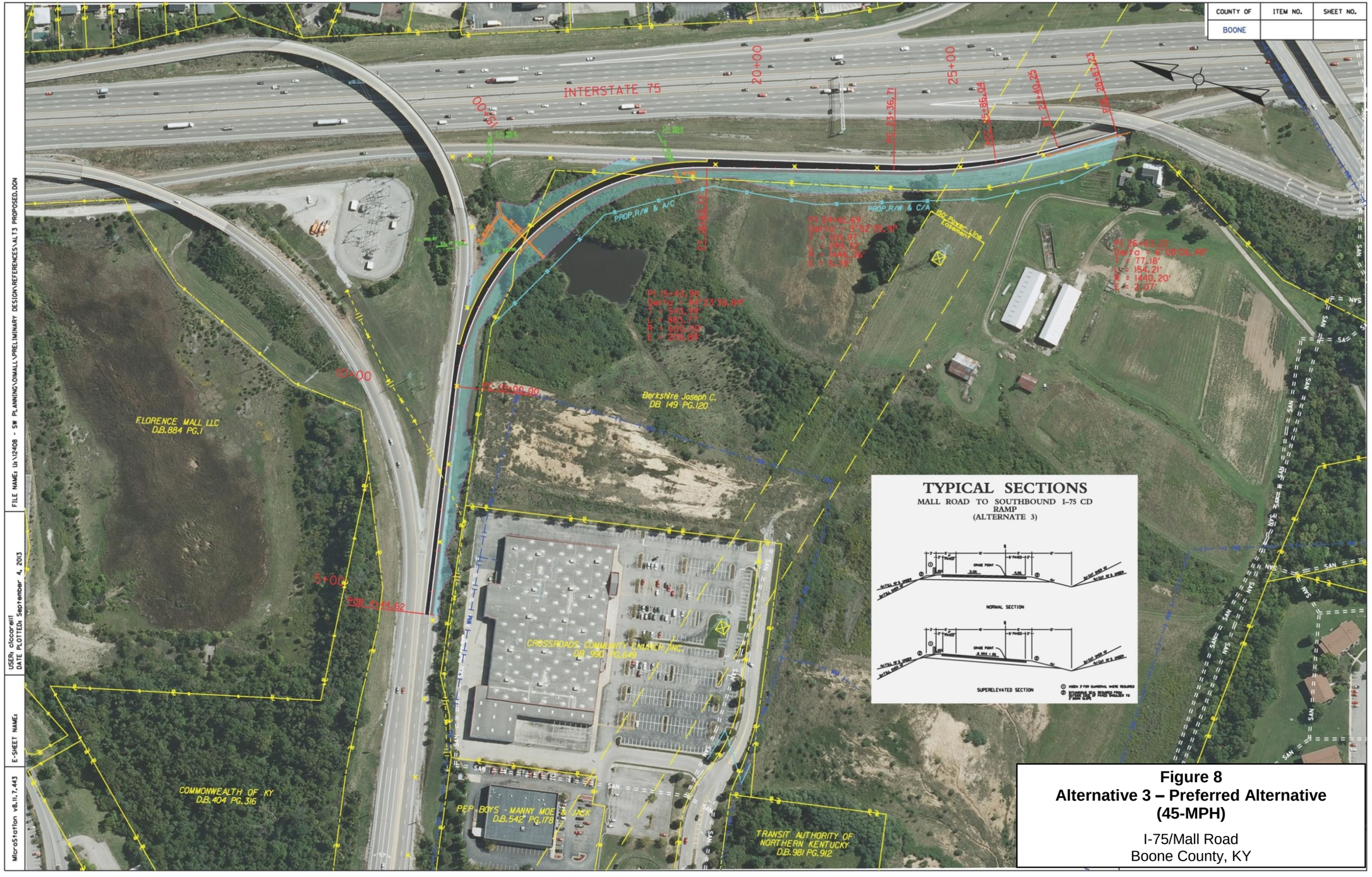


Figure 8
Alternative 3 – Preferred Alternative (45-MPH)

I-75/Mall Road
Boone County, KY

The I-75/Mall Road interchange exists today as a partial interchange. The proposed interchange modification would improve safety and connectivity to I-75 from major regional development in and around Mall Road. Today motorists must use either the I-75/KY 18 or the I-75/US 42 interchange to travel south on I-75. As noted in Section 1.4 “Purpose and Need,” travelers using either option encounter “at capacity,” congested intersections and numerous traffic signals. There are seven traffic signals on Mall Road, three signals between Mall Road and the I-75/US 42 southbound ramps, and one traffic signal between Mall Road and the I-75/KY 18 southbound ramps. Development area traffic could travel through as many as five signalized intersections to reach I-75 to travel southbound. Each signalized intersection has a potential for 32 conflict points. Additional conflict points occur at individual entrances between those signalized intersections. Existing intersection delays range from 15.5 seconds/vehicle for a level of service C (LOS C) in the AM Peak Hour to 237 seconds/vehicle (LOS F) in the PM Peak Hour.

In the project area, US 42 and KY 18 are congested at present. KY 18 is six lanes in a highly developed area with each intersection having existing multiple turn lanes. The US 42 and KY 18 intersections with I-75 ramps in the study area are operating at a level of service at or near capacity with peak hour intersection delays at LOS E and LOS F in both years 2012 (current) and 2040 (design year) as shown in Tables 1 and 2 on page 9. US 42 is planned for six lanes in the OKI 2040 Regional Transportation Plan adopted in June 2012.

A southbound on-ramp via the current C/D road to I-75 southbound would be a minor, low-cost addition that would provide better and more direct connectivity to the Mall Road development area.

Policy Requirement 2: Transportation System Management

All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit and HOV facilities) have been assessed and provided for, if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

KY 18 is currently six lanes in the project area with multiple turn lanes at each intersection, and the adjacent properties are nearly built out. There is little room for Transportation System Management (TSM) improvements, except for access management opportunities. The OKI 2030 Regional Transportation Plan identified a project that would pursue an access management retrofit along KY 18 in the area of influence.

Although the area around US 42 (a four-lane facility in the project area) is not completely built out, providing for six lanes on US 42 would be very costly and would likely attract additional vehicles to the I-75 ramps. There is a project in the OKI 2040 Regional Transportation Plan to widen US 42 to six lanes in the area of influence; however, this project is not currently funded. As shown in Appendix A, Exhibit 2 (Existing Other Modes), there are bus routes, sidewalks, and pedestrian paths in the study area at present. Capacity analysis does show providing an additional right-turn lane from US 42 to Mall Road would be beneficial; however it does not meet the purpose and need of this project.

Neither ramp metering onto I-75 nor High Occupancy Vehicle (HOV) lanes on I-75 would satisfy the purpose of the project, which is to improve connectivity and safety between the major regional commercial development areas in Florence, Kentucky, and the Interstate System. The proposed improved connection to I-75 from the Mall Road development area would satisfy the project's purpose.

In the study area, I-75 consists of only general purpose lanes—four in each direction. No special use lanes, such as High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes, exist within the study area, the encompassing Northern Kentucky Area, or any portion of I-75 in Kentucky.

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.

The Transit Authority of Northern Kentucky (TANK) currently delivers passengers to and from Florence Mall and surrounding developments on regular routes and at specified times. TANK is currently in the process of constructing a new park and ride facility near the I-75 ramp at the corner of Mall Road and Heights Road (see Appendix A, Exhibit 2). The new ramp would assist in the connectivity of this new park and ride facility and improve connectivity to the park and ride at KY 536/Mt. Zion.

Policy Requirement 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)).

To address this policy requirement, a traffic operations analysis was conducted for the I-75 (mainline), existing, new or modified ramps, and the local street network. The procedure used to conduct the traffic operations is divided into 4 subchapters and described as follows:

Traffic Operations

KYTC used existing traffic data and obtained more current data by conducting special interstate traffic volume, vehicle classification, and turning movement counts at intersections 1 through 7 (see Appendix A, Exhibit 4; and Appendix C). The special counts were conducted on July 10, 11, and 12, 2012. The turning movement data were collected 7 to 9 a.m. and 4 to 6 p.m. Current year (2012) traffic volumes were based on KYTC's newly collected special counts as well as on other, relatively recent KYTC classification counts.

For the Build scenario, OKI's traffic model was used to generate an Average Daily Traffic (ADT) volume for the proposed new ramp in year 2012 and a projected ADT volume for design year 2040. Then the OKI model was used to forecast diversionary percentages for each roadway link in the area of influence. These percentages were then applied to existing counts to add or subtract traffic volumes to project Build scenario conditions.

The new I-75 southbound on ramp volume was then calculated as the difference between the C/D road volume segments before and after the ramp merges into the C/D road. The 2012 ramp volume was calculated to be 4,300 vpd. The design year growth factors were dictated by the OKI model. Since this ramp would be a new route, truck percentages were calculated using functional class averages for Urban Interstates. A current year truck percentage of 18.7% was used for the proposed southbound ramp, which is slightly less than the truck percentage on I-75 south of Mall Road and a total 2040 ramp volume of 5,700 vpd was estimated.

Mainline I-75

The 2010 Highway Capacity Manual (HCM) and corresponding software were used to analyze delays and density in intersections, freeway merge and diverge movements, and differences between Build and No-Build scenarios. All HCM

calculations are located in Appendices D and E and more detailed tables are shown in Appendix A, Exhibits 7 and 8. As shown in Table 3, I-75 in the area of influence exhibits LOS E and LOS F in the current year (2012) and the design year (2040), respectively, for the No-Build scenario. Adding a southbound I-75 entrance ramp at Mall Road to the C/D road shows I-75 will continue to operate at the same level of service as the No-Build scenario.

Table 3: Mainline I-75 Analysis

Location	Year	Scenario	ADT	Design Hour Volume	Peak Direction Design Hour Volume	Truck %	Number of Lanes	Capacity (vphpl)	v/c Ratio	LOS
North of KY 18	2012	No-Build	168,350	15,657	8,815	9.5%	10	2,400	0.93	E
		Build	166,500	15,485	8,718	9.5%	10	2,400	0.92	E
	2040	No-Build	221,300	20,581	11,587	9.5%	10	2,400	1.23	F
		Build	218,700	20,339	11,451	9.5%	10	2,400	1.21	F
Between KY 18 & US 42	2012	No-Build	134,850	12,541	7,061	10.4%	8	2,400	0.94	E
		Build	131,900	12,267	6,906	10.4%	8	2,400	0.92	E
	2040	No-Build	174,600	16,238	9,142	10.4%	8	2,400	1.22	F
		Build	173,000	16,089	9,058	10.4%	8	2,400	1.21	F
South of Mall Rd	2012	No-Build	125,750	11,695	6,584	20.5%	8	2,400	1.00	F
		Build	123,600	11,495	6,472	20.5%	8	2,400	0.98	E
	2040	No-Build	163,100	15,168	8,540	20.5%	10	2,400	1.03	F
		Build	162,300	15,094	8,498	20.5%	10	2,400	1.03	F

Abbreviations: v/c = volume to capacity ratio ADT = Average Daily Traffic vphpl = vehicles per hour per lane LOS = Level of Service

Ramps

Table 4 (p.23) depicts the operation of the I-75 merge and diverge movements, with levels of service ranging from LOS A in 2012 to LOS F in 2040. Because I-75 is at or near capacity during peak hours, many of the merge and diverge movements are at LOS F in the design year for both the No-Build and Build scenarios. There are two changes in levels of service between the No-Build and Build scenarios in 2012. A single lane ramp with a 45 mph design speed is 2,100 pc/hr. This proposed ramp will not exceed capacity until after the design year 2040.

- I-75 southbound to US 42 improves from LOS E to LOS D in both the AM and PM Peak Hours.
- The movement from I-75 southbound to KY 18 reduces from LOS A to LOS B in the AM Peak Hour.

The HCM analysis shows in the PM Peak Hour, the I-75 southbound ramp to Mall Road will reach capacity in year 2030. The Mall Road/I-75 intersection delay can be improved by adjusting the signal timing to provide additional green time for the

Table 4: Ramps Existing (No-Build 2012) / Build (2040) LOS and Density

RAMP MOVEMENT		2012 ADT		2012 AM				2012 PM				2040 ADT		2040 AM				2040 PM			
Movement	Roadway Section	2012 No-Build ADT	2012 Build ADT	Existing LOS	Existing Density (pc/mi/ln)	Build LOS	Build Density (pc/mi/ln)	Existing LOS	Existing Density (pc/mi/ln)	Build LOS	Build Density (pc/mi/ln)	2040 No-Build ADT	2040 Build ADT	No-Build LOS	No-Build Density (pc/mi/ln)	Build LOS	Build or Density (pc/mi/ln)	No-Build LOS	No-Build Density (pc/mi/ln)	Build LOS	Build Density (pc/mi/ln)
I-75 NB to US 42	Ramp 411	5,300	5,400	D	31.4	D	31.3	D	31.4	D	31.3	7,500	7,400	**F**	**41.6**	**F**	**40.9**	**F**	**42.0**	**F**	**40.8**
US 42 EB to I-75 NB	Ramp 412	8,000	8,600	D	29.2	D	29.8	C	27.1	C	27.1	10,600	11,400	**F**	**39.7**	**F**	**37.3**	**F**	**35.6**	**F**	**34.1**
US 42 WB to I-75 NB	Ramp 421	6,500	6,500	D	30.0	D	30.5	D	33.6	D	33.9	8,600	8,600	**F**	**39.9**	**F**	**39.7**	**F**	**39.9**	**F**	**44.0**
I-75 SB to US 42	Ramp 431	12,600	12,400	E	35.2	D	33.4	E	35.5	D	33.7	16,600	16,400	E	44.3	E	43.9	E	44.6	E	44.1
Mall Road to I-75 NB	Ramp 521	5,250	4,200	D	31.9	D	29.6	**F**	**33.1**	D	29.0	6,900	5,500	**F**	**39.3**	**F**	**37.0**	**F**	**38.0**	**F**	**36.9**
I-75 SB to Mall Road	Ramp 531	5,250	5,900	E	38.4	E	37.0	E	38.8	E	38.6	6,900	7,800	**F**	**56.0**	**F**	**55.7**	**F**	**49.7**	**F**	**50.2**
I-75 NB to KY 18	Ramp 611	7,400	7,300	E	37.4	E	37.7	E	37.6	E	37.7	9,800	9,600	**F**	**53.5**	**F**	**51.0**	**F**	**54.1**	**F**	**51.6**
I-75 SB to KY 18[+] (major diverge analysis)	Ramp 631	14,300	14,900	A	9.3	B	10.0	B	17.4	B	15.7	20,200	19,000	B	11.6	B	11.0	C	20.9	C	22.1
	Mainline before	85,000	83,000	**F**	**40.4**	**F**	**39.5**	**F**	**40.4**	**F**	**39.5**	110,000	108,600	**F**	**52.3**	**F**	**51.7**	**F**	**52.3**	**F**	**51.7**
	Mainline after	70,700	68,100	**F**	**45.4**	**F**	**43.8**	**F**	**40.9**	**F**	**40.7**	89,800	89,600	**F**	**59.0**	**F**	**58.5**	**F**	**53.9**	**F**	**52.4**
C/D Road KY 18/US 42 to I-75 SB++	Ramps 641 & 441	12,700	13,800	C	23.8	C	25.1	D	30.5	D	29.0	16,800	18,300	D	29.9	D	30.9	E	38.5	E	37.7

[+] *The diverge of Ramp 631 is a major diverge area. The procedure in the HCM for analyzing a major diverge area is to check the entering demand and the departing demand of each exit leg against the capacity of the entry leg.*
++This is the C/D road that includes Ramps 641 and 441 and in the build scenario will include the new SB I-75 on-ramp at Mall Road (Alternative 3) until such time the I-75 southbound auxiliary lane between KY 536 and US 42 is constructed.

Density = Passenger cars / mile / lane
NB = Northbound
SB = Southbound
EB = Eastbound
WB = Westbound
ADT = Average Daily Traffic

I-75 Mall Road ramp. All signals located on Mall Road are maintained by the city of Florence. KYTC will work with them to retime these signals to minimize delay and improve efficiency along this corridor at the completion of this project. Also, when US 42 is widened, providing an additional right-turn lane at Mall Road would be beneficial to the overall operation of the route.

Collector / Distributor (C/D) Road - KY 18/US 42 to I-75 SB

With the addition of the proposed I-75 southbound on-ramp at Mall Road, the number of vehicles entering the existing C/D Road has not really changed, just the location at which those vehicles are entering the C/D Road. The capacity of a one-lane ramp roadway with a speed of over 50 mph is 2,200 passenger cars per hour (pc/hr.). In the design year 2040 PM Peak Hour (heaviest movement), this C/D Road will not reach capacity until after Year 2040. The proposed southbound on-ramp acceleration length provided in the proposed design is in accordance with the *2011 A Policy on Geometric Design of Highways and Streets* and KYTC policies and the movement will be a yield condition. Table 5 shows a further breakdown of the C/D Road.

It should be noted that, with the addition of the southbound auxiliary lane between US 42 and KY 536 currently in the right of way acquisition phase, the existing C/D Road merge movement directly to I-75 will no longer exist because that traffic will have a "dedicated" lane (the new auxiliary lane). This KYTC project was implemented for design prior to this IMR.

Table 5: Collector / Distributor (C/D) Road Analysis

Location	Year	Scenario	ADT	AM DHV	PM DHV	Flow Rate AM	Flow Rate PM	Capacity (vph)	AM v/c Ratio	PM v/c Ratio	AM Density	AM LOS	PM Density	PM LOS
KY 18 to Mall Road	2012	No-Build	7,100	310	700	326	735	2,200	0.15	0.33	6.9	A	15.6	B
		Build	5,200	360	500	378	525	2,200	0.17	0.24	8.4	A	11.7	B
	2040	No-Build	9,400	500	950	525	998	2,200	0.24	0.45	11.7	B	22.2	C
		Build	6,900	450	750	473	788	2,200	0.21	0.36	10.5	A	17.5	B
Mall Road to US 42	2012	No-Build	7,100	310	700	326	735	2,200	0.15	0.33	6.9	A	15.6	B
		Build	9,500	560	500	588	525	2,200	0.27	0.24	13.1	B	11.7	B
	2040	No-Build	9,400	500	950	525	998	2,200	0.24	0.45	11.7	B	22.2	C
		Build	12,600	540	950	567	998	2,200	0.26	0.45	12.6	B	22.2	C
US 42 to I-75	2012	No-Build	12,700	580	1,400	609	1,470	2,200	0.28	0.67	12.9	B	31.1	D
		Build	13,800	810	1,150	851	1,208	2,200	0.39	0.55	18.9	C	26.8	C
	2040	No-Build	16,800	800	1,850	840	1,943	2,200	0.38	0.88	18.7	E	43.2	E
		Build	18,300	790	1,750	830	1,838	2,200	0.38	0.84	18.4	E	40.8	E

Abbreviations and Notes: *Truck % =10%* *v/c = volume to capacity ratio* *ADT = Average Daily Traffic* *C/D Road is a one lane facility* *vph = vehicles per hour* *Density – passenger cars per mile per lane*

Local

As previously shown, Tables 1 and 2 (p. 9) show the operational delay analyses of the intersections within the area of influence for current year 2012 and design year 2040 (shown in more detail in Appendix A, Exhibits 7 and 8). Many of the intersections' movements operate at or near capacity currently and in the design year. The PM Peak Hours have the heaviest volumes.

An analysis of the degree to which the OKI traffic model replicated existing traffic volumes on the current roadway network in the year 2012 showed excellent overall correlation; total daily traffic volumes on specific links in the model were only 0.29% less than KYTC estimates of current volumes on those same links. However, the percent difference on individual links ranged from -9.55% to +9.82%. To assess the impact the proposed ramp would have on the overall network within the area of influence, an average delay was calculated for both AM and PM Peaks for the Build and No-Build scenarios in 2012 and 2040. The intersection network analysis shows that the overall 2012 Build scenario improves over the No-Build scenario in the AM Peak Hour by 0.4% and the PM Peak Hour by 3.4%. The overall 2040 Build scenario shows an improvement of 1.0% in the AM Peak, and a slight increase of 2.0% in the PM Peak. This increase was considered acceptable for the peak hour. Actual movement delays and the supporting HCM analyses are located on the enclosed C/D (Appendix D and E), respectively.

Safety

Geometric deficiencies were examined for I-75 in the area of influence. As shown in Exhibit 3 (Appendix A), the merge from US 42 to northbound I-75 is considered deficient. However, as will be explained in this section, there is not a crash history at this location; therefore, this deficiency was not considered significant. As mentioned in Section 1.3 "Area of Influence" (p. 6), Appendix A, Exhibit 1 illustrates the ramp spacing for I-75 in the area of influence.

Crash data for the project area were obtained from the Kentucky State Police database of reported collisions. The data were acquired for the three-year time period from January 1, 2009, to December 31, 2011, to match the time period available in the Kentucky Transportation Center's Crash Buildup program. Exhibits 5 and 6 (Appendix A) show the location and type of collisions in the area of influence. Crash analyses were performed for I-75, US 42, KY 18, and Mall Road in the area of influence. A Critical Crash Rate Factor (CCRF) was calculated for 0.1-mile and 0.3-mile spots and for 1.0-mile segments for the aforementioned routes. I-75 did not have any CCRF greater than 1.0. Therefore, further analysis was considered not warranted. As shown in Figure 9, US 42, KY 18, and Mall Road exhibit crash issues with CCRFs greater than 1.0 for the 0.1-mile and 0.3-

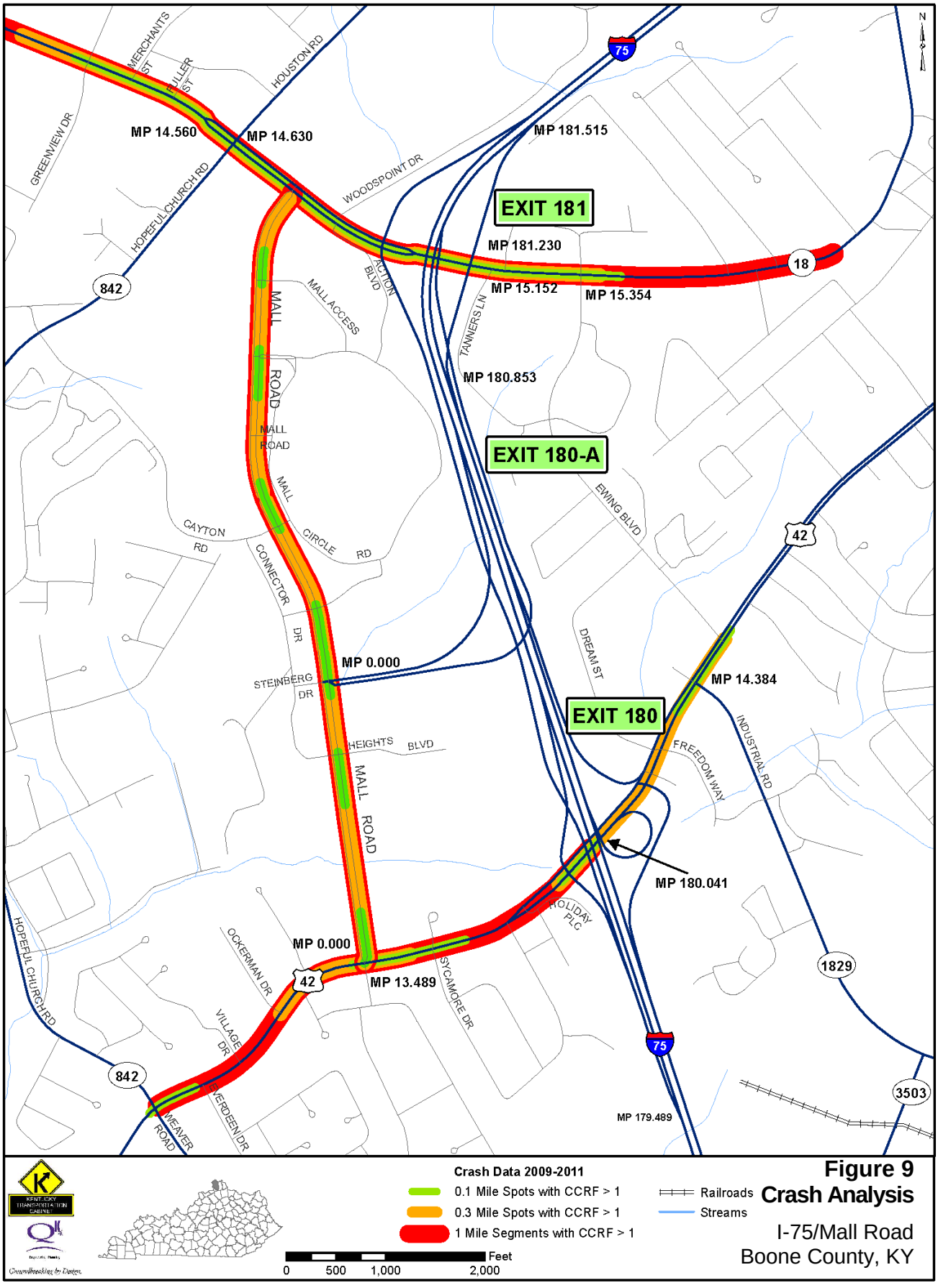


Figure 9
Crash Analysis
I-75/Mall Road
Boone County, KY

mile spots and the 1.0-mile segments, with crash types and conditions as follows: 51% were rear end and 25% were angle; 78% occurred in dry weather; and 80% occurred during daylight hours. A more in-depth analysis of those spots was performed. That analysis showed that many of the crashes along KY 18, US 42, and Mall Road were attributed to access management-related issues.

In early 2012, in keeping with the Mall Road District Study, Mall Road was converted to a divided facility with access points at strategic locations. This access management improvement is expected to reduce the crash rates along this route. However, at the time of this request there were not enough data to make a statistically significant analysis to determine whether a reduction in crashes has occurred. As shown in the planned projects (see Appendix A, Exhibit 17), an access management study was slated for KY 18. On US 42 in the area of influence, two turn lanes are expected to be added and widening to six lanes is planned but has not yet been funded.

The proposed southbound on ramp would not pose a safety concern as traffic on the ramp merges with a C/D road rather than directly with traffic on I-75 southbound. As shown in Table 4 on page 23, the ramp-freeway junction area will operate at LOS E in both the no-build and build scenarios in the PM peak hour. KYTC will soon be in the process of purchasing right of way to construct both northbound and southbound auxiliary lanes from KY 536 (interchange south of US 42) to US 42. The addition of the southbound auxiliary lane will essentially remove this merge movement from I-75. Traffic on the C/D road will not reach capacity until beyond 2040.

As shown in Appendix A, Exhibit 16, the additional ramp will require four new signs: one in each direction on Mall Road at the Mall Road/I-75 ramp intersection, and two signs on the I-75 ramp before the northbound/southbound split. No new signs are required on the I-75 mainline. Minor, additional yellow merge warning signs should be considered at the following locations:

- On the existing C/D Road prior to the proposed I-75 southbound on ramp via the CD Road warning motorists of the pending merge;
- On the proposed I-75 southbound on ramp prior to it joining the existing C/D Road warning travelers from Mall Road of the impending merge;
- The existing merge warning should stay in place for the US 42 merge onto the existing C/D Road warning C/D motorists of the merge onto I-75;
- Where the C/D Road will eventually merge with the southbound auxiliary lane from KY 536 to US 42 that is currently in the right of way phase, informing motorists of the added lane (when constructed).

In summary, the operational safety analysis concluded that the proposed change in access would not have a significant adverse impact on the safety and operation of the interstate facility, including the mainline, lanes, the proposed ramp, the ramp terminals on US 42 and KY 18, and the local street network.

Policy Requirement 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 new access to the I-75 C/D road connects to a public road (Mall Road also known as City Street 1002) that is maintained by the City of Florence.

The existing I-75 interchange with Mall Road is a partial interchange. To construct a full interchange at this location, a northbound flyover exit ramp from I-75 to Mall Road is required. Three single-lanes northbound off ramp alternatives (Alternative 1, 1A, and 1B) were studied and shown in Figures 6, 7, and 8. Each NB Off Ramp would require a C/D road from US 42 to provide for adequate ramp spacing on I-75 northbound. Each northbound ramp alternative will most likely require a noise wall under a new northbound off ramp structure over I-75 to minimize the noise levels along Miriam Drive (subdivision adjacent to I-75 directly off of Ewing Drive).

The Northbound Ramp Alternative 1 provides for a very short weave for the movement from I-75 NB from US 42 to I-75. Northbound ramp alternatives 1A and 1B also:

- enter existing Mall Road ramp on the left causing motorists traveling westbound to change multiple lanes to exit right to travel to Florence Mall (a major traffic generator);
- do not allow US 42 motorists entering I-75 to travel NB to exit at Mall Road;
- motorists entering I-75 N from US 42 will no longer be able to exit at KY 18.

A direct access northbound off-ramp at Mall Road would affect between 21 and 27 parcels with property values between $15M to $28M. The commercial properties include Bob Evans, McDonald's, Motel 6, Knights Inn, Red Lobster, and the Florence Mall. A northbound off-ramp at Mall Road will likely require a C/D road from the US 42 northbound off-ramp. The northbound off-ramp at Mall Road will be added to KYTC'S Unscheduled Projects List and will be prioritized every other year for potential inclusion in KYTC's Highway Plan and lastly the combination of full

interchange alternatives have a total cost with all phases ranging from $44 and $55M.

Due to the business and residential impacts, the impacts to I-75 current traffic patterns discussed above, and KYTC budget constraints, the northbound off ramp alternatives at Mall Road 1, 1A and 1B were eliminated from additional consideration and not carried forward. They are shown in Table 6 just for information purposes only. The northbound off-ramp at Mall Road will be added to KYTC's Unscheduled Projects List and will be prioritized every other year for potential inclusion in KYTC's Highway Plan.

Consequently, the proposed southbound on-ramp via the existing C/D road affects only two properties for a total of two acres, and ties to an existing C/D road. The proposed access would be designed and built to current KYTC and FHWA design standards. It also provides a better operational value than the current conditions.

Alternatives 2 and 3 and their corresponding typical sections and profiles are illustrated on Exhibits 9 through 15 in Appendix A. Both preliminary designs for the two Build alternatives tie into the existing C/D ramp prior to the overpass of the I-75 southbound exit ramp at US 42. Because of the higher design speed attained,

Table 6: Preliminary Cost Estimates for Alternatives

Phases	Alternative No-Build	Full Interchange (Alternative 1 & 3)	Alternative 1 NB Off Ramp	Alternative 1A NB Off Ramp	Alternative 1B NB Off Ramp	Alternative 2 (I-75 SB On Ramp at Mall Road) 35-mph	Alternative 3 (I-75 SB On Ramp at Mall Road) 45-mph
# of Affected Parcels	0	28	26	21	27	2	2
Design	$0	$1,527,000	$1,392,000	$1,866,000	$2,014,000	$150,000	$135,000
Right of Way	$0	$27,849,800	$27,425,000	$21,870,000	$14,700,000	$436,000	$424,800
Utilities	$0	$296,800	$232,000	$311,100	$355,700	$159,900	$64,800
Construction	$0	$12,654,400	$11,604,000	$15,554,100	$16,784,100	$706,600	$1,046,400*
Contingencies	$0	$12,300,500	$12,195,900	$11,880,400	$10,150,100	$435,800	$104,600
TOTAL	**$0**	**$54,624,500**	**$52,848,900**	**$51,481,600**	**$43,983,900**	**$1,888,300**	**$1,775,600**

provided by KYTC

minimal right-of-way impacts, minimal impacts to I-75 and the existing intersections within the area of influence, the project team recommends Alternative 3 as the preferred alternative. A summary of the Project Team Meeting Minutes is contained in Appendix H.

The environmental process will be a part of the next phase of this project. Regarding a large tract of land in the northwest quadrant of the US 42/I-75 interchange, it is noteworthy that the Mall Road District Study: "Plan Recommendation" (contained in Appendix B on the CD) states there is a "historic residence and several agricultural structures....also a historic cemetery in this same general area...." (p.4.12). The study indicates the residence is part of a large farm that is currently in agricultural use. During the environmental phase of this project, a determination of the site's eligibility for listing in the National Register of Historic Places will be made according to the process identified in Section 106 of the National Historic Preservation Act.

Policy Requirement 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.

The addition of an I-75 southbound on-ramp at Mall Road was identified as a priority in the Boone County Transportation Plan 2030 (dated November 30, 2005), and was a recommended project in the County Planning Commission's 2012 *Mall Road District Study* (see Section 1.2, herein, and Appendix B). It was also identified in the OKI 2040 Regional Transportation Plan. In the Highway District-6 Transportation Plan, this project was ranked fifth to be considered for the KYTC's 2012 Highway Plan. In 2012, this project was included in the 2012 Highway Plan, and is now a part of the 2012 Statewide Transportation Improvement Program (STIP) identified under the Regionally Significant Air Quality State Funded Projects for FY 2013–FY 2016 approved by the Kentucky General Assembly (STIP #6-409). The proposed interchange modification would be consistent with the area's future land use plan (see Figure 10).

Table 7 (p.32) lists additional Boone County projects in KYTC's current Highway Plan to help address area congestion. Exhibit 17 in Appendix A shows the planned

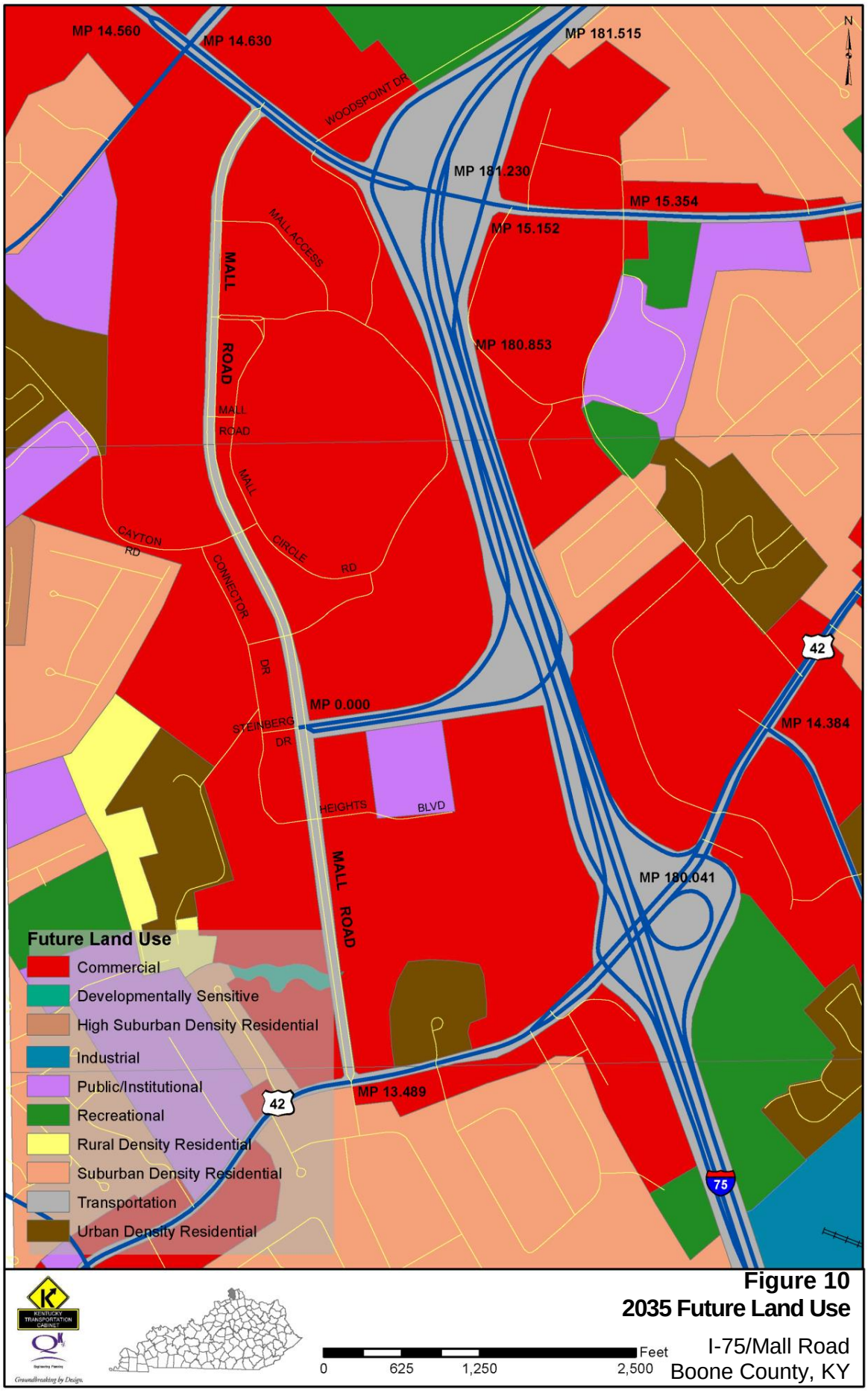


Figure 10
2035 Future Land Use
I-75/Mall Road
Boone County, KY

projects in the area of influence. Those projects were taken into consideration in developing this request.

Table 7: Boone County Roadway Projects in KYTC's Highway Plan

Item Number	Route	Begin MP	End MP	Description	Purpose and Need
06-14.00 and 14.02	I-75	177.659	178.345	Reconstruct the KY 536 (Mt. Zion Road) interchange	Economic Development/Interchange Reconstruction
6-14.50	I-75	178.039	180.106	Add auxiliary lanes on I-71/I-75 from KY 536 to US 42	Reliability/Minor Widening
6-367.00	US 42	12.803	13.066	Construct additional turn lanes at the intersection of KY 842 and US 42	Safety
6-3700.00 and 3700.01	US 42	13.400	13.489	Construct an additional US 42 left-turn lane to northbound Mall Road	Reliability/Congestion Mitigation

Policy Requirement 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 interchange additions are foreseen by any long-range plan of OKI, the Northern Kentucky Area Development District, or KYTC. To the south, outside of the area of influence, the KY 536 interchange is being re-designed as a diverging diamond. There will also be auxiliary lanes constructed on I-75 both north and southbound from KY 536 to US 42. These auxiliary lanes are in the NEPA phase and are being processed as a Categorical Exclusion-3 (CE-3). This will essentially add capacity between US 42 and KY 536 and eliminate the merge movement from the C/D road and US 42 to I-75 Southbound.

Policy Requirement 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 project is the next logical step as the development in the area continues—before the land use in the southwest quadrant at I-75 and Mall Road interchange changes from agricultural to commercial use and the property becomes so expensive that it precludes the possibility of a modified access. Through the planning processes, this interchange modification went through the STIP and the OKI TIP (# 6-409) public comment period. KYTC met with local elected officials as a part of the District-6 Transportation Plan, and the 2012 Highway Plan also went through a public comment period.

Policy Requirement 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).

The preferred alternative recommended in this report will be included as an alternative in the required environmental evaluation, review, and processing. This request is a two-phase approval process. The first phase addresses the engineering and operational acceptability of the proposed project, as described throughout this report. The second phase will be the Environmental Phase. Currently this project is expected to be accomplished with state funds; however, because it will require Federal approval, an environmental document will be required by FHWA.

4.0 CONCLUSION AND RECOMMENDATIONS

This proposed project will provide access to southbound I-75 via an existing C/D road directly from Mall Road, eliminating the need for some travelers to navigate through several congested and high-crash intersections and corridors. The proposed ramp will tie into an existing one-lane C/D road, which merges into I-75 approximately 1,000 feet south of the new ramp's tie to the C/D road. The proposed southbound ramp would be in compliance with the FHWA Interstate Access policies, per the 2010 *Guide*, and would 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 crossroads) or on the local street network based on both the current and the planned future traffic projections. Therefore, it is recommended for approval.