U.S. Department of Transportation
Federal Highway Administration

Kentucky Division

330 W. Broadway
Frankfort, KY 40601

FHWA-KY-SEIS-11-01-D

Louisville-Southern Indiana Ohio River Bridges Project
Jefferson County, Kentucky and Clark County, Indiana

Supplemental Draft Environmental Impact Statement and Section 4(f) Evaluation
Submitted Pursuant to 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303
by the
U.S. Department of Transportation
Federal Highway Administration (FHWA)
and
Kentucky Transportation Cabinet (KYTC)
and
Indiana Department of Transportation (INDOT)

Cooperating Agencies: U.S. Coast Guard, Eighth District and
U.S. Army Corps of Engineers, Louisville District

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for Indiana Department of Transportation

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Jose Sepulveda, Division Administrator

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On April 8, 2003 a Final Environmental Impact Statement (FEIS) was prepared for the Louisville – Southern Indiana Ohio River Bridges Project. This was followed by a Record of Decision on September 6, 2003. The preferred alternative as described in the FEIS provides the improvement of cross-river mobility between Jefferson County, Kentucky, and Clark County, Indiana. The preferred alternative is a two bridges/highway alternative. It provides for a new Ohio River Bridge between Louisville, KY and Jeffersonville, IN immediately upstream and adjacent to the existing I-65 and for a second new Ohio River bridge, approximately 8 miles upstream of the existing I-65 crossing, which provides connections in the eastern part of Jefferson and Clark Counties between KY 841 (Gene Snyder Freeway) in Kentucky and SR 265 in Indiana. The preferred alternate also provides for the reconstruction of the Kennedy Interchange (Interstates I-65, I-64, and I-71) near Downtown Louisville and the approaches in Jeffersonville to the new Ohio River bridge.

On February 15, 2011, a Notice was placed in the *Federal Register* establishing that a Supplemental Environmental Impact Statement (SEIS) would be prepared for the project. This Supplemental DEIS provides a discussion of new circumstances or relevant information to environmental concerns that have risen since completion of the FEIS. This document will discuss modifications that have occurred in the basic design, effects associated with consideration of tolling as a financing mechanism, and environmental elements that might have changed because of the passage of time since the completion of the original EIS.

This Supplemental DEIS is expected to be published in the *Federal Register* on Friday, November 25, 2011. Comments on this Supplemental DEIS are due by January 9, 2012. Comments are to be sent to the individuals listed above.

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SUMMARY

S.1 Proposed Action

This Supplemental Draft Environmental Impact Statement (SDEIS) has been prepared by the Federal Highway Administration (FHWA), the Indiana Department of Transportation (INDOT), and the Kentucky Transportation Cabinet (KYTC) for the Louisville-Southern Indiana Ohio River Bridges (LSIORB) Project. The SDEIS responds to the National Environmental Policy Act (NEPA) regulations issued by the Council on Environmental Quality (CEQ) regarding documenting "substantial changes in the proposed action that are relevant to environmental concerns." [40 CFR 1502.9(c)(1)(i)].

The SDEIS format generally follows the section-heading outline used in the 2003 Final Environmental Impact Statement (FEIS). Changes to the project and/or conditions in the project area that have occurred since the FEIS are described in their respective sections; and where the information presented in the 2003 FEIS remains valid, such is noted. While the SDEIS builds upon and incorporates work already completed as part of the project development process, it does not reproduce in full the voluminous FEIS and Record of Decision (ROD) documentation. Instead, it incorporates information from those documents by reference, where applicable. The FEIS and ROD are available for review at the Community Transportation Solutions' (CTS) office located at the Forum Office Park III, 305 North Hurstbourne Parkway, Suite 100, Louisville, Kentucky. These documents can also be reviewed on the project website: www.kyinbridges.com.

This SDEIS examines the impacts of proposed modifications to the "Two Bridges/Highway Alternative" (comprised of Alternatives A-15 and C-1) identified as the Preferred Alternative in the FEIS/Section 4(f) Evaluation completed on April 8, 2003; and as the Selected Alternative in the ROD approved on September 6, 2003. The SDEIS has been prepared to evaluate the impacts of tolling to assist in funding the project, which was determined necessary through the Metropolitan Transportation Planning process; to evaluate cost-saving modifications in the design of the Selected Alternative to minimize the amount of toll based revenue needed; and to update information and data where necessary to address changes to the project and the affected environment since the approval of the 2003 FEIS/ROD.

The major components of the Selected Alternative from the ROD included:

- A new bridge across the Ohio River connecting KY 841/I-265 (Gene Snyder Freeway) in northeastern Jefferson County, Kentucky, with S.R. 265 at S.R. 62 in southeastern Clark County, Indiana (Alternative A-15).
- A new interstate bridge parallel to the Kennedy Bridge (Alternative C-1) as well as the reconstruction of the Kennedy Interchange to the south.
- Non-motorized facility enhancements (17-foot-wide pedestrian and bicycle paths on both bridges), expanded employer-based trip reduction programs, expanded Intelligent

Transportation System (ITS) applications, expanded incident management programs, and enhanced cross-river bus service, as well as numerous mitigation commitments.

The proposed cost saving modifications to the Selected Alternative include:

- Reconstructing the Kennedy Interchange within its existing location instead of relocating it to the south.
- Reducing the East End Bridge, roadway, and tunnel from six to four lanes.
- Eliminating the pedestrian/bike path from the Downtown Bridge because a similar facility will be provided on the nearby Big Four Bridge as a separate project.

Since the issuance of the ROD, INDOT and KYTC divided the Selected Alternative into the following six Design Sections (Figure S.1-1):

Section 1 – Reconstruction of the Kennedy Interchange to the South. (Also referred to as the "Kennedy Interchange Section.")
Section 2 – New I-65 Northbound Bridge over the Ohio River. (Includes the reconfiguration of the existing seven-lane Kennedy Bridge to a six-lane bridge to accommodate I-65 southbound traffic.) (Also referred to as the "Downtown Bridge Section.")
Section 3 – I-65 in Indiana north of the Kennedy Bridge. (Also referred to as the "Downtown Indiana Approach Section.")
Section 4 – Extension of I-265 in Kentucky from I-71 to the new Ohio River East End Bridge. (Also referred to as the "East End Kentucky Approach Section.")
Section 5 – New Ohio River Bridge on the I-265 extension. (Also referred to as the "East End Bridge Section.")
Section 6 – Extension of S.R. 265 in Indiana from the S.R. 62 interchange to the new Ohio River East End Bridge. (Also referred to as the "East End Indiana Approach Section.")

Right-of-way acquisition within these Design Sections began in 2010 but was put on hold as a result of the proposed design modifications. Some right-of-way acquisition did occur prior to 2010 but was limited to either hardship cases or advanced acquisitions. Only a few properties have been acquired in the Louisville and Jeffersonville downtown areas. The majority of properties have been acquired on the East End of the project in both Kentucky and Indiana.

The purpose and need for the project as identified in the 2003 FEIS/ROD was reevaluated as part of the SEIS process and documented in a *Purpose and Need White Paper* (see AppendixA.1). A draft version of this document was distributed to resource agencies for comments and feedback on June 3, 2011, and to the public during the public information meetings held June 27th and 28th. The draft document was also provided on the project website. Based upon feedback as well as the analysis from the draft document, it was determined that the purpose and need, as defined in the 2003 FEIS/ROD, remains valid.

FIGURE S.1-1
DESIGN SECTIONS

The following text identifies the purpose and need as presented in Chapter 2 of the 2003 FEIS/ROD.

> *The purpose of this proposed action is to improve cross-river mobility between Jefferson County, Kentucky, and Clark County, Indiana. Several specific factors demonstrate the need for action, including:*
>
> - *Inefficient mobility for existing and planned growth in population and employment in the downtown area and in eastern Jefferson and southeastern Clark Counties;*
> - *Traffic congestion on the Kennedy Bridge and within the Kennedy Interchange;*
> - *Traffic safety problems within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways;*

- *Inadequate cross-river transportation system linkage and freeway rerouting opportunities in the eastern portion of the Louisville Metropolitan Planning Area (LMPA); and*
- *Locally adopted transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange.* (2003 FEIS, p 2-1)

S.2 Alternatives

S.2.1 Re-Assessment of FEIS Alternative Screening Decisions

For this SDEIS, the range of alternatives considered and evaluated in the FEIS has been re-assessed. As part of this process, an *Alternatives Evaluation Document* was developed (see Appendix A.3). The *Alternatives Evaluation Document* presents the original process that was used to develop and evaluate the range of alternatives in the 2003 FEIS, and the process that was used to re-assess those alternatives for the SDEIS. It also presents the following recommended range of alternatives to be studied in the SDEIS:

- **No-Action**
  This alternative assumes that all of the projects in the current *Horizon 2030* MTP will be implemented. This does not take into account improvements associated with the LSIORB Project.

- **FEIS Selected Alternative (without Tolls)**
  This alternative is generally the same as the Selected Alternative approved in the 2003 ROD, which does not include tolls. Given the current economic conditions that exist within the region and the nation as a whole and the amount of funding that is reasonably available from federal and state sources (as determined by the Louisville Metropolitan Planning Organization), this alternative is no longer considered to be a reasonable alternative because it is not financially feasible; it is being considered in the SDEIS as a baseline for comparison with the modifications to this alternative proposed with the Modified Selected Alternative. See Section S.2.2.2, below, for a more detailed description of the FEIS Selected Alternative.

- **Modified Selected Alternative (with Tolls)**
  This alternative would include many of the elements of the Selected Alternative, but would be modified in two ways to improve its financial feasibility: 1) it would include several cost-saving design changes and 2) it would include the use of tolls. The cost-saving design changes include: a reduction in the width of the proposed East End Bridge, tunnel, and roadway; reconstruction of the Kennedy Interchange in downtown Louisville in-place; and elimination of a proposed pedestrian/bikeway facility from the new Downtown Bridge. See Section S.2.2.3, below, for a more detailed description of the Modified Selected Alternative.

S.2.1.1 Review of Conceptual Alternatives

This step involves a re-assessment of the conceptual alternatives considered in the 2003 FEIS and presented in the *Alternatives Evaluation Document*; and of each alternative's ability to meet the project's purpose and need. As shown in Table S.2-1, none of the conceptual alternatives considered in the 2003 FEIS meet the purpose and need, except for the Two Bridges/Highway Alternative.

S.2.1.2 Review of Alignment Selection

This step involves a re-assessment of the selection of alignments A-15 and C-1 as the preferred alignments in the Far East (herein referred to as East End) and Downtown LSIORB Project areas, respectively. As noted in the *Alternatives Evaluation Document*, the screening process for the 2003 FEIS identified a range of reasonable alignments for consideration in the East End and Downtown. Those alignments were studied in detail in the 2003 FEIS, and then a preferred alignment was identified for the East End (A-15) and Downtown (C-1). At each stage, the dismissal or advancement of alignments was based primarily on environmental factors, as documented in the 2003 FEIS.

This re-assessment focuses on determining whether there have been any changes in the affected environment that have the potential to alter the underlying basis for the decision to select alignments A-15 and/or C-1.

Alternatives Eliminated During Initial Screening

As part of the initial alternatives screening process, the following alternatives evaluated in the 2003 FEIS were dismissed from further consideration in this SDEIS. These alternatives are described in the *Alternatives Evaluation Document* in Appendix A.3, and in FEIS sections 3.4.1 (pages 3-45 through 3-53), 3.4.2 (pages 3-53 and 3-54), and 3.4.3 (pages 3-54 through 3-57).

- Alternatives A-1, A-3, A-4, A-5, A-6, A-7, A-8, A-10, A-11, A-12, and A-14
- Alternative B-2
- Alternatives C-2 and C-3
- Oldham County Corridor Alternative

No additional environmental or other considerations have been identified during this SDEIS process that would alter the decision to dismiss these alternatives from detailed analysis. In fact, additional residential and industrial growth in the area would likely add to the impacts of many of the alternatives that were originally dismissed and would increase their social/community effects.

TABLE S.2-1
EVALUATION OF CONCEPTUAL ALTERNATIVES

Alternatives	Summary	Conclusion
No-Action	Does not meet the purpose and need.	Carried forward as a baseline comparison to other alternatives in the SDEIS per NEPA guidelines.
TDM, TSM, TM, and Mass Transit	Does not meet the purpose and need.	Dismissed as standalone options
Kennedy Interchange Reconstruction	Does not meet the purpose and need.	Dismissed as a standalone option
One Bridge/Highway w/Kennedy Interchange Reconstruction		
Downtown Bridge Only	Does not meet the purpose and need.	Dismissed.
East End Bridge Only	Does not meet the purpose and need.	Dismissed.
Two Bridges/Highway w/Kennedy Interchange Reconstruction		
Oldham County/Downtown Corridor	Meets purpose and need, but its greater length results in much higher impacts and cost, and would result in reduced traffic usage.	Dismissed.
West/Downtown Corridor	Does not meet purpose and need; also, greater length results in much higher impacts and cost.	Dismissed.
East Corridor River Tunnel Highway System/Downtown Corridor	Meets purpose and need, but tunneling results in much higher cost, which far exceeds the cost of other alternatives.	Dismissed.
Near East/Downtown Corridor	Meets purpose and need.	Carried forward for further evaluation.
Far East/Downtown Corridor	Meets purpose and need.	Carried forward for further evaluation.

Alternatives Advanced for Detailed Evaluation in the 2001 DEIS

In the 2001 DEIS, build alternative alignments in each of the three corridors—Far East, Near East, and Downtown—were advanced for detailed evaluations.

In the Far East Corridor, as documented in the 2003 FEIS, Alternatives A-2, A-9, A-13, A-15, and A-16 were carried forward for detailed evaluation, as described in Section 3.4.1 on pages 3-45 through 3-53 of the FEIS. When compared to Alternative A-15, however, these alternatives were eliminated and Alternative A-15 was identified as the Preferred Alternative in the 2003 FEIS.

In the Near East Corridor, Alternative B-1 had similar impacts to Alternative B-2, which was previously dismissed during the initial screening phase. No revisions to the effects of this alternative, as described in the FEIS (p. 3-93), have been identified; therefore, the decision to dismiss this option remains valid for the SDEIS.

In the Downtown Corridor, only Alternative C-1 is carried forward for detailed evaluation in this SDEIS. In the 2003 FEIS, Alternative C-1 provided two options for the reconstruction of the Kennedy Interchange—an option to reconstruct the interchange in-place and an option to reconstruct the interchange to the south of the existing interchange. The FEIS Selected Alternative includes the reconstruction of the interchange to the south, and Modified Selected Alternative includes the reconstruction on the interchange in-place.

Conclusion

Based on the re-assessment of the alternatives evaluated in the 2003 FEIS, the decisions reached in the 2003 FEIS remain valid. This re-assessment has confirmed the selection of the Two Bridges/Highway Alternative consisting of Alternatives A-15 and C-1. The alternatives that were eliminated in the FEIS will not be re-considered further.

S.2.1.3 Cost/Financial Feasibility

The FEIS Selected Alternative currently has a year of expenditure cost estimate of $4.1 billion, an increase of $1.6 billion over the $2.5 billion year-of-expenditure cost estimate in the 2003 FEIS (FEIS p. S-11). The Louisville Metropolitan Planning Organization's (MPO) Metropolitan Transportation Plan (MTP) *Horizon 2030* currently states that KYTC, INDOT, and FHWA can reasonably be expected to provide up to $1.9 billion from traditional federal and state programs for the Project. This leaves a shortfall of approximately $2.2 billion. In response to this shortfall, two strategies have been identified: evaluate additional revenue options, including tolling, and modify design features to reduce costs, as follows:

- Tolling has been identified in the current MTP as an additional revenue source for the LSIORB Project. This and other possible additional revenue sources would provide the ability for the Louisville MPO to meet the requirement that the MTP be fiscally

constrained. For more information see Appendix G.2, *Financial Demonstration for the Ohio River Bridges Project in Support of the Louisville (KY-IN) Metropolitan Transportation Plan (September 2011).*

- The following modifications to the FEIS Selected Alternative are being considered to reduce costs:
  - Reconstructing the Kennedy Interchange within its existing location instead of relocating it to the south.
  - Reducing the East End Bridge, roadway, and tunnel from six to four lanes.
  - Eliminating the pedestrian/bike path from the Downtown Bridge because a similar facility will be provided on the nearby Big Four Bridge as a separate project.

During the public involvement process, some public comments recommended FHWA consider re-evaluating the tunnel in the East End Corridor in Kentucky (Alternative A-15) as a cost saving measure. For reasons described in the *Construction Options at U.S. 42 and Drumanard Estate Historic District* (see Appendix D.5), removal of the tunnel or additional modification to the tunnel design are not reasonable and will not be evaluated further in this SDEIS.

The Project design modifications are projected to result in a $1.2 billion savings from the estimated $4.1 billion cost of FEIS Selected Alternative. Therefore, the estimated cost of the Modified Selected Alternative is $2.9 billion. Based on preliminary estimates in the *Revenue Estimates and Indicative Financial Capacity SEIS Modified Selected Alternative Tolled Scenario* memo in Appendix G.5, tolling revenues are expected to generate from $800 million to $1.2 billion[1] in funding capacity. The projected toll funding, in combination with the $1.9 billion from traditional funding sources that are reasonably expected to be available according to the MTP, would provide total funding in the range of $3 billion, which would be sufficient to meet the $2.9 billion cost of the Modified Selected Alternative. It has therefore been concluded that a Modified Selected Alternative (with tolling) is financially feasible and warrants detailed study in the SDEIS. These cost and -funding estimates are preliminary, and are being presented at this time solely as a basis for evaluating the reasonableness of alternatives.

The FEIS Selected Alternative has an estimated year-of-expenditure cost of $4.1 billion, because it does not include the cost-saving design changes that are incorporated into the Modified Selected Alternative. As noted above, the total funds available for construction (from traditional and toll-based funding) would be in the range of $3 billion, if tolls are set at the same rates as assumed for the Modified Selected Alternative (i.e., $1.50 for cars, $3.00 for small trucks, and $6.00 for large trucks). While the cost and funding estimates are preliminary, a shortfall of this magnitude (approximately $1 billion) would make the FEIS Selected Alternative financially infeasible. Therefore, as part of this SEIS process, a separate analysis was conducted to assess the level at which toll rates would need to be set in order to provide sufficient funding (along with the $1.9 billion from traditional sources) to cover the $4.1 billion cost of the FEIS Selected

[1] This amount represents the net toll funding available for construction costs after subtracting the costs associated with operation and maintenance, along with debt service.

Alternative. (For more information see Appendix G.4, *Financial Feasibility Revenue Estimates for the FEIS Selected Alternative*). This new analysis documents that toll funding could generate approximately $1.4 billion to $2.1 billion in funding capacity. At the upper end of this range, it is conceivable that toll funding plus traditional funding could nearly cover the $4.1 billion cost of the FEIS Selected Alternative. However, toll rates would need to be much higher than assumed for the Modified Selected Alternative – for example, the analysis assumes passenger cars would pay a toll of $9.00 southbound in the morning and $10.00 northbound in the evening on both bridges in the year 2030 (expressed in year 2010 dollars). Toll rates at this level are unlikely to be accepted by the public and in any event are unnecessary given that an acceptable, lower-cost alternative (the Modified Selected Alternative) is available and can be implemented with much lower toll rates.

Therefore, while the current MTP state that the FEIS Selected Alternative is financially feasible with alternative funding sources, such as tolling, this new traffic forecasting and updated revenue analysis indicates that (1) tolling funding would be insufficient to cover the $4.1 billion year-of-expenditure cost estimate for the FEIS Selected Alternative if that alternative is tolled at the same rates as the Modified Selected Alternative, and (2) if the FEIS Selected Alternative were tolled at extremely high rates, toll revenues would still fall somewhat short of the funding needed, and the toll rates themselves would likely be considered unacceptable. Based on these findings, the FEIS Selected Alternative is not financially feasible. However, this alternative is being carried forward for detailed study in the SDEIS as a baseline for analysis as the currently approved alternative.

S.2.1.4 Summary of Findings

The following is a summary of findings from the re-assessment of the 2003 FEIS alternatives:

- The decisions reached in the 2001 DEIS and 2003 FEIS regarding the dismissal of conceptual alternatives and alignment alternatives remain valid in this SDEIS.

- The FEIS Selected Alternative cannot be constructed with currently available or reasonably anticipated funds, but should continue to be considered as a baseline for comparison with the Modified Selected Alternative.

- The FEIS Selected Alternative with the addition of tolls is not financially feasible because projected toll revenues would not be sufficient to cover the funding gap for this alternative.

- The FEIS Selected Alternative with design modifications (i.e., the Modified Selected Alternative), but without tolls, is not financially feasible because, even with cost-saving design changes, the cost of the Modified Selected Alternative would still far exceed the available and anticipated traditional revenue sources.

- The Modified Selected Alternative with tolls is a financially feasible alternative and is

therefore carried forward for detailed evaluation in this SDEIS.

- The basis for selecting alignments A-15 and C-1 as the preferred alignments in the East End and Downtown corridors, respectively, remains valid, and these alignments continue to be considered for both the FEIS Selected Alternative and the Modified Selected Alternative.

Based on these findings, three alternatives will be evaluated in detail in this SDEIS: (1) No-Action Alternative, (2) the FEIS Selected Alternative, and (3) the Modified Selected Alternative (with tolls).

S.2.2 Description of Alternatives

S.2.2.1 No-Action Alternative

The No-Action Alternative assumes that all of the projects listed in the *Horizon 2030* MTP will be implemented, with the exception of the LSIORB Project, which includes two new bridges over the Ohio River (i.e., Downtown/I-65 and East End/I-265), reconstruction of the Kennedy Interchange, and enhanced bus service improvements (i.e., KIPDA ID #s 52 and 185). For a more detailed description of other major planned projects in the vicinity of the project area, see Section 3.2.1 and Figure 3.2-1 in Chapter 3.

S.2.2.2 FEIS Selected Alternative

The FEIS Selected Alternative represents the same alternative that was presented in the 2003 FEIS as the Preferred Alternative and in the 2003 ROD as the Selected Alternative (see Figures S.2-1A and S.2-1B for the Downtown and East End corridors, respectively). This alternative is referred to in the FEIS as a Two Bridges/Highway Alternative and is composed of the following alignment Alternatives A-15 and C-1:

Alternative A-15
This alternative includes a 6-lane freeway on new alignment that would connect I-265/KY 841 (Gene Snyder Freeway) in Kentucky with S.R. 265 (Lee Hamilton Highway) in Indiana. This alternative includes a new 6-lane bridge over the Ohio River and a 6-lane tunnel under the historic Drumanard Property in Kentucky. It also includes interchanges at U.S. 42 (half diamond) in Kentucky and at Salem Road and S.R. 265/S.R. 62 in Indiana.

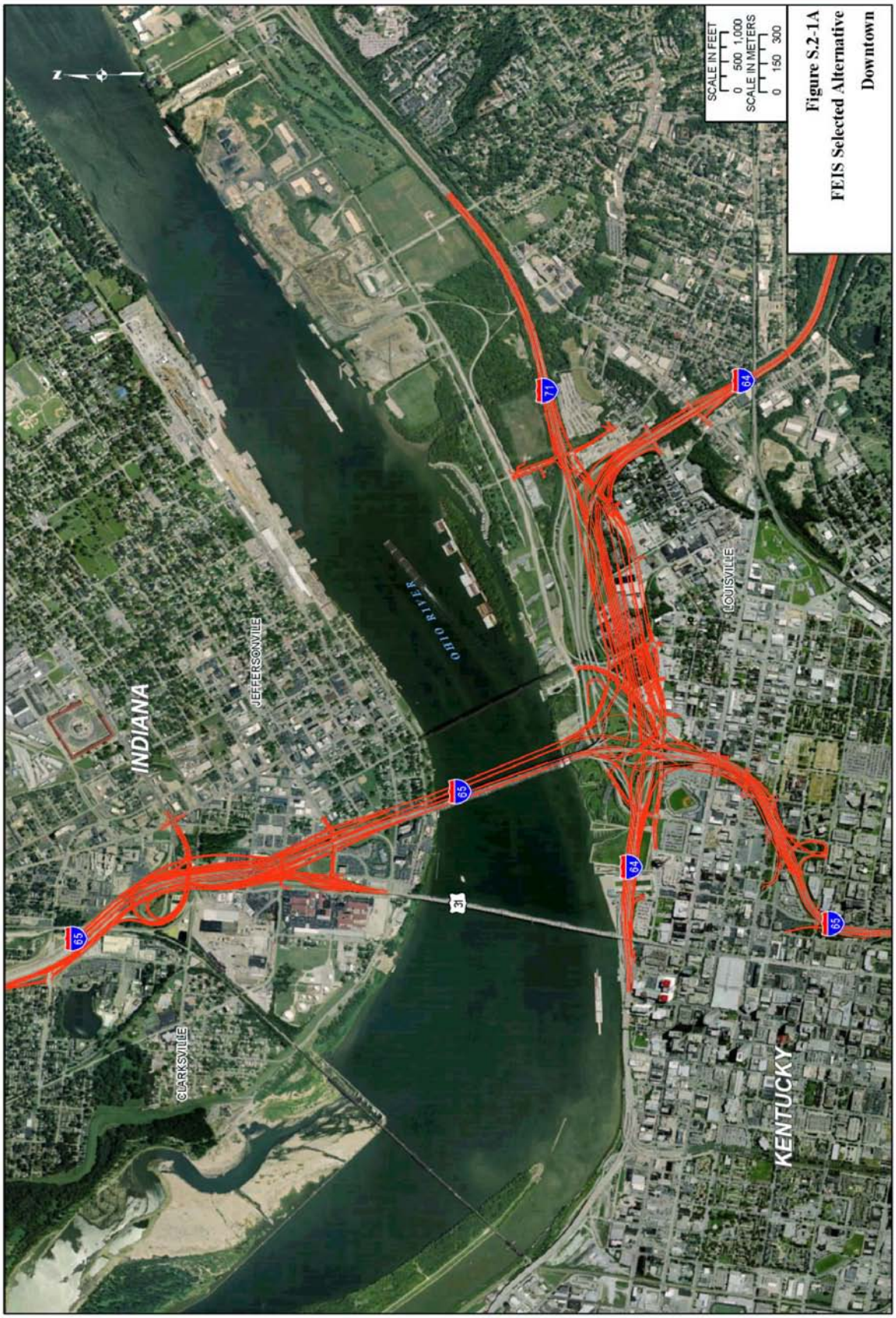
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Figure S.2-1A
FEIS Selected Alternative
Downtown

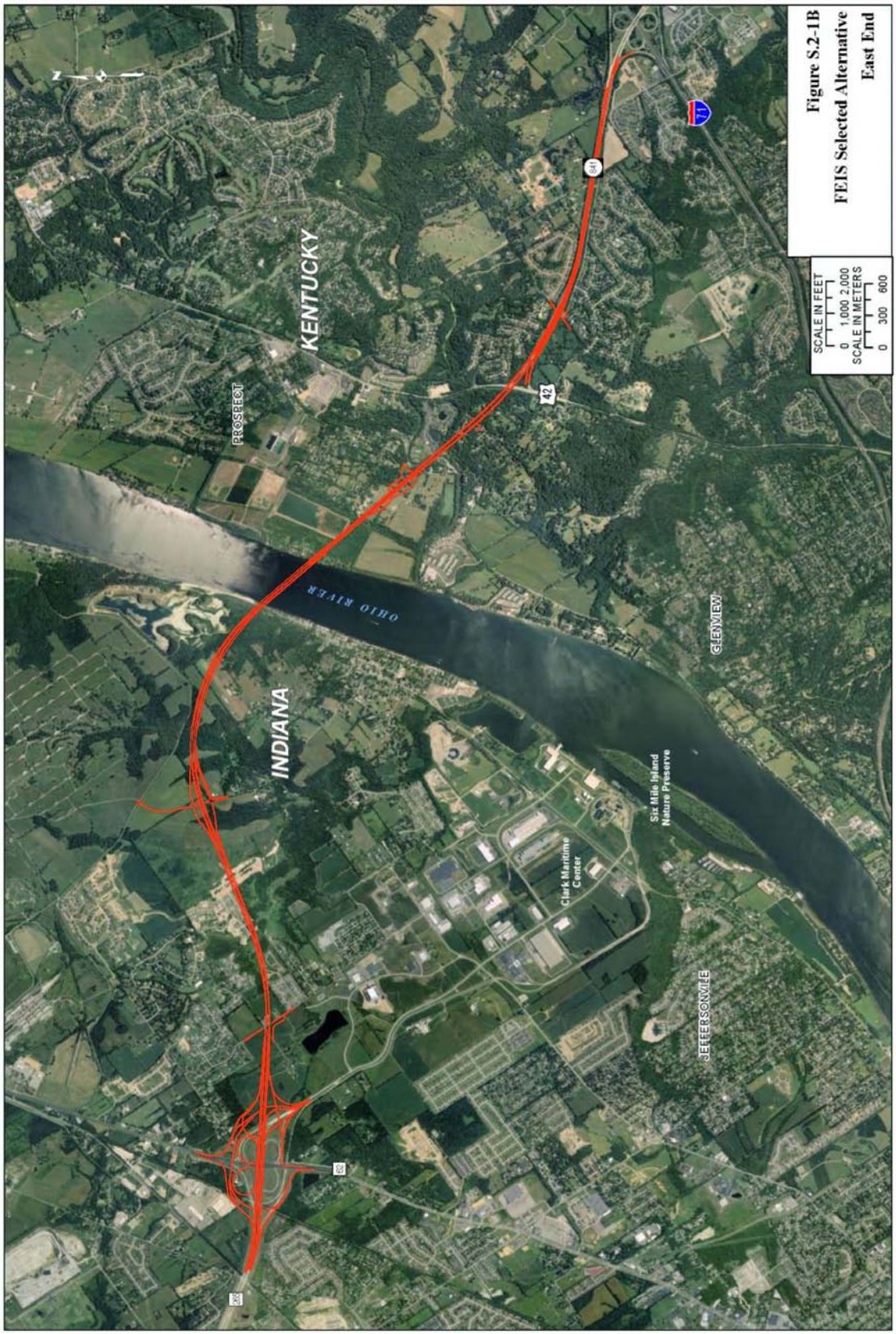


Figure S.2-1B
FEIS Selected Alternative
East End

Alternative C-1
This alternative includes the reconfiguration of the existing 7-lane Kennedy Bridge to a 6-lane bridge to accommodate I-65 southbound traffic and the construction of a new 6-lane bridge, plus a 17-foot wide pedestrian/bicycle lane, over the Ohio River just east of the Kennedy Bridge to accommodate I-65 northbound traffic. This alternative also includes the reconstruction of the Kennedy Interchange to the south of the existing interchange and an interchange with I-71/Frankfort Avenue in Kentucky, and the reconfiguration of I-65 and U.S. 31 in Indiana.

This alternative also includes the following elements of the Transportation Management Alternative that was presented in the FEIS (Note: More detailed descriptions of these elements are provided in the *Alternatives Evaluation Document* in Appendix A.3.):

- TDM—non-motorized facility enhancements and employer-based trip reductions.
- TSM—expanded Intelligent Transportation System applications.
- Mass Transit—enhanced bus service. Future options for enhanced bus service will be coordinated with Transit Authority of River City (TARC).

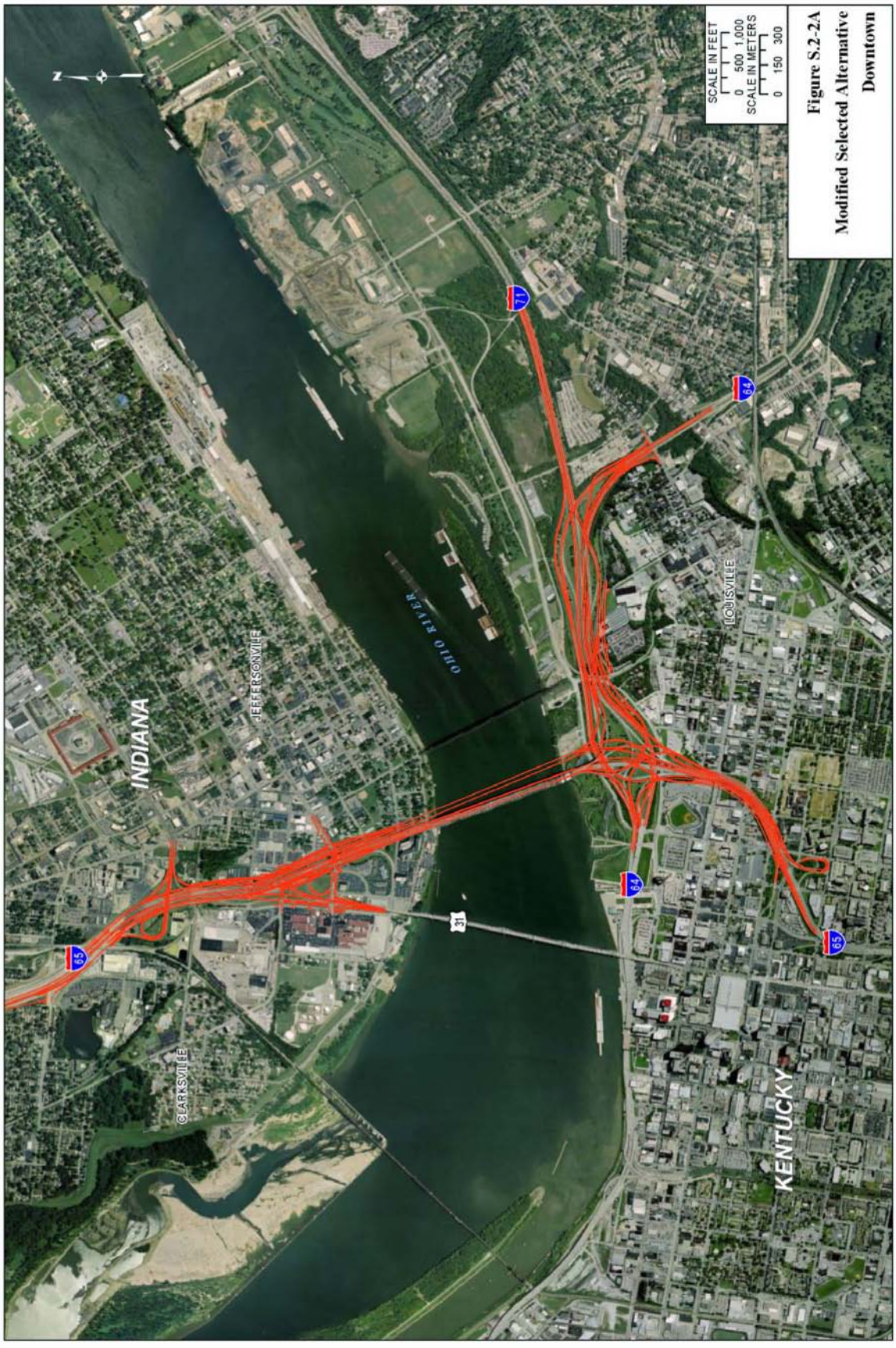
Starting in 2003 INDOT and KYTC selected design consultants to begin work on the design phase of the project. The design consultants conducted field surveys, performed geotechnical investigations, completed bridge type selections, and prepared right-of-way plans (which are used by the right-of-way agents to acquire land). During the seven-year design process, based on new information, public involvement and further engineering refinement, adjustments to the designs in the FEIS were made. Consequently, the FEIS Selected Alternative analyzed and addressed throughout this SDEIS process and document is reflective of the most current design. The most current design of the FEIS Selected Alternative includes the following differences, as compared to the 2003 design of the same alternative:

- Overall lower Kennedy Interchange ramps and structure elevations
- Reduced width of the Kennedy Interchange over the Louisville Waterfront Park
- Removal of the 3rd Street ramp in downtown Louisville and addition of an exit ramp from I-64 to River Road in downtown Louisville to serve the same traffic
- Modified Indiana East End Corridor interchange with S.R. 62 from a “standard diamond” design to a “divergent diamond” design.

Each of these modifications was communicated to the local leaders and the public during the design process, and before the issuance of the NOI for this SDEIS.

S.2.2.3 Modified Selected Alternative

This alternative would include many of the same elements as the FEIS Selected Alternative, but with the following modifications (see Figures S.2-2A and S.2-2B for the Downtown and East End corridors, respectively):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SCALE IN FEET
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Figure S.2-2A
Modified Selected Alternative
Downtown

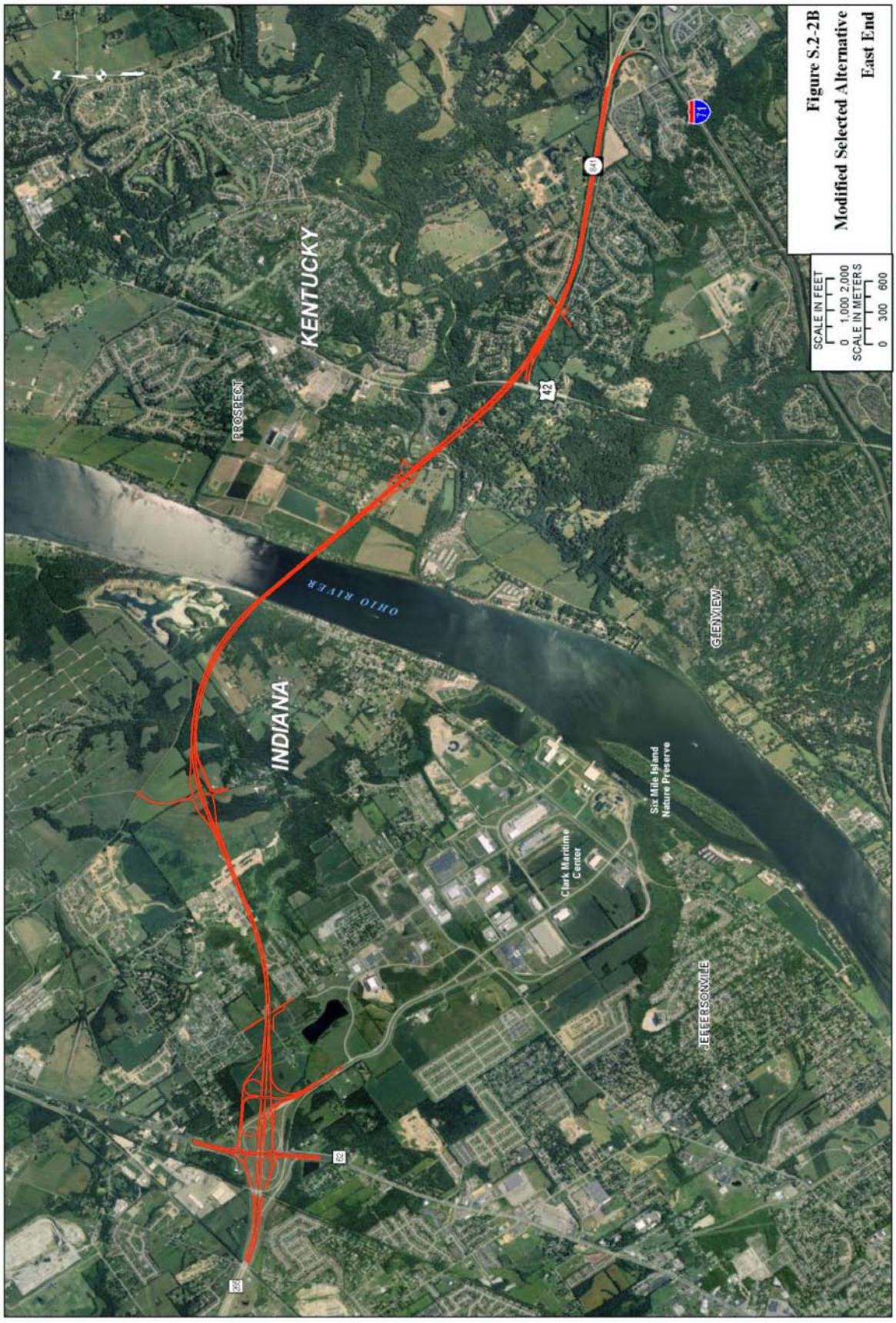

Figure S.2-2B
Modified Selected Alternative
East End

- Electronic tolls would be added on both the downtown I-65 river crossings (i.e., the Kennedy Bridge and the new downtown bridge) and the new East End Bridge. The use of electronic tolls would not require toll booths/plazas on the bridges. For the purposes of this SDEIS, the following baseline toll rates were estimated:

  Cars: $1.50
  Small Trucks: $3.00
  Large Trucks: $6.00

  These baseline toll rates are subject to change during the design and financing process. As presented in the *Traffic Forecast* (see Appendix H.1) a toll sensitivity test was conducted to better understand the impacts of different toll rates on travel patterns. The range of toll rates considered was from $1/$2/$4 to $2/$4/$8 for the three different types of vehicles. This analysis showed that these variations in toll rates would have less than a 1% difference in total cross-river traffic volumes.

- The number of lanes on the roadway, bridge, and tunnel associated with Alternative A-15 would be reduced from six lanes to four lanes.

- The Kennedy Interchange would be reconstructed on the existing alignment (i.e., in-place) instead of to the south, and would eliminate the I-71/Frankfort Avenue interchange. In addition, it would reduce the length of roadway improvements along the I-65, I-64, and I-71 approaches.

- The 17-foot-wide pedestrian/bicycle path would be removed from the new downtown I-65 bridge because a 22-foot-wide pedestrian/bicycle access across the river will be provided on the Big Four Bridge as a separate project. On the Kentucky side of the Big Four Bridge Project, the ramps have been completed and rehabilitation of the bridge began in 2011 and is currently under construction. On the Indiana side, construction is expected to begin in 2012. A Finding of No Significant Impact (FONSI) was approved for the bridge on the Kentucky side of the project by the USACE on July 16, 2007. A FONSI was approved for the Indiana side of the project by FHWA on October 19, 2011, which included an Individual 4(f) Evaluation for both sides of the river and the bridge itself.

As with the FEIS Selected Alternative, this alternative would also include the following elements of the Transportation Management Alternative as presented in the original FEIS (Note: More detailed descriptions of these elements are provided in the *Alternatives Evaluation Document* in Appendix A.3.):

- TDM—non-motorized facility enhancements and employer-based trip reductions.
- TSM—expanded Intelligent Transportation System applications.
- Mass Transit—enhanced bus service. Future options for enhanced bus service will

be coordinated with TARC.

S.2.3 Evaluation of Alternatives

The original EIS evaluated the alternatives in terms of their ability to meet the following five elements of the Purpose and Need:

- Inefficient cross river mobility for existing and planned growth in population and employment in the Downtown area and eastern Jefferson and southeastern Clark Counties
- Traffic congestion on the Kennedy Bridge and within the Kennedy Interchange
- Traffic safety problems within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways
- Inadequate cross-river system linkage and freeway rerouting opportunities in the Eastern portion of the Louisville Metropolitan Area
- Locally approved transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange

While these elements of the Purpose and Need have remained consistent, the criteria used to evaluate alternatives' ability to achieve the purpose and need have been refined as part of the preparation of the SDEIS. The refined set of alternatives evaluation criteria are described and explained in Table S.2-2. In general, an alternative meets the Purpose and Need if it meets all four of the Project purposes, as measured by the evaluation criteria.

The Purpose and Need also identifies a fifth need – "Locally approved transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange." The plan itself is based on the other needs. Therefore, an alternative is assumed to be compatible with the goals of the plan if it meets all four of the other elements of the Purpose and Need.

Table S.2-3 summarizes the purpose and need measures of effectiveness for the No-Action, FEIS Selected, and Modified Selected Alternatives. There is very little difference in measures of effectiveness between the FEIS Selected Alternative and the Modified Selected Alternative. Although it provides fewer capacity improvements than the FEIS Selected Alternative, the Modified Selected Alternative meets the purpose and need of the project because it:

- improves mobility in the region (decreases VHD);
- reduces traffic congestion on the Kennedy Bridge and within the Kennedy Interchange;
- improves traffic safety within the Kennedy Interchange;

TABLE S.2-2
ALTERNATIVES EVALUATION CRITERIA

Project Purpose	Evaluation Criteria
Improving Cross-River Mobility	• Reduce Vehicle Hours of Delay (VHD) in the LMPA region[2]
Reduce Congestion on Kennedy Interchange and Kennedy Bridge[3]	• Improve the Level of Service (LOS) to a D or better on the Kennedy Bridge. • Improves the bridge demand as percent of capacity.[4] • Improves the Kennedy Interchange operating speed during the peak hour. • Improves the Kennedy Interchange Peak Hour throughput to be closer to 100%[5] • Improves the Kennedy Interchange average link density such that each individual roadway "link" within the interchange also has reduced congestion and improves the level of service on each link to a LOS of D or better.
Improve Safety on Kennedy Bridge and Kennedy Interchange.	• Improves the geometrics of the Kennedy Bridge and Kennedy Interchange to meet the American Association of State Highway and Transportation Officials (AASHTO) recommended minimum design guidance.
Improve System Linkage and Freeway Re-Routing Opportunities	• Completes the eastern cross-river transportation system (i.e., by providing an additional highway connection across the Ohio River on the east end of the LMPA).

[2] The 2003 FEIS also considered an alternative's effect on vehicle hours of travel (VHT) and vehicle miles of travel (VMT), in addition to vehicle hours of delay (VHD), when evaluating the alternatives' ability to improve cross-river mobility. Both of these factors continue to be considered in this SEIS as part of the comparison of build and no-build alternatives. However, for purposes of determining whether an alternative meets the goal of improving cross-river mobility, the reassessment of alternatives for SEIS focuses on VHD. FHWA, KYTC, and INDOT determined that VHD is the measure that most closely correlates with the goal of improving cross-river mobility because it measures the total amount of delay. As such, a reduction in VHD means that drivers are spending less time sitting in congested traffic and are experiencing more efficient cross-river travel. Reductions in VMT and VHT also may be correlated with an improvement in mobility, but an improvement in mobility could also be correlated with an increase in VMT or even VHT. The availability of a shorter and/or less congested route may increase VMT or even VHT, because its allow for faster travel, which in turn may result in an increase in the number and length of trips as those trips become more attractive.

[3] With regard to the criteria used for evaluating congestion on the Kennedy Interchange and Kennedy Bridge, it is possible for strong performance on some evaluation criteria to outweigh weak or negative performance on others.

[4] Bridge demand as percent of capacity is a measure of the ratio of the weekday volume of traffic that desires to cross a given bridge relative to the design capacity of that bridge. The capacity is a function of the maximum Level of Service D traffic flow rates, the proportion of daily traffic that occurs in the peak hour of travel, and the number of lanes on the bridge.

[5] Throughput is the percentage of peak hour traffic entering the Kennedy Interchange that can pass through the interchange without experiencing undue delay or congestion. If throughput is less than 100 percent of demand, traffic congestion and diversions result.

TABLE S.2-3
MEASURES OF EFFECTIVENESS SUMMARY

Alternative	System Efficiency* (Percent Change VHD)	User Benefits $(Billion)	Traffic Congestion								Traffic Safety	System Linkage	Local Plan Compatibility
			Total Cross-River Demand as % of Capacity	Bridge Levels of Service				Kennedy Interchange Peak-Hour Operations					
				Sherman Minton	Clark Memorial	Kennedy Memorial	East End	Improves Average Speed	Improves Throughput	Improves Link Density			
No-Action	NA	-	111%	F	C	F	-	NA	NA	NA	No	No	No
FEIS Selected	-12.9	1.26	70%	E	C	D	C	Yes	Yes	Yes	Yes	Yes	Yes
Modified Selected	-12.1	1.29	73%	E	C	D	D**	Yes	Yes	Yes	Yes	Yes	Yes

* *These numbers are a measure of the efficiency of the LMPA network. Negative numbers represent an increase in the LMPA efficiency.*

** *The East End Bridge would have four lanes in the Modified Selected Alternative while it would have six lanes in the FEIS Selected Alternative.*

Note: Percent change is relative to the No-Action Alternative. Population and Employment Growth and Traffic Congestion Measures are for a Year 2030 weekday.

- provides adequate cross-river transportation system linkage; and
- is consistent with locally adopted transportation plans.

S.2.4 Costs/Schedule

The current estimated total costs for the two build alternatives are $2.9 billion for the Modified Selected Alternative and $4.1 billion for the FEIS Selected Alternative. A breakdown of the cost comparison between these two alternatives by design section is presented in Table S.2-4. As the table indicates, the design modifications that were implemented for the Modified Selected Alternative have resulted in a total savings of approximately $1.2 billion. It is estimated that construction of the project would begin in 2012 and be completed by 2022.

S.3 Summary of Impacts

Table S.3-1 summarizes the impacts associated with the FEIS Selected Alternative and the Modified Selected Alternative. As the table indicates, both alternatives would result in the same number of impacts to prime farmland, Section 4(f) properties, cultural resources, and agricultural properties. In addition, both alternatives would have no impacts to air quality and community

resources. The Modified Selected Alternative would result in fewer impacts with regard to noise (including historic properties), terrestrial/wildlife habitat, wetlands, streams, floodplains, and residential and commercial displacements. The most notable differences are that the Modified Selected Alternative would result in 10 and 56 fewer residential and commercial displacements, respectively, and would impact about 98 fewer acres of floodplains and 43 fewer acres of terrestrial/wildlife habitat compared to the FEIS Selected Alternative.

TABLE S.2-4
COST COMPARISON OF BUILD ALTERNATIVE BY DESIGN SECTION

Project Segment	FEIS Selected Alternative	Modified Selected Alternative	Savings
Section 1 - Kennedy Interchange	$1,530.0	$728.2	$801.8
Section 2 - Downtown Bridge	$569.7	$532.6	$37.1
Section 3 - Downtown IN Approach	$392.7	$177.8	$214.9
Section 4 - KY East End Approach	$885.2	$794.8	$90.4
Section 5 - East End Bridge	$406.2	$326.2	$80.0
Section 6 - IN East End Approach	$234.8	$231.7	$3.1
Other Costs[2]	$124.2	$125.0	-$0.8
TOTAL[1]	**$4,142.8**	**$2,916.2**	**$1,226.6**

(Year-of-Expenditure (2022) Costs in $, million).
(1) Totals may not sum due to rounding.
(2) Includes costs that are not section specific, including Project Oversight, Environmental Mitigation of Hazardous Materials, Wetland Remediation and Historic Preservation.

TABLE S.3-1
SUMMARY OF IMPACTS

Quantitative Impacts To	FEIS Selected Alternative	Modified Selected Alternative
Agricultural Resources Acres of prime farmland converted	57	57
Section 4(f) Properties used	8	8
Cultural Resources Number of historic districts impacted Number of historic sites impacted Number of archaeological sites impacted	 11 16 11	 11 16 11
Air Quality Impacts	None	None
Noise Number of impacted receptor sites Number of impacted Historic Properties	 244 18	 240 13
Natural Resources Acres of terrestrial wildlife/habitat impacted	237.3	194.4
Wetlands Acres of wetlands impacted	13.18	9.58
Water Resources Number of stream impacts (including Ohio River)	21	20
Floodplains Number of floodplains crossed Total acres of encroachment	 6 178.35	 5 80.03
Number of Residential Displacements	80	70
Number of Commercial / Not-for Profit Facility Displacements	80	24
Number of Agricultural Properties Impacted	18	18
Number of Community Resources Displaced	0	0

S.4 Permits Required

This section of the 2003 FEIS listed the federal and state permits that are likely to be required for the project. The information presented in the FEIS is still valid and applicable. For more detailed information, see page S-33 of the FEIS. It is anticipated the permits will be obtained during or prior to the summer of 2012.

S.5 Preferred Alternative

The Preferred Alternative for the LSIORB Project is the Modified Selected Alternative. As documented in this SDEIS, this alternative was selected as the Preferred Alternative because it would: 1) meet the project's purpose and need; 2) be financially feasible; and 3) result in less environmental impacts than the FEIS Selected Alternative. It was determined that the FEIS Selected Alternative would not be financially feasible and the No-Action Alternative would not meet the project's purpose and need.

S.6 Areas of Controversy

A lawsuit was filed in September 2009 against the FHWA, challenging the 2003 ROD for this project. The lawsuit was filed by two groups, River Fields and the National Trust for Historic Preservation. The lawsuit remains pending in the United States District Court for the Western District of Kentucky, Case No. 3:10-cv-00007. All litigation deadlines have been stayed while this SEIS is prepared.

A major component of the Modified Selected Alternative is the proposed addition of tolls. Throughout the public involvement process, some individuals have expressed their opposition to the tolls and the potential financial impact it may cause to individuals and businesses. It has also been expressed that a less costly one bridge only option (i.e., East End or Downtown) be developed that would eliminate the need for tolls to fund the project.

Throughout the LMA, strongly held and often-conflicting opinions have been expressed about whether to build one or two bridges. Some residents say both bridges are badly needed; while others argue the East End Bridge should be the priority. Still others disapprove of any bridge and advocate a light rail cross-river option. A common concern is about which bridge to build first, if two are to be built.

Some argue that bridge options for the Downtown area and the East End should be considered separately. They say that the two locations are not related, but are two distinctively different projects. Others, however, believe they are related and that if a bridge is built to the east that it will impact the Downtown area.

Some argue that traffic safety and congestion, especially in the Kennedy Interchange underscore the need for downtown improvements to be the top priority. An East End bridge, they argue, would be a "sprawl" bridge and ruin the scenic, pastoral setting along the river and lead to

unwanted development. Those favoring an East End bridge believe that a cross-river outer beltway in eastern Clark and Jefferson Counties is long overdue to accommodate growth and to provide access to residents and to commercial traffic that now is routed through downtown.

S.7 Unresolved Issues with other Agencies

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties and afford a reasonable opportunity for interested persons to comment on the proposed undertaking. Regulations by which a Federal agency meets its obligations under Section 106 are found at 36 CFR Part 800. The Section 106 Process for this SDEIS is still on-going.

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CHAPTER 1: PROJECT HISTORY

This Draft Supplemental Environmental Impact Statement (SDEIS) has been prepared by the Federal Highway Administration (FHWA), the Indiana Department of Transportation (INDOT), and the Kentucky Transportation Cabinet (KYTC) for the Louisville-Southern Indiana Ohio River Bridges (LSIORB) Project. The SDEIS has been prepared in accordance with the National Environmental Policy Act (NEPA) regulations issued by the Council on Environmental Quality (CEQ) requiring preparation of a supplemental environmental impact statement when there are "substantial changes in the proposed action that are relevant to environmental concerns." [40 CFR 1502.9(c)(1)(i)]

This SDEIS examines the impacts of proposed modifications to the "Two Bridges/Highway Alternative" identified as the Preferred Alternative in the Final Environmental Impact Statement (FEIS)/Section 4(f) Evaluation completed on April 8, 2003; and as the Selected Alternative in the Record of Decision (ROD) approved on September 6, 2003. The SDEIS has been prepared to evaluate the impacts of tolling to assist in funding the project, which was determined necessary through the Metropolitan Transportation Planning process; to evaluate cost-saving changes in the design of the Selected Alternative to minimize the amount of toll based revenue needed; and to update information and data where necessary to address changes to the project and the affected environment since the approval of the 2003 FEIS/ROD.

Chapter 1 of the 2003 FEIS summarized the regional transportation planning processes that identified the need for improvements in cross-river mobility in the Louisville Metropolitan Area (LMA), and introduced the recommendation that improvement alternatives be evaluated in an EIS. Chapter 1 of the SDEIS contains the following substantive updates and additions to the information presented in the FEIS:

- Section 1.4—Discusses the development of updated transportation plans and financial plans since the 2003 FEIS/ROD, including updates to the metropolitan long-range plan for the LMA.
- Section 1.5—Summarizes the following major steps taken to advance the project since the 2003 FEIS/ROD: the division of the project into six design sections; the design, right-of-way acquisition, and mitigation/enhancement activities conducted to date; the creation of the Louisville and Southern Indiana Bridges Authority (Bridges Authority); the development of financial plans in accordance with Federal and State requirements; ; and the cost-saving efforts that resulted in the development of the Modified Selected Alternative (with tolls) being evaluated in this SDEIS. Section 1.5 also summarizes the status of pending litigation involving a challenge to the 2003 FEIS/ROD.

1.1 Transportation Planning History

This section of the 2003 FEIS discussed the history of transportation planning with regard to cross-river mobility within the LMA from 1963 to 1993. The information presented therein remains valid for this SDEIS. For more detailed information, see page 1-1 of the FEIS.

1.2 Metropolitan Louisville Ohio River Bridge Study

This section of the 2003 FEIS discussed the results of the Metropolitan Louisville Ohio River Bridge Study conducted from 1991 to 1994. The information presented therein remains valid for this SDEIS. For more detailed information, see page 1-3 of the FEIS.

1.3 Ohio River Major Investment Study (ORMIS)

This section of the 2003 FEIS discussed the results of the Ohio River Major Investment Study (ORMIS) conducted from 1995 to 1996. The information presented therein remains valid for this SDEIS. For more detailed information, see page 1-3 of the FEIS.

1.4 Metropolitan Transportation Plan Updates and Development of Finance Plans

This section of the 2003 FEIS described the development and periodic updates to the metropolitan transportation plan (MTP) for the Louisville metropolitan area. It explained that, at the time the 2003 FEIS was issued, the current version of the MTP was *Horizon 2025*, which was adopted in 1998 by the Kentuckiana Regional Planning and Development Agency (KIPDA)[1]. *Horizon 2025* reflected recommendations of ORMIS, which identified a "two-bridge solution" to cross-river mobility needs. As noted in the 2003 FEIS, *Horizon 2025* included recommendations for a new six-lane bridge parallel to the existing Kennedy Bridge (I-65), reconstruction of the Kennedy Interchange, and a new four-lane I-265 freeway over the Ohio River between KY 841/I-265 in eastern Jefferson County, Kentucky, and S.R. 265 at S.R. 62 in Clark County, Indiana.

Since 2003, the Louisville MPO has continued to update its MTP in accordance with federal transportation planning requirements. The remainder of this section describes actions the MPO has taken since 2003 to update its MTP, and explains how the "fiscal constraint" requirement in the planning process led to the decision to incorporate tolling into the LSIORB project.[2]

2005: Adoption of Horizon 2025. In November 2005, the Louisville MPO adopted the *Horizon 2030* MTP, which was the update of *Horizon 2025.* The *Horizon 2030* MTP identified proposed transportation improvements for a 20-year horizon. This version of the MTP continued to include the LSIORB project as approved in the September 2003 ROD. At the time this plan was adopted, it was assumed that the cost of the project could be funded entirely by traditional revenue sources, without the need for tolls.

2007: Interim Financial Plan. In October 2007, in response to a federal law requiring a financial plan for all "Major Projects", KYTC and INDOT submitted to FHWA the *Louisville – Southern Indiana Ohio River Bridges Project Initial Financial Plan* (IFP).[3] The plan included

[1] KIPDA serves as the Louisville-Southern Indiana Metropolitan Planning Organization and is referred to in this document as "KIPDA" or the "Louisville MPO." The Louisville MPO serves the following counties: Oldham, Bullitt, and Jefferson in Kentucky; Clark, Floyd, and a portion of Harrison in Indiana. KIPDA provides regional planning, review, and technical services for the Louisville MPO, and is often referred to as being the Louisville MPO.

[2] The federal transportation planning regulations require that metropolitan transportation plans must be "fiscally constrained." Fiscal constraint means, in general terms, that the MPO can only approve a plan if it determines (and FHWA and FTA concur) that sufficient funding is reasonably anticipated to be available to carry out the projects included in the plan. ..

[3] Federal law requires recipients of federal financial assistance for a "Major Project" to develop an initial financial plan prior to construction and to prepare annual updates until the "Major Project" is complete. A "Major Project" is a project costing

updated project costs, estimates of future costs, and revenue scenarios, including tolling scenarios, and was intended to "provide an accurate basis upon which to schedule and fund the Ohio River Bridges Project" (IFP, p. i). The plan proposed funding the project using traditional Federal and state transportation funding sources, without the need for tolls. FHWA approved the IFP in January 2008.

2009: Expiration of Horizon 2025. Work began on an update to the MTP in 2008, with the goal of completing the update in 2009, four years after approval of the *Horizon 2025* plan in 2005.[4] However, the adoption of an updated MTP was delayed because of funding uncertainties – including concerns relying entirely on traditional (non-toll) funding could require up to 60% of Kentucky's annual highway funding to be directed to the LSIORB Project. Due to the uncertainty about the adequacy of traditional funding sources, the Louisville MPO did not update its MTP in 2009. Instead, the MTP expired in December 2009.

2009: Creation of Bridges Authority. The Kentucky General Assembly introduced legislation that would allow "Project Authorities" to be established to pursue innovative financing strategies for "Major Projects." That year, the Kentucky General Assembly enacted Sections 75 through 98 of House Bill 3 during an Extraordinary Session, which is now codified under Kentucky Revised Statutes (KRS) 175B. The enacted law led to the creation of the Bridges Authority. In October 2009, Kentucky's Governor and Louisville's Mayor appointed seven members to the Authority. In December, Indiana's Governor issued Executive Order 09-11 authorizing Indiana's participation and appointing seven members to the Authority. The Bridges Authority was tasked by the governors and the mayor to finance, construct, and oversee the LSIORB. The Bridges Authority is described in greater detail in Section 1.5, below.

2009-2010: Grace Period. When the MTP expired in December 2009, the Louisville MPO entered into a one-year grace period, which is provided by federal transportation planning regulations. The grace period provided an opportunity to resolve the financial issues that had prevented approval of an update to the MTP. During this grace period, the Louisville MPO was allowed to continue working on an update to the MTP, and projects that were already included in the Transportation Improvement Program (TIP)[5] were allowed to proceed.

2010: Financial Demonstration. In July 2010, the Bridges Authority, KYTC, and INDOT submitted to KIPDA a document titled *Financial Demonstration for the Ohio River Bridges Project, in Support of the Louisville (KY-IN) Metropolitan Transportation Plan (Financial Demonstration).* The *Financial Demonstration* presented potential funding sources and financing options, including a tolling scenario and other revenue-generating alternatives. The *Financial Demonstration* showed there to be reasonable expectations that the LSIORB project could be funded, with a combination of traditional funding sources and toll revenues. The *Financial Demonstration* was based on then-current assumptions about project costs and toll rates; it did

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$500 million or more. See 23 U.S.C. § 106(h). The estimated cost of the LSIORB Project substantially exceeds $500 million, so the project is clearly subject to Major Projects requirements. Additional information is available at: http://www.fhwa.dot.gov/ipd/project_delivery/defined/major_project.htm

[4] Under federal transportation planning regulations, the Louisville MPO is required to update (i.e., comprehensively review and revise) its MTP at least once every four years.

[5] The TIP is a staged, multiyear, intermodal program of transportation projects that require Federal funding, and is consistent with the MTP prepared by KIPDA.

not reflect cost-saving changes that were later incorporated into the project. (For a copy of this financial analysis, see Appendix G.1.)

2010: Adoption of Horizon 2030. Because the *Financial Demonstration* provided a source of funding for the LSIORB project, the Louisville MPO was able to satisfy the fiscal constraint requirement for the MTP. With that requirement satisfied, the MPO adopted an updated *Horizon 2030* MTP on October 7, 2010. This version of the MTP included the LSIORB project based on the assumption that the new bridges (Downtown and East End) would be tolled. The adoption of this plan in October 2010 reflected a decision by local governments, acting through the MPO, to include tolling as a key element of the financial plan for the LSIORB project.

2010: Update to Interim Financial Plan. In December 2010, the Bridges Authority updated the 2007 *Initial Financial Plan* (IFP) (see Appendix G.3 for the *Financial Plan Update*, December 2010). This update reflected the incorporation of toll revenues into the funding plan for the project. This updated IFP was submitted just before the initiation of this SDEIS, so it did not reflect the cost-saving design changes and tolling assumptions that are used in this SDEIS.

2011: Updated Financial Demonstration. In February 2011, FHWA initiated this SDEIS. As the alternatives analysis for the SDEIS moved forward, it became clear that the financial demonstration would need to be updated to reflect the cost-saving design changes and tolling assumptions that are shown in the SDEIS. In September 2011, the Bridges Authority, KYTC, and INDOT submitted an updated version of the *Financial Demonstration* to the Louisville MPO. The updated *Financial Demonstration* is consistent with the cost and tolling assumptions that are used in this SDEIS; specifically, it is consistent with the cost estimates and toll rate assumptions for the Modified Selected Alternative in this SDEIS. (For a copy of this financial analysis, see Appendix G.2.)

2011: Adoption of Updated Horizon 2030. In October 2011, an updated *Horizon 2030* MTP was adopted by the Louisville MPO. The MTP included the Modified Selected Alternative, with the cost savings and tolling assumptions that are reflected in this SDEIS. In November 2011, the updated *Horizon 2030* MTP received Federal approval[6].

1.5 Louisville-Southern Indiana Ohio River Bridges Project

This section summarizes major steps that have been taken to advance the project since the issuance of the ROD in 2003, including: the division of the FEIS Selected Alternative into six design sections; design, right-of-way acquisition, and mitigation/enhancement activities; project-related financial planning activities, including the creation of the Bridges Authority; and proposed modifications to the FEIS Selected Alternative.

The FEIS Selected Alternative includes these major components:

- A new bridge across the Ohio River connecting KY 841/I-265 (Gene Snyder Freeway) in northeastern Jefferson County, Kentucky, with S.R. 265 at S.R. 62 in southeastern Clark County, Indiana (Alternative A-15).
- A new interstate bridge parallel to the Kennedy Bridge (Alternative C-1) as well as the Reconstruction of the Kennedy Interchange to the south.

[6] http://www.kipda.org/Transportation/MPO/LRP.aspx

- Non-motorized facility enhancements (17-foot-wide pedestrian and bicycle paths on both bridges), expanded employer-based trip reduction programs, expanded Intelligent Transportation System (ITS) applications, expanded incident management programs, and enhanced cross-river bus service, as well as numerous mitigation commitments.

Six Design Sections

After the issuance of the ROD, INDOT and KYTC divided the Selected Alternative into the following six Design Sections (Figure 1.5-1):

Section 1—Reconstruction of the Kennedy Interchange to the South. (Also referred to as the "Kennedy Interchange Section.")

Section 2—New I-65 Northbound Bridge over the Ohio River. (Includes the reconfiguration of the existing seven-lane Kennedy Bridge to a six-lane bridge to accommodate I-65 southbound traffic.) (Also referred to as the "Downtown Bridge Section.")

Section 3—I-65 in Indiana north of the Kennedy Bridge. (Also referred to as the "Downtown Indiana Approach Section.")

Section 4—Extension of I-265 in Kentucky from I-71 to the new Ohio River East End Bridge. (Also referred to as the "East End Kentucky Approach Section.")

Section 5—New Ohio River Bridge on the I-265 extension. (Also referred to as the "East End Bridge Section.")

Section 6—Extension of S.R. 265 in Indiana from the S.R. 62 interchange to the new Ohio River East End Bridge. (Also referred to as the "East End Indiana Approach Section.")

Status of Project-Related Activities Since the 2003 FEIS/ROD

From 2003 to 2004, INDOT and KYTC selected six Section Design Consultants (SDC) to begin work on the design phase on the sections. Since 2004 the Section Design Consultants have pursued the following courses of action in their project sections:

- Continued community involvement efforts to guide the integration of the specific sections into their urban/rural settings
- Surveyed the project area
- Performed geotechnical investigations
- Completed bridge type selection processes
- Prepared right-of way-plans for acquisition

Right-of-way acquisition began in 2010. Prior to 2010, purchases were limited to either hardship cases or advanced acquisitions. Only a few properties have been acquired in the Louisville and Jeffersonville downtown areas. The majority of properties have been acquired on the East End of the project in both Kentucky and Indiana.

Several mitigation and enhancement measures identified in the 2003 FEIS (Chapter 8, *Commitments and Mitigation*) have been implemented. These include the following:

Figure 1.5-1
DESIGN SECTIONS

- Rehabilitation of the Louisville Railway Complex (Trolley Barn) (FEIS p. 8-18)
- Preparation of Historic Preservation Plans for the Old Jeffersonville Historic District, Phoenix Hill Historic District, and Country Estates Historic District (FEIS pp. 8-12, 8-19, and 8-20, respectively)
- Sponsorship of a Smart Growth Conference for Louisville – Southern Indiana Region (a cooperative effort among KYTC, FHWA, INDOT, historic preservation agencies, and local government organizations) (FEIS p. 8-10).

Financial Plans: Compliance with Federal and State Requirements

Three distinct mandates—two under Federal law and one under a state statute—governed the need to develop a financial plan for the LSIORB Project. First, as noted in Section 1.4, Federal law (23 U.S.C. §134) requires a metropolitan transportation plan to be "fiscally constrained." Second, Federal Law (23 U.S.C. § 106(h)) requires that recipients of Federal financial assistance for a Major Project submit a project-specific financial plan to FHWA. Third, Kentucky state law requires the Bridges Authority to develop a financial plan for the LSIORB project.

Initial Financial Plan (IFP). The Initial Financial Plan addressed the two Federal requirements. The IFP was submitted to FHWA under the Major Project requirement, and became one of the elements used to implement the requirement that the Louisville MPO's MTP include a financial plan. According to FHWA's *Financial Plan Guidance* (January 2007), a Major Project financial plan must reflect the project's cost estimate and revenue structure and provide a reasonable assurance that sufficient financial resources will be available to implement and complete the project as planned. The plan must be submitted to FHWA prior to construction and annually updated with detailed estimates of the cost to complete the project.

Responding to the Federal mandates, KYTC and INDOT submitted to FHWA the *Louisville – Southern Indiana Ohio River Bridges Project Initial Financial Plan* (IFP) in October 2007. In January 2008, KYTC and INDOT received FHWA's approval of the IFP for the project. The plan included detailed project cost estimates to complete the project; estimates of future costs; and revenue scenarios—including tolling scenarios—to "provide an accurate basis upon which to schedule and fund the Ohio River Bridges Project" (IFP, p. i).

The plan estimated a cost increase, due to inflation, that would raise the estimated year-of-expenditure cost to approximately $4.1 billion ($1.61 billion more than the 2003 FEIS/ROD projection); and proposed funding the project entirely through traditional Federal and state transportation program funding sources, which included Federal funding designated specifically for the project, and Kentucky and Indiana's federal-aid apportionments. The states' funding was to be comprised of state matching funds for the federal-aid program, state construction program funds and, in Indiana's case, proceeds from the Indiana Toll Road concession made available through Indiana's "Major Moves" transportation program[7].

The IFP noted that planned annual updates would include "the potential to employ alternative funding approaches…both states recognize that circumstances can change and alternative structures may present themselves" (see IFP p. 4-12). Tolling options were listed among the potential alternative funding approaches that could be included in the annual updates. An updated Interim Financial Plan was submitted to FHWA in December 2010.

Bridges Authority. A key step taken by the Commonwealth of Kentucky and State of Indiana to ensure the availability of funding sources was the establishment of the Bridges Authority—a bi-state authority charged with overseeing the financing of the project—as described in Section 1.4, above.

The Bridges Authority held its inaugural meeting in February 2010, and immediately began working toward its primary objective of developing a financial plan that provided updated project cost estimates; and identified potential funding sources and finance mechanisms that would be reasonably expected to be available to complete the project.

During the course of that work, the Bridges Authority followed the directive of its appointing authorities—the Governors of Kentucky and Indiana and the Mayor of Louisville—to consider and explore any and all possible funding options for the project.

[7] In late 2005, Indiana launched a 10-year, $10 billion transportation plan, known as "Major Moves," to improve and expand Indiana's highway infrastructure. A total of $2.6 billion was committed to Major Moves from the long-term lease of the Indiana Toll Road and the plan called for 104 new roadways by 2015. (Source: www.in.gov/indot/2407.htm)

In July 2010, the Bridges Authority, KYTC, and INDOT submitted to KIPDA the *Financial Demonstration* (see Section 1.4, herein) that, while not intended to be an update of the IFP, provided a "synopsis of the potential sources of funding" to meet anticipated project funding needs. The *Financial Demonstration* analyzed the cost estimates associated with the project and concluded that the project could not be funded solely through traditional revenue sources because of the unpredictability of such funding as a result of the economic downturn and other factors. The document identified an estimated year-of-expenditure project cost of approximately $4.1 billion, and noted (p. 5) that the Bridges Authority was "exploring the full range of alternative funding sources potentially available for the Project," including toll revenues. Soon after, in December 2010, the Bridges Authority produced the *Financial Plan Update* (see Appendix G.3).

As noted in Section 1.4, above, in September 2011 the Bridges Authority submitted to KIPDA an updated *Financial Demonstration.* The document included a revised project development and construction cost of approximately $2.9 billion (projected year-of-expenditure dollars) based on project scope changes and revenue projections that "reflect the baseline tolling scenario that is being used in this SEIS update." (p. 6)

Modified Selected Alternative (with Tolls)

The current estimated $4.1 billion cost reflects an increase of $1.6 billion over the $2.5 billion year-of-expenditure cost estimate in the 2003 FEIS (FEIS p. S-11). Of the estimated $4.1 billion amount, the current MTP assumes that $1.9 billion will be available from traditional Federal and state funds, based on past history in both states. This leaves a shortfall of approximately $2.2 billion, which would need to be obtained from other sources.

In response to the amount of toll based revenue needed to complete the 2003 Selected Alternative, in January 2011 the Indiana and Kentucky Governors and the Louisville Mayor asked INDOT, KYTC, and FHWA to pursue cost-saving adjustments to the 2003 plan for building two new bridges and rebuilding the Kennedy Interchange. Consequently, design modifications to the 2003 FEIS Selected Alternative were evaluated to reduce the overall cost of the project and, thereby, minimize the amount of toll based revenue required. The evaluation showed that costs could be substantially reduced with the following proposed modifications:

- Reconstructing the Kennedy Interchange within its existing location instead of relocating it to the south.
- Reducing the East End Bridge, roadway, and tunnel from six to four lanes.
- Eliminating the pedestrian/bike path from the Downtown Bridge because a similar facility will be provided on the nearby Big Four Bridge as a separate project.

These changes are projected to result in a $1.2 billion savings. While this cost reduction would narrow the funding gap, it does not close it; tolls are still needed to supplement funding. The proposed addition of tolls and design modifications to reduce costs resulted in the reevaluation of the project and its environmental impacts, as required by NEPA. On February 15, 2011, to comply with NEPA, FHWA, KYTC, and INDOT published in the *Federal Register* a Notice of Intent to prepare an SEIS to document the changes since the 2003 FEIS that would be associated with the proposed tolling options, design modifications, and changes in the project area.

The design modifications and tolling option comprise a new build alternative—the "Modified Selected Alternative"—that is evaluated in this SDEIS. The SDEIS considers how a Modified Selected Alternative would affect the environment compared with the originally selected "Two Bridges/Highway Alternative" (without tolls) and the No-Build Alternative; and addresses the requirements of environmental laws, regulations and Executive Orders that are applicable to the project.

Litigation Status

A lawsuit was filed in September 2009 against the FHWA, challenging the 2003 ROD for this project. The lawsuit was filed by two groups, River Fields and the National Trust for Historic Preservation. The lawsuit remains pending in the United States District Court for the Western District of Kentucky, Case No. 3:10-cv-00007. All litigation deadlines have been stayed while this SEIS is prepared.

Format of this SDEIS

The SDEIS format generally follows the section-heading outline used in the 2003 FEIS. Changes to the project and/or conditions in the project area that have occurred since the FEIS are described in their respective sections; and where the information presented in the 2003 FEIS remains valid, such is noted. While the SDEIS builds upon and incorporates work already completed as part of the project development process, it does not reproduce in full the voluminous FEIS and ROD documentation. Instead, it incorporates information from those documents by reference, where applicable. The FEIS and ROD are available for review at the Community Transportation Solutions' (CTS) office located at the Forum Office Park III, 305 North Hurstbourne Parkway, Suite 100, Louisville, Kentucky. These documents can also be reviewed on the project website: www.kyinbridges.com.

CHAPTER 2: PURPOSE AND NEED

The purpose and need for the project as identified in the 2003 FEIS/ROD was reevaluated as part of the SEIS process and documented in a *Purpose and Need White Paper* (see Appendix A.1). A draft version of this document was distributed to resource agencies for comments and feedback on June 3, 2011, and to the public during the public information meetings held June 27 and 28. 2011. The draft document was also provided on the project website. Based upon feedback as well as the analysis from the document, it was determined that the purpose and need, as defined in the 2003 FEIS/ROD, remains valid.

The following text identifies the purpose and need as presented in Chapter 2 of the 2003 FEIS/ROD.

> *The purpose of this proposed action is to improve cross-river mobility between Jefferson County, Kentucky, and Clark County, Indiana. Several specific factors demonstrate the need for action, including:*
>
> - *Inefficient mobility for existing and planned growth in population and employment in the downtown area and in eastern Jefferson and southeastern Clark Counties;*
> - *Traffic congestion on the Kennedy Bridge and within the Kennedy Interchange;*
> - *Traffic safety problems within the Kennedy Interchange and on the Kennedy Bridge and its approach roadways;*
> - *Inadequate cross-river transportation system linkage and freeway rerouting opportunities in the eastern portion of the Louisville Metropolitan Area (LMA); and*
> - *Locally adopted transportation plans that call for two new bridges across the Ohio River and the reconstruction of the Kennedy Interchange.* (2003 FEIS, p 2-1)

Chapter 2 of the 2003 FEIS described the project setting, including the transportation limitations associated with the existing cross-river roadway system; identified the project's purpose and the needs for improved cross-river mobility; and described the regional, socioeconomic, traffic, and other factors that helped define and quantify the needs. Chapter 2 of the SDEIS contains the following substantive updates and revisions to information presented in the 2003 FEIS:

- Section 2.1—Updates status of weight restriction for Milton-Madison Bridge (U.S. 421), adds a discussion of the Big Four Bridge bicycle/pedestrian project, and updates Transit Authority of River City (TARC) passenger and route information.
  - Section 2.2—Changes the planning horizon year from 2025 to 2030. Revises subsections as follows:

- 2.2.1—Revises text and tables to update regional socioeconomic forecasts and travel demand data and methodology, including 2030 cross-river travel demand forecasts; and adds Table 2.2-3, *Ohio River Crossing Demand as Percent of Capacity (2010 and 2030).*

- 2.2.2—Updates population and employment data and forecasts, including figures 2.2-2, *No-Action Alternative Population Forecasts 2007–2030 Change,* and 2.2-3, *No-Action Alternative Employment Forecasts 2007–2030 Change*; and revises the "Land Use Plans and Infrastructure Improvements" subsection to discuss the 2007 comprehensive plans of Clark County and Jeffersonville, both of which include features of the LSIORB Project.

- 2.2.3—Revises the peak-hour periods based on updated traffic data; revises the projected increase in congestion on the Sherman Minton Bridge; updates the discussion of truck traffic through the Louisville Metropolitan Planning Area (LMPA) on I-64 and I-65 and on the Kennedy Bridge; and identifies existing (2010) and projected (2030) Levels of Service on roadway segments in the Kennedy Interchange including the Kennedy Bridge and its approaches. Also, eliminates, revises, and/or adds figures and tables, as identified in the introduction to the section.

- 2.2.4—Substantially revises the section to reflect crash data, and provide crash rate comparisons, for the years 2005 through 2009.

Travel Demand Modeling

To update the project's purpose and need, since the 2003 FEIS, a travel demand model was developed for the project and used to forecast future travel conditions in the region. The project model has many enhancements over the existing model prepared by the Louisville Metropolitan Planning Organization (MPO)[1], which included the following extensive data collection efforts to improve model inputs and results:

- External station surveys on all of the interstates.
- Vehicle classification counts collected at over 50 ramps.
- Turning movement counts made at 50 different intersections.
- I-65 origin-destination survey between points north of Kennedy Bridge and the I-64 split.
- Collection of traffic signal data (signal location, green cycle, phasing) at more than 1,100 locations.
- New traffic counts at nearly 1,400 count locations in both Kentucky and Indiana, up from around 260 in the previous model.
- The latest socioeconomic data provided by the Louisville MPO.

[1] The Kentuckiana Regional Planning and Development Agency (KIPDA) provides staffing services to the Louisville MPO and, therefore, the traffic model and certain planning documents are often referred to as the KIPDA model or KIPDA plans, as appropriate.

- Transit information including 48 routes and over 1,300 stops integrated into the various highway networks.

This data helped develop these new travel demand modeling features:

- Time of day modeling where flows for four periods (AM, mid-day, PM and overnight) were developed to give better information than just the average daily traffic (ADT) level.
- Mode choice that included forecasting of all transit travel and transit alternatives.
- A truck model developed for forecasting heavy vehicle flows on all facilities.
- Enhanced trip generation equations to include income categories.
- Trip distribution model that included a generalized cost based on adjusted travel time plus operating cost divided by the value of time.
- Improved calibration performed for the trip generation, trip distribution, mode choice, time of day and traffic assignment steps.
- Enhanced validation performed at the system level, facility type level, area type level, county level and link level—especially the bridges.
- Extensive sensitivity testing completed using travel times and other attributes to understand model performance and deviations between the model and ground counts.

The new model exceeded the daily validation results from the Louisville MPO model and provided many new features that could be used to answer key traffic-related questions.

Using the new model, traffic for a No-Action Alternative was forecasted to provide a baseline for comparing with the build alternatives and evaluating the purpose and need for the project. The transportation network used in the model was based on the assumption that all of the projects included within the current Louisville MPO Metropolitan Transportation Plan (MTP) (*Horizon 2030*) will be implemented, with the exception of the two new Ohio River bridges and the reconstruction of the Kennedy Interchange recommended in the 2003 FEIS. The initial socioeconomic input for the travel demand model was based on Louisville MPO's latest socioeconomic forecast for the region in year 2030, which assumes two new bridges across the Ohio River in the LMPA. However, for the SDEIS No-Action Alternative, an alternate distribution of the MPO socioeconomic forecast was developed for the project model that did not include the two new Ohio River bridges or the reconstruction of the Kennedy Interchange.

Traffic Modeling

For the Kennedy Interchange and its interstate approaches (including the Kennedy Bridge), a detailed analysis was performed using corridor simulation software (CORSIM), which determines several measures that demonstrate traffic congestion such as average peak-hour speed, total vehicle hours of delay, and throughput as a percent of demand. Another measure of traffic congestion is known as the "level of service" or LOS. LOS identifies the degree of congestion on a particular roadway segment for the peak hour. LOS ranges from A to F, with

LOS A indicating the least congestion and best traffic flow, and LOS F indicating the most congestion and worst traffic flow.

2.1 Project Setting

This section of the 2003 FEIS discussed the transportation limitations associated with the existing cross-river roadway system within and outside of the LMPA along with the partial "inner beltway" (i.e., I-264) and "outer beltway" (i.e., I-265). The SDEIS updates the information presented in this section of the FEIS to include information about the Milton-Madison Bridge (U.S. 421), the pedestrian and bicycle routes across the Ohio River, and cross-river transit routes.

The Milton-Madison Bridge crosses the Ohio River 40 miles northeast of the Kennedy Bridge. Reconstruction of the bridge, which began in January 2011, will eliminate weight restrictions on the bridge and is expected to be completed in the Fall of 2012.

The 2003 FEIS noted that a bicycle and pedestrian river-crossing is provided only on the Clark Memorial Bridge. Since that time, local, state, and Federal governments have initiated a project to convert the Big Four Railroad Bridge into a bicycle/pedestrian crossing of the Ohio River. The Big Four Bridge is located about 1,200 feet upstream from the Kennedy Bridge and connects the cities of Louisville, Kentucky, and Jeffersonville, Indiana (see FEIS Figure 2.1-1, page 2-2). It is no longer in use as a railroad bridge and access was removed in 1969.

The Big Four Bridge project will provide a 22-foot-wide pedestrian/bicycle pathway over the Ohio River between Louisville, Kentucky and Jeffersonville, Indiana. On the Kentucky side of the Big Four Bridge project, the ramps have been completed and rehabilitation of the bridge began in 2011 and is currently under construction. On the Indiana side, construction is expected to begin in 2012. A Finding of No Significant Impact (FONSI) was approved for the bridge on the Kentucky side of the project by the USACE on July 16, 2007. A FONSI was approved for the Indiana side of the project by FHWA on October 19, 2011, which included an Individual 4(f) Evaluation for both sides of the river and the bridge itself.

The Transit Authority of River City (TARC) provides public transportation within the LMPA. Through coordination with TARC, the following passenger and route information from the FEIS has been updated for the SDEIS. Currently, TARC operates six bus routes across the Ohio River. Two routes use the Sherman Minton Bridge (I-64) and carry a total of approximately 350 passengers per weekday on 31 one-way trips. Four routes use the Clark Memorial Bridge (U.S. 31), serving approximately 1,422 weekday passengers in aggregate on 117 one-way trips. Two of these routes use the Kennedy Bridge for peak-hour express trips.

There are no other changes to information that was presented in this section of the FEIS. See Section 2.1, page 2-1 of the FEIS, for a more detailed description of the project setting.

2.2 Purpose and Need for Action

This section of the FEIS defined the purpose of the proposed action as improving cross-river mobility between Jefferson County, Kentucky, and Clark County, Indiana; and detailed the factors that contribute to, and demonstrate the need for, an improvement in cross-river mobility for LMPA residents and interstate travelers. The information in this section remains unchanged since the FEIS with the following substantive exception: The SDEIS is based on the most recent MTP, *Horizon 2030.* For more detailed information, see page 2-6 of the FEIS.

2.2.1 Regional Context

This section of the FEIS described the socioeconomic (population and employment) forecasts for the LMPA that were prepared by the Louisville MPO's and used in the travel demand computer model to estimate current and future travel demand within the LMPA. For more detailed information, see pages 2-9 through 2-12 of the FEIS. The information in this section remains unchanged since the FEIS with the following substantive exceptions: The SDEIS updates the regional population and employment forecasts, and travel demand data, including 2030 cross-river travel demand forecasts.

The identification of specific transportation needs within the LMPA and the assessment of potential solutions to those needs require an understanding of the overall population and employment growth patterns in the area. This "regional context" helps to better define and quantify the specific needs for improvements in cross-river mobility that have been identified between Clark County, Indiana, and Jefferson County, Kentucky. It also provides the framework for evaluating alternative solutions to address those needs.

KIPDA, which provides staff support for the Louisville MPO, prepares socioeconomic (population and employment) forecasts for the LMPA, which are incorporated into Louisville MPO's travel demand computer model to estimate current and future travel demand within the area. Those regional travel demand conditions help to predict future travel conditions and the needs of the transportation systems; and, ultimately, to evaluate potential solutions to the identified transportation needs.

Since the 2003 FEIS was issued, a new travel demand model was developed for use in forecasting future travel conditions in the region to aid in determining the project's purpose and need. The model was based on extensive data collection efforts, including traffic counts at nearly 1,400 locations, turning movement counts at 50 intersections, current transit data, an origin-destination survey, and the latest socioeconomic data provided by the Louisville MPO.

Traffic for a No-Action Alternative was forecasted to provide a baseline for comparing with the build alternatives and assessing the need for action. The transportation network used in the model was based on the assumption that all of the projects included within the current MTP (*Horizon 2030*) will be implemented, with the exception of the two new Ohio River bridges and the reconstruction of the Kennedy Interchange recommended in the FEIS. The initial socioeconomic input for the travel demand model was based on Louisville MPO's latest socioeconomic forecast for the region in year 2030, which assumes two new bridges across the

Ohio River in the LMPA. However, for the SDEIS No-Action Alternative, an alternate distribution of the socioeconomic forecast was developed for the project model that did not include the two new Ohio River bridges or the reconstruction of the Kennedy Interchange. (Chapter 5 provides a more detailed discussion of the methodology used to develop the two different distributions of population and employment.)

The 2030 regional forecasts indicate the changes that are expected to take place on an LMPA-wide basis. Population is now predicted to increase by 15% between 2007 and 2030, while employment is predicted to increase by 42% in the same period.[2] The total number of daily trips in the LMPA is expected to increase by 19% (see Table 2.2-1). In addition, the number of vehicle miles of travel (VMT), vehicle hours of travel (VHT), and vehicle hours of delay (VHD) is expected to increase by 26%, 52%, and 161%, respectively. These summary figures demonstrate that travel demand in the LMPA will increase nearly as fast as or faster than population and employment in the same period. For comparison, Table 2.2-1 also shows 2025 traffic data from the FEIS which indicates that the projected 2030 daily trips, VMT, VHT, and VHD are all higher than the 2025 projections. A comparison of percent change cannot be made with the FEIS because the lengths of the time periods are different (i.e., FEIS 1990-2025: SDEIS 2007-2030).

TABLE 2.2-1
WEEKDAY TRAVEL SUMMARIES FOR THE LMPA (2007 and 2030)

	2007*	FEIS 2025 No-Action Alternative	2030 No-Action Alternative	Percent Change 2007 to 2030
Daily Trips	2,970,000	2,899,000	3,522,000	19%
Vehicle Miles of Travel	28,010,000	31,731,000	35,297,000	26%
Vehicle Hours of Travel	703,000	923,000	1,069,000	52%
Vehicle Hours of Delay**	152,000	208,000	397,000	161%

** The year 2007 is used as the base year for this forecast because it is the base year in the Louisville MPO travel demand model.*

*** Additional hours of travel time caused by traffic congestion.*

Cross-river travel demand is expected to increase 29% by 2030 (see Table 2.2-2). By 2030, a total of 292,000 vehicles per day are expected to cross the Ohio River on the three existing bridges, an increase of approximately 1.3% per year. For comparison, Table 2.2-2 also shows 2025 weekday traffic volumes from the FEIS, which indicates that all of the projected 2030 weekday traffic volumes for the bridges are lower than the 2025 projections. However, as noted previously, the 2030 total cross-river traffic volumes still represent a significant increase (i.e., 29%) from the existing traffic volumes. As shown on Table 2.2-3, the Kennedy Bridge was operating at 97% of its daily design capacity in 2010. By 2030, the AM southbound and PM northbound traffic volumes on the Kennedy Bridge are projected to be 139% and 120% of capacity, respectively. Traffic during the AM southbound and PM northbound periods on the

[2] The population and employment distributions used to forecast the No-Action Alternative travel conditions are consistent with the No-Action Alternative transportation network, that is, no new bridges over the Ohio River and no modifications to the Kennedy Interchange.

Sherman Minton Bridge in 2030 are projected to be at 119% and 126% of capacity, respectively. For comparison, Table 2.2-3 also shows the 2025 daily percent of capacity data from the FEIS, which indicates that the 2030 daily percent of capacity for all of the bridges are less than those for 2025. However, the Sherman Minton and Kennedy bridges are still projected to exceed their capacity. In addition, the total river crossing capacity of all of the bridges is also still projected to be exceeded by 2030. Thus, the existing Ohio River bridges alone cannot effectively address the cross river mobility needs for the area. Percent of capacity for AM, midday, PM, and night was not conducted in the FEIS for 2025 so a comparison cannot be made with the 2030 data.

TABLE 2.2-2
DAILY OHIO RIVER CROSSINGS WEEKDAY TRAFFIC VOLUMES (2010 and 2030)

Bridge	2010*	FEIS 2025 No-Action Alternative	2030 No-Action Alternative	Percent Change 2010 to 2030
Sherman Minton Bridge (I-64)	82,000	129,700	112,000	37%
Clark Memorial Bridge (U.S. 31)	21,900	33,700	25,000	14%
Kennedy Bridge (I-65)	122,300	178,600	155,000	27%
Total Daily Ohio River Crossings	226,200	342,000	292,000	29%

** The year 2010 is used as the base year for this forecast because it represents actual traffic counts.*

TABLE 2.2-3
OHIO RIVER CROSSING DEMAND AS PERCENT OF CAPACITY* (2010 and 2030)

Bridge	Daily			2030 No-Action Alternative							
				AM (6AM – 9AM)		Midday (9AM – 3PM)		PM (3PM – 6PM)		Night (6PM – 6AM)	
	2010	2025*	2030	NB	SB	NB	SB	NB	SB	NB	SB
Kennedy Bridge (I-65)	97%	142%	123%	63%	139%	65%	93%	120%	113%	29%	34%
Sherman Minton Bridge (I-64)	76%	120%	104%	60%	119%	64%	67%	126%	81%	25%	20%
Clark Memorial Bridge (U.S. 31)	73%	112%	83%	20%	76%	30%	58%	93%	64%	20%	12%
Total Daily Ohio River Crossings	86%	130%	111%	57%	121%	60%	77%	119%	92%	27%	22%

** 2025 demand as percent of capacity data from the FEIS.*

The 2030 cross-river travel demand forecast also shows a large increase in cross-river trips with origins and destinations in the eastern portion of the study area. In 2007 approximately 31,000 daily cross-river trips were estimated to have occurred between eastern portions of the LMPA upstream of the Kennedy Bridge—including eastern Clark County, eastern Jefferson County and Oldham County (see Figure 2.2-1). Daily cross-river trips with those origins and destinations are forecast to increase to 41,000 by 2030, a 32% increase. This latter increase compares with an

estimated 29% increase in the overall number of cross-river trips between 2010 and 2030 (see Table 2.2-2). In addition, under the No-Action Alternative, the total VMT associated with those eastern-oriented, cross-river trips is forecast to increase by 41% between 2007 and 2030, and the total VHT are forecast to increase by 63% in the same period. It is important to note that the eastern-oriented cross river trips, VMTs, and VHTs are all projected to have greater percent increases than those for the entire LMPA. Under the No-Action Alternative, all of these cross-river trips with origins and destinations in the eastern portion of the study area must utilize the Kennedy Bridge or one of the other existing downstream bridges.

DAILY VEHICLE TRAVEL SUMMARY BETWEEN
EASTERN CLARK COUNTY AND EASTERN JEFFERSON/OLDHAM COUNTY

DAILY TRAVEL	YEAR 2007	2030	% Change
Vehicle Trips	31,000	41,000	32%
Vehicle Miles of Travel	776,000	1,092,000	41%
Vehicle Hours of Travel	16,000	26,000	63%

Source: Travel Demand Model Projection

LEGEND
- EASTERN CLARK COUNTY
- EASTERN JEFFERSON / OLDHAM COUNTY

FIGURE 2.2-1
CROSS-RIVER VEHICLE TRAVEL BETWEEN EASTERN CLARK COUNTY AND EASTERN JEFFERSON COUNTY

2.2.2 Population and Employment Growth and Land Use Plans

This section of the 2003 FEIS focused on the discussion of 1995-2025 socioeconomic forecasts and land use plans on the LSIORB Project areas of downtown Louisville, Jeffersonville, eastern Jefferson County, and southeastern Clark County. Clark County's *1991 Comprehensive Plan* and Louisville and Jefferson County's *Cornerstone 2020 Comprehensive Plan* were referenced in connection with plans for infrastructure improvements and mobility strategies. For more detailed information, see pages 2-13 though 2-22 of the FEIS. The information presented in this section remains unchanged since the FEIS, with the following substantive exceptions: The SDEIS updates population and employment forecasts to the 2007-2030 timeframe; and revises the "Land Use Plans and Infrastructure Improvements" subsection to discuss the 2007 comprehensive plans of Clark County and Jeffersonville, both of which include features of the LSIORB Project.

As described in the previous section, population in the LMPA is predicted to grow by 15% between 2007 and 2030 and employment is predicted to increase by 42% in the same period. The forecast rates of population and employment growth vary throughout the LMPA, with some areas showing large increases, other areas showing more moderate growth, and some areas showing decreases (see figures 2.2-2 and 2.2-3). Employment growth is anticipated in the downtown Louisville and Jeffersonville areas, although the predictions suggest some loss of population in those areas. Much of eastern Jefferson County, Kentucky, and southeastern Clark County, Indiana, is predicted to see moderate to high population and employment growth rates between 2007 and 2030. Those growth predictions are generally consistent with locally approved land use plans and proposed infrastructure improvements in those areas, except that land use planners in both Jefferson and Clark counties have indicated a desire to slow or reverse the rate of population decline in the downtown areas.

The areas of eastern Jefferson, western Oldham, and southern Clark counties that are predicted to see moderate to high population growth through 2030 generally showed moderate to high population growth between 1990 and 2000 (see Figure 2.2-4). Similarly, those areas that are predicted to see less rapid growth or declines through 2030 generally showed those same trends between 1990 and 2000.[3]

[3] The 2010 Census data was not available at the time the SDEIS was prepared. As a result, the same 1990 and 2000 census data that was used in the FEIS has been included in the SDEIS. Comparable employment data is not available from the census for use in confirming the Louisville MPO employment forecasts. Employment data from the census is gathered based on the household residence of employees, rather than their place of employment. The employment data contained in this SDEIS is based on place of employment. Consequently, the employment information available from the census is not useful in confirming the employment information contained herein.

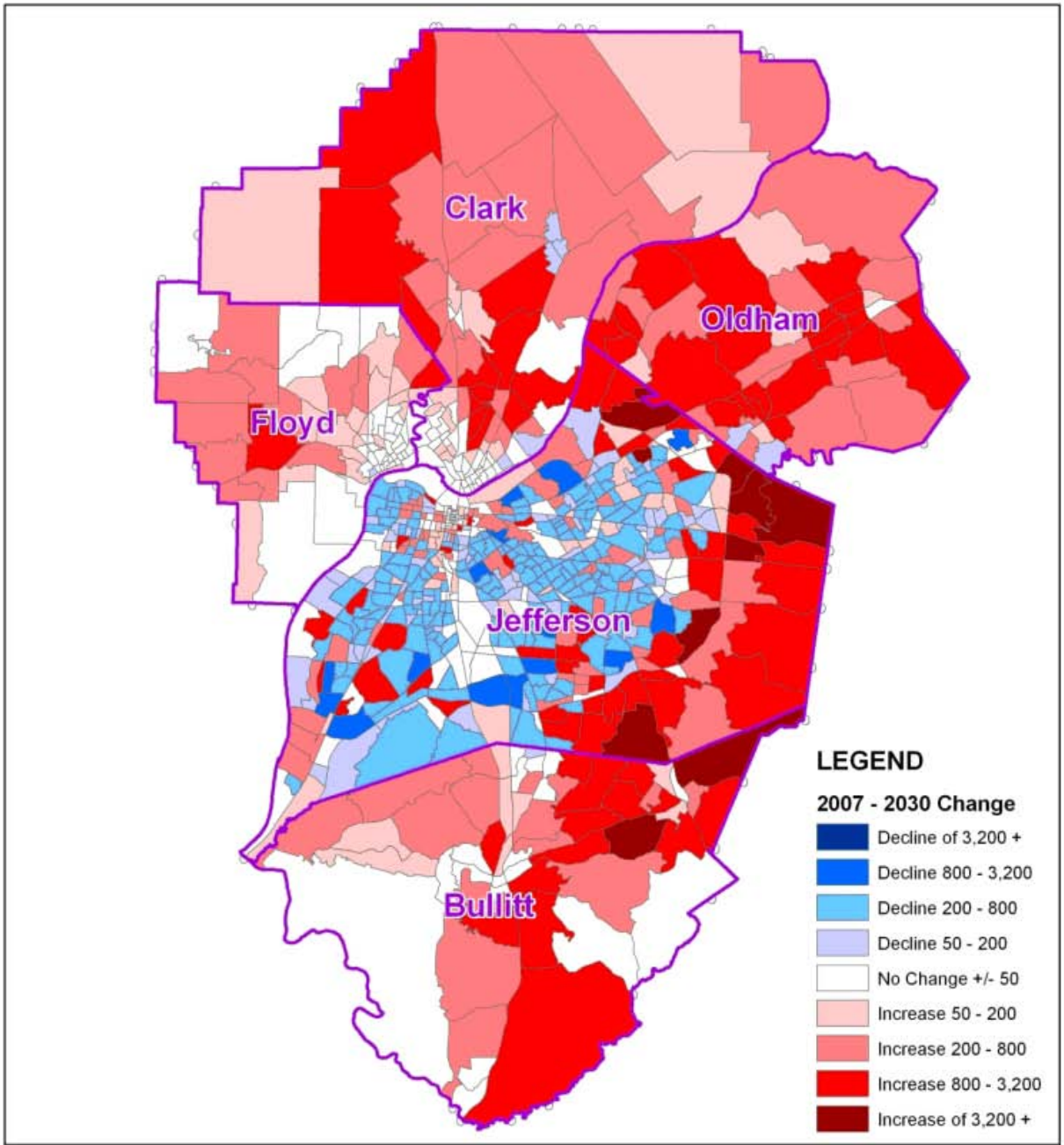


FIGURE 2.2-2
NO-ACTION ALTERNATIVE
POPULATION FORECASTS
2007 - 2030 CHANGE

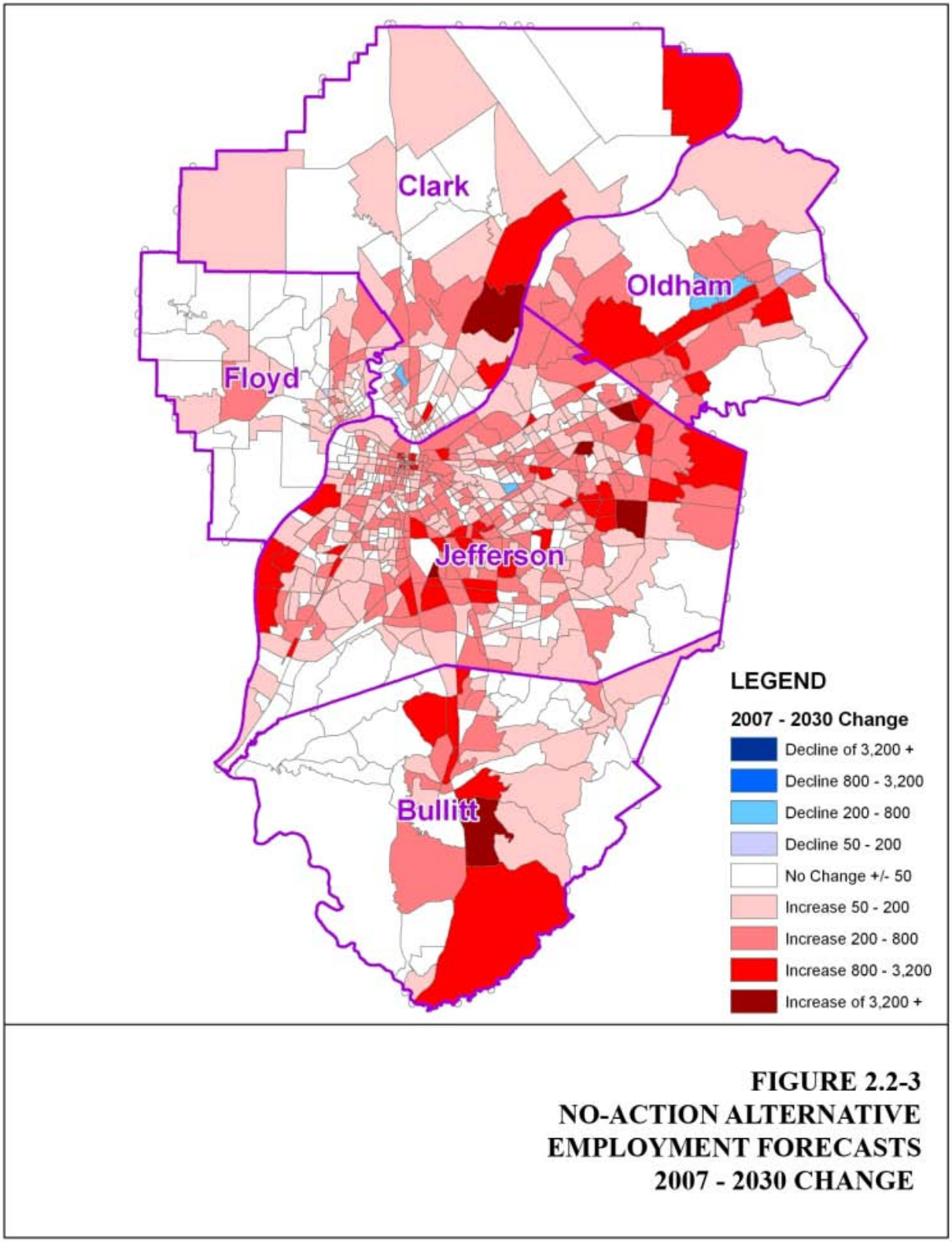


FIGURE 2.2-3
NO-ACTION ALTERNATIVE
EMPLOYMENT FORECASTS
2007 - 2030 CHANGE

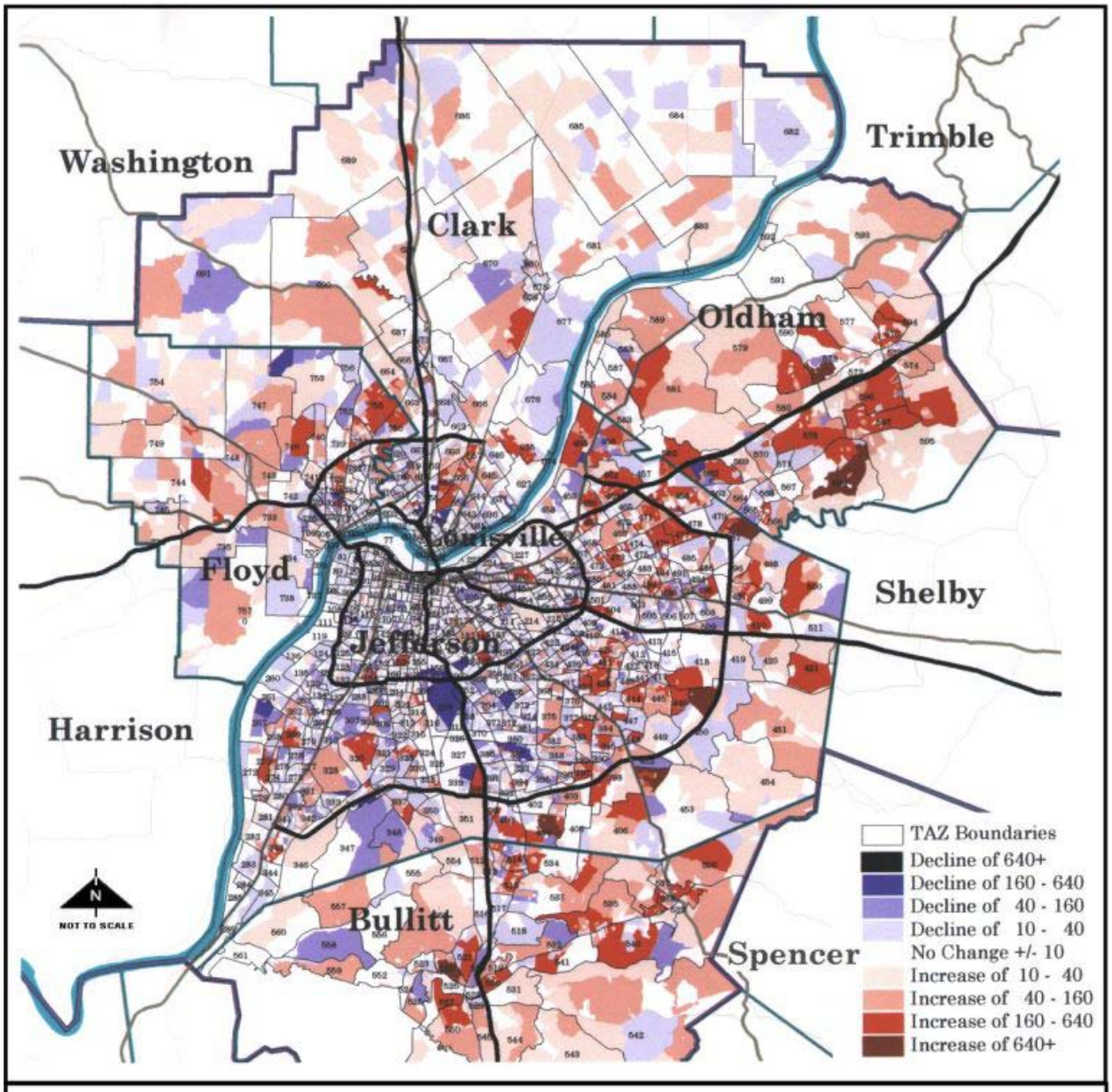


FIGURE 2.2-4
POPULATION CHANGE 1990-2000
BY CENSUS BLOCK

The Kennedy and Clark Memorial bridges currently provide cross-river transportation access in the downtown area, which serves as the economic and employment center of the LMPA. However, as described in Section 2.2.3, below, the existing roadway bridges in the downtown area are already congested and are predicted to become more heavily congested by 2030. Meanwhile, the high growth areas of eastern Jefferson, western Oldham, and southern Clark counties are juxtaposed across the Ohio River, but lack convenient cross-river transportation access, which hinders cross-river mobility. The closest cross-river transportation access for these eastern areas is the Kennedy Bridge, located in the downtown area. Consequently, many cross-river trips within the LMPA with origins and destinations in the eastern portion of the study area incur additional VMT and VHT, and contribute to congestion on the downtown crossings.

Moreover, if travel on the Kennedy Bridge is impaired or foreclosed by an incident on the bridge or its approaches, or by necessary maintenance activities, the only other river crossing options are the Clark Memorial and the Sherman Minton bridges, both of which are located farther downstream and are already heavily utilized. Local transportation planners have identified a need to improve cross-river mobility for these high growth areas (downtown and east end), and thereby improve the efficiency of the transportation system by reducing trip lengths and duration.

Projected Growth

In general, the updated population and employment growth trends (i.e., 2007–2030) within the LMPA have not significantly changed from the trends described in the FEIS (i.e., 1990–2025). The No-Action Alternative population and employment forecasts for the 2007–2030 period indicate that employment growth will continue to occur in the downtown Louisville area, with some employment growth also occurring in downtown Jeffersonville/Clarksville. Particularly high growth in employment is predicted in the area surrounding the medical complex in downtown Louisville. These high growth areas are shaded in pink and red on Figure 2.2-3. However, with some exceptions, Figure 2.2-2 indicates that population is predicted to continue to decline in much of the downtown area (as shown by blue-shaded areas) through the year 2030. This trend is consistent with the 1990–2000 population census data (see Figure 2.2-4).

The socioeconomic forecasts for 2007–2030 also show that rapid population and employment growth is occurring, and will continue to occur, in the eastern portion of the LMPA. In Indiana, such growth is apparent in the area of southeastern Clark County between I-65 and the Ohio River (extending north to about Charlestown, Indiana). As indicated by the dark red shaded areas on Figure 2.2-3, large employment gains are predicted in the vicinity of the Port of Indiana-Jeffersonville (formally Clark Maritime Center) and the River Ridge Commerce Center (formerly the Indiana Army Ammunition Plant [INAAP]). Major growth in population is also anticipated in this area of southeastern Clark County, including the areas near S.R. 265, as well as the area just to the west of S.R. 62 across from the River Ridge Commerce Center. Areas of dark red shading on Figure 2.2-2 indicate high rates of population growth in southeastern Clark County, between I-65 and the Ohio River. Similarly, Figure 2.2-4 shows that many of those areas already have shown substantial growth between 1990 and 2000, especially as compared to other areas of the region.

The 2007-2030 population and employment forecasts indicate high growth in eastern Jefferson County (as well as much of adjacent Oldham County), across the Ohio River from the high growth areas of southeastern Clark County. Much of the predicted population growth in eastern Jefferson County over that period is expected to occur in a corridor along the existing I-265/KY 841 (Gene Snyder Freeway), with several areas of high growth between I-64 and the Ohio River, as shown by the dark red areas on Figure 2.2-2. These general population trends have been borne out in fact between 1990 and 2000, as shown on Figure 2.2-4. Employment in this area also is expected to increase between 2007 and 2030, with several areas of high growth again concentrated along the Gene Snyder Freeway from the I-64 interchange to the Ohio River, as shown in dark red on Figure 2.2-3. While areas of moderate to high population and employment growth are distributed throughout much of the LMPA, a large portion of that growth is predicted to occur in the areas of eastern Jefferson, Oldham, and southeastern Clark counties located opposite each other across the Ohio River. Those areas of growth also tend to be concentrated along or near the existing S.R. 265 in Indiana and I-265/KY 841 in Kentucky. However, as noted previously, cross-river mobility between these two high growth areas is hindered by the lack of any cross-river transportation access closer than the downtown Kennedy Bridge.

Land Use Plans and Infrastructure Improvements

Clark County, Indiana

Since the 2003 FEIS, Clark County adopted a new *Comprehensive Plan* in 2007. The most notable development in the plan is the River Ridge Commerce Center (formerly INAAP) located northeast of the existing S.R. 265/S.R. 62 interchange. It is a business and industrial park with approximately 6,000 acres of land available for development. The *Comprehensive Plan* includes the River Ridge Commerce Center in the following goals, objectives, and guidelines.

> *Goal 1 (Economic Development)*
> *Objective 1.1—Promote the development of the River Ridge Commerce Center by encouraging existing businesses to expand and new businesses to locate within the business park.*
>
> *Goal 6 (Transportation)*
> *Objective 6.1—Improve existing roadway connections to the River Ridge Commerce Center and consider additional connections.*
>
> *Guidelines (Government)*
> *G-6: Work with One Southern Indiana, the River Ridge Development Authority, other economic development organizations, and the private sector to promote growth of the River Ridge Commerce Center, develop additional industrial and business parks for basic industries, and preserve existing prime industrial sites for business retention and attraction.* (*Comprehensive Plan,* p. 66)

Clark County's *Comprehensive Plan* notes that the Port of Indiana-Jeffersonville, which is located southeast of the existing I-265/S.R. 62 interchange, is one of the fastest growing ports on the Inland Waterway System.

With regard to residential development recommendations, the plan identifies vacant land along I-65, U.S. 31, and S.R. 60 surrounding Sellersburg, along S.R. 62 northwest of Jeffersonville, and along S.R. 403 between Charlestown and Sellersburg as prime locations for future residential development because they provide easy access and commutes to the River Ridge Commerce Center and downtown Louisville.

With regard to transportation, the Ohio River Bridges Project is included in the *Comprehensive Plan's* list of "Major Moves[4]" projects and in the Thoroughfare Plan. In addition, the plan identifies Overlay Districts for the future path of I-265 as a major issue because this corridor will be a prime area for development. The overlay district will create land use goals and guidelines for this corridor to help ensure appropriate future development.

Jeffersonville, Indiana

Since the 2003 FEIS, Jeffersonville has adopted a new *Comprehensive Plan* in 2007. The plan indicates that most of the vacant and developable land is located northeast of Jeffersonville in unincorporated Clark County and that these are areas of major future growth due to their convenient access to the I-265 and I-65 interchanges. Areas of proposed industrial expansion include:

- Land in the vicinity of the Port of Indiana-Jeffersonville
- Land near Clark County Airport (located north of I-265 and east of I-65)
- Land north of I-265 between S.R. 62 and Charlestown Pike
- Land lying between Hamburg Pike and U.S. 31

The plan identifies Business Park Industry land use areas such as the River Ridge Commerce Center, North Port Industrial Park, and America's Place industrial area as sites that could develop as light industrial, flex-space (office and warehouse), or as a campus with different businesses within the same industry or several buildings serving one business.

With regard to public parks, the *Comprehensive Plan* includes a recommendation to "locate, acquire and develop at least 700+ acres of land for a multi-purpose park in the north to northeast section of the community."

Planning Districts along the proposed I-265 corridor include primarily two types: Suburban Neighborhood and Regional Marketplace Center (located around the proposed interchange with Salem Road). Suburban Workplace Districts are located immediately north (i.e., River Ridge Commerce Center) and south (i.e., Port of Indiana-Jeffersonville) of the proposed I-265 corridor.

Jeffersonville recognizes that one of the major features of its Land Use Plan is the proposed designated approaches for the downtown and eastern bridges, as part of the Ohio River Bridges Project. As a result, the LSIORB Project is included as one of their Planned Transportation

[4] In late 2005, Indiana launched a 10-year, $10 billion transportation plan, known as "Major Moves," to improve and expand Indiana's highway infrastructure. A total of $2.6 billion was committed to Major Moves from the long-term lease of the Indiana Toll Road and the plan called for 104 new roadways by 2015. (Source: www.in.gov/indot/2407.htm)

Projects. They also recognize that the construction of the I-265 portion of the Ohio River Bridges Project will enhance the potential development of regional shopping complexes in the vicinity of the I-265/ S.R. 62 interchange.

Jefferson County, Kentucky

Since the 2003 FEIS, there have been no updates/changes to the Louisville and Jefferson County *Cornerstone 2020 Comprehensive Plan*. As a result, there are no changes to the information presented in the FEIS on page 2-20.

2.2.3 Traffic Congestion

This section of the FEIS described existing peak period congestion in the Kennedy Bridge-Interchange area, and predicted future problems in the area due to the lack of viable alternative river crossing options for much of the Kennedy Bridge traffic—particularly truck traffic. For more detailed information, see pages 2-22 through 2-27 of the FEIS. The section remains unchanged from the FEIS with the following substantive exceptions: The SDEIS, based on the most recent data, revises the peak hour periods; revises the projected increase in congestion on the Sherman Minton Bridge; updates the discussion of truck traffic through the LMPA on I-64 and I-65 and using the Kennedy Bridge; and identifies existing (2010) and projected (2030) Levels of Service on roadway segments on the Kennedy Interchange including the Kennedy Bridge and its approaches. In the process of updating the data, the SDEIS replaces Figure 2.2-5, *Truck/Bus Traffic on I-65 Southbound*, with Table 2.2-4, *Truck Percentage (2010) on the Kennedy Bridge by Time Period*; updates data in Figure 2.2-6 (SDEIS Figure 2.2-5), *External Truck Travel with Potential Eastern Ohio River Bridge Diversion Potential*; updates data in Table 2.2-3 (SDEIS Table 2.2-5), *Kennedy Interchange Area Weekday Operations*; and updates Figure 2.2-9 (DEIS Figure 2.2-7), *2010 and 2030 A.M./P.M. Levels of Service, Kennedy Interchange.*

As cross-river travel demand has continued to increase along with population and employment growth, traffic congestion problems have become particularly acute in the Kennedy Bridge and Kennedy Interchange area and on its interstate freeway approaches in downtown Louisville, Kentucky and Jeffersonville and Clarksville, Indiana. Peak period (i.e. “rush hour”) congestion occurs nearly every weekday, with traffic congestion on the Kennedy Bridge spilling over to the Kennedy Interchange and vice versa. (The peak hours within the peak periods are defined as 7:00 AM to 8:00 AM and 4:00 PM to 5:00 PM) In the 2003 FEIS peak periods were defined as 7:30 to 8:30 AM and 4:45 to 5:45 PM. The change is due to the results of recent (2010) traffic data collection on the interstate network in the project area. Traffic congestion on those freeway facilities also extends to their adjacent interstate approaches on I-64 and I-71 in Kentucky and on I-65 in both Kentucky and Indiana. In addition to the transportation inefficiencies it causes, congestion also can lead to additional problems, such as increased crash frequencies and increased emissions of air pollutants from vehicles.

The lack of viable alternative river crossing options for much of the Kennedy Bridge traffic aggravates traffic congestion problems, which in turn hinders cross-river mobility for travelers throughout much of the LMPA who must use these congested facilities. By 2030, traffic

congestion is projected to increase on the Sherman Minton Bridge, with AM peak period demand at 119% of southbound capacity and PM peak period demand at 126% of northbound capacity. Thus, that crossing will provide little, if any, relief to the congestion in the vicinity of the Kennedy Bridge. Moreover, no cross-river connections are provided in the LMPA upstream of the Kennedy Bridge. As noted previously, the demand for cross-river trips between those areas upstream of the Kennedy Bridge is projected to grow at a greater rate than the overall demand for cross-river trips in the LMPA. Thus, all travel between Jefferson County, Kentucky, and Clark County, Indiana, must utilize one of the congested downtown crossings, which will continue to become more congested.

Freight traffic constitutes a substantial portion of the traffic using the existing cross-river transportation system and plays an important role in the interstate shipment of goods in an economy that increasingly relies on "just-in-time" inventory deliveries and the free flow of goods and services throughout the country. I-65, in particular, is a major north-south commercial route, with a substantial amount of freight traffic. Congestion and delays at the current river crossing bottleneck interfere with the free flow of commerce through the area. Freight traffic suffers from the traffic congestion that occurs in the downtown area, resulting in delays and additional costs for commerce passing throughout the LMPA. In addition, freight movement across the Ohio River contributes to existing and projected traffic congestion on the Ohio River crossings in the LMPA.

The importance of freight in cross-river travel is shown in the proportion of trucks among vehicles crossing the Ohio River. Daily vehicle counts conducted in 2010 indicate that trucks comprise 21 percent of the total vehicles crossing the Ohio River on the Kennedy Bridge (I-65). During an average 24-hour period, over 25,000 trucks crossed the Kennedy Bridge. During the PM peak period, southbound trucks comprise more than 25% of total vehicles (see Table 2.2-4).

TABLE 2.2-4
TRUCK PERCENTAGE (2010) ON THE KENNEDY BRIDGE BY TIME PERIOD

Kennedy Bridge	AM (6AM – 9AM)	Midday (9AM – 3PM)	PM (3PM – 6PM)	Daily
Northbound	13.3%	20.8%	16.1%	18.3%
Southbound	18.1%	24.2%	26.3%	24.1%
TOTAL	16.0%	22.5%	20.0%	21.1%

Freight traffic passing through the LMPA (i.e., with no local origin or destination) represents a large portion of total cross-river truck trips and thus both contributes to congestion and suffers from congestion that occurs on the existing bridges, particularly during the peak period. Data from a 2010 external origin-destination survey show that approximately 12% of the truck traffic exiting the LMPA on I-65 northbound originates from the east on I-64 westbound, which is the same as FEIS, and approximately 15% of truck traffic exiting the LMPA on I-64 eastbound originates from the north on I-65 southbound, which is less than what was determined in the FEIS (i.e., 21%) (see Figure 2.2-5). Based on the distribution of data from that origin-destination

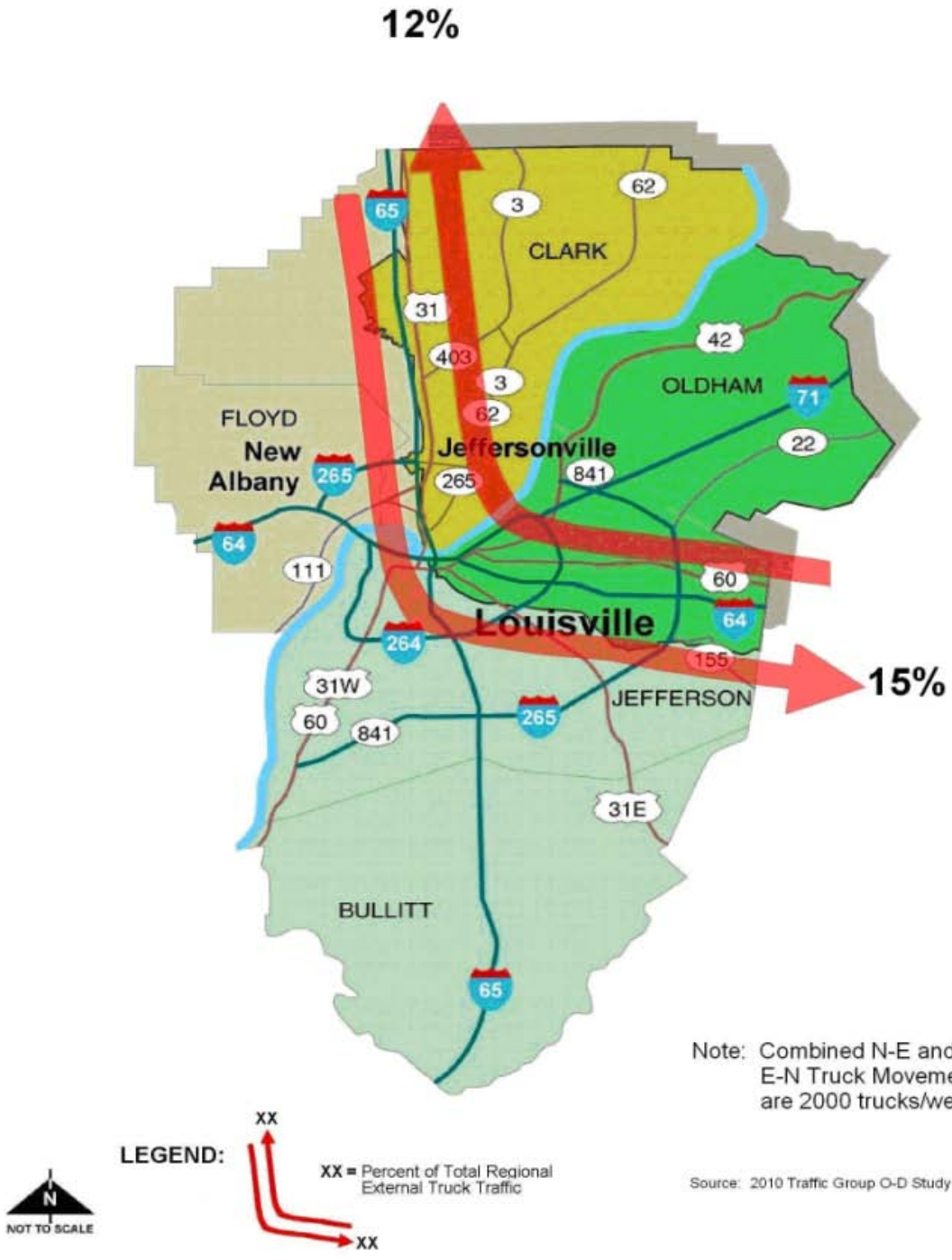


FIGURE 2.2-5
EXTERNAL TRUCK TRAVEL WITH POTENTIAL EASTERN OHIO RIVER BRIDGE DIVERSION POTENTIAL

study, at least 2,000 trucks per day are traveling through the LMPA from I-64 westbound to I-65 northbound and from I-65 southbound to I-64 eastbound, which are 500 more trucks than what was determined in the FEIS (i.e., 1,500 trucks). All of those trips currently must use the heavily congested Kennedy Bridge to cross the Ohio River because of the lack of any alternate eastern river crossing route.

In addition to traffic congestion caused simply by high traffic volumes, the complex nature of the Kennedy Interchange causes additional problems (see Figure 2.2-6). For example, traffic backups on a single ramp can spill over and cause congestion throughout the interchange and on its interstate approaches.

Consequently, a detailed analysis of the Kennedy Interchange and its interstate approaches was performed using corridor simulation software (CORSIM). As shown in Table 2.2-5, the CORSIM analysis provided several measures that demonstrate that traffic congestion in the Kennedy Interchange and on its interstate approaches, including the Kennedy Bridge (I-65), will increase between 2010 and 2030. These projections are based on the No-Action Alternative described in Section 2.2.1. Comparatively, the CORSIM analysis in the FEIS showed larger decreases in speeds and larger increases in delay between the existing (1999) conditions and the 2025 No-Action scenario. One of the reasons for the difference is that the 1999 volumes are slightly lower than the 2010 volumes and the 2025 forecast volumes are higher than the 2030 forecast volumes. This causes there to be less of a difference between the 2010 and 2030 measures of effectiveness. However, the 2030 data also shows a lower throughput as percent of demand compared to the FEIS, which indicates an increase in the projected level of congestion.

Another measure of traffic congestion is known as the "level of service," or LOS. LOS identifies the degree of congestion on a particular roadway segment for the peak hour. LOS ranges from A to F, with LOS A indicating the least congestion and best traffic flow, and LOS F indicating the most congestion and worst traffic flow. The design book, *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO), states:

> *For acceptable degrees of congestion, freeways and their auxiliary facilities, i.e., ramps, main line weaving sections and [collector-distributor] roads in urban and developing areas, should generally be designed for LOS C. In heavily developed sections of metropolitan areas, conditions may necessitate the use of LOS D.*

INDOT's Design Manual generally calls for providing at least LOS C on all newly-constructed or reconstructed roads, with LOS B desirable. As an exception to this general rule is, a minimum LOS D may be used for urban freeway reconstruction projects.[5] In 2010, seven of the roadway segments of the Kennedy Interchange, which includes the interstate approaches and the Kennedy Bridge, were functioning at LOS E or F (see Figure 2.2-7). Level of Service is especially poor on roadway segments where traffic flows cross each other (known as "weaving movements"). One example is the weaving section where traffic from southbound I-71 and westbound I-64 must merge together. This area currently operates at a LOS F in both the AM

[5] Source: INDOT Design Manual, September 7, 2005.

and PM peak hours. By the year 2030, the number of interchange segments functioning at LOS E or F is projected to more than double—from 7 to 16. For comparison, the FEIS had very similar results with 18 of these same segments projected to operate at LOS E or F by 2025 (see FEIS page 2-30, Figure 2.2-9).

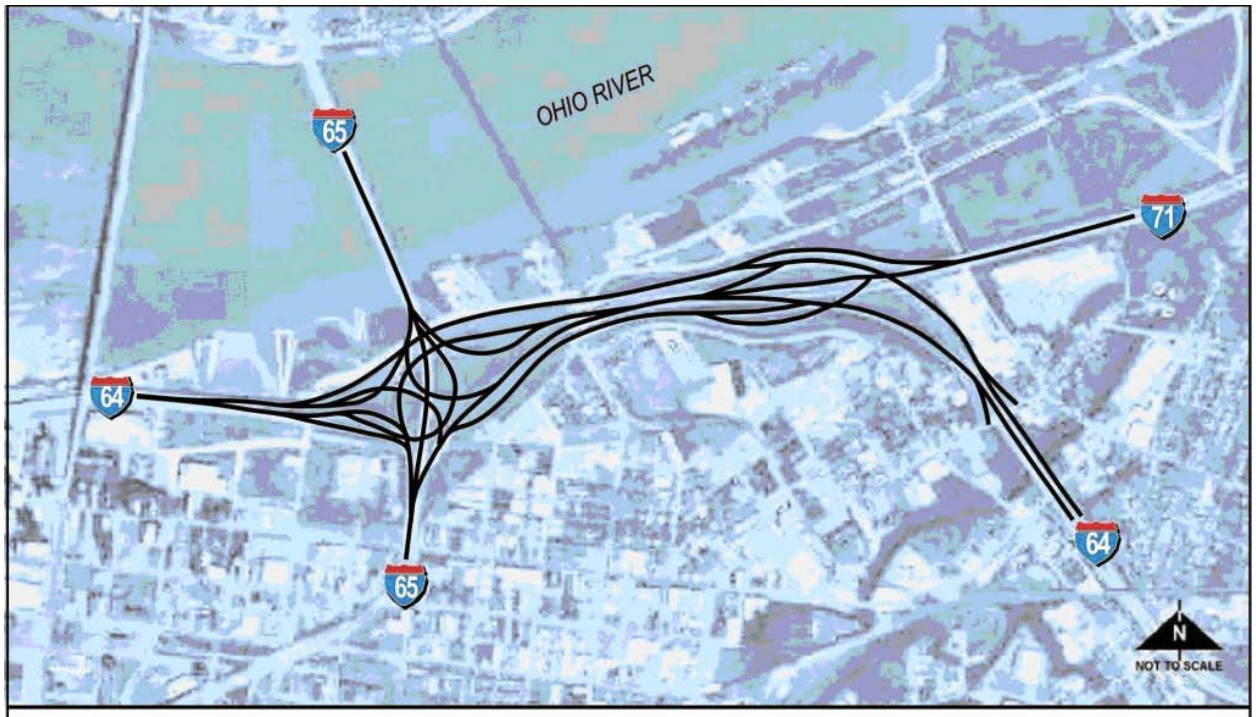


FIGURE 2.2-6
KENNEDY INTERCHANGE

TABLE 2.2-5
KENNEDY INTERCHANGE AREA WEEKDAY OPERATIONS AVERAGE SPEED

Measure		2010	2030 No-Action	FEIS 2025 No-Action
Average Peak-Hour Speed:	AM Peak Hour	44 mph	39 mph	17 mph
	PM Peak Hour	31 mph	24 mph	16 mph
Total Vehicle Hours of Delay:	AM Peak Hour	208	380	1,581
	PM Peak Hour	636	1,056	1,841
Throughput as Percent of Demand*:	AM Peak Hour	98%	84%	84%
	PM Peak Hour	92%	76%	91%

* *Throughput is the amount of traffic passing through a roadway system. If throughput is less than 100% of demand, traffic backups and diversions result. The lower the throughput, as a percent of demand, the worse the congestion and diversion.*

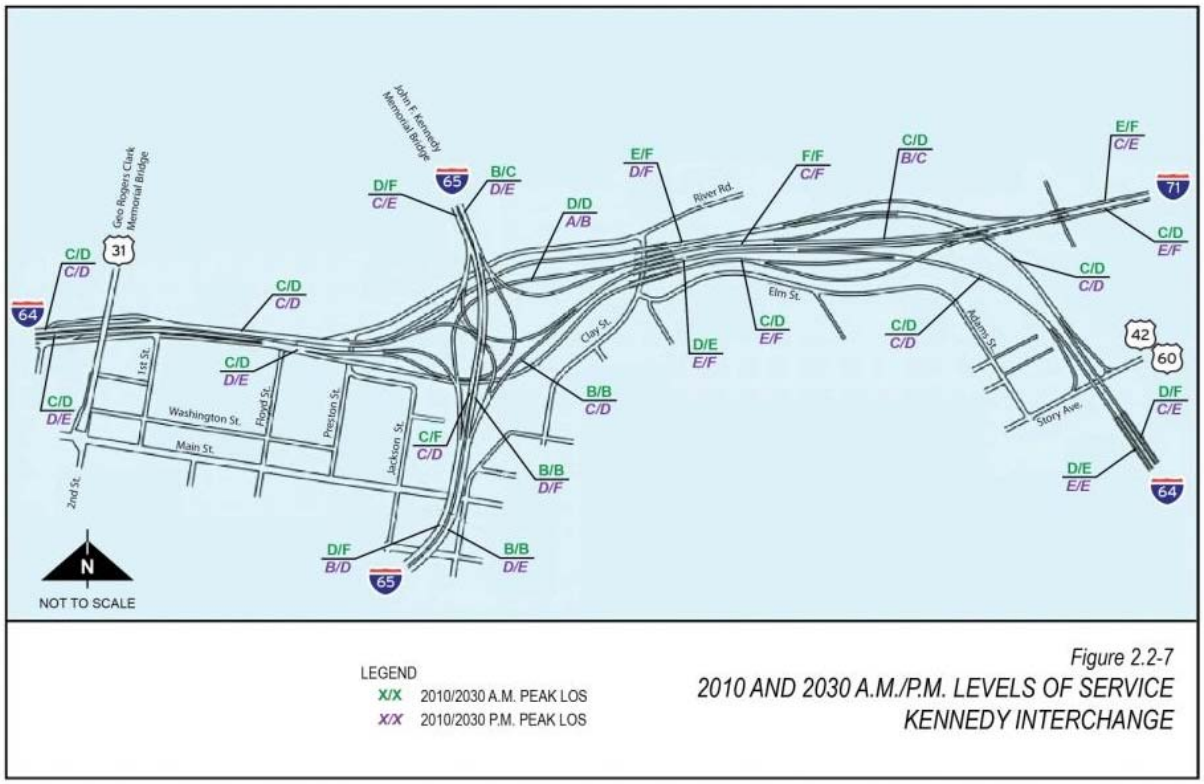


Figure 2.2-7
2010 AND 2030 A.M./P.M. LEVELS OF SERVICE
KENNEDY INTERCHANGE

2.2.4 Traffic Safety

The crash analysis for this section of the FEIS was updated to reflect the most recent crash data, which is for the years 2005 through 2009. The crash analysis was focused on the Kennedy Interchange Corridors, and included the following interstate sections:

- I-65 from Broadway north to the Indiana terminus of the Kennedy Bridge
- I-64 from Cochran Hill Tunnel west to 9th Street
- I-71 from Zorn Avenue south to I-64

For comparison, a crash analysis was also conducted for the following similar adjacent interstate sections, referred to as Adjacent Corridors:

- I-65 from the Indiana terminus of the Kennedy Bridge north to the I-265 interchange
- I-64 from 9th Street in Louisville west to I-265 in Indiana
- I-265 in Indiana from I-64 east to I-65

Crash rates were calculated for these corridors based on the number of crashes per 100 million vehicle-miles (100 MVM). The crash analysis for the Kennedy Interchange corridors found that the total crash rate (230.8 per 100 MVM) was 138% higher than the statewide average rate of 97 crashes per 100 MVM for similar roadway classifications (see Table 2.2-6). When comparing the fatal and injury crash rates, the Kennedy Interchange Corridor crash rates were 23% and 113%

higher than the statewide averages (0.49 vs. 0.40; and 40.4 vs. 19.0 crashes per 100 MVM, respectively).

TABLE 2.2-6
CRASH RATES (2005 – 2009)

	Kennedy Interchange Corridors (Per 100 MVM)	Percent Increase from Average Statewide Rates	Adjacent Corridors (Per 100 MVM)	Percent Increase from Adjacent Corridors
Injury	40.4	113%	21.9	85%
Fatal	0.49	23%	0.16	206%
Total	230.8	138%	116.4	98%

When compared to the total crash rate (116.4 per 100 MVM), fatal crash rate (0.16 per 100 MVM), and injury crash rate (21.9 per 100 MVM) for the Adjacent Corridors, the Kennedy Interchange Corridors rates were 98%, 206%, and 85% higher, respectively.

For more detailed information regarding the crash analysis, the technical report titled *Kennedy Interchange Crash Study* (November 2010) is available for review upon request and on the project website at *www.kyinbridges.com*.

The design deficiencies of the Kennedy Bridge and Interchange that were described in the FEIS remain unchanged. For more detailed information see pages 2-27 through 2-28 of the FEIS.

2.2.5 Inadequate Cross-River System Linkage

This section of the FEIS discussed the transportation limitations associated with the existing cross-river roadway system within the LMPA and the lack of cross-river access in the eastern portion of the LMPA. There are no changes to this section since the FEIS. For more detailed information, see pages 2-30 through 2-32 of the FEIS. During the preparation of this SDEIS, on September 9, 2010, the Sherman Minton Bridge (I-64) was closed due to cracks in the bridge structure. Reconstruction of the bridge has started and is expected to be completed by Spring 2012. The temporary closure of the bridge will have no long term effects on the operation of the proposed LSIORB Project.

2.2.6 Consistency with Locally Adopted Transportation Plans

Louisville MPO Transportation Policy Committee adopted a new *Horizon 2030 Metropolitan Transportation Plan* on October 7, 2010. The plan includes the Selected Two Bridges/Highway Alternative identified in the FEIS and ROD and the need for tolls as an alternative funding source. There are no other changes to this section from the FEIS. For more detailed information, see pages 2-32 and 2-33 of the FEIS.

2.3 Performance Measures

This section of the 2003 FEIS presented the performance measures that were used to determine if the project alternatives met the project's identified needs. These performance measures have not

changed from the FEIS except for the addition of peak-period percent capacity as a measure of traffic congestion and the removal of VMT and VHT as measures for cross-river mobility. Period volumes are now available because a time-of-day model has been developed for this phase of the project. With regard to VMT and VHT, FHWA, KYTC, and INDOT determined that VHD is the measure that most closely correlates with the goal of improving cross-river mobility because it measures the total amount of delay. As such, a reduction in VHD means that drivers are spending less time sitting in congested traffic. Reductions in VMT and VHT also may be correlated with an improvement in mobility, but an improvement in mobility could also be correlated with an increase in VMT or even VHT. The availability of a shorter and/or less congested route may increase VMT or even VHT, because it allows for faster travel, which in turn may result in an increase in the number and length of trips. Although VMT and VHT are not being used as performance measures to determine if the alternatives meet the project's purpose and need, they are being used in this SDEIS to compare the alternatives' traffic impacts. For more detailed information, see page 2-33 through 2-36 of the FEIS.

2.4 Conclusion

Based on the aforementioned updated information, this review of the purpose and need, as completed in the SDEIS, resulted in the same conclusion presented in the 2003 FEIS, which states that:

> *Careful evaluation of the community's transportation needs has demonstrated a need for improvement in cross-river mobility between Jefferson County, Kentucky and Clark County, Indiana. Growth in the Downtown and Eastern areas of both Jefferson and Clark Counties has increased pressure on the existing cross-river transportation system, resulting in increased travel times and distances for cross-river travelers. Projections of growth through the year [2030][6] indicate that without any improvement in cross-river mobility, the resulting economic and system inefficiencies will continue to worsen. Congestion in the Kennedy Bridge/Interchange complex is already serious and is forecast to worsen without any improvements. Safety problems associated with the tight roadway geometry and narrow shoulders in the Kennedy Bridge/Interchange complex also hinder cross-river mobility and contribute further to the serious congestion problem in the Downtown area. Moreover, the lack of any river crossing upstream of the Kennedy Bridge in the LMA will continue to force cross-river trips with eastern orientations to incur the additional travel distance and times necessary to utilize the Kennedy Bridge. This lack of cross-river system linkage impairs the efficiency of the transportation system. Those additional cross-river trips downtown will also contribute to the worsening congestion on the existing crossings. Likewise, congestion, construction and incidents on the existing crossings, especially the Kennedy Bridge, will continue to adversely affect the entire transportation system and important governmental functions because of the lack of alternate river crossings.* (FEIS p. 2-36)

[6] The projected year has changed from 2025 for the FEIS to 2030 for the SDEIS.

CHAPTER 3: ALTERNATIVES

Chapter 3 of the 2003 FEIS discussed the alternatives evaluation process and methodology (Section 3.1, FEIS p. 3-2); described all of the alternatives considered (Section 3.2, FEIS p. 3-4); presented the results of the two-step alternatives screening process (Sections 3.3 and 3.4, FEIS p. 3-21 and p. 3-44); described the alternatives selected for evaluation in the EIS (Section 3.5, FEIS p. 3-58); analyzed the EIS alternatives based on their ability to meet the project's five purpose and need criteria, and presented a summary of the environmental impacts and costs of the EIS alternatives (Section 3.6, FEIS p. 3-64); and identified the Two Bridges/Highway Alternative (combining alternatives C-1 and A-15) with the Kennedy Interchange relocated to the south as the Preferred Alternative (Section 3.7, FEIS p. 3-83).

Chapter 3 of the SDEIS contains the following substantive changes to the information presented in the 2003 FEIS:

- Section 3.1—Updates the information contained in sections 3.1 to 3.4 of the FEIS, including a review of the FEIS alternatives evaluation and screening process, a discussion of the alternatives evaluation process and methodology employed for the SDEIS, and the results of the re-assessment of the FEIS alternatives.
- Section 3.2—Updates the information presented in Section 3.5 of the FEIS by describing the three alternatives selected for detailed evaluation in this SDEIS: the No-Action Alternative (with updated transportation projects from the *Horizon 2030 Metropolitan Transportation Plan* [MTP]), the FEIS Selected Alternative, and the Modified Selected Alternative.
- Section 3.3—Updates the information presented in Section 3.6 of the FEIS to focus on an analysis of the SDEIS alternatives and their ability to meet the LSIORB Project's five purpose and need criteria, based on the updated 2030 travel demand model. Also, adds time-of-day traffic data (i.e., AM, Midday, PM, and Night) to this analysis; identifies and evaluates potential changes to traffic patterns as a result of proposed tolls and project design modifications; updates the discussion of the environmental impacts for the FEIS Selected Alternative and the Modified Selected Alternative; and discusses the updated costs and financial feasibility of the FEIS Selected Alternative and the Modified Selected Alternative.

3.1 Alternatives Evaluation Process and Methodology

For this SDEIS, the range of alternatives considered and evaluated in the FEIS has been re-assessed. As part of this process, an *Alternatives Evaluation Document* was developed (see Appendix A.3)[1]. The *Alternatives Evaluation Document* presents the original process that was

[1] This document was based on the *Range of Alternatives Document*, which was prepared on August 5, 2011, distributed to the resource agencies for comment, and posted on the project webpage for public input. That report also stated that the alternatives considered in the 2003 FEIS "will be reevaluated to the extent necessary to determine if they warrant detailed study as viable alternatives." Subsequently, those alternatives were reevaluated and documented in the *Alternatives Evaluation Document*, attached hereto as Appendix A.3).

used to develop and evaluate the range of alternatives in the 2003 FEIS, and the process that was used to re-assess those alternatives for the SDEIS. It also presents the following recommended range of alternatives to be studied in the SDEIS:

- **No-Action**
  This alternative assumes that all of the projects in the current *Horizon 2030* MTP will be implemented. This does not take into account improvements associated with the LSIORB Project. See Section 3.2.1 for a more detailed description of the No-Action Alternative.

- **FEIS Selected Alternative (without Tolls)**
  This alternative is generally the same as the Selected Alternative approved in the 2003 ROD, which does not include tolls. Given the current economic conditions that exist within the region and the nation as a whole and the amount of funding that is reasonably available from Federal and state sources (as determined by the Louisville Metropolitan Planning Organization), this alternative is no longer considered to be a reasonable alternative because it is not financially feasible; it is being considered in the SDEIS as a baseline for comparison with the modifications to this alternative proposed with the Modified Selected Alternative. See Section 3.2.2 for a more detailed description of the FEIS Selected Alternative.

- **Modified Selected Alternative (with Tolls)**
  This alternative would include many of the elements of the Selected Alternative, but would be modified in two ways to improve its financial feasibility: (1) it would include cost-saving design changes, and (2) it would include the use of tolls. The cost-saving design changes include: a reduction in the width of the proposed East End Bridge, tunnel, and roadway; reconstruction of the Kennedy Interchange in downtown Louisville in-place; and elimination of a proposed pedestrian/bikeway facility from the new Downtown Bridge. See Section 3.2.3 for a more detailed description of the Modified Selected Alternative.

3.1.1 Re-Assessment of FEIS Alternative Screening Decisions

This section presents the results of the re-assessment of the alternatives screening process since the 2003 FEIS, as documented in the *Alternatives Evaluation Document*.

3.1.1.1 Review of Conceptual Alternatives

This step involves a re-assessment of the conceptual alternatives considered in the 2003 FEIS and presented in the *Alternatives Evaluation Document*; and of each alternative's ability to meet the project's purpose and need based on the criteria described in Chapter 2 of this SDEIS. For the reasons given in the *Alternatives Evaluation Document* and summarized below, none of the conceptual alternatives considered in the 2003 FEIS meets the purpose and need, except for the Two Bridges/Highway Alternative.

- **No-Action Alternative**

  The No-Action Alternative does not meet any of the purpose and need criteria for the project, but the alternative is evaluated in this SDEIS as a baseline against which to compare other alternatives.

- **Transportation Demand Management (TDM), Transportation System Management (TSM), Transportation Management (TM), and Mass Transit Alternatives**

  These alternatives would not meet the purpose and need of the project and, therefore, would not be reasonable alternatives on their own. These alternatives would not meet the purpose and need because they would not improve the geometrics of the Kennedy Interchange and Kennedy Bridge to American Association of State Highway and Transportation Officials (AASHTO) recommended minimum design guidelines to meet the project's identified safety needs, and they would not provide a cross-river connection in the east end to provide the needed system linkage. In addition, while these alternatives may yield some operational benefits, they are highly unlikely to have any significant impact on reducing vehicle hours of delay (VHD) in the Louisville Metropolitan Area (LMA). Consequently, these alternatives do not meet the need to improve inefficient mobility in the LMA. They would not improve the level of service (LOS) on the Kennedy Bridge to LOS D or better; would not allow cross-river bridge demand to be met on the Kennedy Bridge during peak periods; and would not improve the Kennedy Interchange operating speed during the peak hour to address the need to improve traffic congestion. For all of these reasons, these alternatives do not meet the purpose and need of the project and are not reasonable alternatives. Therefore, they have been dismissed from further analysis as stand-alone options.

- **Bridge/Highway Alternatives**

  - **Kennedy Interchange Reconstruction Alternative**

    The Kennedy Interchange Reconstruction Alternative would not meet the purpose and need because it would not provide a cross-river connection in the east end to meet the need for improved system linkage and would not correct the geometric deficiencies of the existing Kennedy Bridge, which is part of the project's identified safety need. In addition, while this alternative may yield some operational benefits by reconstructing the Kennedy Interchange, it is highly unlikely to have a significant impact on reducing VHD in the LMA. Therefore, this alternative would not meet the need to improve inefficient mobility. While this alternative may improve the Kennedy Interchange operating speed during the peak period, it is highly unlikely to improve the level of service on the Kennedy Bridge to LOS D or better, nor meet cross-river bridge demand on the Kennedy Bridge; therefore, it would not satisfy the need to reduce traffic congestion. For all these reasons the Kennedy Interchange Alternative does not meet the purpose and need of the project and is not a reasonable alternative. Therefore, it is dismissed from further analysis as a stand-alone alternative.

- **One Bridge/Highway Alternatives (Includes Kennedy Interchange Reconstruction)**

  The One Bridge/Highway alternatives include either a new Downtown Bridge or a new East End Bridge. Both of these One Bridge/Highway alternatives also include the reconstruction of the Kennedy Interchange. The conclusions regarding further consideration of these alternatives in the SDEIS are presented in the following paragraphs and in Appendix A.5, *Technical Memorandum One Bridge/Highway Alternatives: Downtown Only, East End Only*.

  Downtown Bridge Only
  The Downtown Bridge Only Alternative would not provide a cross-river connection in the east end to meet the need for improved system linkage and would not reduce VHD in the LMA to meet the need to improve inefficient mobility. Therefore, the Downtown Bridge Only Alternative would not meet the purpose and need and is dismissed from further analysis.

  East End Bridge Only
  While the East End Bridge Only Alternative includes reconstruction of the Kennedy Interchange and, therefore, would reasonably be expected to improve the Kennedy Interchange operating speed during the peak hour, it does not improve the level of service to LOS D or better on the Kennedy Bridge, nor does it meet cross-river demand on the Kennedy Bridge during the peak periods; as a result, it does not meet the need to reduce traffic congestion. The alternative would improve the geometrics of the Kennedy Interchange but would not address the geometric deficiencies of the Kennedy Bridge, thereby not meeting the identified need for improved safety. Therefore, the East End Bridge Only Alternative does not meet the purpose and need for the project and is dismissed from further analysis.

- **Two Bridge/Highway Alternatives (Includes Kennedy Interchange Reconstruction)**

  The Two Bridges/Highway alternatives include construction of a new bridge outside downtown, construction of a new Downtown Bridge (beside the existing Kennedy Bridge), and reconstruction of the Kennedy Interchange. In the FEIS, several versions of a Two Bridges/Highway Alternative were considered. These versions differed based on the location of the new bridge outside downtown: Oldham County, Far East, Near East, and West. In addition, one concept was considered that included a tunnel under the Ohio River in Far East Corridor rather than a bridge. The conclusions regarding further consideration of these alternatives in the SDEIS are presented in the following paragraphs.

  Oldham County and West Corridors
  The alternatives in the Oldham County and West corridors were eliminated without detailed study in the November 2, 2001, DEIS based on a range of considerations. As stated in the DEIS (p 3-30), these alternatives are approximately 10 miles longer than

the Far East Corridor, which was the longest of the three corridors recommended to be carried forward. As a result, provision of a new freeway in either of these corridors would be substantially more expensive and would involve more environmental impacts. In addition, the West/Downtown Corridor Two Bridge/Highway Alternative would not provide a cross-river connection in the east end to meet the need for improved system linkage. There is no new information available that calls into question the basis for dismissing these alternatives, and no further consideration of these alternatives is warranted.

River Tunnel/Highway Alternative

The concept of constructing a new tunnel under the Ohio River, east of downtown Louisville and Jeffersonville, was suggested by the public as a potential alternative to a new bridge in the Far East Corridor. This alternative was investigated as part of the 2003 FEIS as a result of these comments. Preliminary estimates indicated that a tunnel, alone, would cost up to three times more than the estimated cost of other bridge/highway alternatives (see 2001 DEIS, p. 3-30). Based on the higher estimated cost of this alternative, it was eliminated without further detailed study in the 2001 DEIS. There is no new information available that calls into question the basis for dismissing this alternative, and no further consideration of this alternative is warranted.

Far East and Near East Corridors

The Far East and Near East corridors were carried forward for detailed study in the 2003 FEIS, based on a determination that alignments in either corridor had the potential to meet the purpose and need as part of a Two Bridges/Highway Alternative. The Far East Corridor connects I-265/KY 841 in Kentucky with S.R. 265 at its interchange with S.R. 62 in Indiana. The Near East corridor connects to I-71 near I-264 in Kentucky and ties into the same S.R. 265/S.R. 62 interchange in Indiana. Alignments were considered in each of those corridors, and the choice among those alignments was based primarily on environmental factors.

Alternatives in the Far East and Near East corridors continue to have the potential to meet the purpose and need as part of a Two Bridges/Highway Alternative. Two Bridges/Highway Alternatives in the Far East and Near East corridors are reasonably expected to reduce VHD within the LMA to address the need to improve mobility; they are reasonably expected to improve the level of service to LOS D or better on the I-65 crossing (both the Kennedy Bridge and the proposed new downtown bridge), to meet cross-river demand on the I-65 crossing during the peak periods, and to improve the Kennedy Interchange operating speed during the peak hour, thereby meeting the need to relieve traffic congestion. These alternatives also would improve the geometrics within the Kennedy Interchange and on the I-65 river crossing to AASHTO recommended minimum design guidelines, thereby meeting the need to improve safety. The alternatives all provide an East End Bridge, thereby meeting the need for improved system linkage.

In summary, this updated analysis confirms that a Two Bridges/Highway Alternative with a new bridge in the Near East or Far East Corridor has the potential to meet the purpose and need. The decision to recommend the Far East Corridor was made in the 2003 FEIS as part of the alignment selection process. That decision was based primarily on a comparison of environmental impacts, as discussed in SDEIS Section 3.1.1.2, below.

A summary of the results from the re-assessment of the conceptual alternatives is provided in Table 3.1-1.

3.1.1.2 Review of Alignment Selection

This step involves a re-assessment of the selection of alignments A-15 and C-1 as the preferred alignments in the Far East Corridor (herein referred to as East End Corridor) and Downtown Corridor of the LSIORB Project, respectively. As noted in the *Alternatives Evaluation Document*, the screening process for the 2003 FEIS identified a range of reasonable alignments for consideration in the East End and Downtown corridors. Those alignments were studied in detail in the 2003 FEIS, and then a preferred alignment was identified for the East End (A-15) and Downtown (C-1) corridors. At each stage, the dismissal or advancement of alignments was based primarily on environmental factors, as documented in the 2003 FEIS.

Based on the re-assessment of the alternatives evaluated in the 2003 FEIS, as described the *Alternatives Evaluation Document*, the decisions reached in the 2003 FEIS remain valid. This re-assessment has confirmed the selection of the Two Bridges/Highway Alternative consisting of alternatives A-15 and C-1. The alternatives that were eliminated in the FEIS will not be re-considered further. See Appendix A.3, *Alternatives Evaluation Document*, for more detail.

3.1.1.3 Cost/Financial Feasibility

The FEIS Selected Alternative currently has a year-of-expenditure cost estimate of $4.1 billion, an increase of $1.6 billion over the $2.5 billion year-of-expenditure cost estimate in the 2003 FEIS (FEIS p. S-11). The Louisville Metropolitan Planning Organization's (MPO) Metropolitan Transportation Plan (MTP) *Horizon 2030* currently states that KYTC, INDOT, and FHWA can reasonably be expected to provide up to $1.9 billion from traditional federal and state programs for the project.[2] This leaves a shortfall of approximately $2.2 billion. In response to this shortfall, two strategies have been identified: evaluate additional revenue options, including tolling, and modify design features to reduce costs, as follows:

- Tolling has been identified in the current MTP as an additional revenue source for the LSIORB Project. This and other possible additional revenue sources would provide the ability for the Louisville MPO to meet the requirement that the MTP be fiscally constrained. See Appendix G.2, *Financial Demonstration for the Ohio River Bridges*

[2] The Louisville MPO is currently in the process of updating the MTP. Both the existing approved MTP and the proposed updates include the $1.9 billion estimate of available funds from traditional sources for the LSIORB Project.

Project in Support of the Louisville (KY-IN) Metropolitan Transportation Plan (September 2011).

- The following modifications to the FEIS Selected Alternative are being considered to reduce costs:
  - Reconstructing the Kennedy Interchange within its existing location instead of relocating it to the south.
  - Reducing the East End Bridge, roadway, and tunnel from six to four lanes.
  - Eliminating the pedestrian/bike path from the Downtown Bridge because a similar facility will be provided on the nearby Big Four Bridge as a separate project.

TABLE 3.1-1
EVALUATION OF CONCEPTUAL ALTERNATIVES

Alternatives	Summary	Conclusion
No-Action	Does not meet the purpose and need	Carried forward as a baseline comparison to other alternatives in the SDEIS per NEPA guidelines.
TDM, TSM, TM, and Mass Transit	Does not meet the purpose and need.	Dismissed as standalone options
Kennedy Interchange Reconstruction	Does not meet the purpose and need.	Dismissed as a standalone option
One Bridge/Highway w/ Kennedy Interchange Reconstruction		
Downtown Bridge Only	Does not meet the purpose and need.	Dismissed.
East End Bridge Only	Does not meet the purpose and need.	Dismissed.
Two Bridges/Highway w/ Kennedy Interchange Reconstruction		
Oldham County/Downtown Corridor	Meets purpose and need, but its greater length results in much higher impacts and cost, and would result in reduced traffic usage.	Dismissed.
West/Downtown Corridor	Does not meet purpose and need; also, greater length results in much higher impacts and cost.	Dismissed.
East Corridor River Tunnel Highway System/Downtown Corridor	Meets purpose and need, but tunneling results in much higher cost, which far exceeds the cost of other alternatives.	Dismissed.
Near East/Downtown Corridor	Meets purpose and need criteria.	Carried forward for further evaluation.
Far East/Downtown Corridor	Meets purpose and need criteria.	Carried forward for further evaluation.

During the public involvement process, some public comments recommended FHWA consider re-evaluating the tunnel in the East End Corridor in Kentucky (Alternative A-15) as a cost saving

measure. The tunnel under the Drumanard Estate was reevaluated. See *Construction Options at U.S. 42 and Drumanard Estate* (SDEIS Appendix D.5) for this reevaluation. The reevaluation found the removal of the tunnel or additional modification to the tunnel design were not reasonable.

The project design modifications are projected to result in a $1.2 billion savings from the estimated $4.1 billion cost of FEIS Selected Alternative. Therefore, the estimated cost of the Modified Selected Alternative is $2.9 billion. Based on preliminary estimates in the memo *Revenue Estimates and Indicative Financial Capacity—SEIS Modified Selected Alternative Tolled Scenario,* in Appendix G.5, tolling revenues are expected to generate from $800 million to $1.2 billion[3] in funding capacity. The projected toll funding, in combination with the $1.9 billion from traditional funding sources that are reasonably expected to be available according to the MTP, would provide total funding in the range of $3 billion, which would be sufficient to meet the $2.9 billion cost of the Modified Selected Alternative. It has therefore been concluded that a Modified Selected Alternative (with tolling) is financially feasible and warrants detailed study in this SDEIS. These cost and funding estimates are preliminary, and are being presented at this time solely as a basis for evaluating the reasonableness of alternatives.

The FEIS Selected Alternative has an estimated year-of-expenditure cost of $4.1 billion, because it does not include the cost-saving design changes that are incorporated into the Modified Selected Alternative. As noted above, the total funds available for construction (from traditional and toll-based funding) would be in the range of $3 billion, if tolls are set at the same rates as assumed for the Modified Selected Alternative (i.e., $1.50 for cars, $3.00 for small trucks, and $6.00 for large trucks). While the cost and funding estimates are preliminary, a shortfall of this magnitude (approximately $1 billion) would make the FEIS Selected Alternative financially infeasible. Therefore, as part of this SEIS process, a separate analysis was conducted to assess the level at which toll rates would need to be set to provide sufficient funding (along with the $1.9 billion from traditional sources) to cover the $4.1 billion cost of the FEIS Selected Alternative (see Appendix G.4, *Financial Feasibility Revenue Estimates for the FEIS Selected Alternative*). This new analysis documents that toll funding could generate approximately $1.4 billion to $2.1 billion in funding capacity. At the upper end of this range, it is conceivable that toll funding plus traditional funding could nearly cover the $4.1 billion cost of the FEIS Selected Alternative. However, toll rates would need to be much higher than assumed for the Modified Selected Alternative; for example, the analysis assumes passenger cars would pay a toll of $9.00 southbound in the morning and $10.00 northbound in the evening on both bridges in the year 2030 (expressed in year 2010 dollars). Toll rates at this level are unlikely to be accepted by the public and, in any event, are unnecessary given that an acceptable, lower-cost alternative (the Modified Selected Alternative) is available and can be implemented with much lower toll rates.

Therefore, while the current MTP states that the FEIS Selected Alternative is financially feasible with alternative funding sources such as tolling, this new traffic forecasting and updated revenue analyses indicates that (1) toll funding would be insufficient to cover the $4.1 billion year-of-expenditure cost estimate for the FEIS Selected Alternative if that alternative is tolled at the

[3] This amount represents the net toll funding available for construction costs after subtracting the costs associated with operation and maintenance, along with debt service.

same rates as the Modified Selected Alternative, and (2) if the FEIS Selected Alternative were tolled at extremely high rates, toll revenues would still fall somewhat short of the funding needed, and the toll rates themselves would likely be considered unacceptable. Based on these findings, the FEIS Selected Alternative is not financially feasible. However, that alternative is being carried forward for detailed study in the SDEIS as a baseline for analysis as the currently approved alternative.

3.1.1.4 Summary of Findings

The following is a summary of findings from the re-assessment of the 2003 FEIS alternatives:

- The decisions reached in the 2001 DEIS and 2003 FEIS regarding the dismissal of conceptual alternatives and alignment alternatives remain valid in this SDEIS.
- The FEIS Selected Alternative cannot be constructed with currently available or reasonably anticipated funds, but should continue to be considered as a baseline for comparison with the Modified Selected Alternative.
- The FEIS Selected Alternative with the addition of tolls is not financially feasible because projected toll revenues would not be sufficient to cover the funding gap for this alternative.
- The FEIS Selected Alternative with design modifications (i.e., the Modified Selected Alternative) but without tolls is not financially feasible because, even with cost-saving design changes, the cost of the Modified Selected Alternative would still far exceed the available and anticipated traditional revenue sources.
- The Modified Selected Alternative with tolls is a financially feasible alternative and is, therefore, carried forward for detailed evaluation in this SDEIS.
- The basis for selecting alignments A-15 and C-1 as the preferred alignments in the East End and Downtown corridors, respectively, remains valid, and these alignments continue to be considered for both the FEIS Selected Alternative and the Modified Selected Alternative.

Based on these findings, three alternatives will be evaluated in detail in this SDEIS: (1) No-Action Alternative, (2) the FEIS Selected Alternative, and (3) the Modified Selected Alternative (with tolls).

3.2 Description of Alternatives

3.2.1 No-Action Alternative

The No-Action Alternative assumes that all of the projects listed in the *Horizon 2030* MTP will be implemented, with the exception of the LSIORB Project, which includes two new bridges over the Ohio River (i.e., Downtown/I-65 and East End/I-265), reconstruction of the Kennedy Interchange, and enhanced bus service improvements (i.e., KIPDA ID #s 52 and 185). Figure

3.2-1 shows the current major projects planned in the vicinity of the project area, and a current list of these planned projects is provided below. An asterisk is provided next to each project that was not included in the MTP at the time of the 2003 FEIS. The descriptions are taken from the MTP; the numbers preceding each project correspond to the numbers in Figure 3.2-1 while the numbers in parentheses following the project description represent the KIPDA identification numbers.

Interstates

1. I-64: Improvements within the I-64 corridor from the Kennedy Interchange to I-264 (Watterson Expressway) addressing safety and congestion issues. The improvements may include but are not limited to: consideration of alternative transportation modes, deployment of Intelligent Transportation System (ITS) technology, addition of auxiliary and/or travel lanes, interchange modifications, and installation of traffic safety devices, signs and lighting. None of the potential improvements will involve expansion of the Cochran Hill Tunnel. (389)* (note: the 2003 MTP included widening of I-64 to six lanes)
2. I-64: Widen I-64 between I-264 and KY 1747 to add travel lanes in each direction (955)-constructed
3. I-64: Widen I-64 between I-264 and KY 1747 to add westbound auxiliary lane. (1803)-constructed
4. I-71: Add auxiliary lanes on I-71 near the Kennedy Interchange, including operational improvements to the Zorn Avenue Interchange. (1478)*—the 2003 FEIS included adding a third travel lane in each direction on I-71 in lieu of this and two other interchange rehabilitation projects.
5. I-71: Construct a new interchange with new connector road from KY 1447 to U.S. 42. (952) (Oldham County, Kentucky)
6. I-264: Add 1 lane in each direction on I-264 (Watterson Expressway) from KY 1447 (Westport Road) to I-71. (400)*
7. I-264: Add an auxiliary lane on I-264 eastbound from near the KY 1447 (Westport Road) interchange to the U.S. 42 (Brownsboro Road) interchange. (1481) – constructed
8. I-264: Construct new I-264 (Watterson Expressway) interchange at KY 1447 (Westport Road), adding 1 lane in each direction in the interchange area and adding 300-500 feet of auxiliary lane on I-264 and a second off-ramp lane to U.S. 42. (131) – constructed
9. I-265: Widen I-265 (Gene Snyder Freeway) from 4 lanes to 6 lanes from I-64 to I-71. (958)

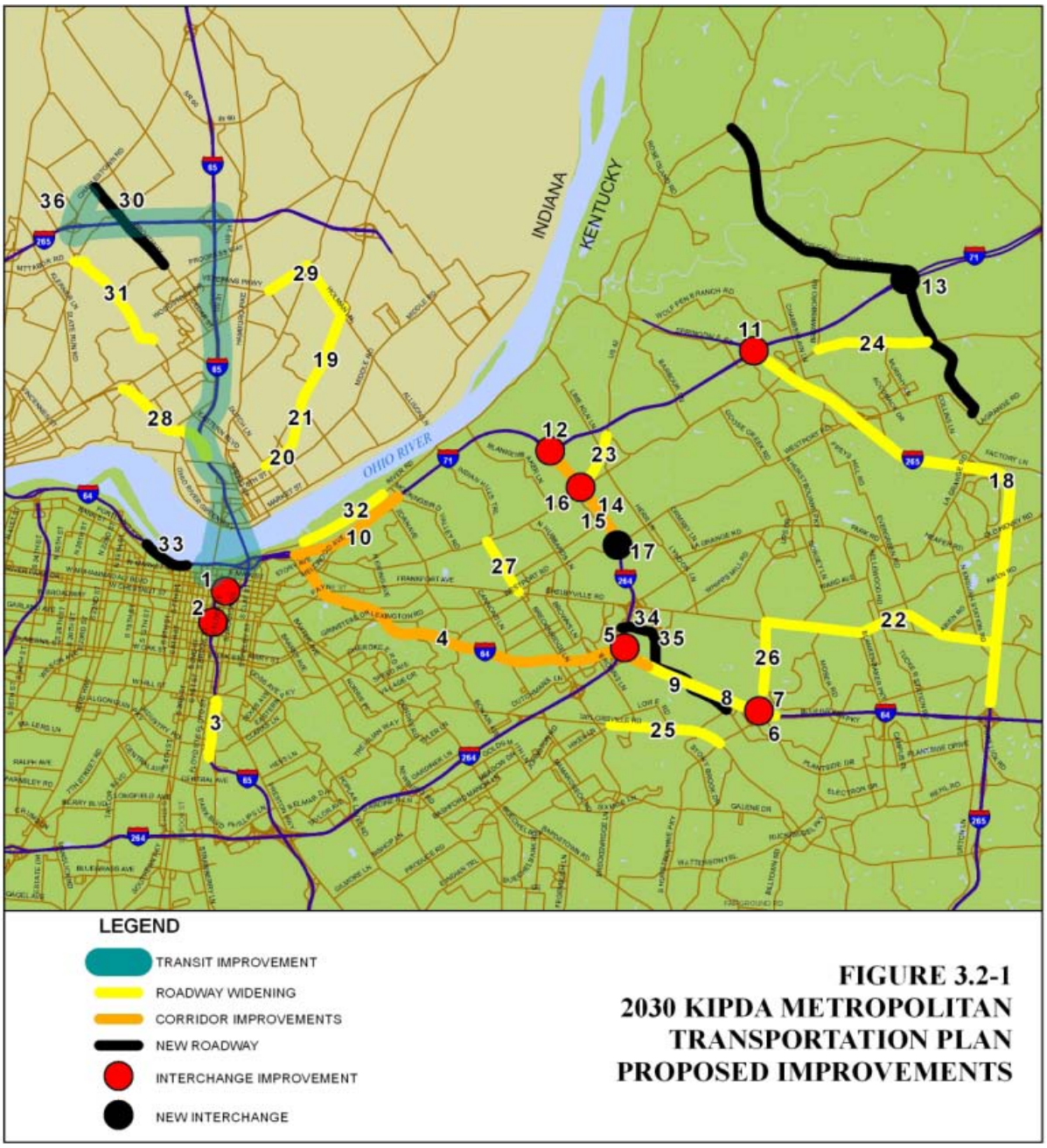


FIGURE 3.2-1
2030 KIPDA METROPOLITAN TRANSPORTATION PLAN PROPOSED IMPROVEMENTS

U.S. and State Highways

10. S.R. 62 (10th Street): Reconstruct and widen from 4 lanes to 7 lanes from Reeds Lane to Allison Lane. (301)*
11. S.R. 62 (10th Street): Reconstruct and widen from 4 lanes to 5 lanes from Dutch Lane to Main Street. (303)*
12. S.R. 62 (10th Street): Reconstruct and widen from 4 lanes to 5 lanes from Main Street to Reeds Lane. (304)*
13. U.S. 60 (Shelbyville Road): Add 1 travel lane in each direction on U.S. 60 (Shelbyville Road) from KY 1747 (Hurstbourne Parkway) to I-265 (Gene Snyder Freeway). (479)*
14. U.S. 42: Widen U.S. 42 (Brownsboro Road) from 5 lanes to 7 lanes from I-264 (Watterson Expressway) to Seminary Drive. (476)*
15. KY 22: Widen KY 22 from 2 lanes to 5 lanes (5th lane will be a center turn lane) from just east of KY 1694 to Haunz Lane. (412)*
16. KY 155 (Taylorsville Road): Add 1 travel lane in each direction (from 4 lanes to 6 lanes) on KY 155 (Taylorsville Road) from Browns Lane/Hikes Lane to KY 1747 (Hurstbourne Parkway). (469)*
17. KY 1747 (Hurstbourne Parkway): Add 3rd travel lane southbound on KY 1747 (Hurstbourne Parkway) from U.S. 60 (Shelbyville Road) to Linn Station Road, 1.6 miles in length. Includes improvement to the U.S. 60 and Hurstbourne Parkway intersection. (359)*
18. KY 1932 (Chenoweth Lane): Widen KY 1932 (Chenoweth Lane) from 2 lanes to 3 lanes (3rd lane will be a center turn lane) from U.S. 60 (Shelbyville Road) to U.S. 42 (Brownsboro Road). (213)*

Other Roadways—Indiana

19. Brown Station Way: Widen Brown Station Way from 4 lanes to 6 lanes from Lewis and Clark Parkway to I-65 (Brown Station Way from Lewis and Clark Parkway to Randolph Avenue and IN 62 from Randolph Avenue to I-65). (575)*
20. Veterans Parkway, Phase 2: Widen Charlestown-New Albany Pike from 2 lanes to 4 lanes from Veterans Parkway to Holman Lane. Widen Holman Lane from 2 lanes to 4 lanes from IN 62 to Charlestown-New Albany Pike. (514)*
21. Broadway: Extend Broadway as a 2-lane road from Potters Lane to Charlestown Road. (498)*
22. Blackiston Mill Road: Reconstruct and widen Blackiston Mill Road from 2 lanes to 3 lanes (3rd lane will be a center turn lane) from Blackiston View Drive to Charlestown Road. (489)*

Other Roadways—Kentucky

23. River Road: Widen River Road from 2 lanes to 4 lanes from east of Beargrass Creek near Pope Avenue to Zorn Avenue. (163)*
24. Bowling Boulevard/Christian Way: Construct a 5 lane (5th lane will be a center turn lane) connector between Bowling Boulevard and Christian Way. (260)*
25. Bunsen Boulevard/Christian Way: Construct Bunsen Boulevard/Christian Way connector as a 5-lane divided highway. (265)*

Transit Projects

26. Southern Indiana Demo Express Bus Service and Park and Ride: Express bus service between downtown Louisville and growing areas of Clark and Floyd counties, Indiana, and construction of a park and ride lot in the vicinity of I-65 and I-265. (1474)*

3.2.2 FEIS Selected Alternative

The FEIS Selected Alternative generally represents the same alternative that was presented in the FEIS as the Preferred Alternative and in the ROD as the Selected Alternative (see figures 3.2-2A and 3.2-2B for the Downtown and East End corridors, respectively). This alternative is referred to in the FEIS as a Two Bridges/Highway Alternative and is composed of the following alignment alternatives A-15 and C-1:

Alternative A-15

This alternative is a 6-lane freeway on new alignment that would connect I-265/KY 841 (Gene Snyder Freeway) in Kentucky with S.R. 265 (Lee Hamilton Highway) in Indiana. This alternative includes a new 6-lane bridge over the Ohio River and a 6-lane tunnel under the historic Drumanard Property in Kentucky. It also includes interchanges at U.S. 42 (half diamond) in Kentucky and at Salem Road and S.R. 265/S.R. 62 in Indiana.

Alternative C-1

This alternative includes the reconfiguration of the existing 7-lane Kennedy Bridge to a 6-lane bridge to accommodate I-65 southbound traffic and the construction of a new 6-lane bridge, plus a pedestrian/bicycle lane, over the Ohio River just east of the Kennedy Bridge to accommodate I-65 northbound traffic. This alternative also includes the reconstruction of the Kennedy Interchange to the south of the existing interchange and an interchange with I-71/Frankfort Avenue in Kentucky, and the reconfiguration of I-65 and U.S. 31 in Indiana.

As mentioned on page 3-85 in Section 3.7 of the FEIS and in the *Alternatives Evaluation Document*, this alternative also includes the following elements of the Transportation System Management Alternative that was presented in the FEIS (Note: More detailed descriptions of these elements are provided in the *Alternatives Evaluation Document* in Appendix A.3.):

- TDM—non-motorized facility enhancements and employer-based trip reductions.
- TSM—expanded Intelligent Transportation System applications.
- Mass Transit—enhanced bus service. Future options and funding sources for enhanced bus service will be coordinated with Transit Authority of River City (TARC).[4]

[4] Funding for enhanced bus service has not been identified at this time. KYTC and INDOT anticipate that funding for this service would be addressed as part of the metropolitan transportation planning process, and would not be provided as part of the construction funding for this project.

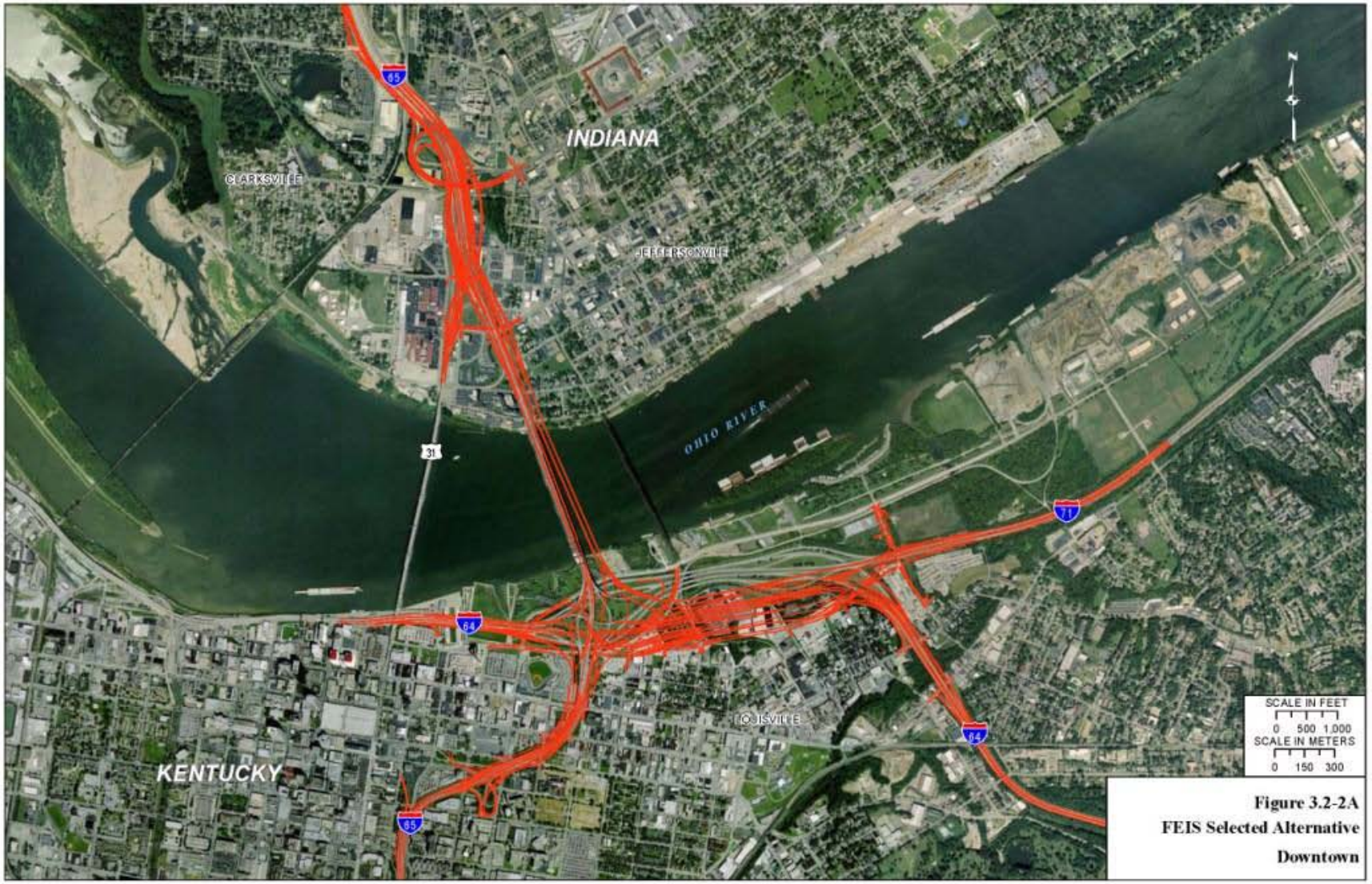


Figure 3.2-2A
FEIS Selected Alternative
Downtown

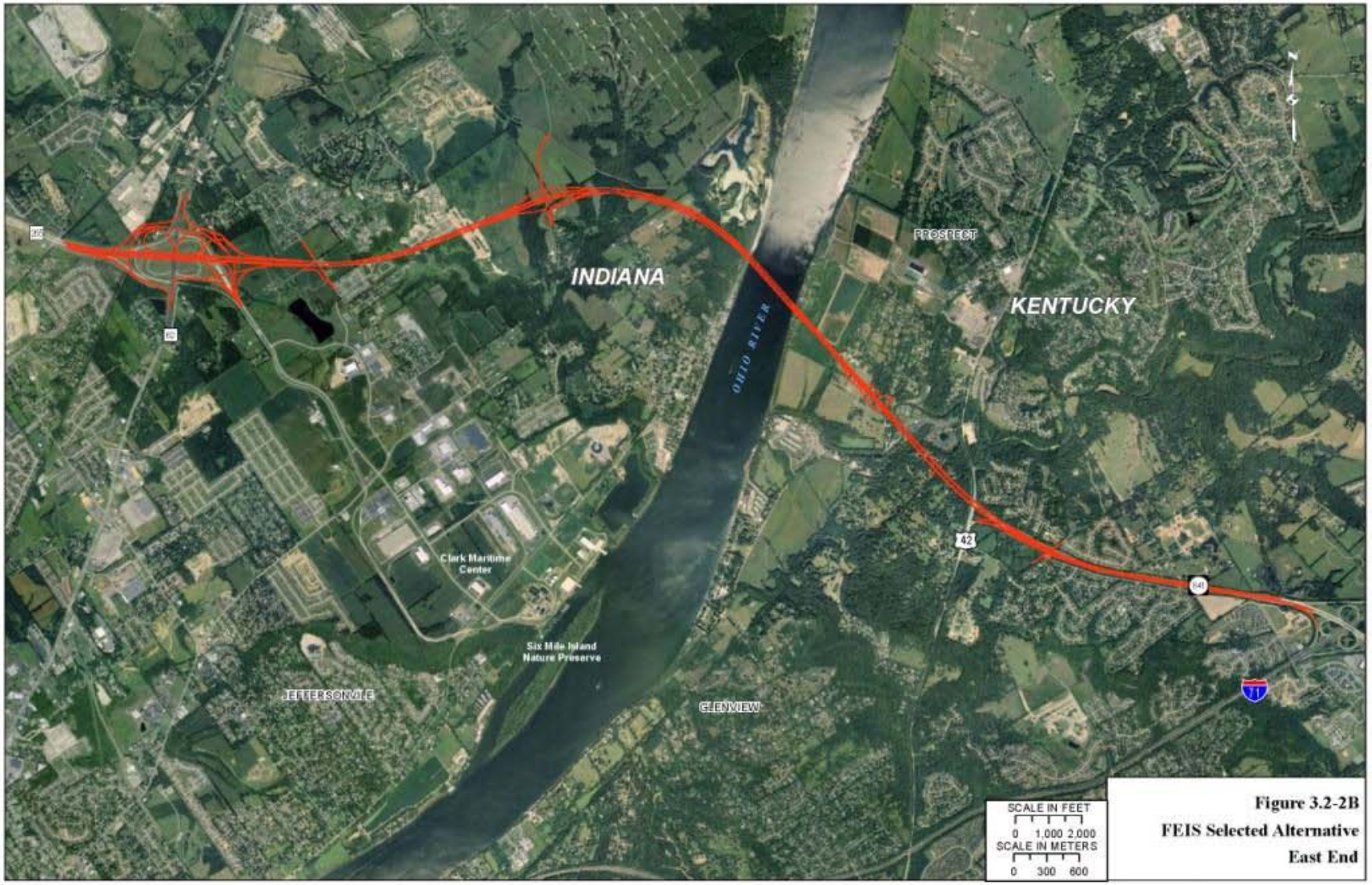


Figure 3.2-2B
FEIS Selected Alternative
East End

Starting in 2003, INDOT and KYTC selected design consultants to begin work on the design phase of the project. The design consultants conducted field surveys, performed geotechnical investigations, completed bridge type selections, and prepared right-of-way plans (which are used by the right-of-way agents to acquire land). During the seven-year design process, based on new information, public involvement, and further engineering refinement, adjustments to the designs in the FEIS were made. Consequently, the FEIS Selected Alternative analyzed and addressed throughout this SDEIS process and document is reflective of the most current design. The most current design of the FEIS Selected Alternative includes the following differences, as compared to the 2003 design of the same alternative:

- Overall lower Kennedy Interchange ramps and structure elevations.
- Reduced width of the Kennedy Interchange over the Louisville Waterfront Park.
- Removal of the 3rd Street ramp in downtown Louisville and addition of a exit ramp from I-64 to River Road in downtown Louisville to serve the same traffic.
- Modified Indiana East End Corridor interchange with S.R. 62 from a "standard diamond" design to a "divergent diamond" design.

Each of these modifications was communicated to the local leaders and the public during the design process, and before the issuance of the Notice of Intent (NOI)for this SDEIS.

Consistent with the description of this alternative in the FEIS, it has been assumed that the FEIS Selected Alternative would be non-tolled. A tolled version of the FEIS Selected Alternative was considered as part of the alternatives screening process during the development of this SDEIS, and was dismissed as unreasonable (see Section 3.1.1.3, *Cost/Financial Feasibility*).

3.2.3 Modified Selected Alternative

This alternative would include many of the same elements as the FEIS Selected Alternative, but with the following modifications (see figures 3.2-3A and 3.2-3B for the Downtown and East End corridors, respectively):

- Electronic tolls would be added on both the downtown I-65 river crossings (i.e., the Kennedy Bridge and the new Downtown Bridge) and the new East End Bridge. The use of electronic tolls would not require toll booths/plazas on the bridges. For the purposes of this SDEIS, the following baseline toll rates were estimated[5]:

  Cars: $1.50
  Small Trucks: $3.00
  Large Trucks: $6.00

[5] All toll rates in this SDEIS are stated in 2010 dollars. For modeling purposes, it was assumed that tolls would be adjusted for inflation to maintain a level consistent with the value as stated in 2010 dollars.

Figure 3.2-3A
Modified Selected Alternative
Downtown

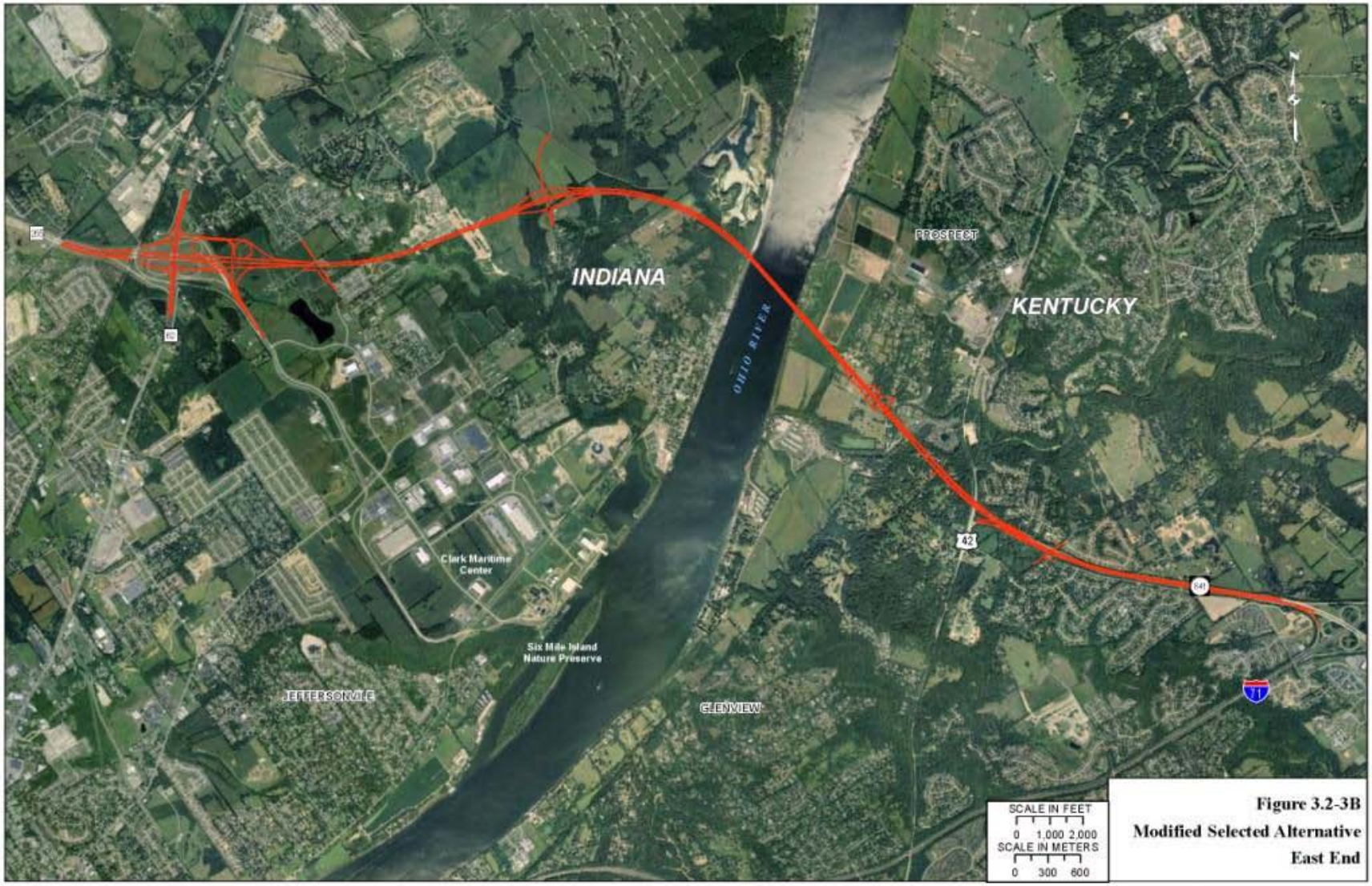


Figure 3.2-3B
Modified Selected Alternative
East End

These toll rates are referred to in this SDEIS as the "baseline tolling scenario." The baseline tolling scenario was used for purposes of environmental impact assessment in this SDEIS, and does not represent a decision on the toll rates that will actually be charged. The toll rates will be determined by the Ohio River Bridges Authority after completion of the NEPA process, as part of the design and financing process. In addition to the baseline tolling scenario, a toll sensitivity test was conducted to better understand the impacts of different toll rates on travel patterns. The sensitivity test examined two additional scenarios: a lower-rate scenario and a higher-rate scenario. The range of toll rates was $1/$2/$4 (for the three different types of vehicles) in the lower-rate scenario and was $2/$4/$8 for those types of vehicles under the higher-rate scenario. This analysis showed that these variations in toll rates would have less than a 1% difference in total cross-river traffic volumes (see Appendix H.1, *Louisville–Southern Indiana Ohio River Bridges Traffic Forecast*).

- The number of lanes on the roadway, bridge, and tunnel associated with Alternative A-15 would be reduced from six lanes to four lanes.

- The Kennedy Interchange would be reconstructed on the existing alignment (i.e., in-place) instead of to the south, and would eliminate the I-71/Frankfort Avenue interchange. In addition, it would reduce the length of roadway improvements along the I-65, I-64, and I-71 approaches.

- The 17-foot-wide pedestrian/bicycle path would be removed from the new downtown I-65 bridge because a 22-foot-wide pedestrian/bicycle access across the river will be provided on the Big Four Bridge as a separate project. On the Kentucky side of the Big Four Bridge project, the ramps have been completed and rehabilitation of the bridge began in 2011 and is currently under construction. On the Indiana side, construction is expected to begin in 2012. A Finding of No Significant Impact (FONSI) was approved for the bridge on the Kentucky side of the project by the USACE on July 16, 2007. A FONSI was approved for the Indiana side of the project by FHWA on October 19, 2011, which included an Individual 4(f) Evaluation for both sides of the river and the bridge itself.

- As with the FEIS Selected Alternative, this alternative would also include the following elements of the Transportation System Management (TSM) Alternative as presented in the original FEIS (Note: More detailed descriptions of these elements are provided in the *Alternatives Evaluation Document* in Appendix A.3.):

- TDM—non-motorized facility enhancements and employer-based trip reductions.
- TSM—expanded Intelligent Transportation System applications.
- Mass Transit—enhanced bus service. Future options and funding sources for

enhanced bus service will be coordinated with TARC.[6]

3.3 Evaluation of Alternatives

In SDEIS Section 3.1, three alternatives were recommended for further evaluation: No-Action Alternative, FEIS Selected Alternative, and Modified Selected Alternative. The FEIS Selected and Modified Selected alternatives include a reconstruction of the existing Kennedy Bridge deck and converting it for I-65 southbound traffic only, a new downtown bridge for I-65 northbound traffic, reconstruction of the Kennedy Interchange, and a new river crossing to the east connecting the eastern circumferential freeway, S.R. 265 in Indiana to KY 841 in Kentucky.

To conduct a more detailed evaluation of each alternative in terms of the performance measures outlined in the Purpose and Need Statement in Chapter 2, year 2030 traffic forecasts were generated for the alternatives retained for further study. Separate forecasts were developed for the No-Action, FEIS Selected, and Modified Selected alternatives. The results of this analysis are documented in Appendix H.1, *Louisville–Southern Indiana Ohio River Bridges Traffic Forecast* (*Traffic Forecast*).

3.3.1 Efficient Cross-River Mobility for Population and Employment Growth

To evaluate cross-river mobility, each alternative was evaluated based on its ability to reduce daily vehicle hours of delay (VHD) for the LMA. As identified in Chapter 2, VHD is projected to increase 161% between 2010 and 2030 for the No-Action Alternative.

For the FEIS Selected Alternative and the Modified Selected Alternative, VHD are projected to decrease 12.9% and 12.1%, respectively, relative to the No-Action Alternative (see Table 3.3-1). These decreases in VHD reflect the improved efficiency in cross-river mobility associated with the FEIS Selected Alternative and the Modified Selected Alternative.

TABLE 3.3-1
WEEKDAY 2030 TRAVEL SUMMARIES

Alternative	VHD	Percent Change*	VMT**	Percent Change*	VHT**	Percent Change*
No-Action	397,000		35,297,000		1,069,000	
FEIS Selected	346,000	-12.9%	35,826,000	1.5%	1,023,000	-4.3%
Modified Selected	349,000	-12.1%	35,740,000	1.3%	1,022,000	-4.4%

** Percent change is relative to the No-Action Alternative.*

*** VMT and VHT are shown for comparison of alternatives, not as performance measures for purpose and need.*

[6] Funding for enhanced bus service has not been identified at this time. KYTC and INDOT anticipate that funding for this service would be addressed as part of the metropolitan transportation planning process, and would not be provided as part of the construction funding for this project.

Although VMT and VHT are not being evaluated as performance measures for purpose and need, they have been taken into consideration for the purpose of comparing project alternatives. As indicated in Table 3.3-1, VHT are expected to decrease 4.3% and 4.4% for the FEIS Selected Alternative and Modified Selected Alternative, respectively. The VMT is projected to increase for the FEIS Selected Alternative (1.5%) and the Modified Selected Alternative (1.3%) relative to the No-Action Alternative. While the travel analysis in the 2003 FEIS indicated that VMT would decrease slightly for the FEIS Selected Alternative, as compared to the No-Action Alternative, the slight increases in VMT projected for the build alternatives in the current traffic analysis are not surprising. VMT often increases as a result of improvements in mobility, because improvements in the efficiency of individual trips often can result in more trips being taken, thereby increasing miles of travel.

3.3.2 Traffic Congestion

A three-tiered traffic analysis was conducted to assess the level of traffic congestion for the alternatives. First, to provide a large-scale (macro-level) assessment of congestion, the daily traffic demand was compared to the daily capacity for each of the bridge crossings. Second, a mid-scale (meso-level) assessment of congestion on each bridge was conducted by comparing demand to capacity, by direction, over a period of hours: three hours for the AM and PM periods, six hours for the Midday period, and 12 hours for the Night period. The third level of analysis was focused in even further by conducting a peak-hour level of service analysis by direction. The final level of analysis was peak-hour (microsimulation) of the Kennedy Interchange to assess specific traffic operations within the Kennedy Interchange. Each of these analyses provided a unique measure of traffic congestion in order to form a more comprehensive assessment of traffic congestion for the project.

3.3.2.1 Bridge Demand as Percent of Capacity

The following text and tables summarize traffic demand/capacity ratios (expressed in terms of percentages) for weekday daily traffic and weekday time period (i.e., AM, midday, PM, night) for each of the three alternatives evaluated in detail in the SDEIS.

No-Action Alternative

Under the No-Action Alternative, the daily cross-river demand in 2030 is projected to exceed capacity on the Kennedy Bridge (i.e., demand will be at 123% of capacity) and the Sherman Minton (i.e., demand at 104% of capacity), see Table 3.3-2. Total weekday traffic volumes overall on the Ohio River bridges are projected to increase by 65,800 vehicles by 2030 with the No-Action Alternative. Absent additional cross-river capacity, total daily cross-river traffic volumes would exceed total capacity (i.e. demand at 111% of capacity) under the No-Action Alternative in 2030.

As indicated in Table 3.3-3 for AM peak period, the southbound volumes are projected to be above capacity for both the Kennedy Bridge and the Sherman Minton Bridge before 2030 (i.e., 139% and 119% of capacity, respectively). For the 2030 PM peak period, demand for the

Kennedy Bridge is projected to be at 120% of capacity in the northbound direction and 113% of capacity in the southbound direction, while the demand on the Sherman Minton Bridge is projected to be at 126% of capacity in the northbound direction.

TABLE 3.3-2
DAILY OHIO RIVER VEHICLE CROSSINGS AND PERCENT CAPACITY

Year/ Alternative	Kennedy Bridge	Sherman Minton Bridge	Clark Memorial Bridge	East End Bridge	New Bridge Lanes	TOTAL River Crossings
2010	122,300 97%	82,000 76%	21,900 73%	---	---	226,200 86%
2030 No-Action	155,000 **123%**	112,000 **104%**	25,000 83%	---	---	292,000 **111%**
2030 FEIS Selected	136,000 63%	100,000 93%	28,000 93%	60,000 56%	+11	324,000 70%
2030 Modified Selected	104,000 48%	122,000 **113%**	35,000 **117%**	52,000 72%	+9	313,000 73%

Note: In each row, the top number is the projected average daily traffic; the bottom number is the demand-to-capacity ratio expressed as a percentage. Any percentage greater than 100 indicates the overall daily capacity will be exceeded. The "New Bridge Lanes" column indicates the number of new through lanes that would be provided across the Ohio River for each alternative.

FEIS Selected Alternative

For this alternative, daily volumes across the Ohio River are projected to increase by 32,000 vehicles in 2030. The combined total daily Ohio River demand as a percentage of capacity for the FEIS Selected Alternative would be reduced from 111% to approximately 70% in 2030. Daily demand would be met on all bridges. Projected bridge crossings by period for this alternative show improvements on both the Kennedy Bridge and Sherman Minton Bridge. Period demand for the Kennedy Bridge is projected to be at acceptable levels during all periods. Period demand for the Sherman Minton Bridge is projected to be above capacity (i.e., 105% of capacity) in the southbound direction during the AM peak period and above capacity (i.e., 113% of capacity) in the northbound direction during the PM peak period. However, both of these periods show improvement over the No-Action Alternative.

Modified Selected Alternative

For this alternative, daily volumes across the Ohio River are projected to increase by 21,000 vehicles in 2030. With the Modified Selected Alternative, the combined total daily Ohio River demand as a percentage of capacity for all bridges would be reduced from 111% (No-Action) to approximately 73% (see Table 3.3-2). Daily demand would not be met on the Sherman Minton Bridge (i.e. demand at 113% of capacity) and the Clark Memorial Bridge (i.e., demand at 117% of capacity). However, period demands show that only the Sherman Minton Bridge during the southbound AM peak-period and the northbound PM peak-period would be over capacity (119% and 125% of capacity, respectively) (Table 3.3-3). Both of these period demands are similar to or slightly improved over the No-Action Alternative cross-river demands.

TABLE 3.3-3
BRIDGE CROSSING DEMAND/CAPACITY BY TIME PERIOD

Year/ Alternative		Kennedy Bridge		Sherman Minton Bridge		Clark Memorial Bridge		East End Bridge		TOTAL River Crossings	
		NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
2010	AM	47%	89%	31%	90%	20%	73%	---	---	38%	87%
	Midday	57%	75%	43%	43%	34%	31%	---	---	49%	55%
	PM	84%	79%	93%	59%	84%	73%	---	---	88%	70%
	Night	25%	32%	21%	20%	15%	11%	---	---	22%	24%
2030 No-Action	AM	63%	**139%**	60%	**119%**	20%	76%	---	---	57%	**121%**
	Midday	65%	93%	64%	67%	30%	58%	---	---	60%	77%
	PM	**120%**	**113%**	**126%**	81%	93%	64%	---	---	**119%**	92%
	Night	29%	34%	25%	20%	20%	12%	---	---	27%	22%
2030 FEIS Selected	AM	32%	76%	54%	**105%**	22%	82%	70%	39%	45%	75%
	Midday	35%	39%	57%	61%	47%	56%	30%	30%	40%	43%
	PM	85%	46%	**113%**	72%	91%	60%	43%	75%	82%	59%
	Night	16%	13%	22%	18%	24%	16%	12%	12%	17%	14%
2030 Modified Selected	AM	18%	65%	66%	**119%**	71%	78%	88%	51%	46%	77%
	Midday	26%	30%	71%	76%	62%	62%	41%	40%	43%	46%
	PM	74%	33%	**125%**	86%	80%	76%	58%	94%	85%	60%
	Night	12%	08%	29%	24%	31%	32%	16%	16%	18%	15%

3.3.2.2 Bridge Levels of Service

As described in Section 2.2.3, level of service (LOS) values provide a measure of congestion on a particular roadway segment. Levels of service range from A to F, with LOS A indicating the least congestion and best traffic flow, and LOS F indicating the most congestion and worst flow. LOS C is considered acceptable for peak travel periods in urban areas. Drivers can operate at desirable speeds and can safely maneuver in the traffic stream. Provision of LOS C is used as the criterion for design of new facilities or rehabilitation of existing roadways. LOS D operation in urban areas is considered minimally acceptable for existing urban highways. Each of the interstates in the Louisville Metropolitan Planning Area (LMPA) is classified as Urban

Interstate. Indiana's highway design policy is that LOS D is the minimum 20-year design criterion for urban facilities[7].

No-Action Alternative

Projected levels of service under the No-Action Alternative are LOS F on the Kennedy and Sherman Minton bridges and LOS C on the Clark Memorial Bridge. See Table 3.3-4.[8]

TABLE 3.3-4
PROJECTED 2030 BRIDGE LEVELS OF SERVICE

Alternative	Kennedy Bridge	Sherman Minton Bridge	Clark Memorial Bridge	East End Bridge
No-Action	F	F	C	-
FEIS Selected	D	E	C	C
Modified Selected	D	E	C	D

FEIS Selected Alternative

Under the FEIS Selected Alternative, projected levels of service on the Ohio River crossings would generally improve relative to the No-Action Alternative. On the Clark Memorial Bridge, the level of service is projected to remain LOS C. Provision of an East End Bridge and additional lanes for the downtown crossing would improve the LOS on the I-65 crossing from LOS F to LOS D. The level of service on the Sherman Minton Bridge is projected to improve from LOS F to LOS E with this alternative. The new East End Bridge is projected to perform at LOS C under the FEIS Selected Alternative. See Table 3.3-4.

Modified Selected Alternative

Under the Modified Selected Alternative, projected levels of service on the Ohio River crossings would generally improve relative to the No-Action Alternative. On the Clark Memorial Bridge, the level of service is projected to remain LOS C. Provision of a modified East End Bridge and additional lanes on the I-65 crossing would improve the level of service on the crossing from LOS F to LOS D, similar to the FEIS Selected Alternative. The level of service on the Sherman Minton Bridge is also projected to improve from LOS F to LOS E with this alternative[9]. The new East End Bridge is projected to perform at LOS D under the Modified Selected Alternative. This

7 Source: The Indiana Design Manual, February 18, 2011. http://www.in.gov/dot/div/contracts/standards/dm/2011/index.html

8 Bridge level of service was calculated according to the Highway Capacity Manual using projected 2030 peak-hour volumes. The worst case is reported.

9 Even though the daily Sherman Minton Bridge volumes in the Modified Selected Alternative (tolled) show an increase over the No-Action Alternative, the peak-hour, peak-direction (worst case) volumes actually decrease slightly from those with the No-Action Alternative. Much of the additional daily traffic occurs in the Midday (12% increase) and Night (18% increase) periods.

reduction in the LOS compared to the FEIS Selected Alternative is due to the reduction in the number of lanes from six to four.

3.3.2.3 Kennedy Interchange Operations

No-Action Alternative

Three performance measures were identified relative to traffic operations in the Kennedy Interchange: peak-hour speed, peak-hour throughput[10], and average link density. Under the No-Action Alternative, average peak-hour speed and throughput in the Kennedy Interchange are 39 mph and 84% in the AM peak hour and 24 miles per hour (mph) and 76% in the PM peak hour. This lack of 100% throughput of projected peak-hour travel indicates that all projected demand would not have been accommodated during the peak hours. Unmet demand would either have to be served at other times, including extending the peak period of travel, or by diversion to non-freeway facilities or other modes of travel. Without improvements, the Kennedy Interchange will be severely congested during the peak travel periods.

Link densities for existing (2010) and future No-Action (2030) conditions are shown on Figure 3.3-1. On this figure, the Measure of Effectiveness (MOE) is defined as average link density (average vehicles/mile).

Figure 3.3-1 shows that much of the Kennedy Interchange will operate at an average link density of 32 vehicles per mile or greater in 2030 under the No-Action Alternative, particularly in the PM peak hour. Few segments will operate at average link densities of 24 vehicles per mile or less.

Table 3.3-5 lists average speed, vehicle hours of delay (VHD), and throughput projected for the Kennedy Interchange area under both the FEIS Selected and Modified Selected alternatives. Kennedy Interchange link densities for these alternatives are shown on Figure 3.3-2.

TABLE 3.3-5
KENNEDY INTERCHANGE AREA WEEKDAY OPERATIONS

Alternative	Average Speed		Vehicle Hours Delay		Throughput	
	AM	PM	AM	PM	AM	PM
No-Action	39	24	380	1056	84%	76%
FEIS Selected	42	51	342	110	99%	99%
Modified Selected	43	45	293	262	99%	97%

[10] Peak-hour throughput is a measure used by traffic engineers to indicate the productivity of the roadway system. It is based on a microsimulation traffic model, and determines of the number of vehicles (or people) able to enter or exit the system during the analysis period. Overall, it is represented as the percentage of demand that goes through the system. It is calculated by recording the number of vehicles backed up (if any) behind each traffic node (entry point) and comparing it to the number of vehicles coded to enter the model at that node. This is calculated for all entry points in the system to determine throughput.

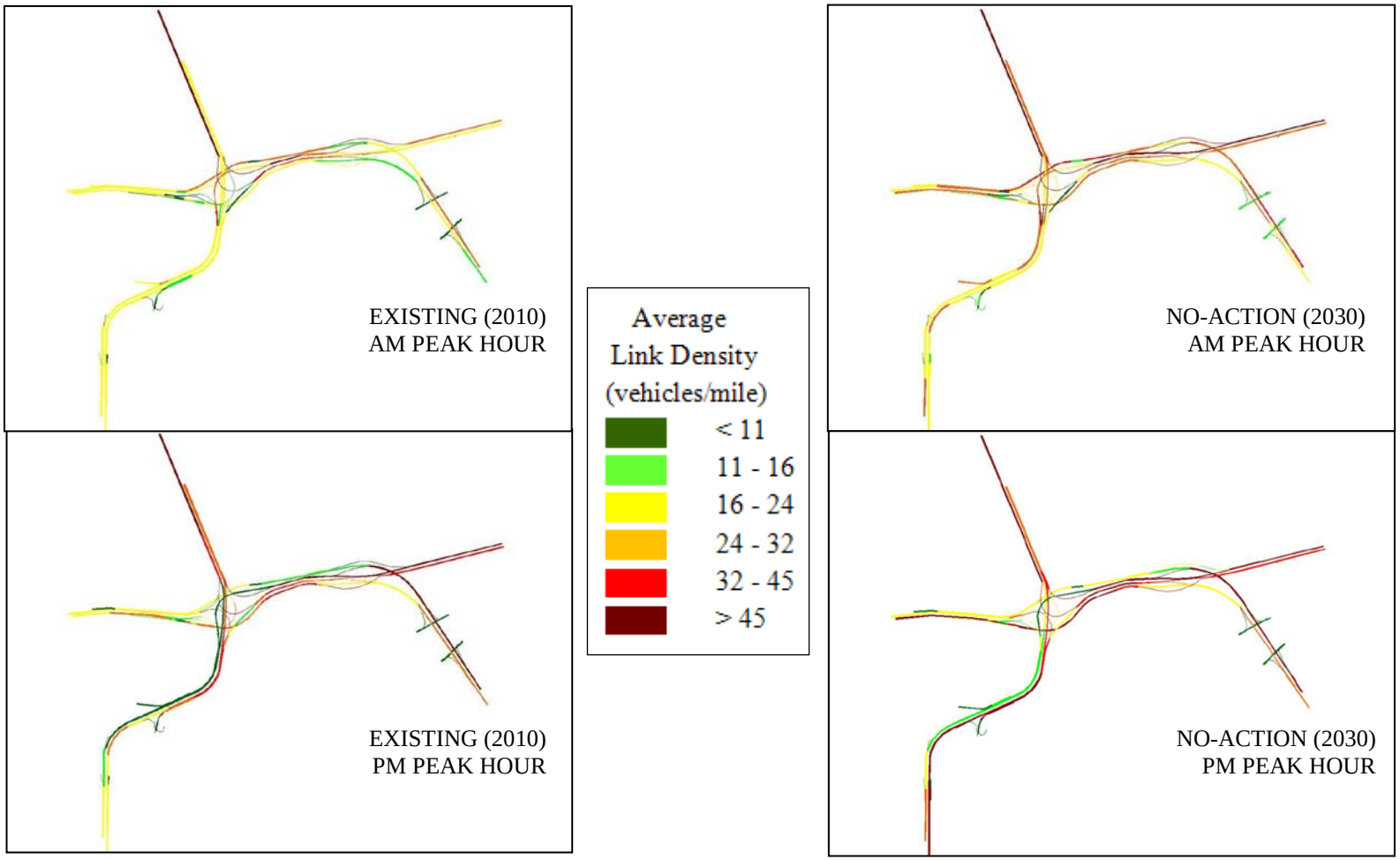


FIGURE 3.3-1
KENNEDY INTERCHANGE AVERAGE LINK DENSITY MAPS
EXISTING (2010) CONDITION AND NO-ACTION ALTERNATIVE

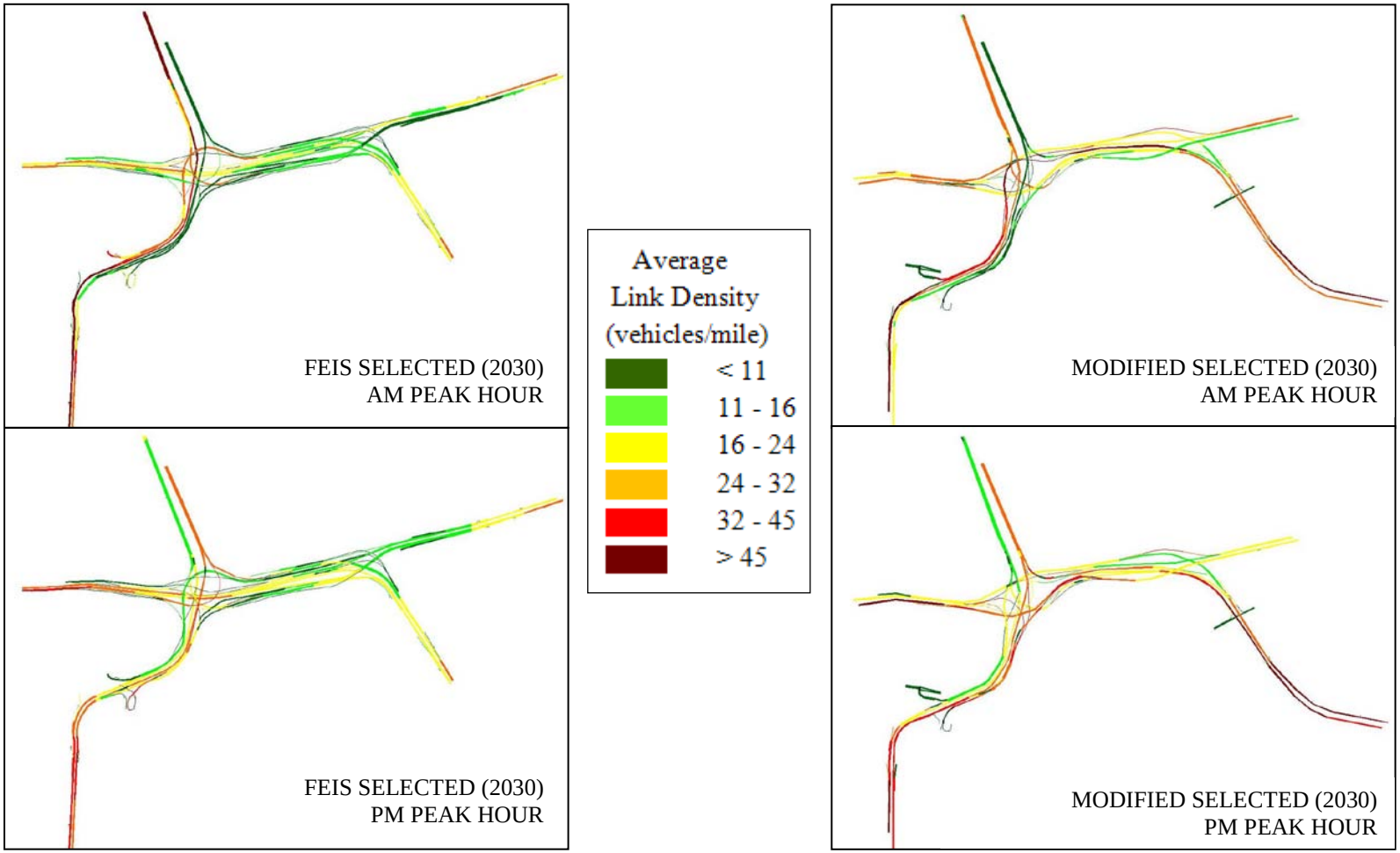


FIGURE 3.3-2
KENNEDY INTERCHANGE AVERAGE LINK DENSITY MAPS
FEIS SELECTED AND MODIFIED SELECTED ALTERNATIVES

FEIS Selected Alternative

Under the FEIS Selected Alternative, the average link density figures show that this alternative would result in improved operations in the Kennedy Interchange. Very few segments within the interchange are projected to operate at average link densities above 45 vehicles per mile. The data presented in Table 3.3-5 indicate that traffic operations would be substantially improved in the Kennedy Interchange if the FEIS Selected Alternative is implemented. Average speeds are projected to be 42 mph in the AM peak hour and 51 mph in the PM peak hour. This alternative shows a substantial improvement in PM peak-hour speeds and delay and both AM and PM throughput when compared to the No-Action Alternative.

Modified Selected Alternative

Under the Modified Selected Alternative, the average link density figures show that this alternative would result in improved operations in the Kennedy Interchange. Very few segments within the interchange are projected to operate at average link densities above 45 vehicles per hour. The data presented in Table 3.3-5 indicate that traffic operations would be substantially improved in the Kennedy Interchange if the Modified Selected Alternative is implemented. Average speeds are projected to be 43 mph in the AM peak hour and 45 mph in the PM peak hour. This alternative shows a substantial improvement in PM peak-hour speeds and delay and both AM and PM throughput when compared to the No-Action Alternative. The results for the Modified Selected Alternative are very similar to the results for the FEIS Selected Alternative.

3.3.3 Traffic Safety

The alternatives were evaluated for traffic safety based on their ability to meet current design standards. As described in Chapter 2, the Kennedy Interchange and the Kennedy Bridge have a history of high crash rates. The design geometry of the Kennedy Interchange and substantially reduced shoulder widths on the Kennedy Bridge contribute to these high crash rates. To address these problems, redesign of these facilities to current roadway design standards is required. The No-Action Alternative will not address this traffic safety problem. The FEIS Selected and Modified Selected alternatives both include reconstruction of the Kennedy Interchange, including the approaches to the bridges, to current roadway design standards. Improvements to the I-65 crossing—by adding a second bridge for northbound traffic, reconfiguring the existing bridge for southbound traffic, and increasing the overall number of bridge lanes from 7 to 12—will also occur if either alternative is constructed.

3.3.4 Inadequate Cross-River System Linkage

Both the FEIS Selected Alternative and the Modified Selected Alternative would close the existing five-mile gap in the eastern circumferential freeway (i.e., I-265). The proposed build alternatives would provide additional cross-river system linkage and freeway rerouting alternatives. In contrast, the No-Action Alternative would not provide enhanced linkage or traffic rerouting capabilities.

The two proposed bridges would provide service to the fast-growing eastern areas of the LMPA (i.e., eastern Jefferson County, Kentucky, and Clark County, Indiana, which are experiencing

rapid population and employment growth), and to downtown Louisville, which is projected to experience growth in employment.

Completion of the eastern portion of the circumferential highway transportation system would make travel between eastern Clark County and eastern Jefferson County/Oldham County more efficient. These areas are projected to grow substantially in both population and employment over the next 20 years. Table 3.3-6 summarizes travel projections between these two areas for the different alternatives. Under the No-Action Alternative, daily traffic crossing the Ohio River with origins and destinations in eastern Clark and eastern Jefferson County/Oldham County is projected to increase by about 10,000 trips, or a 32% increase, between 2010 and 2030. The VMT associated with those trips would increase by about 316,000 miles per day, or a 41% increase. Similarly, the VHT associated with those trips would increase by about 10,000 hours per day, or nearly 63%.

TABLE 3.3-6
DAILY VEHICLE TRAVEL SUMMARY BETWEEN EASTERN CLARK COUNTY AND EASTERN JEFFERSON COUNTY/OLDHAM COUNTY

Alternative	Daily Trips	VMT	VHT
2010	31,000	776,000	16,000
No-Action	41,000	1,092,000	26,000
FEIS Selected	61,000	1,404,000	29,000
Modified Selected	61,000	1,405,000	29,000

With the provision of a new eastern bridge, the number of trips with an east-east orientation is projected to increase by approximately 20,000 trips per day, or about a 49% increase over the No-Action levels. Thus, the construction of an East End Bridge would result in more cross-river trips with an east-east orientation. VMT would increase by almost 30% while VHT associated with such trips would only increase by 12% over the No-Action levels. Moreover, the average east-east trip length would decrease by about 15% from the No-Action scenario to the FEIS Selected Alternative and the Modified Selected Alternative. Similarly, the average east-east trip duration also would decrease by about 25%. This indicates transportation efficiencies attributable to the new bridges.

3.3.5 Consistency with Local Transportation Plans

The alternatives were evaluated to determine their consistency with local transportation plans. A Two Bridge/Highway Alternative with new bridges in the Far East and Downtown corridors is fully consistent with the Louisville MPO's *Horizon 2030* MTP. Construction of a new bridge in the East End Corridor completing the eastern portion of the cross-river transportation system would be consistent with locally approved transportation plans, but alone, it would not resolve the Kennedy Interchange and Kennedy Bridge congestion and safety problems downtown. The proposal for a new I-65 Bridge in the Downtown Corridor is also consistent with locally approved transportation plans, but would not complete the eastern portion of the circumferential highway transportation system. Reconstruction of the Kennedy Interchange is also called for in the locally approved transportation plans and would address safety problems, but alone would

not solve the region's cross-river mobility needs. The No-Action Alternative is not consistent with the MTP because it neither completes the eastern portion of the circumferential highway transportation system, nor provides the necessary improvements to the Kennedy Bridge and Kennedy Interchange downtown to help resolve congestion and safety issues.

3.3.6 Summary of Measures of Effectiveness

Table 3.3-7 summarizes the purpose and need measures of effectiveness for each alternative discussed in this section. There is very little difference in measures of effectiveness between the FEIS Selected Alternative and the Modified Selected Alternative. Although it provides fewer capacity improvements than the FEIS Selected Alternative, the Modified Selected Alternative meets the purpose and need of the project because it:

- Improves mobility in the region (decreases VHD).
- Reduces traffic congestion on the Kennedy Bridge and within the Kennedy Interchange.
- Improves traffic safety within the Kennedy Interchange.
- Provides adequate cross-river transportation system linkage.
- Is consistent with locally adopted transportation plans.

TABLE 3.3-7
MEASURES OF EFFECTIVENESS SUMMARY

Alternative	System Efficiency* (Percent Change VHD)	Traffic Congestion								Traffic Safety	System Linkage	Local Plan Compatibility
		Total Cross-River Demand as % of Capacity	Bridge Levels of Service				Kennedy Interchange Peak-Hour Operations					
			Sherman Minton	Clark Memorial	Kennedy Memorial	East End	Improves Average Speed	Improves Throughput	Improves Average Link Density			
No-Action	NA	111	F	C	F	-	NA	NA	NA	No	No	No
FEIS Selected	-12.9	70	E	C	D	C	Yes	Yes	Yes	Yes	Yes	Yes
Modified Selected	-12.1	73	E	C	D	D**	Yes	Yes	Yes	Yes	Yes	Yes

* *These numbers are a measure of the efficiency of the LMPA network. Negative numbers represent an increase in the LMPA efficiency.*

** *The East End Bridge would have four lanes in the Modified Selected Alternative while it would have six lanes in the FEIS Selected Alternative.*

Note: Percent change is relative to the No-Action Alternative. Population and Employment Growth and Traffic Congestion Measures are for a Year 2030 weekday.

3.3.7 Environmental Impact Summary

Table 3.3-8 summarizes the impacts associated with the FEIS Selected Alternative and the Modified Selected Alternative. As the table indicates, both alternatives would result in the same number of impacts to prime farmland, Section 4(f) properties, cultural resources, and agricultural properties. In addition, both alternatives would have no impacts to air quality and community resources. The Modified Selected Alternative would result in fewer impacts with regard to noise (including historic properties), terrestrial/wildlife habitat, wetlands, streams, floodplains, and residential and commercial displacements. The most notable differences are that the Modified Selected Alternative would result in 10 and 56 fewer residential and commercial displacements, respectively, and would impact about 98 fewer acres of floodplains and 43 fewer acres of terrestrial/wildlife habitat compared to the FEIS Selected Alternative.

TABLE 3.3-8
SUMMARY OF IMPACTS

Quantitative Impacts To	FEIS Selected Alternative	Modified Selected Alternative
Agricultural Resources Acres of prime farmland converted	57	57
Section 4(f) Properties used	8	8
Cultural Resources Number of historic districts impacted Number of historic sites impacted Number of archaeological sites impacted	 11 16 11	 11 16 11
Air Quality Impacts	None	None
Noise Number of impacted receptor sites Number of impacted Historic Properties	 244 18	 240 13
Natural Resources Acres of terrestrial wildlife/habitat impacted	237.3	194.4
Wetlands Acres of wetlands impacted	13.18	9.58
Water Resources Number of stream impacts (including Ohio River)	21	20
Floodplains Number of floodplains crossed Total acres of encroachment	 6 178.35	 5 80.03

Number of Residential Displacements	80	70
Number of Commercial / Not-for-Profit Facility Displacements	80	24
Number of Agricultural Properties Impacted	18	18
Number of Community Resources Displaced	0	0

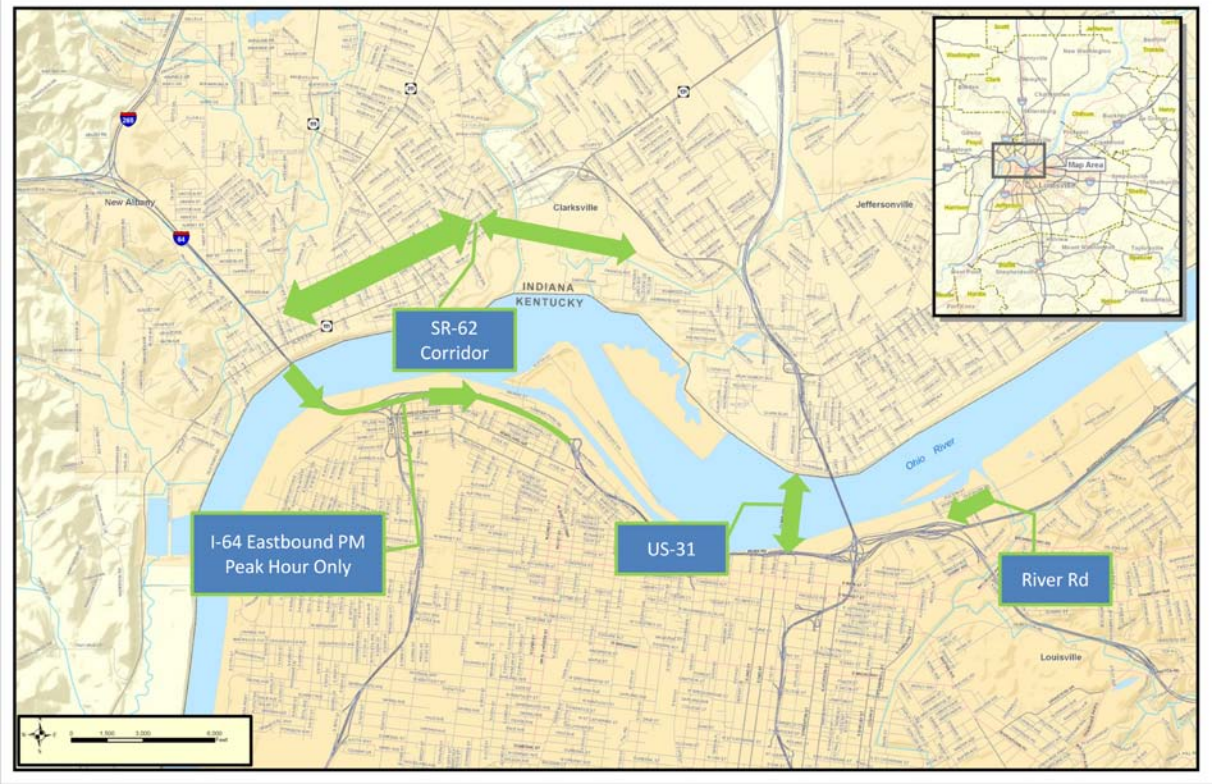
3.3.8 Changes in Travel Patterns

A comparison of the FEIS Selected Alternative and the Modified Selected Alternative was conducted to determine changes in travel patterns due to the modifications described in the SDEIS Section 3.2.3. Figure 3.3-3 illustrates general areas where traffic could potentially increase with the Modified Selected Alternative when compared to the FEIS Selected Alternative. In general, more traffic is projected on the Clark Memorial Bridge (i.e., U.S. 31), Sherman Minton Bridge (i.e., I-64), the S.R. 62 corridor, and River Road. The traffic data and outputs from a travel demand model were used to estimate potential changes in traffic conditions and resulted in the identification of the areas illustrated on the map. These potential differences are because of design modifications (e.g., the removal of the Frankfort Avenue/I-71 Interchange) and/or the proposed tolling associated with the Modified Selected Alternative. These differences in travel patterns have been taken into account in SDEIS Chapter 5, *Environmental Consequences*.

Changes in travel patterns can result in positive and negative impacts. These changes can, among other benefits, help to reduce peak-period congestion on some facilities. However, changes in travel patterns also may increase traffic volumes on arterial streets that are not suited to that increase. Alternative routes also can be longer than the tolled route, resulting in increased travel time.

The methodology presented in this document provides a means to identify areas that could experience changes in travel patterns as a result of (1) applying tolls to the Downtown (I-65) and East End bridges and (2) the proposed design changes associated with the Modified Selected Alternative. This analysis compares the changes in travel patterns in the year 2030 from the FEIS Selected Alternative to the Modified Selected Alternative.

FIGURE 3.3-3
CHANGES IN TRAVEL PATTERNS



To consider the changes in travel patterns from the implementation of the Modified Selected Alternative, the project team developed a methodology for identifying areas where increases or decreases in traffic may occur. This methodology is based on traffic data and output from the travel demand model, and can be used to estimate potential changes in traffic conditions in subareas within the LSIORB Project area. The methodology is intended to identify increases or decreases in traffic that are relevant to the assessment of effects, while screening out increases or decreases that are too small for the model to predict accurately.

Section 7 of the *Travel Forecast* report provides detailed information regarding the methodology used to identify and evaluate changes in travel patterns, and the results of the evaluation process (see Appendix H.1).

3.3.9 Costs/Schedule

The project's costs and financial feasibility are discussed in the *Alternatives Evaluation Document* (see Appendix A.3), as well as in Section 3.1.1.3 of this SDEIS. In addition, in July 2010 the Bridges Authority, KYTC, and INDOT submitted to KIPDA a document titled *Financial Demonstration for the Ohio River Bridges Project in Support of the Louisville (KY-IN) Metropolitan Transportation Plan* (see Appendix G.1) that presented potential funding sources and financing options, including a tolling scenario and other revenue generating alternatives. The document, which showed there to be reasonable expectations that project funding requirements

could be met, was incorporated into the Louisville MPO's updated *Horizon 2030* MTP (adopted by the MPO in October 2010). In September 2011, that document was again updated (see Appendix G.2) and will be used by the Bridges Authority to develop an Updated Financial Plan, which will be completed in advance of the project's ROD. This document also includes the schedule for funding the project. Based on this schedule, it is estimated that construction of the project would begin in 2012 and be completed by 2022.

The current year-of-expenditure estimated total costs for the two build alternatives are $2.9 billion for the Modified Selected Alternative and $4.1 billion for the FEIS Selected Alternative. A breakdown of the cost comparison between these two alternatives by design section is presented in Table 3.3-9.

TABLE 3.3-9
COST COMPARISON OF BUILD ALTERNATIVE BY DESIGN SECTION

Project Segment	FEIS Selected Alternative	Modified Selected Alternative	Savings
Section 1—Kennedy Interchange	$1,530	$728.2	$801.8
Section 2—Downtown Bridge	$569.7	$532.6	$37.1
Section 3—IN Downtown Approach	$392.7	$177.8	$214.9
Section 4—KY East End Approach	$885.2	$794.8	$94
Section 5—East End Bridge	$406.2	$326.2	$80
Section 6—IN East End Approach	$234.8	$231.7	$3.1
Other Costs[2]	$124.2	$125.0	-$8
TOTAL[1]	**$4,142.8**	**$2,916.2**	**$1,226.6**

(Year-of-Expenditure (2022) Costs in $, million).
(1) Totals may not sum due to rounding.
(2) Includes costs that are not section specific, including Project Oversight, Environmental Mitigation of Hazardous Materials, Wetland Remediation and Historic Preservation.

3.3.10 Preferred Alternative

The Preferred Alternative for the LSIORB Project is the Modified Selected Alternative. As documented in this SDEIS, this alternative was selected as the Preferred Alternative because it would: (1) meet the project's purpose and need, (2) be financially feasible, and (3) result in less environmental impacts than the FEIS Selected Alternative. It was determined that the FEIS Selected Alternative would not be financially feasible and the No-Action Alternative would not meet the project's purpose and need.

CHAPTER 4: AFFECTED ENVIRONMENT

The following introduction is from the 2003 FEIS, with the exception of the last paragraph, which describes the study area. Following this introduction is a methodology section, which is an addition since the 2003 FEIS, describing the general approach to documenting updated information for this SDEIS. Updated information for this SDEIS describing changes to the project and/or the affected environment within the SDEIS study area, from 2003 to 2010, is addressed in the individual subchapters listed below:

4.1 Social/Economic
4.2 Agricultural
4.3 Historic and Archaeological Resources
4.4 Air Quality
4.5 Noise
4.6 Vibration
4.7 Natural Resources
4.8 Water Resources
4.9 Floodplains
4.10 Wetlands
4.11 Visual and Aesthetic Resources
4.12 Hazardous Materials

Introduction

The Louisville Metropolitan Planning Area (LMPA) is comprised of five counties: Bullitt, Jefferson, and Oldham in Kentucky, and Clark and Floyd in Indiana. It is bisected by the Ohio River, which serves as a major navigational, recreational, and aesthetic feature. The LMPA is a strong economic and employment center that includes business services, retail, banking, shopping centers, residential neighborhoods, industrial land uses, and manufacturing and commercial goods distribution.

The LMPA is situated in two distinct physiographic regions divided by the Ohio River—the Outer-Bluegrass region on the Kentucky side and the Bluegrass Natural region on the Indiana side. The terrain in the project area ranges from the nearly level river valley immediately surrounding the Ohio River, to the Knobs of western Jefferson and Floyd counties. The East End of the project area is characterized by gently rolling terrain typical of the Outer-Bluegrass region. Conversely, the downtown areas of Louisville, Jeffersonville, and New Albany are nearly level and are dominated by a “built” landscape consisting of large buildings and the existing bridges.

Along the banks of the Ohio River, steep cliff lines and rocky escarpments create a distinct topographical transition from the flat lands of Kentucky into frequently inundated floodplains. These floodplains hold large amounts of sand and gravel, resulting in a high water-storage capacity. They are linked to the geological characteristics of the Jefferson County/Southern Indiana area. The floodplains extend along the river throughout the Louisville/Jefferson County and Southern Indiana corridor.

Water features in the project area include the river, streams, lakes, underground aquifers, floodplains and wetlands. Streams include Harrods Creek, Goose Creek, Little Goose Creek, Muddy Fork, Beargrass Creek, and Wolf Pen Branch in Kentucky, and Lentzier and Lancassange creeks in Indiana. Sources of water vary widely throughout the project area. The Ohio River provides over 211 million gallons of water per day to the city of Louisville and the Jefferson

County region. Deep wells in the gravelly outwash areas along the river also furnish an abundant water supply.

The discussion in this chapter focuses on the affected environment; that is, the existing setting and conditions of the area that may be affected by this project. This chapter is organized by the following categories: Social/Economic, Agricultural, Cultural, Air Quality, Noise, Vibration, Natural Environment, Water Resources, Floodplains, Wetlands, Visual and Aesthetic and Hazardous Substances.

For the 2003 FEIS, the study area was divided into two areas: the Downtown Corridor and the East End Corridor. The East End Corridor was a combination of the Near East and Far East corridors. For this SDEIS, the study area is divided into the same two general areas. See Figure 4.0-1 in the FEIS for a depiction of the 2003 FEIS study area.

Methodology

This SDEIS, including the information presented throughout Chapter 4, responds to the National Environmental Policy Act (NEPA) regulations issued by the Council on Environmental Quality (CEQ) regarding documenting "substantial changes in the proposed action that are relevant to environmental concerns" [40 CFR 1502.9(c)(1)(i)]. This chapter and subchapters provide an update to information and data within the corresponding chapter and subsection of the 2003 FEIS, where appropriate. Updated information was gathered and evaluated through additional coordination with Federal, state, and local resource agencies, Greater Louisville Inc.–The Metro Chamber of Commerce, and the Kentuckiana Regional Planning and Development Agency (KIPDA). KIPDA provides the staff support for the Louisville Metropolitan Planning Organization (MPO) for the 9-county region in Southern Indiana and North-central Kentucky. The 5-county area that comprises the LMPA is included within the Louisville MPO boundary. If no update is warranted, no information is provided herein, and such is noted. The updated information addresses changes to the project and/or the affected environment within the SDEIS study area since the approval of the 2003 FEIS/ROD.

4.1 Social/Economic

Section 4.1 of the 2003 FEIS provided: a general introduction to the social and economic conditions and trends within the LMPA (Section 4.1.1); a discussion of the existing social and economic setting of the LMPA in terms of population, ethnic composition, per capita income, land use and land use planning, employment and business development, economic role of the Ohio River, and utilities and services (Section 4.1.2); a discussion of social and economic features within the LMPA such as neighborhoods, community facilities, elderly and minority groups, parks and recreational areas, and housing (Section 4.1.3); and a discussion of pedestrian and bicycle facilities (Section 4.1.4). For more detailed information, see pages 4-1 through 4-35 of the FEIS.

Section 4.1 of the SDEIS revises and/or adds information and data to that presented in the 2003 FEIS, where necessary, in response to changes to the LSIORB Project and/or project area conditions since the approval of the FEIS, as follows:

- Section 4.1.1—Explains why data used in the SDEIS are based on the 2000 Census rather than on the 2010 Census. Also, updates the census data regarding commuter travel in the LMPA.

- Section 4.1.2—

  Land Use and Land Use Planning: Provides information from the current Louisville MPO *Horizon 2030 Metropolitan Transportation Plan* (MTP) (adopted 2010) for the Louisville (KY-IN) Metropolitan Planning Area (LMPA); and describes the Investment Area tool developed through the Kentuckiana Regional Planning and Development Agency (KIPDA) to reflect 2030 land use patterns, identify projected transportation demands, and project the types of transportation investments most compatible with land use patterns. Also, adds a new figure and updates data that were presented in tables and figures in the FEIS, as follows:

  - Adds, as Figure 4.1-1, *Community Form Areas for Louisville Metropolitan Area*, the May 2002 Community Form Areas map from the Louisville and Jefferson County's current *Cornerstone 2020 Comprehensive Plan.* The figure takes the place of the year 2000 version in the FEIS (Figure 4.1-3, *Community Form Areas within Project Area*).

  - Adds new Table 4.1-1, *Investment Areas in Louisville Metropolitan Area*. (FEIS Table 4.1-1, *Total Population Trend for the Project Area*, remains relevant and is not repeated herein.)

  Employment and Business Development: Updates employment and payroll data from 2000 to 2008 in the LMPA, and discusses the effect of the economic downturn that began in 2008; updates the list of Fortune 500 Companies in the LMPA; reflects changes to the Port of Indiana-Jeffersonville (formerly the Clark Maritime Center), the Louisville Central Business District (CBD), and Ohio River commerce in the LMPA; and adds information about the River Ridge Commerce Center (formerly the Indiana Army Ammunition Plant). Also, adds new tables and figures and/or updates data that was presented in tables and figures in the FEIS, as follows:

  - Adds tables 4.1-2, *Fortune 500 Companies with Operations in the Louisville Metropolitan Planning Area,* and 4.1-3, *Average Annual Unemployment Rates (%),* which update information in FEIS tables 4.1-5 and 4.1-4, respectively.
  - Adds new figures 4.1-2, *Investment Area Assignments for Louisville Metropolitan Planning Area*, and 4.1-3, *River Ridge Commerce Center*.

- Section 4.1.3—Updates the range of home values for Indiana and Kentucky neighborhoods; and updates information about facilities for the elderly and minorities,

parks and recreational areas, and housing characteristics within the LMPA. With regard to figures and tables, this section of the SDEIS:

- Adds tables 4.1-4, *Indiana Neighborhood Home Values,* 4.1-5, *Kentucky Neighborhood Home Values,* and 4.1-6, *2000 Housing Characteristics,* which update data presented in the FEIS in tables 4.1-6, *Indiana Neighborhood Composition,* 4.1-7, *Kentucky Neighborhood Composition,* and 4.1-8, *1990 Housing Characteristics.*

- Section 4.1.4—Adds information about the Big Four Railroad Bridge and pedestrian/bicycle access project, and updates information on bicycle and pedestrian facilities and plans in the LMPA. With regard to figures and tables, this section of the SDEIS:

  - Adds tables 4.1-7, *Clark County, Indiana Recommended Pedestrian and Bicycle Projects,* and 4.1-8, *Jefferson County, Kentucky Recommended Pedestrian and Bicycle Projects,* which update data presented in the FEIS in tables 4.1-9 and 4.1-10.
  - Adds figures 4.1-4, *Bicycle & Pedestrian Priority Corridors,* 4.1-5, *Bicycle & Pedestrian Projects Downtown Louisville,* and 4.1-6, *Bicycle & Pedestrian Projects East End,* which take the place of FEIS figures 4.1-5 through 4.1-10 (*Kentuckiana Regional Planning and Development Agency Regional Bicycle Network, Clark County Bicycle Network, Clarksville and Jeffersonville Bicycle Network, Jefferson County Bicycle Network, West and Downtown Louisville Bicycle Network,* and *Northeast Jefferson County Bicycle Network,* respectively).

4.1.1 Introduction

Section 4.1.1 of the 2003 FEIS provided a general description of the social and economic conditions and trends within the LMPA. Although 2000 Census population data were used in the FEIS, not all 2000 Census socioeconomic data were available at that time; therefore, much of the socioeconomic data presented therein was based on the 1990 Census data. Since 2010 Census data are not yet available across-the-board for all socioeconomic elements, 2000 Census data are used in this SDEIS for presenting socioeconomic conditions, except in specific cases as presented throughout this section such as information from the Greater Louisville Inc., and other non-Census source.

According to the 2000 Census, population in the city of Louisville declined 4.7%, from 269,063 to 256,231, during the previous 10 years, while the suburban population in Jefferson County increased 4.3% during the same period.[1] The population of the LMPA increased 7.8% during the same 10 years.

[1] In 2003, the City of Louisville and Jefferson County merged to form a metropolitan government, referred to as Louisville Metro. The city and county boundaries are coterminous, encompassing an area of 386 square miles and a 2010 population of more than 750,000 residents.

Data in the FEIS regarding commuting patterns were based on the 1990 Census, which, for this category, provided the most currently available data at the time the FEIS was published. Because the year 2000 Census provides the most currently available data for this category, this section of the SDEIS updates the number of work-related commuters for the LMPA based on 2000 Census data.

The LMPA, which consists of Jefferson, Oldham, and Bullitt counties in Kentucky and Clark and Floyd counties in southern Indiana, attracts a large number of workers commuting from surrounding counties in both states. For the SDEIS, the 2000 Census Transportation Planning Package (CTPP)[2] has been used. That CTPP data had not been released in time for use in the 2003 FEIS. The 2000 CTPP data indicated that within a 50-mile radius of the LMPA, more than 48,700 people commute from outside communities into the LMPA. Conversely, almost 12,300 workers commuted from the LMPA to outside communities. By comparison, the FEIS used 1990 CTPP data, which indicated that 33,800 people commute from outside communities into the LMPA and 13,600 people commute from the LMPA to outside communities. Thus, the 2000 CTPP data reflects an increase from 1990 to 2000 in the number of commuters from and to the LMPA.

4.1.2 Existing Social and Economic Setting

Section 4.1-2 of the 2003 FEIS provided a general description of the existing social and economic setting of the LMPA in terms of population, ethnic composition, per capita income, land use and land use planning, employment and business development, economic role of the Ohio River and utilities and services. The section remains largely unchanged from the FEIS, as it is still applicable for the SDEIS as well. As stated in Section 4.1.1, since 2010 Census data were not yet available for all socioeconomic elements at the time of SDEIS preparation, 2000 Census data are still the most current, across-the-board data that exist. As a result, socioeconomic characteristics such as population, ethnic composition, and per capita income have not changed from the information presented in the 2003 FEIS, so no discussion of these elements is included in this SDEIS.

Substantive revisions made in this section of the SDEIS to information and data presented in the FEIS include adding information about the Louisville MPO's land use and transportation planning tools; and updating employment and commerce information, including the list of Fortune 500 Companies in the LMPA. This section also adds Figure 4.1-1, *Community Form Areas for the Louisville Metropolitan Planning Area*, which updates FEIS Figure 4.1-3, *Community Form Areas within Project Area*; adds Table 4.1-1, *Investment Areas in Louisville Metropolitan Planning Area*; adds tables 4.1-2, *Fortune 500 Companies with Operations in the Louisville Metropolitan Planning Area,* and 4.1-3, *Average Annual Unemployment Rates (%),* which update information in FEIS tables 4.1-5 and 4.1-4, respectively; and adds new figures 4.1-

[2] CTPP 2000 is a census product that summarizes data by place of work and tabulates the flow of workers between home and work. A working group from FHWA, the Bureau of Transportation Statistics, the Federal Transit Administration, AASHTO, and the Census Bureau meets over a period of several years to develop the content of the CTPP, which is based on data from previous censuses and inputs from state and local transportation agencies.(Source: *www.trbcensuslcom*)

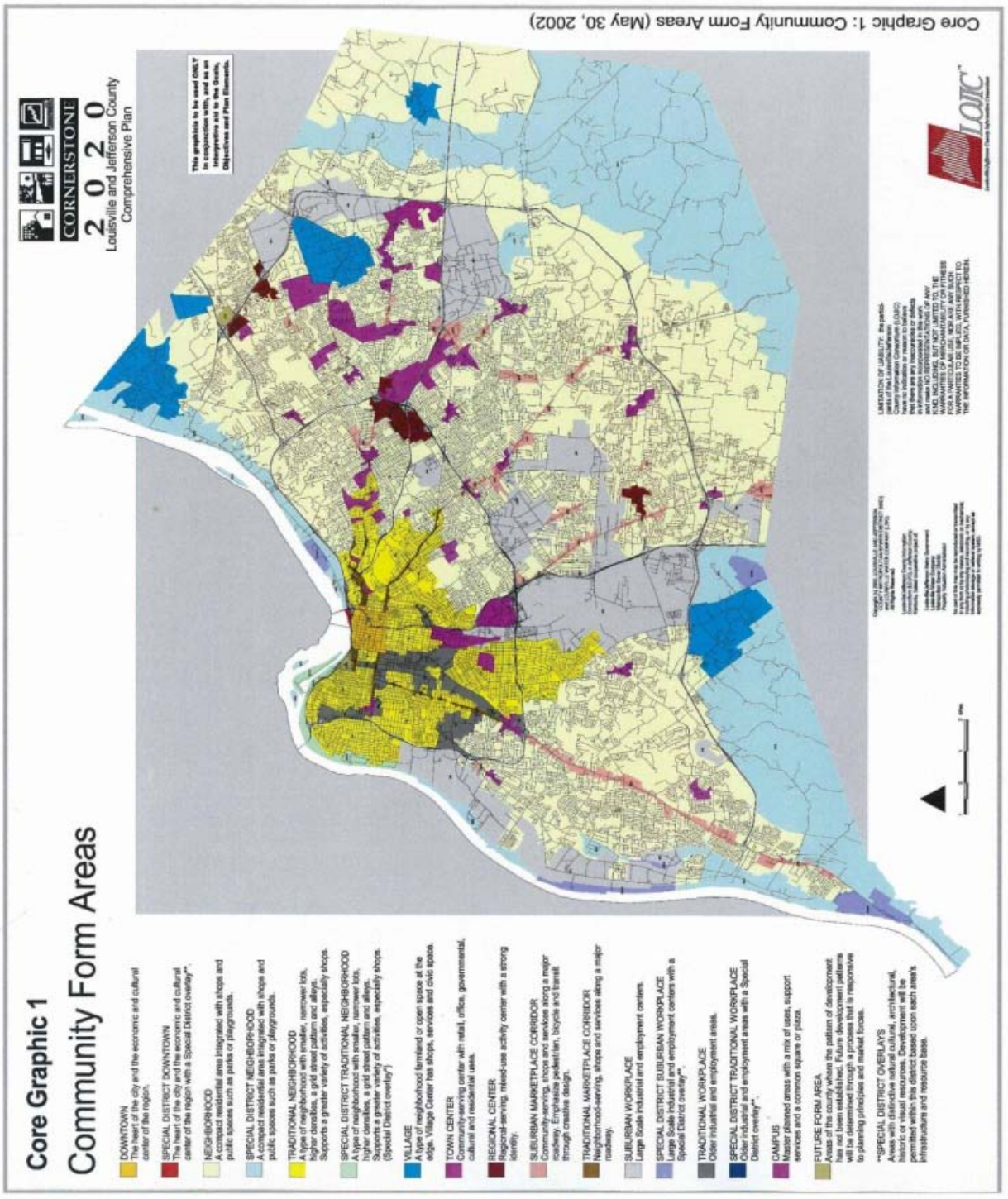
2, *Investment Area Assignments for Louisville Metropolitan Planning Area*, and 4.1-3, *River Ridge Commerce Center*.

Land Use and Land Use Planning

Louisville and Jefferson County's updated comprehensive plan, *Cornerstone 2020*, focuses on how to incorporate change while enhancing the quality of life within the community. It consists of the following elements: Community Form/Land Use, Marketplace, Mobility/Transportation, Livability/Environment, and Community Facilities. The updated Community Form Area map (May 2002) from *Cornerstone 2020* is included as Figure 4.1-1.

The Louisville MPO's *Horizon 2030* transportation plan (adopted 2010) included review of the land use plans developed by individual jurisdictions within the LMPA. The purpose of this review was to promote consistency between the land use plans and the metropolitan transportation plan. The purpose of comprehensive land use planning is to develop a strategy to guide future development. The land use plans inventory current community conditions and develop strategies for what is needed and wanted in the years to come. Growth, development, protection of resources, infrastructure allocation, affordable housing, industry, etc., are all considered in the local governments' land use planning process. Due to that consideration, the local land use plans provide information that is valuable to the metropolitan transportation planning process. Comprehensive land use plans for each jurisdiction in the Louisville (KY-IN) Metropolitan Planning Area (LMPA) inform the transportation planning process about expected growth in terms of population, household size, and employment; identify developable land; determine infrastructure needs; and provide guidance for community development.

FIGURE 4.1-1
COMMUNITY FORM AREAS FOR THE LOUISVILLE METROPOLITAN PLANNING AREA



Source: Louisville and Jefferson County Planning Commission's *Cornerstone 2020 Comprehensive Plan* (May 2002)

Land use and socioeconomic characteristics of transportation system users help to determine travel demand levels and travel patterns. KIPDA coordinated the review of the comprehensive land use plans, infrastructure, economic development, recreation, and preservation plans; and also met with each jurisdiction's land use planning agency to review its plan and its anticipated impact over time. The Investment Area tool, a product of these discussions, was developed to reflect 2030 land use patterns.

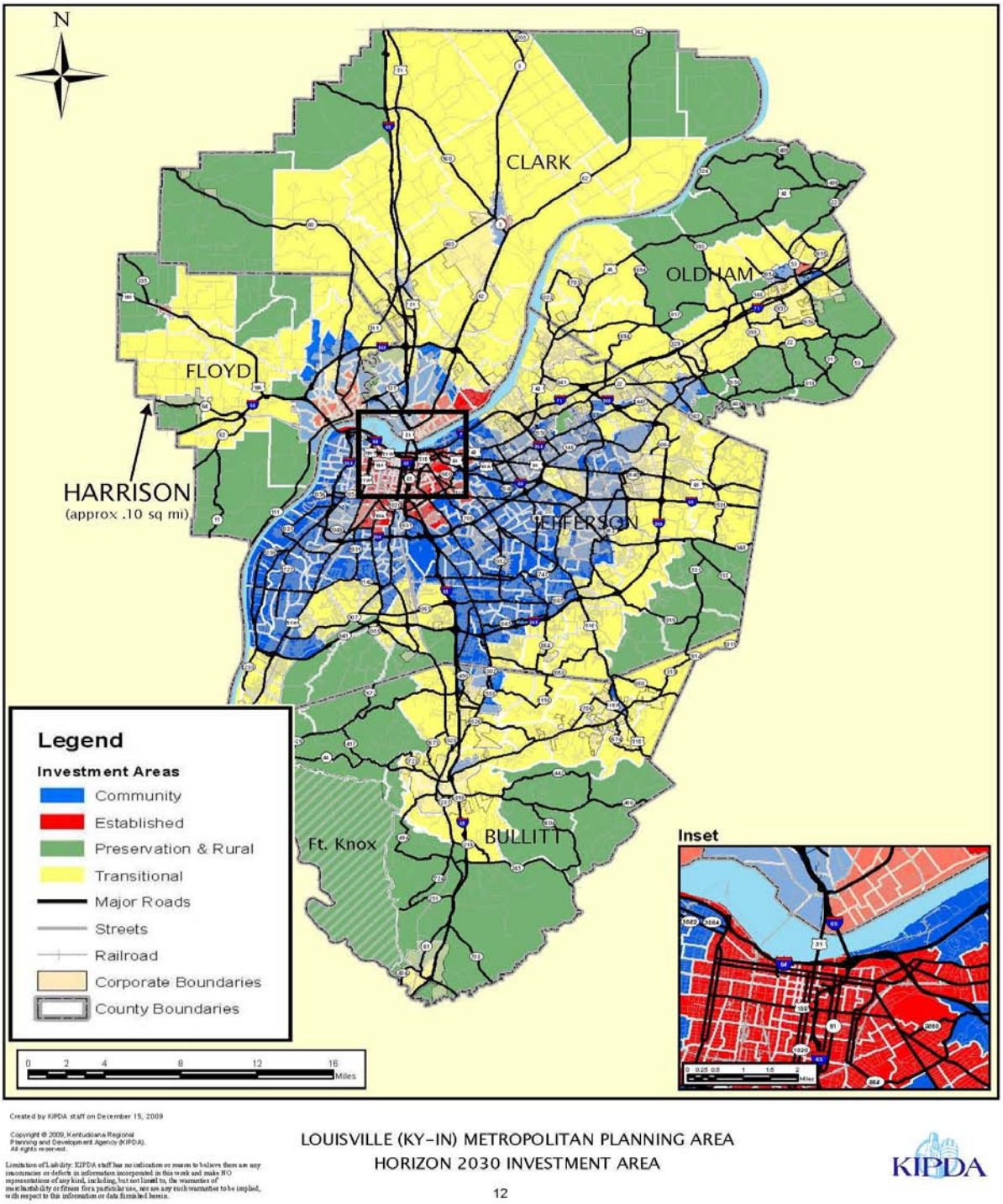
The development of Investment Areas was used to identify projected transportation demands of persons and goods in the LMPA and project the types of transportation investments most compatible with existing and future land use patterns. The Investment Area types, as well as examples of compatible projects for each type, are listed in Table 4.1-1, while Figure 4.1-2 represents the Investment Area assignments for the Louisville MPA.

TABLE 4.1-1
INVESTMENT AREAS IN LOUISVILLE METROPOLITAN PLANNING AREA

	Established	Community	Transitional	Preservation Rural
Transportation Objective	Provide transportation options within existing rights-of-way	To maintain, improve, and when necessary, expand the transportation system	Proactive integration of transportation facilities in areas identified as having future growth	Limit impacts of transportation improvements on the area, preserving the natural and/or sensitive, man-made environment, and ensure compatible transportation improvements in rural areas
Existing Land Use Pattern	Established land use; 100% developed	Established land use; 70-100% developed	Established or planned land use pattern; less than 50% developed	No established or planned land use other than agricultural and/or identified as environmentally sensitive.
Future Land Use Pattern	No change	Little to some planned growth	Planned growth	Little or no change
Existing Density & Intensity	High concentrations of residential and/or employment	Medium concentrations of residential and/or employment	Low concentrations of residential and/or employment	No or low concentrations of residential and/or employment
Future Density & Intensity	Little change	Little change	Medium to high planned concentrations of residential and employment	Little or no change
Existing Units/Acre	13 or more dwelling units per acre	6 to 12 dwelling units per acre	0 to 5 dwelling units per acre	0 to 5 dwelling units per acre
Examples in Region	Downtown Jeffersonville, Downtown New Albany, Downtown Louisville, Portland Neighborhood, Old Louisville	Fern Creek Neighborhood, North Haven Neighborhood, Newburg Neighborhood, New Albany Industrial Park, City of Hillview	Bluegrass Industrial Park, LaGrange Industrial Park, River Ridge Commerce Center, Minor Lane Heights area	Jefferson County Memorial Forest, Clark County State Park, Bernheim Forest, Southern Bullitt County
Compatible Project Types	Roadway improvements within existing ROW; expanded transit; bicycle and pedestrian facilities; TSM/TDM strategies	Limited expansion of roadways that would include bicycle and pedestrian facilities; expanded transit; bicycle and pedestrian facilities; TDM/TSM strategies	Roadway expansion that would include bicycle and pedestrian facilities; new and expanded transit	Roadway maintenance; safety projects; low impact TDM/TSM improvements

Source: *Louisville MPO, Horizon 2030 Metropolitan Transportation Plan (adopted 2010).*

FIGURE 4.1-2
INVESTMENT AREA ASSIGNMENTS FOR LOUISVILLE METROPOLITAN PLANNING AREA



Source: Louisville MPO, *Horizon 2030 Metropolitan Transportation Plan* (adopted 2010)

Employment and Business Development

Among Louisville's major businesses are United Parcel Service, General Electric, Ford Motor Company, KFC Yum! Brands Incorporated, Brown-Forman Corporation, Churchill Downs, Kindred Healthcare, and Hillerich and Bradsby (manufacturer of Louisville Slugger). Table 4.1-2 lists the current Fortune 500 Companies within the LMPA.

TABLE 4.1-2
FORTUNE 500 COMPANIES WITH OPERATIONS IN THE LOUISVILLE METROPOLITAN PLANNING AREA

Company	Description
Ford Motor Company	Automotive manufacturers
General Electric	Home appliances and lighting products
Humana Incorporated	Health insurance and supplemental benefits plans
Kroger Company	Retail grocers and regional distribution center
UPS	Worldport International air hub and global commerce services
Yum! Brands, Incorporated	Quick-service restaurants
Raytheon	Manufactures /overhauls naval missile launching systems
PNC	Commercial banking
BB&T	Commercial banking
Fifth Third	Commercial banking
Tyson Foods	Chicken products
General Mills	Refrigerated dough
Amgen	Pharmaceutical distribution center
Duke Energy	Electricity and natural gas
Gannett	Newspaper publishing
Lear Group	Manufactures automotive seating components

***Source**: Greater Louisville Inc.–Louisville Metro Chamber of Commerce, 2011.*

Greater Louisville Inc.–The Metro Chamber of Commerce indicated that between the years 2000 and 2010, the greater Louisville region gained more than 60,000 jobs, with $5 billion in payroll growth and $4.5 billion in business investment. In this regard, employment within the LMPA remained relatively healthy from 2000 to 2008. However, with the economic downturn experienced by the U.S. economy in the latter part of the last decade, unemployment also began to increase at the end of the decade. From 2008 to 2010 the average unemployment rate for the two Indiana counties within the LMPA increased by 4.0 percentage points. For the same period, the average unemployment rate for the three Kentucky counties within the LMPA increased by 3.4 percentage points. For the most part, unemployment rates for each county within the LMPA were below the state averages for Indiana and Kentucky, Table 4.1-3 lists the unemployment rates in the LMPA from 2000 to 2009.

TABLE 4.1-3
AVERAGE ANNUAL UNEMPLOYMENT RATES (%)

	Kentucky	Indiana	Bullitt County	Clark County	Floyd County	Jefferson County	Oldham County
2000	4.2	2.9	3.3	3.4	3.3	3.7	3.0
2001	5.2	4.2	4.2	4.3	4.0	4.7	3.5
2002	5.7	5.2	5.2	5.2	4.8	5.7	4.1
2003	6.3	5.3	5.7	4.9	4.7	6.2	4.5
2004	5.6	5.3	5.1	5.1	4.9	5.5	4.1
2005	6.0	5.4	5.8	5.1	5.1	6.1	4.9
2006	5.9	5.0	6.1	4.9	4.9	5.9	5.1
2007	5.6	4.6	5.8	4.4	4.2	5.5	4.9
2008	6.6	5.9	7.2	5.3	5.0	6.5	5.8
2009	10.7	10.4	11.1	8.8	8.7	10.5	8.6
2010	10.5	10.4	10.8	9.4	8.8	10.6	8.5

Source: *Kentucky Workforce Development Cabinet and Indiana Workforce Development.*

The overall economic growth that has occurred since 2000 is largely due to the continued development of the Port of Indiana–Jeffersonville, the River Ridge Commerce Center, and Louisville's Central Business District (CBD), all of which are discussed below. Development has continued in eastern Jefferson County as well.

Port of Indiana-Jeffersonville

The Port of Indiana-Jeffersonville (formerly Clark Maritime Center) is operated by Ports of Indiana, an Indiana state agency, formerly known as the Indiana Ports Commission. Ports of Indiana handles domestic and international barge shipments, including steel and agriculture products. The facility is located along the north bank of the Ohio River and is bounded by Lancassange Creek to the west, Middle Road to the north, and Utica-Sellersburg and Brown Forman roads to the east. The port facility has 1,057 acres of land zoned "heavy industrial," 3,200 feet of waterfront, and 25 tenant companies; and contains 320 acres of sites available for industrial development[3]. The port has rail service via CSX and Louisville & Indiana railroads, and ready access to interstates I-65, I-64, and I-71 via I-265. The port annually ships $500+ million in cargo via the Ohio River and was designated as a Foreign-Trade Zone in 2004.

The 2001 freight shipment data presented in the FEIS noted that shipments were distributed fairly evenly among barge, rail, and truck modes. Year 2009 data showed a substantial shift in freight shipment from barge and rail modes to truck. The 2009 freight shipment distributions for the Port of Indiana-Jeffersonville are presented below and compared with the 2001 data reported in the FEIS:

[3] Source: www.portsofindiana.com

	2001 (FEIS)	2009
Barge	1.5 million tons (36.6%)	1.4 million (27.6%)
Rail	1.2 million tons (29.3%)	1.0 million (21.2%)
Trucks	1.4 million tons (34.1%)	2.5 million (51.2%)

In 2009, the businesses and industries within the Port of Indiana-Jeffersonville contributed about $317.2 million in wages and taxes, compared with an estimated $108 million reported in the 2003 FEIS. Ancillary facilities around the port also added to the area's overall economy. As stated in the 2003 FEIS, year 2000 employment at the then-Clark Maritime Center was 2,150. In 2009 the number of direct employees was 1,885, while it was reported that the number of induced, indirect, or related employment was 7,225, for a total of 9,110 jobs.

Improvements to dock facilities include cranes at all docks to handle additional capacity. The port has also expanded the Shoreline Railroad to multiple tenants and is adding additional tracks in response to an increase in need since 2009.

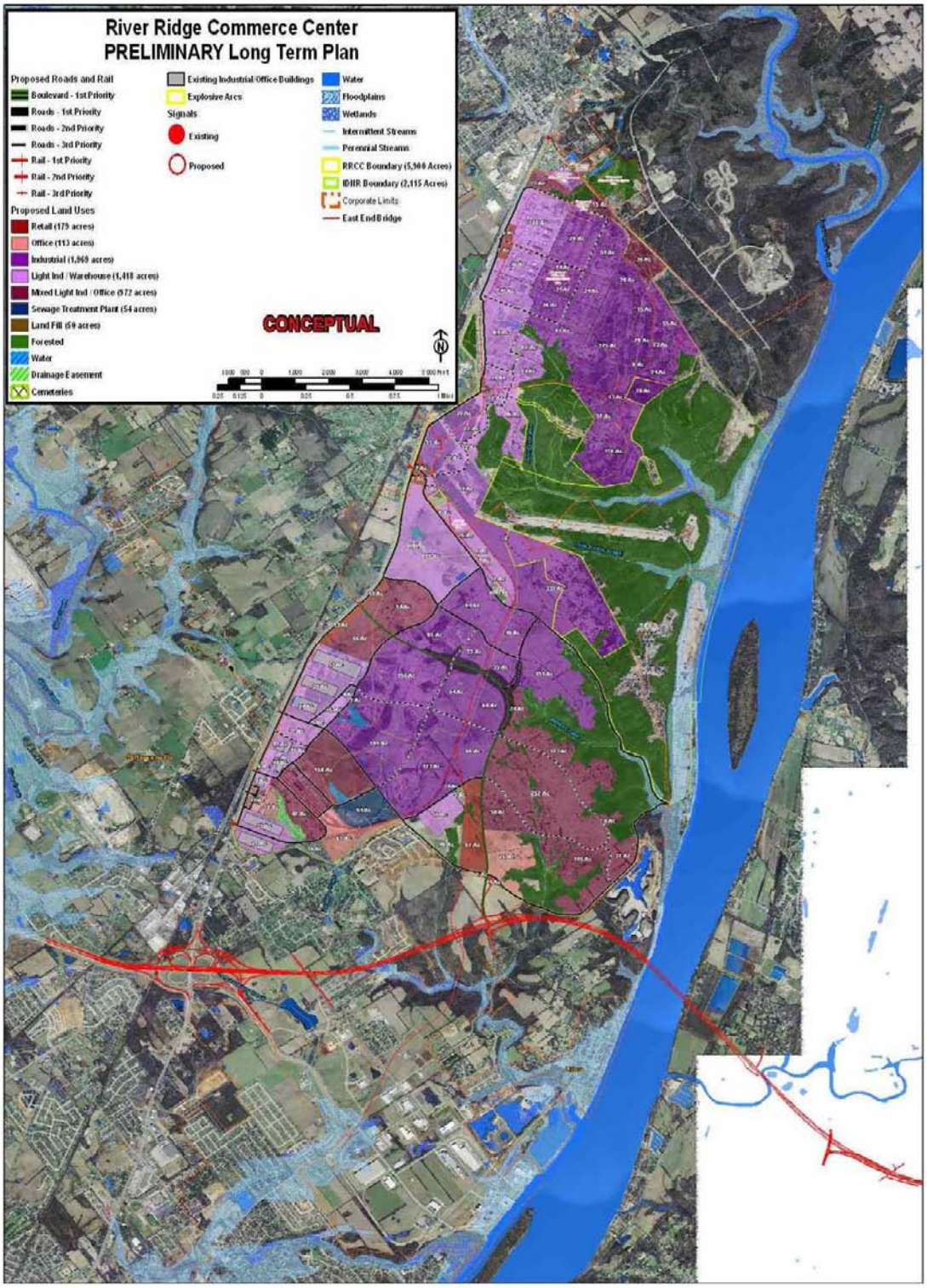
River Ridge Commerce Center

The River Ridge Commerce Center is located in Clark County, Indiana, along the north bank of the Ohio River, northeast of the Town of Utica. The site was formerly known as the Indiana Army Ammunition Plant (INAAP), which manufactured gunpowder. The U.S. Congress declared the property as surplus in 1998 and authorized the property to be conveyed to the River Ridge Development Authority for economic development, with some portions of the property to be used for expansion of the Charlestown State Park. The River Ridge Development Authority, which owns and manages the River Ridge Commerce Center, was created by the Clark County Indiana Commissioners in 1998 for the purpose of redeveloping the former INAAP.

River Ridge Commerce Center includes approximately 6,000 acres of land, of which 3,129 acres have been conveyed to the River Ridge Development Authority from the U.S. Army[4]. Of the 3,129 acres, the River Ridge Development Authority has sold approximately 328 acres for development. The River Ridge Development Authority is developing a business park for industrial and commercial uses, such as manufacturing facilities, warehouse and distribution facilities, offices, wholesale and retail trade facilities, and research facilities. Development within the facility is a combination of leasing existing building space and new construction. The River Ridge Commerce Center facility includes a U.S. Foreign Trade Zone and Indiana Urban Enterprise Zone that offers additional tax incentives for occupants. The River Ridge Commerce Center is near existing interstate highways, the Louisville International Airport, Clark County Regional Airport and the Port of Indiana-Jeffersonville. The East End Corridor portion of the LSIORB Project includes a proposed interchange on Salem Road that would provide direct access to the River Ridge Commerce Center and southeastern Clark County. The location of the commerce center is included on Figure 4.1-3.

[4] Source: www.riverridgecc.com

FIGURE 4.1-3
RIVER RIDGE COMMERCE CENTER



Source: *Community Transportation Solutions (CTS)*

Louisville Central Business District (CBD)

Major renovations have been completed within the CBD along Main and Market streets, resulting in new business opportunities. According to the Greater Louisville Inc.–The Metro Chamber of Commerce, from 2006 through 2011, nearly $1.8 billion has been invested in downtown Louisville[5]. Major developments during that time included the 21C Museum Hotel, which opened on Main Street in 2009; and the $238 million, 22,000-seat KFC Yum! Center on Main Street, which was completed in 2010 and which serves as home court for the University of Louisville Cardinals. In addition, construction began in 2011 on the University of Louisville's $30 million life sciences research park.

Louisville–Jefferson County

Major business expansions have also occurred outside of the CBD. For instance, Worldport is the worldwide air hub for United Parcel Service (UPS) at the Louisville International Airport. UPS, one of the largest employers in Kentucky, has maintained a hub at Louisville since 1980. In 2002, UPS completed the first of three $1 billion-plus expansions of its Worldport facilities, the others following in 2006 and 2010. The facility now has approximately 5.2 million square feet of space and over 20,000 employees, and is capable of handling 416,000 packages an hour.

The Ohio River

The Ohio River serves as one of the primary routes for goods and materials shipped to and through the area. Almost three quarters of a billion tons of cargo are shipped annually on the Ohio River, providing access to both foreign and domestic markets.

In April 2009, the U.S. Army Corps of Engineers (USACE) completed the $430 million renovation and expansion of the McAlpine Locks, which are on the Louisville side of the Ohio River, approximately two miles downriver from the Kennedy Bridge. According to USACE, approximately 33,300 loaded barges have passed through the McAlpine Locks annually between the years 2000 and 2009, hauling between 205 and 250 million tons of cargo. In 2009, traffic was approximately 236 million tons, with 57% coal, 5% iron and steel, 4% chemicals, and the remaining 34% grain commodities, petroleum, aggregates, and finished goods.

Historic growth of 2.3% annually in Ohio River tonnage was experienced from 1990 to 1999. From 2000 to 2005, the tonnage shipped on the Ohio River increased 5.5% annually. Between 2006 and 2009, however, the tonnage shipped on the Ohio River actually decreased 14.2% annually because of the slowdown in the economy. Compared with 2009, USACE projected a 6.0% increase for shipping tonnage on the Ohio River for 2010. Coal is expected to remain the primary commodity cargo on the Ohio River.

According to USACE, approximately 312 pleasure crafts navigated through the McAlpine Locks in 2009. Although recreational usage had been expected to increase on the Ohio River due to improved access and facilities on both the Indiana and Kentucky shorelines in the LMPA, there was in fact, a 69% reduction in the amount of recreation usage from 1998 to 2009. The drop in

[5] Source: www.greaterlouisville.com/GLI/

recreational navigation through the McAlpine Locks may be attributed to the extensive period of renovation and expansion of the McAlpine Locks by USACE and the economic downturn experienced by the U.S. economy in the latter part of the decade.

4.1.3 Social and Economic Features

Section 4.1-3 of the 2003 FEIS identified the existing neighborhoods, community facilities, and elderly and minority facilities within the LMPA. This section also provided information on parks and recreational facilities and housing characteristics for the LMPA. Much of the information presented in the FEIS is still applicable to the SDEIS, and is not repeated here (see page 4-13 in the FEIS for details). However, the SDEIS updates the range of home values by neighborhood, discusses additional elderly and minority communities and facilities developed within the project area, identifies additional park and recreational area projects, and updates housing characteristics for the LMPA. This section also includes new tables 4.1-4, *Indiana Neighborhood Home Values*, and 4.1-5, *Kentucky Neighborhood Home Values* (which update some information in Table 4.1-7, *Kentucky Neighborhood Composition*, in the FEIS); and updates data in Table 4.1-6, *2000 Housing Characteristics* (Table 4.1-8, *1990 Housing Characteristics*, in the FEIS).

Neighborhoods

Since the 2003 FEIS, home valuations have changed in the LMPA. From 2003 to 2006, homes continued to appreciate in value, with housing prices in the LMPA peaking in early 2006. With the economic downturn experienced in the United States and the LMPA, housing values began to drop in 2007. Typically, home appreciation for the LMPA from 2003 to 2006 averaged approximately 3% to 6% per year, while home values dropped approximately 4% to 6% per year between 2007 and 2009. Tables 4.1-4 and 4.1-5 reflect changes in housing values in Indiana and Kentucky, respectively. Values were determined using a conservative 3% appreciation for the years 2003 to 2007 and a 4% reduction in value from 2007 to 2008. In 2009 home prices started to rise again, so a 3% appreciation was used. In general, the LMPA housing market has performed well relative to most of the rest of the country.

TABLE 4.1-4
INDIANA NEIGHBORHOOD HOME VALUES

Neighborhood	Location	Range of Values 2006	Range of Values 2009
Jeffersonville Riverfront	Downtown	$49,000 – $122,000	$48,000 – $117,000
Clarksville Riverfront	Downtown	$49,000 – $122,000	$48,000 – $117,000
Central Utica	East End	$39,000 – $546,000	$37,000 –$ 519,000
Oak Park	East End	$93,000 – $164,000	$88,000 – $156,000

Source: Community Transportation Solutions, 2011.

TABLE 4.1-5
KENTUCKY NEIGHBORHOOD HOME VALUES

Neighborhood	Location	Range of Values 2006	Range of Values 2009
Portland	Downtown	$66,000 – $93,000	$62,000 – $88,000
Russell	Downtown	$82,000 - $137,000	$78,000 - $130,000
Butchertown	Downtown	$137,000 - $235,000	$130,000 - $223,000
Phoenix Hill	Downtown	$66,000 - $382,000	$62,000 - $363,000
Harrods Creek	East End	$87,000 - $3,278,000	$96,000 - $3,112,000
Ken Carla	East End	$164,000 - $246,000	$156,000 - $233,000
Northfield	East End	$219,000 – $656,000	$207,000 - $622,000
Glenview	East End	$656,000 - $3,278,000	$208,000 - $3,112,000
Indian Hills	East End	$273,000 - 1,102,000	$259,000 - $1,046,000
Lyndon/Norwood	East End	$82,000 – $137,000	$77,900 - $130,000
Beechwood Village	East End	$164,000 - $246,000	$156,000 - $233,000
Green Spring	East End	$164,000 - $382,000	$156,000 - $363,000
Prospect	East End	$164,000 - 1,102,000	$156,000 - $1,046,000
Windy Hills	East End	$180,000 - $328,000	$171,000 - $312,000

***Source**: Community Transportation Solutions, 2011.*

Elderly Communities

There are a number of housing facilities for the elderly within the LMPA. Since the 2003 FEIS, there have been additional elderly communities and associated facilities developed within the project area. The Hillcrest Center for Health and Rehabilitation is located in the downtown project area in Jeffersonville, Clark County. The facility is located just south of the Clark Memorial Hospital and is primarily a long-term convalescent rehabilitation facility, which can house approximately 180 clients. In addition, the Windsor Ridge Assisted Living facility is located in the east end project area in Clark County, near the I-265 and S.R. 62 interchange and the Utica Elementary School. It is primarily a long-term assisted living facility that can house approximately 150 to 200 people.

Parks and Recreational Areas

Since the 2003 FEIS, additional parks and recreational areas have been developed or proposed within the LMPA. In 2005 the City of Parks Initiative was established by Louisville Metro Parks. The City of Parks Initiative will add thousands of acres of park land and protected green space to the LMPA and help create new recreational opportunities in the Louisville-Jefferson County Metro Area. Of specific note are the 21st Century Parklands of Floyds Fork project, which will add four major parks and approximately 3,200 acres to Louisville Metro's Parkland in eastern Jefferson County, Kentucky, outside the LSIORB Project area. Construction is underway and will continue through 2015. Some of the proposed projects in the City of Parks Initiative that are within the LSIORB Project area include the expansion of Waterfront Park (Phase III), construction of the Louisville Loop Northeast Loop Trail (Region 1), and the expansion of the River Road Recreational Corridor.

Louisville Extreme Park opened in the downtown portion of the project area in 2002. It is centrally located downtown near Waterfront Park and Slugger Field, and is accessible from the River Walk and connecting multi-use paths. The facility includes 40,000 square feet of outdoor concrete skating surface and restrooms. Louisville Extreme Park provides skateboarding, in-line skating, and biking opportunities.

According to the *Clark County Comprehensive Plan* (2007), the large recreational areas in the county that are near the LSIORB Project area, such as Charlestown and Falls of the Ohio state parks, provide adequate open space and recreational area. Clark County, as of September 2011, does not have a county-wide parks department.

In 2009, the City of Jeffersonville completed an update of the Parks and Recreation Master Plan for 2007–2011. Repairs and facility improvements were recommended for the Colston Memorial Park and Nachand Fieldhouse. In addition, the City of Jeffersonville has plans to develop a new 300–440 acre park in the north end of the city using Land and Water Conservation Funds. The park will include both passive and active recreational facilities, including softball fields, tennis courts, nine-hole golf course and driving range, picnic area, shelter, walking and biking trail, and restroom facilities. The park is proposed to be constructed sometime after 2011 in the Jeffersonville Parks and Recreation Department's Region 9, just north of I-265 between U.S. 31 and S.R. 62. This location, however, is not within the LSIORB Project area.

Jeffersonville Canal District Project

The City of Jeffersonville has a federally mandated, legal obligation to stop allowing raw sewage to overflow into the Ohio River during heavy rainfall events. The proposed Jeffersonville Canal District project is one part of a larger project to correct this sewer overflow issue. The proposed canal will be designed to comply with the federal Clean Water Act by reducing combined sewer overflows to the Ohio River and Cane Run and will also provide a potential economic stimulus for the city, feature housing, retail, a new convention center, and hotel. The project is proposed to be developed as a canal, itself, and the economic and residential development of the canal district. The planned canal will have a 40-feet wide channel, 4 to 15 feet deep depending on the location. The canal channel is planned to be 4,400 feet long, with 1,100 feet below ground. The estimated $65 million dollar project will address downtown flooding issues, help the City of Jeffersonville avoid a potential $8 million fine from EPA and help upgrade the outdated sewer system to help accommodate Jeffersonville's present and future growth. The Jeffersonville Canal District project is expected to break ground in the Winter of 2011–2012 and will likely take five years to complete. The economic development work could continue for an additional ten years.

Housing

Housing within the LMPA ranges from multi-family units to large estate homes and encompasses a variety of income ranges. Table 4.1-6 provides the housing characteristics for each county in the LMPA and for each state, based on 2000 Census data.

TABLE 4.1-6
2000 HOUSING CHARACTERISTICS

	Median Value		
State/County	**Owner Occupied Homes**	**Rental Units Monthly Rent**	**Percent Owner Occupied**
Kentucky	$86,700	$445	70%
Indiana	$94,300	$521	72%
Bullitt County	$105,100	$499	84%
Clark County	$89,900	$511	69%
Floyd County	$104,300	$517	73%
Jefferson County	$103,000	$494	65%
Oldham County	$158,600	$499	83%

Source: *U.S. Census Bureau*

4.1.4 Pedestrian and Bicycle Facilities

Section 4.1.4 of the 2003 FEIS provided a description of the KIPDA *Regional Bicycle and Pedestrian Plan*, dated December 1998, for Floyd and Clark counties in Indiana, and Bullitt, Jefferson and Oldham counties in Kentucky. The SDEIS provides updated information on the status of various bicycle and pedestrian projects within the LMPA based on the Louisville MPO's *Horizon 2030* MTP, including updated data in tables 4.1-7 and 4.1-8 (tables 4.1-9 and 4.1-10, respectively, in the 2003 FEIS). In addition, new figures 4.1-4 through 4.1-6 take the place of FEIS figures 4.1-5 through 4.1-10.

Some of the projects illustrated on the figures and listed in the tables below are in the conceptual stage and the alignments shown on the maps are not necessarily the final alignments for these projects, but they are planned for the general area. There are also projects in the tables that cannot be mapped, such as sidewalk improvements and pedestrian access improvements around Transit Authority of River City (TARC) stops.

Big Four Railroad and Pedestrian Access

Since the 2003 FEIS, Louisville Metro and the City of Jeffersonville have advanced the conversion of the abandoned Big Four Railroad Bridge (which is located approximately 1,200 feet upstream from the existing Kennedy Bridge) to a 22-foot-wide pedestrian and bicycle path. The project includes the removal of the existing railroad ties, installation of a new concrete deck, repair of the superstructure and piers and the installation of lighting on the structure. The improvements will also include ramps providing access to the bridge on both sides of the river. A ramp to the bridge on the Kentucky side of the Ohio River within Waterfront Park was completed in 2010. Construction on the bridge improvements is currently underway and is expected to be complete in 2013. Demolition activities for construction of the Indiana ramp started in November 2011. A Finding of No Significant Impact (FONSI) was approved for the bridge and the ramp on the Kentucky side by the USACE on July 16, 2007. A FONSI was approved for the Indiana side of the project by FHWA on October 19, 2011, which included an Individual 4(f) Evaluation for both sides of the river and the bridge itself.

The 2003 FEIS Selected Alternative includes a pedestrian and bicycle path as a feature of the Downtown Bridge. Because the Big Four Railroad Bridge project will provide a dedicated bicycle and pedestrian river crossing facility between downtown Louisville and Jeffersonville, the Modified Selected Alternative under evaluation in this SDEIS does not include pedestrian and bicycle access as a feature of the Downtown Bridge. The ramp on the Kentucky side of the Ohio River lands within Waterfront Park and patrons of the Big Four Railroad Bridge will have access to the existing bicycle and pedestrian path located along the Ohio River on River Road. The ramp on the Indiana side of the Ohio River lands within the City of Jeffersonville, near the Market Street/Mulberry Street intersection. Patrons of the Big Four Railroad Bridge will have access to the existing Riverfront Path, a bicycle and pedestrian path located along the Ohio River. Due to these improvements, the Big Four Railroad Bridge is proposed to provide the cross-river, non-motorized connectivity in the downtown Louisville/Jeffersonville area, without any potential for pedestrian/vehicular conflict.

Proposed Pedestrian and Bicycle Facilities in Horizon 2030 MTP

The Louisville MPO's *Horizon 2030* MTP (adopted in 2010) is the planning document that reflects all surface transportation investments through the year 2030 in the Louisville (KY-IN) MPA. The *Regional Bicycle and Pedestrian Plan,* which is included in the MTP, recognizes that all modes of surface transportation are on equal footing and should be treated the same. The bicycle and pedestrian priority corridors within the MPA are depicted on Figure 4.1-4, *Bicycle & Pedestrian Priority Corridors.*

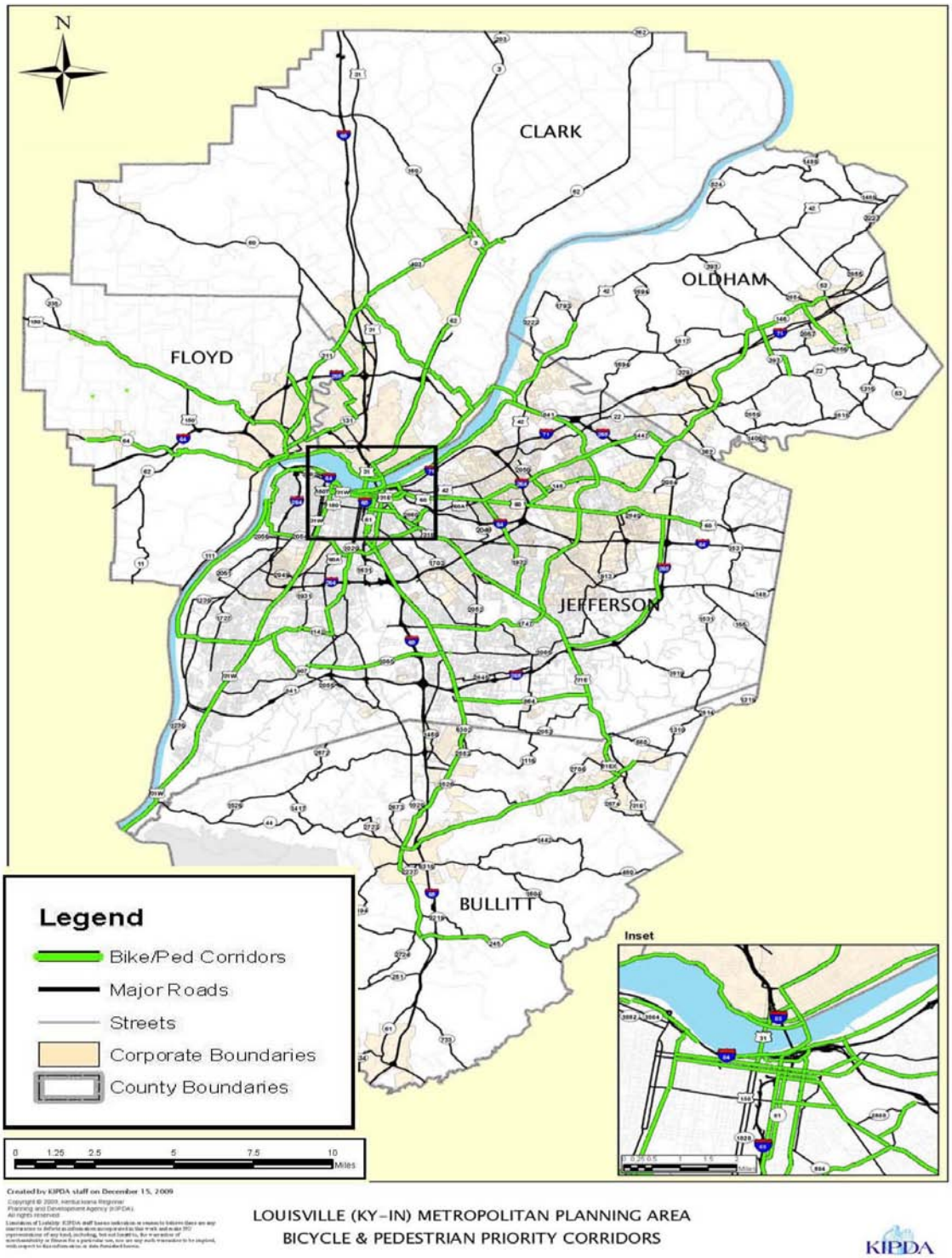
Clark County, Indiana

The recommended pedestrian and bicycle improvement projects for Clark County, Indiana, from the MTP are shown in Table 4.1-7. The updated pedestrian and bicycle improvement projects for the portions of Clark County in proximity to the LSIORB Project's downtown and east end areas, as prepared by KIPDA, are shown in Figures 4.1-5, *Bicycle & Pedestrian Projects Downtown Louisville,* and 4.1-6, *Bicycle & Pedestrian Projects East End,* respectively.

Jefferson County, Kentucky

The recommended pedestrian and bicycle improvement projects for Jefferson County, Kentucky, from the MTP are shown in Table 4.1-8. The updated pedestrian and bicycle improvement projects for the portions of Jefferson County in proximity to the LSIORB Project's Downtown and East End corridors are shown in figures 4.1-5 and 4.1-6, respectively. In addition, Figure 4.1-7 depicts existing and proposed bicycle facilities in areas of Louisville closest to the proposed Downtown Bridge, while Figure 4.1-8 depicts existing and proposed bicycle facilities near the East End Corridor in eastern Jefferson County.

FIGURE 4.1-4
BICYCLE AND PEDESTRIAN PRIORITY CORRIDORS



Source: *Horizon 2030 Metropolitan Transportation Plan* (Adopted 2010)

TABLE 4.1-7
CLARK COUNTY, INDIANA
RECOMMENDED PEDESTRIAN AND BICYCLE PROJECTS

Location	Project Description	Completed
Maintenance Policies and Provisions	For all bicycle and pedestrian facilities.	No
Eastern Boulevard	Add sidewalks on Eastern Boulevard.	See Note 1
Clark Boulevard	Add sidewalks on Clark Boulevard.	No
IN 62 Shared Lane	Add 2' to curb lanes for bicyclists from I-65 to Reed Lane.	No
IN 62 Sidewalk	Add sidewalks from I-65 to Reed Lane.	No
Cooper Lane Shared Lane	Add 2' to curb lanes for bicyclists from U.S. 31 to Utica/Sellersburg Road.	No
Cooper Lane Sidewalks	Add sidewalks from U.S. 31 to Utica/Sellersburg Road.	No
Hamburg Pike Shared Lane	Add 2' to curb lanes for bicyclists from Dutch Lane to New Albany/ Charlestown Road.	No
Hamburg Pike Sidewalks	Add sidewalks from Dutch Lane to New Albany/ Charlestown Road.	No
8th Street	Add 2' to curb lanes for bicyclists from Spring Street to Perrin Lane.	No
Riverfront Path	Construct multi-use path along Ohio River from Falls of the Ohio to Utica.	No
River Greenway – Sponsored by Army Corps of Engineers	Construct scenic byway facility connecting Jeffersonville, Clarksville, and New Albany, providing access to the riverfront and Falls of the Ohio – include bike and pedestrian trails.	No
Ohio River Frontage *	Riverwalk pedestrian walk – include sidewalks and landscaping.	No
Wheels & Heels Trail * City of Jeffersonville	Construct 14-mile-long pedway interconnected system of trails for bicycle and pedestrian use to link residential areas to centers of business, employment, and recreation.	No
Ohio River Greenway * City of Jeffersonville	Construct pedestrian walkway along Restaurant Row by Ohio River.	No
Ohio River – Big Four Bridge	Construct connector ramp at north end of the Big Four Bridge, providing pedestrian and bicycle access.	No
City of Clarksville * Levee Trail Extension	Construct and pave pedestrian/bicycle trail on top of earthen levee between Francis Avenue and abandoned CSX rail corridor.	No

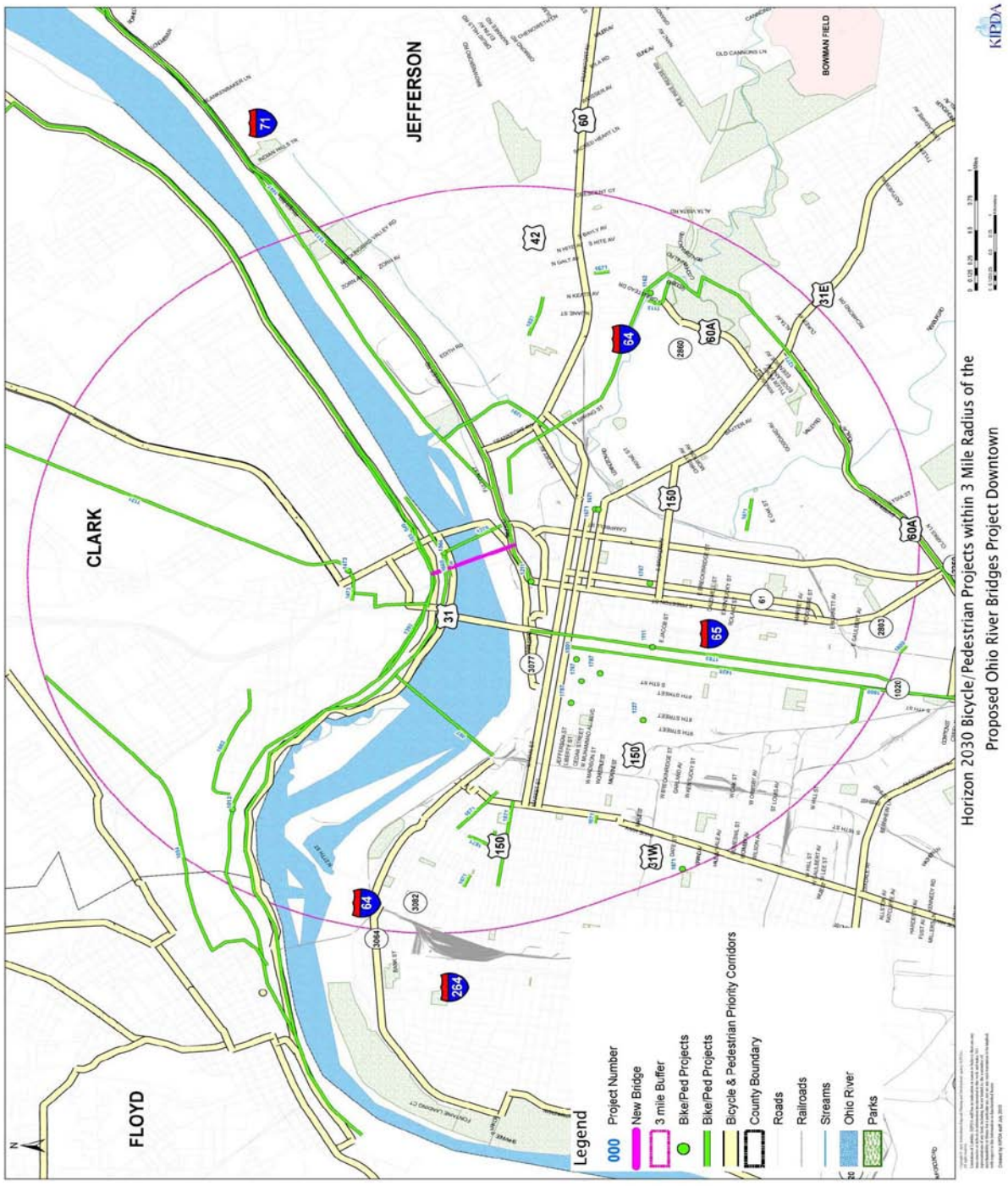
Source: Horizon 2030 Metropolitan *Transportation Plan (Adopted 2010)*

** Regional Priority*

Note:

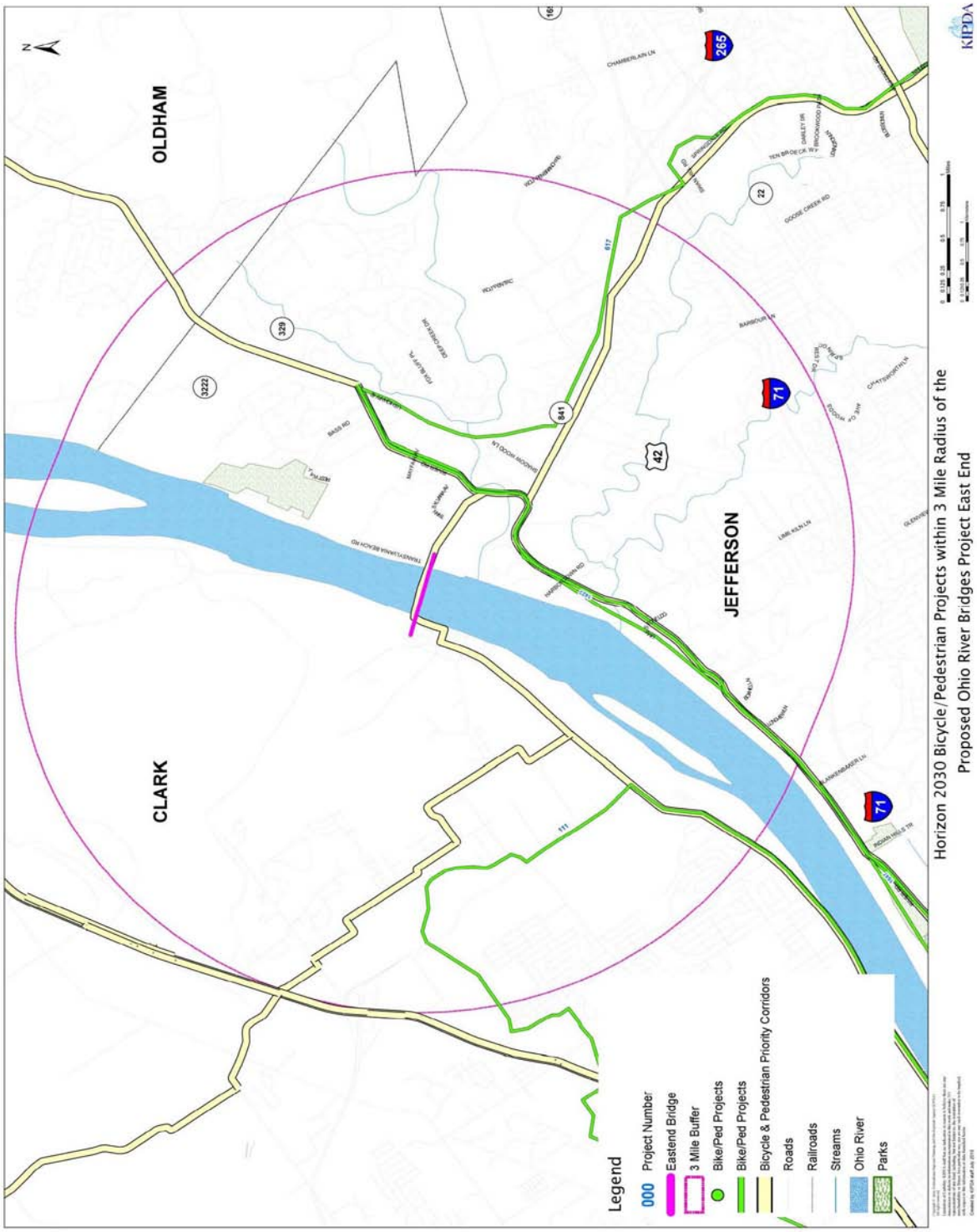
[1] *Sidewalks were added to the east side of Eastern Boulevard. The project was a general reconstruction of Eastern Boulevard from Ettles Lane to Kopp Lane, and includes adding sidewalks to the east side only.*

FIGURE 4.1-5
BICYCLE AND PEDESTRIAN PROJECTS DOWNTOWN LOUISVILLE



Source: *Horizon 2030 Metropolitan Transportation Plan* (Adopted 2010)

FIGURE 4.1-6
BICYCLE AND PEDESTRIAN PROJECTS EAST END



Source: *Horizon 2030 Metropolitan Transportation Plan* (Adopted 2010)

TABLE 4.1-8
JEFFERSON COUNTY, KENTUCKY
RECOMMENDED PEDESTRIAN AND BICYCLE PROJECTS

Street Name	Project Description	Completed
Bicycle Coordinator Position		Ongoing
Maintenance Program		Ongoing
Bus Shelters	Equip with bike/pedestrian amenities.	Ongoing
MSD Easement	Construct 12' path.	Unknown
Louisville Metro Loop Trail	Completion of a 108-mile multi-use trail that will encircle Louisville Metro and connect to existing trail segments.	No
Upper River Road Trail	Construct 12’ path Zorn Avenue to Hays Kennedy Park and shared lane.	No
Adams Street	Sign and stripe as needed shared lane Clay Street/Riverwalk to Spring Street/Story Avenue.	No
Mellwood Avenue	Sign and stripe 6' bike lane Baxter Avenue to Beargrass Creek path.	No
Payne Street + (Alley, Ewing to Birchwood)	Sign and stripe as needed shared lane from Spring Street/ Story Avenue to Birchwood Avenue.	No
Washington Street	Sign and stripe as needed shared lane from Hancock Street to Adams Street/Spring Street.	See Note 1
Hancock Street	Sign and strip as needed shared lane Washington Street to Oak Street.	See Note 1
Wenzel Street	Sign and stripe as needed shared lane Washington Street to Madison Street.	See Note 1
Big Four Bicycle & Pedestrian Bridge	Construct bicycle and pedestrian path on the Big Four Bridge over the Ohio River.	No
2nd and 3rd Streets Alleys	Sign and stripe as needed shared lane Main Street to Cardinal Boulevard.	See Note 1
3rd Street	Construct 6' bike lane Main Street to Oakdale Avenue.	See Note 1
7th Street Road	Sign and strip 6' bike lane Manslick Road to Ormsby Avenue.	See Note 1
8th Street	Sign and stripe as needed shared lane Kentucky Street to Zane Street.	See Note 1
9th Street	Construct 5' bike lane and shared lane Main Street to Catherine Street.	See Note 1
Main Street	Sign and stripe 6' bike lane Story Avenue to 22nd Street.	See Note 1
Market Street	Sign and strip 6' bike lane Baxter Avenue to Northwest Parkway.	See Note 1
River Road	Extend waterfront 12' path from Waterfront Park to Zorn Avenue.	No
Ohio Riverwalk Trail	Construct path from the Belvedere to Chickasaw Park.	No
Waterfront Master Plan	12' path from Riverwalk through Waterfront Park to point near Towhead Island.	No
Waterfront Path	12' multi-use path Clark Memorial Bridge to Towhead Island	No
Louisville –River Road *	Widen River Road from 2 lanes to 4 lanes from near Pope Avenue to Zorn Avenue – includes bicycle lanes.	No
City of Louisville Bicycle and Pedestrian Coordination/Education Program	Establish bicycle and pedestrian coordinator and education and promotion program. Promote education of bicycle and pedestrian travel to encourage travel by promoting engineering and safety	No
City of Louisville Metro Loop Trail	Complete 108-mile multi-use trail for bicyclists and pedestrians that will encircle the Louisville Metropolitan Area.	No
City of Louisville * Comprehensive Improvements for Pedestrian & Bicyclists Phase II	Establish secure and sufficient bicycle parking, install adequate lighting and safety devices, safer street crossing, develop pathways and landscaping to improve access and safety.	No

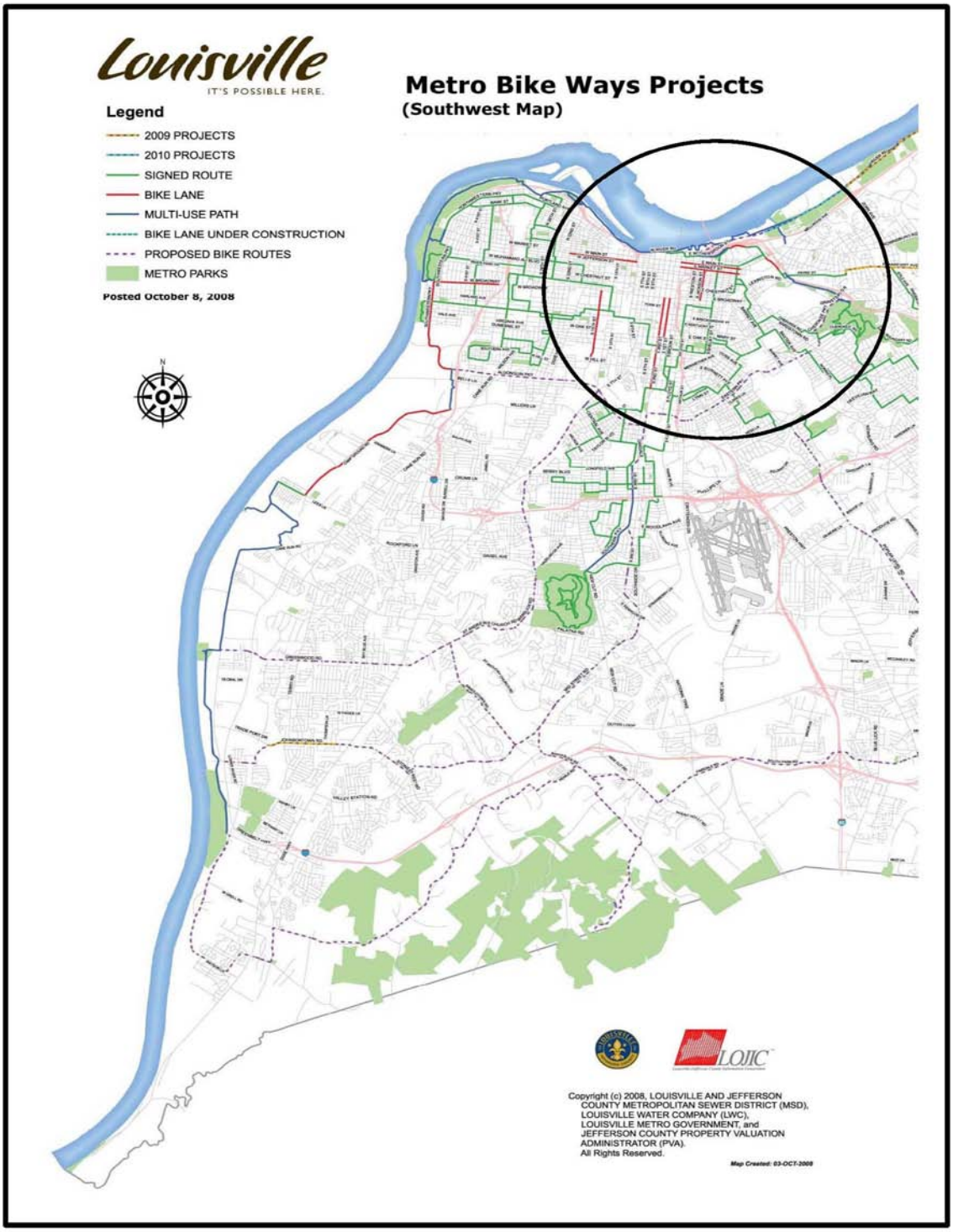
TABLE 4.1-8 (*Continued*)

Street Name	Project Description	Completed
City of Louisville * Olmsted Parkways Multi-Use Path	Construct multi-use path, connecting with existing trails to create a continuous 30 miles of connected paths for pedestrians and bicyclists.	No
City of Louisville K & I Railroad Bridge	Convert K & I Railroad Bridge into multi-use path across the Ohio River.	No
Jefferson County * Transit Access Pedestrian & Bicycle Improvements	Construct new or repair immediate area around bus stops, sidewalks, trails, or other pedestrian or bicycle paths within one mile of transit routes.	No
City of Louisville * Metro Urban Greenway	Construct 13.7-mile connection from the Oldham County greenway to the Ohio River to promote bicycling and walking.	No
Ohio River * Big Four Bicycle and Pedestrian Bridge	Construct pedestrian and bicycle path on the Big Four Bridge over Ohio River.	No
River Road * Bicycle and Pedestrian Improvements	Construct multi-modal corridor with shared use path and bicycle lanes from downtown Louisville to city of Prospect.	No
3rd Street-New Cut-Manslick Road Bicycle & Pedestrian Facilities Improvements	Bicycle and pedestrian facilities improvements from downtown Louisville to Fairdale Road. Major bicycle corridor in the metropolitan area.	No
Louisville Bicycle Parking and Intermodal Transit Facility	Construct new inter-modal transit station at northwest corner of West Jefferson Street and South 4th Street. Will serve bike commuters to downtown and provide a direct connection to TARC routes.	No
Louisville – Bicycle & Pedestrian Striping, Signage & Signals	Implement bike lanes, shared lanes, and pedestrian crosswalks in Louisville metropolitan area.	No
Louisville Metropolitan Sidewalks *	Construct approximately 100,000 linear feet of sidewalks.	No
Louisville Metropolitan Sidewalks & Curbs *	Replace sidewalks and curbs at priority areas targeting deteriorated conditions.	No
Louisville 2nd Street Streetscape	Improve intersections, sidewalks, lighting and landscaping along 2nd Street between Main and River Road. Includes portion of Washington Street east of 2nd Street in downtown.	No
Louisville- Bicycle Sharing System	Pilot system for installation of four bike kiosks (southwest corner of West Jefferson Street and South 8th Street - only location within the project area)	No
Louisville Loop *	Construct shared-use path, 18 miles in length, connecting Miles Park to River Road.	No

Source: *Horizon 2030 Metropolitan Transportation Plan* (Adopted 2010)
* Regional Priority

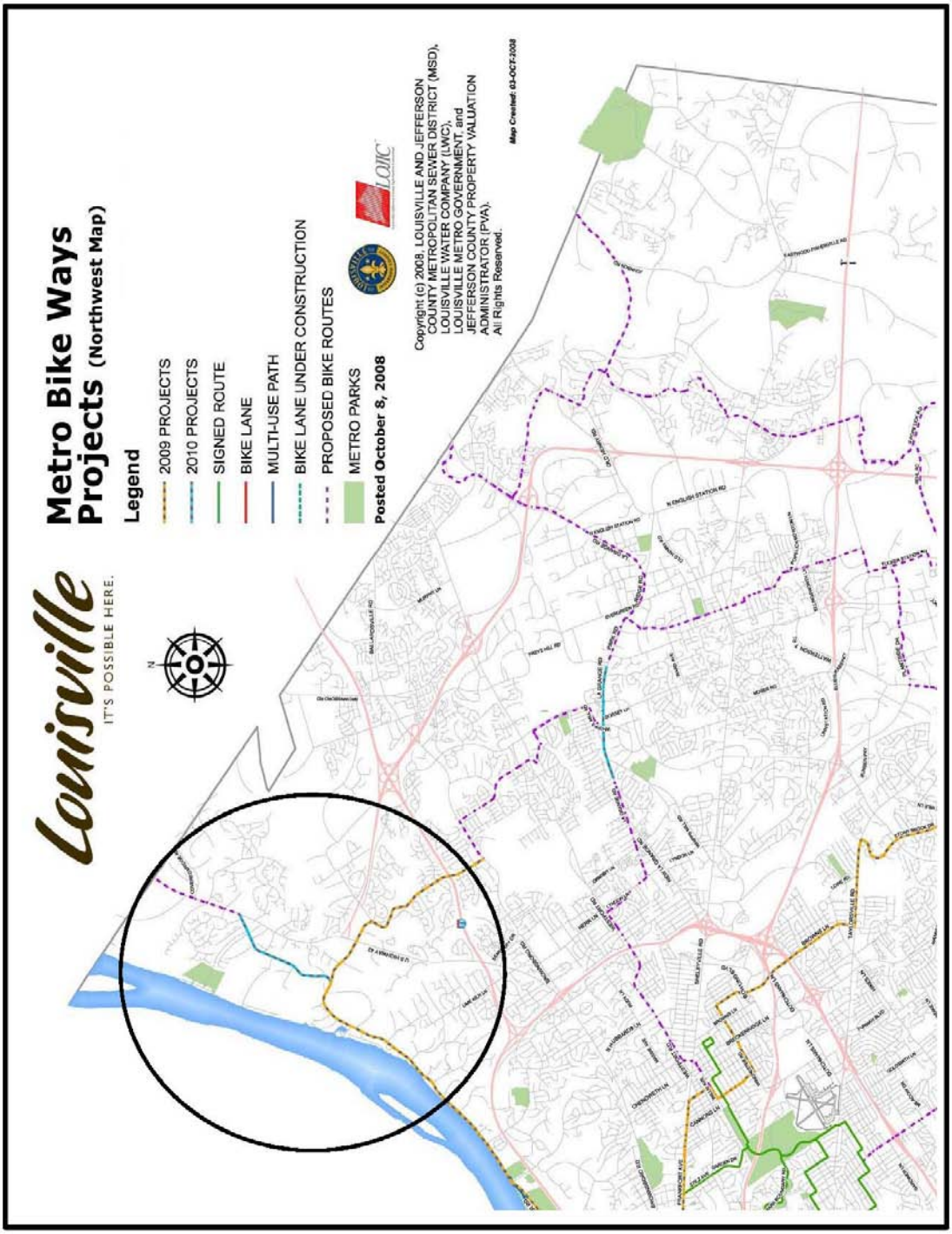
Note:
1 Louisville Metro evaluates roadways that are being repaved to determine if signed/striped facilities could be accommodated within the current right-of-way. Portions of Washington Street are signed as a bike route. Washington Street, Hancock Street, Wenzel Street, 2nd & 3rd streets' alleys, 3rd Street, 7th Street, 8th Street, 9th Street, Main Street, and Market Street are on the maintenance schedule.

FIGURE 4.1-7
BICYCLE AND PEDESTRIAN PATHWAYS IN DOWNTOWN LOUISVILLE



Source: *Louisville Metro (2008)*

FIGURE 4.1-8
BICYCLE AND PEDESTRIAN PATHWAYS IN EAST END JEFFERSON COUNTY



Source: *Louisville Metro (2008)*

4.2 Agricultural

This section of the 2003 FEIS discussed agricultural receipts and acres of agricultural land within the LMPA, including Oldham and Bullitt counties in Kentucky, and Clark and Floyd counties in Indiana. The FEIS used agricultural statistics for the years 1987, 1997, and 1999, provided by the agricultural divisions of the State of Indiana (Clark County) and the Commonwealth of Kentucky (Jefferson County). This section of the SDEIS uses U.S. Department of Agriculture (USDA) statistics to update the data presented in the FEIS; and adds two comparison tables (4.2-2 and 4.2-3). Because the two build alternatives that are being evaluated as part of this SDEIS (i.e., the FEIS Selected Alternative and the Modified Selected Alternative) are located within Clark County, Indiana, and Jefferson County, Kentucky, the re-evaluation of agricultural resources within this chapter focuses only on these two counties.

USDA data is available on five-year intervals from 1987 to 2007. This data was used not only to assess the recent agricultural status of the project area, but also to evaluate trends in agriculture over time. The data available from the USDA differs considerably from the state-level data included in the FEIS. The state-level data was higher with regard to the acres of land in farms than the data from the USDA. This difference is due to the different methods of data collection between the state and federal agencies. The state-level data counted all land in farms, including agricultural fields, pastures, wood lots, drives, homesteads, and co-ops. The USDA data is specific to agricultural (food production [crop and livestock]) parcels and is used herein, rather than the states' data, because it better represents impacts to agricultural resources and allows a comparison from the same data set, based on the same methods.

Clark County is considerably more rural than Jefferson County. According to USDA, depending on the year, the acreage of land in farms is two to three times higher in Clark County than in Jefferson County (see Table 4.2-1). As development pressures continue around the LMPA, land is being removed from agricultural use. As also shown in Table 4.2-1, an evaluation of USDA data indicates a trend of loss of agricultural acreage at an average rate of 7.4% per five years for Clark County and 10.9% per five years for Jefferson County.

TABLE 4.2-1
AGRICULTURAL STATISTICS: LAND IN FARMS

County	Acres in Farms					Avg. % Change per 5 Years
	1987	1992	1997	2002	2007	
Clark, IN	118,810	105,685	108,773	100,602	86,668	-7.4
Jefferson, KY	55,183	44,709	34,028	41,061	32,296	-10.9

Source: *USDA.*

Note: Since the publication of the FEIS, the following revisions have been made to this table: Updated statistics for Oldham and Bullitt counties in Kentucky and Floyd County in Indiana have not been included in this table because the alternatives being evaluated in this SDEIS are located in Clark and Jefferson counties, only; data for years 1987–2007 has replaced the 1987–1999 data in the FEIS; the 1999 Receipts data in the FEIS has been updated to1987–2007 and put in a separate table (Table 4.2-2).

According to the 2007 data, the top crop items (by acreage) in Clark County are soybeans and corn. However, Clark County is ranked first in the State of Indiana for "short-rotation woody crops." The top crop item (by acreage) for Jefferson County is "forage" (land used for all hay and haylage, grass silage, and greenchop). This is likely due to the proximity of Churchill Downs and nearby horse farms, and the demand from the equine industry in the region.

The overall economic contribution of agriculture in Clark County and Jefferson County exhibit diverging trends from 1987 to 2007 (see Table 4.2-2). Although there is a defined trend in loss of agricultural acreage in both counties, Clark County demonstrates a trend toward an average increase in receipts of 10.6% per five-year period. Conversely, Jefferson County exhibits a more direct relationship between loss of acreage and receipts with an average decrease of 4.8% per five-year period.

TABLE 4.2-2
AGRICULTURAL STATISTICS: RECEIPTS

County	Receipts ($1,000)					Avg. % Change per 5 Years
	1987	1992	1997	2002	2007	
Clark, IN	16,065	17,733	21,878	21,999	23,749	10.6
Jefferson, KY	13,753	13,232	12,295	13,328	11,116	-4.8

Source: *USDA*

Note: Since the publication of the FEIS, this table has been added, as indicated above.

The economic contribution of agriculture per acre within Clark and Jefferson counties indicates a positive trend in receipts per acre from 1987 to 2007, with Clark County experiencing a 19.5% average increase per five-year period and Jefferson County experiencing a 9.2% average increase per five-year period (see Table 4.2-3). Furthermore, receipts per acre are consistently higher in Jefferson County than in Clark County. Even though the loss of agricultural acreage is greater and the economic impact is declining in Jefferson County, the cost of livestock (mostly horses) grazing is at a premium in this area, thereby keeping the value of agricultural acreage higher.

TABLE 4.2-3
AGRICULTURAL STATISTICS: RECEIPTS PER ACRE

County	Receipts per Acre ($)					Avg. % Change per 5 Years
	1987	1992	1997	2002	2007	
Clark, IN	135.22	167.79	201.13	218.67	274.02	19.5
Jefferson, KY	249.23	295.96	361.32	324.59	344.19	9.2

Source: *USDA.*

Note: Since the publication of the FEIS, this table has been added

4.3 Historic and Archaeological Resources

Section 4.3 of the 2003 FEIS provided a description of the Area of Potential Effects (APE) for above-ground historic resources and a description of all historic resources within the APE that were listed in or eligible for listing in the National Register of Historic Places (Section 4.3.1, p. 4-36); a description of all archaeological resources identified and investigated in or near the potential areas of disturbance associated with the alternatives being considered at that time (Section 4.3.2, p. 4-150); and a summary of the Section 106 process status as it existed at that time (Section 4.3.3, p. 4-153).

Section 4.3 of the SDEIS contains the following substantive updates to the information in the 2003 FEIS:

- Section 4.3.1—Outlines the rationale for retaining the 2003 FEIS Alternative Specific APE (Original APE) boundary for the FEIS Selected Alternative, and extending it at strategic locations in Louisville (downtown and along River Road), Jeffersonville, Clarksville, and New Albany for the Modified Selected Alternative (Extensions to the Original APE). This section also updates the status of various historic resources within the Original APE, and identifies new properties within the Extensions to the Original APE. Also adds tables 4.3-1 through 4.3-6 to summarize information about properties evaluated in the FEIS.

- Section 4.3.2—Combines and updates 2003 FEIS tables 4.3-1 and 4.3-2 as SDEIS Table 4.3-7, which list archaeological sites in Indiana and Kentucky.

- Section 4.3.3—Updates the status of the Section 106 process and the relevant meetings with the general public and consulting parties during the SDEIS process.

The original (2003) Section 106 process included the evaluation of the project's potential effects on historic properties, and resulted in an overall finding of “adverse effect,” and culminated with the development of mitigation measures. These measures were spelled out in the project's *Section 106 Memorandum of Agreement* (MOA), which was included as part of the Record of Decision (ROD) approved in 2003. The MOA governs the manner in which the project takes into account the historic properties that were determined to experience an adverse effect from the project. Stipulations in the MOA address public involvement, noise abatement, roadway lighting, signage, blasting and vibration, and a number of additional considerations related to the affected historic properties. Since 2003, a number of specific stipulations in the MOA have been either completed or initiated. As part of the discussion of above-ground historic resources in Section 4.3.1 below, references are made to various MOA stipulations pertaining to mitigation measures associated with specific historic resources identified in the FEIS.

4.3.1 Above-Ground Resources

The development of an Area of Potential Effects (APE) is the first step in the identification of historic properties. Its boundaries are defined to encompass geographic areas where project

effects may occur, independent of the presence of historic properties or districts. The APE is used for taking into account the effect of a Federal undertaking, such as the LSIORB Project, on historic properties. To identify and determine potential project impacts during the 2003 FEIS process, an "Alternative-Specific APE" was developed, and detailed inventories were undertaken for historic properties within the APE. The Alternative-Specific APE encompasses almost 13,800 acres (25.5 square miles), and includes geographical areas adjacent to the approximate right-of-way of the build alternatives and an adjacent buffer area generally defined by the surrounding topographical features. These boundaries were developed based on a review of the areas in which elements of project alternatives (roadways, bridges and ramps) might be located.

As noted above, the Original APE defined the geographic area within which the Project may directly or indirectly cause alterations independent of existing historic resources or districts. Districts which fall fully or partially within the APE boundary are considered as a whole, even if portions of the district lie outside the APE. As such, the Original APE was not modified to include historic districts in their entirety or historic properties as part of the Section 106 process. For additional information and a detailed description of the process used for determining the limits of the 2003 FEIS Alternative Specific APE (Original APE) and assessing impacts within the APE, refer to pages 4-36 through 4-53 of the FEIS, including figures 4.3-1 through 4.3-14.

In this SDEIS, the term "Original APE" is used to refer to the 2003 FEIS Alternative-Specific APE. The following information details how the Original APE has been modified for purposes of this SDEIS to include "Extensions to the Original APE." The Extensions are intended to include areas based on potential indirect effects of the Modified Selected Alternative that may occur due to forecasted differences in travel patterns between the Modified Selected Alternative and the FEIS Selected Alternative.

Determination of Extensions to the Original APE

Extensions to the Original APE were initially developed by FHWA, INDOT, and KYTC to establish the area in which the Modified Selected Alternative might have an impact on historic resources. As part of this SDEIS, FHWA, KYTC, and INDOT conducted an analysis to identify areas that could experience differences in traffic patterns based on the proposed project design modifications and the introduction of tolling to the Downtown (I-65) and East End bridges. To consider the effects of such changes to traffic patterns as a result of the Modified Selected Alternative, a methodology was developed for identifying areas where increases or decreases in traffic could potentially affect historic properties. This methodology was based on traffic data and output from a travel demand model, and was used to estimate potential changes in traffic conditions. This resulted in the identification of the following five subareas where such changes could occur: portions of Jeffersonville, Clarksville/S.R. 62, New Albany, downtown Louisville, and River Road. Based on this analysis, FHWA, KYTC, and INDOT proposed designating these five subareas as part of the APE. To distinguish them from the Original APE, the term "Extensions to the Original APE" was used to refer to these areas outside the Original APE that could be affected by changes in traffic patterns.

On July 14, 2011, the proposed Extensions to the Original APE were presented to the staff of the Kentucky and Indiana State Historic Preservation Officers (SHPOs). As a result of this consultation, the boundaries of the Extensions to the Original APE were revised to include additional areas in downtown Louisville and Jeffersonville. In a letter dated August 11, 2011, the Kentucky SHPO suggested expansion of the boundary along River Road; and in a letter dated September 6, 2011, the Indiana SHPO provided concurrence with the boundaries of the Extensions to the Original APE in Indiana. Further details about the travel demand model and the development of the Extensions to the Original APE are provided in the *Section 106 Identification Findings Report* included as Appendix D.4.1.3.

The Extensions to the Original APE were presented to the consulting parties at a consulting parties meeting on September 29, 2011. Comments received during and following the consulting parties meeting primarily focused on the following general themes: (1) extending the boundaries of the Original APE and Extensions to the Original APE to avoid including only portions of historic districts (rather than the entire districts), (2) expanding the boundaries of Extensions to the Original APE along River Road to close a gap between it and the boundaries of the Original APE, and (3) questions and comments related to the NRHP eligibility of various properties within the Original and Extended APEs. See SDEIS Appendix D.4.1 for additional information. As a result of this meeting and further consultation, the Kentucky and Indiana SHPOs concurred with the boundaries of the Extensions to the Original APE on August 11, 2011, and September 6, 2011, respectively. Figures 4.3-1 and 4.3-2, below, illustrate the Extensions to the Original APE.

Regarding the East End portion of the project, there were no extensions to the Indiana or Kentucky portions of the Original APE, which are illustrated on figures 4.3-3 through 4.3-6 on pages 4-41 through 4-44 of the 2003 FEIS, because there are no additional areas beyond the Original APE where traffic is anticipated to be different between the two build alternatives.

Extensions to the Original Area of Potential Effect (APE) Boundaries - Indiana

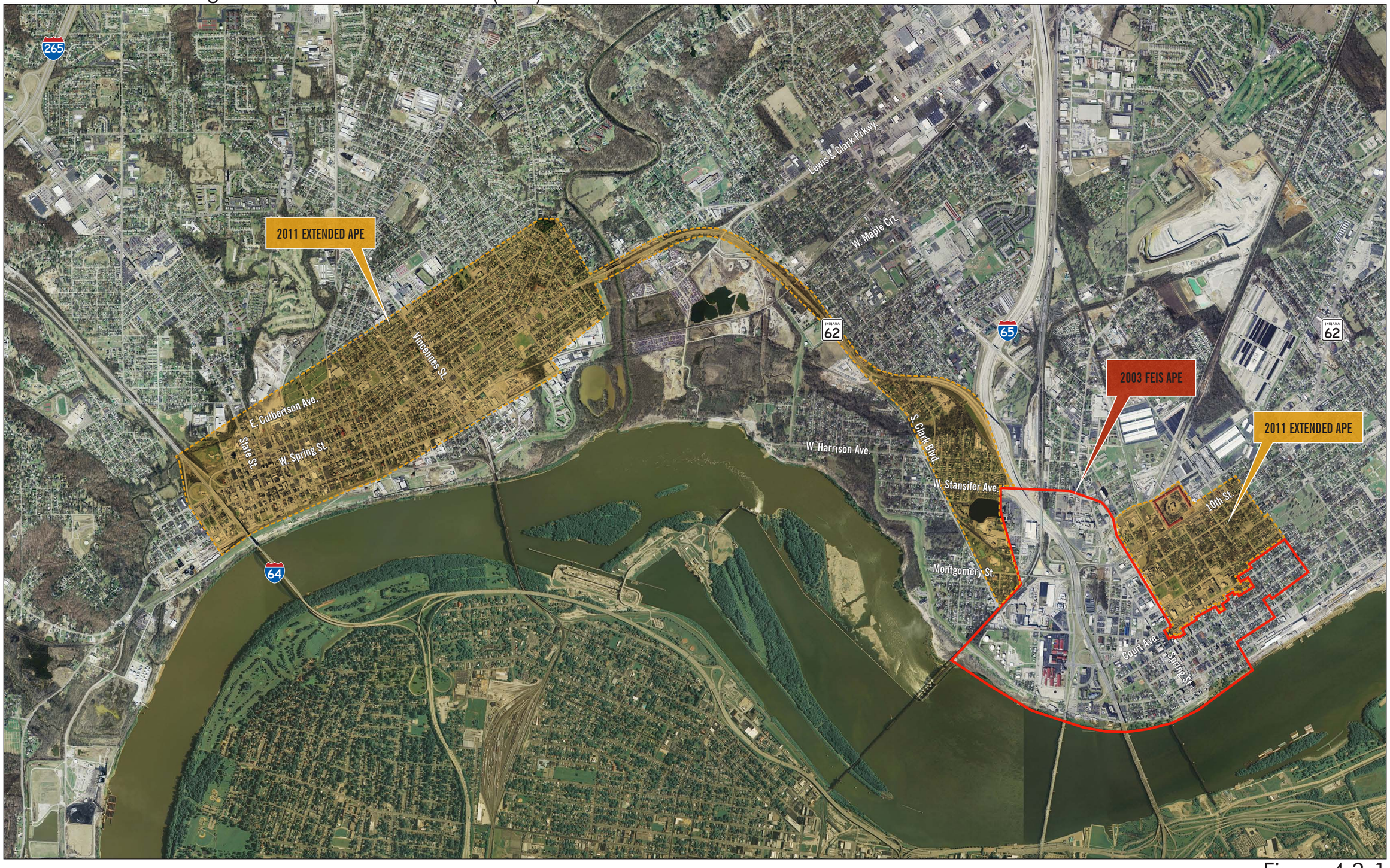


Figure 4.3-1

Extensions to the Original Area of Potential Effect (APE) Boundaries - Kentucky

Figure 4.3-2

Overview of Efforts to Identify Historic Properties

After the Extensions to the Original APE were established in consultation with the respective SHPOs, the identification of historic properties within both the Original APE and the Extensions to the Original APE was completed. Within the Original APE, historic preservation professionals evaluated properties for NRHP eligibility in accordance with the criteria for inclusion in the NRHP. In the Extensions to the Original APE, all properties over 45 years in age were identified and are being treated as NRHP eligible for the purposes of this project. The NRHP is the nation's official list of properties recognized for their significance in American history, architecture, archaeology, engineering, and culture. It is maintained by the National Park Service and includes districts, sites, buildings, structures, and objects. To be eligible for listing in the NRHP, a property must possess integrity and meet at least one of four criteria:

A. Be associated with events that have made a significant contribution to the broad patterns of our history.

B. Be associated with the lives of persons significant in our past.

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

D. Yield, or may be likely to yield, information important in history or prehistory.

As part of the identification efforts, historians researched a variety of data sources to identify properties over 45 years of age within the Extensions to the Original APE. This effort included reviews of SHPO records, aerial photography from online mapping sources, information from Louisville Metro Planning and Design Services, the county property valuation administrator, and GIS services. The team also consulted with the respective SHPOs for Indiana and Kentucky, as well as the Louisville Metro Planning and Design Services to gather relevant information to inform on-site field investigations.

Following this research, historic preservation specialists who met the Secretary of the Interior's Professional Qualification Standards conducted field visits to identify a representative sample of properties over 45 years of age within the Extensions to the Original APE in the five subareas described previously. Multiple site visits were conducted to document and photograph individual buildings as well as overall blocks, in order to provide a general context for areas within the Extensions to the Original APE.

Indiana Data Sources

Clark County, Indiana, Data Sources

During the 2003 FEIS process, surveys were conducted to identify historic and cultural resources in Indiana. These surveys were compiled into one document, *Historical and Cultural Survey—Indiana Downtown and East End Area of Potential Effect* (November 2000). This document was

referred to as part of this SDEIS process to determine whether there have been any changes to the historic sites since the completion of the FEIS.

An update to the *Clark County Interim Report* (per MOA Stipulation II.G.1), which is part of the Indiana Historic Sites and Structures Inventory (IHSSI), was completed under the oversight of the Indiana SHPO in early 2011. This information was disseminated through the Indiana State Historic Architectural and Archaeological Research Database (SHAARD), and served as the foundation for additional research on historic resources within the Original APE and Extensions to the Original APE in Jeffersonville, Clarksville, Utica, and New Albany. The survey update considered historic properties throughout Clark County, including those within the Indiana portion of the Original APE.

Building on the project team's existing understanding of conditions within the areas, the team then reviewed current aerial photography (including oblique views) and street views to determine the character of the remaining urban fabric, and referenced the National Register of Historic Places for a current listing of NRHP-registered properties. Based on this background information, site visits were conducted in the five subareas to document representative examples of properties over 45 years in age within the Extensions to the Original APE. This included both walking and driving surveys of the designated areas in Jeffersonville and Clarksville. Street views of multiple properties were photographed to capture the characteristics of study areas within the Extensions to the Original APE. These representative examples of properties over 45 years in age within the Extensions to the Original APE were photographed individually, and field notes were taken documenting their locations and features.

New Albany (Floyd County), Indiana, Data Sources

The *City of New Albany Interim Report* (1994), which is part of the IHSSI, served as the foundation for additional research on historic resources within the Extensions to the Original APE in New Albany.

Based on this preliminary information, site visits were conducted in the New Albany subarea to document representative examples of properties over 45 years in age within the Extensions to the Original APE. These visits included walking and driving surveys of the designated study areas in New Albany. Some additional resources were identified as a result of this field investigation and were included in the survey. Street views of multiple properties were photographed to capture the characteristics of the downtown area and other areas within the Extensions to the Original APE. These representative examples of properties over 45 years in age were photographed individually, and field notes were taken documenting their locations and features.

Kentucky Data Sources

As part of the 2003 FEIS process, *A Cultural Resource Overview for the Ohio River Bridges at Louisville, Jefferson County, Kentucky* (1999 Overview) was prepared in January 1999, which mapped and described all NRHP-listed properties within the project study area in Kentucky. The literature search included relevant NRHP nominations and related reports including, but not

limited to, the *Ohio River Master Plan*, *Histories of Ohio Falls Cities and Their Counties*, *Historic Jefferson County*, and the *Ohio River Major Investment Study* (ORMIS). The 1999 Overview was referred to as part of this SDEIS process to determine whether there have been any changes to the historic sites since the completion of the 2003 FEIS.

In July 2000, a second report for the Kentucky properties, *The Cultural Resources Survey for the Louisville – Southern Indiana Ohio River Bridges Project*, was completed to identify sites and/or structures located within the Original APE that were listed or eligible for listing in the NRHP. As a result of an expansion of the Original APE (which was in response to consulting party comments and is explained on page 4-37 of the FEIS), an additional historic survey of Kentucky resources, titled *Addendum, Expanded Area of Potential Effect, Kentucky Cultural—Historical Resources*, was completed in February 2002. These documents were referred to as part of this SDEIS process to determine whether there have been any changes to the historic sites since the completion of the 2003 FEIS.

A Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road (Update)) was completed in November 2010. This survey, conducted to satisfy MOA Stipulation II.G.2, was completed through a joint effort between the Kentucky Heritage Council and Kentucky Archaeological Survey staff. The update evaluated only resources located within the Phoenix Hill Historic District, the Butchertown Historic District, and other portions of the Original APE in the 2003 FEIS. Because the portion of the Extensions to the Original APE in downtown Louisville was located outside the study area of the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*, the project team conducted preliminary research on that area prior to any field work.

Based on this preliminary information, site visits were conducted to document representative examples of properties over 45 years in age within this portion of the Extensions to the Original APE. The site visits included a walking and driving survey of the downtown area as well as along the section of River Road included in the Extensions to the Original APE. Some additional resources were identified as a result of this field investigation. These representative examples of properties over 45 years in age within this portion of the Extensions to the Original APE were photographed individually, and most of the street blocks were photographed to capture the characteristics of the surrounding context.

Historic Properties

Additional properties within the Extensions to the Original APE in Indiana and Kentucky, as well as properties previously identified in the Original APE and new properties in the Original APE that were not identified during the 2003 FEIS process, are depicted and described on the following pages. This information was provided to the consulting parties for their review and input. SDEIS Chapter 7 includes additional information about consulting parities' involvement in the Section 106 process, and Appendix D contains correspondence, meeting summaries and other supporting documentation. These findings are also outlined in the Draft 800.11(e) documentation which includes the detailed *Identification Findings Report* and *Effects Recommendations Document* in the supporting appendices. The discussion of the resources in each state begins with

a series of graphics depicting the properties, followed by updated descriptions of properties that have changed since 2003 listed in or eligible for listing in the NRHP. The descriptions are separated by state into Downtown Resources and East End Resources. Furthermore, as part of this SDEIS, properties that have been altered or changed since the completion of the 2003 FEIS have also been noted and re-evaluated for eligibility.

DOWNTOWN PROPERTIES—INDIANA

The following graphics present historic properties in downtown Jeffersonville, Clarksville, and New Albany, Indiana:

- Figure 4.3-3 Historic Properties Identified within the Original APE—Jeffersonville, Indiana
- Figure 4.3-4 Historic Properties Identified within Extensions to the Original APE—Jeffersonville, Indiana
- Figure 4.3-5 Historic Properties Identified within Extensions to the Original APE—Clarksville, Indiana
- Figures 4.3-6 (a and b) Historic Properties Identified within Extensions to the Original APE—New Albany, Indiana

Historic Properties Identified within the Original APE - Jeffersonville, Indiana

Figure 4.3-3

Historic Properties Identified within the Extensions to the Original APE - Jeffersonville, Indiana

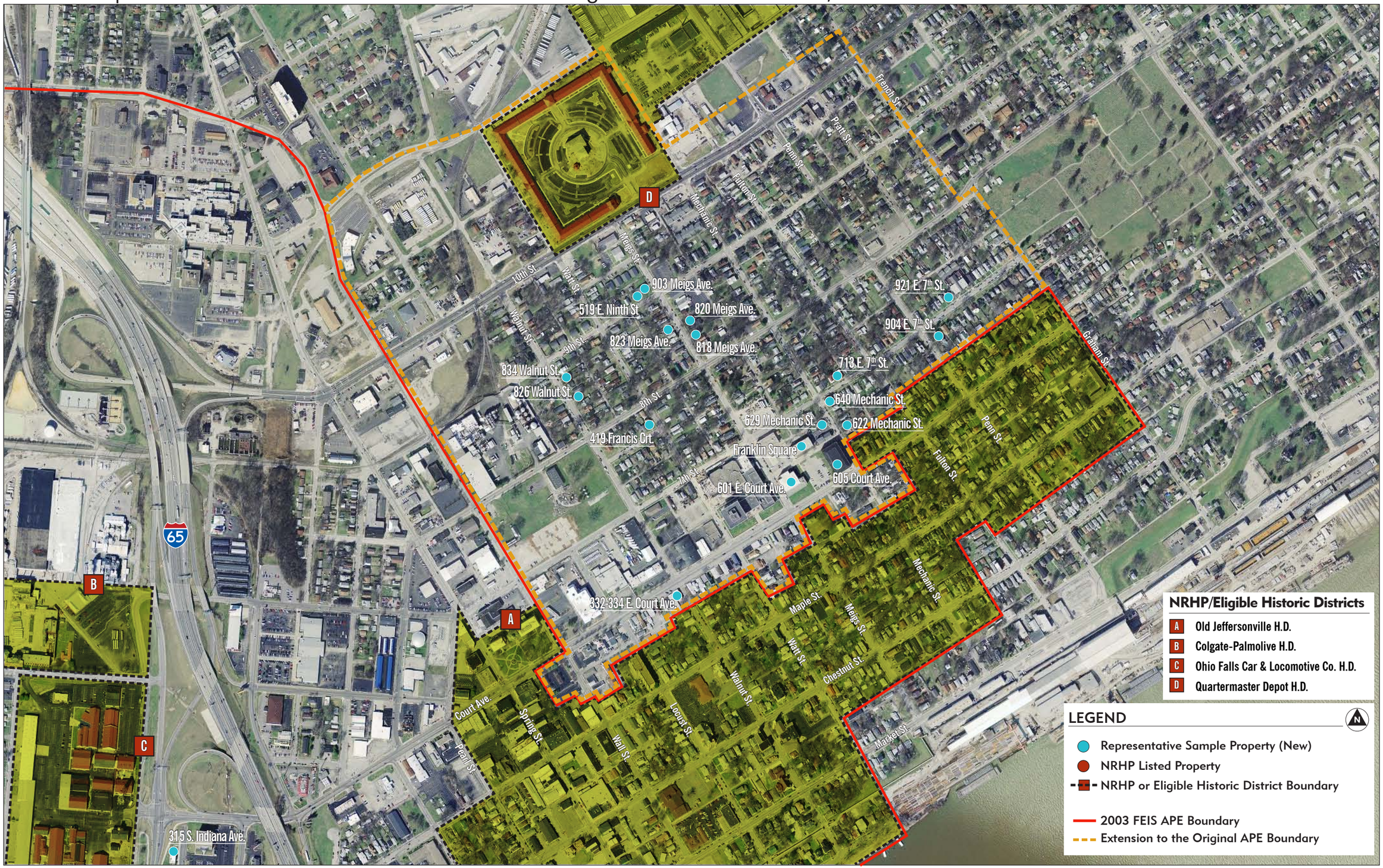


Figure 4.3-4

Historic Properties Identified within the Extensions to the Original APE - New Albany, Indiana

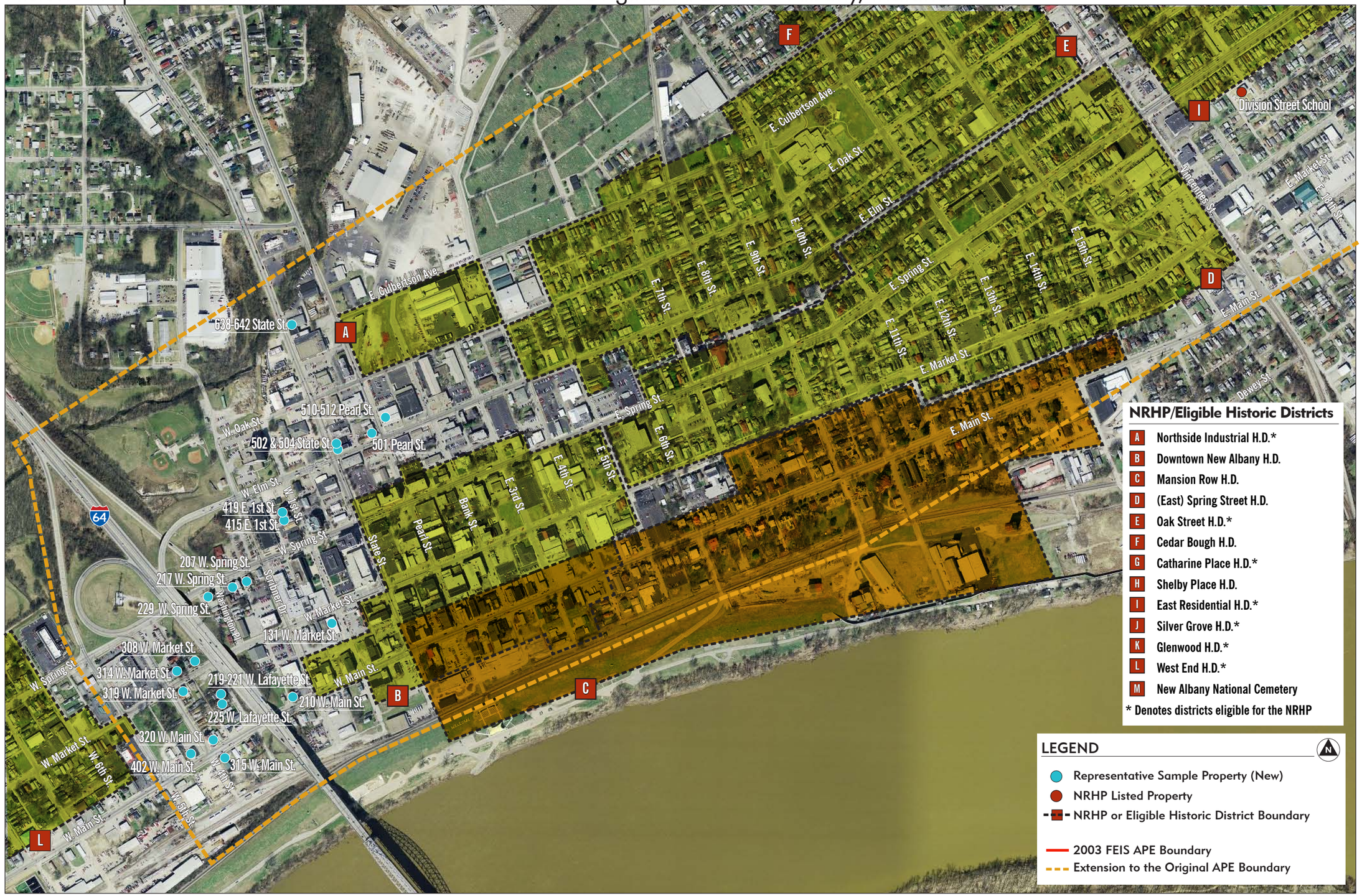


Figure 4.3-6a

Historic Properties Identified within the Extensions to the Original APE - Clarksville, Indiana

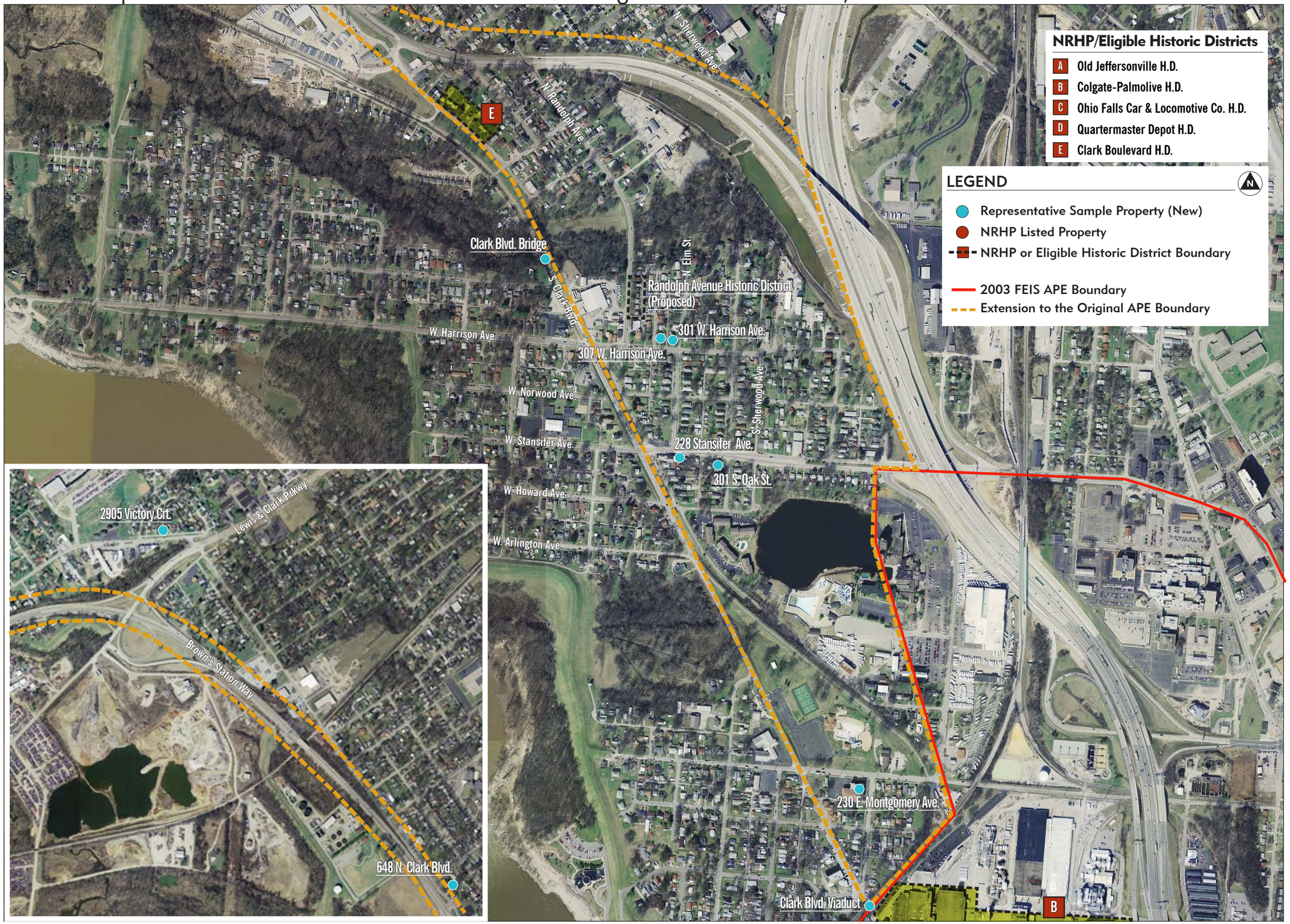


Figure 4.3-5

Historic Properties Identified within the Extensions to the Original APE - New Albany, Indiana

NRHP/Eligible Historic Districts

- A Northside Industrial H.D.*
- B Downtown New Albany H.D.
- C Mansion Row H.D.
- D (East) Spring Street H.D.
- E Oak Street H.D.*
- F Cedar Bough H.D.
- G Catharine Place H.D.*
- H Shelby Place H.D.
- I East Residential H.D.*
- J Silver Grove H.D.*
- K Glenwood H.D.*
- L West End H.D.*
- M New Albany National Cemetery

* Denotes districts eligible for the NRHP

LEGEND

- Representative Sample Property (New)
- NRHP Listed Property
- NRHP or Eligible Historic District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE Boundary

Figure 4.3-6b

UPDATE ON HISTORIC PROPERTIES IDENTIFIED WITHIN THE ORIGINAL APE—INDIANA

National Historic Landmarks

There are no National Historic Landmark properties within the Original APE in Indiana.

Old Jeffersonville Historic District

The Old Jeffersonville Historic District, located entirely within the Indiana portion of the Original APE, is a large district encompassing over 192 acres, including over 500 contributing buildings (see Figure 4.3-3). The only property individually listed in the NRHP in the historic district is the Grisamore House.

The Old Jeffersonville Historic District was listed in the NRHP in 1987 for its association with Jeffersonville's early commerce and transportation and architecture. The Old Jeffersonville Historic District is comprised of a large portion of downtown Jeffersonville and the adjacent residential areas. It is roughly bounded by I-65 on the west, Court Avenue on the north, Graham Street on the east, and the Ohio River on the south. Shotgun style houses, bungalows, Gable-front, Tudor Revival, and Craftsman style houses are all common within the district.

As part of mitigation measures to satisfy MOA Stipulation III.E.1, a Historic Preservation Plan (HPP) for the district was undertaken in August 2006. Following consultation and reviews by the designated Indiana Historic Preservation Advisory Team (IHPAT), this HPP was approved in September 2009 and no further action is currently anticipated relative to the Old Jeffersonville Historic Preservation Plan.

Provided below is a summary of relevant changes to resources within the district since the completion of the FEIS process in 2003.

The non-contributing buildings were reevaluated as part of the historic work undertaken during the 2003 Section 106 process and an additional eight buildings were identified as resources contributing to the district. Since the completion of the FEIS in 2003, two of these structures have been demolished.

Several properties were noted in the 1988 *Clark County Interim Report* as either "Outstanding" or "Notable" resources, which might qualify them as individually eligible for the NRHP. Through consultation with consulting parties, the resources listed below were identified. Additional site investigation of these properties as part of the SDEIS process verified their integrity and contributing status to the historic district:

(1) 228 West Riverside Drive—Outstanding
(2) 304 West Riverside Drive—Outstanding
(3) 416 West Riverside Drive—Outstanding
(4) 318 West Market Street—Outstanding
(5) 330 West Market Street—Notable
(6) 322 West Riverside Drive—Notable

(7) 328 West Riverside Drive—Notable
(8) 418 West Riverside Drive—Notable
(9) 115 Clark Street—Notable

The update to the *Clark County Interim Report* completed in 2011, per MOA Stipulation II.G.1, updated the status of additional properties within the Old Jeffersonville Historic District.

Update to Historic Properties Identified in the FEIS

This section of the SDEIS updates information provided in the 2003 FEIS about four historic properties in the Original APE in downtown Jeffersonville, Indiana. The update identifies changes that have been made to the properties, and where applicable, those changes related to mitigation measures stipulated in the LSIORB Project MOA. The following updates also include information obtained as part of the *Clark County Interim Report* update. All four resources described below are depicted on Figure 4.3-3.

1. Spring Street Freight House (Referred to in the FEIS as the Train Depot)
Since the completion of the 2003 FEIS, the Train Depot, now known as the Spring Street Freight House, has been listed in the NRHP as part of mitigation measures stipulated in the LSIORB Project MOA. The Spring Street Freight House was acquired by INDOT in 2005 per MOA Stipulation III.A.2. Per MOA Stipulation III.A.4, INDOT prepared a NRHP nomination for the Freight House and forwarded the nomination to the Indiana SHPO for review and comment in September 2006. It was listed in the NRHP in March 2007 for its associations with railroad transportation in the Jeffersonville area and because it is a good example of an early 20th century depot design (Criteria A and C). It was constructed c.1920 with Craftsman detailing enhancing a 20th century Functional style.

After acquisition, INDOT initiated rehabilitation plans for the Freight House in 2010 per MOA Stipulation III.A.2.b. Final drawings were completed in early 2011 and subsequent rehabilitation work began in the summer of 2011. During review of the rehabilitation plans, coordination with the Indiana SHPO determined archaeological investigations would be required at this site during construction; INDOT has been conducting these archaeological investigations. For additional information about this resource, refer to page 4-64 of the 2003 FEIS.

2. Colgate-Palmolive Historic District
The Colgate-Palmolive Historic District has been altered since the original Section 106 process by private entities not associated with the project. Per MOA Stipulation III.B.1, INDOT was required to document and seek NRHP nomination for the Colgate-Palmolive Historic District. Because the owners declined to provide access to the property to complete the nomination process, a documentation report was prepared and submitted to the Indiana SHPO in August 2006 in lieu of a nomination form. It was submitted to the IHPAT for review and comment on October 2006. In March 2007, the Indiana SHPO indicated that the documentation report satisfied the requirements of MOA Stipulation III.B.l, and no additional action has been taken on the property.

In 2007 the Colgate-Palmolive Company ceased operations at this location, and the facility is currently vacant. For additional information about this resource, refer to page 4-64 of the 2003 FEIS.

3. Ohio Falls Car and Locomotive Company Historic District

The Ohio Falls Car and Locomotive Company Historic District has been altered since the original Section 106 process by private entities not associated with the project. For additional information or a description of this resource, refer to page 4-65 of the 2003 FEIS.

In 2007 efforts were undertaken to develop documentation and seek NRHP nomination for the Ohio Falls Car and Locomotive Company Historic District per MOA Stipulation III.C.1. The information developed was subsequently submitted to the Indiana SHPO for review in January 2008. The nomination was submitted to the Keeper of the NRHP[6] in April 2009, and in June 2009 it was determined that the historic district was eligible for the NRHP. However, the property owners objected to the nomination; therefore, while the property has been determined to be eligible, placement in the NRHP could not be completed. In December 2009, the Indiana SHPO representative stated that the MOA stipulation had been satisfied, and further listing of the Ohio Falls Car and Locomotive Company Historic District would not be pursued. For additional information about this resource, refer to page 4-65 of the 2003 FEIS.

4. Big Four Railroad Bridge

The Big Four Railroad Bridge has been altered since the original Section 106 process by entities not associated with the project. For additional information or a description of this resource, refer to page 4-65 of the 2003 FEIS.

According to the Indiana SHAARD, the bridge was built in 1895 and rebuilt in the mid 1920s. In 1893, 21 workers died during construction when a crane blew over. The bridge was decommissioned in 1968. The bridge is now owned by the Commonwealth of Kentucky. The bridge is currently being reconstructed as a 22-foot-wide pedestrian and bicycle path as part of a cross-river bicycle and pedestrian system linking Jeffersonville and downtown Louisville. The recently constructed ramp on the Kentucky side of the Ohio River lands within Waterfront Park and patrons of the Big Four Railroad Bridge will have access to the existing bicycle and pedestrian path located along the Ohio River on River Road. The ramp on the Indiana side of the Ohio River, for which funding has recently been approved, will land within the City of Jeffersonville, near the Market Street/Mulberry Street intersection. A Finding of No Significant Impact (FONSI) with a Section 106 MOA was approved for the bridge on the Kentucky side of the project by the USACE on July 16, 2007. A FONSI with a Section 106 MOA was approved for the Indiana side of the project by FHWA on October 19, 2011. The Section 106 determination was a "No Adverse Effect" to the bridge property itself. For additional information about this resource, refer to page 4-65 of the 2003 FEIS, or additional information about the conversion to a bicycle and pedestrian bridge, see SDEIS Section 2.1.

[6] The Keeper of the National Register of Historic Places is a National Park Service (NPS) official who is responsible for deciding on the eligibility of historic properties for inclusion in the NRHP.

Historic Resources Unchanged Since the FEIS

A number of other properties were evaluated in the 2003 FEIS and were not described in this document. These properties are either currently listed, or potentially eligible for listing in the National Register of Historic Places. The table below lists these historic resources within the Original APE in downtown Jeffersonville, Indiana, which have essentially remained unchanged or unaltered since the original Section 106 process. For additional information about these properties, refer to pages 4-63 to 4-66 of the 2003 FEIS.

TABLE 4.3-1
OTHER DOWNTOWN INDIANA PROPERTIES EVALUATED IN 2003 FEIS

Resource Name	NRHP Criterion
Grisamore House	C
City School	A and C
Pennsylvania Railroad Bridge	A
George Rogers Clark Memorial Bridge & Administration Building	A and C
House, 519 Riverside Drive (Clarksville)	C
House, 527 Riverside Drive (Clarksville)	C

Identification of Additional Historic Resources for the SDEIS

Using the *Clark County Interim Report* update as a foundation, qualified professionals researched a variety of additional data sources and conducted field visits to identify properties over 45 years in age within the Extensions to the Original APE.

It should be noted that historic properties within the Extensions to the Original APE are only expected to experience indirect effects (such as noise, visual, air quality, etc.) as a result of changes in traffic patterns; direct effects are limited to within the Original APE. Indirect effects from changes in traffic patterns would be similar for each individual property along travel corridors and property-specific impact information cannot be provided given the uncertain nature of these potential indirect effects. Therefore, effects are assessed at the district or neighborhood level in Section 5.3.1.4, *Indirect Effects on Historic Properties*, and all properties over 45 years in age within the Extensions to the Original APE are being treated as eligible for the purposes of this project. There are no National Historic Landmark (NHL) properties within the Extensions to the Original Indiana APE.

Representative Sampling of Additional Jeffersonville Properties within Extensions to Original APE (See Figure 4.3-4)

The Extension to the Original APE in Jeffersonville is comprised primarily of traditional, single family residential development. The primary east-west highway connections through the area are Court Avenue and 10th Street are lined with commercial development.

The northeastern area of the Jeffersonville Extended APE contains the most intact concentration of single-family, detached residences—a majority of which are 1 or 1½ stories. The style of homes includes Craftsman Bungalows from the 1920s, Italianate, Queen Anne, and some gable-front shotgun homes. There is also some contemporary housing scattered throughout the subarea. Nearly all of the street blocks have mid-block alleys accessing detached garages. Most residential streets in this area are 2-way streets with on-street parking and sidewalks either directly adjacent to the street or separated by a grass strip between the sidewalk and street. Where there are changes in elevation between the sidewalk/street and adjacent front yards, some residences also have decorative stone retaining walls. Although the neighborhood does have somewhat of an urban tree canopy, there are few trees within the public right-of-way.

The Court Avenue corridor follows the southern edge of the Extension to the Original APE and is comprised almost entirely of professional offices and institutional/government uses. This includes city-county government functions, a public library, and the U.S. Post Office all fronting the north side of Court Avenue. The south side of Court Avenue includes a number of service-oriented, or professional offices, as well as some retail commercial uses. Many of these buildings are older commercial buildings, typically 1 or 2 stories in height. The corridor includes 2-way traffic with turn lanes at intersections, and some on-street parking (both parallel and angled). There is also a raised, landscaped median with trees along a 1-block section of the street. Much of the remaining corridor includes a grass strip with trees between the sidewalk and street.

The 10th Street corridor is comprised primarily of commercial development characterized by new suburban-style 1-story structures separated from the street by parking areas. The Quartermaster Depot is a former US Army facility that currently houses a mix of government offices, located along the northern side of the street. The character of uses for the area west of the Quartermaster Depot contains a mix of residences, small-scale industrial uses, and a number of vacant/empty parcels. The 10th Street corridor includes two lanes of traffic with a center turn lane and no on-street parking. Sidewalks along the street are either directly adjacent to the street or separated by a grass strip between the sidewalk and street.

The following representative sampling of properties were identified within the Jeffersonville Extension to the APE:

1. Quartermaster Depot Historic District, (IHSSI #019-305-57001 to 012)

The Quartermaster Depot Historic District in Jeffersonville is eligible for listing in the NRHP. The district generally lies along Quartermaster Court and Dutch Street in northern Jeffersonville. Built in the 1870s, the site operated as a manufacturing center for uniforms and a power plant.

According to the Indiana SHAARD, the Quartermaster Depot is located within a larger district that contains 53 properties.

2. Commercial Building, 332-334 E. Court Avenue (#019-305-58125)

This Italianate commercial building was built c.1870. The façade is divided into two bays. At the first floor, each bay contains a storefront opening framed by cast iron columns. These storefronts were subdivided into three bays each by iron columns. These columns have been covered with other materials but remain partially visible on the western storefront. The storefront openings have been in-filled with later material. A storefront cornice divides the first and second floors. The second floor is of red brick. The east bay contains three evenly-spaced two-over-two double-hung wood sash windows with segmental-arched heads and stone sills. The west bay contains a pair of two-over-two double-hung wood sash windows with segmental-arched heads and a stone sill. The building is topped by a low hipped roof with soffits clad in aluminum siding. Corbelled brick chimneys rise from the east and west walls of the building.

3. Jeffersonville High School Gymnasium Wing, 601 E. Court Avenue (#019-305-58053)

The Jeffersonville High School Gymnasium Wing was built c.1920 and reflects the Classical Revival style. The building's primary façade along Court Avenue is divided into five bays. Each bay contains one central tripartite window opening flanked by one single window opening at each side. The windows have been replaced with aluminum windows and louvers. The outer bays project slightly, reinforcing the classical symmetry of the façade. The walls are clad in limestone to the height of the first floor window sills. The first floor is clad in oversized red brick. A wide limestone belt course forms the first floor window lintels and divides the oversized red brick of the first floor from the standard-sized reddish-brown brick of the second floor. A narrow limestone belt course extends around the second floor above the window lintels, followed by a shallow limestone cornice and a brick parapet wall with limestone coping. The secondary elevation along Meigs Avenue features evenly-spaced window openings and an entrance door with a limestone surround and a limestone plaque reading "JEFFERSONVILLE GYMNASIUM." The entry doors and windows along this elevation are also replacements.

4. School City Of Jeffersonville Community Building 605 E. Court Ave. (#019-305-58113)

The City of Jeffersonville Community Building, also known as Nachand Field House, was built in 1937 and reflects the influence of the Art Deco style in its streamlined pilasters. The building's main façade is divided into seven bays by fluted brick pilasters that run from ground level to the parapet, terminating in curved limestone caps. The central bay is the widest and contains the primary entrance at the first floor level. The main entry doors have been replaced and the transoms have been boarded over. A large limestone plaque between the second and third floors bears the name "SCHOOL CITY OF JEFFERSONVILLE COMMUNITY BUILDING." All first floor windows have been boarded over. The outer bays are the narrowest, with two evenly-sized bays between the outer bays and the central bay. The second and third floors retain their original steel sash windows.

5. House, 419 Francis Court (#019-305-58115)

This c.1930 bungalow reflects the influence of the Craftsman style in its low form and divided-lite windows. The roof features a combination of hipped and gabled masses. The exterior is clad in dull orange brick with simple wood trim.

6. School Building 4, Franklin Square (#019-305-58228)

School Building 4 was built c.1930 and reflects the influence of the Art Moderne style in its simple form and fenestration. The building is clad in red brick with limestone trim. The primary entrance façade is divided into three bays. The central bay projects slightly and contains an entry door with limestone surround. The double entry doors have been replaced and the transom is boarded over. The limestone door surround extends up to enclose a window at the second floor level. All windows are boarded over. The roof is trimmed by a tall limestone band and radiused limestone coping.

House, 622 Mechanic Street (#019-305-58332)

This gable-front Craftsman Bungalow was built c.1920. The house rests on a rock face concrete block foundation. The front porch features tapered brick piers and brick knee walls supporting Tudor-arched beams. The house is clad in wood clapboard siding. The windows are double-hung wood sash with divided-lite upper sashes over single-lite lower sashes.

7. House, 629 Mechanic Street (#019-305-58334)

This Craftsman Bungalow was built c.1920. It features a side-gabled roof and a shed-roofed dormer, both trimmed with knee braces. An incised porch extends across the façade at the first floor level. The foundation is of rock-face concrete block and the porch knee walls and piers are of red brick with limestone trim. The porch beams feature Tudor-arch shapes. The house is clad in wood clapboards. The first floor façade features a central entry door flanked by six-over-one double-hung wood sash windows. The face of the dormer features a bank of three four-over-one double-hung wood sash windows.

8. Commercial Building, 640 Mechanic Street (#019-305-58303)

This Italianate commercial building was built c.1880. The first floor storefront has been infilled with brick veneer and smaller openings but the metal storefront cornice and stone sill remain intact. The second floor of the façade contains three evenly-spaced two-over-two double-hung wood sash windows with limestone sills and metal lintels. Three chimneys rise from the hipped roof along the north elevation. The secondary elevation along Seventh Street features windows matching those of the front façade. This wall shows evidence of painted signs.

9. House, 818 Meigs Avenue

This c.1885 house reflects the influence of the Italianate style with its tall, narrow windows, deep cornice, and low hipped roof. The house retains its original wood window casings and a porch with turned posts and corner brackets. The exterior has been clad in vinyl siding, windows have been replaced, and the front door has been downsized.

10. House, 519 E. Ninth Street (#019-305-58411)
This c.1940 American Small House features as side-gabled roof with a front-facing gabled mass. The exterior is clad in red brick and features divided-lite windows. A small gabled entry porch with unornamented wood posts shelters a side entrance, while the recessed front entry is covered by an aluminum awning. The house retains its historic wood windows and entry door.

11. House, 713 E. Seventh Street (#019-305-58381)
This Craftsman Bungalow was built c.1915. It rests on a rock-face concrete block foundation and features a gable-front roof. The first floor is clad in wood clapboard siding while the gable is clad in wood shingles. The façade is divided into two bays. The west bay contains an incised porch with Tudor-arched beams and a concrete Ionic column resting on a rock-face concrete block pedestal. The porch shelters a 2/3 glazed wood door and sidelights with Craftsman-style muntin patterns. The east bay contains one twelve-over-one double-hung wood sash window. The gable contains a pair of divided-lite casement windows.

12. House, 921 E. Seventh Street (#019-305-58390)
This gable-front Craftsman Bungalow was built c.1920. The house rests on a rock face concrete block foundation. The front porch features tapered brick piers and brick knee walls supporting Tudor-arched beams. The house has been clad in vinyl siding but the corner boards, window trim and gable stickwork remain visible. The windows are double-hung wood sash with divided-lite upper sashes over single-lite lower sashes. The roof retains ornamental metal cresting. An exposed brick chimney rises along the east elevation.

13. House, 904 E. Seventh Street (#019-305-58386)
This one-story Italianate house was built c.1870. It has a cross-gabled form and is clad in wood clapboard siding. The front façade is divided into three bays. The eastern two bays each contain one four-over-four double-hung wood sash windows with paneled wood frames and bracketed wood window hoods. The west bay contains a recessed entry with a paneled wood frame similar to those of the adjacent windows. The entry contains a 2/3 glazed paneled wood entry door. The gable contains an arched attic vent with scroll-sawn wood trim and a wood drip mold. A cornice with scroll brackets trims the eaves.

14. House, 826 Walnut Street (#019-305-58297)
This Queen Anne cottage was built c.1901. It rests on a brick foundation and is clad in vinyl siding with wood fish scale-shingled gables. The house has a cross-gabled plan with a hipped and gabled roof. The front-facing gable contains one one-over-one double-hung wood sash window at the first floor sheltered by a bracketed hood with ball and stick fretwork and a metal hipped roof. This is topped by a semicircular attic window set into the shingled gable and sheltered by a smaller hood similar to that below. The soffits are trimmed with wood dentil moldings. A corner porch features Tudor-arched beams and a brick column and knee walls. The porch shelters a fully-glazed wood entry door. A gabled bay window projects from the south elevation with a bracketed corner featuring ball and stick fretwork. The property is fronted by a limestone retaining wall.

15. House, 834 Walnut Street (#019-305-58300)
This red brick Italianate house was built c.1870. The front façade is divided into two unequal bays. The larger north bay is accented by a gable rising from the house's hipped roof. A central pavilion projects from the façade containing two one-over-one double-hung wood sash windows with limestone lintels. The smaller south bay contains a recessed entry framed by a semicircular arch. This entry shelters a fully-glazed wood entry door. The soffits are trimmed with wood dentil moldings.

16. House, 820 N. Meigs Avenue (#019-305-58325)
This red brick Queen Anne cottage was built c.1890. The house rests on a brick foundation and has a cross-gabled roof. The front-facing gable shelters a projection with clipped corners forming a three-sided bay window. The central window is a large Queen Anne window with divided-lite sash, while the two side windows are one-over-one double-hung wood sash windows. The windows have limestone sills and segmental brick-arched heads. The clipped corners are trimmed with scroll-sawn brackets supporting a wood frieze. The gable itself is clad in metal shingles. An elaborate wood porch featuring scroll-sawn fretwork and turned porch posts wraps around the south side of the house.

17. House, 823 N. Meigs Avenue (#019-305-58326)
This gable-front brick shotgun house was built c.1870. The house features a two-bay façade with a two-over-two double-hung wood sash window in the north bay and a half-glazed paneled wood entry door with transom in the south bay. Both openings are topped by limestone lintels with chamfered and scalloped decoration, reflecting the influence of the Italianate style. The gable contains an attic vent with a triangular top. Shaped rafter tails trim both ends of the gable.

18. House, 903 N. Meigs Avenue (#019-305-58328)
This one-story brick Italianate house was built c.1860. The primary façade is divided into three bays, with a recessed entry in the south bay and two-over-two double-hung wood sash windows in the other bays. The windows have limestone lintels and sills and are topped by bracketed wood window hoods. The recessed entry features a paneled door surround with a scroll brackets supporting a wood hood. The entry door is a 2/3 glazed paneled wood door. A wing projecting from the south elevation is set back from the front façade but contains a secondary entrance. The façade of this wing contains one window matching those of the front façade and a smaller recessed entry similar to the front entrance. Dentil molding trims the soffits and corbelled brick chimneys rise from the hipped roof. A vinyl-sided addition extends from the rear of the house.

Representative Sampling of Additional Clarksville Properties Within Extensions to Original APE (See Figure 4.3-5)

The Extension to the Original APE in Clarksville is comprised primarily of traditional, single family residential development along with some commercial development at or near major intersections. Clark Boulevard represents the western edge of the sub-area, and I-65/Brown's Station Way serves as the eastern boundary.

The northern half of this area contains the most intact concentration of single-family, detached residences—a majority of which are 1 story structures. Many of the homes were built in the 1930s and 1940s, and exhibit characteristics typically found in the American Small House style. Nearly all of the street blocks have alleys accessing detached garages. Throughout these residential neighborhoods, there are 2-way streets with on-street parking and sidewalks found intermittently throughout the area. These sidewalks are either directly adjacent to the street or separated by a grass strip between the sidewalk and street. South Clark Boulevard (between Harrison Street and Arlington Avenue) features a wide grass median containing a number of mature trees. Although some individual homes in the neighborhood have mature trees that are visible from the street, there are only a few trees found along the roadways, scattered throughout the area. Approximately one block north of Harrison Street, a small creek and associated natural/wooded area traverses the Clarksville sub-area.

Brown's Station Way (SR 62) is a limited access arterial connecting Clarksville to New Albany. It is comprised of two travel lanes in each direction that are separated by a grass median. The corridor is characterized by heavy commercial and some industrial developments that back up to this roadway. There are also limited views of salvage yards and mineral extraction activity southwest of the Brown's Station Way and Lewis and Clark Boulevard interchange, as well as limited views of older residential developments farther north. The character of the remaining Brown's Station Way corridor extending to the New Albany limits contains limited development, and significant wooded areas lining the roadway, including views of the Silver Creek riparian area.

The following representative sampling of properties were identified within the Clarksville Extension to the APE:

1. Clark Boulevard Historic District

The Clark Boulevard Historic District was identified as eligible for the NRHP for its association with architecture. The houses are all vernacular and Cape Cod in design and all are described as American Small House that date to the 1940s. The district is comprised of eight contributing structures along North Clark Boulevard.

2. Randolph Avenue Historic District (Potential)

Although the proposed Randolph Avenue Historic District was not identified in the 2011 *Clark County Interim Report* update, the resources that comprise the proposed district were identified as "Contributing" resources that "can be listed in the National Register of Historic Places if they are part of an historic district, but would not usually qualify individually." The proposed district

includes seven houses: 120, 124, 128, 132, 136, 140, and 142 North Randolph Avenue. These houses were all built in the range of c.1935 – c.1940 and exhibit characteristics of the American Small House or English Cottage styles. The houses feature a uniform setback and spacing along the east side of Randolph Avenue and are distinct from adjacent buildings in their form and style. All utilize red brick with limestone accents and feature similar roof pitches and heights.

The proposed Randolph Avenue Historic District reflects the housing trends of middle and working class American families during the 1930s and early-1940s, prior to the onset of the postwar Baby Boom and suburban sprawl tract housing. This housing also reflects the continued prosperity of Clarksville's industries during the Great Depression and early years of World War II. The continued presence of the Colgate-Palmolive Company and other manufacturers contributed to this growth.

3. Colgate School, 230 E. Montgomery Avenue (#019-446-64119)

The Colgate School was built in 1925 and was designed by architect O. W. Holmes. The building reflects the influence of the Classical Revival style in its symmetrical façade and entrance porches. The primary façade is divided into three bays. The outer bays project and feature panel motifs in brick and limestone. The central bay is recessed and is subdivided into three smaller bays. The central bay at the first floor contains an entrance with a semicircular fanlight. The entrance doors have been replaced. This entrance is sheltered by a porch featuring round Tuscan columns and square Tuscan pilasters supporting an entablature topped by a wrought-iron railing. The porch if flanked by two window openings containing paired six-over-six double-hung windows. The transoms of these windows are boarded over. The second floor of this section contains three banks of tripartite windows with six-over-six double-hung wood sash windows. A sheet metal cornice and simple brick parapet trim the top of the façade. Windows along the secondary elevation facing State Street are partially boarded over. A small gabled entrance porch is located on this elevation.

4. Railroad Viaduct, Near Clark Boulevard and Winbourne Avenue (#019-446-64155)

This railroad viaduct was built c.1918. It is supported by rock-face limestone abutments with rusticated rock-face limestone coping. Steel columns with X-bracing support the middle of the span and are encased in a battered concrete base. Steel girders support wooden railroad ties and steel tracks above.

5. Railroad Bridge, N. Clark Boulevard (#019-446-64120)

This railroad bridge was built c.1870. It features stepped rock-face limestone retaining walls at either side of limestone arches fronting a brick barrel vault. The railroad tracks have been removed and the bridge is now incorporated into a walking trail.

6. Commercial Building, 228 Stansifer Avenue (#019-305-64122)

This Craftsman bungalow and commercial building was built c.1925 and represents an unusual mixed-use application of the Craftsman bungalow form. The building features a front-gabled jerkin head roof. The east half of the first floor features an open arcade with two semicircular-arched openings. The west half contains a storefront with recessed entry and display windows.

The gable above contains a pair of one-over-one double-hung wood sash windows and features knee braces supporting the eaves. Shed-roofed dormers project along both side elevations.

7. House, 301 W. Harrison Avenue (#019-446-59015)

This Queen Anne style house was built c.1890. It rests on a brick foundation and has a side-gabled roof. The first floor of the façade is divided into two bays. The west bay contains a half-glazed paneled wood entry door and a turned corner containing one one-over-one double-hung window. All double-hung windows are one-over-one double-hung vinyl replacement sash. This bay is sheltered by a porch with square posts and a brick foundation. The east bay of the first floor contains a projecting bay window with a hipped roof. The first floor is clad in wood clapboard siding. The second floor contains a large dormer in the form of a three-sided bay window clad in wood shingles. The center bay of this dormer contains a large fixed sash window while the others contain double-hung sash. A paneled wood band trims the top of these windows. A small hipped roof returns to the face of the shingled gable where two small sliding attic windows are centered.

8. House, 648 North Clark Boulevard (#019-446-64052)

This c.1935 English Cottage features a steeply-pitched gabled roof and multi-colored brickwork. Limestone accents surround the entrance door and the base of the adjacent chimney. The primary opening in the front-facing gable contains a large window opening with a bank of replacement sash. A fanlight accents the attic level of the gable.

9. House, 307 West Harrison Avenue (#019-446-59016)

This c.1930 English Cottage has a side-gabled roof and a red brick exterior. Limestone trim surrounds the arched entry door. A chimney rises from the corner of the gabled entry pavilion. All windows have been replaced and false shutters have been attached to the walls at each side of the window openings. The house's integrity has been compromised by the installation of replacement windows and the entry door.

Representative Sampling of New Albany Properties
Within Extensions to Original APE (See Figures 4.3-6a and 6b)

The Extension to the Original APE in New Albany encompasses much of the downtown area and extends from just west of I-64, south along the riverfront/floodwall, east to Silver Creek, and to the north approximately along Shelby Street. Much of the area is single-family residential, with new commercial development characteristic of the Vincennes Street corridor, industrial uses along the southern portion, and typical commercial/retail uses and governmental functions in the west.

Similar to Clarksville residential areas, the residential subareas are single-family, detached residences—the majority of which are one story structures. Many of the homes were built in the 1930s and 1940s and exhibit characteristics typically found in the American Small House style. Although some of the residential street blocks have alleys accessing detached garages, more recent housing provides access from the street. Throughout these residential neighborhoods, there are 2-way streets with on-street parking. Sidewalks are generally provided in pre-WW2 developments and most are separated from the street by a grass strip that contains a few mature trees.

The Vincennes Street corridor, which bisects Spring Street, is characterized primarily by commercial development. This development includes both new, suburban-style 1-story structures separated from the street by parking areas and redeveloped traditional 2- and 3-story commercial buildings immediately adjacent to the sidewalk. The corridor includes 2-way traffic with limited, on-street parking and continuous sidewalks. These sidewalks are either directly adjacent to the street or separated by a grass strip between the sidewalk and street.

The development within downtown New Albany area east of I-64 is comprised almost entirely of commercial (professional offices) and institutional/government uses. This includes city-county government offices, a public library, and a federal courthouse. The traditional street grid contains a series of one-way streets containing 2-3 travel lanes with turn lanes at intersections. Nearly all of the blocks have mid-block alleys accessing parking, delivery areas, or similar service areas. A number of these downtown streets also include on-street parking, trees and raised plantings, as well as other decorative street furniture.

The downtown New Albany area west of I-64 is comprised of a mix of land uses including residential, commercial, light industrial uses, and some vacant parcels. Similar to the rest of the downtown, the traditional street grid is comprised of a series of one-way streets containing two travel lanes with some on-street parking. These blocks also contain mid-block alleys that serve both businesses and residences. However, although this area contains continuous sidewalks, there are very few trees or other streetscape features.

The following representative sampling of properties were identified within the Extensions to the Original APE in New Albany:

1. New Albany Downtown Historic District (#043-446-12001 to 213)

The New Albany Downtown Historic District was listed in the NRHP in 1999. The district generally lies along Main, Market, and Spring streets, from State Street to Fifth Street. New Albany was one of the largest and most prosperous cities in Indiana in the 1800s. Its favorable position on the Ohio River and several rail lines made it a center of shipping, commerce, and industry. In the early to mid 19th century, the economy was based on steamboat building and shipping; following the Civil War, it was a center for glass production.

The district contains a significant collection of commercial buildings that were constructed above the riverfront and date from the first half of the 19th century. Eventually, religious, residential, and other types of buildings were integrated with the commercial buildings, many surviving today. Generally, the oldest buildings are located along Main Street, which is significant for its high concentration of Federal and Greek Revival style buildings.

As part of the *1994 New Albany Interim Report*, 211 historic resources were surveyed within the district, including 133 identified as contributing to the district.

2. Mansion Row Historic District (#043-446-13001 to 267)

The Mansion Row Historic District in New Albany was listed in the NRHP in 1983. The district generally lies between Floyd and Market streets, from Second Street to Fifteenth Street.

The district is significant for its association with the development of New Albany and for its excellent examples of 19th century commercial and residential architecture. Most of the oldest remaining residences exhibit the restrained Federal style. Later residences became more elaborate as the city grew and prospered; Upper High Street (later renamed East Main Street) was the fashionable address for New Albany's 19th century elite.

The Indiana State Bank Building, the first bank in New Albany, built in 1837, and the Isaac Smith House at 523 East Main Street, built in 1840, are excellent examples of the Greek Revival style. The Merchant's Bank Building, built in 1869, and the Sloan-Bicknell-Paris House (600 East Main Street) represent the Italianate style. The oldest residence (106 East Main Street) is that of Joel Scribner, one of the founders of New Albany. The Italian Villa style is demonstrated by the residence at 1003 East Main Street. Washington C. DePauw, one of the wealthiest men in the state, lived in the Second Empire residence at 714 East Main Street. William Culbertson built the Second Empire style mansion at 916 East Main Street, which is now a state historic site. One of the significant churches in the district is St Paul's Episcopal Church, a Gothic Revival style building constructed in 1895.

As part of the *1994 New Albany Interim Report*, 267 historic resources were surveyed within the district, including 179 identified as contributing to the district.

3. East Spring Street Historic District (#043-446-14001 to 450)

The East Spring Street Historic District in New Albany was listed in the NRHP in 2002. The district generally lies along Spring, Market, and portions of Elm streets, from Fifth Street on the west to Vincennes Street on the east.

The district developed between 1840 and 1920, generally as a middle to upper-middle class neighborhood. Its development is related to the industrial growth of New Albany as the city outgrew its original plan due to success in the steamboat building industry. Large residential plats were made to the east and west, starting in the 1830s. Lots are generally larger on Market Street; houses are smaller and less elaborate moving northwards.

One of the oldest houses in the district is the Metchell-Wolf-Easley House, a substantial two-story brick house at 613 East Spring Street built in 1847. Among other impressive dwellings are a Second Empire style house at 1420 East Market Street, a Queen Anne style house at 1119 East Spring Street, and a Colonial Revival style house at 1001 East Spring Street. In addition, there are many good examples of vernacular house types, including gabled-ell, cross-plan, and shotgun. There are also several churches and commercial structures within the district.

As part of the *1994 New Albany Interim Report*, 450 historic resources were surveyed within the district, including 352 identified as contributing to the district.

4. Cedar Bough Historic District (#043-446-16001 to 027)

The Cedar Bough Historic District in New Albany was listed in the NRHP in 2008. The district lies along Cedar Bough, a residential extension of East Thirteenth Street between Elkin Avenue and Beeler Street.

The land was undeveloped until the late 19th century. When development began, quality of the construction caused Cedar Bough to be considered one of New Albany's most prestigious addresses. Houses in the district, built between 1890 and 1910, are mostly Queen Anne style houses, with cross-plan and composite cottages featuring Queen Anne style detailing. The house at 831 Cedar Bough Place is the most elaborate example of the style. Other structure styles represented in the district include American Four-square, Bungalow, and Craftsman.

As part of the *1994 New Albany Interim Report*, 27 historic resources were surveyed within the district, including 22 identified as contributing to the district.

5. Shelby Place Historic District (#043-446-18001 to 030)

The Shelby Place Historic District in New Albany was listed in the NRHP in 2008. The district lies along Shelby Place, a residential block between East Fifteenth Street and Vincennes Street. Shelby Place was developed within a short period of time soon after the turn of the 20th century. Previously, it had been a lumber yard. An esplanade runs through the center of this short street. Houses were built within a short period of time and are similar in size, scale, materials, and detailing. Most are modest middle-class houses of the Craftsman, Bungalow, or Colonial Revival styles. The district has a high degree of integrity.

As part of the *1994 New Albany Interim Report*, 30 historic resources were surveyed within the district, including 29 identified as contributing to the district.

6. Northside Industrial Historic District (#043-446-11001 to 008)

The Northside Industrial Historic District in New Albany is bounded by Culbertson Avenue to the north, East Fourth Street to the east, Oak Street to the south, and Pearl Street to the west. The district retains a high concentration of 19th century and early 20th century industrial buildings. The oldest among them is the New Albany and Salem Railroad Station/Train Shed, built around 1851. Listed in the NRHP, it is the oldest surviving structure associated with the railroad.

The building at 627 East Fourth Street, built in 1854, was the New Albany Gas and Lighting Company. The outstanding Italianate style building at 401 East Fourth Street, built around 1875, was the beam house for the Day Leather company Tannery. The building just to the north dates from about 1905 and contained the vats and leather storage for the company.

7. Oak Street Historic District (#043-446-15001 to 622)

The Oak Street Historic District in New Albany generally follows Elm Street, Oak Street, Culbertson Avenue, and Elkin Avenue, between Fourth Street on the west and Vincennes Street on the east.

With the industrial expansion of the 19th century, the population grew rapidly. The steamboat industry ended after the Civil War, but the glass industry took its place. When several glass industries failed in the 1920s, the economy went into a recession, population began to decline, and house construction nearly ceased. Up until this point, houses were being rapidly constructed in the Oak Street neighborhood. The area is a cohesive, working class, residential area that developed between 1840 and 1920. Most houses are examples of vernacular types (shotgun, cross-plan, gabled-ell, and gable-front), with a few examples of high style residences, stores, and churches.

As part of the *1994 New Albany Interim Report*, 622 historic resources were surveyed within the district, including 462 identified as contributing to the district.

8. Catherine Place Historic District (#043-446-17001 to 024)

The Catherine Place Historic District in New Albany lies along Catherine Place, a residential block between Elkin Avenue and Beeler Street. The district was part of the Lowery estate. The Lowery House was situated near the north end of the west side of the street, near a 1960s era apartment building today. The street was developed by John Verina shortly after the turn of the 20th century. Many of the houses were built by Verina to be rentals and are similar in appearance. The majority of structures are composite cottages or bungalows.

As part of the *1994 New Albany Interim Report*, 24 historic resources were surveyed within the district, including 18 identified as contributing to the district.

9. East Residential Historic District (#043-446-21001 to 545)

The East Residential Historic District in New Albany is generally bounded by Division Street to the south, Silver Street to the east, Shelby Street to the north, and Vincennes Street to the west.

The East Residential Historic District represents residential growth in New Albany in the late 19th and early 20th centuries. Houses in the western part of the district were generally built in the late 1800s prior to an economic recession, followed later by the eastern portions in the 1910s and 1920s. The neighborhood is historically a working and middle class neighborhood. The earlier developments generally do not include garages, have smaller lots, and include composite cottages, cross-plan cottages, bungalows, and small shotgun style houses. Larger houses include those of the Italianate, Queen Anne, and American Four-square styles. The district has a few non-residential buildings, indicating that the commercial areas were well established by the time the neighborhood was developed.

As part of the *1994 New Albany Interim Report*, 545 historic resources were surveyed within the district, including 484 identified as contributing to the district.

10. Silver Grove Historic District (#043-446-22001 to 641)

The Silver Grove Historic District in New Albany is generally bounded by Silver Street on the west, Rear Market Street on the south, Beharrell Avenue on the east, and Beeler Street on the north. Silver Grove was established in 1886 as a separate town. With additions, the town boundaries were roughly Silver Street on the west, Willow Street on the south, Beharrell Avenue on the east, and Charlestown Road on the north. The streetcar line extended from New Albany, enabling Silver Grove to become a suburb. The town was annexed in 1914 but continued to maintain its identity as a neighborhood.

Historically, Silver Grove was a community of modest, middle class houses. Among house types found in the district are cross-plan, gabled-ell, shotgun, and composite cottages. The most common style is the Bungalow. The town hall was located in a building on the west side of Indiana Avenue near the corner of Shelby Street. The Advent Christian Church, built in 1891, remains as a neighborhood focal point. At one time, Silver Grove had a number of stores and light industries; few of these remain. One which does is a popular ice cream eatery, Emery Ice Cream, built in 1930.

As part of the *1994 New Albany Interim Report*, 641 historic resources were surveyed within the district, including 523 identified as contributing to the district.

11. Glenwood Historic District (#043-446-23001 to 040)

The Glenwood Historic District in New Albany follows Glenwood Court and Glenwood Park, both dead-end streets of Beharrell Avenue.

Glenwood is a small residential neighborhood which was developed between the late 1930s and the early 1950s. An amusement park known as Glenwood Park was established on the site in 1903. The park, which was a popular regional attraction, had a theater, baseball diamond, bowling alley, pond, band stand, and dance hall. The 1917 tornado destroyed some of the park buildings; the 1937 flood caused its ultimate demise.

The short period in which the houses were built represents the rapid expansion of housing in the New Albany area during and after World War II. Glenwood was a middle to upper-middle class

neighborhood. The houses are set back from the street on large parks. Period Revivals are predominant, including the Colonial Revival style house at 2523 Glenwood Park, the Jacobethan style cottage at 2509 Glenwood Court, and several simple brick Upright-and-wing cottages on Glenwood Court.

As part of the *1994 New Albany Interim Report*, 40 historic resources were surveyed within the district, including 38 identified as contributing to the district.

12. West End Historic District (#043-446-08001 to 182)

The West End Historic District in New Albany generally lies along Market and Spring streets, from the creek to Sixth Street. The West End Historic District represents the oldest intact working class neighborhood in New Albany. It was a part of an early addition to the city, just west of the original plat, and was first developed in the late 1830s. The West End was historically a working class neighborhood, housing the families of carpenters and laborers.

The historic district contains a fine collection of vernacular house types. Among notable examples are a shotgun cottage at 605 West Spring Street and a cross-plan cottage at 708 West Spring Street. There is one rare example of an early dogtrot cottage at 806 West Market Street, although this has been altered to some extent. There are some good examples of academic styles in the historic district. One of these is the Greek Revival style Woodward House, built in 1837. Another Greek Revival style building located at 702 West Market Street has served as a neighborhood grocery since about 1860.

As part of the *1994 New Albany Interim Report*, 182 historic resources were surveyed within the district, including 138 identified as contributing to the district.

13. House, 210 W. Main Street (#043-446-34213)

This Federal style house was built c.1830. It features Flemish-bond brickwork and flared brick lintels above window and door openings. The façade is divided into three bays, each containing one opening at each floor. The outer openings at the first floor contain doors and transoms, with both the doors and the transoms being contemporary replacements. The other openings contain one-over-one double-hung windows with limestone sills. A simple frieze trims the edge of the side-gabled roof. A chimney rises from the west gable.

14. Industrial Building, 315 W. Main Street

This brick industrial building was built c.1890. The façade is divided into five bays by brick pilasters. The central and outer bays each contain one window opening. These openings contain one-over-one double-hung replacement windows within the segmental-arched openings with corbelled brick hoods. The remaining bays contain door openings with contemporary infill. The upper part of each bay contains corbelled brickwork. A paneled brick parapet conceals the building's low gabled roof. The west elevation retains its historic six-over-six double-hung wood sash windows at the first floor and divided-lite windows at the basement level.

15. Commercial Building, 320 W. Main Street

This c.1870 commercial building is clad in red brick and has stone lintels and window hoods. The second and third floors of the facade each contain three window openings, all infilled with brick or sheet metal. The storefront is entirely concealed by metal siding and a metal-sided pent roof. The parapet shows signs of a cornice that has been removed. The storefronts have been concealed by infill and metal siding and a metal-sided pent roof has been constructed across the façade. Four of the six window openings at the second and third floors have been infilled with brick while the remaining two have been downsized and infilled with sheet metal.

16. Commercial Building, 402 W. Main Street

This small commercial building was built c.1920 and features an unusual exterior design utilizing concrete block components. The one-story building has a façade divided into three bays. The central bay contains the door opening flanked by one window opening in each of the outer bays. All openings are boarded over. The building is composed of a variety of rock-face and smooth-face concrete block components. Either side of the façade is lined by rock-face concrete block pilasters with chamfered edges. The three openings are topped by rusticated concrete block units. The area below the window sills is clad in small rock-face blocks, as is the parapet. The upper portion of the parapet features crenellations topped by molded concrete capitals, reflecting the influence of the Late Gothic Revival or Collegiate Gothic. The building has many early-20th century concrete block components commonly used for porch columns and piers. This distinctive design represents a unique application of concrete block components for the construction of a highly-ornamented small building.

17. Commercial Building, 131 W. Market Street (#043-446-34211)

This commercial building was built c.1925 and reflects the influence of the Mission style in its shaped parapet. It is likely associated with early 20th century commerce in New Albany, likely automobile related commerce, and retains a moderate to high degree of integrity. The building features a three-bay storefront containing historic metal storefront glazing components and a recessed entry with textured glass. The brick façade and stone coping have been painted. The building's form and design suggest that it may have been built for an automobile dealership.

18. House, 308 W. Market Street (#043-446-34242)

This vernacular side-gabled frame house was built c.1830. The façade is divided into two bays, with one opening per bay on each floor. The east opening at the first floor contains a half-glazed paneled wood entry door topped by a transom. The other openings contain six-over-six double-hung wood sash windows. The second floor windows feature projecting molded wood lintels. A c.1920 hipped roof porch with square posts extends across the first floor of the façade. The original clapboard siding remains exposed.

19. House, 314 W. Market Street (#043-446-34240)

This T-plan Queen Anne Cottage was built c.1910. The house features a front porch composed of concrete block components. Rock-face piers support round columns with rock-face banding and square capitals. Concrete balustrades trim the porch. The porch roof features a wood frieze with dentil moldings and a curved corner. The front gable of the house contains a large window

at the first floor composed of a large fixed sash flanked by two narrow sashes and topped with a stained and leaded glass fanlight. The front door retains a historic wood storm door.

20. Hoosier Fire Station #3, 319 W. Market Street (#043-446-34244)

The Greek Revival style Hoosier No. 3 Fire Station was built in 1855 to house a fire company established in 1839. The façade is divided into three bays, with the center bay slightly recessed. At the first floor level, the outer two bays each featured rusticated limestone columns flanking paneled doors with glazed upper halves and four-lite transoms. The columns support a Doric entablature. The center bay of the first floor currently contains a glazed paneled wood garage door with bead-board siding above. This door is a later addition and the columns at either side have been cut back to accommodate a wider opening. The entablature above this door features raised stone letters bearing the name of "HOOSIER No. 3." At the second floor level, the outer bays each contain one six-over-six double-hung window with a segmental-arched head. These windows are set between paneled pilasters. Stone plaques with stucco frames are set into the façade above each window. The west plaque reads "INSTITUTED MAY 30, 1839," while the east plaque reads "ERECTED A.D. 1855." The center bay contains a large twelve-over-twelve double-hung wood sash window with a molded stucco surround. A wood cornice trims the top of the building. Few mid-19th century firehouses survive in Indiana and this building is a distinctive high-style example of this rare building type

21. House And Industrial Building, 2115 E. Market Street

These two concrete block buildings appear to represent the work of an individual builder utilizing decorative concrete block components. The western building, apparently built as a residence, is a one-story concrete block building with a flat roof. The building's exterior is clad in rock-face concrete block up to the sill level of the first floor windows, where the sill forms a projecting smooth concrete block band that encircles the building. The walls are stuccoed above this level. The building's windows are four-over-one divided-lite wood sash windows reflecting the influence of the Craftsman style. One window has been replaced with a vinyl replacement window. A gabled roof over the entry door also reflects the influence of the Craftsman style in its knee braces. The roof is surrounded by a balustrade made up of concrete block components including turned balusters, pedestals, and ball finials. The balustrade has been covered with plywood along the façade. The eastern building, apparently built for industrial uses, is clad in rusticated concrete block and features a barrel vaulted roof with a stepped parapet at the front façade. The building has two steel sash windows flanking a central entry door. The stepped parapet features ball finials at either end of the façade.

22. House, 207 W. Spring Street (#043-446-34203)

This c.1890 Queen Anne style house features a hipped roof central block with gabled projections. The front facade features porches at the first and second floor level with some historic fretwork remaining. A diamond-shaped stair window is visible on the side elevation. The house has been clad in vinyl siding. The house has been clad in vinyl siding and all window and door trim appears to have been covered with aluminum. Perforated vinyl siding indicates the presence of attic vents that have been concealed by the siding. Although the upper fretwork of the front porch remains intact, the porch posts have been cut off below the fretwork and replaced with contemporary stock turned porch posts. A surviving engaged porch post indicates that the

new posts do not reflect the original design. Railings at the porch and balcony have been replaced by new railings with turned spindles that do not match the heights of the original railings. While the visible windows appear to retain their historic sash behind storm windows, it is unclear whether other window openings have been concealed by the vinyl siding.

23. James Carr House, 217 W. Spring Street (#043-446-34202)
This Italianate house was built in 1853. If features a narrow rectangular plan more commonly seen in Kentucky than Southern Indiana. The façade is two bays wide with one opening per bay on each floor, reflecting the simple fenestration of the Federal style. The eastern opening on the first floor contains a paneled wood door with transom. The other openings contain six-over-six double-hung windows with limestone sills. The façade is topped by a bracketed cornice along the edge of the side-gabled roof.

The house was given an "Outstanding" rating in the *1994 New Albany Interim Report*, meaning that "the property has enough historic or architectural significance that it is already listed, or should be considered for individual listing, in the National Register of Historic Places."

24. Rose-Friend House, 229 W. Spring Street
The Rose-Friend House was built c.1855. It reflects the influence of the Italianate style in its tall, narrow windows and bracketed door surround. All windows are one-over-one double-hung wood sash windows with storm windows. The façade is divided into five bays with the central three bays projecting forward under a gable with an arched attic window. The central bay of the first floor contains the main entrance with a bracketed wood door surround. Other bays contain one window opening with a limestone sill and lintel at each floor. The house features elaborate Italianate side porches with brackets and chamfered columns.

25. Double House 219 - 221 W. Lafayette Street (#043-446-34246)
This gable-front Italianate double house was built c.1860. The façade is divided into four bays, each with one opening at the first and second floors. The outer bays contain the entrances to both houses. These entrances feature transom bars with dentil molding and gabled pediments. The doors have been replaced with contemporary steel entry doors. The other bays each contain one six-over-six double-hung window with trim matching that of the door openings. The gable contains a louvered attic vent with a triangular cap and molding similar to the other window trim. The original clapboard siding has been covered with vinyl siding and the scrolled cornice brackets have been removed. The siding has been fitted around the window trim, leaving all of the trim intact.

26. House 225 W. Lafayette Street (#043-446-34245)
This gable-front Greek Revival house was built c.1850, with a front porch added c.1905. The façade of the house is divided into three bays, with one opening per bay at each floor. The south bay contains a recessed entry with a fully glazed wood door. The other two bays at the first floor contain floor-length window openings that are currently boarded. At the second floor, the outer bays each contain one six-over-six double-hung wood sash window. The center bay contains a pair of four-lite casement windows. An attic vent centered in the gable has been covered with vinyl shutters and vinyl louvers. The original clapboard siding has been covered with vinyl

siding. The porch features a concrete floor, rock-face concrete block piers supporting square brick columns, turned wood balusters, and scrolled stone brackets flanking the front steps.

27. House, 415 E. First Street

This vernacular gable-front house was built c.1870. It has a narrow plan with a two-bay façade. Each bay contains one opening per floor. The south opening of the first floor contains the entrance door and transom. The door has been replaced with a contemporary steel entry door. The other openings contain one-over-one double-hung vinyl replacement sashes. The roof is lined by a simple frieze and cornice returns, with a central circular vent in the gable. A hipped-roof porch spans the front façade at the first floor. The porch posts are square wood posts with paneled bases and fluted upper sections trimmed by scroll-sawn brackets reflecting the influence of the Italianate style. The site also retains a limestone retaining wall along the sidewalk.

28. House, 419 E. First Street

This vernacular side-gabled house was built c.1870. It has a narrow plan with a two-bay façade. Each bay contains one opening per floor. The south opening of the first floor contains the entrance door and transom. The door is a half-glazed paneled wood door. The other openings contain one-over-one double-hung wood windows. The roof is lined by a simple projecting box gutter. A hipped-roof porch spans the front façade at the first floor. The porch posts are square wood posts with scroll-sawn brackets and fretwork reflecting the influence of the Stick or Eastlake style. The site also retains scrolled limestone brackets flanking the front steps.

29. Commercial Building, 502 State Street

This three-story brick commercial building was built c.1850 and reflects the influence of the Federal and Greek Revival styles in its simple massing and fenestration. The first floor storefront is divided into three bays by limestone columns with Doric capitals and chamfered edges. These columns support a simple stone entablature. The storefront openings have been in-filled with contemporary materials. The second and third floors each have three window openings per floor. The windows have been replaced with single-lite replacement sash but the limestone lintels and sills remain intact. Two S-shaped tie rod brackets are found on the façade between the second and third floors. The building has a low hipped roof with a parapet along the north side. The south elevation along Elm Street features upper floor openings matching those of the front façade. The storefront returns along this elevation for the depth of one bay.

30. Commercial Building, 504 State Street

This one-story commercial building was built c.1905 and reflects the influence of the Colonial Revival style. The façade features two openings, a storefront window and an entrance door. The storefront window is a large segmental-arched opening with a stone keystone and stone accents at the spring of the arch. The window openings retains its two operable five-lite transom sashes. The door opening features a semicircular arch with a keystone and stone accents at the spring of the arch. The door has been replaced but the leaded glass fanlight remains intact. The façade is topped by a simple brick parapet. Wood pilasters and a small roof have been applied around the door opening at a later date.

31. Commercial Building, 638-642 State Street
This commercial building was built c.1950 and appears to have incorporated earlier buildings on the site. The building features a rock-face random ashlar façade. The southernmost section of the building appears to have incorporated an earlier gable-front building and evidence in the façade suggests that it was connected to the building at a later date. The central section is a two-story structure, while the north portion is one story in height. The building features aluminum storefront in all first floor openings except one door containing wood infill and a contemporary steel entry door. The second floor openings contain one-over-one double-hung replacement windows.

32. Marble Works Building, 501 W. Pearl Street (#043-446-34200)
The Marble Works Building was built c.1920 and reflects the influence of the Craftsman style in its divided-lite transoms and simple patterned brickwork. The building's façade is divided into six bays. Each bay contains an opening at the main level and a buff-brick panel outline at the parapet. Storefront widows occupy four of the bays. These consist of paired single-lite display windows with divided-lite transoms and limestone sills. A soldier course forms the lintels and divides the lower façade from the parapet. A similar soldier course trims the top of the parapet. In both cases, limestone corner blocks accent these horizontal elements.

The building entrance is set below transoms matching those of the storefront windows. The entrance consists of a pair of ¾ glazed wood entry doors flanked by sidelights. The northernmost bay contains half-glazed divided-lite folding wood paneled garage doors. The building's south elevation along Elm Street extends for two bays. The eastern bay contains a storefront window matching those on the primary façade. The western bay contains a similar window with one-over-one double-hung wood sash windows in place of the fixed display windows

33. Commercial Building, 510-512 Pearl Street (#043-446-34199)
This c.1870 commercial building features a facade divided into five bays by projecting brick pilasters. Segmental-arched window openings have stone sills. The first floor storefront is divided by the pilasters and has been covered in siding at the transom level. Replacement sash at the second floor are covered by metal bars. The parapet shows evidence of a cornice that has been removed. The storefront openings have been infilled and contain smaller replacement windows. The upper part of the storefront is covered in siding and no historic fabric remains visible at the first floor level.

34. House, 1837 Shelby Street
This c.1880 gable-front Italianate house features simple cornice returns and a pedimented window hood supported by wood brackets. A side porch retains its porch posts, brackets, and frieze, with contemporary railings and balusters. The exterior has been covered with vinyl siding and the windows have been replaced.

35. House, 903 Silver Street
This c.1920 gable-front Craftsman Bungalow features a gabled front porch. The porch gable contains a pair of divided-lite wood sash windows and is supported by buff brick piers rising

from a matching knee wall surrounding the porch and an adjacent terrace. The gables are clad in wood shingles while the first floor walls are clad in wood clapboards.

36. Commercial Building, 601-603 Vincennes Street (#043-446-34093)
This three-story brick commercial building was built c.1910 and reflects the influence of the Classical Revival style in its cornice details. The first floor of the primary façade is divided into two storefront bays. Each bay contains a central recessed entry with display windows on either side. The transoms of the storefront and entry doors have been boarded over. The cast iron columns of the storefront remain intact, as does the storefront cornice. The second and third floors each contain five evenly-spaced one-over-one double-hung vinyl replacement windows with stone sills and brick lintels. A sheet metal cornice trims the top of the façade. The side elevation along Oak Street features clerestory windows at the first floor level aligned with double-hung windows on the upper floors matching those on the front façade.

37. House And Commercial Building, 621 Vincennes Street (#043-446-34087)
This two-story brick Italianate combination house and commercial building was built c.1870. It features a corner commercial section with storefront attached to a residential wing set back from the street behind a small front yard and front porch. Windows on the front elevation of both sections are two-over-two double-hung wood sash windows with corbelled brick hoods and limestone sills. The storefront features limestone columns with chamfered edges supporting an entablature with cornice molding. An angled corner contains a half-glazed wood entry door and sidelights with transoms and paneled knee walls. The front storefront window has been replaced with two double-hung replacement windows.

The second floor of the commercial section contains three window openings. The southern window opening has been in-filled and a smaller window has been installed in the opening. The residential section has a façade divided into three bays. Each bay contains a window except for the north bay of the first floor, which contains a recessed entry. The door is a two-over-three glazed paneled wood entry door. A front porch extends across the first floor of this façade. The porch roof is supported by square wood posts atop decorative concrete block piers.

38. Gebhart-Hedden House, 801 Vincennes Street (#043-446-34079)
This house was built in 1877 for John R. Gebhart by James and William Banes, master builders. The Gebhart family was a prominent New Albany family and was involved with the nearby New Albany Woolen Mills. John R. Gebhart's granddaughter Jennie married William Hedden in 1878. Hedden was a proprietor of the Hedden Dry Goods Company and later founded the New Albany Hosiery Mill. The house was connected to New Albany's first telephone exchange. The Hedden family later developed Hedden Court and Hedden Park (now known as Hedden's Grove).

The Hedden House is a two-story frame house on a brick foundation. It features a cross-gabled roof. The front gable façade contains a three-sided bay window at the first floor with one-over-one double-hung wood sash. Above this is a pair of two-over-two double-hung wood sash windows topped by a small canopy. All other windows on the primary elevations are two-over-two double-hung wood sash with similar flared canopies, reflecting the influence of the Stick or

Eastlake style. Two half-glazed paneled wood entry doors are located within the corner formed by the projecting front gable and the projecting south gable. A porch shelters these entrances. The porch rests on a brick foundation and has replacement aluminum-clad porch posts. A balcony railing atop the porch roof appears to retain historic fabric. The exterior of the house has been clad in vinyl siding with door and window trim wrapped with sheet metal trim.

39. House, 720 Vincennes Street (#043-446-34081)

This Queen Anne style house was built c.1900. It is a two-story frame house on a brick foundation. The front façade of the house is divided into two bays. The north bay projects slightly from the façade and contains a cottage window at the first floor level and a projecting three-sided oriel window with one-over-one double-hung wood sash at the second floor. A gable with square attic window tops this bay. The south bay contains a half-glazed paneled wood entry door and a one-over-one double-hung wood sash window at the first floor with a larger one-over-one double-hung wood sash window at the second floor. A hipped roof porch extends across the first floor. This porch rests on a rock-face concrete block foundation with brick knee walls and square brick piers.

40. Commercial Building, 624 Vincennes Street (#043-446-34086)

This Italianate commercial building was built c.1880. The building's primary façade along Vincennes Street is divided into three bays. The first floor storefront features limestone columns with chamfered edges and diamond-shaped panels. Each bay of the storefront is topped by a low segmental arch with a paneled motif above. Limestone brackets rise from the capitals of each column and support a limestone storefront cornice trimmed with dentil molding.

The storefront retains its historic paneled knee walls and two-over-three glazed paneled wood entry doors. The second floor is trimmed with rusticated limestone quoins at both corners. Three segmental-arched window openings with limestone hoods and sills are evenly spaced across the second floor façade. The window sashes have been removed and single-lite windows have been installed on the interior side of the original window frames. The north elevation along Culbertson Avenue features window openings with stone hoods and sills matching those of the front façade. Many of these openings retain one-over-one double-hung wood sash windows while a few have been boarded over. The storefront returns for the depth of one bay along this elevation, matching the details of the front façade

41. House, 702 Vincennes Street (#043-446-34085)

This Craftsman bungalow was built c.1910. It features a side-gabled form and rests on a concrete foundation. All first floor windows are divided-lite wood casement sash. A small gabled entry pavilion projects from the main façade. This pavilion shows the influence of the Georgian Revival style in its corner pilasters. The pavilion contains a pair of fully-glazed divided-lite entry doors. Banks of casement windows are located on either side of the entrance pavilion. Portions of the first and second floors are clad in either red brick or wood clapboard siding. A gabled dormer projects from the center of the roof. This dormer contains a Palladian window with divided-lite double-hung wood sash. A projecting sunroom at the southeast corner of the house features a bank of casement windows sheltered by a projecting shingled canopy supported by knee braces.

42. Commercial Building, 608 Vincennes Street
This one-story vernacular commercial building was built c.1935. It features an orange brick façade and a hipped roof. The front façade contains a large two-part storefront window and a turned corner containing a fully-glazed aluminum entry door. A projecting canopy may be an original feature or could be an early addition.

43. Commercial Building, 428 Vincennes Street (#043-446-34095)
This c.1900 commercial building is of brick with a cast iron storefront. The building features a chamfered corner with a rectangular roof supported by brackets at this corner. The storefront has been infilled and second floor windows have been modified in size. The first floor cast iron storefront columns and metal cornice remain intact but the storefront openings have been infilled. At the second floor level, two of the three window openings of the primary façade have been altered in size and shape and the historic windows have been replaced with aluminum storefront. Although two brackets remain at the projecting corner of the roof, the remainder of the cornice has been stripped down and clad in aluminum siding.

44. House, 610 Vincennes Street (#043-446-34091)
This Colonial Revival house was built c.1895. The primary façade is divided into two bays. The south bay projects slightly from the façade and features a cottage window at the first floor, a projecting oriel window with one-over-one double-hung wood sash at the second floor, and a steel sash attic window within the front-facing gable. The north bay contains an entry door and one-over-one double-hung wood sash window at the first floor with a pair of French doors, transom, and elliptical window at the second floor. The edge of the hipped roof is trimmed with a cornice featuring scrolled modillions. A porch extends across the front of the north bay at the first floor level. A rock-face concrete block foundation supports a concrete slab with stuccoed piers below turned wood Tuscan columns. A wooden entablature with dentil moldings supports a wood balcony railing at the second floor level. The property also contains a carriage house that appears to retain its historic integrity.

45. House, 614 Vincennes Street (#043-446-34089)
This c.1900 Colonial Revival house features a gable-front facade. A semicircular attic window opening remains but the sash has been removed. The second floor of the facade is divided into panels by wood pilasters. These panels have been covered with vinyl and aluminum siding and appear to have once contained additional window openings. The first floor is sheltered by a porch with square wood posts. First floor openings have been modified and their historic configuration is unclear.

EAST END PROPERTIES—INDIANA (See Figure 4.3-7)

Historic Properties Identified in the FEIS and Modified Since 2003

This section of the SDEIS updates information provided in the 2003 FEIS about three historic properties identified in the Indiana East End portion of the Original APE. The updates identify

changes that have occurred related to eligibility determinations or mitigation measures stipulated in the LSIORB Project MOA.

National Historic Landmarks

There are no National Historic Landmark properties within the Indiana portion of the Original APE.

1. Swartz Farm Rural Historic District

The Swartz Farm Rural Historic District identified in the FEIS consisted of the Swartz Farm, the Schwartz-Voight-Marble Farm and the Central Passage House. Per MOA Stipulation III.I.9, a portion of the Swartz Farm was to be purchased by INDOT as mitigation of impacts on the Swartz Farm Rural Historic District.

In October 2007, the Swartz Farmhouse and other contributing buildings on the farmstead were razed by the property owner. As a result, the Indiana SHPO, in a letter dated June 9, 2009, determined that the Swartz Farm Rural Historic District had lost its historic integrity as a result of this demolition. This determination was re-affirmed by the Indiana SHPO in a letter dated October 14, 2011. Therefore, only the MOA Stipulation III.I.1 regarding the development of a thematic context study for agriculture in Clark County and Stipulation III.I.7 regarding archival documentation of the Central Passage House prior to its removal have been completed. No further mitigation will be undertaken**.** Changes in the MOA related to the Swartz Farm Rural Historic District would be discussed during the mitigation phase of the Section 106 process for the project.

2. James A. Smith Farmstead

The James A. Smith Farmstead consists of a farmhouse, an early cemetery, the farm lane and several outbuildings. The house is a brick, two story structure, c.1830. The symmetrical plan of the main façade is typical of the Federal/Greek Revival era, which the house represents. Other buildings and features on the property include several outbuildings, including sheds, a springhouse and a family cemetery. The cemetery contains a number of marked burials relative to the Smith family with readable dates from 1835 to 1887. An 1875 atlas of the county shows property ownership by the Smith family, and a 1920 plat map shows portions of the property also owned by the Smith family, thereby maintaining considerable continuity throughout the years.

Per MOA Stipulation III.I.9, approximately 8.2 acres of the 126-acre James A. Smith Farmstead was to be donated to the LSIORB Project as mitigation of impacts on the Swartz Farm Rural Historic District.

A visit to the property occurred in 2004 to evaluate the effect of damage resulting from a fire in the residence. During work on the 2003 FEIS, the property was determined eligible under National Register criteria A and D. As a result of the on-site review, the Indiana SHPO concluded that the property probably had also been eligible under Criterion C; however due to the loss of integrity resulting from the fire in the residence, it was no longer eligible under Criterion A or C but continued to be eligible under Criterion D.

Following intermittent but ongoing correspondence with the property owners between June 2004 and June 2006, the LSIORB Project was unable to secure commitments from the owners to donate the property. As a result, communications ceased and the project advanced without implementing MOA Stipulations III.I.9 (a-e) concerning preservation of the farm.

3. Utica Lime Kilns

The lime industry was active in Utica Township during the latter 19th and early 20th centuries. The town and township became known for the production of lime, which came from the dolomitic limestone exposed on the bluffs near the Ohio River. For a period of time, the lime industry actually supported the town. Utica was known up and down the Ohio River for this product. According to contemporary sources, about 13 individuals or local families were involved in lime, either ground hog or patent kiln production. An 1873 map included with the annual report of the state geologist showed several kilns upstream of the town of Utica, and two properties owned by companies active at the time: i.e., the Louisville Cement Company and the Utica Lime Company.

Limestone quarries were conveniently located adjacent to the river, where workers could easily load processed limestone aboard river boats and barges. Limestone mining occurred at these quarries from as early as 1818 to as late as the 1930s. However, the quarries were associated with lime burning from about 1818 to perhaps no later than 1907, although it is possible that lime burning occurred here on a limited basis into the 1920s. Although Utica's lime industry was nearly finished by the late 1890s, numerous quarrymen and lime manufacturers initiated businesses at Utica well into the 1920s and 1930s.

Two types of kilns have been identified through the cultural investigations. A ground hog or temporary, limited-use kiln was built into the side of a hill. Later, larger more permanent kilns were built, including perpetual kilns, which were in operation in 1875. Per MOA Stipulations III.H.1-8, studies, documentation and stabilization measures were to be undertaken as mitigation of impacts on the properties.

The four identified kilns include sites 019-305-48001, 019-305-48002, 019-305-48003 and 019-305-48004, and are described in detail on pages 4-73 and 4-74 of the 2003 FEIS. Since the completion of the 2003 FEIS, sites 019-305-48001, 019-305-48002, and 019-305-48004 have remained unchanged or unaltered. The only physical change to the 019-305-48003 kiln since the FEIS is that there is evidence of ground disturbance some time in Spring 2009 immediately adjacent to the kiln, although the kiln itself was not affected. Heavy equipment was used to clear a number of trees and level several tailing piles/remnants associated with kiln operations during that period.

Research conducted since the 2003 FEIS as part of the development of a historic context for the lime industry in Utica Township identified nearby quarries that are associated with the four kilns. While this research could not definitively determine a time period the quarries were active or how long the quarries remained active after the kilns were no longer functioning, the quarries adjacent to each of the kilns were identified as eligible for listing alongside each kiln. The resource is described further in Section 5.3 of the FEIS and depicted on Figure 6.2-4.

The Utica lime kilns and associated quarries are eligible for the NRHP as a multiple property group (and as archaeological features, above and below ground) under criteria A and D. Each kiln and its associated quarry is a historic district. Preservation in place is not necessary for the quarry walls or the open spaces within and around the quarries, as long as additional documentation is performed on those quarry walls, floors, and other spaces to be impacted within lime kiln sites 48003 and 48004.

Identification of Additional Historic Properties within the Original APE

Based on the *Clark County Interim Report* update as well as additional field investigations, one historic resource within the Original APE was determined to be NRHP eligible resource that was not included in the 2003 FEIS. This historic property is described below.

1. Thomas Benton Jacobs House, 4002 Utica Pike (#019-305-45054)

The house at 4002 Utica Pike is a Federal / Greek Revival style farm house built in 1840. It is a two story house with a side gabled roof, flanked by end chimneys. The main entrance is centered and topped with a portico. The windows are double-hung, four-over-four and symmetrically placed. The house has been altered by a south addition, a boarded doorway, and the removal of a second story door that has been replaced by a double-hung sash window. The residence is currently vacant. The Jacobs House retains a high degree of integrity, with its historic clapboard siding, wood sash windows, and exterior trim intact. The property's association with the Indiana State Reformatory in Jeffersonville adds to the house's significance. As an intact example of a mid-19th century farmhouse in Clark County, the house is recommended as eligible for listing in the NRHP under Criterion C.

Historic Properties Identified within the Original APE - Utica, Indiana (East End)

Figure 4.3-7

Historic Properties Unchanged Since the FEIS

A number of other properties were evaluated in the 2003 FEIS and were not described above in this document. These properties are either currently listed, or potentially eligible for listing in the National Register of Historic Places. The table below lists these historic properties within the Town of Utica and the East End that have essentially remained unchanged or unaltered since the original Section 106 process. For additional information about these properties, refer to pages 4-66 to 4-77 of the 2003 FEIS.

TABLE 4.3-2
OTHER EAST END INDIANA PROPERTIES EVALUATED IN FEIS

Resource Name	NRHP Criterion
Fry House	A and C
Prather Farm	A and C
Dellinger Farm	A
Woods House	A and C
John Hoffman House	C
Moss Family House	C
House, 3209 Utica Pike	C
House, Longview Drive	C
Farmstead, 1117 Utica Sellersburg Road	A and C
Utica Cemetery	A
Utica Methodist Episcopal Church	A and C
Howes Farm	A and C
House, 609 Locust Street	C
Utica Christian Chapel	C
House, 206 Second Street	C
William Brindle House	C
House, 108 Locust Street	C
Lentz Cemetery	A
Lentz Heirs Cemetery	A
Central Utica Historic District	A and C
WPA Sea Wall	A
Ranney Wells Historic District	A and C
INAAP Igloo Storage Historic District	A
House, 203 South Fourth Street	C

INDIANA—PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

This section of the 2003 FEIS included a listing and description of Indiana resources determined to not be eligible for the NRHP. Changes to this section include:

- The addition of the Swartz Farm Rural Historic District as an ineligible NRHP property within the Original APE as presented in the 2003 FEIS.
- The removal of the Colgate School (Clarksville) from this list of ineligible NRHP properties since it is located within the Extensions to the Original APE and is therefore being treated as eligible for purposes of Section 106 review.
- Two farmsteads near Utica which were previously determined eligible for listing have been demolished since the 2003 analysis was completed; therefore, 4711 Middle Road and 2307 Utica Pike were identified as not eligible in this supplemental analysis.
- An update to the following properties due to their demolition since the completion of the FEIS in 2003.
    - House, 105 Sparks Avenue
    - House, 101 Sparks Avenue
    - House, 409 West Market Street
    - House, 509 Locust Street
    - House, 508 Locust Street

With the exception of the changes identified above, there are no changes in the information presented in this section of the 2003 FEIS. Following the updated information for Swartz Farm Rural Historic District presented below, Table 4.3-3 lists the Indiana historic resources included in the 2003 FEIS that were determined to be not eligible for NRHP listing. For more detailed information on these properties, refer to pages 4-101 through 4-132, including figures 4.3-21 and 4.3-22 of the FEIS.

TABLE 4.3-3
INDIANA RESOURCES DETERMINED NOT ELIGIBLE FOR NRHP LISTING

Indiana Resource Name	Address
House	4707 New Chapel Road
English Barn	1510 Old Salem Road
Myers Farm	1018 Utica-Charlestown Road
Houses	S.R. 62
House	4029 Herb Lewis Road
Dairy Barn	Near 2614 Utica-Sellersburg Road
House	2120 Utica-Sellersburg Road
Federal House	4501 Middle Road
House	1011 Utica-Charlestown Road
Farmstead	4203 Middle Road
House (45032a)	Utica Pike
House (45034)	Utica Pike
Prentice Houses	340 West Maple Street and 338 West Ohio
Colston Memorial Park	Mulberry Street.
House	1225 Woerner Avenue
House	501 Riverside Drive
House	1206 Spring Street
House	105 Sparks Avenue *(Demolished)*
House	101 Sparks Avenue *(Demolished)*
House	2201 Utica Pike
Smith's Riverview Farm - Barn	2611 Utica Pike
House	3105 Utica Pike
House	3210 Utica Pike
Farmstead	3311 Utica Pike
House	3606 Utica Pike
House	4013 Utica Pike
Farm (45034B)	Utica Pike
House	5614 Utica Pike
Farm (45033A)	Utica-Sellersburg Pike
House	409 West Market Street *(Demolished)*
House	317 2nd Street (Utica)
Utica Baptist Church (46006A)	-
House	112 6th Street (Utica)
Combs House (46009)	-
First District School (46010)	-
House	509 Locust Street *(Demolished)*
House	109 6th Street (Utica)
House	117 6th Street (Utica)
House	508 Locust Street *(Demolished)*

TABLE 4.3-3 (*Continued*)

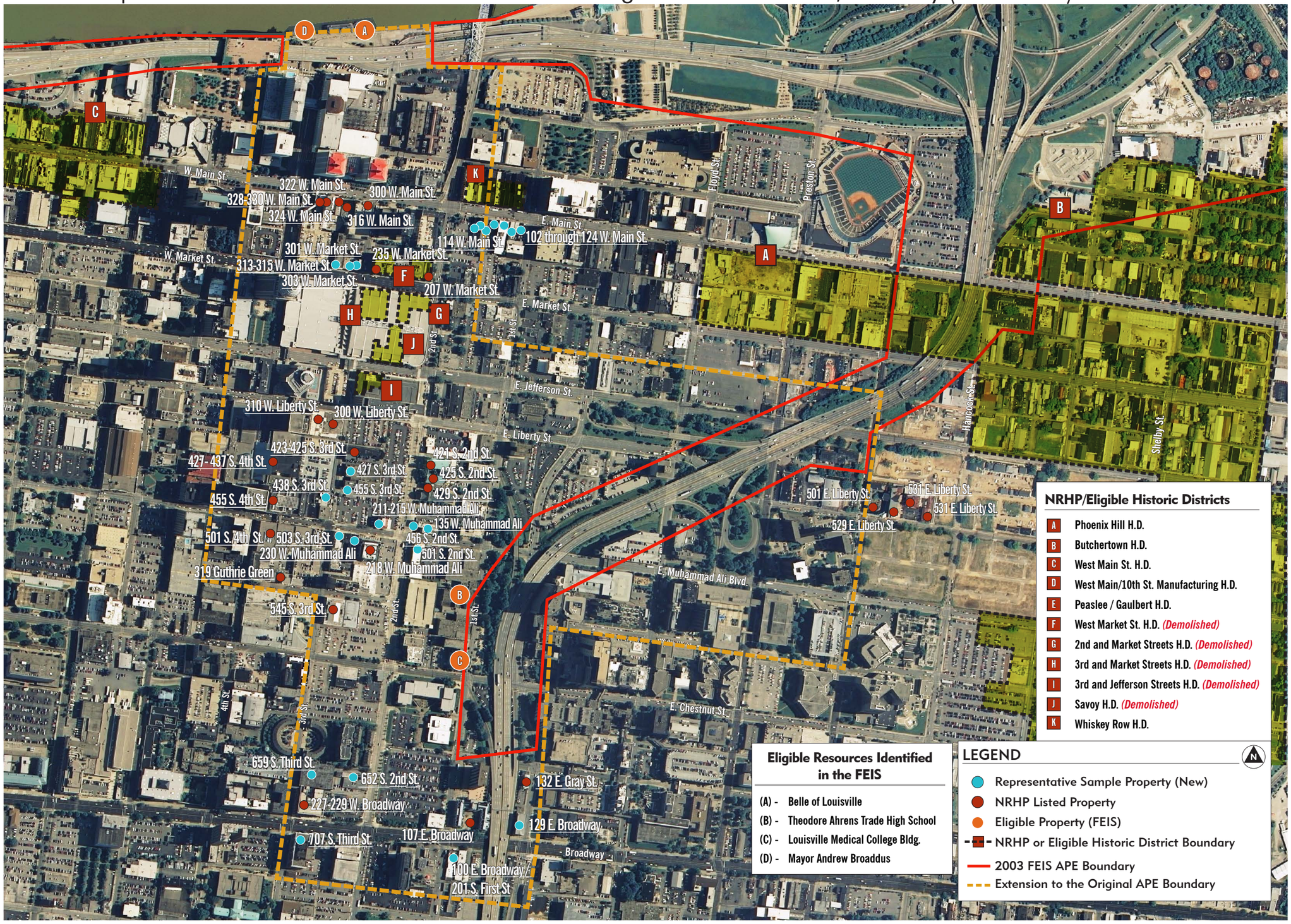
Indiana Resource Name	Address
House	Corner 6th and Locust Street
House	307 4th Street
House	311 4th Street
House	410 Front Street
House	409 Front Street
Caboose	300 Block of Front Street
Mistletoe Falls (45016A)	-
Log Cabin and Bus Shelter (45016B)	-
Fireplace/ Possible Foundation (45016C)	-
House, (007)	112 5th Street
House, (010)	107 4th Street
Lots 106 and Lot 107	-
Lot 88 (016)	3rd Street
Utica Pike	-

DOWNTOWN PROPERTIES—KENTUCKY

The following graphics present historic properties in Louisville, Kentucky:

- Figure 4.3-8 Historic Properties Identified within the Original APE—Downtown Louisville, Kentucky
- Figure 4.3-9 Historic Properties Identified within the Extensions to the Original APE—Downtown Louisville, Kentucky
- Figure 4.3-10 Historic Properties Identified within the Extensions to the Original APE—River Road Corridor in Louisville, Kentucky

Historic Properties Identified within the Extensions to the Original APE - Louisville, Kentucky (Downtown)



NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F West Market St. H.D. *(Demolished)*
- G 2nd and Market Streets H.D. *(Demolished)*
- H 3rd and Market Streets H.D. *(Demolished)*
- I 3rd and Jefferson Streets H.D. *(Demolished)*
- J Savoy H.D. *(Demolished)*
- K Whiskey Row H.D.

Eligible Resources Identified in the FEIS

- (A) - Belle of Louisville
- (B) - Theodore Ahrens Trade High School
- (C) - Louisville Medical College Bldg.
- (D) - Mayor Andrew Broaddus

LEGEND

- Representative Sample Property (New)
- NRHP Listed Property
- Eligible Property (FEIS)
- NRHP or Eligible Historic District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE Boundary

Figure 4.3-9

Historic Properties Identified within the Original APE - Louisville, Kentucky (Downtown)

Figure 4.3-8b

Historic Properties Identified within the Original APE - Louisville, Kentucky (Downtown)

NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main / 10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.

Eligible Properties Identified in the FEIS

- (A) - Belle of Louisville
- (B) - Theodore Ahrens Trade High School
- (C) - Louisville Medical College Bldg.

"Eligible" Properties Noted in the Updated Jefferson County Survey

- (1) - House (1321 Main St.)
- (2) - House (1323 Main St.)
- (3) - House (1325 Main St.)
- (4) - House (1327 Main St.)
- (5) - House (1329 Main St.)
- (6) - House (1331 Main St.)
- (7) - House (1429 Mellwood Ave.)
- (8) - House (1431 Mellwood Ave.)
- (9) - House (1433 Mellwood Ave.)
- (10) - House (1435 Mellwood Ave.)
- (11) - House (1437 Mellwood Ave.)
- (12) - House (1445 Mellwood Ave.)
- (13) - House (1447 Mellwood Ave.)
- (14) - House (1449 Mellwood Ave.)
- (15) - House (1451 Mellwood Ave.)
- (16) - House (1453 Mellwood Ave.)
- (17) - House (1455 Mellwood Ave.)
- (18) - House (1459 Mellwood Ave.)
- (19) - House (1463 Mellwood Ave.)
- (20) - House (1465 Mellwood Ave.)
- (21) - House (1467 Mellwood Ave.)
- (22) - House (713 Broadway)
- (23) - Commercial Bldg. (719 Broadway)
- (24) - Commercial Bldg. (725 Broadway)
- (25) - Commercial Bldg. (909 Broadway)
- (26) - Commercial Bldg. (706 Chestnut St.)
- (27) - Eclipse Woolen Mill (1044 Chestnut St.)
- (28) - House (703 Jefferson St.)
- (29) - Commercial Bldg. (727 Jefferson St.)
- (30) - Commercial Bldg. (747 Jefferson St.)
- (31) - Commercial Bldg. (218-220 Shelby St.)
- (32) - House (909 Jefferson St.)
- (33) - House (921 Jefferson St.)
- (34) - House (923 Jefferson St.)
- (35) - House (925 Jefferson St.)
- (36) - Commercial Bldg. (1450 Mellwood Ave.)
- (37) - Commercial Bldg. (1634 Mellwood Ave.)
- (38) - Commercial Bldg. (1648 Mellwood Ave.)
- (39) - Commercial Bldg. (1726 Mellwood Ave.)
- (40) - Commercial Bldg. (1728 Mellwood Ave.)
- (41) - Commercial Bldg. (1734 Mellwood Ave.)
- (42) - Commercial Bldg. (130 Spring St.)

LEGEND

- Eligible Property (New)
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- FEIS APE Boundary

Figure 4.3-8a

Historic Properties Identified within the Extensions to the Original APE - Louisville, Kentucky (River Road Corridor)

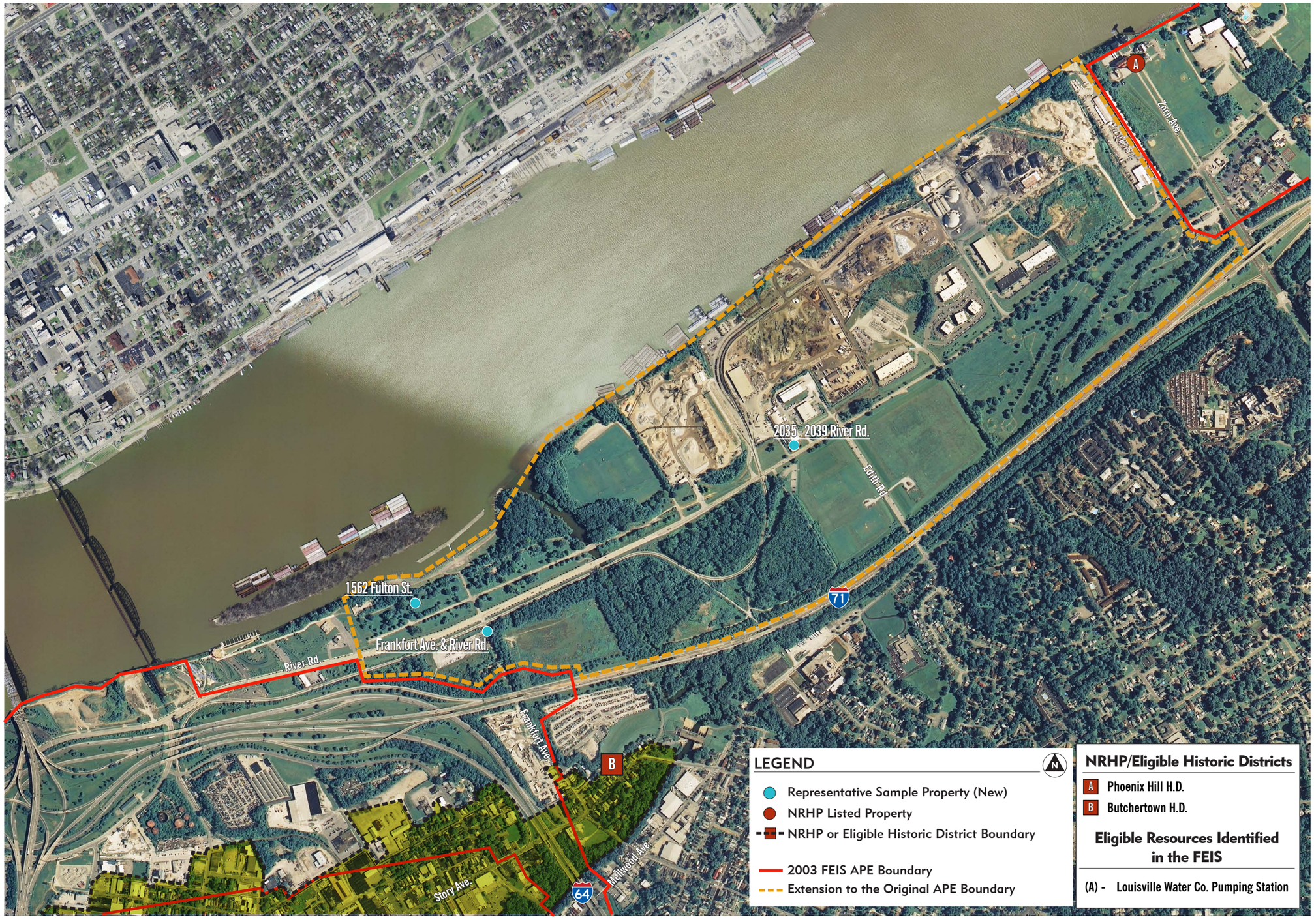


Figure 4.3-10

Historic Properties Identified in the FEIS

This section of the SDEIS updates information provided in the 2003 FEIS about several historic properties identified in the downtown Louisville portion of the Original APE. Descriptions identify properties which have changed since the 2003 FEIS was published. The primary source of the following updated information is the 2010 *A Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*.

National Historic Landmarks

There are two National Historic Landmark (NHL) properties located with the downtown Louisville portion of the Original APE: the Belle of Louisville river steamboat and the Mayor Andrew Broaddus lifesaving station (see Table 4.3-4).

Phoenix Hill Historic District

As noted in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road,* Phoenix Hill has a strong residential character, along with significant ecclesiastical architecture and commercial and industrial building stock. The neighborhood was irrevocably shaped by the development of the Louisville Medical Center campus (which covers 24 blocks at the eastern edge of the neighborhood) as well as the 1940s Clarksdale Public Housing development, which has since been replaced by the Liberty Green Housing development.

As part of this update, all of the historic structures in the Phoenix Hill District were intensively surveyed. A total of 382 historic sites were recorded in Phoenix Hill; some of these sites were documented in the 1980s, but the majority was previously un-documented. However, it did not identify any additional properties within the downtown Louisville portion of the Original APE as individually eligible for the NRHP. The update did recommend the expansion of the Phoenix Hill Historic District boundary in three different locations to include additional, potentially eligible properties. No additional action has been taken regarding this recommendation.

As part of mitigation measures, a Historic Preservation Plan (HPP) for the district was undertaken in April 2006 to satisfy MOA Stipulation III.L.1. Following ongoing consultation and reviews, this HPP was approved in November 2009 and no further action is anticipated relative to the Phoenix Hill Historic Preservation Plan.

Butchertown Historic District

As noted in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road,* Butchertown covers approximately 223 acres. Part of the neighborhood was annexed by the city of Louisville in 1827, but its settlement dates back to the 1790s. The confluence of transportation corridors, both roads and waterways, spurred the neighborhood's growth in the first half of the nineteenth century.

As part of the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road,* all of the historic structures in the Butchertown Historic District were intensively surveyed. The update recorded 427 historic resources, encompassing previously surveyed sites within the district, as well as historic resources previously undocumented. It also included a

historic context to fully understand these historic resources and their role in the development of Louisville and Jeffersonville County. However, it did not identify any additional properties within the downtown Louisville portion of the Original APE as individually eligible for the NRHP. The update did recommend the expansion of the historic district boundary to include additional, potentially eligible properties along both East Main Street and Mellwood Avenue. No additional action has been taken regarding this recommendation.

As part of mitigation measures, a HPP for the district was undertaken in December 2005 to satisfy MOA Stipulation III.K.1. Following consultation and reviews, this HPP was put on hold and is awaiting a decision regarding the dispute resolution process.

Historic Properties Unchanged Since the FEIS

In addition to the historic resources described above, there were also a number of other properties evaluated in the 2003 FEIS. These properties are either currently listed, or potentially eligible for listing in the National Register of Historic Places. The table below lists these historic resources that have essentially remained unchanged or unaltered since the original Section 106 process. For additional information or a complete description of these resources, refer to pages 4-78 to 4-85 of the 2003 FEIS.

TABLE 4.3-4
OTHER DOWNTOWN KENTUCKY RESOURCES EVALUATED IN FEIS

Resource Name	NRHP Criterion
West Main Street Historic District	A and C
West Main/Tenth Street Manufacturing Historic District	A
Pennsylvania Lines Freight Depot	A & C
Peaslee-Gaulbert Paint Manufacturing Historic District	A
Brown Tobacco Warehouse	C
Snead Manufacturing	C
Givens, Headley & Co. Tobacco Warehouse	A and C
Conrad-Rawls Shoe Company	A and C
E.J. O'Brien Office	C
Belle of Louisville*	C
Mayor Andrew Broaddus*	C
Theodore Ahrens Trade High School	A and C

** National Historic Landmark*

Identification of Additional Historic Properties for the SDEIS

The Extensions to the Original APE in downtown Louisville were developed to reflect the potential effects of the Modified Selected Alternative being studied in this SDEIS. Listed below are NRHP districts within the Extensions to the Original APE, followed by individual representative properties in the downtown area and along River Road.

It should be noted that historic properties within the Extensions to the Original APE are only expected to experience indirect effects (such as noise, vibration, air quality, etc.) as a result of changes in traffic patterns; direct effects are contained within the Original APE. Indirect effects from changes in traffic patterns would be similar for each individual property along travel corridors and property-specific impact information cannot be provided given the uncertain nature of these potential indirect effects. Therefore, effects are being assessed at the district or neighborhood level in Section 5.3.1.4 (Indirect Effects on Historic Resources). Because effects are being assessed at a district or neighborhood level, all properties over 45 years in age within the Extensions to the Original APE are being treated as eligible for the purposes of this project.

National Historic Landmarks

There is one National Historic Landmark (NHL) property within the Extension to the Original APE in downtown Louisville: the Bank of Louisville at 322 West Main Street.

Representative Sampling of Additional downtown Louisville Properties Within Extensions to Original APE (See Figures 4.3-8a and 8b)

The Extension to the Original APE in downtown Louisville extends one block on either side of the Second Street corridor to Broadway, along with an area between Jefferson Street and Muhammad Ali Boulevard to Jackson Street. Much of this area is comprised of both older structures modern in-fill, as well as a number of surface parking lots.

The type and scale of urban development, as well as the street corridors, are similar to that in the rest of Louisville's Central Business District. Buildings typically front the sidewalk and range in height from typical 3-story commercial buildings, to new mid/high-rise towers. Land uses include a mix of office space, retail establishments, religious and social institutions, as well as some multi-family, multi-story residential uses. A major feature found within this subarea is the modern Louisville Convention Center bounded by Market, Fourth, Jefferson, and Second streets.

The street pattern is a traditional city grid, comprised of a series of one-way streets containing 3-4 travel lanes with on-street parking. The wide sidewalks (ranging from 10'-20') include trees and raised plantings, as well as other decorative street furniture. Nearly all blocks have mid-block alleys accessing parking, delivery areas, or similar service areas.

The following representative sampling of properties were identified within the downtown Louisville Extension to the APE:

1. Savoy Historic District

The Savoy Historic District was listed in the NRHP in 1988 for its association with a significant event, persons and architecture. The district lies along Jefferson Street, between Second and Third streets. The district was determined significant under Criterion A for its contribution in the area of local commerce, especially in the area of theater and entertainment; under Criterion B for its association with John and James Whallen, brothers who were influential political bosses during the late 19th and early 20th century; and under Criterion C for the Savoy Theater's

excellent eclectic theater design by prominent Louisville architect D. X. Murphy, and for embodying distinct characteristics of Victorian era commercial architecture. The district's period of significance spans from 1880 to 1913, during which time all of the buildings were constructed and underwent major remodeling and the district experienced its heyday as one of Louisville's premier entertainment centers. According to information obtained from the NRHP nomination form, the original district included three contributing structures and one non-contributing site (a parking lot). However, these resources have since been demolished and now the Kentucky International Convention Center occupies the location.

2. Second and Market Streets Historic District

The Second and Market Streets Historic District was listed in the NRHP in 1988 for its association with commerce and architecture. The district lies roughly centered on Second and Market streets. It originally contained eight buildings over a 9-acre area with a period of significance ranging from 1850–1924. The resources were associated with architect Henry Whitestone, having a style of Late Victorian and Chicago. A majority of the resources are no longer extant.

3. Third and Jefferson Streets Historic District

The Third and Jefferson Streets Historic District was listed in the NRHP in 1988 for its architecture, association with commerce, and German/Jewish ethnic history. At the time of its nomination, the district contained five buildings dating from 1883 through 1908. All of these structures were removed for the new Marriott Hotel. Components of the façade of the Coleman Building, formerly located at 240-244 West Jefferson Street, have been incorporated in the façade of the hotel.

4. Third and Market Streets Historic District

The Third and Market Streets Historic District was listed in the NRHP in 1988 for its architecture, association with commerce, and German/Jewish ethnic history. At the time of its nomination, the district contained ten buildings dating from 1869 through 1925. All buildings have since been demolished.

5. West Market Street Historic District

The West Market Street Historic District is listed in the NRHP in 1974 for its association with architecture. The district lies along the north side of the 200 block of Market Street. At the time of its listing, the district contained nine commercial structures with only one intrusion, a surface parking lot located in the middle of the block. The district was comprised by a variety of building styles and represented a range of building periods. The buildings represented works by various local architects, including Charles D. Meyer. The district has lost several of its contributing resources as a large multi-story parking garage has been erected in the middle of the block.

6. Whiskey Row Historic District

The Whiskey Row Historic District was listed in the NRHP in 2010 for its association with architecture and commerce. The district lies along the north side of the 100 block of West Main Street and includes addresses 101 through 133 West Main Street (odd street numbers only). The area, originally called "Whiskey Row," was named this because of the buildings' cast-iron

facades and the many whiskey businesses that began there. The historic Whiskey Row Block is a row of attached 3- to 4-story buildings built between approximately 1852 and 1905. Architects included Henry Whitestone, John Andrewartha, and D. X. Murphy. Many of these structures were built and used by pork dealers and whiskey companies. The L&N Railroad Company and Belknap Hardware Company also had headquarters in the buildings. Today, buildings are in varying stages of disrepair.

7. Commercial Building, 102 W. Main Street
This Italianate commercial building was built c.1890. It features a bracketed cornice and corbelled brickwork. The second floor is defined by paired double-hung windows with one-over-one wood sashes. The storefront has been in-filled. The building was occupied by a saloon in the 1890s and by a blacksmith shop as of 1905.

8. Commercial Building, 104 W. Main Street
This Italianate commercial building was built c.1880. It features a façade of cast iron and sheet metal components. The first and second floors feature cast iron columns with swag-draped capitals. Paneled and molded sheet metal and cast iron trim the piers at the sides of each floor. The second floor features two large one-over-one double-hung windows. The bracketed cornice features panels and rosettes.

9. Caldwell Building, 106 W. Main Street
This Italianate commercial building was built c.1875. The first floor features a cast iron storefront. The second floor features three windows with window hoods bearing incised Eastlake motifs. These windows have been partially infilled. The bracketed cornice features sheet metal components. The building was occupied by a wholesale flour company in the 1890s.

10. Belknap Hardware & Manufacturing Company Building, 110 W. Main Street
This c.1900 commercial building features large expanses of glass reflecting Chicago School influence. The first floor storefront has been replaced by new materials. The second and third floors feature banks of windows divided by pilasters with Beaux Arts-inspired capitals. The building is crowned by a corbelled brick cornice. This building was occupied by the Belknap Hardware& Manufacturing Company's stock rooms and saddle and harness factory as of 1905.

11. Commercial Building, 114 W. Main Street
This c.1925 commercial building reflects vague influences of the Arts and Crafts and Craftsman styles in its patterned brickwork. The façade is clad in buff brick and features limestone coping and window sills. A central entry door is flanked by two replacement storefront windows. A recessed panel in the upper facade may have once contained signage.

12. Commercial Building, 122 W. Main Street
This Italianate building was built c.1880. It features a cast iron storefront with chamfered columns and Tudor arches. The second and third floors have windows with limestone lintels bearing incised ornament. A sheet metal cornice extends across the façade. The building was occupied by Eugene B. Dye's hardware firm. The firm dealt in a variety of products including roofing, building papers, tin-ware, hardware, woodenware, twines, baskets, feathers, dusters,

mops, brooms and brushes. Elaborate painted signs from the Dye store remain faintly visible across the façade.

13. Commercial Building, 124 W. Main Street

This Classical Revival commercial building was built c.1900. It features an elaborate metal façade. The first floor storefront is surrounded by a wide frame with an egg-and-dart molding. A Tuscan column divides the storefront into two bays. The east half retains its historic wood entrance door and framing. The west half features a projecting display window with a transom above. A signage panel rises from the top of the storefront. The second floor features arched windows with one-over-one double-hung sashes. This level is divided into two bays by Tuscan pilasters supporting a frieze and cornice. The rooftop is trimmed by a Neoclassical balustrade featuring ball finials.

14. Income Life Insurance Co. Bldg./ Kentucky National Bank, 300 W. Main St. (JFCD 51)

The Romanesque Revival style Income Life Insurance Company Building, later known as the Kentucky National Bank Building, was designed by the Louisville firm of Kenneth, Henry, and Donald McDonald. It was listed in the National Register of Historic Places in 1979. The building's limestone exterior exhibits many characteristics of the Romanesque Revival style popularized by H. H. Richardson, including the use of rock-face masonry, round arches, and foliate carved details. The building has one-over-one double-hung wood windows, with transoms.

15. Bowles Building, 316 W. Main Street

The Bowles Building was built c.1860 for Joshua B. Bowles. It housed the leather goods company of Mooney, Mantel & Cowan followed by the carpet store of J. G. Mathers. A furniture store occupied the building during the 1890s. The building's façade is divided into two bays, each containing a three-bay storefront at the first floor and three arched windows on the second through fourth floors. The windows have semicircular arched tops, wood casement sashes, transoms featuring a circle motif, and cast iron window hoods. A bracketed cornice crowns the façade. This building is located within the expanded boundaries of the Main Street Historic District and was listed in the NRHP in 1980.

16. Bank of Louisville, 322 W. Main Street (JFCD 52)

The Bank of Louisville building was designed by New Orleans architect James H. Dakin (1806–1852). Dakin, a former apprentice to and later partner with New York architects Alexander Jackson Davis and Ithiel Town, designed a number of prominent buildings including the Old Louisiana State Capitol. The building has been erroneously attributed to Louisville architect Gideon Shryock, a local architect who oversaw the construction on Dakin's behalf. The building's façade is of limestone and consists of a monumental incised portico supported by two ionic columns flanked by tapering pylons. The entablature contains a simple frieze and dentil molding surmounted by a limestone cornice with a large cast iron panel at the center featuring scrolls and a palmette ornament. The Bank of Louisville was listed in the NRHP in 1971 and is also a National Historic Landmark.

17. McKnight Building, 324 W. Main Street (JFCD 54)

This Renaissance Revival style building was built in 1886 for the wholesale carpet firm of William H. McKnight and was designed by Louisville architect C. J. Clarke. The first floor storefront is framed by cast iron pilasters supporting an entablature with ornate corner blocks. The storefront opening has been in-filled. The second through fifth floors contain three one-over-one double-hung windows each. The outer sides of the façade are treated as pilasters, with elaborate terra cotta ornament and capitals. The center portion containing the windows features Corinthian pilasters, orate spandrel panels, and a variety of moldings. The building is topped by a cornice featuring consoles and a fan motif. A metal fire escape has been added to the façade. This building is located within the expanded boundaries of the Main Street Historic District and was listed in the NRHP in 1980.

18. Commercial Building, 328–330 W. Main Street

This Italianate building was built c.1875. It was occupied by a liquor store and a restaurant during the 1890s. The storefront has been concealed by the addition of brick veneer. The second and third floors of the façade are divided into two bays, each containing three arched one-over-one double-hung windows with cast iron window hoods. The upper floors are clad in stone and feature rusticated quoins at the second floor and paneled pilasters at the third floor. A bracketed cornice rises above a paneled frieze at the attic story. This building is located within the expanded boundaries of the Main Street Historic District and was listed in the NRHP in 1980.

19 .German Insurance Bank / Liberty Insurance Bank, 207 W. Market Street (JFCD 98)

The 1887 German Insurance Bank Building was designed by German-born Louisville architect Charles D. Meyer. Additions to the building were made in 1900 and 1919. The German Insurance Bank was established in 1854. Due to anti-German sentiment during World War I, the bank was renamed the Liberty Insurance Bank, later operating as the Liberty National Bank & Trust Co. The building's eclectic limestone façade reflects the influence of a number of styles and movements, including the Beaux Arts, Renaissance Revival, Second Empire, and Italianate. The German Insurance Bank Building was individually listed in the NRHP in 1985.

20. Levy Brothers Building, 235 W. Market Street (JFCD 103)

The Levy Brothers Building was built in 1893 and was designed by the Louisville firm of Clarke & Loomis. The building reflects a combination of Romanesque Revival and Renaissance Revival influences. The exterior is clad in buff brick with extensive terra cotta ornament. The first floor consists of a tall storefront with cast iron grilles over the transoms. A marquee projects from the south façade. A corner tower rises to a height of six stories and is crowned by a hipped slate roof with copper trim. Floors two through five of the building contain one-over-one double-hung windows of a variety of shapes and configurations. Large arched openings running through the second and third floors of both facades contain metal-clad bay windows with acroterion ornaments. All openings are trimmed with terra cotta ornament reflecting a variety of patterns and motifs. An elaborate copper cornice trims the building's roofline. A 1913 annex along the north side of the building was designed by the firm of Joseph & Joseph. This annex matches the materials of the main building but features more restrained detail and simpler fenestration. The building housed the Levy Brothers clothing store. The Levy Brothers Building was listed in the NRHP in 1978.

21. Commercial Building, 301 W. Market Street (JFCD 281)

This c.1850 commercial building appears to have originally reflected the Greek Revival style. Windows along the east elevation retain their original lintels with decorative corner blocks. The building appears to have been remodeled in the Italianate style c.1870, with new segmental-arched windows on the south façade featuring cast iron window hoods. The building contained a saloon during the 1890s and 1900s. The first floor storefront features cast iron columns. The second and third floors are clad in tan brick with three one-over-one double-hung windows per floor. The building was remodeled in the Spanish Colonial Revival style c.1925. At that time, a deep projecting bracketed cornice supporting a tile roof was added to the building.

22. Commercial Building, 303 W. Market Street (JFCD 280)

This Italianate commercial building was built c.1880. It contained a saloon during the 1890s and a commercial establishment during the early 20th century. The first floor storefront features paneled cast iron columns. The second and third floors each have three window openings with limestone lintels and sills. These openings have been partially in-filled and contain smaller replacement windows. The façade is crowned by a bracketed cornice atop a band of corbelled brickwork.

23. Bensinger Buildings, 313-315 W. Market Street

This property consists of two buildings built for the Bensinger Outfitting Company, dealers in furniture and other items. The larger Bensinger Building was built c.1905 and reflects the influence of the Chicago School in its large banks of windows while exhibiting neoclassical details in orange brick and polychrome terra cotta. This building features a large first floor storefront opening with a terra cotta frame. The second through fifth floors feature three bays of windows, with large sized windows at the second floor and one-over-one double-hung sash at the upper floors. Spandrel panels feature a terra cotta panel with a border of orange brick. Terra cotta pilasters divide the upper façade into three bays. A bracketed terra cotta cornice is surmounted by a brick parapet wall with terra cotta accents. The Bensinger Annex was built in 1909 and also reflects the influence of the Chicago School and neoclassical conventions. The first floor storefront is surrounded by a simple orange brick frame. The second through fourth floors feature large fixed windows flanked by casements in an adaptation of the Chicago window form. These windows are flanked by orange brick pilasters with limestone capitals and bases. A frieze and cornice topped by a brick parapet wall crown the façade.

24. YMCA Building, 227–229 W. Broadway

The Louisville Young Men's Christian Association was organized in 1853. This building designed by Louisville architects Kenneth McDonald and William J. Dodd in association with the Chicago firm of Shattuck & Hussey was completed in 1913 and housed the Y.M.C.A. from 1913 until 1976. The Beaux Arts design of the red brick and limestone building is reflected in the Weissinger-Gaulbert Building (1911–1912), also designed by McDonald & Dodd and located directly across Broadway. The Y.M.C.A. Building was listed in the NRHP in 1977.

25. Commercial Building, 100 E. Broadway/201 S. First Street

This one-story commercial building was built c.1925 and reflects a combination of the Collegiate Gothic and Mediterranean Revival styles, apparently reflecting the Collegiate Gothic style of the

Louisville Presbyterian Theological Seminary across Broadway to the north. The building extends for three bays along Broadway and for ten bays along S. First Street. The facades are clad in tan glazed terra cotta and feature green marble knee walls and brown brick panels above the storefronts. The outer bays of the west elevation feature gables trimmed by pilasters with Gothic-arched panels. Plasters along the west elevation are topped by terra cotta finials. The gables each contain a semicircular-arched attic window with a projecting metal railing. The north façade along Broadway features three shed-roofed dormers and a clay tile roof. Four bays along the west façade have been concealed by later brick veneer and metal panels. The storefronts of the north commercial space have been replaced with aluminum storefront glazing. The four south bays of the west elevation contain historic metal storefronts with recessed entries.

26. Louisville Presbyterian Theological Seminary, 107 E. Broadway (JFCD 246)

This structure was built in several phases between 1903 and 1909 to house the Louisville Presbyterian Theological Seminary. The seminary was established in 1853 at Danville, Kentucky, and opened in 1893 in Louisville. Prominent Louisville architect William J. Dodd (1862-1930) had trained under Chicago architects William Henney and Solon S. Beeman. The building is an outstanding and high-style example of the Collegiate Gothic style. The exterior is clad in limestone from quarries near Bowling Green, Kentucky. Grant-Robinson Memorial Hall in the building's west wing was funded by a donation by William Thomas Grant and his wife Mary Robinson Grant. Other spaces in the complex include Harbison Chapel, Lucy Stites Barrett Library, Mary Belknap Refectory, Haldeman Hall, and Todd Memorial Hall. The construction of Interstate 65, adjacent to the campus on the east, prompted the school to relocate to the suburbs in 1963. The campus was purchased by Jefferson Community and Technical College in 1966 and was renovated during 1967–1968. The building was listed in the NRHP in 1978.

27. Raymond E. Myers Hall, Louisville College of Dentistry, 129 E. Broadway (JFCD 228)

Myers Hall was built to house the Louisville College of Dentistry of Central University, later housing the University of Louisville's Dental School from 1918 until 1970. The building was named for Raymond E. Myers, former dean of the Dental School. The Classical Revival building features a rock-face stone basement, a first floor clad in smooth limestone, and upper floors clad in textured buff brick with smooth-face buff brick quoins. A cornice and pediment with dentil molding trim the top of the building's façade. A central entrance is framed by a semicircular arch, paneled Tuscan pilasters, a frieze, and a plaque bearing the name "LOUISVILLE COLLEGE OF DENTISTRY." The entrance is flanked by two semicircular arched windows with pediments and molded surrounds. A pair of windows at the second floor over the main entrance is trimmed by a similar molded surround and pediment. The building retains its historic one-over-one double-hung wood sash windows. The building's east elevation along Brook Street features an unusual bank of 18 fixed sash windows with transoms. The exterior retains a high degree of integrity. Notable alterations include the infill of basement windows, replacement of the front entrance doors, and the installation of metal louvers in two window openings on the east elevation.

28. Tyler-Muldoon House, 132 E. Gray Street (JFCH 701)

This house was built in 1866 for Erastus D. Tyler, an insurance and real estate agent. In 1868 the house was sold to Alice Lithgow Muldoon, wife of Michael Muldoon, founder of a prominent

Louisville marble-cutting firm. The Muldoons sold the house in 1877. From 1892 until 1920, the house was owned by the Herman Rothert family. Rothert's son, Otto A. Rothert, was an historian and president of the Filson Club from 1917 to 1945. In 1976 the house was purchased by the J. Graham Brown Foundation for use as offices. The property was acquired by the University of Louisville and was named for Arthur H. Keeney, dean of the University of Louisville Medical School from 1973 to 1980.

The house features elaborate cast iron window hoods, a semicircular entrance door with pedimented door surround, and a cornice with dentil moldings and scrolled modillions. The attic story features small segmental-arched casement windows trimmed by corbelled brick hoods that tie into a stringcourse that wraps the house. The house retains its historic double-hung wood sash windows at the first and second floor. Cast iron porches are found on the east and south elevations and a cast iron fence encircles the property. A concrete retaining wall extends along Gray Street and supports the fence. The Tyler-Muldoon House was listed in the NRHP in 1977.

29. Old U.S. Customs House and Post Office, 300 W. Liberty Street (JFCD 137)

The design for the 1853–1858 U.S. Customs House is attributed to the Louisville architect Elias E. Williams in association with Ammi B. Young, Supervising Architect of the Treasury from 1852 to 1860. The building was listed in the National Register of Historic Places in 1977. It contained the offices of the customs collector, federal courts, and a post office until a new federal building was completed in 1896. The Old Customs House was used as a warehouse for several years before being remodeled to house the offices of the Louisville Courier-Journal newspaper in 1912. The 1912 renovation under the direction of Louisville architect John Bacon Hutchings involved the modification of the storefronts, infill of the open arcades, subdivision of the second floor into two levels, and the complete interior reconstruction of the building. A new steel and reinforced concrete structure within the original walls supported the heavy printing presses and other machinery of the newspaper company. The *Courier-Journal* newspaper occupied the building until 1948.

The building reflects the Italian villa variant of the Italianate style in its round-arched windows with molded hoods and its bracketed cornice. The first floor features rusticated limestone while the upper floors are clad in smooth limestone. The original second floor windows were removed in 1912 and the openings were divided to accommodate the division of this floor into two levels. The original third floor (now the fourth floor) retains the original window tracery, featuring two arched windows topped by a small round window within a larger arched opening.

30. Fireproof Storage Warehouse Building, 310 W. Liberty Street (JFCD 241)

The Fireproof Storage Warehouse Building was built in 1907 and reflects the influence of Beaux Arts classicism. The buff brick façade features limestone trim with classical motifs. The first and second floors are faced with limestone, while the upper floors are clad in buff brick. The third through sixth floors are divided by three sections of rusticated yellow brick simulating pilasters. These are topped by limestone capitals featuring eagles at the line between the sixth and seventh floors. The parapet features neoclassical ornament. The building was listed in the NRHP in 1980.

31. St. Boniface Monastery, 501 E. Liberty Street

The St. Boniface Monastery was designed by Louisville architect D. X. Murphy and was built in 1899, at the time of the construction of the present church. The building is clad in red brick with limestone trim. The symmetrical façade features rectangular windows at the first floor and pointed-arch windows at the second floor. Two gabled dormers project from the hipped roof and align with the façade at either end of the building. A hipped dormer rises from the center of the roof. The St. Bonifacius Kirche Complex was listed in the NRHP in 1982.

32. St. Boniface Catholic Church, 529 E. Liberty Street

The Gothic Revival style St. Boniface Catholic Church was designed by Louisville architect D. X. Murphy and was built between 1898 and 1900. The building features rock-face limestone and tall, narrow lancet windows. The primary façade features a central gable mass with a large rose window above a bank of three entrance portals. The gabled façade is flanked by two towers, a smaller eastern tower and a larger western tower topped by a belfry and spire. St. Boniface Catholic Church is the oldest German Catholic congregation in Kentucky and the second oldest Catholic congregation in Louisville. The St. Bonifacius Kirche Complex was listed in the NRHP in 1982.

33. St. Boniface School / Holy Angels Academy, 531 E. Liberty Street

St. Boniface School was designed by John F. Sheblessey and was built in 1907. The building reflects both the Collegiate Gothic and the Renaissance Revival in its massing and details. The building is clad in red brick with buff brick quoins and limestone trim. The school was later known as Holy Angels Academy. Attached to the rear of the building is the one-story St. Boniface Hall, designed by D. X. Murphy. This wing is clad in red brick with limestone trim. The St. Bonifacius Kirche Complex was listed in the NRHP in 1982.

34. St. Boniface Teachers' Home / Convent, 531 E. Liberty Street

The St. Boniface Teachers' Home was built c.1910 by John Tobe. This simple building reflects the influence of the Craftsman style in its form and its knee braces. The exposed foundation is of limestone while the remainder of the building is brick. A hipped-roof dormer rises from the center of the hipped roof. The building was later used as a convent. The St. Bonifacius Kirche Complex was listed in the NRHP in 1982.

35. Commercial Building, 211-215 W. Muhammad Ali Boulevard

This c.1895 commercial building reflects the influence of Beaux Arts classicism. The first floor is clad in limestone while the second and third floors are clad in red brick. The façade is divided into five bays, the outer two having rusticated masonry and rectangular openings topped by limestone-framed oval attic windows while the center three feature smooth masonry and arched openings at the first floor and attic level. The building is topped by a cornice with modillions and dentil molding. The building features details of molded brickwork and terra cotta in addition to carved limestone. Elliptical metal-clad oriel windows featuring panels with swag motifs project from the east and west elevations.

36. Pendennis Club, 218 W. Muhammad Ali Boulevard (JFCD 151)

It was designed by Frederic Lindley Morgan of Nevin, Morgan & Wischmeyer and was built between 1927 and 1928. The building is a high-style example of the Georgian Revival style and was built for one of Louisville's prominent businessmen's social clubs. The basement and first floor of the building are clad in Indiana limestone while the second and third floors are clad in Flemish-bond red brick. The façade is divided into three bays, the central bay forming a central pavilion divided by four Corinthian pilasters and accented by arched windows and an iron-railed balcony at the second floor level. A limestone entablature and cornice support a brick and limestone balustrade at roof level. Large brick chimneys rise from the east and west elevations. A terrace with a limestone balustrade extends across the front façade. Divided-lite double-hung windows of varying patterns are used on all elevations. A porte-cochere extends from the east elevation. The building retains its original slate roof.

The building contains many public spaces including a barber shop, billiard room, poolroom, grille, library, reading room, ladies' lounge, a main dining room, nine private dining rooms, the Center Lounge, the Gold Room, the Card Room, and a ballroom. The lavish interiors feature paneling, plasterwork, and panoramic art wallpaper by the French firm of Zuber & Company. The Pendennis Club was listed in the NRHP in 2003.

37. Commercial Building, 230 W. Muhammad Ali Boulevard

This c.1905 commercial building reflects the influence of the Italianate style and the Renaissance Revival style. The first floor storefronts are framed by an egg and dart molding. The storefronts have been altered. The second floor features two banks of three one-over-one double-hung windows with stone sills. A projecting cornice supported by three corbels features dentil molding and raised corner details. The building is capped by a simple brick parapet with limestone coping.

38. Speed Building, 319 Guthrie Green(JFCD 158)

The Speed Building was designed by Louisville architect Arthur Loomis of the firm of Loomis & Hartman and was completed in 1917. The building was listed in the NRHP in 1983. The Neoclassical building is clad in white glazed terra cotta. The building consists of four sections alternating between two and four stories. The storefronts have been altered. The upper floors contain large banks of windows reflecting the influence of the Chicago School. Some windows are double-hung sash with transoms while others have been replaced with aluminum storefront. The upper façade features pilasters, banding, cornices supported by scrolled consoles, and rooftop balustrades. The building was listed in the National Register of Historic Places in 1983.

39. University of Louisville School of Medicine / Louisville Medical College, 101 W. Chestnut Street

The Louisville Medical School was designed by the firm of Clarke & Loomis and was built between 1891 and 1893. The Louisville Medical College merged with the University of Louisville Medical School and the Louisville Hospital Medical College during 1907–1908. The new school was known as the University of Louisville School of Medicine and occupied the building until 1970. A four-story yellow-brick-clad addition to the rear was designed by the Louisville firm of D. X. Murphy & Brothers and was built in 1937. The Romanesque Revival

style building, listed in the NRHP in 1975, features rock-face limestone with carved limestone details. A tower with a clock and tiled hipped roof rises from the southeast corner of the building. The main building is four stories in height with gabled dormers and one-over-one double-hung windows. A two-story infirmary wing extends to the north and was part of the original construction. The façade of the infirmary wing features a central loggia topped by a gabled dormer and flanked by two turrets. The building was listed in the NRHP in 1975.

40. Christ Church Cathedral, 421 S. Second Street (JFCD 140)

Christ Church was established in 1822 and the nave of the present church was completed in 1824. The original building reflected the Federal style in its simple massing details. The east end of the church was enlarged in the mid-1840s by Louisville architect John Stirewalt (1811–1871). In 1859 a chancel was added following the design of English-born Louisville architect W. H. Redin. Redin also designed the church's new façade, completed in 1870. This façade is clad in rock-face limestone and is divided into three bays. A central gable contains three semicircular-arched windows and is flanked by two towers, a lower northern tower topped by a tall copper-roofed belfry, and a taller southern tower with a flat roof. Redin's use of round arches follows the Norman Revival variant of the Gothic Revival style. Stained glass memorial windows were installed in the nave during the last quarter of the 19th century. Christ Church became Christ Church Cathedral in 1894. Christ Church Cathedral remains Louisville's oldest extant church building. The Christ Church Cathedral was listed in the NRHP in 1973.

41. Christ Church Cathedral House, 425 S. Second Street (JFCD 140)

The Christ Church Cathedral House was built during 1911 and 1912. The building contained a kitchen, meeting room, parlor, auditorium, Sunday school rooms, and a Sexton's apartment. The building reflects the trends of the Collegiate Gothic but utilizes the semicircular arch of the Norman Revival as well as fenestration patterns evoking the Renaissance Revival. The Cathedral House was listed in the NRHP in 1973 as a part of the Christ Church Cathedral complex.

42. Howard-Hardy House, 429 S. Second Street (JFCD 141)

The Howard-Hardy House was built c.1830 for John Howard and was listed in the NRHP in 2004. It is a Federal style urban house featuring a small front yard and a narrow plan conforming to its urban location. The house features simple Federal details including limestone lintels with carved corner blocks and a simple cornice and frieze. The entrance features an elliptical fanlight and molded limestone trim. A cast iron balcony with a concave canopy projects from the south elevation. The Howard-Hardy House is the last extant pre-Civil War house in downtown Louisville with its slave quarters intact and is one of only two pre-1840 houses remaining in downtown Louisville. The house was acquired by prominent merchant Nathaniel Hardy in 1834. Lawyer Patrick Joyes owned the house from 1866 until 1904. A 1-story addition was built across the front of the building c.1905–1906 to house a restaurant. This addition was removed during the rehabilitation of the house between 2004 and 2006.

43. Service Station, 456 S. Second Street

This c.1960 service station is rectangular in form, with two garage bays and an office/sales space featuring aluminum storefront glazing. The enameled metal panel exterior has been painted over,

obscuring the historic colors. The doors of the garage bays have been replaced with later solid metal garage doors.

44. Office Building, 501 S. Second Street

This c.1950 office building reflects the influences of the International Style mixed with Classical Revival and Art Deco elements. The main block of the building features red brick walls with banks of three eight-over-eight double-hung windows set in a limestone frame. A stair tower rises from the corner of the building and features a neoclassical limestone entrance with Doric pilasters topped by a tall rectangular window. The side elevation of this tower features three stair landing windows with Art Deco influenced spandrel panel motifs.

45. Commercial Building, 652 S. Second Street

This c.1910 brick commercial building features a two-bay façade. Each bay contains a first-floor entry door and surround centered below a second floor opening. Both openings are contained within a semicircular-arched panel topped by a keystone. All openings contain aluminum storefront or glass block infill. A simple frieze contains small attic vents.

46. Transfer Livery / Bosler Fireproof Garage, 423–425 S. Third Street (JFCD 142)

The façade of this Romanesque Revival building was built c.1895 and originally fronted a livery stable. In 1919 a new fireproof garage designed by Louisville architect J. J. Gaffney was built behind this façade. The garage building retained the original configuration with a central arched drive entrance flanked by two storefronts. The central entrance arch is centered on a projecting pavilion featuring decorative brickwork and springs from ornate terra cotta molding. The second floor is divided into three bays by pilasters and contains three arched openings. These openings originally contained large divided-lite windows but were in-filled with brick and smaller steel sash windows sometime after 1920. An ornamental terra cotta cornice extends across the façade and is partially covered by a sheet metal cornice with Art Deco motifs. The building contained two small commercial spaces along the sidewalk and a corkscrew concrete ramp at the rear connecting the two levels and the roof. The Bosler Fireproof Garage is the oldest surviving automobile garage building in Louisville. It was listed in the NRHP in 1983.

47. Commercial Building, 427 S. Third Street

This c.1925 commercial building reflects the influence of both the Tudor Revival and the Art Deco in its simple limestone façade with Tudor-arched storefront and the simulated balustrade at the parapet. The second and third floor windows are grouped in vertical openings with white marble spandrel panels between them. The windows have been replaced with large single-lite windows. An Art Deco neon sign remains in place across the first floor, bearing the name of the Falls City Theatre Equipment Co.

48. Louisville Water Company Buildings, 455 S. Third Street

The Louisville Water Company Buildings were built in 1912 and reflect the influence of the Classical Revival and Georgian Revival styles with their quoins, corbelled cornices, rooftop balustrades, and Ionic-columned entrance porch. The two buildings are of tan roman brick with limestone foundations, quoins and friezes. The north building features an entrance porch with ionic columns and a rooftop balustrade. Both feature sheet metal cornices with dentil moldings

and modillions as well as one-over-one double-hung windows with limestone lintels featuring keystones. An office and garage building was built behind the two front building in 1915.

49. Madrid Building, 545 S. Third Street (JFCD 157)

The Club Madrid was built in 1929 and was designed by the Louisville architect E. T. Hutchings and was listed in the National Register of Historic Places in 1985. The building contained a ballroom and bowling alley over first floor retail space. The rear portion of the building originally contained a three-level parking garage. In 1952 the building was purchased by the FBI and converted into office space. The building's first floor is clad in limestone and contains storefront openings. The second and third floors are clad in red brick and are divided into bays by limestone pilasters. These floors feature divided-lite double-hung windows set in limestone frames. The third floor level features rectangular windows at the outermost bays on each façade with arched windows between. A simple terra cotta entablature supports a brick parapet wall with terra cotta accents.

50. Commercial Building, 438 S. Third Street

This commercial building appears to have been built c.1840. The building reflects the simple massing of Federal and Greek Revival commercial buildings of the early and mid-19th century. The upper floors feature six-over-six double-hung wood sash windows with limestone sills and lintels. A simple corbelled brick cornice trims the top of the parapet. The façade has been coated with stucco. The first floor storefronts were rebuilt c.1920 and reflect the influence of the Arts and Crafts movement in their simple pattern of black and white tile panels. The storefront transoms and the tiled recessed entry floors remain intact.

51. McDowell Building, 503 S. Third Street (JFCD-152)

The McDowell Building was built c.1905 and reflects Classical Revival and Colonial Revival influences. The first floor storefront has been boarded over but the storefront cornice remains exposed. A large entry portal is centered on the west façade. The second floor features paired one-over-one double-hung windows in segmental arched openings with molded brick frames and keystones. Molded stringcourses forming the sill and lintel lines of the third floor extend around the building. The third floor windows are paired one-over-one double-hung windows flanked by narrow pilasters. The fourth floor window treatment matches that of the third except that the pilasters have no capitals. A cornice molding and parapet crown the façade.

52. Parking Garage, 659 S. Third Street

This parking garage was built c.1925 and reflects the design of new purpose-built parking garage buildings within the urban fabric of downtown Louisville during the 1920s. The building originally contained five storefront bays along the street with parking space at the rear of the first floor and at the second floor. The façade is clad in textured buff brick with limestone accents. A sheet metal cornice trims the top of the façade. Pilasters define the garage entrance bay and the ends of the building, projecting through the cornice and featuring limestone panel accents. The storefronts have been boarded over. Despite the windows at the second floor level that have been removed from the masonry openings, the building's historic façade remains largely intact, providing a good example of an early urban parking garage with street-level storefronts.

53. Weissinger-Gaulbert Apartments – Third Street Annex, 707 S. Third Street (JFCD 178)
The Weissinger-Gaulbert Apartments – Third Street Annex was built in 1912 and was designed by the Louisville firm of Kenneth McDonald and William J. Dodd. The building followed the construction of two earlier buildings; the Weissinger-Gaulbert Building (1903) at the southwest corner of Broadway and Third Street, and the Broadway Annex (1907) to its west were also part of the Weissinger-Gaulbert complex. The other two buildings were demolished in 1955 and 1963. The nine-story building features a brown brick exterior with limestone trim and projecting oriel windows. It retains its historic one-over-one double-hung wood sash windows. The Weissinger-Gaulbert Apartments were listed in the NRHP in 1977

54. Kaufman-Straus Building, 427–437 S. Fourth Street (JFCD- 299/144)
The Kaufman-Strauss Building was built in 1902–1903 and was designed by Louisville architect Mason Maury (1846–1919). Maury was the only Louisville architect of this period whose work reflected the developments of the Chicago School. Five floors of the building were designed to house a department store while the sixth housed a public library. The building's façade follows the format of Louis Sullivan's Gage Building (1899) but adapts it to a wider mass. The storefront level of the building has been in-filled with brick and aluminum storefront.

The second through sixth floors are divided into five recessed bays by a series of molded pilasters topped with bursts of Sullivanesque foliate ornament. Each bay contains an identical series of windows. The second floor windows extend entirely across each bay and feature stained glass transoms. The third through fifth floors feature two window openings per floor, divided by narrow brick pilasters, and topped with stained glass transoms matching those at the second floor. The fifth floor windows extend the width of each bay but have no transoms. The outer edges of the façade are trimmed with a dentil molding that wraps the two sides and the top. A cornice projects from the top of the façade and features coffers with rosettes. The Kaufman-Straus Building was listed in the NRHP in 1978.

55. Starks Building, 455 S. Fourth Street (JFCD-300/148)
The Starks Building was built during 1911 to 1913 to the design of D. H. Burnham & Co. An extension to the east side of the building was built in 1926 and was designed by Graham, Anderson, Probst & White following the original design. The building's facades extend fourteen bays along Muhammad Ali Boulevard and nine bays along South Fourth Street, with identical ornamentation on both elevations.

The first and second floors are treated as one unit, with large masonry openings divided by paneled piers and topped by a projecting cornice above the second floor. The first floor storefronts have been replaced with aluminum storefront. Bronze spandrel panels divide the first and second floors. A pair of two-over-two double-hung windows occupies each bay at the second floor, divided by bronze mullions featuring bas reliefs. The third through thirteenth floors are treated as one unit, forming the shaft of the base-shaft-capital division favored by neoclassical architects of this period. Each bay features a pair of two-over-two double-hung windows divided by a narrow brick pier. The bays are divided by wider brick piers with projecting pilasters. The windows of the third floor feature molded consoles over their central piers, supporting shelves with finials at the fourth floor level. The spandrel panels between the

third and fourth floors feature elaborate bas relief sculpture. The spandrel panels between the twelfth and thirteenth floors feature medallions with lions' heads surrounded by swags and other ornaments. The panels between the paired windows of the thirteenth floor also feature base relief ornament. A fluted and molded band divides the thirteenth and fourteenth floors. The fourteenth floor features bas relief panels with Renaissance motifs between each window. A brick parapet caps the façade. The Starks Building was listed in the NRHP in 1985.

RIVER ROAD KENTUCKY CORRIDOR RESOURCES (See Figure 4.3-10)

Representative Sampling of Additional River Road Properties Within Extensions to Original APE (See Figures 4.3-10)

The Extension to the Original APE along River Road extends between the Ohio River and I-71, from just south of Zorn Avenue to Frankfort Avenue. Along the southern side of River Road, there are expansive views of wooded/natural areas including a former golf course near Zorn Avenue and the City of Louisville Soccer Park. The northern side of the roadway contains industrial uses, such as a series of mineral extraction activity and gravel operations. This area also includes some new commercial and office land uses near Zorn Avenue. River Road is a two-lane connector road with narrow shoulders and includes a crossing at Beargrass Creek. In the western portion of the APE, River Road transitions to a gateway boulevard into downtown Louisville with sidewalks.

National Historic Landmarks
There are no National Historic Landmark properties located within the River Road corridor**.**

The following representative sampling of properties were identified within the River Road corridor Extension to the APE:

1. Margaret Wright Paget House, 1562 Fulton Street
The Margaret Wright Paget House was built in 1838 as an addition across the front of c.1820 house on the site. The Paget House was built by carpenter Jeremiah V. Hollinshead (also spelled Hollingshead). Margaret Wright Paget (1791–1842) and her husband Jonathan Paget divorced in 1838 while the house was under construction. Margaret Paget owned the house until her death in 1842. The house passed through numerous owners before it was acquired by the Louisville Board of Park Commissioners in 1941. It was used as a meetinghouse for the Riverview Boat Club for many years.

In 1940, Margaret Paget's great-grandson, Louisville architect Stratton O. Hammon, designed a residence for a client with a near-replica of the Paget house façade. The Hammon-designed house is extant and is located at the fork of Lightfoot Road and Mayfair Lane in Louisville.

The Paget House is a brick I-house with a side-gabled roof. Second floor windows feature lintels with Greek key designs. Photographs taken before the house was stabilized show six-over-six double-hung windows and an entrance door with columned surround. It is not known whether these details remain under the plywood covering the openings. The railing of the 1838 cast iron

balcony has been removed but may be in storage. The Paget house is the last remaining structure from the neighborhood once known as "The Point." The Paget House was listed in the National Register of Historic Places in 1978 as a contributing element of the Paget House–Heigold House Facade nomination.

2. Heigold House Facade, Frankfort Avenue median at River Road

This façade was originally part of a house at 264 Marion Street (no longer extant) just southeast of River Road. The house was built after 1853 and the carving of the façade began in 1857. The house is believed to have been completed by 1866. The carving was done by the owner, German stone mason Christian Heigold. The sculpture was originally painted in bright colors and some traces of paint were visible into the late 20th century. The façade was dismantled and the house demolished in 1953 to make way for expansion of the city dump. The preservation of the façade was due to the work of Dr. Walter Creese, professor of art history at the University of Louisville, and George A. Hendon, Jr., executive assistant to Mayor Charles Farnsley. The façade was reassembled on a new site on the north side of River Road west of the Paget House.

The façade exhibits the strong influence of Georgian architecture, very unusual for the mid-19th century. The gabled façade is divided into three bays, with a projecting central pavilion. The outer bays each feature one six-over-six double-hung window (the glass has been removed) at each floor. The foundation is of limestone with a molded water table. Quoins trim either side of the red brick façade. The first floor windows of the outer bays feature sills and scrolled pediments supported by corbels. Panels below these windows contain swag motifs. A molded stone stringcourse divides the first and second floors. The second floor windows feature lintels supported by corbels and have wreath-patterned panels below their sills. The upper portions of the gable are of brick with simple limestone caps and copper flashing. The central pavilion is entirely of stone. A series of limestone steps lead to a recessed entry with molded frame and a lintel supported by corbels. A Greek Revival door surround is set within the portal. The door opening is flanked b pilasters with rosettes and sidelights with stone panels below. The door opening is topped by a stone transom bar with a central keystone, above with the transom opening contains divided-lite window frames (without glass).

At the second floor level the area above the entrance porch is treated as a shallow balcony. The face of this balcony features elaborately carved stone panels with wreaths, stars swags, and bas relief sculpture. The central panel contains an allegorical bas relief with figures, eagles, shields, and foliate ornament. Other panels contain depictions of Liberty and Justice flanking the Constitution with an unidentified male (possibly meant as a likeness of George Washington) bust at center. The base of this panel features the inscription "George Washington the First President of the Untied States the Man Whose Greatness Has Never Been Surpassed To Whom Americans Thank Their Freedom and the World Owes Its Love and Esteem." A central door opening features a carved frame and a lintel supported by corbels. This opening is set within an arch rising from Corinthian pilasters at either side of the window. The arch is ornamented with 31 stars, likely representing the number of states then in the Union, with a central keystone bearing a shield with "E. Pluribus Unum." Above the lintel and within the arch is a smaller arched niche containing a bust of President James Buchanan. The arch also bears the inscription, "James Buchanen [sic] 15th President of the U.S. in 1857. His Virtues And Patriotism Entitle Him To A

Crown Of Laurel From The Gratitude of His Country," and "The Union Forever. Hail to the Union. Never Dissolve It." A stone course above the second floor bears the inscriptions "Hall All men of the U. States." And "Hail to the City of Louisville." A shaped stone parapet rises above the arch and is topped with copper flashing.

The Heigold House Façade was listed in the NRHP in 1978 as a contributing element of the Paget House–Heigold House Facade nomination.

3. Industrial Complex, 2035–2039 River Road

This industrial complex appears to date from c.1910 to c.1940 and contains three notable structures. A c.1910 industrial building with a clerestory monitor, pilastered brick exterior and steel sash windows appears to be the earliest building on the site. Adjacent to this building is a large steel-reinforced concrete structure. The exact purpose of this structure is unknown, but it appears to have been designed to support a heavy load on top of the concrete deck. A small tower-like structure of unknown purpose is also located near these buildings.

EAST END PROPERTIES—KENTUCKY (See Figures 4.3-11a & 11b)

Historic Properties Identified in the FEIS

This section of the SDEIS updates information provided in the 2003 FEIS about historic properties identified in the Kentucky East End portion of the Original APE as detailed in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*. There is one National Historic Landmark (NHL) property within the Kentucky East End portion of the Original APE; the Louisville Water Company Pumping Station, as shown in Table 4.3-5.

1. Rosewell, 6900 Transylvania Avenue

According to the *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*, this two-story brick Greek Revival dwelling is thought to be the work of Henry Whitestone. The structure is three-bays wide and rests on a stone foundation. A stone water table runs along the top of the foundation. The central bay of the façade projects slightly and contains an arched entryway with double panel doors. The entryway is sheltered by a one-story portico with paired Corinthian columns and an open rail balustrade above. The six-over-six double-hung sash windows are slightly elongated, a nod to the emerging Italianate style, with simple stone sills and lintels. A 19th century two-story, two-bay wide brick and frame wing, thought to be the oldest portion of the dwelling, extends to the east. A 1-story frame, 20th century addition with a three-car garage extends from the 19th century wing. The property was listed in the NRHP in 1983. The only extant outbuilding is the brick, front gable smokehouse, located to the east of the house. One-bay wide and one-and-one half story high, the smokehouse has vents in the loft space and a hipped roof. Refer to page 4-85 of the 2003 FEIS for additional information on this historic resource.

With respect to MOA Stipulation III.P.2, the KYTC acquired the Rosewell property in November 2005. Following this acquisition, a Treatment Plan was developed for the property in response to MOA Stipulation III.P.1. This Treatment Plan, which includes both construction

drawings and specifications, was initiated in April 2006 and has undergone a number of reviews and comment periods since that time.

2. Belleview, 6600 River Road, Prospect

According to the *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* , Belleview was listed in the NRHP in 1992. Situated atop a small rise and reached via a long, tree-lined drive from River Road, Belleview is a good example of an intact 19th century gentleman's farm. The complex encompasses 123 acres and includes the dwelling, carriage house/garage, smokehouse, barn, corn crib and tenant house. Originally laid out like Rosewell by the Transylvania Seminary of Lexington, Belleview was not developed as a farm until the mid-19th century. Joseph Bell, a merchant in Louisville, purchased the land in 1854 and is responsible for the 19th century landscape.

The main dwelling at Belleview was originally constructed around 1855 as a two-story, three-bay wide brick I-house with Greek Revival details. Today it appears as a five-bay, two-story I-house with flanking wings. The central portion of the house dates from 1865, and linked the first portion to the originally-detached kitchen, which also dates to c.1855. The brick, front-gable carriage house located south of the dwelling dates from the last quarter of the 19th century. The east gable end is now open, and it appears there were two bays originally on the west gable end. One set of double, hinged glass and panel doors remain. The north and south elevations are pierced by nine-light fixed windows. The brick, one-bay wide front gable smokehouse is located adjacent to the carriage house. The two agricultural structures and the tenant house both date from the 20th century and are located to the north of the domestic yard. Refer to page 4-85 and 4-86 of the 2003 FEIS for information on this historic resource.

As stated above, Belleview was listed in the NRHP on April 2, 1992, which noted;

> *Belleview is significant at the local level under criterion A as an active and well-preserved example of a Gentleman Farm Property Type. As part of the Agriculture in Louisville and Jefferson County, Kentucky 1800-1930 context, Belleview's built, tilled and natural landscape has retained integrity associated with it since its development by Joseph Bell in 1854.*

The nomination inventory identified seven contributing resources: the Domestic Complex, the Carriage House/Garage, the Smokehouse, the Barn, the Corn Crib, the Tenant House, and the Pasture. The Boundary Justification reads:

> *The boundaries include the 123.2 acres of extant buildings, structures, and sites that are historically and culturally related to Belleview during its tenure as a gentleman farm. The farm is roughly bounded by the Ohio River on the west, Harrods Creek on the south, River Road on the east and the property line on the north.*

The nomination form indicated a period of significance of 1860-1939 and c.1855-1939. However, the Keeper[7] of the National Register, in consultation with the SHPO, amended the nomination and defined the Period of Significance as ending in 1930, and changed the Architectural Classification to be Mid-Nineteenth Century Greek Revival.

A letter from the National Trust for Historic Preservation (NTHP), dated July 15, 2011 (see Appendix D.4.1.5), identified the "north field" of the Belleview property as a property that should be reassessed for NRHP eligibility because of the passage of time since the 2003 FEIS and other considerations. The National Register nomination had not included the 27-acre "north field," which was added to the property by Mr. James Thompson in March of 1964. In a letter to the Kentucky Heritage Council (KHC), dated August 13, 2003, FHWA stated the following:

> *1) the boundaries of the Belleview historic property used in our Section 106 consultation process are precisely the boundaries identified in the National Register of History Places (NRHP) listing; 2) that Mr. Thompson's north field is not a part of the NRHP description of the Belleview historic property; that 3) that Mr. Thompson's north field has no known historic connection of association with the Belleview historic property during its period of significance; and 4) that Mr. Thompson's north field is not individually eligible for the NRHP.*

In a letter to FHWA, dated August 18, 2003, KHC stated:

> *In all cases, the boundaries described and justified in the nomination support the boundaries used by Federal highways in the Section 106 processes….In addition, the nomination text offers no suggestion that the North Field was considered part of the listing. Text in Section 7 and 8 provides no reference to the North Field, either as a significant part of Belleview's overall acreage or as the place where important buildings and landscape features are located. Finally, the USGS quad map depicts a straight line as the Northern boundary with no indication that the questioned property was included in the nomination.*

A site visit to the property was conducted on September 12, 2011. While the "north field" is currently being used as a horse pasture in association with the rest of the Belleview property, it is not individually eligible and no new information has become evident to connect the "north field" to the Belleview property during its Period of Significance, as defined in the *Agriculture in Louisville and Jefferson County, Kentucky 1800-1930* context.

Criterion A—The "north field" property has no known association with a series of events significant in the history of Louisville and Jefferson County. The 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* suggests an update to the 1990 MPDF for agriculture in Jefferson County to expand the period of significance to 1970. The current context ends at 1930. However, the "north field" would still have no association with Belleview during its period of significance as a Gentleman Farm Property Type as so listed in the National Register.

[7] The Keeper is the National Park Service official having the final authority over determinations of eligibility in cases where the matter is in dispute.

Criterion B—The "north field" property has no known association with a person significant in the history of Louisville and Jefferson County.

Criterion C—The "north field" property has no known buildings or landscape features past or present.

Based upon field reviews in September 2011 and archival research, no evidence was discovered to suggest the previous findings would change.

3. Allison-Barrickman House (KE-HC-JF563)

The property was listed in the NRHP in 1983. The *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* did not provide additional information regarding the Allison-Barrickman House. Refer to page 4-90 of the 2003 FEIS for additional information on this historic resource. With respect to MOA Stipulation III.O.1, the KYTC shall make reasonable efforts to acquire a preservation easement on the tract of land within the designated NRHP boundary. Communication with the property owner remains ongoing regarding this easement.

4. Upper River Road Bridge Over Harrods Creek (JF-845)

According to the *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*, construction began on the one-lane, triple span reinforced concrete arch bridge over Harrods Creek at Upper River Road in 1910. Jefferson County Fiscal Court records illustrate a long and often contentious effort to construct the bridge, which was awarded to the firm of Adams and Sullivan. In January 1912, the wing walls were under construction. Later that year, the Fiscal Court records note that "the part of the spandrel wall that has fallen, was pulled down by the wing wall" and a motion to file suit against Adams and Sullivan carried. Flooding damaged portions of the bridge in 1913; the County decided to raise the bridge above the 1884 flood mark and raise the approaches leading up to the bridge. Concrete piers that support an open concrete railing and balusters form the side walls of the bridge. A cut stone foundation from an earlier bridge is located on the west side of the current bridge. The bridge was upgraded with a new two-lane deck and railing in 2010.

5. Upper River Road Historic District

The *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* did not provide additional information regarding the Upper River Road Historic District. Refer to page 4-98 of the 2003 FEIS for additional information on this historic resource. As part of mitigation measures, a Historic Preservation Plan (HPP) for the district was undertaken in December 2005 to satisfy MOA Stipulation III.M.1. Following ongoing consultation and reviews, this HPP was completed and approved in the spring of 2011.

Historic Properties Unchanged Since the FEIS

In addition to the historic properties described above, there were also a number of other properties evaluated in the 2003 FEIS. These properties are either currently listed, or potentially eligible for listing in the NRHP. The table below lists these historic properties that have essentially remained unchanged or unaltered since the original Section 106 process. For

additional information or a complete description of these properties, refer to pages 4-85 to 4-100 of the 2003 FEIS.

TABLE 4.3-5
OTHER EAST END KENTUCKY PROPERTIES EVALUATED IN 2003 FEIS

Resource Name	NRHP Criterion
Upper River Road Historic District	B and C
Juniper Beach Historic District	A
River Hill/Stonebridge Historic District	C
Country Estates of River Road Historic District (and individual properties within the larger district)	A and C
Harrods Creek Village Historic District	A
James T Taylor Subdivision	A
Upper River Road over Goose Creek	C
Determan House	A
Bruce House	C
Fincastle	C
Dogwood Hill	C
Croghan-Blankenbaker House & Blankenbaker-Mattingly House	C
Midlands	C
Alice Speed Stoll House	A
Sutherland Farm	C
Jacob School Road Historic District	A
Bennett/Griesbaum/Lang House	C
Gaffney House	C
Edgewater Garden/Richmond Boat Club	A and C
Louisville Water Co. Pumping Station*	C
John C. Doolan House, Dunmanway	B
McFerran House	C
J.E. Skinner House	C
T.G. Peyton	C
Cedarbrook Farm	A
Addison W. Lee House	B
Horner House	C
St. Francis in the Fields Church	A
Green Castle Baptist Church	A
Prospect Store	A
Shirley/Baass/Taylor House	B and C
Dr J C Metcalfe House	C
Merriweather House	A
James Taylor/James Chandler House	B and C
Crowfoot	C

* *National Historic Landmark*

Identification of Additional Historic Resources for the SDEIS

As noted previously in the discussion of the Extensions to the Original APE, the East End portion of the Original APE was not extended as part of this SDEIS process. However, the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* evaluated resources located within the Original APE and identified five resources within the East End portion of the Original APE that would likely qualify as individually eligible for the NRHP. These historic properties are listed below and include a brief description based on site investigations as part of the SDEIS process, information obtained from the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*, and coordination with the Kentucky SHPO.

1. Kirzinger House, 7314 River Road (JF-1987)
The Kirzinger House at 7314 River Road is a Federal style house. It is rectangular in form with a side gabled roof and horizontal siding. The windows of the front façade are symmetrical with wood shutters and double-hung, six-over-one sashes. There is a small extended entry porch topped by a triangular pediment. The centered entrance is flanked by sidelights and a transom.

2. Stone Place Stables, 7718 Rose Island Road (JF-1949)
The house at 7718 Rose Island Road is a Colonial Revival style cottage. It is a single story house with a side gabled roof and has a cut away porch supported by a simple, round corner column. The main fieldstone chimney protrudes from the side of the house. The windows are double-hung two-over-two sashes, but appear to be replacements.

3. Woodhill Valley Subdivision Historic District
The Woodhill Valley Road Subdivision Historic District was identified in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* as eligible for listing in the NRHP. Thirteen structures along Woodhill Valley Road were surveyed as part of the survey update. Twelve were determined to be contributing resources to a potential historic district once the 50-year threshold was reached under a context of mid-century suburban development in Jefferson County.

4. Mockingbird Valley Historic District
The Mockingbird Valley Historic District is a residential neighborhood five miles east of the center of downtown Louisville. The identity of the area began to take shape in 1905 as owners initially purchased acreages from several large farms to establish a loose group of country estates. By the 1920s, a neighborhood of upscale suburban developments had coalesced, bounded by I-71 on the north, Brownsboro Road on the south, Swing Lane on the east, and Jarvis Lane on the west. Mockingbird Valley Road provides the spine of the district. The undulating landscapes, sharp bluffs, a meandering creek bed, stone outcroppings, floodplains, and stands of trees are the character-defining features of this residential, suburban landscape. The built environment complements and enhances the natural setting, with curvilinear roadways, deep setbacks, and architect-designed buildings and landscapes. The most popular architectural style is Colonial Revival bar far and there are also examples of Neo-Classical, Italian Renaissance,

French Eclectic, Mission, Modernist, International, and Monterey styles. The period of significance is 1905 through 1955.

5. Ohio River Recreational Camps/Communities (multiple properties)

As noted in the *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*, the recreational river camps/communities originated in the late 19th century and were designed for weekend or summer recreational activities. Historic examples along the Ohio River range from the 1930s to the late 1950s. The properties include small cabins built parallel or perpendicular to the river, along with beaches that were developed along the Ohio River and Harrods Creek. Many of these properties have been continuously remodeled and updated since their original construction. This group of properties also includes second generation river camp structures that are typically one story, concrete block or masonry buildings. Many of these recreational camps/communities are accessed from long entrances connecting to River Road.

Select properties located within the camps/communities were identified in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* as eligible for listing as a multiple property group in the NRHP under Criterion A for their association with river recreation. This group would consist of a number of residences within nine camp and/or riverfront neighborhood locations located along the Ohio River between Longview and Glenview. Individual properties were identified as eligible as a group, but not as a contiguous district. The survey update recommended undertaking a Multiple Property Documentation Form (MPDF, a National Park Service form 10-900-b) to document the contexts and property types for a multiple property listing. A multiple property listing refers to a group of historic properties related by common theme, general geographical area, and period of time for the purpose of National Register documentation and listing.

Below, in tables 4.3-5a through 4.3-5i, are the listings of the individual properties identified in the 2010 *Survey Update* as eligible as a group, but not as a contiguous district. Properties marked with an asterisk, below, were identified as individually eligible for NRHP listing, as well as being part of an Ohio River Camps MPDF listing. A brief description of the individually eligible properties follows the table in which each is referenced.

TABLE 4.3-5 a
MPDF RIVER CAMPS GROUP RESOURCES—WALDOAH BEACH

KHC#	Name	Address
JF-1927	Cabin	2801 Waldoah Beach Road
JF-1926	Cabin	2805 Waldoah Beach Road
JF-1925	Cabin	2809 Waldoah Beach Road
JF-1923	Cabin	2810 Waldoah Beach Road
JF-1924	Cabin	2811 Waldoah Beach Road
JF-804	Cabin	2901 Waldoah Beach Road
JF-1918	Cabin	2903 Waldoah Beach Road
JF-1919	Cabin	2905 Waldoah Beach Road
JF-1920	Cabin	2907 Waldoah Beach Road

JF-1921	Cabin	2909 Waldoah Beach Road
JF-1922	Cabin	2911 Waldoah Beach Road
JF-805	Cabin	2913 Waldoah Beach Road
JF-2372	Cabin	3227 River Road

TABLE 4.3-5b
MPDF RIVER CAMPS GROUP RESOURCES—TURNER'S BEACH

KHC#	Name	Address
JF-2033	Cabin	3125 River Road (#4)
JF-806	Cabin	3125 River Road (#6)
JF-2034	Cabin	3125 River Road (#8)
JF-807	Cabin	3125 River Road (#12)
JF-2035	Cabin	3125 River Road (#13)
JF-2036	Cabin	3125 River Road (#16)
JF-2039	Cabin	3125 River Road (unnumbered)
JF-2031	Club and Pool Houses	3125 River Road

TABLE 4.3-5c
MPDF RIVER CAMPS GROUP RESOURCES—TRANSYLVANIA BEACH

KHC#	Name	Address
JF-2145	House	6000 Transylvania Beach Road
JF-2075	House	6012 Transylvania Beach Road
JF-2077	House	6212 Transylvania Beach Road
JF-2078	House	6312 Transylvania Beach Road
JF-2146	House	6400 Transylvania Beach Road
JF-2079	House	6402 Transylvania Beach Road
JF-2080	House	6404 Transylvania Beach Road
JF-2081	House	6410 Transylvania Beach Road

JF-2076—House at 6206 Transylvania Beach Road: Based on site visits in October 2011, the structure does not have the integrity to be a contributing element to the MPDF River Camps group. Although the property dates to 1940, it has a massive and unsympathetic addition on its eastern façade (away from the river). The addition is clad in painted plywood and has large geometric windows. There have also been window and door alterations on the first level. The house does not appear to have permanently changed due to recent flood damage, but it does not convey itself as mid-century river cabin. The other contributing properties on Transylvania Beach are easily identifiable to a building period. While physical integrity does not need to be as high with a group nomination, the historic qualities of design, materials, workmanship, and feeling have been diminished by a large addition located on the front façade. Therefore, this structure is no longer considered contributing to the Multiple Property Group: Ohio River Camps.

TABLE 4.3-5d
MPDF RIVER CAMPS GROUP RESOURCES—GUTHRIE BEACH

KHC#	Name	Address
JF-2029	Cabin	6208 Gutherie Beach Road
JF-2030	Cabin	6212 Gutherie Beach Road

TABLE 4.3-5e
MPDF RIVER CAMPS GROUP RESOURCES—CREEKSIDE COURT

KHC#	Name	Address
JF-2014	Cabin	1 Creekside Court

TABLE 4.3-5f
MPDF RIVER CAMPS GROUP RESOURCES—RIVIERA NEIGHBORHOOD

KHC#	Name	Address
JF-1933*	House	4210 Riviera Drive
019-446-64205	House	519 Riverside Drive
019-446-64206	House	527 Riverside Drive
JF-1931	House	912 East Riverside Drive
JF-1934	House	904 Riverside Drive
JF-1935	House	906 Riverside Drive
JF-1936	House	918 Riverside Drive
JF-1937	House	922 West Riverside Drive
JF-1928*	Tudor Revival House	906 East Riverside Drive
JF-1939*	Cape Cod House	906 West Riverside Drive

JF-1933—House: This moderne-inspired ranch house was constructed in 1954 by Charles Farmer to resemble a ship. The house has a prominent picture window on the front façade, low horizontal lines, and a stone-veneered chimney pylon projecting asymmetrically from near the center of the main body of the house. The house also features low overhanging roof eaves that extend from the main body of the house on the south elevation to create a sheltered entry porch. The house is located within the Riviera neighborhood, platted in 1924 as a vacation community. This house is in good condition and exhibits few alterations. It is eligible for NRHP listing as an example of modern beach architecture.

JF-1928—Tudor Revival House: This 1.5-story Tudor Revival dwelling was probably constructed in the late 1930s. The building measures three structural bays; the north and south gable bays project from the main body on the front façade to form a recessed central entry. A stone chimney is situated in the center bay. The house has wooden casement windows on the principal façade and elevations with Tudor-style multi-paned leaded glass and some one-over-one wood double-hung windows. The house is located within the Riviera neighborhood, platted in 1924 as a vacation community. This house is in excellent condition and

exhibits few alterations. It is eligible for NRHP listing as an example of the Tudor Revival style in Louisville.

JF-1939—Cape Cod House: This is a 1.5-story Cape Cod style house with some elements of the Tudor Revival style. It was constructed in the late 1930s. The house has some eight-over-eight double-hung wood windows and some three-light wood casement windows. A central entry bay projects symmetrically on the façade. Also symmetrically placed, two shed-roofed dormers flank the main entry onto the steeply-pitched top half-story. On the building's south elevation there is a brick chimney. To the north of the main body of the house is an attached garage, designed in the same style. The house is located within the Riviera neighborhood, platted in 1924 as a vacation community. This house is in good condition and exhibits few alterations. It is eligible for NRHP listing as an example of the Cape Cod/Tudor Revival style in Louisville.

TABLE 4.3-5g
MPDF RIVER CAMPS GROUP RESOURCES—JUNIPER BEACH

KHC#	Name	Address
JF-2001	House	5301 Juniper Beach
JF-2025	House	5399 Juniper Beach
JF-2026	House	5401 Juniper Beach
JF-2027	House	5403 Juniper Beach
JF-2117	House	5407 Juniper Beach
JF-2118	House	5455 Juniper Beach
JF-2148	House	5515 Juniper Beach
JF-2071	Collett House	5601 Juniper Beach
JF-1997	House	5605 Juniper Beach
JF-1998	House	5611 Juniper Beach
JF-1999	House	5615 Juniper Beach
JF-2000	House	5617 Juniper Beach
JF-2072	House	5623 Juniper Beach
JF-2073	House	5625 Juniper Beach
JF-2074	House	5629 Juniper Beach

TABLE 4.3-5h
MPDF RIVER CAMPS GROUP RESOURCES—EIFLER BEACH

KHC#	NAME	ADDRESS
JF-2007*	William Eifler House	5209 River Road
JF-2008	Cottage	5135 Eifler Beach Road
JF-2009	Cottage	5139 Eifler Beach Road
JF-2010	Cottage	5143 Eifler Beach Road

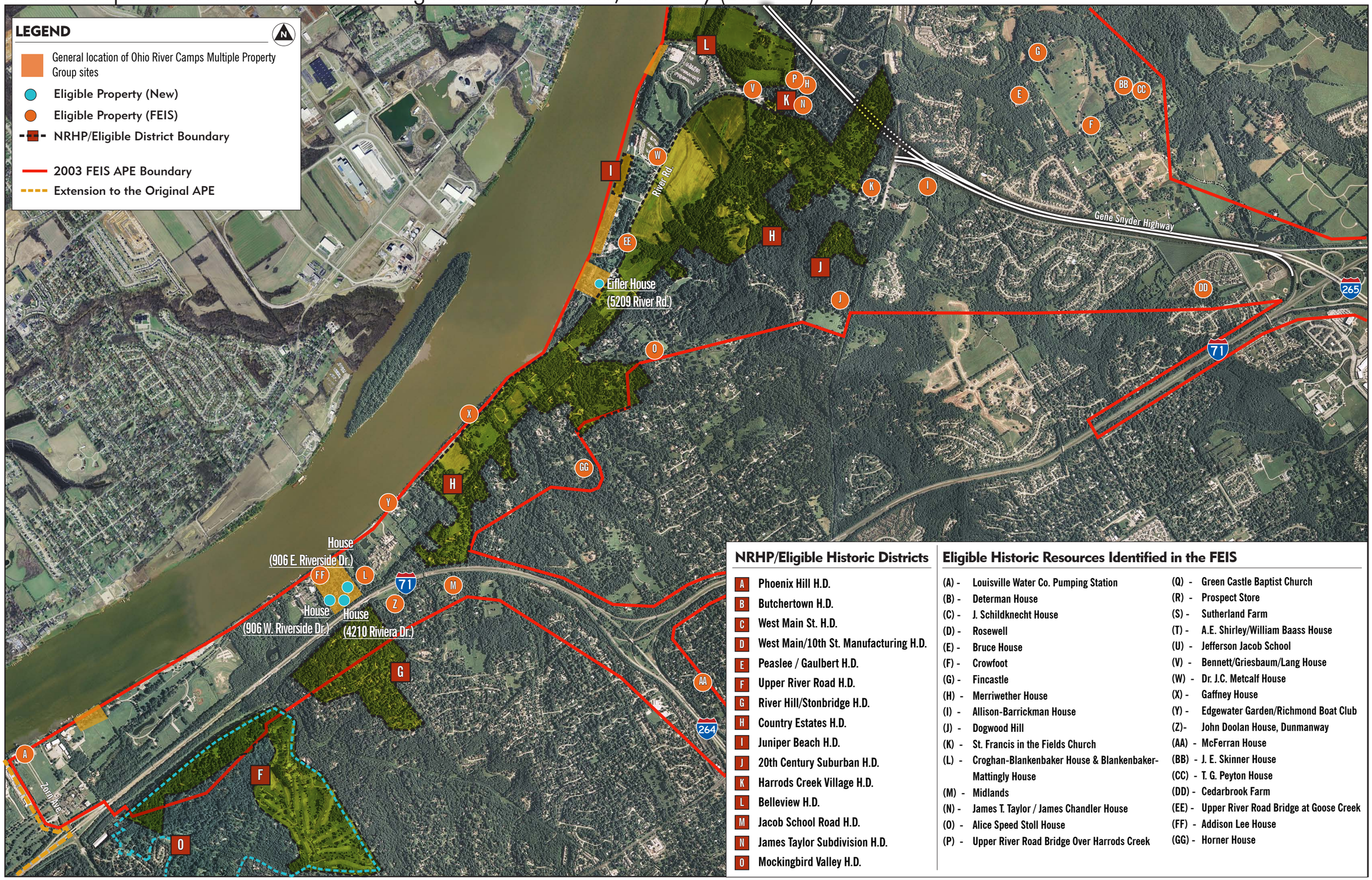
JF-2007—William Eifler House: This 1.5-story Craftsman-style bungalow was constructed by William Eifler, founder of Eifler Beach. The house was built in 1913. The stone fence that forms the front boundary of the property was constructed c.1914. The house has original two-over-two wood windows and the original rolled tin roof. A rear porch was enclosed c.1950 for additional

living space. Eifler's house is at the entry to Eifler Beach Road, where approximately nine river cabins are currently located. The beach-front land has historically been part of the current property; the cabins are owned by various individuals. This house exhibits moderate alterations. It is eligible for NRHP listing under Criterion A for its association with early twentieth century river camp communities and possibly under Criterion B for its association with William Eifler.

TABLE 4.3-5i
MPDF RIVER CAMPS GROUP RESOURCES—BEACHLAND BEACH

KHC#	Name	Address
JF-2115	Cabin	7206 Beachland Beach Road
JF-2371	Cabin	7214 Beachland Beach Road

Historic Properties Identified within the Original APE - Louisville, Kentucky (East End)



NRHP/Eligible Historic Districts

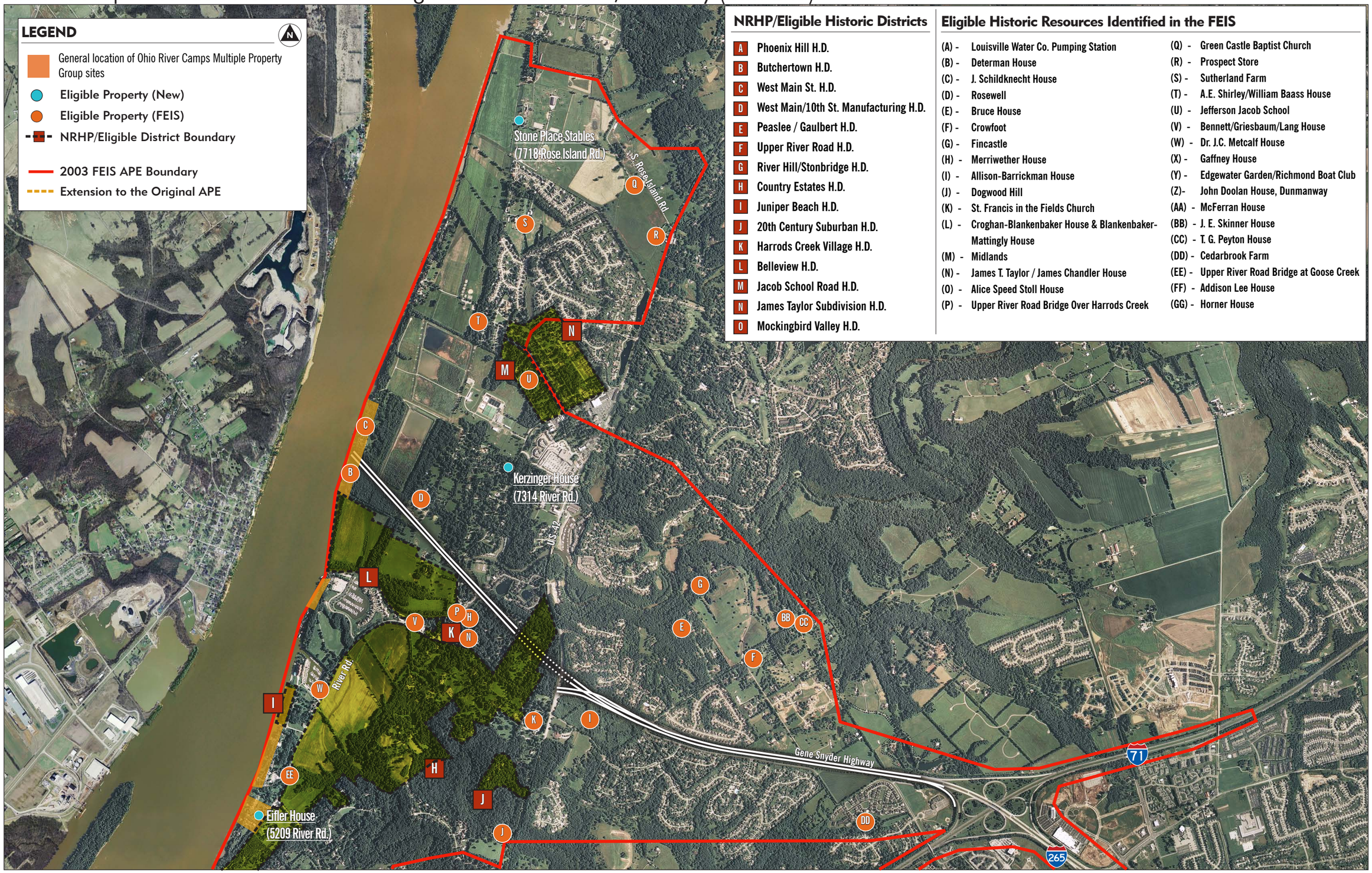
- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O Mockingbird Valley H.D.

Eligible Historic Resources Identified in the FEIS

- (A) - Louisville Water Co. Pumping Station
- (B) - Determan House
- (C) - J. Schildknecht House
- (D) - Rosewell
- (E) - Bruce House
- (F) - Crowfoot
- (G) - Fincastle
- (H) - Merriwether House
- (I) - Allison-Barrickman House
- (J) - Dogwood Hill
- (K) - St. Francis in the Fields Church
- (L) - Croghan-Blankenbaker House & Blankenbaker-Mattingly House
- (M) - Midlands
- (N) - James T. Taylor / James Chandler House
- (O) - Alice Speed Stoll House
- (P) - Upper River Road Bridge Over Harrods Creek
- (Q) - Green Castle Baptist Church
- (R) - Prospect Store
- (S) - Sutherland Farm
- (T) - A.E. Shirley/William Baass House
- (U) - Jefferson Jacob School
- (V) - Bennett/Griesbaum/Lang House
- (W) - Dr. J.C. Metcalf House
- (X) - Gaffney House
- (Y) - Edgewater Garden/Richmond Boat Club
- (Z)- John Doolan House, Dunmanway
- (AA) - McFerran House
- (BB) - J. E. Skinner House
- (CC) - T. G. Peyton House
- (DD) - Cedarbrook Farm
- (EE) - Upper River Road Bridge at Goose Creek
- (FF) - Addison Lee House
- (GG) - Horner House

Figure 4.3-11a

Historic Properties Identified within the Original APE - Louisville, Kentucky (East End)



NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O Mockingbird Valley H.D.

Eligible Historic Resources Identified in the FEIS

- (A) - Louisville Water Co. Pumping Station
- (B) - Determan House
- (C) - J. Schildknecht House
- (D) - Rosewell
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- (F) - Crowfoot
- (G) - Fincastle
- (H) - Merriwether House
- (I) - Allison-Barrickman House
- (J) - Dogwood Hill
- (K) - St. Francis in the Fields Church
- (L) - Croghan-Blankenbaker House & Blankenbaker-Mattingly House
- (M) - Midlands
- (N) - James T. Taylor / James Chandler House
- (O) - Alice Speed Stoll House
- (P) - Upper River Road Bridge Over Harrods Creek
- (Q) - Green Castle Baptist Church
- (R) - Prospect Store
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- (T) - A.E. Shirley/William Baass House
- (U) - Jefferson Jacob School
- (V) - Bennett/Griesbaum/Lang House
- (W) - Dr. J.C. Metcalf House
- (X) - Gaffney House
- (Y) - Edgewater Garden/Richmond Boat Club
- (Z)- John Doolan House, Dunmanway
- (AA) - McFerran House
- (BB) - J. E. Skinner House
- (CC) - T. G. Peyton House
- (DD) - Cedarbrook Farm
- (EE) - Upper River Road Bridge at Goose Creek
- (FF) - Addison Lee House
- (GG) - Horner House

Figure 4.3-11b

KENTUCKY PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER

The 2003 FEIS identified 27 properties in Kentucky that were evaluated for NRHP eligibility during the Section 106 process and determined to be not eligible. Since that time, one individual property, one multiple property group, and one historic district that were included in this section of the FEIS have been determined to be eligible for listing in the NRHP: the Kirzinger House, the MPDF Ohio River Camps Group, and the Woodhill Valley Subdivision Historic District (see EAST END RESOURCES—KENTUCKY, above). In addition, the Mockingbird Valley Historic District has been listed on the NRHP.

As a result of consultant parties' comments during the Section 106 process, additional updates to the information in this section of the 2003 FEIS include the following:

- Nuttall House: The eligibility status of the Nuttall House, which was listed in the FEIS as not eligible, has been revisited to re-evaluate that determination, based on comments from the NTHP (see letter dated July 15, 2011 in Appendix D.4.1.5). The results of the re-evaluation, which reconfirmed the not eligible determination, are presented following the table, below.

- Thomas Henry and Amelia Brown Payne House: This property, which is in the Nitta Yuma Historic District, was not included in the 2003 FEIS eligibility evaluations. The 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* was reviewed to identify potential updates to the information presented in the FEIS.

- Upper River Road between Harrod's Creek Bridge and Mayfair Avenue: A cluster of ranch homes along Upper River Road were evaluated for eligibility for the NRHP in response to a comment from a consulting party.

The information regarding the NRHP eligibility of these properties is presented following Table 4.3-6, below. The table lists the remaining 25 Kentucky historic properties that were described in greater detail in the 2003 FEIS as not eligible for NRHP listing (see FEIS pages 4-132 through 4-149, including figures 4.3-23 through 4.3-25). The table also adds the two properties evaluated during this SDEIS process and determined to be not eligible.

TABLE 4.3-6
KENTUCKY PROPERTIES DETERMINED NOT ELIGIBLE FOR NRHP LISTING

Kentucky Resource Name	Address
2003 FEIS List of Properties Not Eligible	
Warner Taylor House	5610 Wolf Pen Trace Road
Cottage	5103 Cherry Valley Road
Harry S. Frazier Jr. House	4810 Cherry Valley Road
Goff House	8001 Rock Hill Road
Ruth K. Lord/Oliver L. Hook House	9104 U.S. 42
Moseley L. Putney House	9106 U.S. 42
First Baptist Church Of Prospect	8911 U.S. 42
Klein House	7303 River Road
Campbell Bungalow	7004 Transylvania Avenue
John A. Timons House	6702 Transylvania Avenue
Mershon House	7100 River Road
Congrove/Mengel House	6705 Transylvania Avenue
Samuel M. and Emmie Venable Nuttall House *	6900 River Road
Epping-Wachtel Cottage	6609 River Road
Beverly Jean Stewart House	6607 River Road
Curd House	6705 Wolf Pen Branch Road
House	6711 Wolf Pen Branch Road
Child Development Center, First Christian Church of	7700 U.S. 42
Ppb Building	151 North Shelby Street
Henry Fruechtenicht Feed Mill	165 North Clay Street
Building	148-152 North Clay Street
Semet-Solvey Coke Company	? River Road
Building	501-503 East Jefferson Street
Office and Motor Freight Storage Building	930 West Main Street
Harrods Creek Lodge # 456	River Road
SDEIS Additions to List of Properties Not Eligible	
Thomas Henry and Amelia Brown Payne House,	5025 Nitta Yuma
Cluster of Ranch homes along Upper River Road	Between Harrod's Creek Bridge and Mayfair

** The eligibility status of this property has been revisited since the 2003 FEIS. The determination remains "not eligible," as discussed in the text herein.*

Samuel M. and Emmie Venable Nuttall House (JF2044)

The Nuttall House is a foursquare house, a form that was very popular in the Louisville area in the early decades of the 20th century. As stated in the 2003 FEIS, compared to similar more intact houses in Louisville's historic districts, the dwelling does not meet National Register Criterion C because of its modern alterations. It has no known association with a person significant in the history of Louisville and Jefferson County for Criterion B or a series of events for Criterion A.

As noted in the June 26, 2002, LSIORB *Section 106 – Final Determination of Eligibility* report prepared for the project, the property was referred to the Keeper of the National Register based on a recommendation by the NTHP, a consulting party; the Kentucky SHPO agreed with FHWA that this property was not eligible for the National Register; and the Keeper found this property not eligible "based on an exhaustive research of the property." (Report, p. 468)

In the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville, and River Road,* this property was determined to be not eligible for listing in the NRHP. This property would be acquired as part of the LSIORB Project. According to the current owner, the dwelling was built in 1923 and enlarged by W.L. Lyons in the 1960s. The plan is that of an American Foursquare, with Colonial Revival stylistics elements.

A site visit to the property was conducted on September 12, 2011. The house was vacant but appeared to be in relatively good condition. During the site visit, plans developed by Ingram & Ingram and dated February 1962 were discovered. The plans document the alterations that occurred in 1962, which included:

- In-fill of the one-story open porches on the east and west (side) elevations. The west porch was converted into a library and the east porch was converted into a solarium.
- Second stories were then constructed on top of both porches. The west addition contains dressing rooms and a bathroom for the master bedroom and the east addition contains a dressing room and bathroom for one of the other bedrooms.
- Interior alterations were made on the east end of the first floor for the enlargement of the dining room and the creation of a butler's pantry. A new kitchen was constructed at the northeast corner of the house.
- The garage was remodeled to create additional living spaces, bedrooms and bathrooms.
- A new garage was constructed along the east side of the house connecting it to the former garage.

Since then, further remodeling has occurred in the area of the dining room and butler's pantry and an open porch has been added to the west elevation.

Criterion A—The property has no known association with a series of events significant in the history of Louisville and Jefferson County. The 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* suggested an update to the Louisville and Jefferson County Suburban Development MPDF "in order to understand suburbanization in the later time frame." However, the survey form gave no indication that the property would be eligible under such an updated context.

Criterion B—The property has no known association with a person significant in the history of Louisville and Jefferson County. The property was owned by W.L. and Helena Lyons in 1962 at the time the modifications were completed, modifications that compromised the architectural character, see Criterion C below. While W.L. Lyons was the president of W.L. Lyons &

Company at the time of its merger with JJB Hilliard to create the investment firm of Hilliard Lyons in 1965, the Lyon's ownership of the property was too brief in the overall lifespan of the building (1923-present) to be considered a significant association.

Criterion C—Although the initial alterations are nearing 50 years of age, there are better examples of intact American Foursquare houses in Louisville and Jefferson County. Because of the design and materials used in the 1962 remodeling, it would be difficult for the average individual to discern the original 1923 structure from the 1962 additions.

Based upon field reviews in September 2011 and archival research, no evidence was discovered to suggest the previous findings would change.

Thomas Henry and Amelia Brown Payne House, 5025 Nitta Yuma

The Country Estates of River Road Historic District consists of all or portions of a string of contiguous estates, many with designed landscapes, covering approximately 700 acres, northeast of downtown Louisville. Four historic districts and ten individually listed properties are contained within the district. (The district is described above in EAST END RESOURCES—KENTUCKY, item 4 in the **"**Historic Properties Identified in the FEIS" subsection.)

One of the districts is the Nitta Yuma Historic District, which was listed in the NRHP in 1983 with four houses, "three of which were built in the neo-classical styles of the early 20th century. The fourth house is a ca.1870 vernacular farmhouse." The district nomination continues: "These four structures form the core of the original historic area as other houses have been destroyed by fire and have been replaced with mid-20th century dwellings." The period of significance for the district is listed as being from 1870 to 1929.

One of the mid-20th century dwellings is the Thomas Henry and Amelia Brown Payne House, located at 5025 Nitta Yuma. The house was constructed in 1950 on the site of the former summer home of George Garvin Brown and Amelia Owsley Brown, which burned in 1947. The country cottage home was designed by local architect Frederic Morgan.

The Payne House was not identified as listed/eligible historic property during the 2003 FEIS Section 106 process (June 26, 2002, LSIORB *Section 106 – Final Determination of Eligibility* report) nor was it identified in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*. As a result, a field visit was conducted to view the property in order to better assess its potential eligibility.

Criterion A—There is no known association with a series of events significant in the history of Louisville and Jefferson County. In addition to having been constructed more than 20 years after the end of the period of significance for the Nitta Yuma development, the district nomination is specific in its omission of any resource other than the four structures. Further, while the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* suggests an update to the Louisville and Jefferson County Suburban Development MPDF "in order to understand suburbanization in the later time frame," the construction of this cottage-style

dwelling as a replacement house within the turn-of-the-century high-style community is atypical of other mid-20th century suburban development occurring in eastern Louisville.

Criterion B—There is no known association with persons significant in the history of Louisville and Jefferson County. Although the original house on the site was constructed for George Garvin Brown and Amelia Owsley Brown, both had passed away well before the house was destroyed by fire in 1947 and the current house was constructed in 1950. Further, while the house still remains in the ownership of a Brown family member, there are other, more significant resources associated with the Browns already listed in the National Register.

Criterion C—The property does not exhibit great artistic value or being the work of a master. The house was designed by Frederic Morgan. While, Mr. Morgan qualifies as a locally significant architect, there are several more significant examples of his work (i.e., Pendennis Club, Schuster Block, and St. Francis-in-the Fields) listed in or eligible for the National Register. Further the four properties already listed as part of the Nitta Yuma Historic District are more complete and intact examples of the turn-of-the-century residential developments integrating planned landscape designs.

Based on the above, the property is not eligible for listing in the NRHP.

Upper River Road between Harrod's Creek Bridge and Mayfair Avenue

In response to a consulting party comment received in September 2011, a "cluster of ranch homes … along Upper River Road between Harrods Creek Bridge and Mayfair Avenue" was evaluated for eligibility for the NRHP as an example of a 20th Century Suburban Historic District.

A field visit was conducted to view the 23 properties surveyed from 6603 River Road to 7214 River Road, that were identified in the 2010 *Jefferson County Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road*. Of these 23 properties, 7 were designated as undetermined and 16 were designated as not eligible. A designation of undetermined means additional research needs to be conducted to determine whether the property may be eligible for listing; a designation of not eligible means the property does not appear to be at least 50 years old or it has been so altered that it has lost its historic character.

Criterion A—There is no known association with a series of events significant in the history of Louisville or Jefferson County. The 2010 Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road suggested an update to the Louisville and Jefferson County Suburban Development MPDF "in order to understand suburbanization in the later time frame." Based on the survey forms prepared during the 2010 survey update and field visits in October 2011, more than two-thirds of the properties within the surveyed area lack the integrity to be eligible under such an updated context.

Criterion B—There is no known association with persons significant in the history of Louisville or Jefferson County.

Criterion C—The seven-block area along upper River Road contains four properties constructed between 1900-1924, nine constructed between 1925-1949, and ten constructed between 1950-1974. Architectural styles listed include Bungalow, Ranch, Cape Cod and Unknown. Because of this wide range of construction dates, varying styles and overall lack of historic integrity, the architecture does not evoke a recognizable sense of place necessary to represent a significant and distinguishable entity.

Based on the above, this cluster of homes along River Road is not eligible as an example of a 20th Century Suburban Historic District. No individual structures within the group were noted as individually eligible for listing on the NRHP.

4.3.2 Archaeological Resources

This section of the 2003 FEIS provided a summary of the methodology and results of archaeological investigations in the project area. The archaeological investigations were conducted to determine whether there were any archaeological sites listed in or eligible for listing in the NRHP. The information presented in Section 4.3.2 of the 2003 FEIS is still generally applicable, and is not repeated herein. For more detailed information, refer to pages 4-150 through 4-153 of the FEIS. Table 4.3-7 identifies the archaeological resources located within the current alignments of both the FEIS Selected Alternative and the Modified Selected Alternative. The table updates information from the 2003 FEIS (tables 4.3-7 and 4.3-8) to include archaeological investigations conducted since that time.

TABLE 4.3-7
STATUS OF ARCHAEOLOGICAL SITES ASSOCIATED WITH THE FEIS SELECTED AND THE MODIFIED SELECTED ALTERNATIVES

Site	Description	SHPO Determination—2003 FEIS	SHPO Determination—Current	Build Alternative Corridor
INDIANA				
12-CL-516	Prehistoric Terminal Archaic Riverton Site	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-525	Prehistoric Woodland Site	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-527	Historic Isolated Well/Cistern	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-559	Historic Site Associated with Farmstead	Additional Investigations Required Before Eligibility Can Be Determined	No change since 2003	East End
12-CL-561	Historic Site Associated with Lime Industry	Potentially Eligible; Additional Investigations Required	No change since 2003	East End

Site	Description	SHPO Determination—2003 FEIS	SHPO Determination—Current	Build Alternative Corridor
12-CL-762	Colston Park	(Identified after 2003 FEIS)	Not Eligible (Based on 2006 Phase 1 Investigation)	Downtown
N/A	Spring Street Freight House – Associated with Historic Site ID-HC-61007 (referred to as the Train Depot)	Archaeological potential not known in 2003	Investigations Required Before Eligibility can be Determined	Downtown
KENTUCKY				
15Jf677	Prehistoric Site	Potentially Eligible; Additional Investigations Required	No change since 2003	East End
15Jf678	Prehistoric Site	Historic Site is a Contributing Element to the National Register Property; Additional Investigations Required.	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End
15Jf679	Prehistoric Site, Historic Site Associated with Rosewell Plantation (JF-452/Site 18)	Potentially Eligible; Additional Investigations Required	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End
15Jf680	Prehistoric Site	Contributing Element to the National Register Property; Additional Investigations Required	No change since 2003	East End
15Jf683	Historic Site Associated with Allison-Barrickman Plantation (JF-563/Site33)	Potentially Eligible; Additional Investigations Required	No change since 2003	East End
15Jf716	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Not Eligible (Based on 2005 Phase 1 Investigation)	Downtown
15Jf717	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Eligible; Phase 3 Data Recover Completed in 2008	Downtown
15Jf718	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Eligible; Phase 3 Data Recover Completed in 2008	Downtown
15Jf719	Historic Complex	(Identified after 2003 FEIS)	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End
15Jf720	Prehistoric Site	(Identified after 2003 FEIS)	Phase 1 Investigations Conducted in 2008. Site Potentially Eligible, Further Coordination Required	East End

Note: Locations of archaeological sites are not shown or described in detail in order to protect them from destruction or desecration.

4.3.3 Summary of Section 106 Process

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of their undertakings on historic properties and to afford a reasonable opportunity for interested persons and the ACHP to comment on the proposed undertaking. Regulations by which a Federal agency meets its obligations under Section 106 are found at 36 CFR Part 800.

Section 4.3.3 of the 2003 FEIS detailed the Section 106 process, including the various meetings held to gather information and feedback. For additional information on the initial Section 106 process, refer to pages 4-153 through 4-156 of the FEIS. The following information details the Section 106 process as it relates to the SDEIS.

In April 2011, invitations were sent out to the consulting parties identified in the FEIS in an effort to re-engage those individuals, organizations, and agencies as partners in this SDEIS process. Included with this letter was a request to identify additional individuals, organizations, and agencies to be included as consulting parties to the Section 106 process for this project. Invitations were then sent to all of the consulting parties to attend an informational Section 106 meeting scheduled for June 1, 2011.

The June 1, 2011, meeting was held to provide a brief overview of the LSIORB Project and the commitments in the 2003 MOA implemented to date, as well as to explain potential changes to the project to be considered during the SDEIS process. The discussion also described the Original APE presented in the 2003 FEIS, as well as potential changes/extensions to the Original APE based on new information or conditions relative to the then-proposed Modified Selected Alternative.

On June 27 and 28, 2011, public information meetings were held in Jeffersonville and Louisville to discuss the status of development of the SDEIS with the general public. Each meeting was structured into two phases. An Open House format allowed the general public to review the differences between the FEIS Selected Alternative and the Modified Selected Alternative. Following the open house portion of the meeting, the general public was given the opportunity to comment on the materials presented and the project in general.

As part of this SDEIS, a re-evaluation of the Original APE was undertaken to identify areas that could potentially experience changes to traffic patterns, based on the proposed project design modifications and the introduction of tolling. To consider the effects of such changes to traffic patterns as a result of the Modified Selected Alternative, traffic data and output from a travel demand model were developed to estimate potential changes in traffic conditions within the project area. The travel demand model identified several areas in New Albany, Clarksville, and Jeffersonville (Indiana) and downtown Louisville (Kentucky) that could experience increases in traffic that could potentially result in indirect effects on historic properties. No such areas were identified within the East End Corridor of the project. Extensions to the Original APE were initially developed by FHWA, INDOT, and KYTC to assess the potential effects of the Modified Selected Alternative to historic resources.

A Section 106 kick-off meeting was held for consulting parties on June 1, 2011 in Jeffersonville. On July 14, 2011, the Extensions to the Original APE and the methodology for their creation were presented to the staff of the Indiana and Kentucky SHPOs. This meeting was held to present initial findings and gather preliminary feedback/comments from the respective SHPOs. As a result of this consultation, the boundaries of the Extensions to the Original APE were revised to include additional resources in downtown Louisville and Jeffersonville. The Extensions to the Original APE boundaries were approved by Kentucky SHPO on August 11, 2011, and by Indiana SHPO on September 6, 2011.

Draft recommendations on the eligibility of historic properties were provided to consulting parties on September 14, 2011 with a request for comments within 30 days. On September 29, 2011, consulting parties met in Louisville to review the preliminary eligibility recommendations provided by the project team for resources within the Original APE and Extensions to the Original APE. All comments received on the APE and eligibility recommendations are included in Appendix A of the draft 800.11(e) report, which is included in Appendix D.4.2 of this SDEIS.

The draft recommendations on the effects of the project on historic properties were transmitted to the consulting parties on November 3, 2011, with a thirty day comment period. Included in this transmittal was the "Identification Findings Report," a summary of the responses to comments received from the SHPOs and the consulting parties on the eligibility recommendations, and the draft effects recommendations. On November 4, 2011, the consulting parties were provided with the draft 800.11(e) report, which documents FHWA's Section 106 findings and determinations on the Area of Potential Effects and Eligibility. The report also presents the proposed effect findings for the project. A consulting parties meeting is scheduled on November 18, 2011, to discuss the effects findings; final determinations will be incorporated into the SFEIS in early 2012. Coordination with consulting parties on measures to avoid, minimize, or mitigate adverse effects will occur prior to the signature of the SFEIS.

4.4 Air Quality

Section 4.4 of the 2003 FEIS provided a general description of the regulatory setting (Section 4.4.1), and a description of the existing ambient air quality in Louisville and Jefferson County (Section 4.4.2). Section 4.4 of the SDEIS contains additions and updates to the information that was presented in the 2003 FEIS, including the following:

- Section 4.4.1—Identifies current National Ambient Air Quality Standards (NAAQS) attainment status in the project area. At the time of the FEIS, the project area was in attainment for the NAAQS for all pollutants. Since the publication of the FEIS, the attainment status of the project area has changed. The project area is still in attainment for carbon monoxide, but is now in a maintenance status for ozone (under the 8-hour standard), non-attainment status for $PM_{2.5,}$ and non-attainment status for sulfur dioxide. The long-range transportation plans for both Kentucky and the Louisville–Southern Indiana Metropolitan Planning Organization (Louisville MPO) have been updated, as well as conformity determinations and the MPO Transportation Improvement Program (TIP).

- Section 4.4.2—Provides updated monitoring data for the project area to show current air quality trends.

- Section 4.4.3 (added since the 2003 FEIS)—Updates and augments information about the transportation-related pollutants that are currently of air quality concern for the project area, including pollutants for which the project area has previously been in nonattainment; and adds a discussion of Mobile Source Air Toxics.

- The following figures have been added to update data that was presented in the FEIS: Figure 4.4-1 *Carbon Monoxide Trends from 2001 to 2008*; Figure 4.4-2, *Ozone Trends from 2001 to 2008*; and Figure 4.4-3, *$PM_{2.5}$ Trends from 2001 to 2008*.

4.4.1 Regulatory Setting

The Clean Air Act (CAA) required the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) for pollutants that are considered to be harmful to public health and the environment. USEPA set forth standards for six criteria pollutants: particulate matter (PM), sulfur dioxide (SO_2), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb). Generally, when levels of pollutants do not exceed an NAAQS, an area is considered in "attainment" for that particular NAAQS. An area that does not meet the NAAQS is designated as "nonattainment." When a nonattainment area comes into compliance with the NAAQS, it is designated as a "maintenance" area.

The project area is located in the Louisville (Kentucky-Indiana) transportation planning study area. Much of the transportation planning study area coincides with an air quality maintenance area and/or an air quality nonattainment area. The 2003 FEIS noted that the project area was "in attainment for all pollutants covered by the NAAQS," and that the Louisville Metropolitan Area had been "redesignated as 1-hour ozone attainment in November 2001" (p. 4-156). In June 2004, Clark and Floyd counties in Indiana, and Bullitt, Jefferson, and Oldham counties in Kentucky were designated as a nonattainment area under the 8-hour standard for the pollutant ozone. In July 2007, the area was re-designated as an attainment area for ozone with a maintenance status. In April 2005, Clark and Floyd counties and Madison Township of Jefferson County, Indiana, and Bullitt and Jefferson counties, Kentucky, were designated as a nonattainment area under the particulate matter less than 2.5 microns ($PM_{2.5}$) standard (based on average annual concentration).

Transportation conformity requirements in 40 CFR Part 93 apply in all nonattainment and maintenance areas. A conformity determination is a finding that a transportation plan, program, or project is consistent with ("conforms to") the State's plan for attaining the NAAQS or maintaining compliance with the NAAQS. As described below, conformity determinations are made at the regional level and at the project level.

Regional Conformity

For an MPO in a nonattainment or maintenance area, a conformity determination is required for any update or amendment to the MPO's long-range transportation plan and Transportation Improvement Program (TIP); a conformity determination for a plan or TIP is based on an emissions analysis for the metropolitan region; and it requires a regional emissions analysis to demonstrate that the plan and TIP conform with the emissions budget established for mobile sources in the SIP. The U.S. Department of Transportation (USDOT) determines conformity on the transportation plan and TIP in consultation with USEPA Regions 4 and 5.

The LSIORB Project is located in the Louisville-Southern Indiana metropolitan area. The LSIORB Project is included in the Louisville MPO's *Horizon 2030 Metropolitan Transportation Plan* (p. 427), and in the *FY 2011–FY 2015 Transportation Improvement Program* (p. 162). A conformity analysis was completed to support determinations of conformity under both the 8-hour O_3 standard and the annual $PM_{2.5}$ standard for both plans. The analysis showed that both plans are consistent with the goals and emission budgets established in the SIPs of both Kentucky and Indiana. On November 9, 2010, FHWA and FTA made a conformity determination on the *Horizon 2030* transportation plan and TIP. The LSIORB Project as described in this SDEIS is included in Amendment 3 of the *Horizon 2030 Metropolitan Transportation Plan* and in Amendment 3 of *FY 2011 - FY 2015 Transportation Improvement Program*.[8]

Project-Level Conformity

When approving an individual project, FHWA is required to make a project-level conformity determination. For a project in a metropolitan area (such as Louisville) that is in nonattainment or maintenance status, the requirement for a project-level determination is satisfied in two ways. First, the project must be included in an approved metropolitan plan and TIP, for which a regional conformity determination has been made. Second, the project may also require a project-level emissions analysis to assess the project's potential to cause localized emissions that exceed the NAAQS. Project-level emissions analysis are required in the Louisville metropolitan area for two pollutants—CO and $PM_{2.5}$.

4.4.2 Existing Ambient Air Quality

The Air Quality Section of the Louisville Metro Air Pollution Control District (LMAPCD) is responsible for ambient air monitoring in Jefferson County, Kentucky. LMAPCD works in partnership with USEPA, the Kentucky Division for Air Quality, and Indiana Department of Environmental Management (IDEM) to monitor and report air quality. As of July 2011, there were seven monitoring sites in Jefferson County. Pollutants monitored are PM, SO_2, CO, O_3 and

[8] At KYTC and INDOT's request, the Louisville MPO is in the process of updating *Horizon 2030* to include the current design and scope of the LSIORB Project. The MPO has conducted an air quality conformity analysis for this proposed update to its long-range plan, and that analysis found that the plan conforms to the applicable emissions budgets. The MPO is scheduled to vote on this update to its long-range plan at its November 2011 meeting, shortly after this SDEIS is published. If the update is approved, the project as described in this SDEIS will be included in a conforming long-range plan.

NO_x. IDEM has two monitoring sites in Clark County, Indiana. The pollutants monitored in Indiana are PM and hydrocarbons (also known as volatile organic compounds or VOCs).

Monitored values are used to forecast air quality and are reported to USEPA for use in determining pollutant levels in relation to the NAAQS and compliance with the CAA. Data from USEPA's AirData inventory for 2008, the most recent reported year in the USEPA database, show no monitoring data exceeding the NAAQS for PM, SO_2, CO, or NO_2. Data showed monitored values exceeding the 8-hour ozone NAAQS within the study area. Air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area.

4.4.3 Transportation-Related Criteria Pollutants in the Project Area

This section discusses the following transportation-related criteria pollutants in the project area: ozone (O_3); carbon monoxide (CO); and particles with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). Transportation conformity only applies to these criteria pollutants and their applicable precursors.

Ozone (O_3)

Ozone is a gas composed of three oxygen atoms. It is created by a chemical reaction between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight. Ground-level ozone is the primary constituent of smog. As discussed in Section 4.4.1, in June 2004, Clark and Floyd counties, Indiana, and Bullitt, Jefferson, and Oldham counties, Kentucky, were designated as a basic nonattainment area under the 8-hour standard for O_3, and in July 2007 this combined area was re-designated as an attainment area with a maintenance status. As also stated in Section 4.4.1, the LSIORB Project is included in a conforming transportation plan and TIP; therefore, conformity with the SIP for O_3 has been demonstrated.

Particulate Matter (PM)

Particulate matter, also known as particle pollution or PM, is a complex mixture of extremely small particles and liquid droplets. The size of particles is directly linked to their potential for causing health problems. The CAA requires USEPA to set air quality standards to protect both public health and the public welfare (e.g., crops and vegetation). Particle pollution affects both. USEPA groups particle pollution into two categories:

- "Inhalable coarse particles," such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter (PM_{10}).

- "Fine particles," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller ($PM_{2.5}$). These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries, and automobiles react in the air.

As discussed in Section 4.4.1, in April 2005 Clark and Floyd counties and Madison Township in Jefferson County, Indiana, and Bullitt and Jefferson counties, Kentucky, were designated as a nonattainment area under the standard (based on average annual concentration) for $PM_{2.5}$. As also discussed in Section 4.4.1, the proposed project is included in a conforming transportation plan and TIP; therefore, regional conformity with the SIP for $PM_{2.5}$ has been demonstrated.

Based on the transportation conformity regulations found in 40 CFR 93.123(b)(1) (as amended March 10, 2006), a project-level ("hot spot") conformity analysis is required for certain types of transportation projects, including "new or expanded highway projects that have a significant number of, or significant increase in diesel vehicles" and "projects affecting intersections that are at Level-of-Service D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project." The regulations state that the hot-spot analysis must be quantitative, but postpone the effective date for that requirement until appropriate models and procedures are in place. Until that time, the regulations allow for hot-spot analyses to be "based on a qualitative consideration of local factors." On December 20, 2010, EPA released guidance for conducting quantitative hot-spot analyses, but established a two-year grace period to allow for training. During this grace period, which ends on December 20, 2012, project sponsors can continue to conduct qualitative hot-spot analyses. See 40 CFR 93.123(b)(4).

The procedures for conducting hot-spot analyses are provided in a guidance document that EPA issued in March 2006, at the same time the conformity regulations were amended ("Hot-Spot Guidance").[9] Under the Hot-Spot Guidance, a qualitative hot-spot analysis must be performed for each "project of air quality concern," which is defined as any project that meets the criteria specified in 40 CFR 93.123(b)(1). The LSIORB Project was determined to be a project of air quality concern according to 40 CFR 93.123(b)(1). Therefore, a qualitative PM hot-spot analysis was completed according to the Hot-Spot Guidance for the LSIORB Project. The results of the hot-spot analysis are included in Section 5.4, *Air Quality* and the full qualitative analysis is included in Appendix B.1.1, in this SDEIS.

Carbon Monoxide (CO)

The NAAQS for CO is 35.0 parts per million (ppm) for the 1-hour standard and 9.0 ppm for the 8-hour standard. The project area, which is a part of the MPO, is currently an attainment area for CO. As a part of the 2003 FEIS, CO hot-spot modeling was performed at 23 intersections within the project area to determine future CO levels. None of the intersections showed CO levels that would exceed either the 1-hour or 8-hour standard. Carbon monoxide levels are highest at the most congested intersections where more cars spend time idling (the condition in which the highest levels of CO are produced). Carbon monoxide hot-spot analyses have also been conducted for this SDEIS at the two intersections having the highest traffic volumes for each build alternative currently being considered, and compared to the original analyses. The results and conclusions of the CO modeling are discussed in Section 5.4.

[9] USEPA/FHWA (March 29, 2006). *Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM2.5 and PM10 Nonattainment and Maintenance Areas.* (http://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/pmhotspotguidmemo.cfm)

The 2003 FEIS figures 4.4-2 through 4.4-5 illustrated trend data for the years 1996 to 2001 and 1982 to 2000 for CO, O_3, PM_{10}, and NO_x. The values from the project area monitoring stations were evaluated, and trend data for the transportation-related criteria pollutants for which the project area has been, or is currently in non-attainment (CO, O_3, and $PM_{2.5}$) are updated to the years 2001 to 2008 and presented in SDEIS figures 4.4-1 through 4.4-3.

FIGURE 4.4-1 CARBON MONOXIDE TRENDS FROM 2001 TO 2008

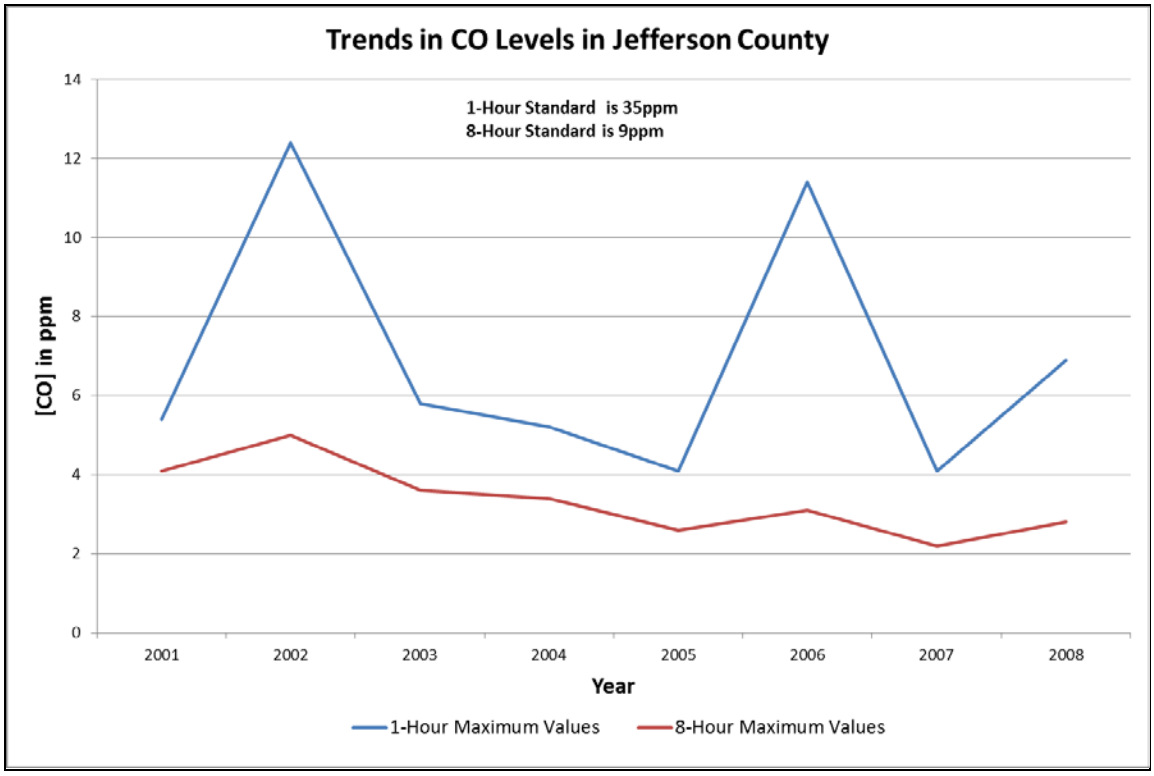


FIGURE 4.4-2 OZONE TRENDS FROM 2001 TO 2008

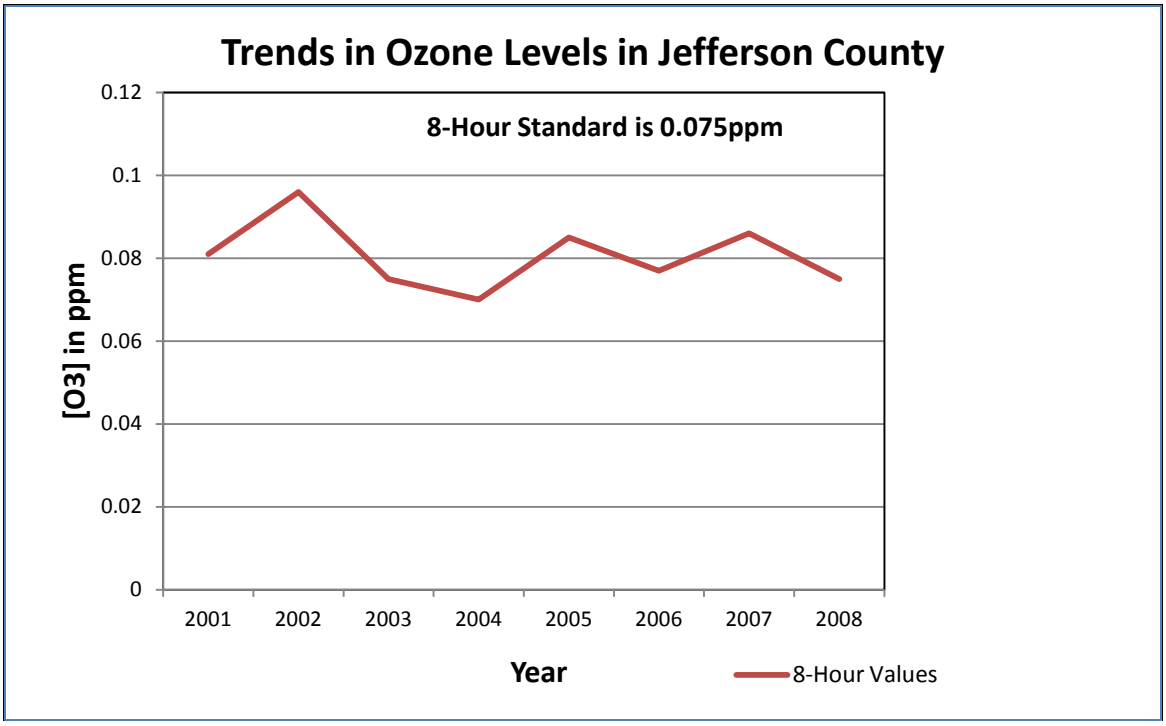
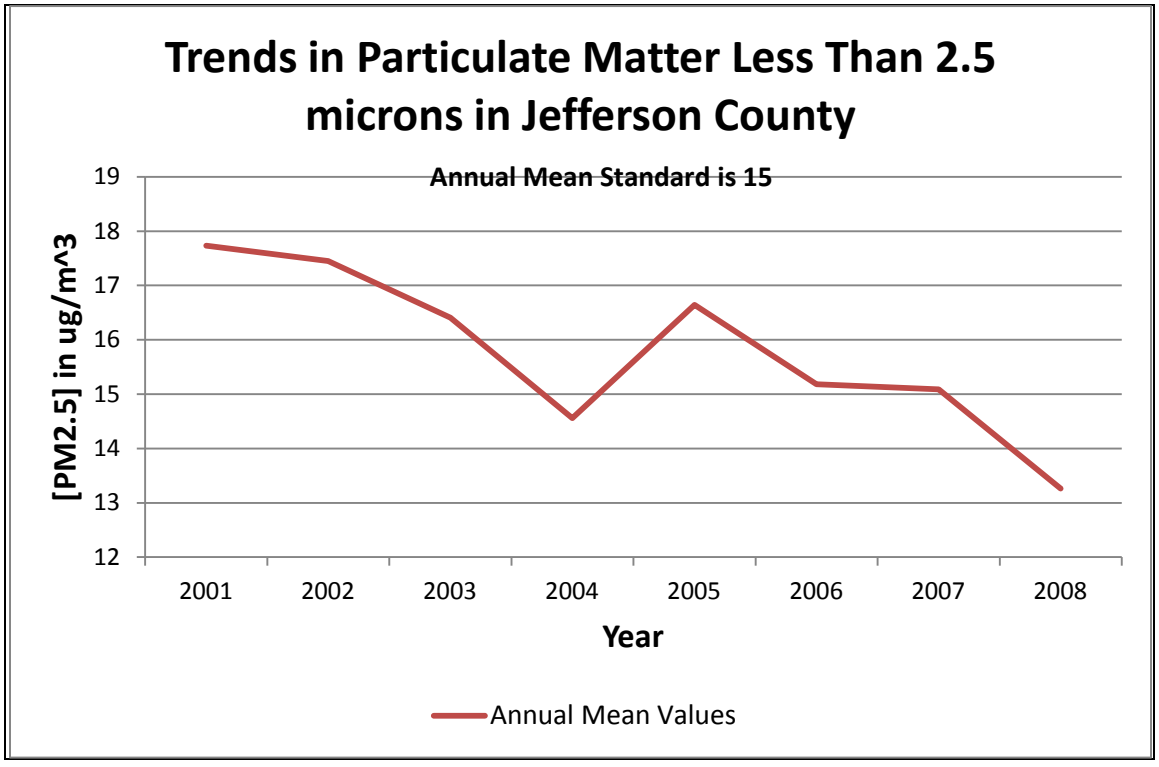


FIGURE 4.4-3 $PM_{2.5}$ TRENDS FROM 2001 TO 2008



4.4.4 Mobile Source Air Toxics (MSATs)

In addition to the criteria pollutants for which there are existing NAAQS, USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

MSATs are a subset of the 188 air toxics defined by the CAA. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

USEPA is the lead Federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64% increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3 butadiene, and acetaldehyde by 57% to 65%, and reduce on-highway diesel PM emissions by 87%.

As a result, USEPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 201(I) that will address these issues and could make adjustments to the full 21 and 6 primary MSATs.

This SDEIS includes a basic analysis of the likely MSAT emission impacts of the construction of the project. However, available technical tools do not enable predictions to be made of the project-specific health impacts of the emission changes associated with the alternatives currently being considered. Because of these limitations, a discussion is included in SDEIS Section 5.4, in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate health impacts of MSATs at the project level, it is possible to qualitatively assess the level of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential

differences among MSAT emissions, if any, from the alternatives being evaluated. The qualitative assessment and conclusions are included herein in Section 5.4 and Appendix B.1.2.

4.5 Noise

This section of the 2003 FEIS identified the highway traffic noise prediction model used in the noise analysis, summarized the methodology used to measure the existing noise levels in the project area, summarized the 24-hour noise measurements used to determine peak noise hour traffic volumes, and presented existing noise level ranges for the receptors used to assess project-related highway traffic noise impacts. Details are provided on pages 4-164 through 4-168 of the FEIS.

Since the approval of the original FEIS, there have been changes to the noise regulation and guidance issued by FHWA and the noise policies of both INDOT and KYTC. This section provides updated information to address these changes, as well as focusing the noise analyses to specifically cover the areas in proximity to the FEIS Selected Alternative and the Modified Selected Alternative.

4.5.1 Highway Traffic Noise Guidance and Policy Updates

As discussed on page 4-164 of the 2003 FEIS, the original noise impact analyses were modeled utilizing the FHWA-approved STAMINA2.0/OPTIMA noise analysis software. On April 14, 2004, FHWA issued a memo on the release and phase-in of a new highway traffic noise model. The new Traffic Noise Model was designated TNM2.5 and the memo stated that the FHWA TNM, version 2.5 (or the latest version), would be required for use in all new traffic noise analyses for Federal-aid highway projects that begin six months or later from the date of the memorandum. Therefore, traffic noise level predictions for the FEIS Selected Alternative and the Modified Selected Alternative have been made using the TNM2.5 computer model in accordance with *FHWA Highway Traffic Noise Prediction Model, Report No.FHWA-PD-96-010 (April, 2004).* The model is designed for calculation of traffic noise emissions for constant speed and accelerating traffic flows comprising a mix of vehicle types. The sound level emissions measured and those generated by TNM2.5 are expressed in terms of dBA Leq[10].

On July 13, 2010, the FHWA published a final rule updating 23 CFR 772. This final rule amends sections 772.1, 772.5 to 772.17, and Table 1—Noise Abatement Criteria. The final rule required each State DOT to revise its noise policy to be in accordance with this final rule. The final rule also released an updated guidance document, an optional *Draft State Highway Agency Noise Policy Template* and eliminated the use of the TNM Lookup Tables in either form (hard copy table or executable program) to predict noise levels on Federal or Federal-aid projects. All noise analyses for this project were conducted in accordance with the procedures established for the abatement of highway traffic noise as outlined in 23 CFR 772 .

[10] Sound levels are quantified in units called decibels (dB). dBA Leq is an expression of decibels that are "A" weighted, or adjusted to represent the range of human hearing and statistically integrated over time (Leq).

INDOT issued its revised *Traffic Noise Analysis Procedure* on June 2, 2011, and KYTC issued its revised *Noise Analysis and Abatement Policy* on July 13, 2011. All noise modeling was conducted in accordance with the INDOT procedure for roadways in Indiana and the KYTC policy in Kentucky.

4.5.2 Modeling Methodology

Noise Receptors

The project area was divided into four noise analysis areas for assessing highway traffic noise-related impacts. The areas consist of: 1) Downtown Louisville; 2) Downtown Jeffersonville; 3) East End Louisville; and 4) East End Clark County. Existing noise levels were characterized through the use of receptor sites selected in proximity to the two build alternatives being considered in this SDEIS (i.e., FEIS Selected Alternative and Modified Selected Alternative). A noise receptor is defined as a discrete or representative location of a noise sensitive area(s). A total of 430 noise receptors were measured or modeled in order to determine existing noise levels for the project.

Existing noise levels were determined either by taking measurements of noise levels during peak noise period traffic using an approved acoustical meter or by modeling the existing levels using TNM2.5. When measurements were conducted, they were only conducted during meteorologically acceptable periods (i.e., low wind and no precipitation). As part of the overall assessment of existing noise levels, specific measurements and/or modeling were conducted at 27 properties that are on or eligible for listing in the National Register of Historic Properties.

In locations where there is an existing roadway facility, existing noise levels were modeled using TNM2.5 and utilized in the assessment of the potential impacts from either of the build alternatives, as well as the No-Action Alternative. The locations of the noise receptors and analysis areas are shown in figures 4.5.2-1 and 4.5.2-2. The range of existing noise levels was as follows:

- Area 1: 56 dBA to 75 dBA
- Area 2: 49 dBA to 74 dBA
- Area 3: 43 dBA to 69 dBA
- Area 4: 44 dBA to 58 dBA

Representative Receptors

Each field-measured noise receptor also “represents” other properties within the project area. Representative receptors are those that are in proximity to the field-measured receptor and are approximately the same distance from the build alternative edge of pavement. The number of additional receptors that are represented by each field-measured or modeled receptor increases as housing density increases. The project impacts and potential mitigation measures are considered for these represented receptors as well as those that are measured and modeled.

Traffic

Highway traffic noise is directly related to the speed, vehicle type (number of tires making contact with the road) and traffic volumes. Updated design year (2030) No-Action and build traffic data for the FEIS Selected Alternative and the Modified Selected Alternative were used in the traffic noise modeling. Some roadway segments of the 2030 peak hour traffic volumes would create a level of service worse than LOS C. The noise levels based on that traffic would not be representative of "worst-case" future noise levels because, at a level of service worse than LOS C, the traffic is not moving at free-flow conditions; therefore the noise levels at those times would not be the highest experienced for the rebuilt facility. FHWA's and the states' guidance requires that measured and predicted noise levels be representative of the peak noise levels, which correspond to LOS C conditions; therefore, for roadway segments where the level of service was worse than LOS C, new traffic projections were generated to be representative of LOS C. To generate peak noise results, LOS C traffic volumes were used in the models for any roadway segment where the original traffic projections showed LOS worse than C.

Noise Level Modeling

All noise level predictions were made using TNM2.5. The TNM2.5 model was validated by measuring existing noise levels on existing facilities while simultaneously conducting traffic counts on the roadways to be modeled. The field-measured traffic volumes were then entered into the TNM2.5 model and, if the predicted noise level was within 3dBA of the field-measured noise level, then the model was considered to be validated. All roadway models used in the assessment of highway traffic noise for this project validated to within 3dBA.

The receptors' existing and predicted noise levels, model validation results, impacts identification, and mitigation analyses are included in Section 5.5 of this SDEIS.

4.6 Vibration

Section 4.6 in the 2003 FEIS presented a general discussion of vibration and its relationship to displacement, velocity, and acceleration; as well as a discussion and graphic (Figure 4.6-1, *Vibration Measurement Sites*) identifying five locations in the study area where baseline soil vibration measurements were taken. These measurements determine how vibration is propagated through the soil so potential vibration impacts can be assessed. The locations of the initial monitoring sites were chosen to represent areas where vibration impacts may be projected from future traffic on bridges and elevated expressways that would be constructed as a result of the project, and also to reflect areas where vibration concerns were expressed by residents and business representatives. Because of this, the information is still applicable to the project alternatives currently being considered. This SDEIS presents no updates or additions to the information provided in this section of the FEIS. For more detailed information, see page 4-169 of the FEIS.

4.7 Natural Resources

4.7.1 Soils and Geology

Section 4.7.1 of the 2003 FEIS discussed soils and geology of the project area. This SDEIS presents no updates or additions to that discussion, as the information presented in the FEIS is still valid and applicable to the project alternatives currently being considered. For more detailed information, see page 4-169 of the FEIS.

4.7.2 Terrestrial Wildlife and Habitat

Section 4.7.2 of the 2003 FEIS (pp. 4-173 through 4-175) presented an overview of the natural habitat, terrestrial plant and animal surveys conducted, and known invasive plant species. The following Section 4.7.2The following habitat types were described: Riparian Forest, Upland Forest, Agricultural Land, Upland Fields, Wetlands, and Karst. The information presented in the FEIS continues to be valid and applicable to this project, with two exceptions: invasive species and karst. This section of the SDEIS updates the discussion of invasive species and karst features in the project area with information that was not available at the time of the FEIS, and shows the karst areas on figures 4.8-1a and 4.8-1b on pages 4-186 and 4-187 of the FEIS.

Terrestrial plant and animal surveys of the project area were conducted during the spring, summer, and fall of 1999 and the spring and summer of 2000. The field observations were compiled into comprehensive lists of the plants and animals observed in the project area and the list was provided in the FEIS Appendix B.5. That list includes the species that are within the SDEIS study area. Color aerial photographs dated 2008 and 2009 were examined and habitat types were identified to determine if there were any significant changes to habitat since the FEIS. No significant changes were noted.

In accordance with Executive Order 13112, Federal agencies are required to evaluate their actions to ensure that they prevent the introduction of invasive plants and provide for their control; and to minimize the economic, ecological, and human health impacts that invasive plants cause.

Invasive species are common throughout the project area. The 2003 FEIS noted there were 26 exotic plant species considered “a severe threat among invasive exotic plants in Kentucky.” Indiana had no companion listing at the time (see FEIS, p. 4-173). Since that time, the Kentucky Exotic Pest Plant Council (KY-EPPC), which is the Kentucky affiliate of the Southeast Exotic Pest Plant Council (SE-EPPC), has developed a listing. In 2009, Indiana passed legislation creating the Invasive Species Council, which is in the process of developing a state list.

For this SDEIS, listings of suspect species were obtained from Indiana Code (I.C.) 15-3-4.6-2, and from KY-EPPC. Ninety-three plant species are included in the list and are divided into three classes by the KY-EPPC (not all states, including Indiana, divide such species into classes):

(1) Severe threat—26 exotic plant species that spread easily into native plant communities and displace native vegetation.

(2) Significant threat—34 exotic plant species that possess some invasive characteristics but have less impact on native plant communities; also, may have the capacity to invade natural communities along disturbance corridors or to spread from stands in disturbed sites into undisturbed areas.

(3) Lesser threat—33 exotic plant species that seem to principally spread and remain in disturbed corridors, not readily invading natural areas; also, some agronomic weeds.

A review of the literature and results from the plant surveys ascertained 19 "severe threat" species and 28 "significant threat" species of invasive plants were either documented within or likely to be within the project area. Eight of the "severe threat" species and eight of the "significant threat" species were listed in the FEIS, Appendix B.5, which identifies species that were observed in the project area. These species are identified below by asterisks:

Severe Threat Species—Tree of heaven (*Ailanthus altissima*)*, garlic mustard (*Alliaria petiolata*), poison hemlock (*Conium maculatum*)*, Chinese yam (*Dioscorea oppositifolia*), autumn olive (*Elaeagnus umbellate*)*, winged euonymus (*Euonymus alatus*), Chinese privet (*Ligustrum sinense*), privet (*Ligustrum vulgare*)*, Japanese honeysuckle (*Lonicera japonica*)*, bush honeysuckle (*Lonicera maackii*), Morrow's honeysuckle (*Lonicera morrow*), tatarian honeysuckle (*Lonicera tatarica*), purple loosestrife (*Lythrum salicaria*), white sweetclover *(Melilotus alba*), yellow sweetclover (*Melilotus officinalis*)*, Chinese silvergrass (*Miscanthus sinensis*), multiflora rose (*Rosa multiflora*)*, Johnson grass (*Sorghum halapens*)*, and common chickweed (*Stellaria media*).

Significant Threat Species—Five-leaf akebia (*Akebia quinata*), *mimosa (Albizia julibrissin*), common burdock (*Arctium minus*), smooth brome (*Bromus inermis*), spotted knapweed (*Centaurea biebersteinii*), ox-eye daisy (*Chrysanthemum leucanthemum*), creeping thistle (*Cirsium arvense*), Queen Anne's lace (*Daucus carota*)*, common teasel (*Dipsacus sylvestris*)*, Indian goosegrass (*Eleusine indica*), ground ivy (*Glechoma hederacea*)*, English ivy (*Hedera helix*)*, English ivy (*Ipomoea hederacea*)*, morning glory *(Ipomoea purpurea*), Korean clover (*Lespedeza stipulacea*), common lespedeza *(Lespedeza striata*), white mulberry *(Morus alba*), Star-of-Bethlehem (*Ornithogalum umbellatum*)*, empress tree (*Paulownia tomentosa*), Kentucky bluegrass (*Poa pratensis*), Oriental lady's thumb (*Polygonum cespitosum*), spotted lady's thumb (*Polygonum persicaria*), white poplar (*Populus alba*)*, watercress (*Rorrippa nasturtium-aquaticum*), giant foxtail (*Setaria faberi*), green foxtail (*Setaria viridis*), Japanese spirea (*Spiraea japonica*), and periwinkle (*Vinca minor*)*.

Karst

Karst features such as sinkholes and springs occur in area limestone. In the 2003 FEIS it was stated that karst features were along the bluffs of the Ohio River in both Indiana and Kentucky.

It was also stated that the following habitat would use the karst features: spring amphipod, Louisville cave beetle, gray and Indiana bats, evening bats, as well as common species of bats.

According to recently published Kentucky and Indiana state geological surveys' GIS data, which was not available at the time of the FEIS, karst geology occurs within the SDEIS study area in Jefferson County, Kentucky, only (see figures 4.8-1a and 4.8-1b on pages 4-186 and 4-187 of the FEIS). However, field surveys indicate no karst features occur within the rights-of-way of the two build alternatives.

4.7.3 Threatened and Endangered Species

This section of the 2003 FEIS summarized the requirements of the Endangered Species Act (ESA) of 1973, as amended; noted USFWS's finding that the project is "not likely to adversely affect" endangered species; explained the methodology used to identify the federally protected and state protected species in the project area; and provided details regarding these species in tables 4.7-1 and 4.7-2. This section of the SDEIS updates the information and data presented in the FEIS, as follows:

- Identifies additional surveys conducted for federally listed endangered and threatened species.
- Adds several species to the discussion of federally listed and state-listed protected species having the potential to occur in the project area and updates tables 4.7-1 and 4.7-2 to include the added species.

Within Section 5.7.3 of the SDEIS is a description of the original Biological Assessment (BA), recent and on-going correspondence with USFWS, and the process for developing an amended BA. Section 5.7.3 provides information on determinations of effect and mitigation for the federally listed species.

Additional Surveys

Following the 2003 FEIS, additional surveys were conducted specifically for federally listed endangered and threatened species:

- Additional surveys for the running buffalo clover were conducted for the alternatives in Indiana on May 10-11, 2007, and in Kentucky in the Spring of 2008. The environmental team did not identify any running buffalo clover or suitable habitat in the project impact area during those field investigations.
- To supplement the 1999-2000 surveys, mussel surveys were conducted September 4-10, 2007. The primary objectives of these surveys were to determine the presence/absence of mussels; the suitability of stream bottoms ("substrates") for mussel colonization; the presence of mussel beds; and the general species diversity upstream, downstream, and within the disturbance area of the proposed bridge piers. The USFWS Kentucky Field Office was consulted and assisted in the development of the survey methodology. A

SCUBA mussel survey was designed and conducted at the two proposed crossings of the Ohio River and one proposed crossing of Harrods Creek. Substrate throughout the study area did not appear to be conducive to mussels. Surveys did not produce any listed mussels or mussel beds within the proposed project area. No federally listed live or relict mussels were observed during the 2007 mussel survey.

- On August 30, 2007, a field survey was conducted for the interior least tern and piping plover. The primary focus area included three areas: exposed sand and gravel bars near the downtown bridges at the FEIS Selected Alternative location; in the vicinity of the FEIS Selected Alternative crossing of the Ohio River in the east end; and near the water settlement ponds of the Louisville Water Company in the east end of the project area. There was no evidence of the least tern or piping plover in any of the areas surveyed in 2007.

Changes to Species Lists

Federal Species

Seventeen federally protected species were identified through consultation with the USFWS as having potential to occur within the project area. The species added since the FEIS are indicated with an asterisk. The bald eagle, which was included on the list in the FEIS, has been since de-listed by USFWS; however, the species is still protected by the Bald and Golden Eagle Protection Act. The current list of Federal species includes:

- ***Birds***
  Interior Least Tern (*Sterna antillarum*)
  Piping Plover (*Charadrius melodus*) *
- ***Mammals***
  Gray Bat (*Myotis grisescens*)
  Indiana Bat (*Myotis sodalis*)
- ***Mussels***
  Clubshell (*Pleurobema clava*)
  Fanshell (*Cyprogenia stegaria*) *
  Fat Pocketbook (*Potamilus capax*)
  Orangefoot Pimpleback (*Plethobasus cooperianus*)
  Pink Mucket (*Lampsilis abrupta*)
  Ring Pink (*Obovaria retusa*)
  Rough Pigtoe (*Pleurobema plenum*) *
  Sheepnose (*Plethobasus cyphyus*) *
  Spectacle-case (*Cumberlandia monodonta*) *
- ***Insects***
  American Burying Beetle (*Nicrophorus americanus*) *
  Louisville Cave Beetle (*Pseudanopthalmus troglodytes*) *
- ***Plants***

Running Buffalo Clover (*Trifolium stoloniferum*)
Short's Goldenrod (*Solidago shortii*)

Table 4.7-1 also lists these species and provides information regarding their habitat and potential to occur within the project area.

State Species

Sixty-five state-listed species were found, through consultation, to have the potential to occur within the project area. State-listed endangered species include any species whose prospects for survival or continued existence within the state are in immediate jeopardy and are in danger of disappearing entirely from the region. Table 4.7-2 lists these state species along with their habitat and potential for occurrence in the project area. Those species added since the FEIS are indicated with an asterisk.

TABLE 4.7-1
FEDERAL THREATENED, ENDANGERED, AND CANDIDATE SPECIES POTENTIALLY OCCURRING IN THE PROJECT AREA

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
BIRDS				
Charadrius melodus	Piping Plover*	Key habitat locations in Kentucky are transient lakes in Warren and Christian counties, shoreline of Kentucky and Barkley lakes, and mudflat and sandbar habitat on the Tennessee, Ohio, Mississippi, and Cumberland rivers.	Federal-E	Kentucky Department of Fish and Wildlife Resources (KDFWR) lists the piping plover as having a documented record from Jefferson County, Kentucky. Mengel (1965) indicated that the piping plover was a rare transient in Kentucky. He described it as rare in Kentucky with most of the few records being from the Falls of the Ohio River between August and October. Not found during field surveys.
Sterna antillarum	Interior Least Tern	Open or sparsely vegetated sandbars, gravel beaches, and alluvial islands. Also on artificial habitats, such as dredge islands, dike fields, shores of reservoirs, and sand and gravel pits. Lays eggs in a shallow depression in sand or gravel.	Federal-E	Found near the confluence of the Tennessee and Ohio rivers. A nesting colony exists in Gibson County, Indiana. Historical breeding range has included the Ohio River system. Recorded in the Falls of the Ohio River area. Not found during field surveys.
MAMMALS				
Myotis grisescens	Gray Bat	Caves in specific home territories, which meet certain temperature and environmental criteria. May migrate seasonally between hibernating and maternity caves, usually located near streams or reservoirs. Uses forested riparian areas, sometimes several miles from the roost cave, for forage and protective flyways.	Federal-E	Recorded in Goose Creek Drainage Basin. Found during field surveys in Indiana and Kentucky within Goose Creek and Lancassange Creek drainage basins. A known maternity site occurs outside the project limits in southern Indiana. Also identified on the INAAP property outside the project limits.
Myotis sodalis	Indiana Bat	Caves (in winter), which meet certain temperature requirements for hibernation. Large, old (dead), exfoliated trees in forested areas during summer, where it raises young. Forages several miles from the maternity roost, near streams. Tends to return to specific maternity areas each year.	Federal-E	Recorded in a wooded area off Woodside Drive just east of downtown Louisville. Found during field surveys in the Goose Creek drainage area.
MUSSELS				
Lampsilis abrupta	Pink Mucket	Characterized as a large river species although in recent years it has been able to survive and reproduce in impoundments with river-lake conditions but never in standing pools of water. Found in waters with strong currents, rocky substrates, with depths up to about 1 m. Also found in deeper waters with slower currents and sand and gravel substrates.	Federal-E	Recorded in Ohio River and its larger tributaries, including a 1982 Ohio River study. Presently considered sporadic in Ohio River from the lower Ohio to the Licking River. Not found during field surveys.
Obovaria retusa	Ring Pink	Shallow water over silt-free sand and gravel bottoms of large rivers.	Federal-E	Historically found in the large streams of the Ohio River basin in Indiana and Kentucky, including in the Ohio River at Louisville. In Kentucky viable populations only considered to remain in the upper Green River and lower Tennessee River. Not found during field surveys.
Plethobasus cooperianus	Orange-foot Pimpleback	Large rivers in sand, gravel, and cobble substrates in riffles and shoals in deep water and steady currents.	Federal-E	Historically common in Ohio River, including New Albany area. Presently considered sporadic in the Ohio River and rare in the Tennessee River in western Kentucky. Not found during field surveys.
Pleurobema clava	Clubshell	Gravel or mixed sand and gravel substrates in small, medium, and large streams.	Federal-E	Reported in Ohio River at Louisville from New Albany shore. Presently sporadic in the upper Green River and may still be present in the lower Ohio River. Not found during field surveys.

TABLE 4.7-1 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
MUSSELS				
Potamilus capax	Fat Pocketbook	Medium to large-sized rivers in sand, mud, and fine gravel substrates and flowing water; in slow-flowing water (often near the bank) in mud or sand; often occurs around islands and back channels at depths of a few inches to 8 feet.	Federal-E	Historically common in Ohio River; found near McAlpine Dam and Falls of the Ohio. Recorded along shoreline near Jeffersonville. Presently sporadic in the Mississippi, lower Ohio, and extreme lower Cumberland rivers. Not found during field surveys.
Cyprogenia stegaria	Fanshell*	Medium to large rivers having gravel substrate; individual mussels are believed to prefer relatively deep water with moderate current.	Federal-E	Historically in Ohio River. Currently the only reproducing populations in Kentucky are in the upper Green River and the Licking River. Not found during field surveys.
Pleurobema plenum	Rough Pigtoe*	Medium to large rivers in sand, gravel, and cobble substrates in shoals and sometimes found on flats and muddy sand.	Federal-E	Historically in Ohio River. Presently sporadic in the Green and Barren rivers. Not found during field surveys.
Cumberlandia monodonta	Spectacle-case*	Occurs in large rivers and is commonly found on outside river bends below bluff lines in microhabitats, sheltered from the main force of current. Common preferred substrates include mud, sand/gravel, cobble, and boulders in shallow riffles and shoals. Also has been found in tree stumps and root masses.	Federal-C	Historically in Ohio River. Presently sporadic in the upper Green River. Not found during field surveys.
Plethobasus cyphyus	Sheepnose*	Usually found in larger streams. It may be associated with riffles and gravel/cobble substrates but usually has been reported from deep water (>6 feet) with slight to swift currents and mud, sand, or gravel bottoms.	Federal-C	Historically in Ohio River. Distribution in Kentucky is sporadic nearly statewide. The closest recent Ohio River record is upstream in Campbell County and downstream in Daviess County. Not found during field surveys.
INSECTS				
Nicrophorus americanus	American Burying Beetle*	Habitat requirements, particularly reproductive habitat requirements, are not fully understood. Has been found in various types of habitat including oak-pine woodlands, open fields, oak-hickory forest, open grasslands, and edge habitat.	Federal-E	In Kentucky, USFWS lists the American burying beetle as historically known from Fayette, Henderson, Jefferson, Lyon, and Trigg counties. The last American burying beetle found in Kentucky came from Trigg County in 1974. The USFWS considers this species to be extirpated from the state of Kentucky.
Pseudanopthal-mus troglodytes	Louisville Cave Beetle*	Only known from Oxmoor and Eleven Jones Caves in Jefferson County, Kentucky.	Federal-C	Only known from Oxmoor and Eleven Jones Caves in Jefferson County. Urban expansion has resulted in the loss of Oxmoor Cave. Eleven Jones Cave is located approximately 2 miles south of the project area.
PLANTS				
Solldago shortii	Short's Goldenrod	Does not appear to compete well with other vegetation, and apparently does not tolerate dense shade.	Federal-E	Historically found only in the inner Bluegrass Region along old buffalo traces. Recorded in the Falls of the Ohio, but today considered extirpated from the area. The most recent list for Kentucky, compiled by the Kentucky Field Office of USFWS, does not list Short's goldenrod for Jefferson County, presumably because they now consider it to be extirpated there. Blue Licks Battlefield State Park in north-central Kentucky is the only site where the species grows. It is not listed for Clark County, Indiana. None found during field surveys.
Trifolium stoloniferum	Running Buffalo Clover	Along stream banks, trails, and forested areas with filtered light. Apparently prefers disturbed areas such as lawns, parks and cemeteries.	Federal-E	Historically associated with movement of bison. Occurs only in KY and IN Bluegrass regions. None found in project area during field surveys. Grows in the Wolf Pen area (outside project area).

** Since the FEIS, this table has been revised to add these species.*

Note: According to ecos.fws.gov, the Piping Plover is not listed for Kentucky, but in the Great Lakes Region, including Indiana, it is listed as Endangered. In the Northeast Region it is listed as Threatened.

Legend: *T = Threatened E = Endangered C = Candidate*

TABLE 4.7-2
STATE THREATENED AND ENDANGERED SPECIES AND SPECIES OF SPECIAL CONCERN POTENTIALLY OCCURRING IN THE PROJECT AREA

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
FISH				
Acipenser fulvescens	Lake Sturgeon	Lakes and large streams with firm sand or gravel bottoms. Usually travels up river to spawn, although some lake populations do not migrate.	Indiana-E Kentucky-E	Occurs at Falls of the Ohio area. NatureServe.org shows it currently in the Ohio River in the Louisville area.
Alosa alabamae	Alabama Shad	Spends most of adult life in ocean, but swims up rivers to spawn.	Kentucky -E	Occurred in Ohio River near Kennedy Bridge and the area between Sand Island and Sherman Minton Bridge. The species has not been documented in Kentucky since the late 1970s. NatureServe.org shows it extirpated from the Ohio River in the Louisville area.
Atractosteus spatula	Alligator Gar	Large rivers and oxbow lakes in backwaters and sluggish pools. Bottomland swamps, which flood about the same time the species spawns.	Kentucky-E	Historically recorded in Falls of the Ohio area. Historically, this species occurred in the middle Ohio River. No reports have subsequently been reported; however NatureServe.org shows it currently in the Ohio River in the Louisville area.
Ictiobus niger	Black Buffalo	Reservoirs and medium to large rivers with a variety of current speeds and medium to low gradient.	Kentucky -S	Historically recorded in the Goose Creek drainage, from the backwater area of Ohio River to the confluence of Goose and Little Goose creeks. None found during field surveys. NatureServe.org shows it extirpated/possibly extirpated from the Ohio River in the Louisville area.
Lota lota	Burbot	Deep water of large rivers and lakes.	Kentucky -S	Ohio River is the extreme southern border of its range; historically recorded in the river at New Albany. NatureServe.org shows it currently in the Ohio River in the Louisville area.
Noturus stigmosus *	Northern Madtom	Large streams to big rivers where it favors gravel and cobble substrates swept clean by moderate to swift current.	Kentucky -S	A few historic records exist from the mainstem of the Ohio River. No recent records from the project area.
Percopsis omiscomaycis	Trout Perch	Sandy bottom pools in medium sized streams.	Kentucky-S	Historically recorded in the Harrods Creek drainage area. None found during field surveys. NatureServe.org shows it currently in the Ohio River and tributaries in the Louisville area.
AMPHIBIANS				
Acris crepitans blanchardi *	Northern Cricket Frog	Open muddy or sandy shorelines of permanent and semipermanent bodies of water.	Indiana-S	Still abundant in southern Indiana; all but gone not too much farther north, occurring only in isolated populations. Not rare in Kentucky. Not found during field surveys in Indiana.
REPTILES				
Apalone mutica mutica *	Midland Smooth Softshell	Large unpolluted rivers with sandy substrate; nesting in open areas on beaches and sand bars. Probably the newer high-level dams on Ohio River are altering or eliminating nesting habitat on beaches and sandbars.	Kentucky-S	Recent Jefferson County record from Ohio River.
Clonophis kirtlandii	Kirtland's Water Snake	Inhabits urban areas including vacant lots, wet meadows, thickets, woods margins, and waste areas; also marshy land, open prairie, pastures, edges, areas near wetlands and water, and woodlands.	Indiana-E Kentucky-T	Historically recorded in Louisville area and north side of Jeffersonville. None found during field surveys. This snake seems to be holding its own in some sections of Louisville.
Nerodia erythrogaster neglecta *	Copperbelly Water Snake	Bottomland forest and tannic seasonally flooded pools but also found regularly in sloughs, sluggish stream margins, bayous, oxbows, and other slow-moving or standing water habitats.	Kentucky-S	Known historically from wetland habitats in southwestern Jefferson County but probably extirpated there. Not found during field surveys.

TABLE 4.7-2 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
REPTILES				
Tantilla coronata *	Southeastern Crowned Snake	Primarily in dry rocky habitats. Most found in mounds of old bark debris, around old logs and stumps, or under flat stones and other cover on south-facing rocky hillsides.	Indiana-E Kentucky-S	All recent reports from Kentucky are from Land Between the Lakes (Lyon and Trigg counties) except for a single individual that was found in Hart County. Not found during field surveys.
BIRDS				
Accipiter striatus	Sharp-shinned Hawk	Large tracts of mature forest or small forested lots, for nesting. Also semi-open areas.	Indiana-S Kentucky-S	Historically recorded in area southwest of Anchorage, Kentucky (outside project area). Found in Lancassange Creek area during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Actitis macularius	Spotted Sandpiper	Open areas, including fields, pastures, edges of ponds and streams, and roadsides.	Kentucky-E	Nests sporadically in Kentucky, including Falls of the Ohio area where it nested in substantial numbers in the 1960s; breeding confirmed there in 1985. None found during field surveys.
Aimophila aestivalis	Bachman's Sparrow	The species is a habitat specialist. In Kentucky, it is a breeding bird that formerly inhabited a variety of early successional habitats, including old fields and pastures, young pine plantations, and regenerating clear- cuts.	Indiana-E Kentucky-E	Historically recorded in Indian Hills, just east of Louisville, and at Black Bridge near Worthington. None found during field surveys. Only known current nesting population in Kentucky is on Fort Campbell Military Reservation, Trigg County. NatureServe.org shows it extirpated from a huge area of Kentucky and Indiana surrounding the project area. Jefferson County not considered to be in its breeding range in Kentucky by KDFWR.
Ammodramus henslowii	Henslow's Sparrow	Open areas dominated by grassy vegetation, such as abandoned fields, and other unmowed grassy areas. Nests in or on ground.	Indiana-E Kentucky-S	Historically recorded near the junction of Schuler Lane and Brownsboro Road, at Wolf Pen Branch Road, and in the Worthington area, Highway 22. Locally distributed summer resident across Kentucky. Jefferson County considered to be in its breeding range in Kentucky by KDFWR. Not found during field surveys.
Anas discors	Blue-winged Teal	Marshes and ponds; builds nest on ground on borders of water bodies.	Kentucky-T	Historically recorded in Caperton Swamp in the Beargrass Creek basin; and at the Falls of the Ohio where it has been documented as nesting. None found during field surveys.
Ardea alba	Great Egret	Large river floodplains; nests in high trees along riparian corridors, swamps, and forests.	Indiana -S Kentucky-E	Found during field surveys; observed wading near Falls of the Ohio (shoreline). No known nesting colonies in project area. In Kentucky documented nesting only in western third of the state; however Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Bubulcus ibis	Cattle Egret	Ponds and marshes; farms. Nests in trees near water.	Kentucky -S	Historically recorded nesting on Shippingport Island near Falls of the Ohio. None found during field surveys.
Chondestes grammacus *	Lark Sparrow	Most frequently in rural farmland, where it typically inhabits well-grazed pastures with patches of bare ground or rocks, as well as scattered trees.	Kentucky -T	Historically recorded from Jefferson County. No recent records and none found during field surveys.
Cistothorus platensis	Sedge Wren	Moist meadows and grassy margins of marshes and bogs. Cultivated grain fields, overgrown pastures, fallow fields, hayfields, and moist meadows, in areas of thick herbaceous cover.	Indiana -E Kentucky-S	Historically recorded near Worthington and in the Ohio River bottomlands near Prospect. Found in Wolf Pen Branch area (outside project area) during field surveys. Documented as historically nesting in Jefferson County. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Egretta caerulea	Little Blue Heron	Fresh water marshes.	Kentucky-E	Historically recorded at nesting at Shippingport Island near Falls of the Ohio, but site abandoned in 1992. None found during field surveys. Jefferson County not considered to be in its breeding range in Kentucky by KDFWR.

TABLE 4.7-2 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
BIRDS				
Falco peregrinus	Peregrine Falcon	Steep and rocky cliffs, or tall buildings, where it nests and hunts for other birds in open areas around the nest. Returns to the same territory each year.	Indiana-E Kentucky-E	Historically nested in Kentucky in cliffs of Pine Mountain area, the south central river gorges, and in trees in western wetlands. Nesting on the Big 4 Bridge has been documented for past several years. Observed on three occasions during field surveys, flying over the Ohio River near Kennedy Bridge. Louisville presently has 4 known nesting pairs.
Ixobrychus exilis	Least Bittern	Freshwater marshes, for feeding.	Indiana-E Kentucky-T	Nests across much of Kentucky but very locally distributed. Historically recorded at Riverfields Park area in Louisville and in Caperton Swamp in the Beargrass Creek Basin. None found during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Lanius ludovicianus	Loggerhead Shrike	Open country with scattered trees.	Indiana-E	Found on abandoned quarry property north of Utica during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Lophodytes cucullatus	Hooded Merganser	Wetland sloughs and ponds in the lowlands of major rivers, for feeding. Tree cavities in mature forests, for nesting.	Kentucky-T	Historically recorded in Caperton Swamp just east of Louisville, approximately 300 yards from the Ohio River and Riverfields Park area. None found during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Nyctanassa violacea	Yellow-crowned Night Heron	Marshes, swamps, lakes and lagoons; prefers wooded areas. Will nest near residential areas.	Indiana-E Kentucky-T	Historically recorded at Cherokee Park, Riverfields Park, and two sites at Shippingport Island. Found during field surveys at Harrods Creek, Goose Creek, and Little Goose Creek drainages; probably nesting. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Nycticorax nycticorax	Black-crowned Night Heron	Riparian corridors.	Indiana-E Kentucky-T	Long-standing colony has nested along Ohio River in Louisville area since at least 1930, first on river islands, most recently on Louisville Zoo grounds (outside project area). Also recorded at Sand and Shippingport islands, and Water Treatment Plant at Clarksville. Found along Harrods Creek, Goose and Little Goose creeks during field surveys. No nest colonies found.
Pandion haliaetus *	Osprey	Primarily along rivers, lakes, and reservoirs.	Kentucky-T	Historically recorded from Jefferson County. Recently (2009-2011) nesting on Shippingport Island.
Passerculus sandwichensis	Savannah Sparrow	Hayfields, pastures, and other grassy areas, where it nests on the ground.	Kentucky -S	Historically recorded in the project area near Anchorage, Kentucky. By the mid-1970s it was considered a regular in the Louisville area. None found during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Phalacrocorax auritus *	Double-crested Cormorant	Nests along large rivers and lakes.	Kentucky-E	None found nesting during field surveys and not historically known to nest in project area.
Podilymbus podiceps	Pied-billed Grebe	Ponds, lakes, and marshes where it attaches nests to reeds, grasses, or bushes in water.	Kentucky-E	Historically recorded at Caperton's Swamp in Beargrass Creek basin and Riverfields Park area. None found during field surveys. Jefferson County considered to be in its breeding range in Kentucky by KDFWR.
Rallus elegans	King Rail	Floodplain sloughs and marshes along large rivers. Nests in cattails, rushes or other aquatic vegetation 6 to 18 inches above the water or ground.	Indiana-E Kentucky-E	Historically recorded at Beargrass and Falls of the Ohio areas. None found during field surveys.

TABLE 4.7-2 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
BIRDS				
Riparia riparia	Bank Swallow	River and stream banks, or vertical banks of gravel quarries, for nesting.	Kentucky-S	Historically recorded in Six Mile Island area. Found during field surveys in Utica Pike area near Martin-Marietta ponds, and in Lentzier Creek drainage area.
Thryomanes bewickii	Bewick's Wren	Semi-open areas. Nests in any suitable cavity ranging from woodpecker holes and fence posts to tin cans and automobiles.	Indiana-E Kentucky -S	Historically recorded in the Anchorage area. None found during field surveys.
Tyto alba	Barn Owl	Semi-open and open areas; nests in tree cavities or old buildings and houses.	Indiana-E Kentucky-S	Historically found at Anchorage and near Worthington. More recently recorded at a residential area just northwest of the Louisville International Airport–Standiford Field. Found in the Lancassange Creek drainage area during field surveys.
MAMMALS				
Nycticeius humeralis	Evening Bat	Abandoned or low activity buildings, tree cavities, or sometimes under the sloughing bark of trees (during summer).	Indiana-E Kentucky-T	Found on Goose Creek drainage during field surveys.
SNAILS				
Leptoxis praerosa	Onyx Rocksnail	Rocks and boulders in riffles of large rivers.	Kentucky- S	Historically recorded at Falls of the Ohio. None found during field surveys.
Lithasia verrucosa	Varicose Rocksnail	Pools and recently exposed bars with sand, gravel, and rock bottoms.	Kentucky-S	Historically recorded at northern end of Six Mile Island.
Webbhelix multilineata	Striped Whitelip	Wet marshes, floodplains, meadows, and around lakes and ponds under leaf litter or grass blades and weeds in summer.	Kentucky-T	Historically recorded just outside project area.
MUSSELS				
Cumberlandia monodonta	Spectaclecase	Low flow areas in large swiftly flowing rivers, with patches of sand, cobble, and gravel in rocky areas.	Kentucky- E	Historically recorded at Falls of the Ohio. Considered to be extirpated in Indiana. None found during field surveys.
Epioblasma triquetra	Snuffbox	Medium to large rivers with low sedimentation and gravel riffles.	Kentucky- S Indiana- E	Historically recorded at Falls of the Ohio. None found during field surveys.
Fusconaia subrotunda	Long-solid	Large rivers with areas of gravel bottoms.	Indiana-E Kentucky-S	Historically recorded in the Ohio River at Louisville. None found during field surveys.
Lampsilis ovata *	Pocketbook	Medium-sized to large rivers with areas of sand and gravel bottoms.	Kentucky-E	Sporadic in the lower Ohio River to the upper Green River. Found during field investigations in the Ohio River in the area of the A-15 alignment.
Pleurobema rubrum	Pyramid Pigtoe	Medium to large rivers with gravel or sand bottoms.	Indiana-E Kentucky-E	Historically recorded in the Ohio River at Louisville. None found during field surveys.
Quadrula cylindrica	Rabbitsfoot	Medium to large rivers with sand or gravel bottoms.	Indiana-S Kentucky-T	Historically recorded in the Ohio River at Louisville. None found during field surveys.
Simpsonaias ambigua	Salamander Mussel	Medium to large rivers, where it remains under rocks and slabs over a mud or gravel substrate. Host species is mud puppy (*Necturus maculosus*).	Indiana -S Kentucky-T	Historically recorded at Falls of the Ohio. None found during field surveys.
Villosa lienosa	Little Spectaclecase	Small to medium streams with sand or gravel bottom.	Indiana -S Kentucky- S	Historically recorded at the Indiana side of the Ohio River, 12 miles upstream of Louisville. None found during field surveys.

TABLE 4.7-2 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
CRUSTACEANS				
Gammarus bousfieldi	Bousfield's Amphipod	Bottom of streams and springs frequently abundant in drift.	Indiana-E	Historically recorded in Falls of the Ohio area. Has potential to occur in project area, since related species were found in both the Lentzier and Lancassange Creek drainages and the Goose Creek, Muddy Fork, and Wolf Pen Branch drainages during field surveys.
Orconectes jeffersoni	Louisville Crayfish	Flat cobble and boulder strewn streams.	Kentucky-E	Historically recorded in the project area at many locations in Beargrass Creek basin and in Harrods Creek basin. Found during field surveys in Goose Creek drainage.
PLANTS				
Aristida ramosissima	Branched Three-awn Grass	Open grounds, prairies, or glades, with well-drained soils, or wet soils near populations in adjacent dry soil.	Kentucky-Historic Species	Historically recorded at Poplar Level Road in east Louisville. None found during field surveys.
Cabomba caroliniana	Carolina Fanwort	Ponds, swamps and still waters in streams.	Kentucky-T	Historically recorded at the Cave Hill Cemetery area in Louisville. None found during field surveys.
Castanea pumila	Allegheny Chinkapin	Pine and oak-pine woods, in relatively dry soil.	Kentucky-T	Historically recorded at Cherokee Park in the Beargrass Creek basin. Found in Wolf Pen drainage area and the cliff lines north of Utica during field surveys.
Dryopteris carthusiana *	Spinulose Wood Fern	Acidic, organic-rich bogs, swamps, less frequently in moist rocky ravines and rich forests.	Kentucky-S	Recorded recently from Jefferson County. None found during field surveys.
Heteranthera dubia	Grassleaf mud-plantain	Ponds and streams in calm shallow waters, and mud flats near water.	Kentucky-S	Historically recorded at the Falls of the Ohio area near Clarksville. None found during field surveys.
Leavenworthia exigua var. laciniata *	Kentucky Gladecress	In full sun on outcrops of silurian limestone or dolomite in shallow soils of glades, rock oucrops, pastures and lawns.	Kentucky-E	Recorded recently from Jefferson County. None found during field surveys.
Podostemum ceratophyllum	Threadfoot	Swiftly moving water in larger streams and rivers.	Kentucky-S	Historically found in Falls of the Ohio area. None found during field surveys.
Pontederia cordata	Pickerel-weed	Muddy banks of shallow water, sloughs, oxbow lakes, swamps, ditches and marshes.	Kentucky-T	Historically recorded in Louisville near Cave Hill Cemetery. None found during field surveys.
Potamogeton illinoensis	Illinois Pondweed	Quiet waters of lakes, streams, ponds, and ditches.	Kentucky-S	Historically recorded at the municipal harbor near Towhead Island. None found during field surveys.
Rubus centralis	Illinois Blackberry	Wooded slopes and openings.	Indiana-E	Historically recorded approximately 2 miles north of Jeffersonville. None found during field surveys.
Sagittaria graminea	Grass-leaf Arrowhead	Shallow waters or mud of swamps, drainage ditches, small steams, sloughs, ponds or lakeshores.	Kentucky-T	Historically recorded on the Indiana side of the Falls of the Ohio area. None found during field surveys.
Sedum telephioides	Allegheny Stonecrop	Rocks and cliffs generally at higher elevations.	Indiana-T Kentucky-T	Historically recorded on the cliff lines north of Utica. None found during field surveys.
Stellaria longifolia *	Longleaf Stichwort	Wet woods and meadows.	Kentucky-S	Recorded recently from Jefferson County. None found during field surveys.
Thalictrum pubescens formerly *Thalictrum polygamum*	Tall Meadowrue	Low ground of floodplain woods and thickets.	Indiana-T	Historically recorded about 3 miles north of Jeffersonville, Indiana. Found in Goose Creek drainage area during field surveys.

TABLE 4.7-2 (*Continued*)

Scientific Name	Common Name	Habitat	Status	Potential for Occurrence
PLANTS				
Vallisneria americana	Eel-grass	Major streams near their barks; submerged plant.	Kentucky-S	Historically recorded in the Ohio River at Cox Park, on the southeast side of Six Mile Island, and at Falls of the Ohio. None found during field surveys.
Veratrum woodii *	Wood's Bunchflower	Rich dry or mesic woods.	Kentucky-T	Historically recorded from Jefferson County. No recent records and none found during field surveys.
Viola septemloba var. egglestonii *	Eggleston's Violet	Calcareous barrens, glades and dry prairies associated with silurean and Mississippian limestones.	Kentucky-S	Recorded recently from Jefferson County. None found during field surveys.
Vitis labrusca *	Northern Fox Grape	Mesic to wet woodland borders.	Kentucky-S	Historically recorded from Jefferson County. No recent records and none found during field surveys.

** Since the FEIS, this table has been revised to add these species.*

Legend: T = threatened species E = endangered species S = species of special concern

4.7.4 Natural Areas

This section of the 2003 FEIS discussed dedicated state nature preserves, noting that, in the project area, there were none in Indiana and one in Kentucky. For more detailed information, see page 4-182 of the FEIS. The SDEIS expands the discussion of natural areas beyond dedicated nature preserves to include the Falls of the Ohio National Wildlife Conservation Area because it is an important resource in the study area. The Falls area is located approximately one-half mile west of Clark Memorial Bridge.

In 1981, the U.S. Congress established the Falls of the Ohio National Wildlife Conservation Area (the Falls), consisting of approximately 1,400 acres roughly bounded by the Louisville & Indiana Railroad bridge, the K & I Railroad bridge, and the waters between Indiana and Kentucky, including the Shippingport and Sand islands, extensive fossil beds, the Portland Canal, and the McAlpine Locks and Dam. The Conservation Area is administered by the U.S. Army Corps of Engineers (USACE), the states of Kentucky and Indiana, and the local governments. Their mission is to protect the area for the enhancement of fish and wildlife, and to provide opportunities for scientific research, environmental education, and outdoor recreation.

The Falls are actually a series of rapids, most of which are now flooded behind the McAlpine Dam. Prior to the construction of the dam (the first lock was completed in 1921), the rapids allowed the river to fall 26 feet over the course of two miles. The rapids formed a natural obstacle to river travel during low-water periods, which contributed to the siting of the cities of Louisville, Jeffersonville, and Clarksville along the Ohio's banks above the rapids. The need to facilitate river commerce by providing unobstructed, year-round navigation led to the construction of the Portland Canal, completed in 1830, immediately west of Louisville.

For over 200 years the Falls area has been the focus of scientific and historical research in such fields as paleontology, geology, ornithology, river flora and fauna, and the native peoples who

inhabited the area for thousands of years. The fossil beds exposed below the dam's spillway date to the Devonian Period, 390 million years ago, and represent one of the largest exposures of Devonian fossil beds in the world. Scientists have identified nearly 600 species of fossils there, dominated by corals and other sea flora and fauna. The exposed rock and fossil beds below the spillway make the Falls a natural stop-over for many migrating birds in the spring and fall. Nearly 300 species have been observed there. John James Audubon, the naturalist and artist, studied and painted numerous birds at the Falls. The area also provides recreational opportunities, including bird-watching and fishing. The Falls of the Ohio State Park is located in Clarksville, Indiana, overlooking the fossil beds. The Interpretive Center at the park offers exhibits, activities, nature programs, and a film that tells the story of the Falls area.

4.8 Water Resources

This section of the 2003 FEIS summarized water resources within the project area (see page 4-182 of the FEIS). This SDEIS updates the discussion of impaired streams based on the modification of the study area and on new information associated with the list of impaired state water resources required by Section 303(d) of the Clean Water Act (CWA).

Section 303(d) requires states to list impaired state water resources every other year. Water resources are listed by severity of contamination, and the reason for impairment is identified. A stream is listed as "impaired" when it is unfit for its intended use. Data presented in the FEIS regarding impaired water resources in the project area was based on the Draft 2002 listings, while data presented herein is based on Draft 2010 listings.

In the FEIS, there were no impaired streams listed in the Indiana portion of the project, and six in the Kentucky portion. At present, there are still no impaired streams in the Indiana portion of the project area. Within the Kentucky portion of the SDEIS study area, the list of impaired streams has been reduced to the three presented below. Of the remaining three streams referenced in the FEIS, two are no longer within the SDEIS study area (i.e., Goose Creek and Little Goose Creek), and one (Harrods Creek) is no longer listed as impaired.

According to the Kentucky Division of Water (KDOW) Section 303(d) listings (Draft 2010), the following stream segments are listed as impaired:

- ***Beargrass Creek***
  0.5 to 1.8—Impaired Use: Warm Water Aquatic Habitat (Partial Support)
  Pollutants: Nutrient/Eutrophication Biological Indicators, Organic Enrichment (Sewage) Biological Indicators
- ***Muddy Fork***
  0.0 to 6.9—Impaired Use: Primary Contact Recreation Water (Nonsupport)
  Pollutants: Fecal Coliform
- ***Ohio River***
  488.0 to 603.3—Impaired Use: Fish Consumption (Partial Support)
  Pollutants: Dioxin, Polychlorinated Biphenyls

603.3 to 608.1—Impaired Uses: Fish Consumption (Partial Support), Primary Contact Recreation (Partial Support)
Pollutants: Dioxin, Escherichia coli, Polychlorinated Biphenyls

608.1 to 609.2—Impaired Uses: Fish Consumption (Partial Support), Primary Contact Recreation (Nonsupport)
Pollutants: Dioxin, Escherichia coli, Polychlorinated Biphenyls

609.2 to 614.9—Impaired Uses: Fish Consumption (Partial Support), Primary Contact Recreation (Partial Support)
Pollutants: Dioxin, Escherichia coli, Polychlorinated Biphenyls

614.9 to 683.0—Impaired Uses: Fish Consumption (Partial Support), Primary Contact Recreation (Nonsupport)
Pollutants: Dioxin, Escherichia coli, Mercury in Water Column, Polychlorinated Biphenyls

4.8.1 Surface Water

This section of the 2003 FEIS discussed surface waters of the project area, and the discussion therein remains valid and applicable to this project. For more detailed information, see page 4-183 of the FEIS. This section of the SDEIS adds stream habitat quality data, which was not included in the FEIS.

Surface water resources may include oceans, rivers, lakes, streams, tributaries, estuaries, and impoundments. Surface water bodies within the area of the FEIS Selected Alternative and the Modified Selected Alternative include Harrods Creek and Beargrass Creek and their tributaries in Kentucky; Lentzier Creek and its tributaries, and tributaries of Lancassange Creek, in Indiana; and the Ohio River and its tributaries. Biological and water chemistry data for the perennial streams (Harrods Creek, Beargrass Creek, Muddy Fork, Lentzier Creek, and Lancassange Creek), and the Ohio River were included in the 2003 FEIS (see figures 4.8-1a and 4.8-1b on pages 4-186 and 4-187 of the FEIS). The "designated uses" and 303(d) status of these waters, which are re-evaluated every other year by the environmental protection agencies of Kentucky and Indiana and by the U. S. Environmental Protection Agency, has not changed since the FEIS. Therefore, it is assumed the biological and water chemistry data in these perennial streams has not changed significantly.

Habitat quality data for streams was not included in the 2003 FEIS. Because this data is included as important criteria for assessing the health of streams as provided in *Standard Methods for Assessing Biological Integrity of Surface Waters in Kentucky*, KYDOW (February, 2008), field investigations were conducted in 2011 for Harrods Creek, Beargrass Creek, Muddy Fork, Lentzier Creek, Lancassange Creek, and representative tributaries. Habitat forms ("Habitat Assessment Field Data Sheet—High Gradient Streams") from *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers* which provides a habitat evaluation based on ten parameters including in-stream habitat, channel morphology, bank stability, and riparian vegetation were completed. Rapid Bioassessment Protocols for habitat are not suitable for a

stream of the size and character of the Ohio River; therefore, they were not completed for that water body. The following summarizes the results of the 2011 habitat assessments:

- ***Lancassange Creek***
  Habitat—An unnamed tributary of Lancassange Creek scored 83 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have an intermittent flow regime.
- ***Lentzier Creek***
  Habitat—Lentzier Creek scored 87 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have a perennial flow regime. Two unnamed tributaries of Lentzier Creek scored 110 and 116 (which indicate poor habitat quality) on the Habitat Assessment Field Data Sheet. These streams were judged to have intermittent flow regimes.
- ***Harrods Creek***
  Habitat—Harrods Creek scored 51 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have a perennial flow regime. An unnamed tributary of Harrods Creek scored 136 (which indicates fair habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have an intermittent flow regime.
- ***Beargrass Creek***
  Habitat—Beargrass Creek scored 72 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have a perennial flow regime. An unnamed tributary of Beargrass Creek scored 84 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have an ephemeral flow regime.
- ***Muddy Fork***
  Habitat—Muddy Fork scored 78 (which indicates poor habitat quality) on the Habitat Assessment Field Data Sheet. This stream was judged to have a perennial flow regime.

4.8.2 Groundwater

This section of the 2003 FEIS discussed groundwater in the project area, including the Sole Source Aquifer Protection Program and Wellhead Protection Areas (WHPA). The FEIS identified one WHPA in the project area (in Indiana) and one "proposed" WHPA in the project area (in Kentucky) (see page 4-194 of the FEIS for additional details).

This SDEIS updates the status of the WHPA in Kentucky to note that it has been designated a WHPA by the Louisville Water Company. The area is bounded by Harrods Creek, the Oldham County/Jefferson County line, the Indiana shore of the Ohio River, and a rock ledge east of Brownsboro Road. There are no other updates to the information about groundwater resources in the area since the FEIS.

4.8.3 Special Status Streams

This section of the 2003 FEIS discussed Wild and Scenic Rivers and Navigable Waters of the project area. There are no updates or additions to this section since the FEIS. For more detailed information, see page 4-195 of the FEIS.

4.9 Floodplains

This section of the 2003 FEIS discussed floodplains, noting they often contain wetlands and other water systems. The FEIS described the location of floodwalls, the subsequent reduction in the floodplains in the project area, and the floodplain-related permits that would be needed for the project. For more detailed information, see page 4-195 of the FEIS. Due to the modification to the project study area between the FEIS and the SDEIS, the number of potentially involved floodplains has been reduced from ten in the FEIS to the following five:

- Ohio River
- Harrods Creek
- Beargrass Creek
- Muddy Fork
- Middle Fork Beargrass Creek

4.10 Wetlands

This section of the 2003 FEIS discussed wetlands and their functions within the project study area, which included all of the bridge/highway alternatives analyzed in the 2003 FEIS. There are no updates required to information presented in Sections 4.10.1 and 4.10.2 of the FEIS, as the general discussions of wetland classification and characteristics, respectively, are still applicable to this SDEIS as well. As a result, the information originally presented in these sections of the FEIS are not repeated here, while original sections 4.10.3 and 4.10.4 on wetland delineation methods and potential jurisdictional wetlands, respectively, are renumbered below as sections 4.10.1 and 4.10.2. Minor changes have been made to these subsections to address the most current design specifics of the FEIS Selected Alternative and the Modified Selected Alternative. In addition, Table 4.10-1 has been updated to summarize data regarding wetlands (including wetlands in streams) located within the rights-of-way of the FEIS Selected Alternative and the Modified Selected Alternative. For more detailed information, see pages 4-196 through 4-201 of the FEIS.

4.10.1 Wetland Delineation Methods

A variety of data sources as identified on page 4-198 of the 2003 FEIS were used to update potential jurisdictional wetlands within the project area (see figures 4.8-1a and 4.8-1b on pages 4-186 and 4-187 of the FEIS). A new round of field investigations was then conducted in 2011,

based on the latest USACE guidance[11] for determining "waters of the United States," to locate and delineate wetlands that occur within the current approximate rights-of-way of the FEIS Selected Alternative and the Modified Selected Alternative. The amount, type, and locations of those wetlands are summarized in Table 4.10-1. The acreages presented in the table represent the total acreage of each wetland intersected by the project rights-of-way.

4.10.2 Potential Jurisdictional Wetlands

Wetland types include palustrine (which include bogs, marshes, swamps, and other typical wetlands), riverine (which are wetlands within river or stream channels), and lacustrine (which are wetlands within lakes or reservoirs). The palustrine wetlands within the rights-of-way of each build alternative are the same, with 6.15 acres for both build alternatives. The locations of these wetlands are shown in SDEIS appendices B.5.1–B.5.3.

TABLE 4.10-1
TOTAL ACREAGE OF JURISDICTIONAL WETLANDS DELINEATED IN RIGHTS-OF-WAY OF THE FEIS SELECTED AND MODIFIED SELECTED ALTERNATIVES

Type	Number of Wetlands		Size (Acres)		Length (Miles)	
	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected
Palustrine Forested	3	3	2.64	2.64		
Palustrine Scrub-Shrub	3	3	0.90	0.90		
Palustrine Emergent	5	5	2.61	2.61		
Riverine	17	17			2.54	2.1
Lacustrine	6	5			0.8	0.4
TOTAL	34	33	6.15	6.15	3.34	2.5

Palustrine Forested Wetlands (PFO)
The three PFO wetlands found within the right-of-way of the two alternatives are predominantly within floodplains and adjacent to stream corridors. The forested areas determined to be wetlands total 2.64 acres within the right-of-way of each build alternative, and range in size from 0.31 acre to 1.23 acres. The largest forested wetland identified is adjacent to Lentzier Creek in Indiana. The area includes ash, sycamore, cottonwood and maple trees. Many of the large trees have exfoliated bark.

Palustrine Scrub-Shrub Wetlands (PSS)
The three PSS wetlands found within the right-of-way of each build alternative have been delineated to total 0.90 acre for both the FEIS Selected Alternative and the Modified Selected

[11] Guidance included Regulatory Guidance Letter 07-10 and other guidance documents resulting from the U.S. Supreme Court Decision in *Rapanos v. Untied States*. In *Rapanos*, the U.S. Supreme Court addressed where the Federal Government could apply the Clean Water Act, specifically by determining whether a wetland of tributary is a "water of the United States." As a result of the *Rapanos* decision, USACE conducts "a more thorough and robust analysis for determining the scope of the Clean Water Act Section 404 jurisdiction for waters of the United States."
http://www.nap.usace.army.mil/cenap-op/regulatory/rapanos/guidhigh_06-05-07.pdf

Alternative. Vegetation within these areas includes American elm, black willow, sycamore, and eastern red cedar. Two of the wetlands are located adjacent to Lentzier Creek.

Palustrine Emergent Wetlands (PEM)
Five small PEM wetlands were identified to total approximately 2.61 acres within the right-of-way of each build alternative. The wetlands range in size from 0.2 acre to 0.87 acre.

Riverine Wetlands
Riverine systems include streams; i.e., all wetland and deep-water habitats contained within a channel, except areas dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Seventeen riverine systems, including headwater streams, were delineated within the right-of way of either alternative.

Lacustrine Wetlands
Six lacustrine wetlands were identified within the right-of-way of the FEIS Selected Alternative and five were identified within the right-of-way of the Modified Selected Alternative. (The different number is due to the differences in the design of the Kennedy Interchange.) These wetlands were identified adjacent to Harrods Creek, Beargrass Creek, and the Ohio River. Although they are large streams, Beargrass and Harrods creeks and the Ohio River are classified as lacustrine systems on the National Wetlands Inventory (NWI) map because they have active wave-formed or bedrock shoreline or a depth exceeding 6.6 feet at low water.

4.11 Visual and Aesthetic Resources

This section of the 2003 FEIS discussed visual and aesthetic resources of the project's regional landscape. The project area viewshed was defined and Figure 4.11-2 (FEIS p. 4-204) provided a composite viewshed describing what can be viewed from multiple locations along the project alternatives. The project area was divided into three landscape units (Downtown Riverfront, Eastern Uplands, and Eastern Bottomlands) and five urban districts (Louisville Central Business District [CBD], Louisville East, Louisville West, Jeffersonville-Clarksville North, and Mid-East Indiana). Evaluation of each landscape unit and urban district was then conducted based on U.S. Department of Transportation (USDOT) criteria typically used to evaluate visual quality on highway projects. Representative photographs of each landscape unit and urban district were also provided in FEIS figures 4.11-4a through 4.11-4h. This section of the SDEIS contains the following substantive changes to information presented in the 2003 FEIS:

- Section 4.11.1—Provides updates to the boundary and description of the Downtown Landscape Region by extending the boundary to the west as illustrated on the revised Figure 4.11-1, herein.
- Section 4.11.2—Includes revisions to Figure 4.11-2 illustrating the project viewshed relative to the two build alternatives.
- Section 4.11.3—Details changes to the Louisville West Urban District, and adds the New Albany Urban District since the 2003 FEIS. This includes updates to Figure 4.11-3 and

tables 4.11-1 and 4.11-2, as well as the addition of Existing Character Photographs of the New Albany Urban District (Figure 4.11-4i).

For more detailed information about the viewsheds identified in the 2003 FEIS, see pages 4-201 to 4-223 of the FEIS.

4.11.1 Regional Landscape Character

Aesthetically, the regional landscape can be divided into three distinct regions—Far East, Downtown, and Mid-East Indiana (see Figure 4.11-1). The Downtown Landscape Region has been extended west to include more of the West Louisville area and to add the New Albany Urban District. The extension\addition incorporates areas that are forecasted to experience changes in traffic patterns due to tolling, which is a feature of the Modified Selected Alternative only. In the Downtown Landscape Region, most of the area's natural topography has been altered or obscured by dense urban development, interstate highways and floodwalls. While there are numerous areas displaying high quality aesthetic character, this character is predominantly architectural. Dramatic views relating to the river do exist, all of which are influenced by the existing bridges or riverfront structures.

4.11.2 Viewshed

Figure 4.11-2 outlines a composite viewshed that generally illustrates what can be viewed from multiple points along the proposed build alternatives. At various locations, the actual viewshed may be slightly larger or smaller than shown, due to irregularities in topography or land cover. Alternatives A-15 and C-1, as presented in the 2003 FEIS, comprise the FEIS Selected Alternative being studied in this SDEIS, which is also the general location of the Modified Selected Alternative.

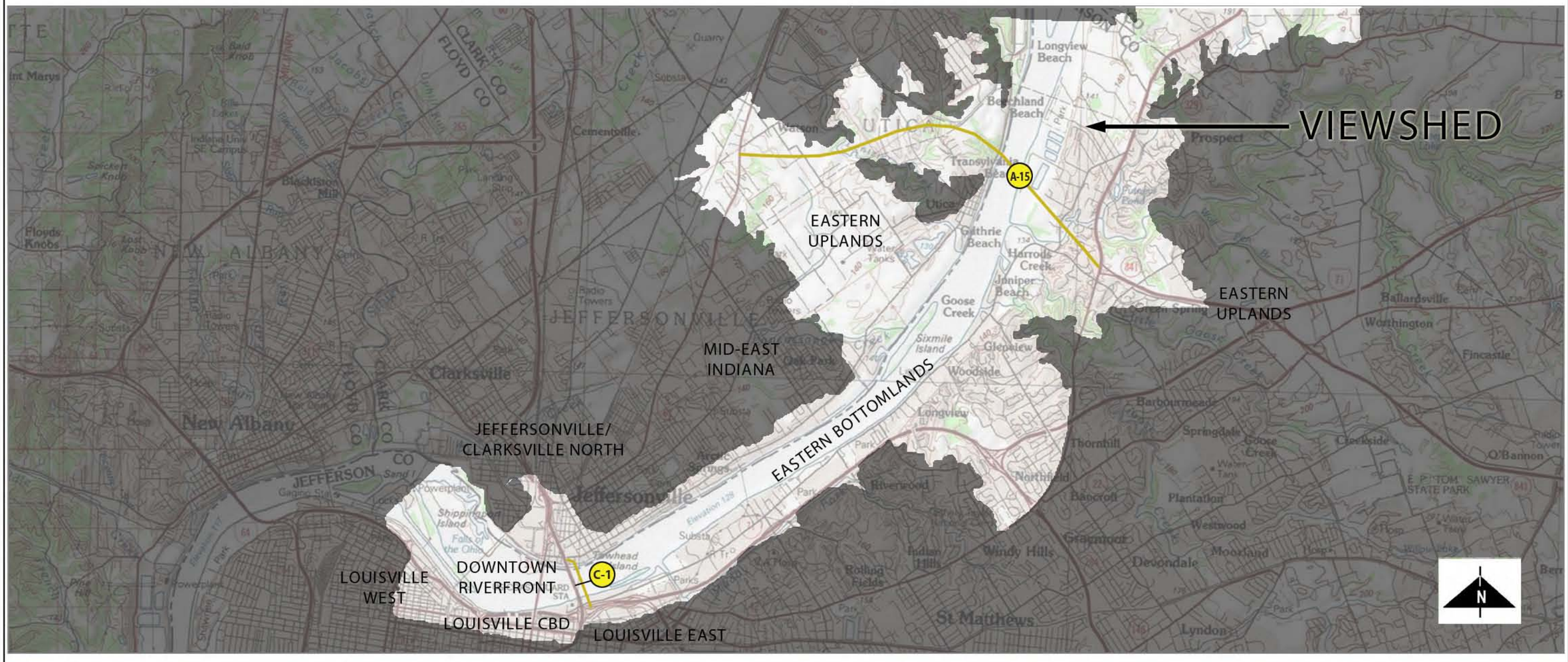
4.11.3 Landscape Units and Urban Districts

Within the project area, each region was subdivided into landscape units according to aesthetic setting, land use or landform. Similarly, urban areas were divided into urban districts. As shown in Figure 4.11-3, the project area contains three landscape units—Downtown Riverfront, Eastern Uplands, and Eastern Bottomlands; and six urban districts—Louisville CBD, Louisville East, Louisville West, Jeffersonville-Clarksville North, New Albany, and Mid-East Indiana. Of the three landscape units, the boundaries of the Downtown Riverfront have changed since the FEIS and are described herein. Of the six urban districts, the boundaries of Louisville West have changed since the FEIS and the New Albany has been added. These changed / new areas are described below. Table 4.11-1 indicates the relationship of the landscape regions to all of the landscape units and urban districts, while Table 4.11-2 presents a visual quality evaluation matrix for all of the landscape units and urban districts..

Landscape Units

Downtown Riverfront

The downtown riverfront landscape unit has been modified to include New Albany and is bounded by the western boundary of the Sherman Minton Bridge/I-64 on the west, a line from Cabel Street in Louisville to Spring Street in Jeffersonville on the east, the Jeffersonville/Clarksville/New Albany floodwall on the north, and the Louisville floodwall and elevated interstate expressways on the south. Between Clarksville and New Albany, the concrete floodwall transitions to a raised earthen berm. However, there is a short section of concrete floodwall between 14th and 9th streets in New Albany, with some residences located on the river side of the wall. Downtown New Albany contains a riverfront amphitheater and waterfront path/park with boat ramp inside the floodwall earthen embankment. A section of railroad runs along the top of a portion of this earthen embankment immediately south of the downtown.



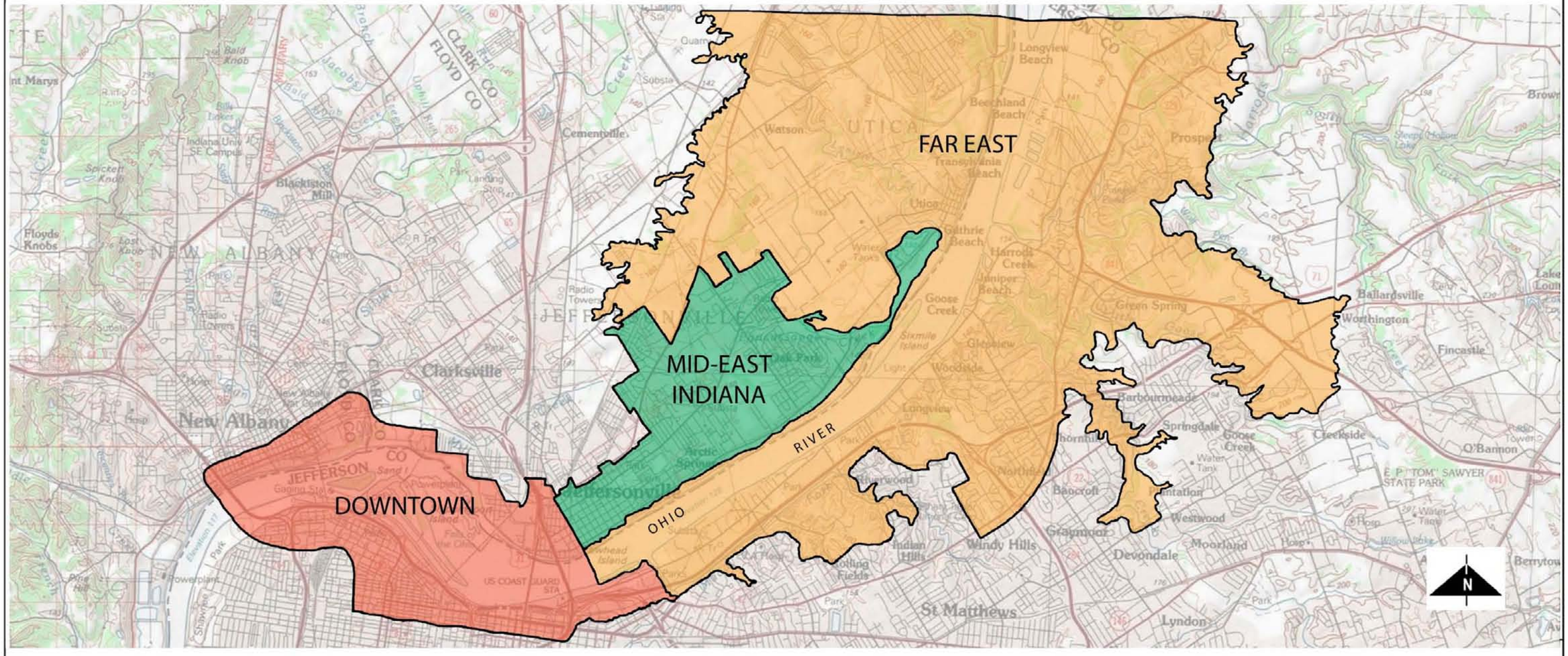
LEGEND

X-X Alignment Identification

THE OHIO RIVER BRIDGES

Figure 4.11-2

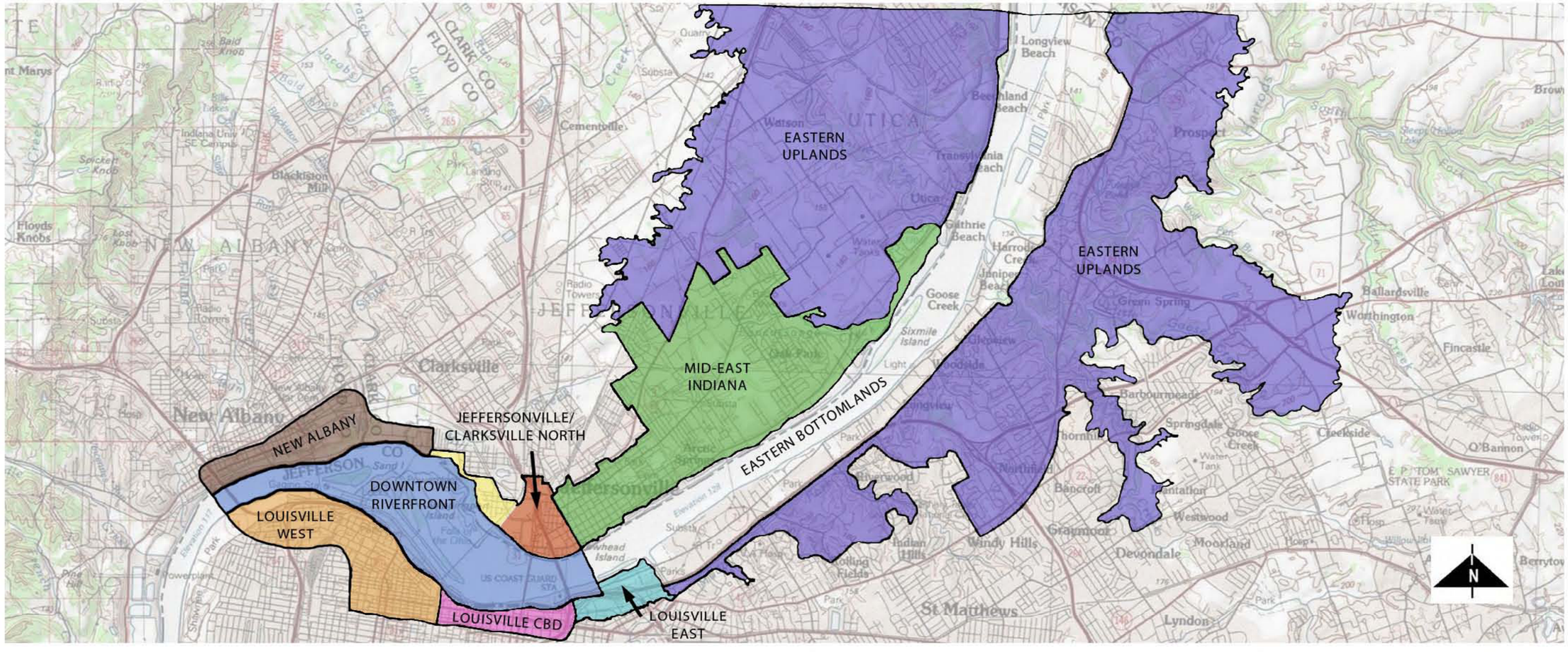
REGIONAL VIEWSHED AND PROPOSED ALIGNMENTS



THE OHIO RIVER BRIDGES

Figure 4.11-1

LANDSCAPE REGIONS



THE OHIO RIVER BRIDGES

Figure 4.11-3

LANDSCAPE UNITS AND URBAN DISTRICTS

TABLE 4.11-1
LANDSCAPE REGIONS, UNITS, AND URBAN DISTRICTS

Landscape Region	Landscape Unit	Urban District
Downtown	Downtown Riverfront	Louisville CBD Louisville East Louisville West Jeffersonville-Clarksville North New Albany
Mid-East Indiana	None	Mid-East Indiana
Far East	Eastern Uplands Eastern Bottomlands	None

Note: While the areas identified in Table 4.11-1 tend to overlap and are somewhat subjective, the scoring provided in the Visual Quality Evaluation Matrix (Table 4.11-2) provides a tool to evaluate visual quality for each landscape unit.

TABLE 4.11-2
VISUAL QUALITY EVALUATION MATRIX

	Landscape Character						Visual Quality				Viewer Sensitivity							
	Resources			Physiography							Looking at Road				Looking from Road			
	Wetlands	Woodlands	Historic Structures	Steep	Rolling	Flat	Uniqueness	Vividness	Intactness	Unity	Rural Residents	Suburban Residents	Urban Residents	Tourists	Rural Residents	Suburban Residents	Urban Residents	Tourists
Landscape Unit																		
Downtown Riverfront	○	○	◗	○	○	●	●	●	◗	●	○	○	●	◗	○	○	●	◗
Eastern Uplands	◗	●	◗	●	◗	○	●	●	●	●	●	●	○	○	●	●	○	○
Eastern Bottomlands	●	◗	◗	○	○	●	◗	◗	◗	◗	●	◗	○	○	●	◗	○	○
Urban District																		
Louisville CBD	○	○	◗	◗	○	●	◗	◗	◗	◗	○	○	●	◗	○	◗	●	◗
Louisville East	○	○	◗	○	○	●	○	○	○	○	○	○	●	○	○	◗	●	◗
Louisville West	○	○	◗	◗	○	●	◗	◗	○	○	○	○	●	○	○	◗	●	◗
Jeffersonville-Clarksville	○	○	◗	○	○	●	◗	◗	○	○	○	●	◗	○	○	●	◗	◗
New Albany	○	○	◗	○	◗	●	◗	◗	●	●	○	○	●	◗	○	○	●	◗
Mid-East Indiana	◗	○	○	◗	◗	●	○	○	○	○	●	◗	○	○	●	◗	○	○

Landscape Character	Visual Quality	Viewer Sensitivity
● Dominant Presence of Land Use / Land Cover ◗ Moderate Presence of Land Use / Land Cover ○ Limited Presence of Land Use / Land Cover	● High ◗ Moderate ○ Low	● High Number of Viewers ◗ Moderate Number of Viewers ○ Limited Number of Viewer

Urban Districts

Louisville West

This district includes the Portland and Russell neighborhoods and is bounded by the concrete floodwall/I-64 on the north, the Sherman Minton Bridge/I-64 on the west, Northwestern Parkway and Jefferson Street on the south, and 9th Street on the east. This densely developed district contains a range of architectural styles and land uses including Shawnee Golf Course along the river, early to mid-19th century brick residential, industrial, and commercial structures north of Main Street, and 1960s-era public housing south of Main Street near 9th Street. As with Louisville East, the floodwall divides the district.

Roads in this district vary from tree-lined, two- and four-lane curb and gutter with parking, to elevated interstate expressways that run parallel to the river. A motorist traveling east on I-64 enjoys high to moderate quality views including the McAlpine Locks and Dam; the Clark, Kennedy, Sherman Minton and Big Four bridges; the Louisville skyline; and the Indiana riverfront.

Views of the river are confined to breaks in the floodwall that occur at the end of north-south streets. However, quality views of the river are presented to the motorist when approaching the Sherman Minton Bridge crossing into Indiana. Public parking and industrial land uses typically occupy the land between the floodwall and the riverfront park system, degrading the quality of the views. The 9th Street interchange plays a dominant role, with most east-west streets offering clear views of the structure.

New Albany

This district includes much of the downtown area and extends from Spring Street on the north, West 5th Street on the west, the floodwall berm on the south, and the Conrail railroad tracks on the east. Land use ranges from the traditional Central Business District centered on State and Market streets, to residential and commercial districts east of the downtown area. Much of the area between Brown's Station Way and the river (between New Albany and Clarksville) can be characterized as industrial, including a quarry operation and several salvage yards.

Most development in the downtown consists of two- and three-story brick and frame structures. Although there are concentrations of commercial development along Vincennes Street and at the intersection of Silver and Spring streets, much of the area east of downtown is characterized by traditional, urban residential development. Figure 4.11-4i, herein, includes a photographic summary of this urban district.

Streets in the New Albany district vary from two- and four-lane curb and gutter with parking, to the elevated I-64 that runs perpendicular to the river via the Sherman Minton Bridge. Brown's Station Way transitions into Spring Street, which serves as the primary street into the district from the east (Clarksville). Motorists crossing the river on I-64 from the south experience high quality views of downtown New Albany and the riverfront amenities. Southbound motorists have low quality views typical of suburban development when approaching the city and limited views of the downtown.







Figure 4.11-4i

LOUISVILLE - SOUTHERN INDIANA
OHIO RIVER BRIDGES PROJECT

EXISTING CHARACTER PHOTOGRAPHS:
NEW ALBANY - URBAN DISTRICT

In downtown New Albany, views of the Ohio River are confined to breaks in the floodwall embankment that occur at the end of north-south streets. The elevated I-64 expressway contributes negatively to the district's visual character and serves to physically divide the district into eastern and western subsets.

4.12 Hazardous Substances

Section 4.12 of the 2003 FEIS presented the results of the Phase I Environmental Site Assessments (ESAs) that were conducted on sites with the potential for hazardous substances located along the project alternatives being evaluated at that time. It also identified the sites that were recommended for Phase II ESAs. This section of the SDEIS contains the following substantive additions to the information presented in the 2003 FEIS:

- Adds the results of the Phase II ESAs that were conducted since the FEIS for the sites that are located within Design Sections 1 (Kennedy Interchange) and 3 (Downtown Indiana Approach) of the FEIS Selected Alternative. (See Chapter 1, Section 1.5 and Figure 1.5-1, of this SDEIS for a list of the six Design Sections.)
- Adds the results of an updated Environmental Data Resources, Inc. (EDR) database search for potentially new hazardous waste sites that may have developed along the FEIS Selected Alternative and the Modified Selected Alternative since the Phase I ESAs and the FEIS.

Design Section 1 Environmental Site Assessments

Based on the recommendations in the Phase I ESA Baseline Reports for Section 1 in 2000 and in the 2003 FEIS, 13 Phase II, Step A[12] ESAs (sites KY 34, KY 36, KY 42, KY 46, KY 46A, KY 58, KY 63, KY 65, KY 67, KY 67A, KY 69, KY 72, and KY 73), and four Limited Phase II ESAs (sites KY 11, KY 21, KY 23/24 and KY 28) were conducted in 2007 for hazardous waste sites (see Figure 4.12-1).

Below are the results of the 13 Phase II, Step A ESAs conducted for Design Section 1. The compounds and metals that exceeded the October 2002 USEPA Region 9 Preliminary Remediation Goals (PRGs) for residential soils, industrial soils, and drinking water are presented in Table 4.12-1.

- The presence of soil contamination exceeding one or more of the EPA Region 9 PRGs was confirmed for all 13 sites.
- For all 13 sites, the predominant contaminants confirmed to exceed EPA Region 9 PRGs are Polynuclear Aromatic Hydrocarbon compounds (PNAs or PAHs), and Resource Conservation and Recovery Act (RCRA) total metals.

[12] Step A investigations are conducted to confirm or deny the presence of contamination associated with Recognized Environmental Conditions (RECs) that are identified in the Phase I ESAs. If Step A confirms the presence of contaminated substances, then Step B investigations are usually conducted to more completely delineate the nature and extent of the contamination. Depending on the information provided in the initial Phase I ESAs, the Phase II, Step A investigations can be skipped, and Phase II, Step B investigations may be conducted.

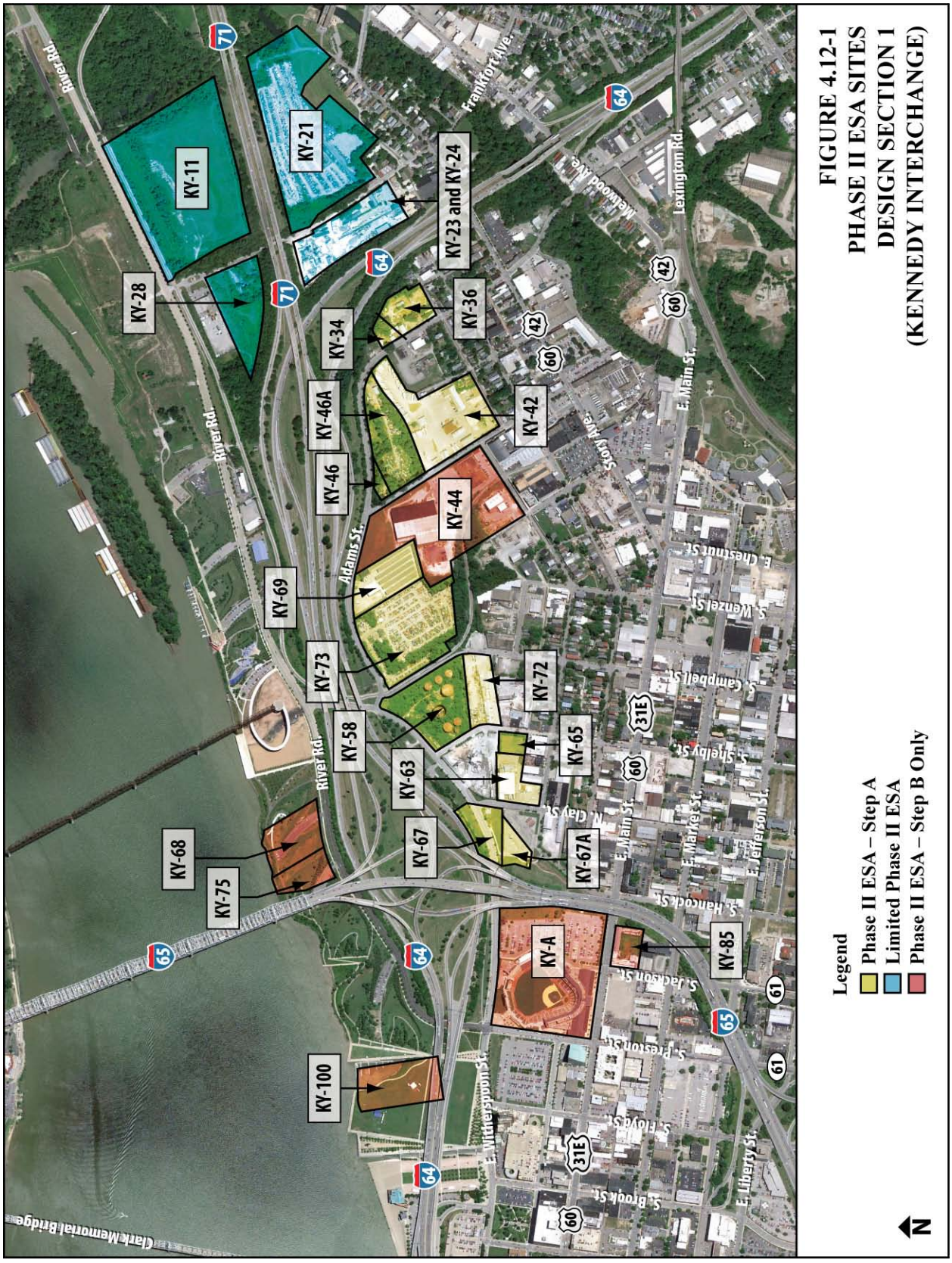


FIGURE 4.12-1
PHASE II ESA SITES
DESIGN SECTION 1
(KENNEDY INTERCHANGE)

TABLE 4.12-1
COMPOUNDS AND METALS EXCEEDING EPA REGION 9 PRGS

	Residential Soil	Industrial Soil	Drinking Water
Volatile Organic Compounds (VOCs)			
Acrolein			✓
Acrylonitrile			✓
Benzene			✓
Chloroethane			✓
Ethylbenzene			✓
Methyl isobutyl ketone			✓
1,2,4-Trimethylbenzene	✓		✓
1,3,5-Trimethylbenzene			✓
Xylenes, Total			✓
Semivolatile Organic Compounds (SVOCs)			
Benzo(a)anthracene	✓	✓	✓
Benzo(b)fluoranthene	✓	✓	✓
Benzo(k)fluoranthene	✓	✓	✓
Benzo(a)pyrene	✓	✓	✓
Bis(2-ethylhexyl)phthalate			✓
Carbazole	✓		✓
Chrysene			✓
Dibenzo(a,h)anthracene	✓	✓	✓
Dibenzofuran			✓
Indeno(1,2,3-c,d)pyrene	✓	✓	✓
Naphthalene			✓
Pyrene			✓
Total RCRA Metals			
Arsenic	✓	✓	✓
Barium			✓
Cadmium	✓	✓	✓
Chromium	✓	✓	
Lead	✓	✓	N/A
Mercury			✓
Silver			✓
Polychlorinated Biphenyls (PCBs)			
Aroclor 1260	✓		

- For all 13 sites, both EPA Region 9 Residential and Industrial soil PRGs were confirmed to be exceeded for PNAs/PAHs and metals in one or more boring locations.

- Groundwater contamination exceeding the EPA Region 9 Drinking Water PRG was confirmed for 11 of the 13 sites. Site KY 46 did not exceed Drinking Water PRG and groundwater was not encountered at Site KY 67 due to soil boring refusal at a shallow depth.

Based on the findings from these Phase II, Step A ESAs, all 13 sites were recommended for Phase II, Step B ESAs.

Regarding the four Limited Phase II ESAs, all four sites had soil contamination that exceeded the 2002 EPA Region 9 PRGs. For two sites (KY 11 and KY 28), limited groundwater data was obtained, which indicated concentrations that exceeded the 2002 EPA Region 9 PRG. Groundwater samples were not obtained for the other two sites (KY 21 and KY 23/24). Based on the findings from these Limited Phase II ESAs, sites KY 11, KY 21, and KY 28 were recommended for Phase II, Step B ESAs. No further soil or groundwater assessments were recommended for Site KY 23/24.

For six other sites (KY 44, KY 68, KY 75, KY 85/Vermont America Building, KY 100, and KY A), it was determined that Phase II, Step A ESAs would not be required because previous studies had already confirmed that these site were contaminated. As a result, it was recommended that only Phase II, Step B ESAs would be conducted for these sites. A brief description of all the Phase II ESA sites in Kentucky is provided in Table 4.12-2.

Additional recommended studies such as Phase II, Step B ESAs have not been completed and have been put on hold due to the introduction of the Modified Selected Alternative for evaluation in this SDEIS.

Design Section 3 Environmental Site Assessments

For Design Section 3 (Downtown Indiana Approach), a Phase I ESA was conducted in 2010 to serve as an update to the Phase I ESA Baseline Report completed in 2000. The 2010 Phase I ESAs recommended the same eight sites for Phase II ESAs as the 2000 Baseline Report (IN 03, IN 04, IN 24, IN 25, IN 32, IN 34, IN 39, and IN 41) (see figures 4.12-2a and 4.12-2b). The following are the results of the Phase II ESAs (also referred to in Indiana as Preliminary Site Investigations) that were conducted in 2010 for these eight sites:

- *Site IN 03 (400 Broadway – McDonalds)*

  The laboratory analytical results revealed impacts to the groundwater above the Indiana Department of Environmental Management's (IDEM) Risk Integrated System of Closure (RISC) residential default closure level (RDCL) for lead in one boring. There were no soil impacts above the RDCLs. All other contaminants of concern (COCs) were below the RDCLs in soil and groundwater. It was recommended that the health and safety plan (HASP) for construction purposes be amended to include the findings from this investigation.

TABLE 4.12-2
DESCRIPTION OF KENTUCKY PHASE II ESA SITES

Site #	Description
KY A	Slugger Field (Former manufactured gas plant)
KY 1	Former Ohio Street Landfill (City of Louisville)
KY 21	Auto Tow Yard/Former Ohio Street Landfill (City of Louisville)
KY 23/24	Allied Ready Mix
KY 28	Former Ohio Street Auto Parts
KY 34	Bob Collett Auto Sales – Used car lot with auto repair shop and salvage yard
KY 36	Auto Junk Yard – Auto body shop and salvage yard
KY 42	Louisville Gas & Electric and Louisville-Jefferson County Metropolitan Sewer District (Former Terry Steadmon Contractor Yard)
KY 44	Challenger Lifts / Logan Co. (Former uses included tannery operation, metalworking, galvanizing, enamel painting, electroplating, and conveyor equipment packaging)
KY 46	Larry Dunn (Marshall's Auto) – Auto parts salvage yard
KY 46A	Marshall's Auto Parts, Adams Street Imports – Auto parts salvage yard
KY 58	Amoco Oil / Ace Salvage – Used equipments and scrap metal salvage yard
KY 63	Producer Feeds – Horse feed mill
KY 65	Producer Feeds – Empty Lot (Former junk yard)
KY 67	Former OK Storage Lot
KY 67A	Louisville Extreme (Skate) Park
KY 68	Ashland Asphalt Terminal
KY 69	Louisville Veneer Mills (ESS PRISA LLC) – Public self storage facility
KY 72	CSX Transportation (Former Amoco Oil site) – Used car lot with repair shop and auto salvage yard
KY 73	Marshall's Auto Parts – Used car lot with repair shop and auto salvage yard
KY 75	Louisville Waterfront Development (Former helipad site)
KY 85	American S & W Stocks/Vermont-America Corporation)
KY 100	Louisville Waterfront Development (Former Klempner Brothers site)

FIGURE 4.12-2a
PHASE II ESA SITES
DESIGN SECTION 3
(DOWNTOWN INDIANA APPROACH)

FIGURE 4.12-2b
PHASE II ESA SITES
DESIGN SECTION 3
(DOWNTOWN INDIANA APPROACH)

- ***Site IN 04 (400 Court Avenue – BP Gas Station)***
  The laboratory analytical results indicated groundwater impacts containing lead, benzene, naphthalene, total petroleum hydrocarbons (TPH) gasoline range organics (GRO), and TPH diesel range organics (DRO) concentrations above the RDCL; and benzene concentrations exceeding the industrial default closure level (IDCL). All other COCs were below the RDCLs in soil and groundwater. It was recommended that the HASP for construction purposes be amended to include the findings from this investigation.

- ***Site IN 24 (600 West 9th Street – Industrial Waste Water Recycling, Inc.)***
  Groundwater laboratory analytical results indicated concentrations of arsenic above the IDCL in several borings. Soil laboratory analytical results indicated concentrations of naphthalene, arsenic, chromium, and lead above the RDCLs and/or IDCLs. All other COCs were below the RDCLs in soil and groundwater. It was recommended that the HASP for construction purposes be amended to include the findings from this investigation.

- ***Site IN 25 (927 Indiana Avenue – Hampton's Used Car Lot)***
  The laboratory analytical results indicated concentrations of benzene above the IDCL and naphthalene above the RDCL in groundwater collected from a few borings. The groundwater analytical results also revealed levels of acenaphthylene, chrysene, and fluoranthene above the RDCL; and benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene above IDCL in one boring. Soil analytical results indicated concentrations of lead, benzo(a)pyrene, benzo(b)flouranthene, dibenzo(a,h)anthracene indeno(1,2,3-cd)pyrene, and 2-methylnaphthalene above the RDCLs and/or IDCLs. All other COCs were below the RDCLs in soil and groundwater. It was recommended that the HASP for construction purposes be amended to include the findings from this investigation.

- ***Site IN 32 (1002 Spring Street – Former Gas Station)***
  Contaminants of concern were either not detected or were detected below IDEM RISC Residential Closure Levels in all soil and groundwater samples taken at 1002 Spring Street.. As a result, no further investigations were recommended.

- ***Site IN 34 (1001 Spring Street – Former Gas Station)***
  Laboratory analytical results of soil and groundwater samples collected indicated that the groundwater at one soil boring had benzene concentrations slightly above IDEM RISC Residential Closure Levels. Contaminants of concern were either not detected or were detected below IDEM RISC Residential Closure Levels in all other soil and groundwater samples taken at this location. As a result, no further investigations were recommended.

- ***Site IN 39 (7th Street and Missouri Avenue – Philadelphia Quartz Corp)***
  The groundwater laboratory analytical results indicated concentrations of arsenic and lead above the RDCLs and/or IDCLs. The soil laboratory analytical results also indicated concentrations of arsenic and lead above the RDCLs and/or IDCLs. All other COCs were

below the RDCLs in soil and groundwater. It was recommended that the HASP for construction purposes be amended to include the findings from this investigation.

- ***Site IN 41 (572 East Montgomery Avenue – Colgate-Palmolive Wastewater Treatment Plant)***
  The groundwater laboratory analytical results indicated concentrations of benzo(a)pyrene, chromium, benzo(a)anthracene, benzo(b)fluoranthene, arsenic, chromium, lead, selenium, and TPH-DRO above the RDCLs and/or IDCLs. Soil laboratory analytical results indicated concentrations of benzo(a)pyrene, naphthalene, arsenic, lead and chromium exceeding the RDCLs and/or IDCLs. All other COCs were below the RDCLs in soil and groundwater. It was recommended that the HASP for construction purposes be amended to include the findings from this investigation.

Design Sections 2, 4, 5, and 6 Environmental Site Assessments

Based on the recommendations in the year 2000 Phase I ESA Baseline Reports for Kentucky and Indiana and in the 2003 FEIS, Phase II ESAs were not conducted for Design Sections 2 (Downtown Bridge), 4 (East End Kentucky Approach), 5 (East End bridge), and 6 (East End Indiana Approach).

Updated Database Search/Records Review

All of the recommendations for Phase II ESAs within project Design Sections 1, 2, 4, 5, and 6 were based on investigations conducted more than 10 years ago in the Phase I ESA Baseline Reports completed in 2000. Recommendations for Design Section 3 were based on the updated Phase I ESA conducted in 2010.

Because of the passage of time, updated database searches/records reviews using EDR were conducted in 2011 for all but Section 3. The updated searches/reviews were conducted within approximately the same study corridors used in the 2000 baseline reports. These searches were the first step in determining the potential presence of any new hazardous waste sites; they were not intended to represent a complete Phase I ESA.

The EDR database search identified 20 additional sites within the study corridors that were not included in the Phase I ESA Baseline Reports. However, based on the information provided by EDR, it was determined that these sites either do not have RECs or are located outside the limits of the project alternatives and would not be impacted. As a result, no further investigations are recommended for these sites.

CHAPTER 5: ENVIRONMENTAL CONSEQUENCES

The introduction to Chapter 5 in the 2003 FEIS presented a description of the general types of potential environmental consequences of the project alternatives on the Louisville Metropolitan Planning Area (LMPA). Direct impacts, including temporary and permanent impacts, were discussed and evaluated. Indirect and cumulative impacts also were evaluated. The introduction to Chapter 5 in the 2003 FEIS introduced an assessment methodology to evaluate indirect and cumulative impacts of the project. The implementation of coordination meetings with resource agencies and local interest groups, as well as public workshops to present and refine the methodology and approach for evaluating indirect and cumulative impacts, was also discussed. The information as presented in the introduction to the FEIS is still applicable and is not repeated herein, although some additional information is presented below.

The overall organization of Chapter 5 used in this SDEIS is also the same as that used in the 2003 FEIS. Evaluations have been made for potential impacts to social and economic resources, agriculture, historic and archaeological resources, air quality, noise, vibration, natural resources, water resources, floodplains, wetlands, visual and aesthetic resources, hazardous substances, and energy. Construction impacts, permitting requirements, short-term use of environmental resources versus long-term productivity, and irreversible and irretrievable commitment of resources are also presented.

The 2003 FEIS evaluated impacts due to different Bridge(s)/Highway(s) Alternatives along various alignments, as well as a No-Action Alternative. The FEIS Selected Alternative consisted of a Two Bridge/Highway Alternative to be constructed along specific Downtown and East End corridor alignments. This chapter of the SDEIS evaluates the potential impacts of the FEIS Selected Alternative as refined after the FEIS, the Modified Selected Alternative that was developed after the FEIS, and the No-Action Alternative. These alternatives, which are evaluated in this section in terms of their impacts, are described in detail in Chapter 3.

5.1 Social and Economic

Section 5.1 of this SDEIS provides updates to the discussion of impacts presented in the 2003 FEIS. The introduction presented in Section 5.1 of the 2003 FEIS provided a description of the various levels of community and socioeconomic impacts that would likely occur as a result of the project alternatives, including macro impacts (i.e., community-wide impacts), vicinity impacts (i.e., impacts in proximity to a given alternative), and right-of-way impacts (i.e., impacts within the limits of the proposed right-of-way). These same geographic levels of impact are still applicable for the SDEIS evaluation, although the specific alternatives being studied are different. Specific changes to the information presented in the introduction to Section 5.1 of the FEIS are detailed below.

The general format of Section 5.1 is also the same as that used in the FEIS. Section 5.1.1 provides a discussion of the project's compatibility with land use and growth within the project area. Section 5.1.2 provides a discussion of the project's consistency with local transportation plans and services. Section 5.1.3 provides a discussion of the project's social impacts within the

LMPA. Section 5.1.4 provides a discussion of impacts to pedestrian and bicycle plans and facilities. Section 5.1.5 discusses potential impacts associated with property displacements and resulting relocations. Section 5.1.6 provides a discussion of economic impacts as related to jobs, income, economic output and construction. Finally, environmental justice impacts to minority and/or low-income populations are discussed in Section 5.1.7.

The changes to the information presented in the 2003 FEIS in each subsection of SDEIS Section 5.1 are largely related to the changes in the alternatives being considered, and include the following:

The changes to the information presented in the 2003 FEIS in each subsection of SDEIS Section 5.1 are largely related to the changes in the alternatives being considered, and include the following:

- Section 5.1 Introduction—Updates the population and employment forecasts for the year 2030, including updates to figures 5.1-1 and 5.1-2 and tables 5.1-1, 5.1-2 and 5.1-3. Also, adds new tables 5.1-4 through 5.1-7.
- Section 5.1.2—Evaluates the consistency of the proposed alternatives with current transportation plans within the LMPA and the overall impacts to public transportation. There are no changes to this section of the 2003 FEIS.
- Section 5.1.3—Evaluates the social impacts of the proposed alternatives within the LMPA. There are no changes to this section of the 2003 FEIS.
- Section 5.1.4—Provides updated information on the recommended pedestrian and bicycle projects for the LMPA. Includes updates to tables 5.1-8 and 5.1-9 (formerly tables 5.1-4 and 5.1-5).
- Section 5.1.5—Provides updated information on the relocations associated with the build alternatives. Includes updates to Table 5.1-10 (formerly Table 5.1-6).
- Section 5.1.6—Provides updated information on the economic impacts associated with the project. Provides new information on projected revenue generated by tolling. Includes updates to tables 5.1-11 and 5.1-12 (formerly tables 5.1-7 and 5.1-8).
- Section 5.1.7—Provides updated information on potential environmental justice impacts associated with the project.

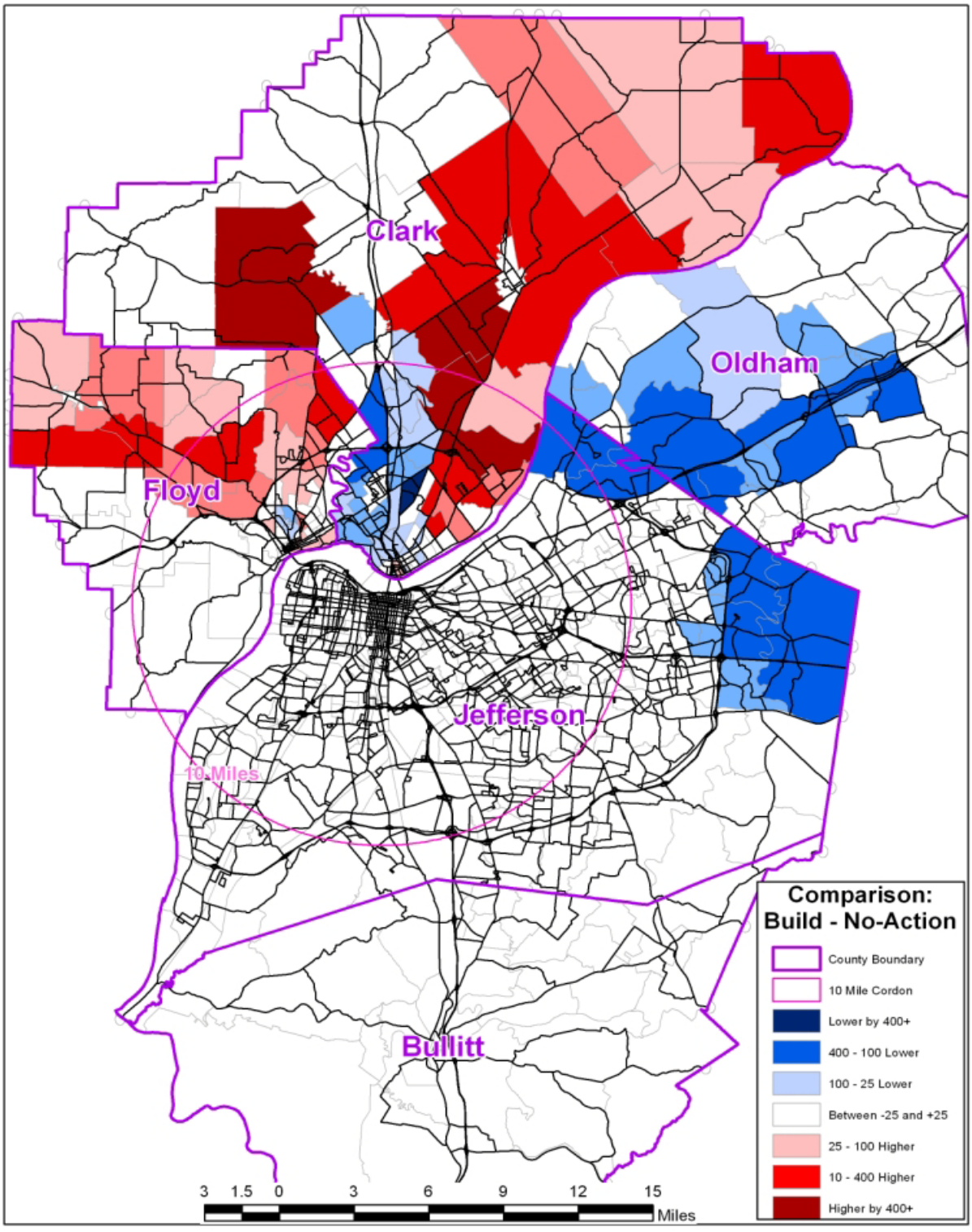
For the FEIS, population and employment forecasts for 2025 were prepared for the No-Action Alternative, the FEIS Selected Alternative, and the Modified Selected Alternative for the LMPA using socioeconomic data from the Kentuckiana Regional Planning and Development Agency (KIPDA) (see FEIS figures 5.1-1 and 5.1-2).

For the SDEIS, population and employment forecasts for 2030 were prepared for the No-Action Alternative, the FEIS Selected Alternative, and the Modified Selected Alternative for the LMPA. Forecasts for 2030 were prepared using updated socioeconomic data from KIPDA. Figures 5.1-1 and 5.1-2 show the comparison of the household and employment forecasts for 2030,

respectively, for these three alternative. In this regard, the impacts of the two build alternatives would be the same.

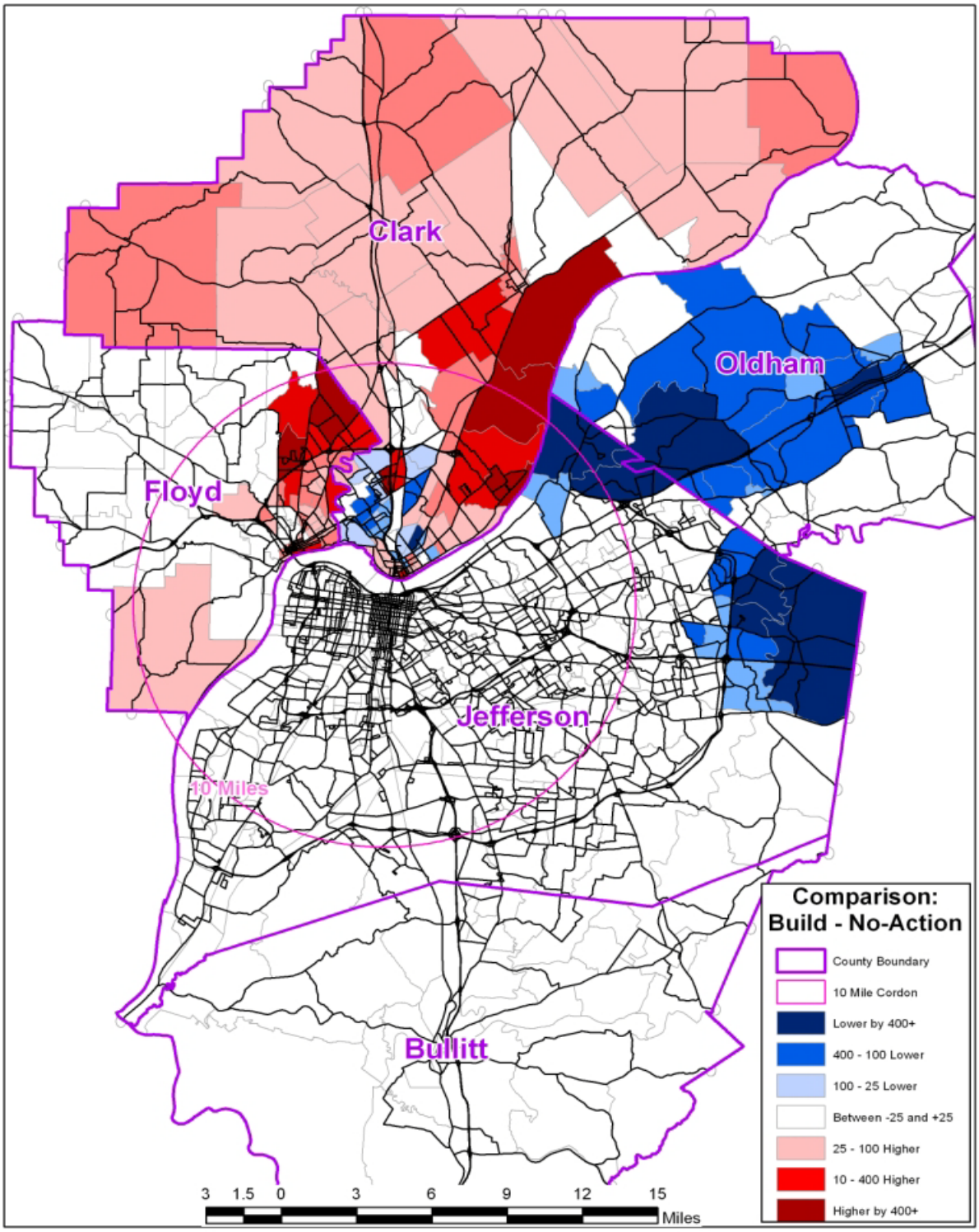
Three sets of regional employment and household forecasts in 2030 were developed for the five-county LMPA. The first set, which focuses on the portion of the five-county LMPA within 10 miles of downtown Louisville, is presented in Table 5.1-1. The second set focuses on the portion of the five-county LMPA located beyond 10 miles of downtown Louisville, and is presented in Table 5.1-2. The final set, which focuses on the entire five-county LMPA, is presented in Table 5.1-3. In addition, tables 5.1-4 and 5.1-5 show the differences in household and employment growth, respectively, between the portion of the five-county region that is within 10 miles of downtown Louisville and the portion that is beyond 10 miles of downtown Louisville. Finally, tables 5.1-6 and 5.1-7 show the differences in household forecasts for 2025 (as presented in the FEIS) vs. 2030 (as used in this SDEIS) for the two portions within 10 miles of downtown Louisville and beyond 10 miles of downtown Louisville, respectively.

FIGURE 5.1-1
COMPARISON OF 2030 HOUSEHOLD FORECASTS BUILD VS NO-ACTION



Source: *Community Transportation Solutions, 2011*

FIGURE 5.1-2
COMPARISON OF 2030 EMPLOYMENT FORECASTS BUILD VS NO ACTION



Source: *Community Transportation Solutions, 2011*

In the FEIS the build alternatives were forecasted to have greater population and employment growth within a 10-mile radius of the downtown area than would the No-Action Alternative. For this SDEIS, the FEIS Selected Alternative and the Modified Selected Alternative, which include the construction of the Downtown Bridge and the East End Bridge, were also forecasted in 2030 to have greater population and employment growth within a 10-mile radius of the downtown area than would the No-Action Alternative. In addition, the these two alternatives are also forecasted in 2030 to result in less population and employment growth in the portion of the region beyond the 10-mile radius of downtown Louisville in comparison to the No-Action Alternative. The forecasted population and employment figures show that more of the region's overall growth would shift slightly beyond downtown Louisville as a result of the construction of the proposed project and the anticipated residential and commercial growth associated with the project. However, as indicated in Tables 5.1-4 though 5.1-5, the percentage change is minor (i.e., approximately 1% difference).

TABLE 5.1-1
DIFFERENCES IN JOBS AND HOUSEHOLDS—PORTION OF THE FIVE-COUNTY REGION WITHIN 10 MILES OF DOWNTOWN LOUISVILLE

Alternative	2009		2030 Forecast		Change from No-Action	
	Households	Total Employment	Households	Total Employment	Households	Total Employment
No-Action	276,596	437,573	290,931	572,281		
Build	NA	NA	292,485	578,482	1,554	6,201

Source: *Community Transportation Solutions, 2011.*

TABLE 5.1-2
DIFFERENCES IN JOBS AND HOUSEHOLDS—PORTION OF THE FIVE-COUNTY REGION BEYOND 10 MILES OF DOWNTOWN LOUISVILLE

Alternative	2009		2030		Change from No-Action	
	Households	Total Employment	Households	Total Employment	Households	Total Employment
No-Action	149,183	147,043	211,411	231,563		
Build	NA	NA	209,857	225,362	(1,554)	(6,201)

Source: *Community Transportation Solutions, 2011.*

TABLE 5.1-3
DIFFERENCES IN JOBS AND HOUSEHOLDS
TOTAL FIVE-COUNTY REGION

Alternative	2009		2030		Change from No-Action	
	Households	Total Employment	Households	Total Employment	Households	Total Employment
No-Action	425,779	584,616	502,342	803,844		
Build	NA	NA	502,342	803,844	0	0

Source: *Community Transportation Solutions, 2011.*

TABLE 5.1-4
DIFFERENCES IN HOUSEHOLDS—PORTION OF THE FIVE-COUNTY REGION LESS THAN 10 MILES & GREATER THAN 10 MILES OF DOWNTOWN LOUISVILLE

Alternative	Less than 10 Miles			Greater Than 10 Miles		
	2009 Households	2030 Households	Percent Change	2009 Households	2030 Households	Percent Change
No-Action	276,596	290,931	5%	149,183	211,411	29%
Build	NA	292,485	5%	NA	209,857	29%

Source: *Community Transportation Solutions, 2011.*

TABLE 5.1-5
DIFFERENCES IN EMPLOYMENT—PORTION OF THE FIVE-COUNTY REGION LESS THAN 10 MILES & GREATER THAN 10 MILES OF DOWNTOWN LOUISVILLE

Alternative	Less than 10 Miles			Greater Than 10 Miles		
	2009 Employment	2030 Employment	Percent Change	2009 Employment	2030 Employment	Percent Change
No-Action	437,573	572,281	23%	147,043	231,563	36%
Build	NA	578,482	24%	NA	225,362	36%

Source: *Community Transportation Solutions, 2011.*

TABLE 5.1-6
DIFFERENCES IN HOUSEHOLD FORECASTS IN PORTION OF THE FIVE-COUNTY REGION WITHIN 10 MILES OF DOWNTOWN LOUISVILLE—2025 VS 2030

Alternative	Within 10 Miles			
	2025 (FEIS) Household	2030 (Modified) Household	2025 (FEIS) Employment	2030 (Modified) Employment
No-Action	312,090	290,931	680,942	572,281
Build	314,488	292,485	691,294	578,482

Source: Community Transportation Solutions, 2011.

TABLE 5.1-7
DIFFERENCES IN HOUSEHOLD FORECASTS IN PORTION OF THE FIVE-COUNTY REGION BEYOND 10 MILES OF DOWNTOWN LOUISVILLE--2025 VS 2030

Alternative	Beyond 10 Miles			
	2025 (FEIS) Household	2030 (Modified) Household	2025 (FEIS) Employment	2030 (Modified) Employment
No-Action	172,500	211,411	178,228	231,563
Build	170,098	209,857	167,872	225,362

Source: *Community Transportation Solutions, 2011.*

5.1.1 Land Use, Comprehensive Plans and Growth Impacts

Similar to the 2003 FEIS, this section evaluates the consistency of the FEIS Selected Alternative and the Modified Selected Alternative with existing land use and comprehensive development plans within the LMPA, in comparison to the No-Action Alternative. As discussed previously, both of the build alternatives for this analysis include the construction of two bridges, one in the downtown area and one in the east end.

The No-Action Alternative would not meet the goals of local comprehensive plans as well as either the FEIS Selected Alternative or the Modified Selected Alternative, because growth in the inner areas of the LMPA, such as downtown Louisville, would be somewhat lower without the project than with the project. Alternatively, a reduced amount of regional growth and land use development is projected to occur in the outlying areas of the LMPA with the build alternatives in comparison to the No-Action Alternative. Plans such as the Louisville Metropolitan Planning Organization's (MPO) *Horizon 2030 Metropolitan Transportation Plan* (MTP) and Louisville Metro's *Cornerstone 2020 Comprehensive Plan* promote redevelopment in the downtown areas, and, therefore, either of the build alternatives would be more desirable in terms of where the growth would occur. In this regard, the No-Action Alternative would not specifically support downtown revitalization efforts in Jeffersonville and Louisville or potential expansion of the Port of Indiana-Jeffersonville. Tables 5.1-1 through 5.1-7 above, demonstrate the differences in employment and household growth in the inner areas of the LMPA in comparison to the outlying areas of the LMPA.

5.1.2 Transportation Planning, Access, and Travel Pattern Impacts

Similar to the 2003 FEIS, this section evaluates the consistency of the FEIS Selected Alternative or the Modified Selected Alternative with existing transportation plans and services within the LMPA, in comparison to the No-Action Alternative. In general, the findings of the 2003 FEIS, especially as they related to the Two Bridges/Highway Alternative and the No-Action Alternative (see FEIS pages 5-12 and 5-13), are still applicable to the project alternatives as they are defined for this SDEIS.

The FEIS Selected Alternative and Modified Selected Alternative are both consistent with local transportation plans. The No-Action Alternative would not improve the transportation infrastructure or cross-river mobility and would not be consistent with regional and local transportation plans. Overall, travel times would increase with the No-Action Alternative compared to implementation of either build alternative (see the traffic reports presented in Appendix H). Delayed access to regions within the LMPA, particularly between Kentucky and Indiana across the Ohio River, would continue to increase. Although travel patterns may remain stable in the short-term, traffic may ultimately shift to secondary roads as congestion increases on the interstate system. There would, however, be no short-term construction impacts with the No-Action Alternative.

The FEIS Selected Alternative and Modified Selected Alternative would support the transportation plans for the LMPA, including the *Horizon 2030* MTP and the Louisville Metro's

Cornerstone 2020 Comprehensive Plan, and are generally consistent with those plans. The build alternatives would result in minimal impacts to the existing public transportation system and construction of either build alternative would aid public transportation. Currently the Transit Authority of River City (TARC) has express service transit routes located in the Downtown and East End corridors. There are express routes located on I-65 and I-265 in Clark County, Indiana, and I-71 and U.S. 42 in Jefferson County, Kentucky. The construction of either build alternative in the East End Corridor would include access to S.R. 42 and I-71 in Kentucky and I-65 and I-265 in Indiana. In addition, a new interchange would be constructed at Salem Road in Clark County. The construction of either build alternative in the East End Corridor would allow for potential expansion of TARC express transit routes in southeastern Clark County and northeastern Jefferson County, and potentially include transit service to the River Ridge Commerce Center and Port of Indiana-Jeffersonville.

Potential short-term impacts to access and travel patterns are expected during the construction phase of the project, including limited access to jobs and employment centers, increased travel times, and travel on detour routes.

For the Modified Selected Alternative, the introduction of tolls is anticipated to potentially shift some traffic to secondary and local roads as interstate users move to those roads to avoid tolls associated with the bridges (see Appendix H.1, *Louisville Southern Indiana Ohio River Bridges Traffic Forecast*).

5.1.3 Social Impacts

Section 5.1.3 of the 2003 FEIS evaluated the social impacts of the proposed alternatives within the LMPA, and largely continue to be applicable to the SDEIS. Potential impacts to social groups, particularly minority and low income groups, are examined in SDEIS Section 5.1.7, *Environmental Justice.*

Social impacts that may be experienced throughout the LMPA would primarily stem from changes in the distribution of populations, changes in public safety and impacts to regional community resources. On a smaller scale, social impacts that may be experienced within the vicinity corridors could include impacts to community cohesion, quality of life impacts to properties adjoining the proposed project, and impacts to local community resources.

Indicators of impacts to community cohesion and quality of life were evaluated. The indicators were examined to assess these impacts, including access to community resources, potential for changes in the community character, and the proximity of the alternatives to neighborhoods and the potential relocations within these neighborhoods.

Public safety within the LMPA would be improved through the reduction of traffic congestion and the improvement of accessibility for emergency services, both for the downtown and the east end communities. Both alternatives would also improve accessibility between communities and to regional community resources within the LMPA.

Social impacts that are specific to each of the alternatives being considered in this SDEIS are presented below.

No-Action Alternative

There would be no social impacts to communities associated with the No-Action Alternative, although emergency response times, especially across the Ohio River, would likely be greater without the additional capacity and system linkage improvements associated with either of the build alternatives.

FEIS Selected Alternative and Modified Selected Alternative

East End Corridor

The alignment of the two build alternatives would essentially be the same, passing between the city of Prospect and the Harrods Creek neighborhoods and encroaching on the outskirts of the city of Green Spring in Kentucky. In Indiana, the alternative would traverse a combination of open farmland and residential and commercial development. In the East End Corridor, the FEIS Selected Alternative and Modified Selected Alternative would potentially result in 53 residential relocations, as further described in Section 5.1.5, below. Divisive or disruptive impacts to the existing local transportation routes would be minimal. Quality of life impacts to the neighborhoods and community occur primarily from increases in noise and development pressures associated with a new link in the interstate system.

The proposed new interchange at Salem Road, as well as a proposed interchange improvement at S.R. 265 / S.R. 62 in Indiana would improve overall access to the area, thereby potentially opening up existing farmland to residential and commercial uses. However, based on the current zoning designations from the city of Jeffersonville, Clark County, Indiana, this growth has been planned and is desired by the community.

There are no anticipated relocations or access impacts to businesses or community resources in either Kentucky or Indiana associated with either build alternative in the East End Corridor.

Downtown Corridor: FEIS Selected Alternative

The Downtown Corridor is located within intensely developed business districts in Jeffersonville, Indiana, and Louisville, Kentucky. The FEIS Selected Alternative would require a total of 107 residential, commercial and not-for-profit relocations, as further described in Section 5.1.5, below. Maintenance of traffic and maintaining access to businesses during construction would require close coordination with the downtown communities.

Within the Downtown Corridor, the FEIS Selected Alternative would closely follow existing interstate routes. In Louisville, the alternative would include:

- Reconstruction of the Kennedy Interchange to the south of the existing location.
- Construction of a partial Frankfort Avenue/Ohio Street interchange on I-71.

- Reconstruction of the Mellwood/Story avenues interchange on I-64.

The alternative would impact the Butchertown and Phoenix Hill neighborhoods in Louisville and the Clarksville Riverfront and Jeffersonville Riverfront neighborhoods in Indiana. The alternative would also result in direct and/or proximity impacts to Waterfront Park and the Extreme Sports Complex in Louisville, as well as Jeffersonville City Park, the Jeffersonville Historic District, and Riverfront Park in Indiana. The direct and/or proximity impacts to Waterfront Park, the Extreme Sports Complex, Jeffersonville City Park, the Jeffersonville Historic District, and Riverfront Park are discussed in Chapter 6, *Section 4(f) Evaluation*, of this SDEIS. There is no anticipated permanent relocation or access impacts to community resources in either Kentucky or Indiana associated with construction of the FEIS Selected Alternative in the Downtown Corridor. The Wayside Mission, a men's homeless shelter on Jefferson Street in Louisville, would be displaced by this alternative, although the loss of this facility would be temporary since relocation assistance would be provided to assist in relocating the facility.

Downtown Corridor: Modified Selected Alternative

The right-of-way of the Modified Selected Alternative within the Downtown Corridor would be similar to that of the FEIS Selected Alternative. There are two notable design differences in Louisville, between the 2003 FEIS and the Modified Selected Alternative:

- The Kennedy Interchange would be reconstructed in place instead of relocated to the south.
- The partial Frankfort Avenue/Ohio Street interchange on I-71 and the reconstruction of the Mellwood/Story Avenue Interchange on I-64 would also be eliminated.

The Downtown Corridor is located within intensely developed business districts in Jeffersonville, Indiana and Louisville, Kentucky. The Downtown Corridor portion of the Modified Selected Alternative would include both residential and commercial relocations. Reconstructing the interchange in its current location would reduce the number of residential, commercial and not-for-profit relocations from 107 (80 business/non-for-profit and 27 residential) with the FEIS Selected Alternative to 41 with the Modified Selected Alternative, as described in Section 5.1.5. Maintenance of traffic and maintaining access to businesses during construction would require close coordination with downtown communities.

In addition to reducing the number of relocations, the modification of the Kennedy Interchange in place would reduce impacts to the Butchertown and Phoenix Hill neighborhoods. The impact to the Clarksville Riverfront and Jeffersonville Riverfront neighborhoods in Indiana would remain the same as with the FEIS Selected Alternative. In the Downtown Corridor, the Modified Selected Alternative would closely follow existing interstate routes, and would result in proximity and/or direct impacts to Waterfront Park and the Extreme Sports Complex in Louisville, as well as Jeffersonville City Park, the Jeffersonville Historic District, and Riverfront Park in Indiana; these impacts are discussed in Chapter 6, *Section 4(f) Evaluation*. As with the FEIS Selected Alternative, no permanent relocation or access impacts to community resources

would be anticipated in either Kentucky or Indiana associated with the Downtown Corridor portion of the Modified Selected Alternative. Also similar to the FEIS Selected Alternative, the Wayside Mission, a men's homeless shelter on Jefferson Street in Louisville, would be displaced by this alternative. The loss of this facility would be temporary since relocation assistance would be provided to assist in relocating the facility elsewhere in the city.

5.1.4 Pedestrian and Bicycle Facilities

Section 5.1.4 of the 2003 FEIS presented anticipated impacts to existing and proposed pedestrian and bicycle projects as identified in KIPDA's *1998 Comprehensive Pedestrian and Bicycle Plan* (updated 1999). This SDEIS provides an update to the discussion of potential impacts of the FEIS Selected and Modified Selected Alternatives, based on updated pedestrian and bicycle projects in Clark County, Indiana, and Jefferson County, Kentucky, as listed in the *Horizon 2030*.

As noted in the FEIS, a 17-foot-wide bicycle and pedestrian path on the upstream side of the proposed new I-65 Downtown Bridge was proposed as part of the FEIS Selected Alternative. That element is still a feature of that alternative. However, since the FEIS was approved in 2003, a separate 22-foot-wide bicycle and pedestrian path has been approved for the nearby Big Four Bridge (a former railroad bridge) as a separate project, and is currently under construction. This facility would fully provide, at minimum, similar benefits as a bicycle and pedestrian path on the new Downtown Bridge. Therefore, the bicycle and pedestrian path proposed on the Downtown Bridge has been eliminated as part of the Modified Selected Alternative.

SDEIS tables 4.4-8 and 4.4-9 (see Section 4.1) list pedestrian and bicycle projects recommended in the *Horizon 2030* MTP within the LSIORB Project area in Clark and Jefferson counties; and figures 4.1-6 through 4.1-8, in Section 4.1 show locations of the Metro bikeways projects. Table 5.1-8 below identifies which of the pedestrian and bicycle projects listed in Section 4.1 would intersect with the proposed alignments of the FEIS Selected Alternative and the Modified Selected Alternative. As noted in the table, the encroachment of the project alignments on these pedestrian and bicycle paths by the project would not result in an adverse effect because grade differences make the projects compatible.

TABLE 5.1-8
RECOMMENDED PEDESTRIAN AND BICYCLE PROJECTS WITHIN THE PROPOSED LSIORB PROJECT CORRIDOR

Location	Corridor	Project Description	Potential Impacts of Build Alternatives
INDIANA			
Riverfront Path	Downtown & East End	Construct multi-use path along Ohio River from Falls of the Ohio to Utica.	Both alternatives intersect, but grade difference makes projects compatible
River Greenway – Sponsored by Army Corps of Engineers	Downtown	Construct scenic byway facility connecting Jeffersonville, Clarksville, and New Albany, providing access to the riverfront and Falls of the Ohio – include bike and pedestrian trails.	Both alternatives intersect, but grade difference makes projects compatible

Ohio River Frontage *	Downtown & East End	Riverwalk pedestrian walk – include sidewalks and landscaping.	Both alternatives cross, but grade difference makes projects compatible.
Ohio River Greenway * City of Jeffersonville	Downtown	Construct pedestrian walkway along Restaurant Row by Ohio River.	Both alternatives cross, but grade difference makes projects compatible.
City of Clarksville * Levee Trail Extension	Downtown	Construct and pave pedestrian/bicycle trail on top of earthen levee between Francis Avenue and abandoned CSX rail corridor.	Both alternatives cross, but grade difference makes projects compatible.
KENTUCKY			
Upper River Road Trail	Downtown and East End	Construct 12' path Zorn Avenue to Hays Kennedy Pike and shared lane.	Both alternatives cross, but grade difference makes projects compatible.
Waterfront Path	Downtown	Construct 12' multi-use path Clark Memorial Bridge to Towhead Island	Both alternatives cross, but grade difference makes projects compatible.
City of Louisville Metro Loop Trail	Downtown & East End	Complete 108-mile multi-use trail for bicyclists and pedestrians that will encircle the Louisville Metropolitan Area.	Both alternatives cross, but grade difference makes projects compatible.
City of Louisville- * Metro Urban Greenway	East End	Construct a 13.7 mile connection from the Oldham County greenway to the Ohio River to promote bicycling and walking.	Both alternatives cross, but grade difference makes projects compatible.
River Road * Bicycle and Pedestrian Improvements	Downtown & East End	Construct a multi-modal corridor with a shared use path and bicycle lanes from downtown Louisville to the City of Prospect.	Both alternatives cross, but grade difference makes projects compatible.

Source: *Horizon 2030 Metropolitan* Transportation Plan (Adopted 2010)

Continuing coordination with the Louisville MPO, Louisville Metro Government, the City of Clarksville, and the City of Jeffersonville combined with design considerations would ensure that impacts to pedestrian and bicycle facilities are minimized and that the trails remain open during construction. No adverse impacts are foreseen.

5.1.5 Relocation

Section 5.1.5 of the 2003 FEIS provided a general description of relocation impacts associated with the build alternatives. This section of the SDEIS updates the type and total number of relocations for the FEIS Selected Alternative and the Modified Selected Alternative. The right-of-way acquisition process initiated for the FEIS Selected Alternative currently totals 35 residential relocations in Kentucky and 10 residential relocations in Indiana, all related to the East End Corridor. In addition, two active businesses in Kentucky have already been relocated in the Downtown Corridor. All of these relocations would have been acquired for either alternative. Table 5.1-9 displays the type and total number of relocations required for both alternatives, including the businesses already relocated. Following the table, further details for each alternative and corridor are presented.

TABLE 5.1-9
POTENTIAL RELOCATIONS BY ALTERNATIVE

		Type of Relocation		
Alternative	**Total Relocations**	**Businesses/ Not-for-Profit Facilities**	**Residential Units Owner/Tenant**	**Agricultural Properties**
FEIS Selected Alternative				
East End Corridor	53	0 / 0	48 / 5	18
Downtown Corridor	107	79 / 1	17 / 10	0
Total	160	79 / 1	65 / 15	18
Modified Selected Alternative				
East End Corridor	53	0 / 0	48 / 5	18
Downtown Corridor	41	23 / 1	7 / 10	0
Total	94	23 / 1	55 / 15	18
No-Action	0	0 / 0	0 / 0	0

Source: *Community Transportation Solutions, 2011.*

No-Action Alternative

There would be no relocations required as a result of the No-Action Alternative.

FEIS Selected Alternative

Downtown Corridor

In the Downtown Corridor, approximately 27 residences, 79 businesses and one not-for-profit facility (Wayside Mission, a shelter for homeless men) would be relocated. Of the 27 residences to be relocated, it is estimated that 17 are owner occupied and 10 are rented. The estimated values of the residences range from $18,000 to $250,000 and the structures are in fair to good condition. It is estimated that, based on the available housing market in the LMPA and the financial capabilities of the displaced residents, Last Resort Housing funds may be necessary to assist with the relocation of 15 households. A displaced person cannot be required to move from his or her dwelling unless at least one comparable replacement dwelling is made available that is within their financial means. When such comparable replacement dwelling is not available, additional measures may be taken to provide for last resort housing for eligible displaced persons. The Last Resort Housing Program allows utilization of project funds to construct or otherwise provide housing. No eligible person will be required to move from the right of way acquired until comparable decent, safe and sanitary housing is available for immediate occupancy. These procedures will be implemented when normal Relocation Assistance Payment limits are inadequate to affect a solution to the housing needs of eligible displaced persons. All of the established businesses are rented and employment ranges from 2 employees to more than

200 employees, with an estimated total employment of approximately 550 employees. The businesses range from industrial to light commercial and retail uses.

East End Corridor

In the East End Corridor, approximately 53 residences would likely be relocated. Of the 53 residences, it is estimated 48 residences are owner occupied and 5 are rented. The values of the owner-occupied residences range from $100,000 to $2,100,000; 6 of the 53 are mobile homes that range from $5,800 to $41,000. It is estimated that, based on the available housing market in the LMPA and the financial capabilities of the displaced residents, Last Resort Housing funds may be necessary to assist with the relocation of one household.

Modified Selected Alternative

Downtown Corridor

In the Downtown Corridor, approximately 17 residences, 23 businesses, and a not-for-profit facility (Wayside Mission, a shelter for homeless men) would likely be relocated. Of the 17 residences, it is estimated 7 are owner occupied and 10 are rented. The estimated values of the residences range from $40,000 to $250,000 and the structures are in fair to good condition. It is estimated that, based on the available housing market in the LMPA and the financial capabilities of the displaced residents, Last Resort Housing funds may be necessary to assist with the relocation of 13 households.

The employment at the businesses and not-for-profit facility likely to be relocated ranges from 1 employee to more than 100 employees, with a total employment of approximately 185 employees. The businesses range from light commercial to retail use.

East End Corridor

In the East End Corridor, approximately 53 residences would likely be relocated. Of the 53 residences, it is estimated 48 residences are owner occupied and 5 are rented. The values of the residences are estimated to range from $100,000 to $2,100,000 and the structures are in fair to good condition. It is estimated that, based on the available housing market in the LMPA and the financial capabilities of the displaced residents, Last Resort Housing funds may be necessary to assist with the relocation of several households.

5.1.6 Economic Impacts

The 2003 FEIS defined economic impacts as inclusive of jobs, income, total economic output, tax base, and construction impacts. Estimates were developed for the business and employment impacts, short-term construction impacts and tax impacts. The economic impacts were evaluated for each alternative as a quantitative screening method to compare alternatives. The general background discussion of the input-output model used to estimate construction employment as presented in the FEIS is still applicable and is not repeated in this SDEIS. However, economic impacts associated with each of the two build alternatives being considered in this SDEIS are

presented in more detail below. The No-Action Alternative is included in the discussion to provide a basis for comparison with the build options.

Economic impacts were evaluated for the business and employment impacts, short-term construction impacts, and tax impacts. To determine the economic impacts, an updated input-output analysis was performed using the IMPLAN Professional 3.0 Economic Modeling program. The estimated economic impacts for the defined study area were projected by economic impact measure and type, year, and project alternatives. The IMPLAN model assumed that the total number of jobs is fixed and it did not attempt to predict whether the project would increase the total number of jobs in the region. Impacts are estimated for the FEIS Selected Alternative and the Modified Selected Alternative.

Business and employment impacts are impacts from businesses moving into and out of the area, employment impacts on the local community, estimated income and total output changes resulting from the project.

Short-term construction impacts are temporary impacts on the economy that result from construction activities. This includes capital spending on the project and resultant employment. Fiscal impacts to the local tax base are examined from two perspectives, including the taxes paid or lost to local and state governments by workers impacted by the project and the amount of taxable property potentially removed from the tax rolls due to right-of-way purchases. To determine regional economic impacts, an input-output analysis was performed. Construction cost estimates for each alternative were used to estimate direct employment. The IMPLAN model was used to determine the multiplier effects of the construction costs.

Direct impacts are associated with spending such as payroll, capital expenditures, operating and maintenance costs, taxes and fees incurred for the project.

The study area includes the five-county western-portion of the Louisville MPO, including Clark and Floyd counties in Indiana and Bullitt, Jefferson and Oldham counties in Kentucky. Impact measures presented include employment, income, value-added, output, and taxes, and the two impact types include direct and total impacts. Employment is presented in job-year terms (i.e., equivalent to one person working one full year), while the remaining monetized measures are presented in constant 2010 dollar terms. Impacts are estimated for the scheduled project time horizon, spanning the ten years from 2012 through 2022.

A copy of the updated IMPLAN Economic Impact Analysis conducted by CTS is included in Appendix B.8.1.

No-Action Alternative

The No-Action Alternative was used as the baseline scenario for economic comparison. The No-Action Alternative has no temporary increases in employment or economic output resulting from bridge construction activities. No property is required for right-of-way and there would be no

loss of property taxes. In addition, no businesses would suffer the effects of reduced visibility or access that may result from detours from construction activities.

Direct Impacts of FEIS Selected Alternative and Modified Selected Alternative

Table 5.1-10 provides an update of the capital development direct costs associated with the FEIS Selected Alternative and the Modified Selected Alternative

TABLE 5.1-10
DIRECT COST IMPACTS BY BUILD ALTERNATIVE ($MILLIONS)

Project Segment	Construction Cost	Engineering & Right-of-Way Cost	Total Cost
FEIS Selected Alternative			
Kennedy Interchange	$1,294.7	$235.3	$1,530.0
Downtown River Bridge	$541.8	$27.9	$569.7
Downtown Approach - Indiana	$324.5	$68.3	$392.7
East End Approach - Kentucky	$783.7	$101.4	$885.2
East End River Bridge	$384.0	$22.2	$406.2
East End Approach Indiana	$194.1	$40.7	$234.8
Additional Costs (non-section specific)	$0.0	$124.2	$124.2
Total	**$3,522.8**	**$620.0**	**$4,142.8**
Modified Selected Alternative			
Kennedy Interchange	$572.2	$156.0	$728.2
Downtown River Bridge	$494.4	$38.2	$532.6
Downtown Approach - Indiana	$140.7	$37.0	$177.8
East End Approach - Kentucky	$659.3	$135.4	$794.8
East End River Bridge	$296.1	$30.1	$326.2
East End Approach Indiana	$184.1	$47.6	$231.7
Additional Costs (non-section specific)	$0.0	$125.0	$125.0
Total	**$2,346.8**	**$569.3**	**$2916.2**

Note: Totals may not sum due to rounding.

***Source**: Community Transportation Solutions (2011).*

Updated forecasts of permanent employment impacts in the individual counties comprising the LMPA as a result of either build alternative were developed. The impacts are the same for both build alternatives, given their generally similar locations. The No-Action Alternative was used as the baseline scenario for comparison, and therefore, no relative economic impacts were developed for it. Table 5.1-11 presents a summary of estimated permanent employment forecasts in the year 2030.

TABLE 5.1-11
FORECASTED PERMANENT EMPLOYMENT IMPACTS
FOR THE NO-ACTION AND BUILD ALTERNATIVE (YEAR 2030)

	2030 Employment	
County	**No-Action**	**Build**
Jefferson	611,830	605,643
Bullitt	37,300	37,300
Oldham	35,457	29,657
Clark	78,688	87,478
Floyd	40,569	43,688
	Employment Differences from the No-Action - Year 2030	
Jefferson		(6,187)
Bullitt		0
Oldham		(5,800)
Clark		8,790
Floyd		3,119

Source: *Community Transportation Solutions (2011)*

As shown, construction of the LSIORB Project would result in a shift in permanent employment within the LMPA, and a decrease of 78 in total employment over the No-Action Alternative. By the year 2030, a shift of almost 12,000 employees from Kentucky into Indiana could potentially occur as a result of the project. It is anticipated that these employees would shift away from Jefferson and Oldham counties and move into Clark and Floyd counties.

Short-term Construction Impacts

Capital infrastructure expenditures on the LSIORB Project support the creation of new jobs and the retention of existing jobs, and contribute to economic activity within the impacted economy. Such infrastructure spending leads to direct construction-related jobs, and through the economic interdependencies of various industries within the study area, the bridge expenditures yield indirect jobs as well. These indirect jobs are related to the suppliers of construction materials and equipment, and related services. In turn, these direct and indirect jobs, and associated earned income, support additional jobs (induced impacts), all of which combine to generate a boost to the regional economy.

Construction activities would provide a temporary boost to the local economy. This would come in the form of increased employment and income from the capital spending. Over the course of the 10-year project, it was assumed that the first three years would be devoted to the planning and engineering, with the last seven years devoted to the actual construction activities. The economic impacts of capital spending are significant, as summarized in Table 5.1-12, below.

TABLE 5.1-12
CONSTRUCTION IMPACTS BY ALTERNATIVE (IN $MILLIONS) 2012 – 2022

Alternative	10-Year Cumulative Total Income	Average Annual Jobs
FEIS Selected Alternative	$1,875	3,850
Modified Selected Alternative	$1,353	2,760

***Source**: IMPLAN modeling*

Although both build alternatives would result in a substantial number of construction-related jobs, it is estimated that there would be 1,090 fewer construction-related jobs with the Modified Selected Alternative, due to the reduced construction footprint and associated cost of that alternative in comparison to the FEIS Selected Alternative. In addition, the cumulative total income over the 10-year project is estimated to be approximately $522,000 less with the Modified Selected Alternative, because it is less costly to construct.

Fiscal Impacts

The IMPLAN model estimated a number of tax categories resulting from economic activity. At the most general level, Federal, state, and local tax impacts were estimated. The tax impacts consider indirect business taxes, including personal taxes (income tax, fines, fees, motor vehicle license, and property tax), corporate profits tax and social security taxes. Included within these categories are property taxes, sales taxes, motor vehicle licenses, severance taxes, excise taxes, and others.

Table 5.1-13 presents an updated summary of tax impacts for the FEIS Selected Alternative and the Modified Selected Alternative. The total taxes are incorporative of both Federal, state and local taxes and for the Modified Selected Alternative; tolls are not included in this data. The economic impacts of actual expenditures pertain to the proposed bridges and not specific toll-related revenues/costs for the Modified Selected Alternative. The model has a general category that includes non-specifically defined taxes, some of which could theoretically include those pertaining to tolling. However, it would be marginal and could be discounted as such. Both alternatives are forecast to generate substantial increases in total revenues within the LMPA during the course of the 10-year project, with the FEIS Selected Alternative generating approximately $537 million in total taxes and the Modified Selected Alternative generating approximately $387 million in total taxes.

TABLE 5.1-13
10-YEAR TOTAL TAX IMPACTS BY ALTERNATIVE (IN $ MILLIONS) 2012 – 2022

Alternative	Federal	State/Local	Total
FEIS Selected Alternative	$344	$193	$537
Modified Selected Alternative	$248	$139	$387

***Source**: IMPLAN model application*

Generally, the economic impacts for the Modified Selected Alternative are between 71% and just over 73% of the economic impacts estimated for the FEIS Selected Alternative, depending on the impact measure and type considered. Both the FEIS Selected Alternative and the Modified Selected Alternative exhibit relatively similar spending patterns across time and expenditure categories. Results of the IMPLAN analysis are presented in Appendix B.8.1.

Commercial Relocations

Temporary economic impacts resulting from the build alternatives include the relocation of a number of businesses. For the FEIS Selected Alternative, there would be 79 identified commercial relocations in the Downtown Corridor and 5 commercial relocations in the East End Corridor. For the Modified Selected Alternative there would be 25 identified commercial relocations in the Downtown Corridor and 5 identified commercial relocations in the East End Corridor (see Section 5.1.5). The Downtown Corridor falls within the Central Business Districts of both Louisville and Jeffersonville, and has the highest impact to existing business and employment. However, there are available replacement commercial and industrial properties within close proximity for both the Downtown and East End corridors, and it is assumed that relocations can be successfully completed with no loss of employment.

Economic Impact Summary

The No-Action Alternative has no relative economic impacts for evaluation. The No-Action Alternative has no temporary increases in employment or economic output resulting from bridge construction activities. No property is required for right-of-way and there would be no loss of property taxes. In addition, no businesses would suffer the effects of reduced visibility or access that would result from detours from construction activities.

For the 2003 FEIS, a summary of economic impacts was prepared to evaluate impacts and to use as a factor in alternative comparison and selection. For the SDEIS, the economic impacts were updated to help quantify the impacts as a result of the build alternatives for the project. A comparison of the economic impacts from the FEIS Selected Alternative and the Modified Selected Alternative are presented below.

FEIS Selected Alternative

Direct Cost Impacts ($ millions – 2010 dollars):

Construction Costs	$ 3,523
Engineering and ROW Costs	$ 620
Total	$ 4,143

Relative Employment Impacts – Year 2030 Build vs. No-Action

Jefferson County	(6,187)
Bullitt County	0
Oldham County	(5,800)
Clark County	8,790
Floyd County	3,119

Total Construction Impacts (in $ millions – 2012-2022)

10-Year Total Impact	$ 1,875
Average Annual Jobs	3,850

Total 10- Year Tax Impacts (in $ millions – 2012-2022)

Federal	$ 344
State/Local	$ 193
Total	$ 537

Modified Selected Alternative

Direct Cost Impacts ($ millions – 2010 dollars)

Construction Costs	$ 2,347
Engineering and ROW Costs	$ 569
Total	$ 2,916

Relative Employment Impacts – Year 2030 Build vs. No-Action

Jefferson County	(6,187)
Bullitt County	0
Oldham County	(5,800)
Clark County	8,790
Floyd County	3,119

Total Construction Impacts (in $ millions – 2012-2022)

10-Year Total Impact	$ 1,353
Average Annual Jobs	2,760

Total 10- Year Tax Impacts (in $ millions – 2012-2022)

Federal	$ 248
State/Local	$ 139
Total	$ 387

5.1.7 Environmental Justice

The introduction to Section 5.1.7 of the 2003 FEIS described the fundamental concepts and definitions of environmental justice. It also described how the project was evaluated to determine any environmental justice impacts, as outlined in Executive Order 12898, FHWA Directive 6640.23, and USDOT Order 5610.2. This introductory information remains valid and is not repeated in detail in this SDEIS. See Section 5.1.7, pages 5-39 and 5-40 of the 2003 FEIS, for more information. In addition, details of FHWA guidance in terms of defining minority populations, low-income households, low-income populations, etc., as presented in Section 5.1.7.1 of the 2003 FEIS, are still applicable. However, a few of the most basic concepts and definitions of environmental justice are briefly summarized below for ease of understanding.

There are three fundamental environmental justice principles identified by FHWA for transportation projects:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The purpose of the environmental justice assessment is to identify the presence of potentially disproportionate human health or environmental effects on the minority and low-income populations within the LMPA.

- *Minority*—A minority population is classified as any readily identifiable group of minority persons, living in geographic proximity, or, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans), who would be similarly affected by a proposed FHWA program, policy, or activity. A minority individual is classified as belonging to one of the following groups: American Indian or Alaskan Native; Asian American; Black; and Hispanic.
- *Low Income*—A low-income population is classified as any readily identifiable group of low-income persons, living in geographic proximity, or, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans), who would be similarly affected by a proposed FHWA program, policy, or activity. The U.S. Department of Health and Human Services (HHS) characterizes a low-income household as being a household with an income level below the 2000 HHS poverty guidelines.

The tasks undertaken for 2003 FEIS included identification of environmental justice communities in the LMPA and an evaluation of impacts to these identified communities. Detailed analysis was conducted using 1990 U.S. Census data to determine the geographic locations of low-income and minority populations. In the 2003 FEIS it was determined that the FEIS Selected Alternative would not result in disproportionately high or adverse impacts to environmental justice communities.

To update the information presented in the 2003 document, an analysis of impacts to environmental justice populations has been conducted for the SDEIS. The basic methodology used for the SDEIS environmental justice update evaluation includes the following steps:

- Identify any changes in the environmental justice populations within the LMPA since the 2003 FEIS.
- Identify any changes in direct impacts (e.g., physical impacts) of the build alternatives on environmental justice populations since the 2003 FEIS.
- Identify any traffic diversion effects of tolling on environmental justice populations.

- Identify any economic effects of tolling on environmental justice populations, by analyzing the effects of the alternatives on the average cost per trip in the region and on the Ohio River bridges.
- In following the above methodology, the SDEIS focuses on differences in environmental justice impacts between the FEIS Selected Alternative and the Modified Selected Alternative. Potentially, either alternative could result in a direct impact on environmental justice populations, so both alternatives are investigated in this regard. In addition, the Modified Selected Alternative is specifically evaluated in terms of impacts that could result from tolling and resulting changes in traffic patterns. The changes in travel patterns include potential shifts in traffic carrying environmental justice populations from tolled bridges to non-tolled bridges as well as potential increases in traffic through environmental justice neighborhoods. The Modified Selected Alternative includes tolls on both the downtown I-65 crossings (Kennedy Bridge and new Downtown Bridge) and the East End Bridge.

Substantive changes to the information presented in the FEIS that have been incorporated into the SDEIS include the following:

- The SDEIS uses year 2000 U.S. Census data for the environmental justice analysis rather than the 1990 U.S. Census data used in the FEIS.
- The SDEIS discusses the results of a survey of residents in Jefferson County, Kentucky and Floyd and Clark counties in Indiana, including minority and low-income individuals, regarding current cross-river travel and use of the existing Ohio River bridges.
- The SDEIS evaluates economic impacts of tolling by analyzing the "average cost per trip" for the region and for each river crossing under the No Action Alternative and each build alternative. The average cost per trip includes not only tolls, but also vehicle operating costs and travel time.

Details of the above-stated steps and the types of analyses evaluated for the SDEIS are presented on the following pages. It should be noted that the specific organizational structure of Section 5.1.7 in the 2003 FEIS is not being used in this update, so as to better reflect the analysis that was used for this updated evaluation.

Identification of Updated Environmental Justice Populations in the LMPA

As noted above, the first step in the environmental justice update includes identifying and reevaluating the geographic distribution of environmental justice communities that have changed since the 2003 FEIS. In the FEIS, nine areas within the alternative corridors were identified as areas with potential environmental justice concerns (i.e. environmental justice populations that could be impacted by one of the alternatives). Six of these areas were associated with the alternative alignments that have since been eliminated from detailed analysis: i.e., C-2, C-3, B-1, A-16, and A-2. The other three areas are associated with the Alternative C-1 alignment in the Downtown Corridor and, therefore, are still relevant, since that alignment is a component of both the FEIS Selected Alternative and the Modified Selected Alternative. These three areas are:

- Downtown Louisville and Kennedy Interchange areas
- North of the Ohio River, south of 6th Street
- North of the Ohio River, north of 6th Street

During the environmental justice analysis conducted for this SDEIS, additional communities were identified as follows:

- Downtown Corridor: 1) northwest New Albany in Floyd County, Indiana, near the I-265/I-64 interchange; and 2) northwest of Clarksville, Clark County, Indiana.
- East End Corridor: 1) northeast Jeffersonville, Clark County, Indiana, near the I-265/SR 62 interchange; and 2) northeast of the Oak Park Area, Clark County, Indiana, along Middle Road.

These four additional areas are located outside the SDEIS footprint, but are within the overall SDEIS study area. These areas have been identified as part of an analysis of potential differences in traffic patterns due to proposed tolling of the bridges associated with the Modified Selected Alternative. The entire SDEIS study area was analyzed to identify areas that would experience notable differences in travel patterns, and those areas were then analyzed to identify environmental justice populations that could experience an impact from the differences in travel patterns.

In the 2003 FEIS, 1990 U.S. Census data was used to identify minority and low-income populations, as complete 2000 U.S. Census data was not available at the time. For this SDEIS, the year 2000 U.S. Census data was used to identify the presence of environmental justice populations, since complete 2010 U.S. Census data is not yet available. The analysis of racial and income characteristics was based on identification of areas with minority or low-income populations using the Census data, and then using that data to determine whether or not those areas meet the minority or low-income thresholds for defining environmental justice populations.

Identification of Minority or Low-Income Populations

Data from the 2000 Census was collected for each block group in the LMPA. Race data was available from the 2010 Census, but income data was not. For consistency in evaluation, the 2000 U.S. Census data was used for both race and income thresholds. This included: (1) the total population, (2) the total minority population and (3) the total population living below the poverty level. From this raw data, the percentage of persons classified as a minority and the percentage of persons below the poverty level were calculated.

Determination of Meeting the Minority or Low-income Threshold

Subsequent to the classification of baseline minority and low-income populations, specific block groups (or single blocks, in the case of minorities, within the build alternative) were identified that met the following threshold criteria used in the 2003 FEIS for classification as an environmental justice population:

1. The minority or low-income population equals or exceeds 50% of the population in that block group.

2. The percentage of minority or low-income population is at least 10 percentage points higher than the minority or low-income population percentage for the LMPA.
3. The percentage of minority or low-income population is at least 10 percentage points higher than the minority or low-income population percentage for the county in which the block group is located.
4. Block groups meeting any of the above criteria for low-income classification.
5. Blocks meeting any of the above criteria for minority classification and inside block groups that meet any of the above criteria for minority classification. Because the income status of individual blocks was not reported and could not be established, all blocks in low-income block groups were treated as environmental justice areas. For this reason, it was unnecessary to analyze minority blocks individually within a block group for identification purposes, if the block group qualified as an environmental justice area based on income.

The above criteria were specifically utilized in order to be consistent with the procedure used in the FEIS. Figure 5.1-3 identifies the current environmental justice block groups in the project study area by minority, poverty, and both minority and poverty designations. This graphic depicts those areas that meet the threshold as an environmental justice area, either due to low-income population, minority population or both.

Environmental Justice Populations

As depicted on Figure 5.1-3 and based on the criteria described above using the 2000 U.S. Census data, only the Downtown Corridor has been identified as containing environmental justice populations in close proximity to the alignment alternatives. These populations are located south of 6th Street in Jeffersonville, as well as in Louisville, mostly to the west of I-65, but also an area to the east of I-65. There is also a sizeable concentration of environmental justice populations in New Albany. This area was evaluated for the presence of environmental justice populations due to the potential for changes in travel patterns through that community resulting from the implementation of tolls with the Modified Selected Alternative. Jefferson County, Kentucky, has the largest concentration of low-income and minority populations in the study area, with the majority concentrated on the west side of Louisville. There are no new environmental justice areas adjacent to the proposed Downtown Corridor of either build alternative that were not previously identified during the 2003 FEIS analysis.

There also had been no environmental justice populations identified in the immediate vicinity of the East End Corridor during the 2003 FEIS. The updated analysis for the SDEIS also did not identify any new environmental justice areas in the immediate vicinity of the East End Corridor.

Assessment of Potential Direct Effects on Environmental Justice Populations

The FEIS Selected Alternative and Modified Selected Alternative were both evaluated for potential disproportionate impacts to the identified environmental justice populations (see Figure 5.1.7-1). As noted above, the 2000 U.S. Census data revealed that the majority of the previously

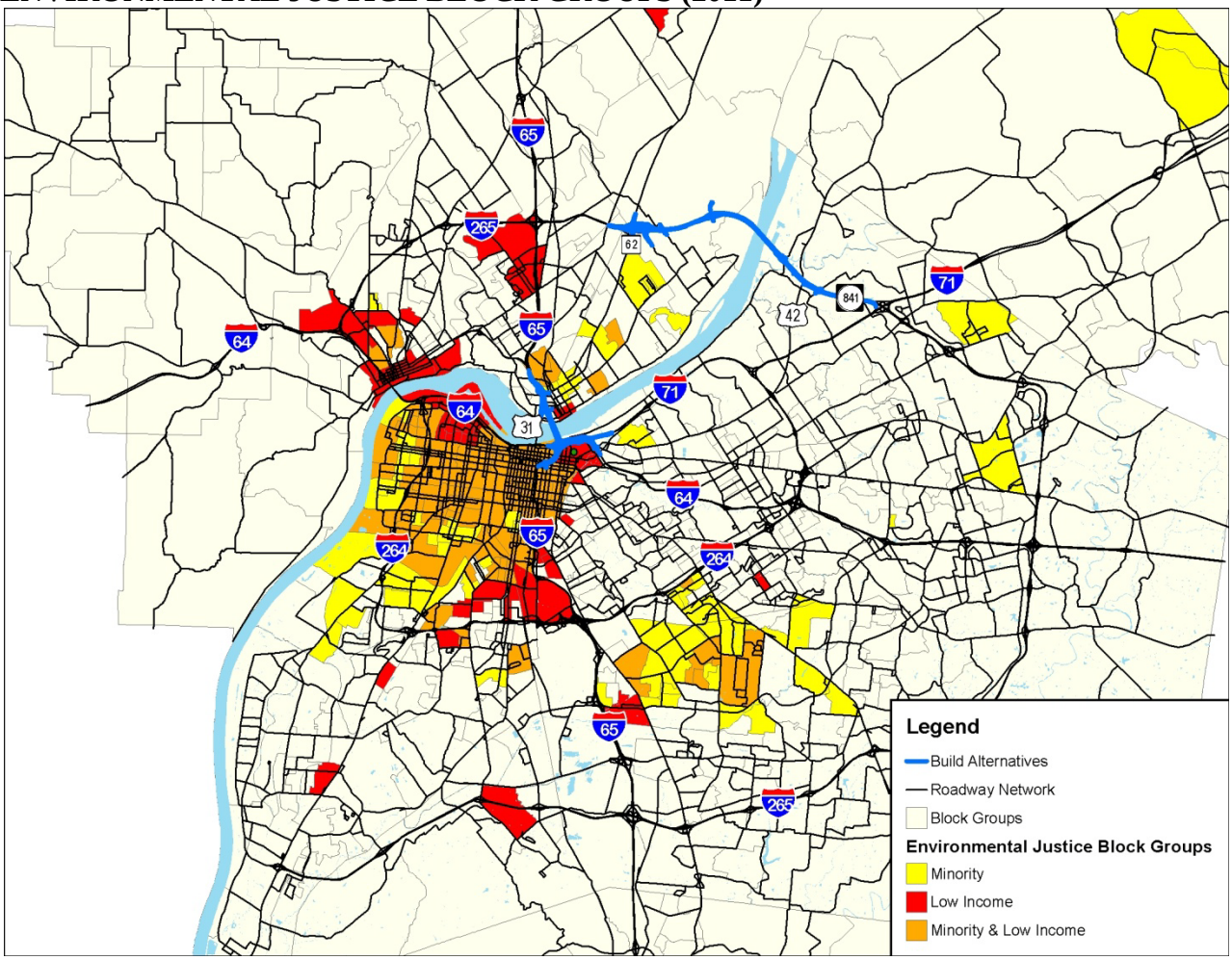
identified environmental justice populations are present primarily on the west side of downtown Louisville, and in and adjacent to New Albany and Jeffersonville.

In Design Section 1 of the project, which is the Kennedy Interchange in Louisville, the area around the project meets the threshold criteria for environmental justice populations. In that particular area, a total of 16 relocations would be required for either the FEIS Selected Alternative or the Modified Selected Alternative, with three located to the west of I-65 and 13 to the east. However, none of those relocations are residences; they are all businesses, and none of them are businesses that directly serve environmental justice populations or other local residents (e.g., food stores, gas stations, etc.). The one exception is the relocation of the Wayside Mission, which is a men's homeless shelter, but that can be relocated in the general vicinity. Therefore, although there are highway improvements proposed to occur within the environmental justice area, none would have any direct impact on environmental justice populations or their overall quality of life. Similarly, the neighborhood would not be impacted due to neighborhood disruption.

In Design Section 3 of the project, which is the Jeffersonville approach to the Downtown Bridge, the area where relocations would occur as a result of either the FEIS Selected Alternative or the Modified Selected Alternative is not an area that meets the threshold criteria for environmental justice populations. Therefore, none of the nine businesses or 17 residences that are proposed to be relocated would be direct environmental justice impacts.

In the 2003 FEIS, it was determined that the Selected Alternative would not result in disproportionately high and adverse long-term or short-term impacts to any environmental justice populations. Based on the foregoing information, that conclusion remains valid for both the FEIS Selected Alternative and the Modified Selected Alternative in terms of direct impacts.

FIGURE 5.1-3
ENVIRONMENTAL JUSTICE BLOCK GROUPS (2011)



Source: *Community Transportation Solutions (2011)*

Ohio River Bridges User Survey

The next step in this environmental justice update analysis was to assess the economic effects of tolling associated with the Modified Selected Alternative on current users of the existing Ohio River bridges, including minority and low-income users. To assist in these analyses, a survey was undertaken in October 2011, to gain a better understanding of residents' use of the Ohio River bridges, including the bridge usage patterns of environmental justice populations, as compared to non-environmental justice populations. A telephone based research survey was administered to 500 households comprised of at least 15% minority respondents and 15% low income respondents. The survey contained specific questions pertaining to patterns of usage of the bridges as well as demographic data.

This study was only designed to provide a statistically valid assessment of the usage patterns of the Ohio River bridges. The final result of this work was an eleven question survey with specific questions pertaining to usage patterns of the bridges as well as demographic data.

The following demographic data were collected from respondents:

- Eight-seven percent (87%) of respondents indicated they own or lease a vehicle. A total of 38% of those who own or lease a vehicle are considered heavy users of the bridges, meaning that they cross one or more bridges either several times per week (24%) or every weekday (14%). In addition, slightly more than a third (37%) of the population indicated that they rarely or never cross the bridges.
- Approximately 15% of the respondents indicated that they use TARC to cross the Ohio River. Comparing the travel patterns of the TARC users, versus the drivers, those who use TARC to cross the Ohio River cross more regularly than those who drive. Specifically, 53% of the TARC users cross the bridges several times a week or every weekday.
- Respondents were asked what specific bridge they normally use to cross the Ohio River. Because the I-64 Sherman Minton Bridge was closed for major repairs during the survey, the respondents were asked to answer how they would have prior to its temporary closure.[1] Furthermore, since some people do travel across multiple bridges regularly, more than one answer was allowed. The survey showed the following bridge usage:
    - I-65—57%
    - I-64—36%
    - Second Street—21%
    - Do Not Cross—3%

Bridge Usage Patterns of the Low-Income Population

Comparison of the vehicle usage statistics between the two income groups indicates that 75% of the respondents with incomes at or below the poverty level stated that they own or lease a vehicle, compared to 89% of the respondents with incomes above the poverty level. Respondents were asked how often they normally cross the Ohio River while driving their own vehicle. The following table compares the bridge usage statistics between drivers at or below the poverty level and those who are above that level and shows that travel patterns are similar for the two income groups.

	Every Day	Several Times Per Week—Not Daily	Several Times Per Month—Not Weekly	Rarely or Never
Poverty	10%	26%	21%	43%
Non Poverty	14%	24%	27%	36%

[1] The Sherman Minton Bridge on I-64 was temporarily close for major repairs on September 9, 2011. The bridge is expected to re-open in or about March 2012.

Respondents were asked how often they normally cross the Ohio River using TARC. When bridge usage is compared between those at or below the poverty level who use TARC and those TARC users who are above that level, again the travel patterns were similar for the two income categories.

Thirteen percent (13%) of TARC users at or below the poverty level indicate using TARC to cross the bridges compared to 15% of the non-poverty population.

	Every Day	Several Times Per Week—Not Daily	Several Times Per Month—Not Weekly	Rarely or Never
Poverty	10%	20%	20%	43%
Non Poverty	21%	37%	19%	36%

Bridge Usage Patterns by Minority Populations

If a respondent indicated that she or he was Black, Hispanic, Asian, or American Indian or Alaska Native, then that person was included in the minority category. If a person indicated White or Other, then he or she was not included in the minority category. When considering the different race groups, 71% of the minority respondents indicated that they owned or leased a vehicle compared with 89% of the non-minority respondents. When comparing the bridge usage behavior of the minority respondents to the non-minority respondents, there are statistically significant differences ($p<.05$) in the patterns.

Respondents were asked how often they normally cross the Ohio River while driving their own vehicle. When comparing the various usage frequencies between the portion of the population in the minority category and those who are not, there are statistically significant differences for all usage frequencies. In this case, the minority group members are crossing the bridge more frequently than those not in the minority category.

	Every Day	Several Times Per Week—Not Daily	Several Times Per Month—Not Weekly	Rarely or Never
Minority	21%	36%	15%	28%
Non Minority	13%	22%	27%	38%

The areas from which the high-frequency minority travelers originate were identified by looking at the county where the frequent travelers reside. Frequent travelers are defined as those who cross the bridge several times a week or every weekday. Based on the following table, the majority of the minority high-usage population (70%) resides in Jefferson County.

County	Non Minority	Minority
Bullitt	6%	3%
Jefferson	41%	70%
Oldham	6%	3%
Clark	23%	17%
Floyd	25%	7%

Comparing the two race categories, there is a consistent pattern where the minority respondents indicate higher bridge usage regardless of income level.

		Non Minority	Minority
Every Weekday	Poverty	8%	22%
	Above	13%	21%
Several Times Per Week Not Daily	Poverty	22%	44%
	Above	22%	34%
Several Times Per Month Not Weekly	Poverty	20%	22%
	Above	28%	14%
Rarely or Never	Poverty	49%	11%
	Above	36%	32%

Respondents were asked how often they normally cross the Ohio River using TARC.

	Every Day	Several Times Per Week—Not Daily	Several Times Per Month—Not Weekly	Rarely or Never
EJ Race	32%	53%	11%	5%
Non EJ Race	15%	28%	22%	35%

The usage patterns of minority respondents who use TARC to cross the bridge are statistically different than the patterns of non minority respondents who also use TARC to cross the bridge. In this case as well, the minority respondents cross the bridge more frequently.

Monetary Tolling Impacts on Environmental Justice Populations

Making a determination of whether or not there are disproportionate and adverse monetary impacts on environmental justice populations due to the introduction of a tolling structure on the bridges across the Ohio River must take into account both the actual cost of the tolls, as well as vehicle user costs. The latter costs include vehicle operating costs and the cost of time spent in traffic. It is important to note that the existence of an impact does not necessarily mean that the impact is "disproportionately high and adverse."

Tolling Impacts

As indicated in the survey described above, 36% of low-income populations and 57% of minority populations cross the Ohio River by car every day or several times per week. Under the No-Action Alternative, these users will be increasingly affected by congestion on all river crossings, which will extend travel times, and gradually make cross-river travel a less viable option for commuting to work. The FEIS Selected Alternative would provide improved mobility without a toll, but (as discussed in Chapter 3) the FEIS Selected Alternative is not financially feasible and thus cannot be implemented. The Modified Selected Alternative provides improved mobility, but includes a toll, which is necessary to fund the project. The cost of the toll would present an economic burden for all travelers who choose to use the tolled bridges.

Whether a tolled facility would have a disproportionate impact on environmental justice populations is determined by the net economic effects of the tolled facility (not just the cost of the toll), when compared to the No-Action Alternative. The economic effects of the tolled facility on users can be calculated by analyzing user costs, which take into account not only tolls, but also vehicle operating costs and the cost of time (see "Vehicle User Costs," below).

The annual cost of tolls based on weekday commutes was calculated to gain an understanding of the potential economic impacts on the low-income community, in particular. The percent of annual income that would be used for tolls was calculated for both low-income and median-income populations. The calculations were computed using a $3.00 per day toll fare.[2] , multiplied by 5 days a week, for 12 months per year. In this manner, it was calculated that the monthly cost for tolls would be $60.00 per month and approximately $720.00 annually. This would equate to approximately 9% of a low-income person's annual income, based on an average annual income of $8,794 for the 2000 HHS poverty threshold and $8,959 from the 2000 Census. Compared to the 2000 median income threshold of $41,994, the toll costs would only constitute approximately 2% of the annual median income. The calculations demonstrate that in general, low-income populations actually using the bridges would have 7% more of their annual income used for tolls than non low-income populations using the bridges.

As a point of comparison, public transit fares are similar in magnitude to the cost of tolls. Based on information obtained from TARC, which provides public transportation to the greater LMPA, a one-way bus fare for cross-river travel costs $2.50, equaling $5.00 per day round trip. Monthly, this would cost the rider $100.00. TARC also offers a monthly bus pass that includes the cross-river express route, for a discounted cost of $80.00, saving the commuter $20.00 per month. Using the discounted monthly cost and assuming use of the cross-river transit system for 5 days a week and 12 months a year, the total annual cost of $960.00 exceeds the anticipated annual cost of $720.00 for paying tolls associated with the Modified Selected Alternative. On a daily basis, the $5.00 per day round trip cost of using the cross-river express bus exceeds the $3.00 per day toll fare (e.g., assumes $1.50 each direction).

Vehicle User Costs

The analysis of vehicle user costs relates to all travel costs for all populations, including both minorities and low income populations, who may respond to the implementation of tolls as part of the Modified Selected Alternative by rerouting cross-river trips in order to avoid tolls. Vehicle user costs for passenger cars on a tolled facility contain three elements—the cost to operate the vehicle, the cost of the time spent in the vehicle, and cost of tolls. For this analysis, these costs were calculated as follows:

- Total vehicle operating costs were calculated by taking the total miles traveled by passenger cars during the course of the day (calculated by the travel demand model) and multiplying that total by the average vehicle operating costs. Vehicle operating costs are discussed in the LSIORB Time-of-Day Travel Demand Model Phase 1 (September 2011)

[2] Assumes toll of $1.50 each way and $3.00 total for entire trip to cross over the Ohio River and return.

and Phase 2 (October 2011) reports. The Time-of-Day Travel Demand Model Phase 1 and Phase 2 reports are provided in Appendix B.8.

- Total cost of time spent in a passenger car was calculated by taking the total number of hours that passenger cars are traveling on the network (taken from the travel demand model) and multiplying that total by an average value of time. Value of time is discussed in the LSIORB Time-of-Day Travel Demand models in Appendix B.8.
- Toll costs were calculated by taking the number of passenger cars using the toll facilities in a day (taken from the travel demand model) and multiplying by the actual toll rates for passenger cars.

To define user costs for each of the bridges, 2030 travel costs were estimated in 2010 dollars. The original total cost is a function of the operating cost, time and toll rate. The evaluation of the operating cost, time and toll for the No-Action, FEIS Selected, and Modified Selected Alternatives is shown in Table 5.1-14. Of the three alternatives being evaluated, only the Modified Selected Alternative assumes the implementation of tolls.

TABLE 5.1-14
2030 VEHICLE OPERATING COSTS – TIME - TOLLS (2010 DOLLARS)

2030 Travel Costs Per Day (2010 dollars) Vehicle Operating Cost + Time + Tolls										
		Cost			Percentage of Respective Cost Type Totals			Percentage of Overall Combined Cost		
		No Action Alt.	FEIS Selected Alt.	Modified Selected Alt. (with Tolls)	No Action Alt.	FEIS Selected Alt.	Modified Selected Alt. (with Tolls)	No Action Alt.	FEIS Selected Alt.	Modified Selected Alt. (with Tolls)
Operating Costs	Region	6,800,000	6,730,000	6,780,000	78%	77%	77%	28%	28%	28%
	Bridge	*1,910,000*	*2,060,000*	*2,010,000*	22%	23%	23%	8%	9%	8%
	Total	**8,710,000**	**8,790,000**	**8,790,000**	**100%**	**100%**	**100%**			
Cost of Time	Region	12,930,000	12,140,000	12,260,000	83%	81%	82%	53%	51%	51%
	Bridge	*2,650,000*	*2,800,000*	*2,650,000*	17%	19%	18%	11%	12%	11%
	Total	**15,580,000**	**14,940,000**	**14,910,000**	**100%**	**100%**	**100%**			
Toll	*Bridge*	*0*	*0*	*310,000*				0%	0%	1%
Subtotal	Region	19,730,000	18,870,000	19,040,000	81%	80%	79%			
	Bridge	*4,560,000*	*4,860,000*	*4,970,000*	19%	20%	21%			
	Total	**24,290,000**	**23,730,000**	**24,010,000**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

***Source**: Community Transportation Solutions (2011).*

With the implementation of tolling related to the Modified Selected Alternative, the cost of time [3] is lower regionally than with the No-Action Alternative, even though the total cross-river traffic would be higher than under No-Action. In general, travel across the bridges comprises a substantial amount of the total regional travel (20%), which could be expected given the bridges' importance to the regional economy and the fact that trips on Interstates are likely longer than those on arterials.

With the Modified Selected Alternative, total travel costs for I-65 decrease slightly, which is likely due to less traffic and greater speeds. Total travel costs for the other existing bridges (i.e., the Sherman Minton and Clark Memorial bridges), which would continue to be non-tolled, would increase, likely due to more traffic and lower speeds. The East End Bridge costs stay about the same, in comparison to the FEIS. The East End Bridge would provide better connectivity to I-265 as a more cost-effective route to reach destinations not in the downtown areas or south along I-65. Under the No Action Alternative, traffic would be diverted to the other bridges with resulting higher travel costs. Cost of time is a substantially greater factor than operating costs ($14.9 million vs. $8.8 million). Total toll costs would comprise about $310,000 of $4,980,000 or about 6.2% of total cross-river travel costs.

A summary of aggregate user travel costs per day for the No-Action Alternative, the FEIS Selected Alternative, and the Modified Selected Alternative (which includes tolls) is shown in Table 5.1-15.

TABLE 5.1-15
2030 TRAVEL COSTS PER DAY (2010 DOLLARS)

	Vehicle Operating Cost + Time + Tolls					
	No Action	**FEIS Selected Alternative**	**Modified Selected Alternative (with Tolls)**	**No Action**	**FEIS Selected Alternative**	**Modified Selected Alternative (with Tolls)**
Regional	$19,730,000	$18,870,000	$19,040,000	81%	80%	79%
I-64 Bridge	$1,660,000	$1,360,000	$1,740,000	7%	6%	7%
US-31 Bridge	$140,000	$160,000	$280,000	1%	1%	1%
I-65 Bridge	$2.760,000	$2.270,000	$2,050,000	11%	10%	9%
East End Bridge	$0.00*	$1,070,000	$900,000	0%	4%	4%
Total	**$24,290,000**	**$23,730,000**	**$24,010,000**	100%	100%	100%

Note: Percentages do not necessarily add to 100% due to rounding.

** Under the No Action, traffic would be diverted to the other bridges with resulting higher travel costs*

***Source**: Community Transportation Solutions (2011)*

Tables 5.1-14 and 5.1-15 provide *total* user costs for all trips in the region, and for all trips using the Ohio River bridges. These totals can be affected by an increase in the total number of trips and therefore do not directly reflect the experience of individual users. To better reflect the costs borne by individual users, Table 5.1-16 provides the average cost per trip in the region and for

[3] The greater the number of hours of travel, the greater the 'cost of time' for that travel. Therefore, there is a direct correlations with vehicle hours traveled (VHT).

each Ohio River bridge under the No Action Alternative and each build alternative. The cost-per-trip was calculated by determining the total user costs, and then dividing by the number of trips.

TABLE 5.1-16
2030 AVERAGE COST PER TRIP (2010 DOLLARS)

Autos Only	No Action	FEIS Selected Alternative	Modified Selected Alternative (with Tolls)
Regional	$ 5.56	$ 5.42	$ 5.47
I-64 Bridge	$ 11.58	$ 11.02	$ 11.01
US-31 Bridge	$ 6.44	$ 6.79	$ 7.90
I-65 Bridge	$ 11.89	$ 10.44	$ 11.71
East End Bridge	$ 0.00*	$ 13.30	$ 13.92

** Under the No Action, traffic would be diverted to the other bridges with resulting higher travel costs*

***Source**: Community Transportation Solutions (2011)*

As explained above, the average cost per trip takes into account not only the out-of-pocket cost of the toll, but also the cost of time (which declines as the trip becomes faster), and the vehicle operating cost (which also declines as the trip becomes faster). When all of these factors are taken into account, it becomes apparent that the increased cost of the toll is largely offset by a reduction in other costs, so that the average cost per trip remains about the same or declines in the region as a whole, and on the I-65 and I-64 bridges. The average cost per trip would increase slightly on the U.S. 31 Clark Memorial Bridge. The increased cost per trip for the Clark Memorial Bridge is largely a result of having improved access on the Indiana approach. The improved access results in people from farther away being more likely to use this bridge. As a result, the average trip length increases, and thus average operating costs increase, for trips using the Clark Memorial Bridge.

In short, the FEIS Selected Alternative or the Modified Selected Alternative do not result in an adverse effect on average costs per trip for the region as a whole or for trips across the Ohio River bridges, when compared to the No-Action Alternative. Average costs per trip remain the same or decline for the region and for two of the three existing bridges. Average travel speeds for trips over each existing bridge also improve. While US 31 shows a higher average trip cost, the increase occurs because of average longer trip lengths. This increase is not an adverse effect for an individual user, because the 20-mile trip on modified U.S. 31 is significantly faster than their 20-mile trip on I-65 under the No-Action Alternative.

Environmental Justice Impacts due to Changes of Travel Patterns

As noted previously, and as shown in Figure 5.1-3, areas of western Louisville, Kentucky and New Albany, Indiana meet the thresholds for being considered as environmental justice communities. These areas were specifically identified on the basis of anticipated changes in travel patterns due to the imposition of tolling under the Modified Selected Alternative.

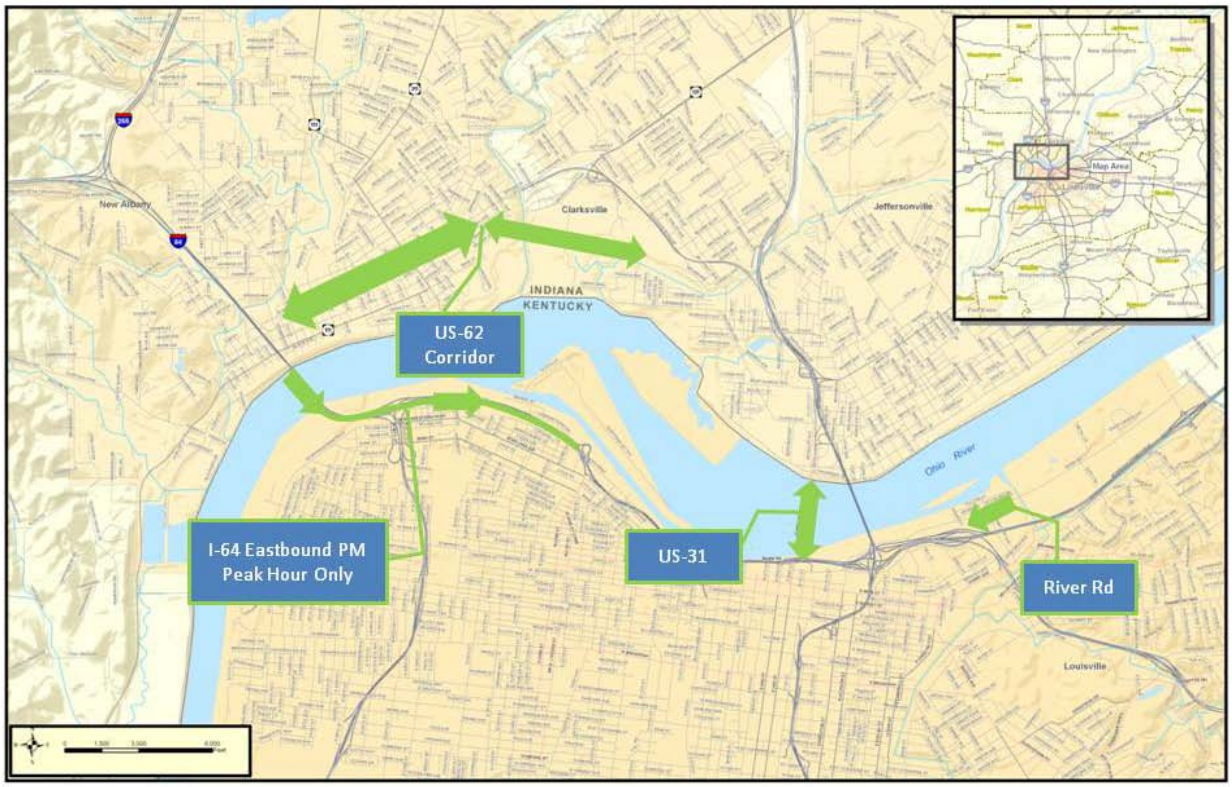
Traffic modeling was finalized in October 2011 to determine where, and to what extent, traffic patterns may be altered outside the immediate study area, shifting traffic to adjacent local roadways as a result of drivers avoiding the tolls. Altered traffic patterns could result in increased congestion and delays on non-tolled routes or heavy truck traffic in urban areas not typically traveled by these vehicles. Figure 5.1-4 shows the general areas where traffic patterns with the FEIS Selected Alternative and the Modified Selected Alternative are different. These potential differences are because of design modifications and/or the proposed tolling associated with the Modified Selected Alternative.

As shown in Figure 5.1-4, the primary routes that are likely to be utilized to accommodate the changes in travel patterns due to the bridge tolling are the S.R. 62 Corridor in Indiana, I-64 and the Sherman Minton Bridge in the eastbound direction during the PM peak hour only, U.S. 31 on the Clark Memorial Bridge and River Road in Kentucky. At least three of these routes (S.R. 62, I-64 and U.S. 31) pass through or near areas that are considered to be environmental justice communities. These include western New Albany along S.R. 62/Spring Street, along I-64 in western Louisville, and south of the Clark Memorial Bridge in downtown Louisville.

There is generally more traffic projected on the Clark Memorial Bridge and the Sherman Minton Bridge and less traffic projected on the Kennedy Bridge with the Modified Selected Alternative, in comparison to the FEIS Selected Alternative. Decreases in traffic volumes are also projected for I-65 and for I-265 between I-65 in Indiana, reflecting the shift of traffic to the Sherman Minton and Clark Memorial Bridges. There are also decreases in traffic volumes on U.S. 42 in Kentucky, including at the East End Bridge.

Changes in travel patterns can help to identify areas where the design modifications and the addition of tolls to the Modified Selected Alternative may have indirect effects on environmental justice populations caused by the changes in traffic. Based on the predicted changes in travel patterns between the FEIS Selected Alternative and the Modified Selected Alternative, no substantial new indirect effects have been identified beyond those previously identified with the 2003 FEIS Selected Alternative. Based on these results, the forecast changes in travel patterns as a result of the inclusion of tolls in the Modified Selected Alternative are not considered to be substantial enough to result in disproportionate and adverse impacts to the environmental justice areas located along the routes where travel patterns may change. The altered traffic pattern impacts are not significant enough to result in a disproportionate impact to the environmental justice communities. The traffic information that forms the basis of the analysis of changes in travel patterns that has been considered with respect to environmental justice communities is included as Appendix H.1, *Louisville-Southern Indiana Ohio River Bridges Traffic Forecast*.

FIGURE 5.1-4
CHANGES IN TRAVEL PATTERNS - FEIS SELECTED ALTERNATIVE – MODIFIED SELECTED ALTERNATIVE



Summary

As demonstrated on the preceding pages, neither the FEIS Selected Alternative nor the Modified Selected Alternative would result in any disproportionate or adverse impacts to environmental justice communities. Neither alternative would result in any displacements to residences or commercial establishments that are considered to be key components of environmental justice neighborhoods. Although both alternatives would require the relocation of the Wayside Mission, a men's homeless shelter in Louisville, it is anticipated that such establishment could be relocated elsewhere in the general vicinity to continue to serve the homeless.

The implementation of tolling with the Modified Selected Alternative would also not result in disproportionate or adverse impacts to environmental justice users of the Ohio River bridges. The user cost data presented above demonstrate that the incorporation of tolling as part of the Modified Selected Alternative would not result in an adverse effect on regional travelers or bridge users, because the cost of tolls would be offset by other user cost savings. This is true for both environmental justice users who would use either of the proposed toll bridges to cross the Ohio River, as well as for those that may choose to change their travel patterns to avoid paying the toll.

Finally, the changes in travel patterns that may cause drivers to travel through environmental justice communities in order to access a non-tolled bridge with the Modified Selected Alternative would also not result in disproportionate or adverse impacts to those communities, given the low levels of additional traffic that would occur.

5.2 Agriculture

Section 5.2 of the 2003 FEIS provided a description of project impacts to farmland. Supporting information from the Natural Resources Conservation Service (NRCS) and the U.S. Department of Agriculture (USDA) AD-1006 form, pursuant to the Farmland Protection Policy Act (FPPA) of 1981, was used to help identify potential impacts to farmland.

This section of the SDEIS updates the information presented in the FEIS in order to evaluate agricultural impacts of the Modified Selected Alternative and the current design of the FEIS Selected Alternative. It also notes that form CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects, was used for this update; however, in the 2003 FEIS form AD-1006 was used[4]. This section also discusses additional coordination with NRCS regarding both the FEIS Selected Alternative and the Modified Selected Alternative; and updates Table 5.2-1 to reflect the results of the evaluation and agency coordination. Additional updates to Section 5.2 include:

- Section 5.2.1—Updates the discussion of acres of impact to prime farmland as a result of the FEIS Selected Alternative (including design refinements to that alternative since the 2003 FEIS), and adds that data for the Modified Selected Alternative.

- Section 5.2.2—Updates the discussion of indirect and cumulative effects to include the Modified Selected Alternative.

NRCS classifies farmland soils under the jurisdiction of the FPPA into distinct categories for determining impacts. These are prime and unique farmland, and Farmland other than prime or unique that is of state or local importance. Using the Form CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects, also known as the Land Evaluation and Site Assessment (LESA) form, the NRCS calculated a relative value for farmland so that alternatives could be ranked numerically based on resource evaluation. A second value was calculated, which evaluated the corridor, including the percentage of the corridor being farmed, the value of on-farm investments, and the compatibility of the project to agricultural uses. According to FPPA regulations (*Federal Register* Vol. 49, No. 130, Thursday, July 5, 1984), sites that receive the highest combined scores are to be regarded as most suitable for protection under the FPPA. Alternatives receiving less than 160 points require no additional evaluation, but in the case of an alternative with a score of 160 or more, additional coordination with NRCS should be undertaken to address ways to reduce impacts. If an alternative that impacts agricultural land is

[4] The information, data, values, and ratings from these two forms are interchangeable for highway projects. The CPA-106 form is designed for evaluating corridor projects, while the AD-1006 form is designed for evaluating alternatives and sites and can be adapted for corridor projects.

selected as the preferred alternative, then minimization efforts must be evaluated during the design phase. These efforts could include, among other things, evaluating access points, minimizing required right-of-way, and minimizing disruption to fence lines.

The proposed LSIORB Project alternatives are situated in two separate districts of the NRCS: i.e., Jefferson County, Kentucky; and Clark County, Indiana. Each NRCS office evaluates FPPA farmland differently due to the relative value of farmland within its jurisdiction. Relatively high values for FPPA soils within a county occur due to either the high quality of the soil type or the scarcity of FPPA soils in that county, or a combination of both factors. The FPPA soils in Jefferson County received higher values (78 points) than the FPPA soils in Clark County (47 points), even though in Jefferson County the project would convert substantially fewer acres from agricultural to transportation use (see Table 5.2-1). No FPPA guidelines exist for combining scores from more than one county. As a result, individual farmland assessments were conducted independently for Jefferson and Clark counties.

In the Downtown Corridor, the project is located within an urbanized area and is not under the jurisdiction of the FPPA; therefore no Land Evaluation Site Assessment (LESA) evaluations were performed. The East End Corridor is under the jurisdiction of the FPPA; therefore LESA evaluations were performed.

As part of the development of this SDEIS, additional coordination with NRCS was conducted in August 2011 with submittal of new CPA-106 forms for corridor type projects, based on current right-of-way widths for both the FEIS Selected Alternative and the Modified Selected Alternative (see Appendix B.6.1 and B.6.2). The total point value assigned to the farmland impacts as a result of either the FEIS Selected Alternative or the Modified Selected Alternative in Jefferson County was 140. The total point value assigned to the anticipated farmland impacts as a result of either alternative in Clark County was 119. Table 5.2-1 illustrates the acres of impact for each alternative, and the total point value of prime farmland that would be impacted.

TABLE 5.2-1
ACRES OF FPPA FARMLAND/LESA EVALUATION RATING

County	**No Action**	**FEIS Selected Alternative** Impacted Acres of Prime Farmland/ Total LESA Point Value of Prime Farmland	**Modified Selected Alternative** Impacted Acres of Prime Farmland/ Total LESA Point Value of Prime Farmland
Jefferson Co., Kentucky	0/0	4.4 / 140	4.4 / 140
Clark Co., Indiana	0/0	53.14 / 119	53.14 / 119
Total acres	0/0	57.54	57.54

Source: *USDA CPA-106, Farmland Conversion Impact Rating for Corridor Type Projects.*

In Jefferson County, the undeveloped areas along the East End Corridor are primarily forested. Open areas are used primarily as pasture for horses and the production of hay. These areas would

experience minimal impacts that are limited to the outer edges of the farms. In Clark County, undeveloped areas are primarily in farm production. These farms primarily produce corn. Some division of farm parcels would occur.

The Indiana NRCS indicated that the project would cause a conversion of 53.14 acres of prime farmland in Clark County. The Kentucky NRCS indicated that the project would cause a conversion of 4.4 acres of prime farmland in Jefferson County and that overall, the project would have a negligible impact on prime farmland. The Kentucky NRCS also indicated that a small amount of prime farmland conversion and a minimal amount of prime/statewide important soils exist along the East End Corridor. Appendix B.6.3 contains copies of the new CPA-106 forms used to calculate the tabulated values.

5.2.1 Direct Impacts

No-Action Alternative

There would be no direct or indirect impacts to agricultural resources as a result of the No-Action Alternative.

FEIS Selected Alternative and Modified Selected Alternative

Because the two build alternatives share an alignment in the East End Corridor, the impacts from each are the same. This alignment includes design refinements made since the 2003 FEIS, such as the selection of a "divergent diamond" interchange with S.R. 62 in Indiana portion of the East End Corridor instead of the originally selected "standard diamond" interchange. According to the LESA evaluation, the two build alternatives in the East End Corridor would require 202 acres of FPPA farmland in Clark County and 5 acres in Jefferson County. The alternatives would also impact 6 acres along the northern edge of an agricultural district in Jefferson County. The alternatives would not divide any of the parcels comprising the district. Based on calculations made in August 2011, the two build alternatives would impact 4.4 acres of prime farmland in Kentucky and 53.14 acres in Indiana, for a total of 57.54 acres of prime farmland.

5.2.2 Indirect and Cumulative Effects

Farmland has been an important resource for the region because it provides for human needs, contributes to the region's economic health and supplies habitat value in wood lots and farm fields. For both the FEIS Selected Alternative and the Modified Selected Alternative, the assessment of agricultural impacts was focused on the East End Corridor in Clark County, Indiana, and Jefferson County, Kentucky.

Clark County is considerably more rural than Jefferson County. According to USDA, depending on the year, the acreage of land in farms is two to three times higher in Clark County than in Jefferson County. As development pressures continue around the LMA, land is being removed from agricultural use. An evaluation of USDA data indicates a trend of loss of agricultural

acreage at an average rate of 7.4% per five years for Clark County and 11.1% per five years for Jefferson County.

No-Action Alternative

There would be no indirect or cumulative impacts to agricultural resources as a result of the No-Action Alternative.

FEIS Selected Alternative and Modified Selected Alternative

For both the FEIS Selected Alternative and the Modified Selected Alternative, **t**here would be no indirect or cumulative effects within the Downtown Corridor. However, within the East End Corridor, both alternatives would potentially cause indirect effects and contribute to cumulative effects to farmland. Residential and commercial development pressure is expected to continue in Clark County and Jefferson County. The project would provide new cross-river mobility with connectivity to I-64, I-65, I-71, and I-265 and provide additional access to the LMA in Clark and Jefferson counties, thereby increasing the pressure for continued development.

For example, in Indiana, the East End Corridor is located between the Port of Indiana-Jeffersonville to the south and the River Ridge Commerce Center to the north. The Port of Indiana-Jeffersonville (formerly Clark Maritime Center) handles domestic and international barge shipments and is designated as a U.S. Foreign Trade Zone. The River Ridge Commerce Center is located in Clark County, is a developing business park for industrial and commercial uses, and is designated as a U.S. Foreign Trade Zone.

The East End Corridor in Indiana also includes a proposed interchange at S.R. 62 and Salem Road in Clark County, both of which would increase access to these developments. The Salem Road interchange will provide access to the River Ridge Commerce Center, the Port of Indiana-Jeffersonville, and southeastern Clark County. The commerce center and port are expected to play an important role in developing the regional economy and assist in establishing the area as a commerce and transportation hub for the LMA.

The current zoning designations for the City of Jeffersonville extend northeast along the Ohio River past the Town of Utica to the River Ridge Commerce Center. Current zoning designations show no future agricultural land use along the East End Corridor. Commercial development is expected near the proposed interchanges with S.R. 62 and, Salem Road and in Kentucky at the proposed U.S. 42 proposed interchanges. Residential development is expected to continue in southeastern Clark County and around the Town of Utica. Induced development generated from changes in land use from the proposed project and the cumulative effects of residential and commercial development would likely continue the trend of farmland loss in the region.

5.2.3 Minimization

Since both the FEIS Selected Alternative and the Modified Selected Alternative received total point values of less than 160 points for the LESA evaluation, the project will receive no further consideration for farmland protection. With the LESA value being less than 160 points, no other alternatives must be examined. Mitigation of farmland impacts would not be required for impacts associated with the project.

Minimization of farmland impacts can be accomplished by minimizing construction limits, through spacing of staging areas and using temporary rights-of-way (temporary easements), thereby allowing some acreage to return to farm use. Best Management Practices would be used during construction to minimize stormwater runoff and other related impacts to adjoining fields.

5.3 Historic and Archaeological Resources

Section 5.3 of the 2003 FEIS provided information on direct, indirect and cumulative effects of the project on aboveground historic properties identified as eligible for listing or previously listed on the NRHP. Section 5.3.1 of the SDEIS contains the following substantive changes to the 2003 FEIS:

- Section 5.3.1.1—Updates the methodology used to evaluate direct effects on individual historic properties and historic districts within the Original APE.
- Section 5.3.1.2—Provides an update of the assessment of effects on individual historic properties and historic districts within the Original APE. Because the Section 106 consultation process is still ongoing, the effects determinations for the Modified Select Alternative in this SDEIS are proposed (rather than final), as are any changes in effect determinations from the 2003 FEIS findings.
- Section 5.3.1.3—Includes the methodology used to evaluate indirect and cumulative effects on historic properties within the Extensions to the Original APE. Because all properties over 45 years in age within the Extensions to the Original APE are treated as eligible for listing on the NRHP for the purpose of this project, effect determinations within the Extensions to the Original APE were assessed at a district or neighborhood level. Similar to the effects determinations on historic properties within the Original APE, the effects determinations within the Extensions to the Original APE in this SDEIS are also proposed.
- Section 5.3.2—Presents an update of archaeological work conducted since the 2003 FEIS.

To initiate the investigations and analyses required by Section 106 of the National Historic Preservation Act (NHPA), as amended, a “Summary of Consulting Party Procedures” was developed for the project. Section 106 of the NHPA requires the identification of parties who may be entitled to participate in the historic preservation review process, because of their interest in historic properties that may be affected by the project. Consulting parties include representatives of local governments, as well as other individuals or organizations “with a demonstrated interest” in the project. The “demonstrated interest” is a result of a legal or

economic relation to the project or historic property, or a stated concern with project effects on historic properties.

FHWA, with the assistance of KYTC and INDOT, has engaged in Section 106 consultation with the SHPOs of Indiana and Kentucky, the Advisory Council as well as other consulting parties as part of the preparation of this SDEIS. The initial step in the Section 106 process of this SDEIS was to re-engage and invite consulting parties to (re)join the consultation process (see Appendix D.2). On April 6, 2011 invitations were mailed to local governments and known historic preservation organizations within the project area. In addition, invitations were forwarded to the Indiana State Historic Preservation Officer (SHPO), the Kentucky SHPO and the Advisory Council on Historic Preservation (ACHP). Invitees were given a 30-day response period to accept the invitation to participate as a consulting party. Included with this letter was information outlining Section 106 consultation procedures and an invitation to an initial meeting scheduled for June 1, 2011.

Listed below are the local governments, historical agencies, Native American tribes, and other organizations renewing their role as a consulting party for this SDEIS Section 106 process. Including the Indiana SHPO, the Kentucky SHPO, the ACHP, and 44 consulting parties, including the National Trust for Historic Preservation, were identified.

Indiana

- City of Jeffersonville, Office of Planning and Development
- City of New Albany
- Clarksville Historical Society
- Clark County Historian
- Clark County Historical Society
- Colgate—Palmolive Representative
- Jeff-Clark Preservation, Inc.
- Jeffersonville Historic Preservation Commission
- Jeffersonville Main Street Association
- Indiana Landmarks, Southern Regional Office
- New Albany Historic Preservation Commission
- Rose Hill Neighborhood Association
- Town of Clarksville
- Town of Utica

Kentucky

- Bridgepointe Neighborhood Assoc.
- Butchertown Neighborhood Association, Inc.
- City of Green Spring
- City of Prospect
- City of Louisville, Department of Public Works
- City of Louisville, Historic Preservation Officer
- City of Louisville, Urban Design Division
- Clifton Community Council
- Clifton Neighborhood Association, Inc.

- Coalition of Original People
- Historic Homes Foundation Bridgepointe
- Jefferson County Public Works, Jefferson County Engineer
- Linden Hill
- Phoenix Hill Association, Inc.
- Preservation Kentucky, Inc
- Preservation Louisville
- Prospect/Harrods Creek Neighborhood Assoc / Harbor at Harrods Ck
- River Fields, Inc
- St. Francis in the Fields Episcopal Church
- Transylvania Beach Association

Tribes

- The Delaware Nation
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe
- Miami Tribe of Oklahoma
- Peoria Tribe of Indians of Oklahoma
- United Keetoowah Band of Cherokee Indians

An informational Section 106 meeting was held on June 1, 2011. The purpose of this meeting was to provide a brief overview of the Project, the commitments in the 2003 Memorandum of Agreement (MOA) implemented to date, as well as potential changes to the project for consideration during the SDEIS process. The discussion also described the 2003 FEIS APE, and potential changes/Extensions to the Original APE based on new information or conditions relative to the proposed Modified Selected Alternative.

On June 27 and 28, 2011, public information meetings were held in Louisville and Jeffersonville to discuss the status of the DSEIS with the general public. Each meeting was structured into two phases. An Open House format allowed the public to review the proposed changes between the 2003 Selected Alternative and the Modified Selected Alternative proposed in this SDEIS. Following the open house portion of the meeting, the general public was given the opportunity to comment on the materials presented and the Project in general.

As part of this SDEIS, a re-evaluation of the APE developed for the 2003 FEIS was undertaken to identify areas that could experience changes to traffic patterns based on the proposed project design modifications and the introduction of tolling on the Downtown (I-65) and East End bridges. The Original APE was defined in accordance with 36 CFR Part 800.16(d). The term “Original APE” is used in this SFEIS to refer the Alternative-Specific APE as defined in the 2003 FEIS.

In order to consider the effects of such changes to traffic patterns as a result of the Modified Selected Alternative, traffic data and output from a travel demand model were developed to estimate potential changes in traffic conditions in subareas within the Project area. The travel

demand model identified several subareas in New Albany, Clarksville, and Jeffersonville (Indiana), and downtown Louisville and River Road, (Kentucky) that could experience noticeable changes in traffic patterns, thereby potentially resulting in effects on historic properties. These areas have been identified as the Extensions to the Original APE and were developed by FHWA, INDOT, and KYTC to assess the potential effects of project changes on historic resources.

On July 14, 2011 the Extensions to the Original APE, and the methodology for their creation, were presented to the Indiana and Kentucky SHPOs. This meeting was held to present initial findings and gather preliminary feedback/comments from the respective SHPOs. As a result of comments received from each State's respective SHPO, Extensions to the Original APE boundaries were revised to include additional resources in downtown Louisville and Jeffersonville. The Extensions to the Original APE were presented to the consulting parties during the September 29, 2011 Section 106 meeting.

On September 5, 2011 FHWA sent out (via email) a notice to consulting parties regarding the Section 106 meeting to review updates to historic resources within the Original APE, and to identify resources in the Extensions to the Original APE (see Appendix D.4). On September 12, 2011 the FHWA provided a package of information (the Section 106 Identification Workbook, see Appendix D.4.3) to the consulting parties for review, updating historic properties within the Original APE as well as in the Extensions to the Original APE. The Section 106 Identification meeting was held on September 29, 2011 to present to the consulting parties the Extensions to the Original APE, as well as to discuss historic resources identified during the SDEIS process. Each consulting party was invited to review the information and provide written comments by October 14, 2011. At the conclusion of this review period, response letters had been received from the following consulting parties:

- Butchertown Neighborhood Association
- City of Jeffersonville
- Indiana Division of Historic Preservation and Archaeology (Indiana SHPO)
- Kentucky Heritage Council (Kentucky SHPO)
- Louisville Metro—Historic Landmarks and Preservation Districts Commission
- National Trust for Historic Preservation
- Neighborhood Planning and Preservation, Inc. (Louisville, KY)
- Phoenix Hill Neighborhood Association
- Preservation Louisville, Inc.
- River Fields, Inc.

As a result of this meeting and further consultation with the SHPOs, FHWA developed a detailed summary of the comments received from consulting parties regarding the identification of historic properties. After concluding the identification of historic properties and resolving consulting parties' comment, FHWA then developed proposed findings of effect for those historic properties identified with the Original APE and the Extensions to the Original APE. The proposed effect determinations are part of the on-going Section 106 process which will be

completed prior to the submission of the SFEIS. The effect findings will be included in the 800.11(e) documentation, which will be made available to all Consulting Parties, and in the SFEIS.

Development of a revised Memorandum of Agreement (MOA) to mitigate for newly identified adverse effects upon resources listed, or eligible for listing, on the NRHP that may be adversely affected by the project will be prepared following conclusion of the effects assessment process and will be included with the SFEIS.

5.3.1 Above-Ground Resources

The following information details how the Original APE was modified based on potential indirect effects of the Modified Selected Alternative due to potential differences in travel patterns as a result of differences in the build alternatives. It should be noted that historic properties within the Extension to the Original APE are expected to experience only indirect effects as a result of the project modifications; direct effects occur within the Original APE boundaries. Indirect effects from changes in traffic patterns would be similar for each individual property along travel corridors and property-specific impact information cannot be provided given the uncertain nature of these potential indirect effects. Therefore, the proposed effects within the Extensions to the Original APE will be determined at the district or neighborhood level during the next phase of the on-going Section 106 consultation process, and prior to the publication of the SFEIS.

5.3.1.1 Methodology used to Assess Direct Effects

The assessment of adverse effects has been conducted according to the criteria of adverse effect (36 CFR 800.5). Per regulations from the Advisory Council on Historic Preservation, an adverse effect is an “alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register of Historic Places” such that a property’s location, design, setting, materials, workmanship, feeling, or association is diminished. This can include both direct effects (caused by the action and occurring at the same time and place) and indirect effects (reasonably foreseeable effects caused by the project but occurring later in time or farther removed). This section of the 2003 FEIS outlined the methodology developed to assess direct effect determinations on historic resources within the Original APE. These effects were evaluated based on six general categories including:

- encroachment
- noise
- visual
- vibration
- air quality
- construction

Except for the updates presented below, the information presented in Section 5.3.1.1 of the 2003 FEIS is still generally applicable, and is not repeated herein. For more detailed information

regarding this methodology, refer to pages 5-75 through 5-83 (including Tables 5.3-1 through 3) of the 2003 FEIS.

Effects Methodology and Criteria Update

In the 2003 FEIS, the effects determinations were provided for the then-current design of the FEIS Selected Alternative. Because the footprint of the FEIS Selected Alternative has been reduced in some places for the Modified Selected Alternative, effects presented in the 2003 FEIS generally represent a worst-case scenario. For this supplemental evaluation effort, the following updates have been completed for the effects described in the 2003 FEIS. As noted in Chapter 3, since 2003 several design refinements have been made to that alternative. The effects determinations presented herein represent the effects to the current design of the FEIS Selected Alternative and the Modified Selected Alternative. Proposed effect determinations that reflect these design refinements or changes to a property's condition are noted throughout this section.

As stated above, because the Section 106 consultation process is still ongoing, the effects determinations for the Modified Select Alternative in this SDEIS are proposed (rather than final), as are any changes in effect determinations from the 2003 findings. Consulting parties have provided input on the area of potential effects and on eligibility determinations, and have received proposed findings of effect, but have not yet provided comments on the proposed findings of effect. In addition, because effect findings have not yet been finalized, consulting parties have not yet been engaged in consultation to resolve adverse effects. FHWA anticipated that Section 106 consultation will be concluded, or nearly concluded, by the time the SFEIS is issued. If there are changes in the eligibility or effects analyses as a result of further Section 106 consultation, those changes will be reflected in the final Section 4(f) evaluation, which will be included in the SFEIS. These findings are also outlined in the 800.11(e) documentation which includes the detailed *Identification Findings Report* and *Effects Recommendations Document* in the supporting appendices. The only type of effect for which the assessment methodology has changed since the 2003 FEIS is noise as described below.

FHWA has issued new guidance regarding noise modeling techniques since the 2003 FEIS analysis was completed. A new noise analysis was completed for the DSEIS effort which compares the FEIS Selected Alternative to the Modified Selected Alternative. The updated 2030 traffic volumes were used for this analysis, which focuses on properties within 500 to 800 feet of the Project. The methodology described in SDEIS Section 5.5 states that all sensitive receptors within 500 feet of the proposed project must be identified and if during the identification of impacts it is shown that receptors are being impacted at 500 feet, the study should be expanded to 800 feet. Noise analysis will not be conducted beyond 800 feet, as the model has not been demonstrated to be accurate beyond that distance. In compliance with the new guidance on the applicability of the TNM2.5 model, only historic properties within 800 feet of the proposed project were modeled in TNM2.5 for future noise levels. The noise level predictions, impact determination and evaluation of the 5 dBA criterion are presented in Table 5.5.2.21-1.

For this supplemental evaluation effort effects for the FEIS Selected Alternative and the Modified Selected Alternative were documented and compared to those effects documented in the Original FEIS.

To determine encroachment impacts for the Modified Selected Alternative, maps detailing the changes in right-of-way requirements between the FEIS Selected Alternative and the Modified Selected Alternative were used to demonstrate differences in encroachment. Visual impacts are similar between each alternative. Ramps within the Kennedy Interchange decrease in elevation between each scenarios: a maximum elevation of 77.1 feet above ground in the FEIS Selected Alternative versus a maximum of 59.9 feet above ground in the Modified Selected Alternative.

Regarding vibration effect findings, the methodology outlined in the 2003 FEIS was used for properties in the Original APE for and for this SDEIS. Properties within 30 feet of the East End Indiana approach, 40 feet of the East End Kentucky approach, 50 feet of the Downtown Indiana approach, 130 feet of the Downtown Kentucky approach, or 80 feet of the Kennedy Interchange were considered to be near enough to the project to experience annoyance from traffic vibration, which is considered at the level of 73 VdB by the FTA. These thresholds were identified based on soil types and pier sizes, as documented in the 2003 analysis. Because updated traffic projections forecast lower volumes for the 2030 analysis year than were identified for the 2025 analysis year covered in the FEIS, the vibration effects presented in the Original FEIS represent a worse-case scenario for vibration impacts.

For air quality within the Original APE, new hot spot analysis techniques predict lower CO levels than the original model due to reductions in projected traffic and refinements to modeling technology. The Louisville Metro Air Pollution Control District identified 24 intersections for hot spot analyses for an updated carbon monoxide (CO) assessment. The analysis utilized the CAL3QHC model developed by the US EPA. None of the 860 receptors analyzed around the 24 hot spot intersections exceeded the one-hour or eight-hour National Ambient Air Quality Standards for CO. $PM_{2.5}$, Ozone, and MSATs were likewise determined to meet air quality conformity standards. Because these results applied to the entire metropolitan area, this air quality analysis did not distinguish between the Original APE and the Extensions to the Original APE. Therefore, none of the properties are considered to have an effect as a result of changes in air quality.

Construction impacts are assumed to be the same as the FEIS for both the FEIS Selected Alternative and the Modified Selected Alternative, excluding maintenance of traffic issues. Staging areas, borrow pits, noise, waste areas, nighttime lighting, and air emissions would be unchanged between the alternatives. Both of the build alternatives would involve the same general maintenance of traffic procedures and impacts related to staging during construction. The primary difference occurs at the Kennedy Interchange: the FEIS Selected Alternative would require more temporary street closures while the Modified Selected Alternative would require more temporary ramp closures, but fewer temporary street closures.

A number of additional historic districts and properties have been identified within the Original APE. The proposed effects of the alternatives on these districts and properties are presented herein, and will be coordinated with the consulting parties during the on-going Section 106 process and finalized before the publication of the SFEIS. Resources which have been

demolished and/or determined ineligible since the 2003 analysis are described in Section 4.3, and the effects on those sites are not addressed in Section 5.3.

Property Specific Evaluations

Evaluations for each of the historic properties identified within the Original APE are provided in Section 5.3.1.2. The Indiana properties are listed first followed by the Kentucky properties and each state is organized by "Downtown Resources" and "East End Resources" respectively. Within each State's respective section, effect determinations for new properties identified within the Original APE are listed first, followed by changes to effect determinations for properties identified in the Original FEIS, and concluding with summary tables of properties identified in the Original FEIS in which the effect findings that remain unchanged. Proposed effects determinations are provided in the *Effects Recommendations Document* (Appendix D.4.2.1), which is an appendix to the 800.11(e) documentation. FHWA, KYTC, and INDOT are consulting as part of the Section 106 process to assess effects on the properties in the Original APE and any changes in these recommended findings will be presented in the SFEIS.

5.3.1.2 Direct Impacts

No-Action Alternative

There would be no direct impacts to above-ground historic properties as a result of the No-Action Alternative.

FEIS Selected Alternative and Modified Selected Alternative

Both the FEIS Selected Alternative and the Modified Selected Alternative and their impacts on historic properties are presented in the following sections. The FEIS Selected Alternative and the Modified Selected Alternatives for the Indiana Downtown and East End areas are depicted in the following figures (figures 5.3-1 and 5.3-2).

Historic Properties Identified within the Original APE - Jeffersonville, Indiana

Figure 5.3-1

Historic Properties Identified within the Original APE - Utica, Indiana (East End)

NRHP/Eligible Historic Districts

- A Swartz Farm H.D. *(No Longer Eligible)*
- B INAAP Igloo Storage H.D.
- C Ranney Wells H.D.
- D Central Utica H.D.

Eligible Properties Identified in the FEIS

- (A) - Fry House (2409 Utica-Sellersburg Rd.)
- (B) - James Smith Farmstead
- *(C) - House - 4711 Middle Rd. (Demolished)*
- (D) - Prather Farm (4075 Herb Lewis Rd.)
- (E) - Dellinger Farm
- (F) - Woods House
- (G) - *Farmhouse - 2307 Utica Pike (Demolished)*
- (H) - John Hoffman House (2405 Utica Pike)
- (I) - Moss Family House (3011 Utica Pike)
- (J) - House (3209 Utica Pike)
- (K) - House (Longview Dr.)
- (L) - Farmstead (1117 Utica-Sellersburg Rd.)
- (M) - Utica Cemetery
- (N) - Utica Methodist Episcopal Church
- (O) - Howes Farm (606 Old Salem Rd.)
- (P) - House (609 Locust St.)
- (Q) - Utica Christian Chapel
- (R) - House (108 Locust St.)
- (S) - William Brindle House (115 Fourth St.)
- (T) - Black Horse Tavern (206 Second St.)
- (U) - Utica Lime Kilns (# 48001-04) / Quarries
- (V) - Lentz Cemetery
- (W)- Lentz Heirs Cemetery
- (X) - WPA Sea Wall
- (Y) - House (203 Fourth St.)

LEGEND

- Outstanding Property (New)
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary

N

Figure 5.3-2

Historic Properties within the Original Ape

The following is an updated evaluation of effects on historic properties listed in or eligible for listing in the NRHP that may be affected by the FEIS Selected Alternative and the Modified Selected Alternative. These evaluations are separated by state into the Downtown Resources and East End Resources. Furthermore, as part of this SDEIS, properties that have been altered or changed since the completion of the 2003 FEIS have also been noted. The following text includes proposed effect determinations for NRHP eligible or listed resources in the Original APE.

DOWNTOWN PROPERTIES—INDIANA

(See Figure 5.3-1)

Identification of Additional Historic Properties for the SDEIS

The *Clark County Interim Report* update did not identify any new NRHP-eligible properties within the Downtown Indiana APE outside the existing Old Jeffersonville Historic District.

Update to Historic Properties Identified in the FEIS

The following information updates any effects associated with the project for each respective property within the Original APE. Table 5.3-3 at the conclusion of this section summarizes the proposed effects for both the FEIS Selected Alternative and the Modified Selected Alternative on these resources. Detailed information about each of these sites can be found in SDEIS Section 4.3 and FEIS Sections 4.3 and 5.3. Such information is therefore not repeated herein.

- ***Louisville Municipal Bridge and Administration Building, (#019-305-58066)***
  The Louisville Municipal Bridge Building was listed on the NRHP in 1984 alongside the George Rogers Clark Memorial Bridge (019-446-58215) and its pylons. The group is listed for its association with architecture, engineering, and transportation. The building is a two-story limestone structure reflecting the influence of both the Classical Revival and Art Deco styles. It was designed by Paul Phillippe Cret and was built during 1928-1929 by the Henry Bicknel Company of Louisville. The building housed bridge offices and other functions until tolls were discontinued in 1946. Individual components for the determination of effects for the FEIS Selected Alternative and the proposed determination of effects for the Modified Selected Alternative are detailed below and summarized in Table 5.3-1.

  Encroachment: Both the FEIS Selected Alternative and the Modified Selected Alternative would require the acquisition of 0.1 acre of right-of-way from this 0.73-acre resource, bringing the road closer to the resource as well as increasing the street's elevation. This would alter its relationship to the transportation system, resulting in an Adverse Effect finding for encroachment.

  Visual: Both the FEIS Selected Alternative and the Modified Selected Alternative would alter the Indiana end of the George Rogers Clark Memorial Bridge. Both alternatives would impact the flanking pylons and both include construction of an embankment for US 31 to

pass over Court Avenue. This embankment would alter the viewshed of the resource and its relationship to the current transportation system, resulting in an Adverse Effect finding for visual impacts.

Noise: While noise studies indicate that both the FEIS Selected Alternative and the Modified Selected Alternative would increase noise levels near the Louisville Municipal Bridge Building (from 60 dBA to 61 dBA), the levels would not rise to the threshold that would constitute an adverse effect (an increase of 5dBA over existing levels), resulting in a No Adverse Effect finding for noise.

Vibration:
Traffic Vibration— The resource currently sits directly adjacent to existing US 31, and while both the FEIS Selected Alternative and the Modified Selected Alternative would experience an increase in traffic volume, it would not rise to the level that would result in an Adverse Effect finding for traffic vibration.

Construction Vibration— Construction of an embankment in close proximity to the resource would result in an Adverse Effect finding for construction vibration for both FEIS Selected Alternative and the Modified Selected Alternative.

Blasting Vibration— No blasting would be required for either the FEIS Selected Alternative or the Modified Selected Alternative at this location.

Construction: Construction of the embankment in close proximity to the resource results in an Adverse Effect finding for construction for both the FEIS Selected Alternative and the Modified Selected Alternative.

TABLE 5.3-1
LOUISVILLE MUNICIPAL BRIDGE BUILDING IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
#019-305-58066	315 South Indiana Ave.	Adverse Effect	Encroachment, Visual, Vibration, & Construction	Adverse Effect	Encroachment, Visual, Vibration, & Construction
		No Adverse Effect	Noise	No Adverse Effect	Noise

- ***Spring Street Freight House (Referred to in the FEIS as the Train Depot) (ID-HC-61007)***
  The Spring Street Freight House (also known as the Train Depot) was acquired by INDOT in 2005 per MOA Stipulation III.A.2. INDOT prepared a NRHP nomination for the Freight House and it was subsequently listed in the NRHP in March 2007 under Criteria A and C. It is significant historically for its associations with railroad transportation in the Jeffersonville area. It is significant architecturally as a good example of an early twentieth century depot design. It was constructed circa 1920 with Craftsman detailing enhancing a twentieth century Functional style.

Encroachment: The FEIS Selected Alternative and the Modified Selected Alternative would not require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The FEIS Selected Alternative, like the Selected Alternative documented in the 2003 FEIS, would introduce an additional elevated ramp for traffic from Court Street to eastbound 10th Street. This ramp would be at a higher elevation than existing roadways and occupy more of the viewshed, resulting in an Adverse Effect for visual. The Modified Selected Alternative eliminates the fly-over ramp at 10th Street. With the elevated facility eliminated, the changes that would occur within the viewshed of the resource would result in a No Adverse Effect finding for visual as it would only alter that transportation system that currently exists and would not introduce any new vertical elements. With both alternatives, artificial lighting would not introduce any new element onto the resource that does not already exist, resulting in a No Effect finding for lighting.

Noise: Studies conducted for the 2003 FEIS indicated that the selected alternative would have no effect for noise on the resource. The alignment has not been drastically altered and the elevated element has been removed for the Modified Selected Alternative therefore resulting in a No Effect finding for noise for both the FEIS Selected Alternative and the Modified Selected Alternative.

Vibration:
Traffic Vibration— The resource is not within the 50-foot (Downtown) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—The resource is not within the 40-foot range of potential vibration damage associated with construction operations for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for construction vibration.

Blasting Vibration—Blasting would not be required for either the FEIS Selected Alternative or the Modified Selected Alternative at this location.

Construction: Construction within the vicinity of this resource would generally be limited to the construction along Court Street and 10th Street. Traffic control measures would be required during construction to manage traffic flow, resulting in a No Effect finding for construction under both alternatives.

The table below summarizes the 2003 determination of effect for the FEIS Selected Alternative and the proposed determination of effects for the Modified Selected Alternative. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of this SFEIS.

TABLE 5.3-2
SPRING STREET FREIGHTHOUSE (TRAIN DEPOT) IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
#019-305-58112	1030 Spring Street	Adverse Effect	Visual, Vibration	Adverse Effect	-
		No Adverse Effect	-	No Adverse Effect	Visual

Historic Properties Unchanged Since the FEIS

A number of historic properties have remained unchanged since the FEIS process and are listed in Table 5.3-4 below. In addition to the status of these properties remaining unchanged, the effects determination relative to the FEIS Selected Alternative has remained the same and the effects of the Modified Selected Alternative are expected to be the same as those of the FEIS Selected Alternative. Table 5.3-4 compares the effects determination for properties evaluated in the 2003 FEIS to the anticipated effects of the Modified Selected Alternative. These determinations address project-related encroachment, noise, vibration, visual, and construction impacts that could affect these historic properties. For a complete evaluation of the effects on these various resources refer to Section 5.3 of the 2003 FEIS and the *Effects Recommendations Document, w*hich is appendix to the 800.11(e) document, is included as Appendix D.4.2.1.

TABLE 5.3-3
DOWNTOWN INDIANA, RESOURCES IMPACT ASSESSMENT SUMMARY

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
-	Old Jeffersonville Historic District	Adverse Effect	Encroachment, Visual, Noise & Vibration	Adverse Effect	Encroachment, Visual, Noise & Vibration
		No Adverse Effect	Construction	No Adverse Effect	Construction
019-305-56592	↳ Grisamore House	No Adverse Effect	Visual	No Adverse Effect	Visual
019-305-58062	City School	No Adverse Effect	Visual	No Adverse Effect	Visual
	Colgate-Palmolive Historic District	Adverse Effect	Visual, Noise	Adverse Effect	Visual, Noise
		No Adverse Effect	Construction	No Adverse Effect	Construction
	Ohio Falls Car and Locomotive Company Historic District	Adverse Effect	Visual, Noise & Vibration	Adverse Effect	Visual, Noise & Vibration
		No Adverse Effect	Construction	No Adverse Effect	Construction
019-446-58018	Big Four Railroad Bridge	No Effect		No Effect	
019-446-58009	Pennsylvania Railroad Bridge	No Effect		No Effect	
019-446-58215	George Rogers Clark Memorial Bridge	Adverse Effect	Encroachment, Visual, Vibration, Construction	Adverse Effect	Encroachment, Visual, Vibration, Construction
		No Adverse	Noise	No Adverse	Noise

		Effect		Effect	
019-446-64205	House (519 Riverside Drive)	No Adverse Effect	Visual	No Adverse Effect	Visual
019-446-64206	House (527 Riverside Drive)	No Adverse Effect	Visual	No Adverse Effect	Visual

↳ Located within Historic District

EAST END INDIANA PROPERTIES

(See Figure 5.3-2)

Identification of Additional Historic Properties for the SDEIS

The recently completed *Clark County Interim Report* identified the Thomas Benton Jacobs House within the Indiana East End APE as an "Outstanding" resource that was determined not eligible during the FEIS Section 106 process. Information about this property is listed below and includes proposed effect determinations for both the FEIS Selected Alternative and the Modified Selected Alternative. Similar to the previous FEIS evaluations, these proposed effect determinations address project-related encroachment, noise, vibration, visual, and construction impacts that could affect this historic property. Because the FEIS Selected Alternative and the Modified Selected Alternative share an alignment, the proposed effect determinations would be the same.

1. Benton Jacobs House 4002 Utica Pike (#019-305-45054)

The Thomas Benton Jacobs House was built c.1864 and reflects the influence of the Federal and Greek Revival styles. The house was also used as the working farm of the Indiana State Reformatory in Jeffersonville. The Jacobs house is a side-gabled frame I-house clad in wood clapboard siding. As an intact example of a mid-nineteenth century farmhouse in Clark County, the house is eligible for listing in the NRHP under Criterion C.

This resource is three miles away from both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives.

TABLE 5.3-4
THOMAS BENTON JACOBS HOUSE IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative & FEIS Selected Alternative Proposed Findings
019-305-45054	4002 Utica Pike	N/A	No Effect

Historic Properties Identified in the 2003 FEIS and Modified Since that Time

Since the completion of the 2003 FEIS, the status of the four lime kilns has been modified based on research related to mitigation measures stipulated in the LSIORB Project MOA. Listed below

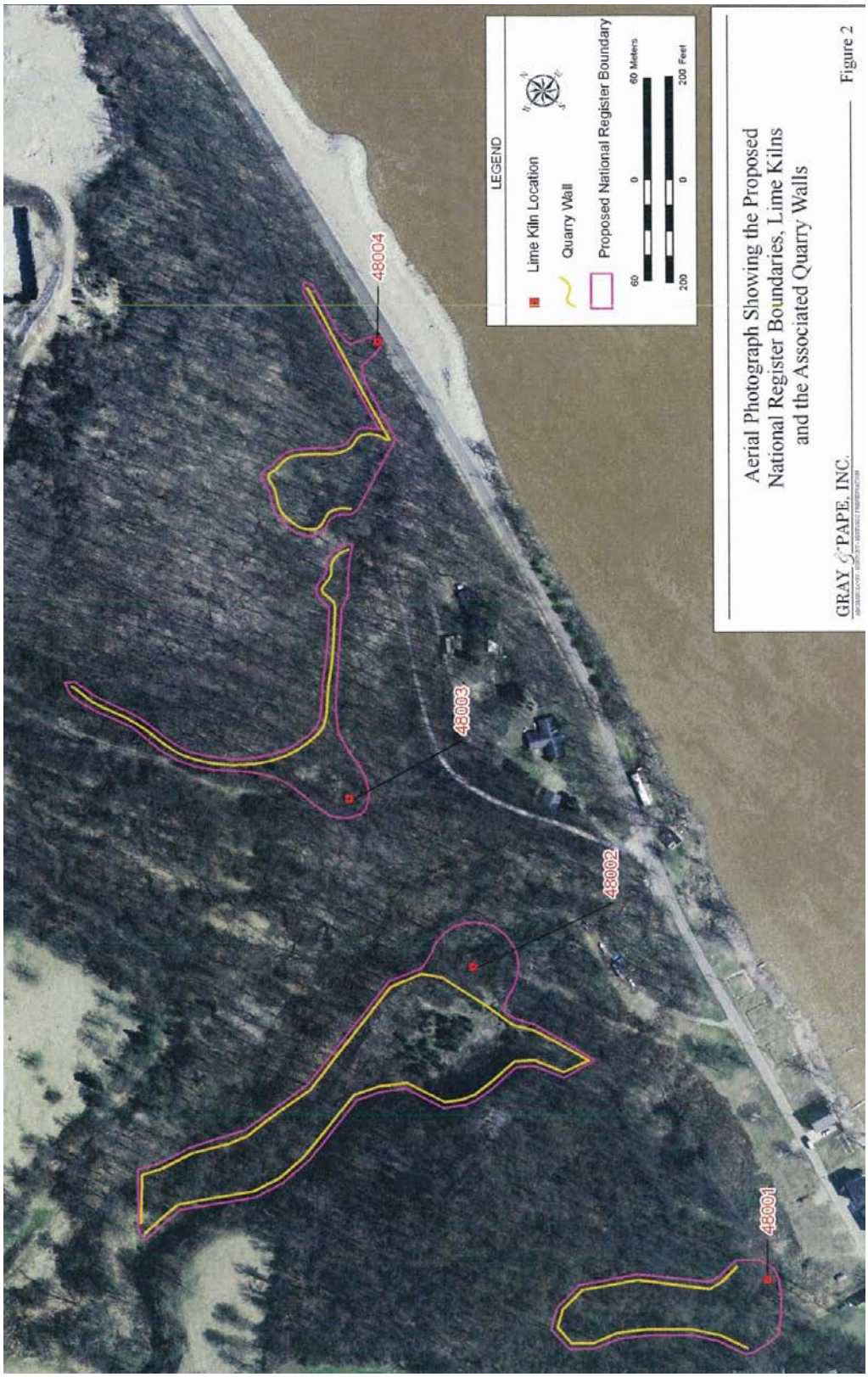
is an overview of these changes in addition to the proposed effect determinations for each of the kilns and quarries.

Utica Lime Kilns (#48001 - #48004)

At the time of the 2003 FEIS/ROD, the Utica lime kilns were outside of the right-of-way limits of the preferred alternative. However, an Adverse Effect was determined due to proximity impacts (vibration). Therefore, the MOA in the 2003 FEIS included a number of mitigation for the lime kilns (Stipulation III.H.1-8), including the preparation of a Historic Preservation Plan (HPP). As part of the preparation of this HPP a context study focusing on the development of the lime industry in Utica Township resulted in the expansion of the historic boundary of each kiln to include the associated limestone quarries. The expansion of two of the sites (48003 and 48004) due to the inclusion of the associated quarries extended the historic boundaries into the footprint of the shared alignment of the build alternatives.

The four kilns and associated quarries are recommended as eligible for listing as a multiple property group (discontinuous) and each kiln with its quarry is a historic district. The kilns and quarries are eligible under Criterion A for their local association with the history of Utica lime manufacturing and under Criteria D for their potential to reveal information. Because of the expansion of the boundaries, the 2003 effects are being revisited during the on-going Section 106 process as part of the DSEIS. The four tables below summarize the previous determination of effects for the FEIS Selected Alternative and the proposed determination of effects for the Modified Selected Alternative for each lime kiln and associated quarry identified in the Architectural and Historical Resources of Utica Township Multiple Property Listing. Recent coordination from the Indiana SHPO, dated October 23, 2011, states that the quarries would not warrant preservation in place (see Appendix D.9).

Two types of kilns have been identified through cultural investigations. A ground hog or temporary, limited use kiln was built into the side of a hill. Limestone was loaded into a vertical cylindrical stone- or brick-lined shaft from the top of the hill and a fire was built in a specially constructed arch below the limestone. Later, larger more permanent kilns were built, including perpetual kilns, which were in operation in 1875.


LEGEND
Lime Kiln Location
Quarry Wall
Proposed National Register Boundary
60 Meters
0
60
200 Feet
0
200
48004
48003
48002
48001
Aerial Photograph Showing the Proposed National Register Boundaries, Lime Kilns and the Associated Quarry Walls
Figure 2
GRAY & PAPE, INC.

- ***Lime Kiln # 48001***
  Farthest south of the four kilns, this intermittent groundhog kiln was built between c.1850 and c.1880. Like most groundhog kilns, it was built into the base of a steep slope. The arched draw-off, which was used to extract burned lime from the kiln, faces the river. The kiln opens onto a plot that has been cleared for residential development. An abandoned tear-shaped quarry is located west of the kiln, measuring roughly 125 meters long by 50 meters wide. The boundaries for this site skirt the outer edge of the quarry and extend to a point just east of the kiln's eastern façade. Because no other supporting structures for this particular operation survive, the boundaries remain confined to Kiln #48001 and its quarry.

  Encroachment: The FEIS Selected Alternative and the Modified Selected Alternative would not require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

  Visual: While the FEIS Selected Alternative and the Modified Selected Alternative would both be visible from the resource, it would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for visual impacts.

  Noise: While the FEIS Selected Alternative and the Modified Selected Alternative are approximately 570 feet from the resource, noise would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for noise.

  Vibration:
  Traffic Vibration—The resource is not within the 30-foot (East End) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

  Construction Vibration—The resource is not within the 40-foot range of potential vibration damage associated with construction operations for either the FEIS Selected Alternative or the Modified Selected Alternative resulting in a No Effect finding for construction vibration.

  Blasting Vibration—The resource would not be within the 500-foot range of potential vibration damage associated with blasting operations for either the FEIS Selected Alternative or the Modified Selected Alternative resulting in a No Effect finding for blasting vibration.

  Construction: Construction within the vicinity of this resource would generally be limited to the construction of the Indiana approach spans to the Ohio River Bridge. The floodplain for the crossings is very narrow at this point and would only involve one or two landward piers. The abutment would be located within the top portion of the rock bluff, above Upper River Road. Any staging area would be located at the piers near the river and Upper River Road. Waste areas or borrow pits would not be required for this portion of the Project. Traffic control measures would be required during construction to manage traffic flow along Upper River Road; however this would only require short-term lane restrictions during construction

of the piers and placement of the superstructure. Access would be maintained along Upper River Road during these activities. All of this would result in a No Effect finding for construction for the alternatives considered in this analysis.

TABLE 5.3-5
UTICA LIME KILN #48001 IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative & FEIS Selected Alternative Proposed Findings
IE-HC-48001	---	No Effect	No Effect

- ***Lime Kiln #48002***

  This is a large vertical double-chambered kiln located on the south side of a small, densely wooded creek valley. It was likely constructed by the Utica Lime Company. Below the north façade, an earthen bench extends northward toward the creek. The bench is covered with a dense layer of burned lime, ashes, coal cinders, and brick fragments. Two roads lead from the kiln toward Upper River Road. An extensive quarry extends west. The boundaries for this site include the kiln itself and its associated quarry, which is located north and west of the kiln. The boundaries skirt the outer edge of the quarry and include a 90-foot radius buffer around the kiln to incorporate extant concrete foundations and lime and ash piles associated with the kiln.

  Encroachment: Neither the FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

  Visual: While both alternatives considered in this analysis would be visible from the resource, it would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for visual impacts.

  Noise: While both the FEIS Selected Alternative and the Modified Selected Alternative are located near the resource, noise would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for noise.

  Vibration:
  Traffic Vibration—The resource is not within the 30-foot (East End) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

  Construction Vibration—The resource is not within the 40-foot range of potential vibration damage associated with construction operations for either the FEIS Selected Alternative or the Modified Selected Alternative resulting in a No Effect finding for construction vibration.

Blasting Vibration—The resource is within the 500 foot area of potential vibration damage associated with blasting operations for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in an Adverse Effect finding for blasting vibration.

Construction: Construction within the vicinity of this resource would generally be limited to the construction of the Indiana approach spans to the Ohio River Bridge. The floodplain for the crossings is very narrow at this point and would only involve one or two landward piers. The abutment would be located within the top portion of the rock bluff, above Upper River Road. Any staging area would be located at the piers near the river and Upper River Road. Waste areas or borrow pits would not be required for this portion of the Project. Traffic control measures would be required during construction to manage traffic flow along Upper River Road; however this would only require short-term lane restrictions during construction of the piers and placement of the superstructure. Access would be maintained along Upper River Road during these activities. All of this would result in a No Effect finding for construction for the alternatives considered in this analysis.

TABLE 5.3-6
UTICA LIME KILN #48002 IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
IE-HC-48002	---	Adverse Effect	Vibration	Adverse Effect	Vibration

- ***Lime Kiln #48003***
  This is a large double kiln located opposite 48002 on the north side of a small, unnamed creek. It was built of large, dry-laid limestone slabs and was likely constructed c.1870. Near the base, a relatively small earthen bench extends toward the creek. A dirt road leading to a large quarry north of the creek valley extending along a bluff north of the kiln, provides access to the combustion chamber openings atop the kiln. The boundaries for this site include the kiln itself and its associated quarry, which is located northwest of the kiln. The boundaries skirt the outer edge of the quarry and include a 20- foot radius buffer around the west and south sides of the kiln incorporating extant lime and ash piles.

  Encroachment: Both the FEIS Selected Alternative and the Modified Selected Alternative would require the acquisition of right-of-way from this resource, which includes over 76 feet (0.22 acre) of the quarry itself, resulting in an Adverse Effect finding for encroachment.

  Visual: Because both the FEIS Selected Alternative and the Modified Selected Alternative would remove a portion of the quarry and introduce a new vertical and horizontal element that bisects the resource, each alternative results in an Adverse Effect finding for visual impacts.

Noise: While both alternatives directly affect this resource, noise would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for noise.

Vibration:
Traffic Vibration—The resource is within the 30-foot (East End) area of potential vibration damage associated with traffic for both the FEIS Selected Alternative and the Modified Selected Alternative resulting in an Adverse Effect finding for traffic vibration.

Construction Vibration—The resource is within the 40-foot area of potential vibration damage associated with construction operations for both the alternatives resulting in an Adverse Effect finding for construction vibration.

Blasting Vibration—The resource is within the 500-foot area of potential vibration damage associated with blasting operations for both of the alternatives resulting in an Adverse Effect finding for blasting vibration.

Construction: Construction would include activities in direct contact with the resource including the removal of a portion of the quarry. This would result in an Adverse Effect for construction.

TABLE 5.3-7
UTICA LIME KILN #48003 IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative & FEIS Selected Alternative Findings	
IE-HC-48003	---	Adverse Effect	Vibration	Adverse Effect	Encroachment, Visual, Vibration, & Construction

- ***Lime Kiln #48004***
  Kiln 48004 is a small, single chamber, in-ground limestone structure located along the western edge of Upper River Road, roughly half a mile north of Utica. It was likely built by Mr. Starkweathers around 1826 and abandoned around 1847. The kiln is set at the base of a wooded bluff; the surrounding landscape is largely rural and undeveloped. The kiln's arched draw-off faced east toward the river. A series of abandoned quarries are located along the bluff, including one just above the kiln. The boundaries for this site include the kiln itself and its associated quarry, which is located in a bluff just west of the kiln. The boundaries skirt the outer edge of the quarry and extend just east of the kiln's east façade. Because no other supporting structures for this particular operation survive, the boundaries remain confined to the kiln and quarry.

  Encroachment: Both the FEIS Selected Alternative and the Modified Selected Alternative would require the acquisition of right-of-way from this resource—302 feet (0.84 acre) of the quarry itself—resulting in an Adverse Effect finding for encroachment.

Visual: Because both the FEIS Selected Alternative and the Modified Selected Alternative would remove a portion of the quarry and introduce a new vertical and horizontal element that bisects the resource, each alternative results in an Adverse Effect finding for visual impacts.

Noise: While both alternatives directly affect this resource, noise would not adversely affect those qualities for which the resource achieves significance, making it eligible for listing. Therefore, this results in a No Effect finding for noise.

Vibration:
Traffic Vibration—The resource is within the 30-foot (East End) area of potential vibration damage associated with traffic for both the FEIS Selected Alternative and the Modified Selected Alternative resulting in an Adverse Effect finding for traffic vibration.

Construction Vibration—The resource is within the 40-foot area of potential vibration damage associated with construction operations for both the alternatives resulting in an Adverse Effect finding for construction vibration.

Blasting Vibration—The resource is within the 500-foot area of potential vibration damage associated with blasting operations for both of the alternatives resulting in an Adverse Effect finding for blasting vibration.

Construction: Construction would include activities in direct contact with the resource including the removal of a portion of the quarry. This results in an Adverse Effect finding for construction for both the FEIS Selected Alternative and the Modified Selected Alternative.

TABLE 5.3-8
UTICA LIME KILN #48004 IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative & FEIS Selected Alternative Findings	
IE-HC-48004	---	Adverse Effect	Vibration	Adverse Effect	Encroachment, Visual, Vibration, & Construction

Historic Resources Unchanged Since the FEIS

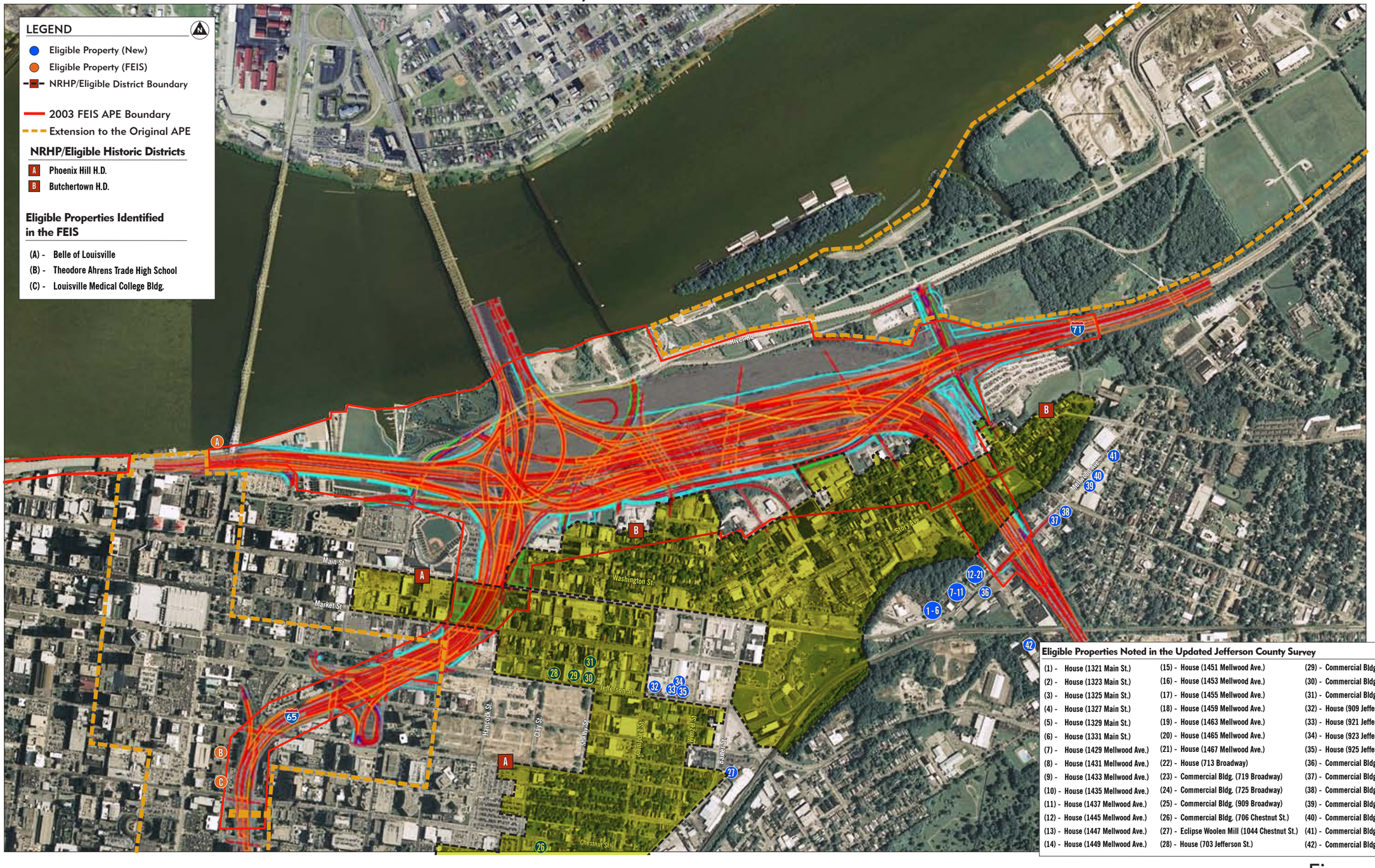
Because the Modified Selected Alternative would maintain the same general alignment and footprint as the FEIS Selected Alternative, the effects determination for respective resources within the Original APE relative to the Modified Selected Alternative are proposed to remain the same as the effects determination relative to the FEIS Selected Alternative. Table 5.3-9 below compares the effects determination for resources evaluated in the 2003 FEIS to those affected by the Modified Selected Alternative. Similar to the previous evaluations for new properties

identified for the SDEIS, these determinations addressed project-related encroachment, noise, vibration, visual, and construction impacts that could affect these historic resources. For a complete evaluation of the effects on these various resources refer to Section 5.3 of the 2003 FEIS and the *Effects Recommendations Document* in Appendix D.4.2.1.

TABLE 5.3-9
EAST END INDIANA RESOURCES IMPACT ASSESSMENT SUMMARY

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
---	James A Smith Farmstead	No Effect		No Effect	
---	Ranney Wells Historic District	No Effect		No Effect	
---	INAAP Igloo Storage Historic District	Adverse Effect	Vibration	Adverse Effect	Vibration
---	Central Utica Historic District	No Effect		No Effect	
---	WPA Sea Wall	No Effect		No Effect	
019-305-46017	William Brindle House	No Effect		No Effect	
---	House (203 4th St., Utica)	No Effect		No Effect	
019-305-46008	Utica Christian Chapel	No Effect		No Effect	
019-305-46025	Utica Cemetery	No Adverse Effect	Visual	No Adverse Effect	Visual
019-305-46013	Prather Farm	No Adverse Effect	Visual, Construction	No Adverse Effect	Visual, Construction
019-305-46009	House	No Adverse Effect	Visual	No Adverse Effect	Visual
---	House (609 Locust St., Utica)	No Effect		No Effect	
---	House (Longview Dr.)	No Effect		No Effect	
	Federal Style House (4711 Middle Road)	No Effect		No Effect	
---	John Dellinger Farm	No Effect		No Effect	
019-305-46019	Utica Methodist Episcopal Church	No Effect		No Effect	
019-305-46024	Howes Farm	No Effect		No Effect	
019-305-45015	Lentz Heirs Cemetery	No Effect		No Effect	
019-305-46026	Black Horse Tavern	No Effect		No Effect	
---	Lentz Cemetery (Upper River Rd)	Adverse Effect	Noise, Vibration	Adverse Effect	Noise, Vibration
019-305-55006	John Hoffman House	No Effect		No Effect	
019-305-58001	Moss Family House	No Effect		No Effect	
019-305-55015	House	No Effect		No Effect	
019-305-45002	Woods House	No Effect		No Effect	
019-305-45024	Farmstead	No Effect		No Effect	
019-305-45027	Fry House	No Effect		No Effect	

Downtown FEIS Selected Alternative -Louisville, Kentucky

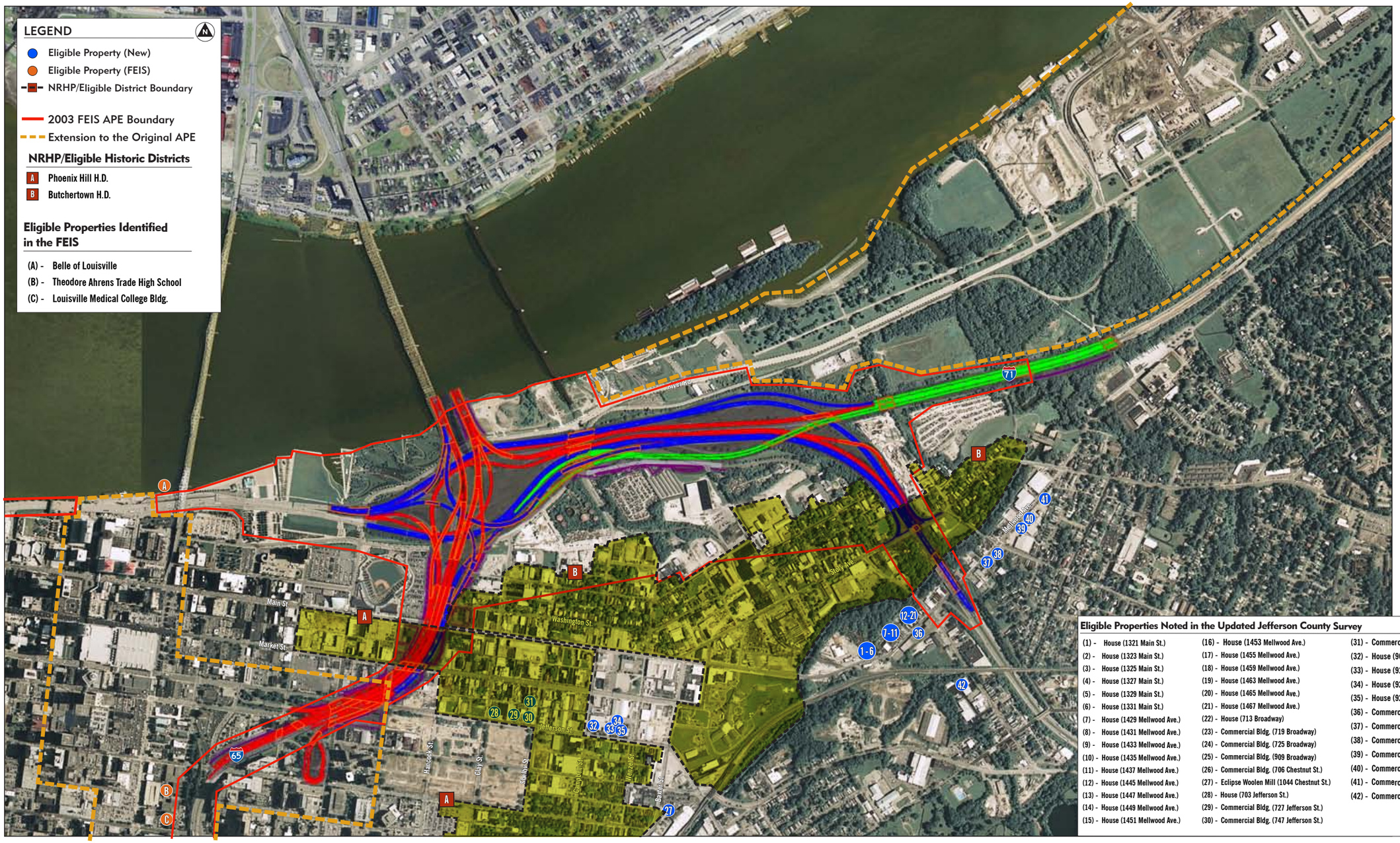


Eligible Properties Noted in the Updated Jefferson County Survey

(1) - House (1321 Main St.)	(15) - House (1451 Mellwood Ave.)	(29) - Commercial Bldg. (727 Jefferson St.)
(2) - House (1323 Main St.)	(16) - House (1453 Mellwood Ave.)	(30) - Commercial Bldg. (747 Jefferson St.)
(3) - House (1325 Main St.)	(17) - House (1455 Mellwood Ave.)	(31) - Commercial Bldg. (218-220 Shelby St.)
(4) - House (1327 Main St.)	(18) - House (1459 Mellwood Ave.)	(32) - House (909 Jefferson St.)
(5) - House (1329 Main St.)	(19) - House (1463 Mellwood Ave.)	(33) - House (921 Jefferson St.)
(6) - House (1331 Main St.)	(20) - House (1465 Mellwood Ave.)	(34) - House (923 Jefferson St.)
(7) - House (1429 Mellwood Ave.)	(21) - House (1467 Mellwood Ave.)	(35) - House (925 Jefferson St.)
(8) - House (1431 Mellwood Ave.)	(22) - House (713 Broadway)	(36) - Commercial Bldg. (1450 Mellwood Ave.)
(9) - House (1433 Mellwood Ave.)	(23) - Commercial Bldg. (719 Broadway)	(37) - Commercial Bldg. (1634 Mellwood Ave.)
(10) - House (1435 Mellwood Ave.)	(24) - Commercial Bldg. (725 Broadway)	(38) - Commercial Bldg. (1648 Mellwood Ave.)
(11) - House (1437 Mellwood Ave.)	(25) - Commercial Bldg. (909 Broadway)	(39) - Commercial Bldg. (1726 Mellwood Ave.)
(12) - House (1445 Mellwood Ave.)	(26) - Commercial Bldg. (706 Chestnut St.)	(40) - Commercial Bldg. (1728 Mellwood Ave.)
(13) - House (1447 Mellwood Ave.)	(27) - Eclipse Woolen Mill (1044 Chestnut St.)	(41) - Commercial Bldg. (1734 Mellwood Ave.)
(14) - House (1449 Mellwood Ave.)	(28) - House (703 Jefferson St.)	(42) - Commercial Bldg. (130 Spring St.)

Figure 5.3-3a

Downtown Modified Selected Alternative - Louisville, Kentucky

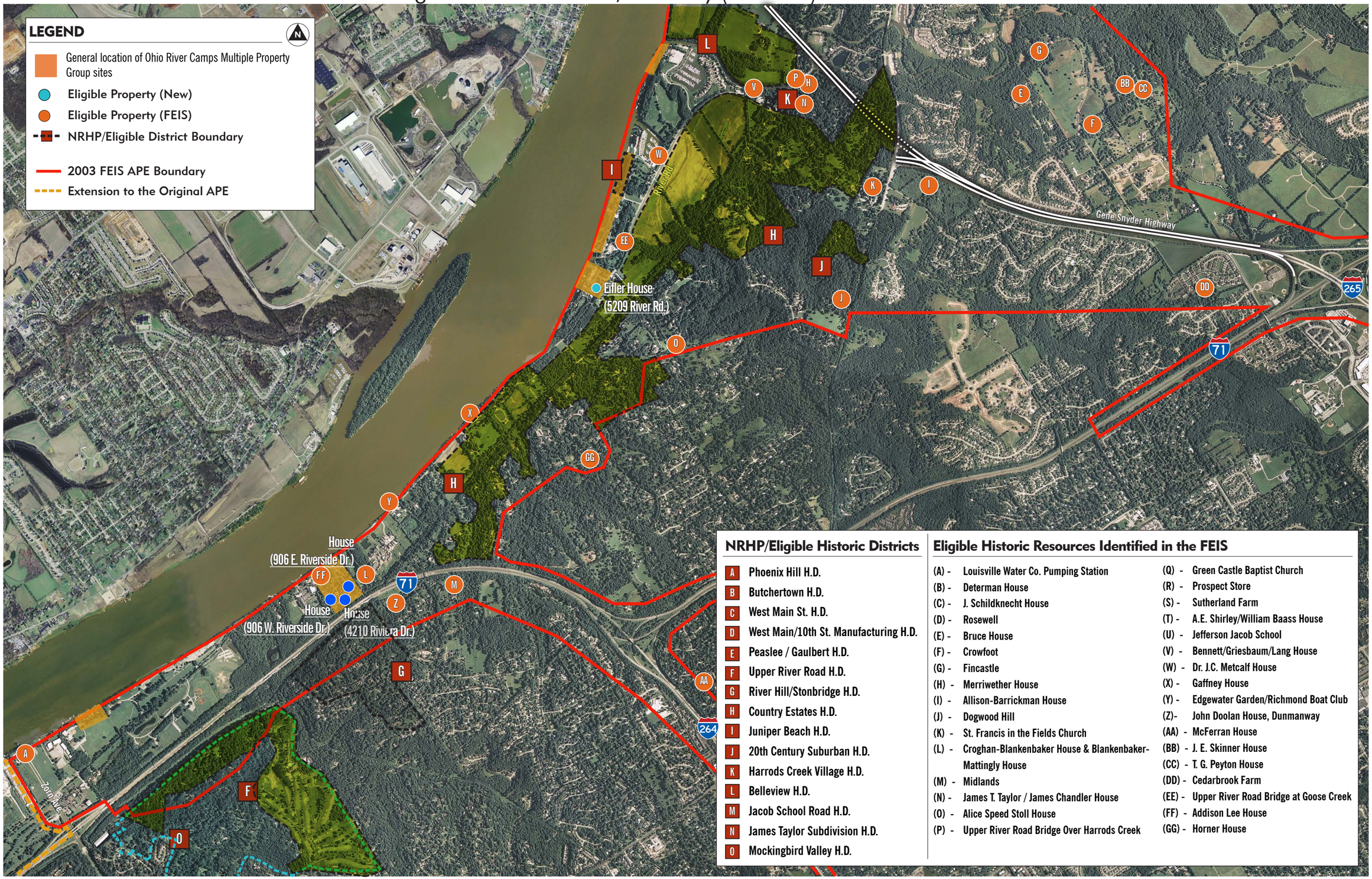


Eligible Properties Noted in the Updated Jefferson County Survey

(1) - House (1321 Main St.)
(2) - House (1323 Main St.)
(3) - House (1325 Main St.)
(4) - House (1327 Main St.)
(5) - House (1329 Main St.)
(6) - House (1331 Main St.)
(7) - House (1429 Mellwood Ave.)
(8) - House (1431 Mellwood Ave.)
(9) - House (1433 Mellwood Ave.)
(10) - House (1435 Mellwood Ave.)
(11) - House (1437 Mellwood Ave.)
(12) - House (1445 Mellwood Ave.)
(13) - House (1447 Mellwood Ave.)
(14) - House (1449 Mellwood Ave.)
(15) - House (1451 Mellwood Ave.)
(16) - House (1453 Mellwood Ave.)
(17) - House (1455 Mellwood Ave.)
(18) - House (1459 Mellwood Ave.)
(19) - House (1463 Mellwood Ave.)
(20) - House (1465 Mellwood Ave.)
(21) - House (1467 Mellwood Ave.)
(22) - House (713 Broadway)
(23) - Commercial Bldg. (719 Broadway)
(24) - Commercial Bldg. (725 Broadway)
(25) - Commercial Bldg. (909 Broadway)
(26) - Commercial Bldg. (706 Chestnut St.)
(27) - Eclipse Woolen Mill (1044 Chestnut St.)
(28) - House (703 Jefferson St.)
(29) - Commercial Bldg. (727 Jefferson St.)
(30) - Commercial Bldg. (747 Jefferson St.)
(31) - Commercial Bldg. (218-220 Shelby St.)
(32) - House (909 Jefferson St.)
(33) - House (921 Jefferson St.)
(34) - House (923 Jefferson St.)
(35) - House (925 Jefferson St.)
(36) - Commercial Bldg. (1450 Mellwood Ave.)
(37) - Commercial Bldg. (1634 Mellwood Ave.)
(38) - Commercial Bldg. (1648 Mellwood Ave.)
(39) - Commercial Bldg. (1726 Mellwood Ave.)
(40) - Commercial Bldg. (1728 Mellwood Ave.)
(41) - Commercial Bldg. (1734 Mellwood Ave.)
(42) - Commercial Bldg. (130 Spring St.)

Figure 5.3-3b

Historic Resources Identified within the Original APE - Louisville, Kentucky (East End)



NRHP/Eligible Historic Districts

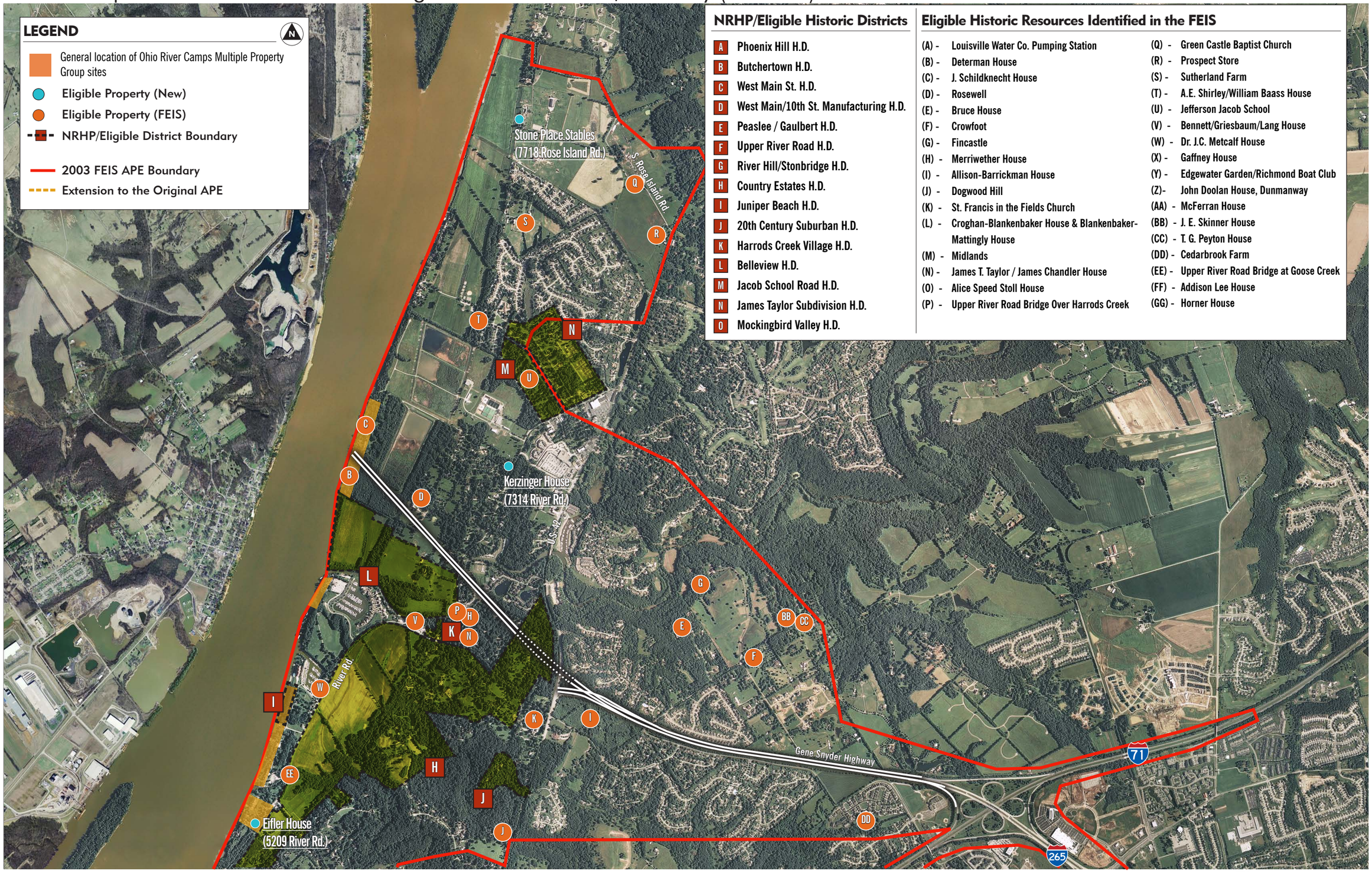
- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O Mockingbird Valley H.D.

Eligible Historic Resources Identified in the FEIS

- (A) - Louisville Water Co. Pumping Station
- (B) - Determan House
- (C) - J. Schildknecht House
- (D) - Rosewell
- (E) - Bruce House
- (F) - Crowfoot
- (G) - Fincastle
- (H) - Merriwether House
- (I) - Allison-Barrickman House
- (J) - Dogwood Hill
- (K) - St. Francis in the Fields Church
- (L) - Croghan-Blankenbaker House & Blankenbaker-Mattingly House
- (M) - Midlands
- (N) - James T. Taylor / James Chandler House
- (O) - Alice Speed Stoll House
- (P) - Upper River Road Bridge Over Harrods Creek
- (Q) - Green Castle Baptist Church
- (R) - Prospect Store
- (S) - Sutherland Farm
- (T) - A.E. Shirley/William Baass House
- (U) - Jefferson Jacob School
- (V) - Bennett/Griesbaum/Lang House
- (W) - Dr. J.C. Metcalf House
- (X) - Gaffney House
- (Y) - Edgewater Garden/Richmond Boat Club
- (Z)- John Doolan House, Dunmanway
- (AA) - McFerran House
- (BB) - J. E. Skinner House
- (CC) - T. G. Peyton House
- (DD) - Cedarbrook Farm
- (EE) - Upper River Road Bridge at Goose Creek
- (FF) - Addison Lee House
- (GG) - Horner House

Figure 5.3-4a

Historic Properties Identified within the Original APE - Louisville, Kentucky (East End)



NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O Mockingbird Valley H.D.

Eligible Historic Resources Identified in the FEIS

- (A) - Louisville Water Co. Pumping Station
- (B) - Determan House
- (C) - J. Schildknecht House
- (D) - Rosewell
- (E) - Bruce House
- (F) - Crowfoot
- (G) - Fincastle
- (H) - Merriwether House
- (I) - Allison-Barrickman House
- (J) - Dogwood Hill
- (K) - St. Francis in the Fields Church
- (L) - Croghan-Blankenbaker House & Blankenbaker-Mattingly House
- (M) - Midlands
- (N) - James T. Taylor / James Chandler House
- (O) - Alice Speed Stoll House
- (P) - Upper River Road Bridge Over Harrods Creek
- (Q) - Green Castle Baptist Church
- (R) - Prospect Store
- (S) - Sutherland Farm
- (T) - A.E. Shirley/William Baass House
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- (X) - Gaffney House
- (Y) - Edgewater Garden/Richmond Boat Club
- (Z)- John Doolan House, Dunmanway
- (AA) - McFerran House
- (BB) - J. E. Skinner House
- (CC) - T. G. Peyton House
- (DD) - Cedarbrook Farm
- (EE) - Upper River Road Bridge at Goose Creek
- (FF) - Addison Lee House
- (GG) - Horner House

Figure 5.3-4b

DOWNTOWN RESOURCES—KENTUCKY

(See Figure 5.3-3)

Identification of Additional Historic Resources for the SDEIS—Original APE

The *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* did not identify any new properties within the Downtown Kentucky APE as NRHP eligible resources.

Update to Historic Properties Identified in the 2003 FEIS and Modified Since that Time

Since the completion of the 2003 FEIS, there were no properties within the Original APE that have been altered in such a way to change the FEIS Selected Alternative effect determinations or the proposed effect determinations for the Modified Selected Alternative.

Historic Resources Unchanged Since the FEIS

This final section includes Table 5.3-10 below which lists properties that have remained unchanged from the 2003 FEIS, and compares the effect determination for properties relative to FEIS Selected Alternative to proposed effect determinations for the Modified Selected Alternative. Similar to the previous evaluations, these determinations address project-related encroachment, noise, vibration, visual, and construction impacts that could affect these historic properties. For a complete evaluation of the effects on these various resources refer to Section 5.3 of the 2003 FEIS and the *Effects Recommendations Document* in Appendix D.4.2.1.

TABLE 5.3-10
DOWNTOWN LOUISVILLE RESOURCES IMPACT ASSESSMENT SUMMARY

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
KD-HC-5	Phoenix Hill Historic District	Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction	Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction
KD-HC-4	Butchertown Historic District	Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction	Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction
KD-HC-JFCD107	Snead Manufacturing Company	No Effect		No Effect	
KD-HC-107	West Main Street Historic District	No Effect		No Effect	
-	Peaslee-Gaulbert Paint Manufacturing Historic District	No Effect		No Effect	
	↳ Wrampelmeier Furniture Company	No Effect		No Effect	
	↳ Greve, Buhrlage and Company	No Effect		No Effect	

	↳ Peaslee-Gaulbert Warehouse	No Effect	No Effect
	↳ Greve, Buhrlage and Company	No Effect	No Effect
	West Main/10th Street Manufacturing Historic District	No Effect	No Effect
KD-HC-JFWP134	↳ New Enterprise Tobacco	No Effect	No Effect
KD-HC- JFWP137	↳ Tobacco Realty Company	No Effect	No Effect
KD-HC-JFCD 218	Belle of Louisville	No Effect	No Effect
KD-HC- JFCD-252	Mayor Andrew Broaddus	No Effect	No Effect
KD-HC-JFCD 159	Louisville Medical College Building	No Effect	No Effect
JFCD-314	Theodore Ahrens Trade High School	No Effect	No Effect
KD-HC-JFWP139	Brown Tobacco Warehouse	No Effect	No Effect
KD-HC-JFWP-142	E. J. O'Brien Office	No Effect	No Effect
KD-HC-JFWP-144	Givens, Headley and Company Tobacco Warehouse	No Effect	No Effect
-	Pennsylvania Freight Depot	No Effect	No Effect
-	Conrad-Rawls Shoe Company	No Effect	No Effect

↳ Located within Historic District

EAST END RESOURCES—KENTUCKY

(See Figure 5.3-4a and 4b)

Identification of Additional Historic Properties for the SDEIS—Original APE

The *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* was recently completed and approved in November 2010. The update identified six properties within the Kentucky East End APE as potentially NRHP-eligible resources. Information about these resources is contained in Section 4.3 of the SDEIS. Proposed effect determinations for both the FEIS Selected Alternative and the Modified Selected Alternative are detailed below. Similar to the previous FEIS evaluations, these effect determinations address project-related encroachment, noise, vibration and visual, or construction impacts that could affect these historic properties. Because the FEIS Selected Alternative and the Modified Selected Alternative share an alignment in the East End Corridor, the proposed effect determinations would be the same.

1. Kirzinger House, 7314 River Road (JF-1987)

The Kirzinger House at 7314 River Road is a Federal style house. It is rectangular in form with a side gabled roof and horizontal siding. The windows of the front façade are symmetrical with

wood shutters and double hung, six over one sashes. There is a small extended entry porch topped by a triangular pediment. The centered entrance is flanked by side lights and a transom.

Because the resource is located approximately one-half mile away from the shared alignment of the FEIS Selected Alternative and the Modified Selected Alternative, neither alternative would have an effect on this property. Between the alternatives and the Kirzinger House are Mayfair Avenue and Transylvania Avenue that are lined with houses and mature trees. The numerous residences and trees block views of both alternatives from the resource, resulting in a No Effect finding for visibility.

TABLE 5.3-11
KIRZINGER HOUSE, 7314 RIVER ROAD IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings
JF-1987	7314 River Road	N/A	No Effect

2. Stone Place Stables, 7718 Rose Island Road (JF-1949)
The house at 7718 Rose Island Road is a Colonial Revival style cottage. It is a single story house with a side gabled roof and has a cut-away porch supported by a simple, round corner column. The main fieldstone chimney protrudes from the side of the house. The windows are double hung two over two sashes, but appear to be replacements.

Because the resource is 2.1 miles away from the shared alignment of the FEIS Selected Alternative and the Modified Selected Alternative, a No Effect determination for encroachment, visual, noise, vibration and construction is proposed.

TABLE 5.3-12
STONE PLACE STABLES, 7718 ROSE ISLAND ROAD IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings
JF-1949	7718 Rose Island Road	N/A	No Effect

3. Woodhill Valley Subdivision Historic District
The Woodhill Valley Road Subdivision Historic District was identified in the 2010 *Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road* as eligible for listing in the NRHP. Thirteen structures along Woodhill Valley Road were surveyed as part of the survey update. Twelve were determined to be contributing resources to a potential historic district once the 50-year threshold was reached under a context of mid-century suburban development in Jefferson County.

The structures that comprise the Woodhill Valley Road Subdivision are approximately 1,500 feet from the alignment for both the FEIS Selected Alternative and the Modified Selected

Alternative. As such, this would result in a No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives.

TABLE 5.3-13
WOODHILL VALLEY SUBDIVISION IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings
---	Woodhill Valley Road	N/A	No Effect

4. Mockingbird Valley Historic District

The Mockingbird Valley Historic District is a residential neighborhood about five miles east of the center of downtown Louisville. The district is generally bounded by I-71 on the north, Brownsboro Road on the south, Swing Lane on the east, and Jarvis Lane on the west Mockingbird Valley Road provides the spine of the district. The undulating landscapes, sharp bluffs, meandering creek bed, stone outcroppings, floodplains, and stands of trees are the character-defining features of this residential, suburban landscape. The district, which includes 179 contributing elements, was listed on the NRHP in 2007 under Criterion A.

The properties that comprise the Mockingbird Valley Road are approximately 2.5 miles away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives.

TABLE 5.3-14
MOCKINGBIRD VALLEY IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings
---	Mockingbird Valley Road	N/A	No Effect

5. Ohio River Recreational Camps/Communities (multiple properties)

Below is a listing of individual properties identified in the 2010 survey update as eligible as a group, but not as a contiguous district. While the 2003 FEIS analysis examined most of the beach communities as potential districts, the 2010 survey update provides a greater level of detail by making eligibility determinations on individual properties as part of a Multiple Property Listing. The group of Ohio River Camp properties that follows also includes proposed effect determinations for the respective properties as they relate to both the FEIS Selected Alternative and the Modified Selected Alternative. The first group of properties includes those that could potentially be adversely affected by the project, followed by those properties that could have No Adverse Effect determinations. The final group of River Camp properties includes those located far enough removed from both the FEIS Selected Alternative and the Modified Selected Alternative that No Effect determinations are proposed. These proposed effects findings are part

of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

Multiple Property Documentation Form (MPDF) River Camps Group Resources—Transylvania Beach

Table 5.3-15a at the conclusion of the multiple Transylvania Beach Road properties discussion compares the previous determination of effects for the FEIS Selected Alternative to the proposed determination of effects for the Modified Selected Alternative

House - 6000 Transylvania Beach Road
This two-story house is like many on Transylvania Beach where the first story is basically a raised foundation for the house. The first story is sided in mortared fieldstone which obscures the material (likely concrete block); the second story is frame, sided in vertical wood paneling. This house is one of the few on Transylvania Beach with an attached garage. The house has an integral two-story rear porch up on piers. The house is identified as eligible as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 680 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The resource is approximately 680 feet away from both alternatives. The 2011 noise study determined that noise levels would rise on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 680 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction:
The resource is approximately 680 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6012 Transylvania Beach Road
This two-story house is like many on Transylvania Beach where the first story is a raised foundation for the house. The second story is frame, sided in vertical boards. All openings have been boarded except for about five sets of sliding windows in an enclosed integral porch area at the front/right corner of the second story. The house has a rear deck up on piers. The house is identified as eligible as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual:
The resource is approximately 250 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The 2011 noise study determined that noise levels would rise on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street; resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 250 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource is approximately 250 feet away from both alternatives, it falls within the 500-foot area where affects from blasting vibration occurs, resulting in an Adverse Effect finding for vibration from blasting.

Construction:
As the resource is approximately 250 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6212 Transylvania Beach Road
This two-story house is like many on Transylvania Beach where the first story is a raised foundation for the house. The first story is brick veneer covered concrete block; the second is aluminum-sided frame. There is a tall, vertically-oriented casement window in the northeast side of the house. The house has a rear enclosed porch opening onto a rear deck. The house is identified as contributing as part of the Ohio River Camps Multiple Property Group.
Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 350 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The resource is approximately 350 feet away from both alternatives. The 2011 noise study determined that noise levels would rise on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street; resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 350 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource is approximately 350 feet away from both alternatives, it falls within the 500-foot area where affects from blasting vibration occurs, resulting in an Adverse Effect finding for vibration from blasting.

Construction:
As the resource is approximately 350 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6312 Transylvania Beach Road
This two-story house is like many on Transylvania Beach where the first story is basically a raised foundation for the house. The first story is rusticated concrete block and the second story is frame, sided in horizontal boards. The house has a single story attached concrete block garage addition. The garage has a patio area on the flat-roofed top with a wooden open rail balustrade, part of a larger deck/patio that spans the rear of the house. The house is identified as eligible as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 900 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The resource is approximately 900 feet away from both alternatives. The 2011 noise study determined that noise levels would increase on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 900 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction:
The resource is approximately 900 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6400 Transylvania Beach Road
This is a single story side gable frame house that rests on piers. A brick foundation wall has been built around the piers. The house is clad in vinyl siding and has an exterior brick chimney located on the western façade. A full width porch adorns the front façade. It is topped by a shed roof that is supported by square, wood posts. The house is identified as contributing as part of the Ohio River Camps Multiple Property Group.
Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 950 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The resource is approximately 950 feet away from both alternatives. The 2011 noise study determined that noise levels would increase on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 950 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction: The resource is approximately 950 feet away from both alternatives and is located on a dead-end street which would likely be used during construction. Therefore, it would likely experience impacts from construction activities, resulting in an Adverse Effect finding for construction.

House - 6402 Transylvania Beach Road

This two-story house is like many on Transylvania Beach where the first story is a raised foundation for the house. The first story is concrete and the second story may be frame; the entire house has been sided in brick veneer. The main, second story entrance is accessed by curved metal stairs which meet at a brick veneer stoop with a poured concrete porch. The house is identified as contributing as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 1,040 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:

The resource is approximately 1,040 feet away from both alternatives. The 2011 noise study determined that noise levels would rise on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street; resulting in an Adverse Effect finding for noise.

Vibration:

Traffic Vibration—The resource is approximately 1,040 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction: The resource is approximately 1,040 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6404 Transylvania Beach Road (JF-2080)
This two-story house is like many on Transylvania Beach where the first story is a raised foundation for the house. The first story appears to be concrete block with a brick veneer on its façade. The second story is frame and sided in vertical wood paneling and aluminum siding on the gable ends. Projecting from the left side of the second story is a single bay shed roof enclosed porch on tall piers and sheltering a first story entrance and another porch area beneath. The second story has double French doors that open onto a round-edged balcony with a metal rail. The house is identified as contributing as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 1,100 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise:
The resource is approximately 1,040 feet away from both alternatives. The 2011 noise study determined that noise levels would rise on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 1,100 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction: The resource is approximately 1,100 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

House - 6410 Transylvania Beach Road (JF-2081)
This two-story house is like many on Transylvania Beach where the first story is a raised foundation for the house. The first story is concrete block with a concrete coating; the second story is frame, sided in vertical wood paneling. At the roof ridge is a wide, interior brick chimney with several pots. The house is identified as contributing as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 1,300 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Both alternatives would introduce a new visual intrusion to the river camp landscape. By introducing new vertical and horizontal elements near the resource, both alternatives would result in an Adverse Effect finding for visibility. In addition, any lighting used for either alternative would also add an element which would be intrusive to the resource.

Noise: The resource is approximately 1,300 feet away from both alternatives. The 2011 noise study determined that noise levels would increase on Transylvania Beach Road by more than 18 dBA over existing levels. This increase in noise is likely to alter the feeling and setting associated with river camp houses situated on a dead-end street resulting in an Adverse Effect finding for noise.

Vibration:
Traffic Vibration—The resource is approximately 1,300 feet away from both alternatives and does not fall within the 40-foot (East End Kentucky approach) area of potential vibration damage associated with traffic for either the FEIS Selected Alternative or the Modified Selected Alternative, resulting in a No Effect finding for traffic vibration.

Construction Vibration—As the resource falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding for construction-induced vibration.

Blasting Vibration—As the resource falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding for blasting-induced vibration.

Construction:
The resource is approximately 1,300 feet away from both alternatives and is located on a dead-end street. The resource would likely experience impacts from construction activities resulting in an Adverse Effect finding for construction.

TABLE 5.3-15a
TRANSYLVANIA BEACH ROAD HOUSES IMPACT ASSESSMENT SUMMARY

Site	Address	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
JF-2145	6000 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, & Construction
JF-2075	6012 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, Vibration & Construction
JF-2077	6212 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, Vibration & Construction
JF-2078	6312 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, & Construction
JF-2146	6400 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, & Construction
JF-2079	6402 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, & Construction
JF-2080	6404 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, n & Construction
JF-2081	6410 Transylvania Beach Road	N/A	N/A	Adverse Effect	Visual, Noise, & Construction

MPDF RIVER CAMPS GROUP RESOURCES—GUTHRIE BEACH

The Guthrie Beach River Camp is comprised of two properties listed in Table 5.3-15b below that are approximately 0.5 mile away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. The house at 6208 Gutherie Beach Road is a one-story topped by a side-gable roof. The house at 6212 Gutherie Beach Road is two-story topped by a side-gable roof covered in new metal sheeting. These proposed effect findings outlined below are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

Encroachment: Neither the FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from these resources. There would be no encroachment on these properties, resulting in a No Effect finding for encroachment.

Visual: These properties are approximately 0.5 mile away from both alternatives at the closest point. Although the alternatives would be visible, neither would be directly in front of the resources. Based on the distance from the resources, both alternatives result in a No Adverse Effect finding for visibility. In addition, any lighting used for the alternatives would not be intrusive to the properties based on their distance from the resource.

Noise: As the resource is approximately 0.5 mile away from both alternatives, there would be no change in noise levels resulting in a No Effect finding for noise.

Vibration:

Traffic Vibration—As the resource is approximately 0.5 miles away from the FEIS Selected Alternative and the Modified Selected Alternative, there would be no opportunity for vibration from traffic.

Construction Vibration—The property falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be a No Effect finding for vibration from construction.

Blasting Vibration—This property also falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, and would result in a No Effect finding for vibration from blasting.

Construction:

As these resources are approximately 0.5 mile away from both the FEIS Selected Alternative and the Modified Selected Alternative, no construction activities would affect this resource resulting in a No Effect finding for construction.

TABLE 5.3-15b
MPDF RIVER CAMPS GROUP RESOURCES—GUTHRIE BEACH

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings	
JF-2029	6208 Gutherie Beach Road	N/A	No Adverse Effect	Visual
JF-2030	6212 Gutherie Beach Road	N/A	No Adverse Effect	Visual

MPDF RIVER CAMPS GROUP RESOURCES— 1 CREEKSIDE COURT

This house is a one-story gable-front river cottage, situated on the banks of Harrods Creek. The house has experienced very little alteration since its construction circa 1940. The building is identified as contributing as part of the Ohio River Camps Multiple Property Group.

Encroachment: Neither the FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 0.35 miles away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Based on the heavily wooded nature of its surroundings, the alternatives would only be partially visible at best, resulting in a No Adverse Effect finding for visibility. In addition, any lighting used for the alternatives would not be intrusive to the resource based on the distance from the resource and filtering by the wooded surroundings.

Noise: As the resource is approximately 0.35 miles away from both alternatives, there would be no change in noise levels, resulting in a No Effect finding for noise.

Vibration:
Traffic Vibration—As the resource is approximately 0.35 miles away from the FEIS Selected Alternative and the Modified Selected Alternative, there would be no opportunity for vibration from traffic.

Construction Vibration—The property falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be a No Effect finding for vibration from construction.

Blasting Vibration—This property also falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, and would result in a No Effect finding for vibration from blasting.

Construction: Because the FEIS Selected Alternative and the Modified Selected Alternative are approximately 0.5 miles away, no construction activities would affect this property resulting in a No Effect finding for construction.

TABLE 5.3-15c
MPDF RIVER CAMPS GROUP RESOURCES—1 CREEKSIDE COURT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative and FEIS Selected Alternative Proposed Findings	
JF-2014	1 Creekside Court	N/A	No Adverse Effect	Visual

MPDF RIVER CAMPS GROUP RESOURCES—BEACHLAND BEACH

The Beachland Beach River Camp is comprised of two properties listed below that are approximately one mile away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. The cabin at 7206 Beachland Beach Road is a one-story end gable river cottage and the resource at 7214 Beachland Beach Road is a one-story structure. Both resources are constructed of concrete block. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

Encroachment: Neither the FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 1.0 mile away from both alternatives at the closest point. Although the alternatives would be visible, neither would be directly in front of the resource. Based on the distance from the resource, both alternatives would result in a No Adverse Effect finding for visibility. In addition, any lighting used for the alternatives would not be intrusive to the resource based on their distance from the resource.

Noise: As the resource is approximately 1.0 mile away from both alternatives, there would be no change in noise levels, resulting in a No Effect finding for noise.

Vibration: Traffic Vibration—As the resource is one mile away from both the FEIS Selected Alternative and the Modified Selected Alternative and is situated on a dead-end street away from any main roadways, there would be no opportunity for vibration from traffic. Therefore, this results in a No Effect finding.

Blasting Vibration—The property falls outside the 40-foot area where the potential to be adversely affected from non-blasting construction occurs, there would be a No Effect finding for vibration from construction.

Construction Vibration—This property also falls outside the 500-foot area where the potential to be adversely affected from blasting occurs, and would result in a No Effect finding for vibration from blasting.

Construction: Because the FEIS Selected Alternative and the Modified Selected Alternative are approximately 1.0 mile away, no construction activities would affect these properties resulting in a No Effect finding for construction.

TABLE 5.3-15d
MPDF RIVER CAMPS GROUP RESOURCES—BEACHLAND BEACH

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative Proposed Findings	
JF-2115	7206 Beachland Beach Road	N/A	No Adverse Effect	Visual
JF-2371	7214 Beachland Beach Road	N/A	No Adverse Effect	Visual

MPDF RIVER CAMPS GROUP RESOURCES—WALDOAH BEACH

The group of resources listed below that comprise the Waldoah Beach River Camp is approximately two miles away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a proposed No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-15e
MPDF RIVER CAMPS GROUP RESOURCES—WALDOAH BEACH

KHC#	NAME	ADDRESS	EFFECTS DETERMINATION
JF-1927	Cabin	2801 Waldoah Beach Road	No Effect
JF-1926	Cabin	2805 Waldoah Beach Road	No Effect
JF-1925	Cabin	2809 Waldoah Beach Road	No Effect
JF-1923	Cabin	2810 Waldoah Beach Road	No Effect
JF-1924	Cabin	2811 Waldoah Beach Road	No Effect
JF-804	Cabin	2901 Waldoah Beach Road	No Effect
JF-1918	Cabin	2903 Waldoah Beach Road	No Effect
JF-1919	Cabin	2905 Waldoah Beach Road	No Effect
JF-1920	Cabin	2907 Waldoah Beach Road	No Effect
JF-1921	Cabin	2909 Waldoah Beach Road	No Effect
JF-1922	Cabin	2911 Waldoah Beach Road	No Effect
JF-805	Cabin	2913 Waldoah Beach Road	No Effect

JF-2372	Cabin	3227 River Road	No Effect

MPDF RIVER CAMPS GROUP RESOURCES—TURNER'S BEACH

The group of resources listed below that comprise the Turners Beach River Camp is approximately 1.9 miles away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a proposed No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-15f
MPDF RIVER CAMPS GROUP RESOURCES—TURNER'S BEACH

KHC#	NAME	ADDRESS	EFFECTS DETERMINATION
JF-2033	Cabin (#4)	3125 River Road	No Effect
JF-806	Cabin (#6)	3125 River Road	No Effect
JF-2034	Cabin (#8)	3125 River Road	No Effect
JF-807	Cabin (#12)	3125 River Road	No Effect
JF-2035	Cabin (#13)	3125 River Road	No Effect
JF-2036	Cabin (#16)	3125 River Road	No Effect
JF-2039	Cabin (no #)	3125 River Road	No Effect
JF-2031	Club & Pool Houses	3125 River Road	No Effect

MPDF RIVER CAMPS GROUP RESOURCES— RIVIERA NEIGHBORHOOD

The group of resources listed below that comprises the Riviera Neighborhood, which is approximately 3.3 miles away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a proposed No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-15g
MPDF RIVER CAMPS GROUP RESOURCES—RIVIERA NEIGHBORHOOD

KHC#	NAME	ADDRESS	EFFECTS DETERMINATION
JF-1935	House	906 Riverside Drive	No Effect
JF-1928	Tudor Revival House	906 East Riverside Drive	No Effect
JF-1931	House	912 East Riverside Drive	No Effect
JF-1934	House	904 Riverside Drive	No Effect
JF-1936	House	918 Riverside Drive	No Effect
JF-1937	House	922 West Riverside Drive	No Effect
JF-1939	Cape Cod House	906 West Riverside Drive	No Effect
JF-1933	House	4210 Riviera Drive	No Effect

MPDF RIVER CAMPS GROUP RESOURCES—EIFLER BEACH

The group of resources listed below that comprise the Eifler Beach River Camp (including the William Eifler House) is approximately 1.7 miles away from the alignment for both the FEIS Selected Alternative and the Modified Selected Alternative. As such, this would result in a proposed No Effect finding for encroachment, visual, noise, vibration and construction for both alternatives. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-15h
MPDF RIVER CAMPS GROUP RESOURCES—EIFLER BEACH

KHC#	NAME	ADDRESS	EFFECTS DETERMINATION
JF-2007	William Eifler House	5209 River Road	No Effect
JF-2008	Cottage	5135 Eifler Beach Road	No Effect
JF-2009	Cottage	5139 Eifler Beach Road	No Effect
JF-2010	Cottage	5143 Eifler Beach Road	No Effect

6. Theodore Mueller House & Shady Brook Farm

The Theodore Mueller House was listed on the NRHP in 1983 under Criterion C. It is a significant example of a twentieth century country house in the Tudor Revival style with Arts and Crafts details. It is one of several dwellings built in the decade after WWI, an era in which wealthy Louisville families continued their turn-of-the-century trend of building of large suburban estates. The larger Shady Brook Farm is also listed on the NRHP as a part of the Harrods Creek Historic District.

Encroachment: Neither FEIS Selected Alternative nor the Modified Selected Alternative would require the acquisition of right-of-way from this resource. There would be no encroachment on this property, resulting in a No Effect finding for encroachment.

Visual: The resource is approximately 1,200 feet away from both the FEIS Selected Alternative and the Modified Selected Alternative at its closest point. Based on the heavily wooded nature of its surroundings and other existing residences, both alternatives are only partially visible, resulting in a No Adverse Effect finding for visibility. In addition, any lighting used for the alternative would not be intrusive to the resource based on its distance from the resource and the wooded surroundings.

Noise:
As the resource is approximately 1,200 feet away from the proposed alternatives, there would be no change in noise levels from the previous analysis, resulting in a No Effect finding for noise.

Vibration:
Traffic Vibration—As the property is approximately 1,200 feet away from the proposed alternatives and is situated on a residential street, there would be no opportunity for increased vibration from traffic. Therefore, this results in a No Effect finding.

Construction Vibration—As the property is approximately 1,200 feet away from the proposed alternative and is situated on a residential street, there would be no opportunity for vibration from construction. Therefore, this results in a No Effect finding.

Blasting Vibration—As the property is approximately 1,200 feet away from the proposed alternatives, there would be no opportunity for vibration from blasting. Therefore, this results in a No Effect finding.

Construction:
As the resource is approximately 1,200 feet away from the proposed alternatives, no construction activities would affect this resource, resulting in a No Effect finding for construction.

TABLE 5.3-16
THEODORE MUELLER HOUSE & SHADY BROOK FARM IMPACT ASSESSMENT

Site	Address	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative Proposed Findings	
JF-556	Avish Lane	N/A	No Adverse Effect	Visual

Update to Historic Properties Identified in the FEIS and Modified Since that Time

Since the completion of the 2003 FEIS, there were no properties within the Original East End APE that have been altered in such a way to change the FEIS Selected Alternative effect determinations or the proposed effect determinations for the Modified Selected Alternative.

Historic Resources Unchanged Since the FEIS

This final section includes Table 5.3-17 below which lists properties that have remained unchanged from the 2003 FEIS, and compares the effect determinations relative to FEIS Selected Alternative to proposed effect determinations for the Modified Selected Alternative. Similar to the previous evaluations, these determinations address project-related encroachment, noise, vibration, visual, and construction impacts that could affect these historic properties. For a complete evaluation of the effects on these various properties refer to Section 5.3 of the 2003 FEIS and the *Effects Recommendations Document* included in Appendix D.4.2.1.

TABLE 5.3-17
EAST END RESOURCES IMPACT ASSESSMENT SUMMARY

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
-	Upper River Road Historic District	No Effect		No Effect	
-	River Hill/Stonebridge Historic District	No Effect		No Effect	
-	Country Estates Historic	Adverse Effect	Visual, Noise,	Adverse Effect	Visual, Noise,

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
	District		Vibration, Construction		Vibration, Construction
-	↳ Drumanard Historic District	Adverse Effect	Visual, Noise, Vibration, Construction	Adverse Effect	Visual, Noise, Vibration, Construction
-	↳ Glenview Historic District	No Effect		No Effect	
-	↳ Harrods Creek Historic District	Adverse Effect	Visual	Adverse Effect	Visual
-	↳ Nitta Yuma Historic District	No Effect		No Effect	
JF-557	↳ Bingham-Hillard Estate	No Adverse Effect	Visual	No Adverse Effect	Visual
JF-533	↳ Winkworth	No Effect		No Effect	
JF-555	↳ Rogers Clark Ballard School	No Effect		No Effect	
JF-531	↳ Lincliffe/William R Belknap House	No Effect		No Effect	
JF-532	↳ Ladless Hill	No Effect		No Effect	
JF-658	↳ Blankenbaker Station/Charles Bonnycastle	No Effect		No Effect	
JF-457	↳ Jesse Chrisler House	No Effect		No Effect	
JF-544	↳ Rockledge	No Effect		No Effect	
JF-545	↳ Shwab House	No Effect		No Effect	
JF-570	↳ Ashbourne	No Adverse Effect	Visual	No Adverse Effect	Visual
-	Juniper Beach District	No Adverse Effect	Visual	No Adverse Effect	Visual
-	Harrods Creek Village Historic District	Adverse Effect	Visual	Adverse Effect	Visual
-	Jacob School Road Historic District	No Effect		No Effect	
-	James T Taylor Subdivisions Historic District	No Effect		No Effect	
JF-839	Shirley/Baass/Taylor House	No Adverse Effect	Visual	No Adverse Effect	Visual
JF-1863	John C Doolan House, Dunmanway	No Effect		No Effect	
JF-529	McFerran House	No Effect		No Effect	
JF-671	Midlands/Morris Belknap	No Effect		No Effect	
-	Louisville Water Company	No Effect		No Effect	

Site	Name	FEIS Selected Alternative 2003 Findings		Modified Selected Alternative Proposed Findings	
	Pumping Station				
-	Addison W Lee House	No Effect		No Effect	
JF-458	Croghan-Blankenbaker House	No Effect		No Effect	
JF-455	Dr. J C Metcalfe House	No Effect		No Effect	
JF-690	Merriwether House	Adverse Effect	Visual, Noise, Vibration	Adverse Effect	Visual, Noise, Vibration
JF-838	Green Castle Baptist Church	No Effect		No Effect	
JF-444	Prospect Store	No Effect		No Effect	
JF-559	Cedarbrook Farm	No Effect		No Effect	
	Alice Speed Stoll House	No Effect		No Effect	
JF-452	Rosewell/Barber House	Adverse Effect	Visual, Noise, Vibration, Construction	Adverse Effect	Visual, Noise, Vibration, Construction
JF-843	John Determan House	Adverse Effect	Visual, Noise, Vibration, Construction	Adverse Effect	Visual, Noise, Vibration, Construction
JF-841	J. Schildknecht House	Adverse Effect	Visual, Noise, Construction	Adverse Effect	Visual, Noise, Construction
JF-786	Old Upper River Road Bridge over Goose Creek	No Effect		No Effect	
JF845	Upper River Road Bridge over Harrods Creek	Adverse Effect	Visual, Vibration	Adverse Effect	Visual, Vibration
JF-802	Edgewater Garden/Richmond Boat Club	No Effect		No Effect	
JF-677	J J Gaffney House	No Effect		No Effect	
-	Bennett/Griesbaum/Lang House	No Effect		No Effect	
JF453	Belleview	Adverse Effect	Visual, Noise, Vibration, Construction	Adverse Effect	Visual, Noise, Vibration, Construction
JF-447	Sutherland Farm	No Effect		No Effect	
JF-772	Dogwood Hill	No Effect		No Effect	
JF-784	James T Taylor/James W Chandler House	Adverse Effect	Visual, Noise, Vibration	Adverse Effect	Visual, Noise, Vibration
JF-676	St Francis in the Fields Church	Adverse Effect	Visual, Construction	Adverse Effect	Visual, Construction
		No Adverse Effect	Noise	No Adverse Effect	Noise
JF-563	Allison-Barrickman House	Adverse Effect	Visual, Noise, Vibration, Construction	Adverse Effect	Visual, Noise, Vibration, Construction
JF-1940	Crowfoot/R. F. Cate House	No Effect		No Effect	
JF-918	Fincastle	No Effect		No Effect	
JF-581	J E Skinner House	No Effect		No Effect	

Site	Name	FEIS Selected Alternative 2003 Findings	Modified Selected Alternative Proposed Findings
JF-580	T G Peyton House	No Effect	No Effect
JF-1948	Royal/Kolbrook/Bruce House	No Effect	No Effect
-	Horner House	No Effect	No Effect

↳ Located within Historic District

HISTORIC PROPERTIES WITHIN THE EXTENSIONS TO THE ORIGINAL APE

5.3.1.3 Indirect Effects on Historic Resources

The 2003 FEIS 5.3.1.3, beginning on page 5-243 provides an assessment of indirect and cumulative effects for the proposed LSIORB Project. That analysis remains valid for this SDEIS, with the following general updates: the population information has been updated in SDEIS Section 5.1, the list of other reasonably foreseeable highway projects has been updated in Chapter 3, and the section that follows provides an assessment of indirect effects anticipated from the Modified Selected Alternative. The 2003 FEIS assessment identifies indirect effects of the Two Bridge/Highway Project, and specifically for the selected alternative of C-1 and A-15, which are common between the FEIS Selected Alternative and the Modified Selected Alternative. The differences between these two build alternatives, and thus the differences in the potential indirect impacts, include (1) the anticipated traffic changes from tolling the Modified Selected Alternative and (2) the fact that the Modified Selected Alternative does not include the I-71/Frankfort Avenue interchange, which is included in the FEIS Selected Alternative. These design differences are anticipated to produce different travel patterns. It is these different travel patterns that are the sources of the indirect effects analyzed herein for the Modified Selected Alternative.

The Extensions to the Original APE, as described in SDEIS Section 4.3.1, were developed based on this traffic analysis for Modified Selected Alternative. A multi-tiered screening process was developed to identify local surface streets in subareas that may experience notable changes in traffic volumes or operations due to the implementation of cross-river tolls and other proposed project modifications. The boundaries of these Extended APE subareas were identified based on travel demand model output for the AM and PM peak periods, interpretation of these results by professional traffic engineers, and consultation with the SHPO in both states. These boundaries represent reasonable attempts to define areas that could experience effects due to changes in traffic patterns or design modifications. The results were five subareas where traffic would be expected to be different: portions of Jeffersonville, Clarksville/S.R. 62, New Albany, downtown Louisville, and River Road. Representative examples of historic properties within these five subareas of the Extensions to the Original APE are also identified in SDEIS Section 4.3.1. The proposed anticipated effects to the subareas are summarized below.

Potential Indirect Effects on Historic Resources within the Extensions to the Original APE

For historic properties within the 2011 Extensions to the Original APE, the effects analysis for historic properties focused on the impacts of diverted traffic, which are indirect and cumulative. Because of the nature of indirect impacts, effects were evaluated based on their impacts at the subarea level, rather than on a property-by-property basis.

Encroachment and construction effects occur only within the 2003 Original APE, and are not discussed for the five subareas in the sections below. Economic impacts are not expected within the five subareas and are also not discussed in the sections below. While increases and decreases in traffic can affect accessibility, parking, or pass-by trips in historic districts, the extent of changes in traffic patterns forecast for this Project are minimal and would not result in an economic loss that would alter the characteristics that qualify the historic buildings in which businesses are located for inclusion in or eligibility for the National Register of Historic Places. Discussion of traffic movements for the project is provided in the Traffic Forecasting Appendix of the SDEIS.

As documented in the *Identification Findings Report* during the Section 106 consultation process, a multi-tiered screening process was developed to identify local surface streets in subareas that may experience noticeable changes in traffic volumes or operations due to the implementation of cross-river tolls and other proposed Project modifications. The boundaries of these Extended APE subareas were identified based on travel demand model output for the AM and PM peak periods, interpretation of these results by professional traffic engineers, and consultation with the SHPO in both states. These boundaries represent reasonable attempts to define areas that could experience effects due to changes in traffic patterns or design modifications. Changes in traffic patterns could result in visual, noise, vibration, or air quality impacts, as discussed below. Specific impacts in each of the subareas are discussed in the following section.

Visual: The introduction of additional traffic can create visual effects. Due to the fact that visual effects cannot be quantitatively measured and do not harm the elements of a historic property in a physical manner, assessing visual effects on historic properties relies primarily on subjective analysis. Forecasted changes in traffic patterns were used to identify whether the change would be visibly perceptible (defined as a change of 1-2 vehicles per minute per lane during the peak hour). If the traffic change reaches this range and is determined to be perceptible, that does not necessarily mean it is an automatic adverse effect. For it to be considered an adverse effect, the traffic change would have to affect the character of the subarea in such a way as to diminish the qualities that relay its significance.

Noise: Similarly, changes in traffic patterns can lead to changes in noise effects along travel corridors. The FHWA Noise Policy website states that a 3 dBA change is the minimum increase in noise that can be perceived by the human ear. Also according to the FHWA Noise Policy website, it takes a doubling of the traffic volume or changes in vehicle mix (i.e., trucks, cars, motorcycles, etc.) to increase noise by 3 dBA. Changes in noise levels could impact the setting of a historic property; if the setting of a historic property does not contribute to understanding its significance, then the introduction of additional traffic in that setting may not diminish the

integrity of the characteristics of the historic property which make it eligible for the National Register of Historic Places.

Vibration: Increased vibration has the potential to damage historic properties. Heavy trucks are the primary source of traffic-induced ground-borne vibration. The FTA Transit Noise and Vibration Impact Assessment manual (May 2006) identifies methodologies to define ground-borne vibration. As illustrated in Figure 7-3 in the FTA manual, heavy trucks and buses generate approximately 65 VdB, which is slightly below the threshold for human perception. For reference, the threshold for cosmetic damage to fragile buildings is considerably higher, estimated at around 100 VdB, similar to the impacts from blasting 50 feet away from the resource.

Air Quality: The air quality analysis does not distinguish between the Original APE and the Extensions to the Original APE. The results showed CO, PM2.5, Ozone, and MSATs meet air quality conformity standards. Because these results apply to the entire metropolitan area, none of the properties are considered to have an effect as a result of changes in air quality.

The following subsections describe the effects of the project on historic properties within the Extensions to the Original APE. Because of the nature of indirect impacts, effects are evaluated based on their impacts at the subarea level, rather than on a property-by-property basis. Only the visual, noise, and vibration impact categories were repeated for these areas; encroachment and construction were omitted since these subareas fall outside the footprint of the project. Air quality was not repeated for each subarea as this analysis was completed for the entire metropolitan area. Because these effect findings have not yet been finalized, consulting parties have not yet been engaged in consultation to resolve adverse effects. FHWA anticipated that Section 106 consultation will be concluded, or nearly concluded, by the time the SFEIS is issued. If there are changes in the effects analyses as a result of further Section 106 consultation, those changes will be included in the SFEIS.

INDIANA RESOURCES:

Indirect effects on the Extensions to the Original APE in Jeffersonville, Clarksville, and New Albany are discussed in the following subsections.

Extensions to the Original APE Subarea—Jeffersonville, Indiana

This subarea is comprised primarily of traditional, single family residential development. The area developed as an urban street grid, lined with commercial and residential structures. It lies between the Old Jeffersonville Historic District to the south and the Quartermaster Depot Historic District to the north. The primary east-west highway connections through the area are Court Avenue and 10th Street, which are lined with commercial development. The northeastern portion of the Jeffersonville Extended APE contains the most intact concentration of single family, detached residences. The Court Avenue corridor follows the southern edge of the subarea and is comprised almost entirely of professional offices and institutional/government uses. The 10th Street corridor generally follows the northern edge of the subarea and is comprised primarily of commercial development.

Effects Findings—FEIS Selected Alternative

This subarea falls beyond the limits of the Original APE. Because this alternative does not include tolling, changes in traffic patterns are not associated with this alternative. This scenario was identified as the baseline for comparison to identify changes in traffic patterns resulting from the Modified Selected Alternative.

Effects Findings—Modified Selected Alternative

Visual: The projected traffic increases fall below the threshold for a perceptible change in traffic (1-2 additional vehicles per lane per minute during the peak hour). This results in a No Effect finding for visual.

Noise: In Jeffersonville, traffic is not projected to double. Therefore, noise would not increase by a perceptible level (3 dBA). This results in a No Effect finding for noise.

Vibration: No change in the mix of traffic patterns are projected in this area. Heavy truck traffic is projected to fall well below the threshold for ground-borne vibratory impacts, which is defined in the FTA Manual as approximately 100 VdB for minor cosmetic damage to fragile buildings. This results in a No Effect finding for vibration.

TABLE 5.3-20
EXTENSIONS TO THE ORIGINAL APE IMPACT ASSESSMENT—JEFFERSONVILLE

	Visual	Noise	Vibration
Modified Selected Alternative	No Effect	No Effect	No Effect

Extensions to the Original APE Subarea—Clarksville, Indiana

This subarea is comprised primarily of traditional, single family residential development along with some commercial development near major intersections. The area developed as an urban street network lined with commercial and residential structures, with primary traffic movements along SR 62 and South Clark Boulevard. Clark Boulevard represents the western boundary. The northern half of this area contains the most intact concentration of single-family, detached residences, most of which are single story structures, generally built in the 1930s and 1940s and exhibiting characteristics typically found in the American Small House style. Two small historic districts are located within the subarea: Clark Boulevard Historic District and Randolph Avenue Historic District.

State Road 62 is a limited access arterial connecting Clarksville and New Albany. The corridor is characterized by heavy commercial and some industrial developments that back up to this roadway. Older residential developments and wooded areas abut the northern portions of the route.

Effects Findings—FEIS Selected Alternative

This subarea falls beyond the limits of the Original APE. Because this alternative does not include tolling, changes in traffic patterns are not associated with this alternative. This scenario was identified as the baseline for comparison to identify changes in traffic patterns resulting from the Modified Selected Alternative.

Effects Findings—Modified Selected Alternative

Visual: The projected traffic increases are within the range for a perceptible change in traffic (1-2 additional vehicles per minute per lane during the peak hour); however, this is not expected to adversely affect the character of the subarea due to the low volume of additional traffic per minute (1-2 cars per lane). The projected traffic increases would not alter the setting, feeling, viewshed or association of its historic resources to their surroundings or to the current transportation system. This results in a No Adverse Effect finding for visual.

Noise: In Clarksville, traffic is not projected to double. Therefore, noise would not increase by a perceptible level (3 dBA). This results in a No Effect finding for noise.

Vibration: No change in the mix of traffic patterns are projected in this area. Heavy truck traffic is projected to fall well below the threshold for ground-borne vibratory impacts, which is defined in the FTA Manual as approximately 100 VdB for minor cosmetic damage to fragile buildings. This results in a No Effect finding for vibration.

TABLE 5.3-22
EXTENSIONS TO THE ORIGINAL APE IMPACT ASSESSMENT—CLARKSVILLE

	Visual	Noise	Vibration
Modified Selected Alternative	No Adverse Effect	No Effect	No Effect

Extensions to the Original APE Subarea—New Albany, Indiana

This subarea is comprised primarily of traditional, single family residential development along with new commercial development characteristic of the Vincennes Street corridor, industrial uses along the southern portion, and typical commercial/retail uses and governmental functions in the west. The area developed as an urban street grid and contains portions of twelve historic districts.

Similar to Clarksville residential areas, the residential subareas are single-family, detached residences—the majority of which are one-story structures. Many of the homes were built in the 1930s and 1940s and exhibit characteristics typically found in the American Small House style. The Vincennes Street corridor, which bisects Spring Street, is characterized primarily by commercial development.

The development within downtown New Albany area east of I-64 is comprised almost entirely of commercial (professional offices) and institutional/government uses. This includes city-county government offices, a public library, and a federal courthouse. The downtown New Albany area west of I-64 is comprised of a mix of land uses including residential, commercial, light industrial

uses, and some vacant parcels. The street pattern is a traditional city grid, with some one-way pairs.

Based on the fact that the twelve historic districts make up a majority of the New Albany subarea, they contain the same character defining features, a mixture of residential, residential and commercial or light industrial, as the larger subarea. Effects on the twelve historic districts previously identified in SDEIS Section 4.3 were evaluated in a combined assessment with the New Albany Extended APE since the character of each district is consistent with the larger subarea.

Effects Findings—FEIS Selected Alternative

This subarea falls beyond the limits of the Original APE. Because this alternative does not include tolling, changes in traffic patterns are not associated with this alternative. This scenario was identified as the baseline for comparison to identify changes in traffic patterns resulting from the Modified Selected Alternative.

Effects Findings—Modified Selected Alternative

Visual: With the traffic divided between the six primary east-west streets running through New Albany, the projected traffic increases are within the range for a perceptible change in traffic (1-2 additional vehicles per minute per lane during the peak hour); however, this is not expected to adversely affect the character of the subarea due to the low volume of additional traffic per minute (1-2 cars per lane). The projected traffic increases would not alter the setting, feeling, viewshed or association of its historic resources to their surroundings or to the current transportation system. This results in a No Adverse Effect finding for visual.

Noise: In New Albany, traffic is not projected to double. Therefore, noise would not increase by a perceptible level (3 dBA). This results in a No Effect finding for noise.

Vibration: No change in the mix of traffic patterns are projected in this area. Heavy truck traffic is projected to fall well below the threshold for ground-borne vibratory impacts, which is defined in the FTA Manual as approximately 100 VdB for minor cosmetic damage to fragile buildings. This results in a No Effect finding for vibration.

TABLE 5.3-24
EXTENSIONS TO THE ORIGINAL APE IMPACT ASSESSMENT—NEW ALBANY

	Visual	Noise	Vibration
Modified Selected Alternative	No Adverse Effect	No Effect	No Effect

Historic Properties Identified within the Extensions to the Original APE - Jeffersonville, Indiana

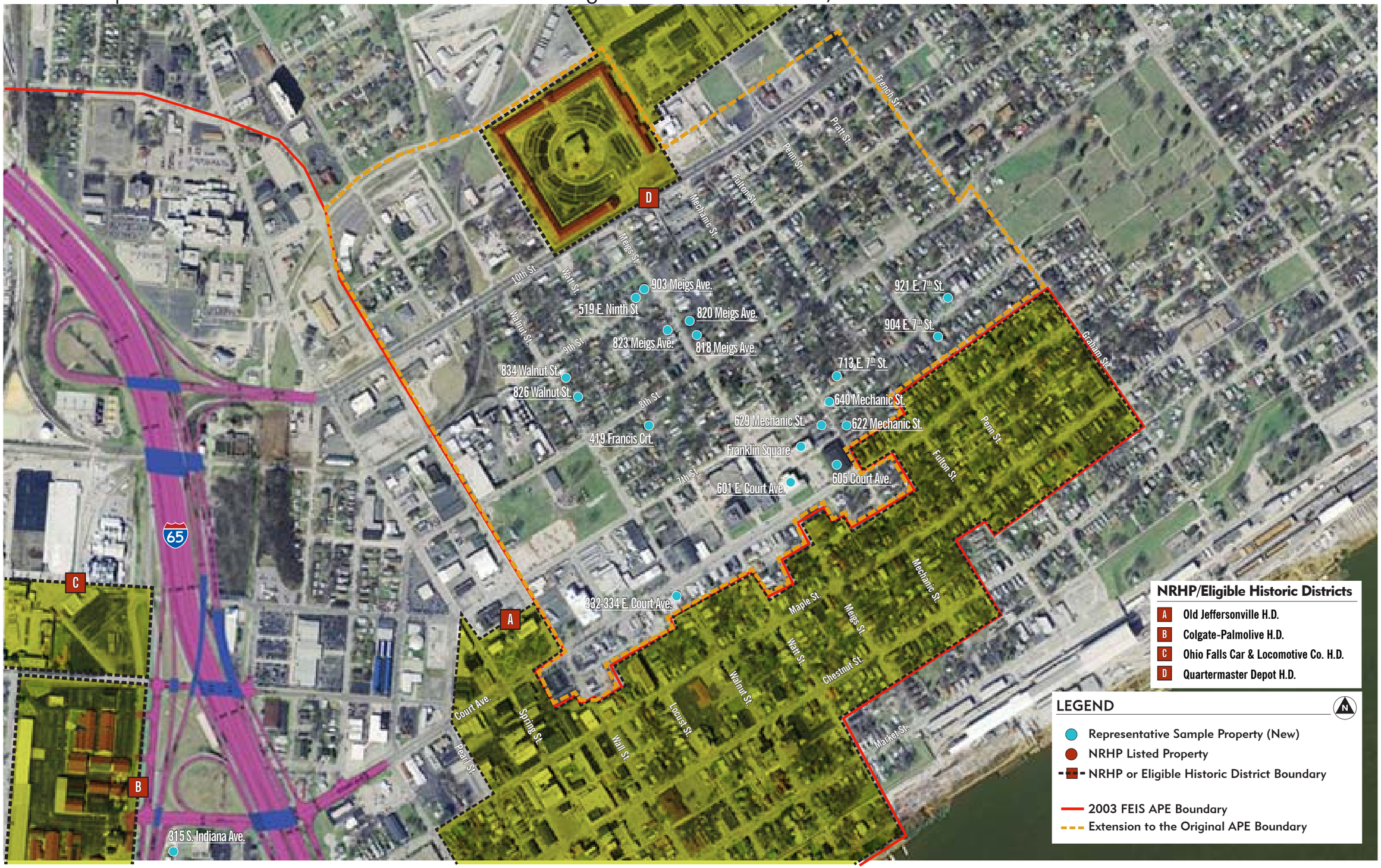


Figure 5.3-5

Historic Properties Identified within the Extensions to the Original APE - Clarksville, Indiana

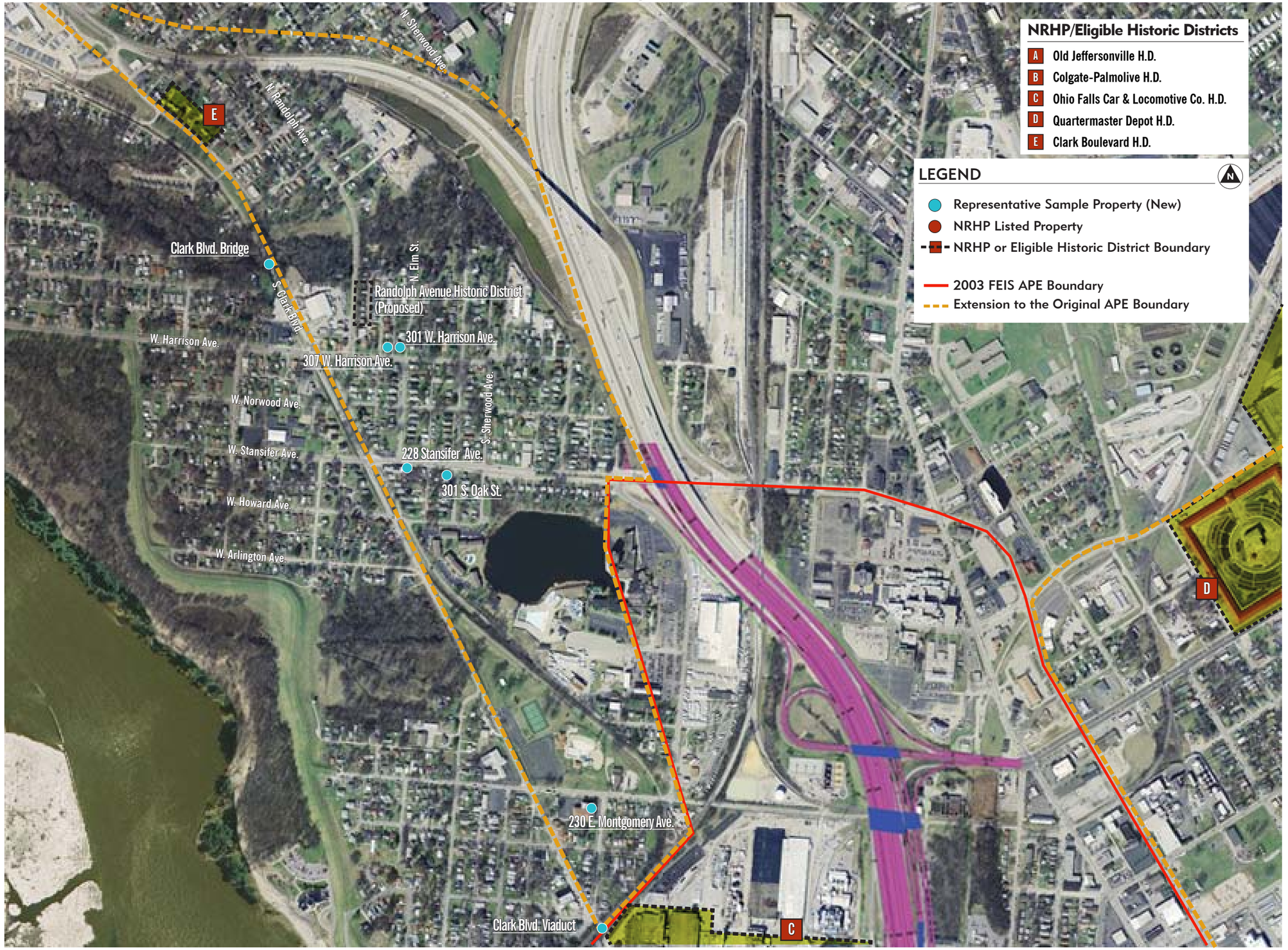


Figure 5.3-6

Historic Properties Identified within the Extensions to the Original APE - New Albany, Indiana

Figure 5.3-7

KENTUCKY RESOURCES

Indirect effects on the Extensions to the Original APE in downtown Louisville and along River Road are discussed in the following subsections.

Extensions to the Original APE Subarea—Louisville, Kentucky (Downtown)

This subarea in downtown Louisville extends one block on either side of the Second Street corridor to Broadway, along with an area between Jefferson Street and Muhammad Ali Boulevard to Jackson Street. The area developed as an urban street grid. Much of this area is comprised of older structures as well as modern in-fill. The area also contains a number of surface parking lots. The type and scale of urban development, as well as the street corridors, are similar to that in the rest of Louisville's Central Business District. Buildings typically front the sidewalk and range in height from three story commercial buildings to new high-rise towers. Land uses include a mix of office space, retail establishments, religious and social institutions, as well as some multi-family, multi-story residential uses. A major feature found within this subarea is the modern Louisville Convention Center bounded by Market, Fourth, Jefferson and Second Streets. The street pattern is a traditional city grid, with on-street parking and wide sidewalks.

Six historic districts lie within this subarea, although several have been partially or fully demolished to make way for modern development. Districts in the subarea include Whiskey Row Historic District, the West Market Street Historic District, 2nd and Market Streets Historic District, 3rd and Market Streets Historic District, 3rd and Jefferson Streets Historic District, and the Savoy Historic District. These districts are described further in Section 4.3 of the SDEIS. The six historic districts share many of the same character-defining features as the larger subarea described above. Effects on the historic districts were evaluated in a combined assessment with the downtown Louisville Extended APE since the character of each district is consistent with the larger subarea.

Effects Findings—FEIS Selected Alternative

This subarea falls beyond the limits of the Original APE. Because this alternative does not include tolling, changes in traffic patterns are not associated with this alternative. This scenario was identified as the baseline for comparison to identify changes in traffic patterns resulting from the Modified Selected Alternative.

Effects Findings—Modified Selected Alternative

Visual: Even though the projected traffic increases using the US 31 Bridge are within the range for a perceptible change in traffic (1-2 additional vehicles per minute per lane during the peak hour), this traffic is dispersed throughout the street grid within the Extensions to the Original APE. The traffic increase is not expected to adversely affect the character of the subarea due to the low volume of additional traffic per minute (1-2 cars per lane). The projected traffic increases would not alter the setting, feeling, viewshed or association of its historic resources to their surroundings or to the current transportation system. This results in a No Adverse Effect finding for visual.

Noise: In downtown Louisville, traffic is not projected to double. Therefore, noise would not increase by a perceptible level (3 dBA). This results in a No Effect finding for noise.

Vibration: No change in the mix of traffic patterns are projected in this subarea. Heavy truck traffic is projected to fall well below the threshold for ground-borne vibratory impacts, which is defined in the FTA Manual as approximately 100 VdB for minor cosmetic damage to fragile buildings. This results in a No Effect finding for vibration.

The table below summarizes the determination of effects of the Modified Selected Alternative for the Downtown Louisville, Kentucky subarea. These proposed effect findings are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-26
EXTENSIONS TO THE ORIGINAL APE IMPACT ASSESSMENT—LOUISVILLE (DOWNTOWN)

	Visual	Noise	Vibration
Modified Selected Alternative	No Adverse Effect	No Effect	No Effect

Extensions to the Original APE Subarea—Louisville, Kentucky (River Road Corridor)
This subarea extends between the Ohio River and I-71, from just south of Zorn Avenue to Frankfort Avenue. Along the southern side of River Road, there are expansive views of wooded/natural areas including a former golf course near Zorn Avenue and the City of Louisville Soccer Park. The northern side of the roadway contains industrial uses, such as a series of mineral extraction activity and gravel operations. This area also includes some new commercial and office land uses near Zorn Avenue.

River Road is a 2-lane connector road with narrow shoulders and includes a crossing at Beargrass Creek. In the western portion of the APE, River Road transitions to a gateway boulevard into downtown Louisville with sidewalks.

Effects Findings—FEIS Selected Alternative

This subarea falls beyond the limits of the Original APE. Because this alternative does not include tolling, changes in traffic patterns are not associated with this alternative. This scenario was identified as the baseline for comparison to identify changes in traffic patterns resulting from the Modified Selected Alternative.

Effects Findings—Modified Selected Alternative

Visual: The projected traffic increases are within the range for a perceptible change in traffic (1-2 additional vehicles per minute per lane during the peak hour); however, this is not expected to

adversely affect the character of the subarea due to the low volume of additional traffic per minute (1-2 cars per lane). The projected traffic increases would not alter the setting, feeling, viewshed or association of its historic resources to their surroundings or to the current transportation system. This results in a No Adverse Effect finding for visual.

Noise: Along River Road, traffic is not projected to double. Therefore, noise would not increase by a perceptible level (3 dBA). This results in a No Effect finding for noise.

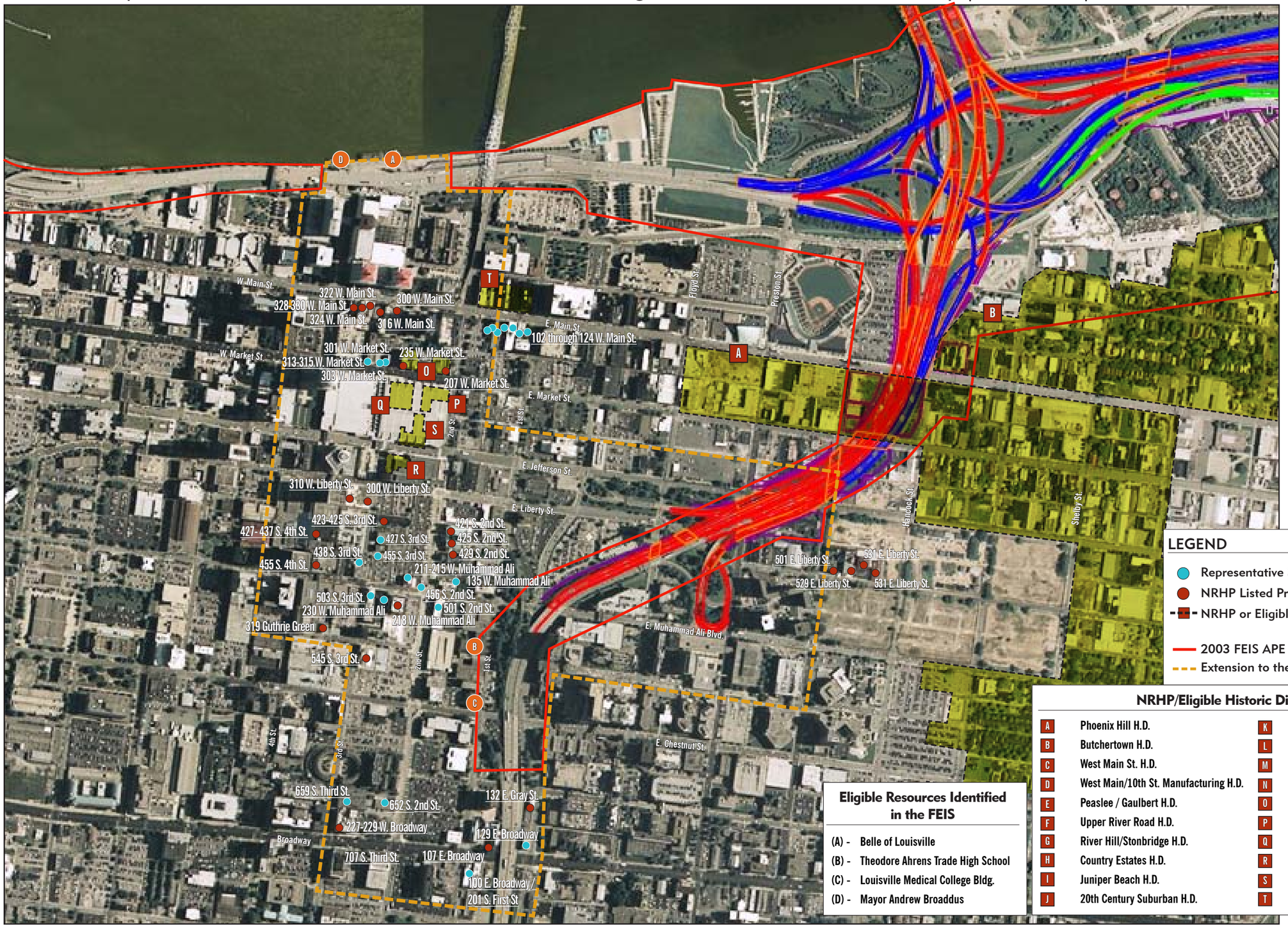
Vibration: No change in the mix of traffic patterns are projected in this subarea. Heavy truck traffic is projected to fall well below the threshold for ground-borne vibratory impacts, which is defined in the FTA Manual as approximately 100 VdB for minor cosmetic damage to fragile buildings. This results in a No Effect finding for vibration.

The table below summarizes the determination of effects of the Modified Selected Alternative for the Louisville, Kentucky River Road subarea. These proposed effect findings has not been finalized, consulting parties will be engaged in consultation to resolve adverse effects are part of the on-going Section 106 process which will be completed prior to the submission of the SFEIS.

TABLE 5.3-28
EXTENSIONS TO THE ORIGINAL APE IMPACT ASSESSMENT—LOUISVILLE (RIVER ROAD)

	Visual	Noise	Vibration
Modified Selected Alternative	No Adverse Effect	No Effect	No Effect

Historic Properties Identified within the Extensions to the Original APE - Louisville, Kentucky (Downtown)



LEGEND

- Representative Sample Property (New)
- NRHP Listed Property
- NRHP or Eligible Historic District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE Boundary

Eligible Resources Identified in the FEIS

- (A) - Belle of Louisville
- (B) - Theodore Ahrens Trade High School
- (C) - Louisville Medical College Bldg.
- (D) - Mayor Andrew Broaddus

NRHP/Eligible Historic Districts

- A Phoenix Hill H.D.
- B Butchertown H.D.
- C West Main St. H.D.
- D West Main/10th St. Manufacturing H.D.
- E Peaslee / Gaulbert H.D.
- F Upper River Road H.D.
- G River Hill/Stonbridge H.D.
- H Country Estates H.D.
- I Juniper Beach H.D.
- J 20th Century Suburban H.D.
- K Harrods Creek Village H.D.
- L Belleview H.D.
- M Jacob School Road H.D.
- N James Taylor Subdivision H.D.
- O West Market St. H.D. *(Demolished)*
- P 2nd and Market Streets H.D. *(Demolished)*
- Q 3rd and Market Streets H.D. *(Demolished)*
- R 3rd and Jefferson Streets H.D. *(Demolished)*
- S Savoy H.D. *(Demolished)*
- T Whiskey Row H.D.

Figure 5.3-8

Historic Properties Identified within the Extensions to the Original APE - Louisville, Kentucky (River Road)

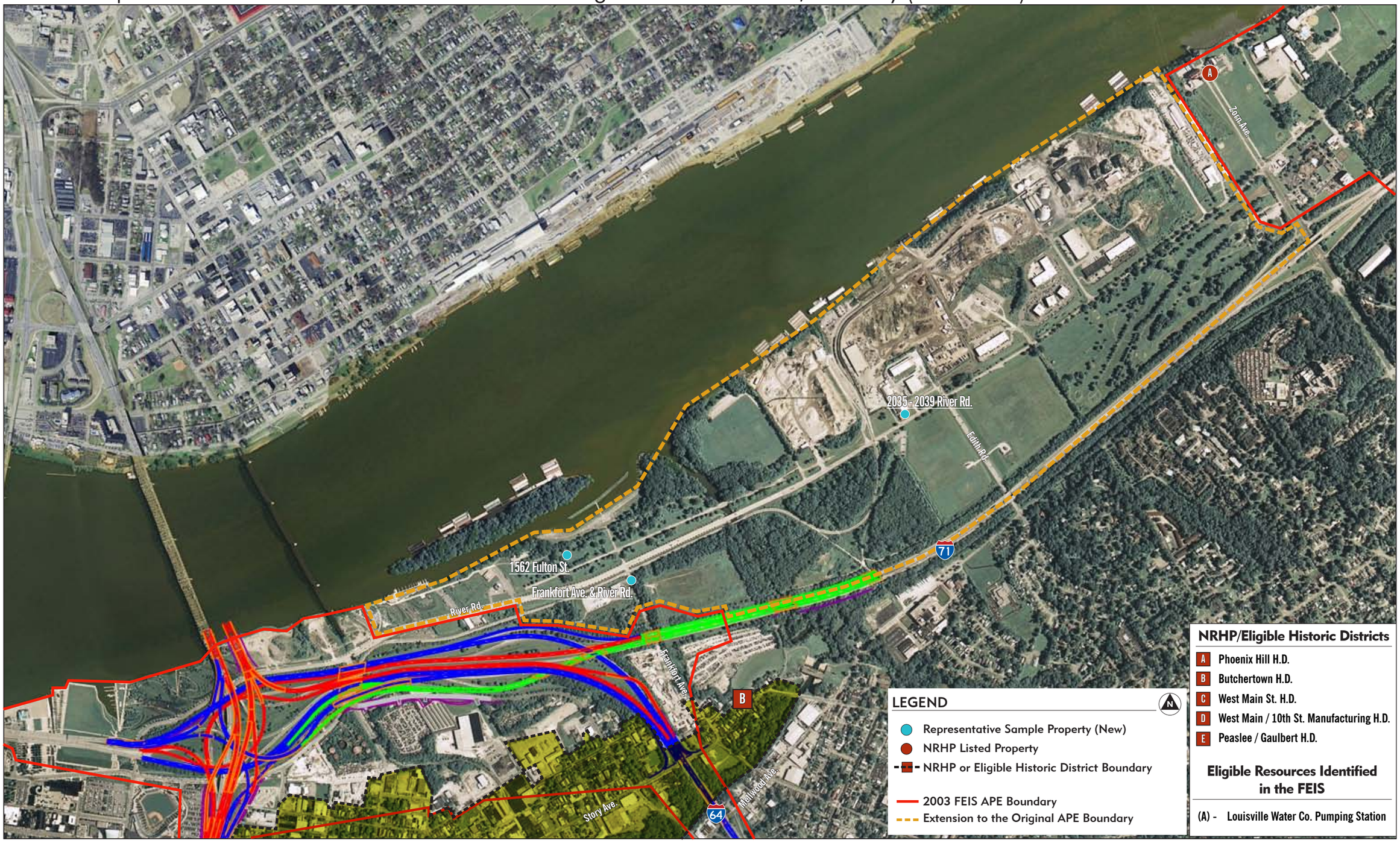


Figure 5.3-9

5.3.2 Archaeological Resources

An extensive evaluation of archaeological resources was provided in the 2003 FEIS and Section 4.3.2 of this SDEIS. Section 4.3.2 of the SDEIS modified the findings of the FEIS, further defining potential impacts to archeological resources. Since completion of the FEIS, additional archaeological investigations were completed in the Downtown Corridors in Indiana (two investigations) and Kentucky and in the East End Corridor in Kentucky. As detailed in Section 4.3.2 of this SDEIS, known archaeological sites could be impacted by either the FEIS Selected Alternative or the Modified Selected Alternative in both of the study corridors in Indiana and Kentucky. There is no mapping included herein that shows the locations of these sites due to the sensitive nature of such information. This information is restricted in accordance with 36 CFR 800.4 to preserve site integrity.

5.3.2.1 Direct Impacts

No-Action/Transportation Management Alternatives

There would be no direct impacts to archaeological resources as the result of the No-Action or Transportation System Management (TSM) alternatives.

Bridge/Highway Alternatives

Table 5.3-29 identifies the archaeological resources located within the current alignments of both the FEIS Selected Alternative and the Modified Selected Alternative. The table updates information presented in the 2003 FEIS and the (aforementioned) archaeological investigations conducted since that time.

TABLE 5.3-29
STATUS OF ARCHAEOLOGICAL SITES ASSOCIATED WITH THE FEIS SELECTED AND THE MODIFIED SELECTED ALTERNATIVES

Site	Description	SHPO Determination—2003 FEIS	SHPO Determination—Current	Build Alternative Corridor
INDIANA				
12-CL-516	Prehistoric Terminal Archaic Riverton Site	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-525	Prehistoric Woodland Site	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-527	Historic Isolated Well/Cistern	Potentially Eligible; Additional Investigations Required	Not Eligible (Based on 2006 Phase 2 Investigation)	East End
12-CL-559	Historic Site Associated with Farmstead	Additional Investigations Required Before Eligibility Can Be Determined	No change since 2003	East End
12-CL-561	Historic Site Associated with Lime Industry	Potentially Eligible; Additional Investigations Required	No change since 2003	East End
12-CL-762	Colston Park	(Identified after 2003 FEIS)	Eligible (Based on 2006 Phase 1 Investigation)	Downtown
N/A	Spring Street Freight House – Associated with Historic Site ID-HC-61007 (referred to as the Train Depot)	Archaeological potential not known in 2003	Investigations Required Before Eligibility can be Determined	Downtown
KENTUCKY				
15Jf677	Prehistoric Site	Potentially Eligible; Additional Investigations Required	No change since 2003	East End
15Jf678	Prehistoric Site	Historic Site is a Contributing Element to the National Register Property; Additional Investigations Required.	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End
15Jf679	Prehistoric Site, Historic Site Associated with Rosewell Plantation (JF-452/Site 18)	Potentially Eligible; Additional Investigations Required	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End
15Jf680	Prehistoric Site	Contributing Element to the National Register Property; Additional Investigations Required	No change since 2003	East End
15Jf683	Historic Site Associated with Allison-Barrickman Plantation (JF-563/Site 33)	Potentially Eligible; Additional Investigations Required	No change since 2003	East End
15Jf716	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Not Eligible (Based on 2005 Phase 1 Investigation)	Downtown
15Jf717	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Eligible; Phase 3 Data Recovery Completed in 2008	Downtown
15Jf718	Historic Site from mid-1800s to the present	(Identified after 2003 FEIS)	Eligible; Phase 3 Data Recovery Completed in 2008	Downtown
15Jf719	Historic Complex	(Identified after 2003 FEIS)	Phase 1 Investigations Conducted in 2006, Phase 2 Required before Eligibility Can Be Determined, Pending Right of Entry	East End

15Jf720	Prehistoric Site	(Identified after 2003 FEIS)	Phase 1 Investigations Conducted in 2008. Site Potentially Eligible, Further Coordination Required	East End

As the table shows, the 16 listed sites fall into one of four categories: eligible, not eligible, additional investigations required, or additional coordination required. None of these archaeological sites were found to warrant preservation in place at this time; therefore, additional surveys to resolve determinations of eligibility and develop appropriate treatment(s) would be included during the development of construction plans.

Site 12-Cl-762 (Indiana, Downtown Corridor) and 15Jf717 and 15Jf718 (Kentucky, Downtown Corridor) were found to be eligible for listing in the NRHP. Site 12-Cl-762 was found to be eligible after completion of a Phase I investigation. For the Modified Selected Alternative, the proposed construction would avoid this site. For the FEIS Selected Alternative, the proposed 17-foot wide bicycle/pedestrian path would cantilever over the site, no piers would be within the sites. It is not anticipated that a direct impact would occur, but should the FEIS Selected Alternative be constructed additional coordination with the Indiana SHPO would occur to discuss potential impacts once final constructions plans are know. For the Modified Selected Alternative there would be no effect to Colston Park and Site 12-Cl-762.

Phase III data recovery was conducted in 2008 at both Kentucky sites 15Jf717 and 15Jf718. At Site 15Jf717, the archaeological research potential had been exhausted. At Site 15Jf718, all available important information about local and regional history had been recovered. It was recommended that no further work be conducted at either site, and that clearance was warranted.

Four sites were determined to not be eligible for listing on the NRHP. Sites 12-Cl-516, 12-Cl-525 and 12-Cl-527 (Indiana East End) received such a recommendation based on the results of Phase II investigations in 2006. Site 15Jf716 (Kentucky, Downtown Corridor) also received a similar recommendation after a Phase I investigations in 2005.

At eight sites, additional investigations are required before NRHP eligibility could be determined; at present, all sites are considered potentially eligible for listing on the NRHP. These sites are 12-Cl-559 (Indiana, East End Corridor), the Spring Street Freight House Site (Indiana, Downtown Corridor), and sites 15Jf677, 15Jf678, 15Jf679, 15Jf680, 15Jf683, and 15Jf719 (Kentucky, East End Corridor).

At one site, 15Jf720 (Kentucky, East End Corridor), a Phase II was completed in 2008. It was recommended that the site was potentially eligible for inclusion in the NRHP. The Kentucky SHPO agreed with that conclusion; however, KYTC and FHWA disagreed. In coordination with FHWA and KYTC in October 2008, the Section Design Consultant (SDC) was tasked to redesign that section to avoid impacting the site. The SDC modified the span arrangement to straddle the site. The piers could be constructed without impact to the site. However, it was felt that construction crews would have to pass through this corridor on multiple occasions to construct the project. Once a preliminary design is developed, KYTC and FHWA must review the redesigned plans and coordinate with the Kentucky SHPO for their review and clearance.

5.3.2.2 Indirect and Cumulative Effects

No-Action/Transportation Management Alternatives

There would be no indirect impacts to archaeological resources as a result of the No-Action or TSM alternatives.

Bridge/Highway Alternatives

East End Corridor

The LSIORB Project could stimulate the planning of future projects and influence their location near the proposed project. Therefore, indirect impacts are possible. Regarding potential cumulative effects in the East End Corridor, other major actions include the River Ridge Commerce Center (formerly INAAP), Port of Indiana-Jeffersonville, North Port Business Center, Bridge Port Business Center, and East Point Business Center. Some potential exists for these projects to have some impacts on archaeological resources. Therefore, these projects in combination with the FEIS Selected Alternative or the Modified Selected Alternative could contribute to cumulative effects to archaeological resources.

Downtown Corridor

The aforementioned archaeological investigations completed in the Indiana and Kentucky Downtown Corridor resulted in the identification of numerous archaeological sites and it is likely that other identified sites are present in the surrounding downtown areas. Therefore, should the project induce development there is the potential other archaeology sites could be impacted. Therefore, indirect effects could be expected with both build alternatives in the Downtown Corridor. Regarding potential cumulative effects, other developments in the downtown areas, combined with the direct and potential indirect impacts of LSIORB Project could contribute to cumulative effects to archaeological resources.

5.3.3 Mitigation

An amended MOA will be prepared, as appropriate, following the assessment of effects on historic and archaeological resources, as a part of the mitigation process. The amendment will be included in the SFEIS.

5.4 Air Quality

This section of the 2003 FEIS contained an analysis to estimate future carbon monoxide concentrations that could occur with the project; discussed the Louisville metropolitan area's "maintenance for ozone" status in relation to the LSIORB Project; discussed potential indirect and cumulative effects of the project on regional air quality; and described measures to mitigate temporary air quality impacts from construction activities. (For more detailed information see

FEIS pages 5-270 through 5-274). The SDEIS updates the information provided in the FEIS as follows:

- Section 5.4.1—Includes carbon monoxide (CO) analyses for the alternatives currently being considered and for the current design year being studied, using the currently-accepted emissions model.
- Section 5.4.2—Presents an analysis of ozone, which was not specifically addressed in the 2003 FEIS because at that time the Louisville area was in attainment. Section 5.4.2 in the 2003 FEIS regarding Conformity Plan Compliance has been eliminated, since conformity is now addressed for multiple pollutants in the separate SDEIS subsections for each (i.e., sections 5.4.2 and 5.4.3).
- Section 5.4.3—Presents an analysis of particulate matter ($PM_{2.5}$), which was not addressed in the 2003 FEIS. (In the FEIS, this section presented a discussion of indirect and cumulative effects, and noted the air quality impact of the project "when considered with all other foreseeable sources of emissions, is found to conform to the requirements of the Clean Air Act." The updated analyses performed for the alternatives studied in this SDEIS determined that this finding remains valid. Because there is no direct impact to air quality as a result of the project, there would be no indirect or cumulative impact that would result from the project. Therefore, the discussion of those effects is eliminated, altogether, from Section 5.4.)
- Section 5.4.4—Presents an analysis of mobile source air toxics (MSATs), which were not addressed in the 2003 FEIS because at that time there were not policies requiring it.
- Section 5.4.5—Presents construction-related air quality mitigation, which primarily references the mitigation measures presented in Section 5.4.4 in the 2003 FEIS.

5.4.1 Carbon Monoxide Hot Spot Analysis

As a part of the 2003 FEIS, a "hot spot" carbon monoxide (CO) analysis was conducted to assess the potential air quality impacts from the project. The Louisville Metro Air Pollution Control District (LMAPCD) identified 24 intersections for hot spot analyses for CO assessment. The analysis used the CAL3QHC model, an EPA preferred and recommended air quality dispersion model. The model considers traffic volume, roadway geometrics, carbon monoxide emission factors and atmospheric conditions and a background concentration (3.0 ppm) to predict 1-hour CO concentrations in parts per million (ppm) at receptors in the vicinity of each intersection. The 8-hour concentrations of CO were then calculated from the 1-hour concentrations by multiplying the 1-hour concentration by the LMAPCD-supplied persistence factor of 0.8 (meaning 20% of the CO emissions are no longer localized at the intersection). The emission factors utilized were generated by LMAPCD using the USEPA's MOBILE5B model.

None of the 860 receptors analyzed at the 24 hot spot intersections exceeded the 1-hour or 8-hour National Ambient Air Quality Standards (NAAQS) for CO. Further details of this analysis were provided on pages 5-270 and 5-271 of the FEIS.

Since the publication of the FEIS, USEPA's MOBILE6.2 model has replaced MOBILE5B and the design year has changed from 2025 to 2030. Several factors indicated that any CO modeling would produce lower CO levels than those modeled in the 2003 FEIS. These factors include:

- MOBILE6.2 shows a considerable (>75%) reduction in emission factors for CO (e.g., the idle emission factor, which is the largest contributor to CO levels, goes from 275.79 grams per hour (g/hr) in the original analysis to 63.6 g/hr in MOBILE6.2 for the same design year.
- The analysis year is 2030 instead of 2025 and future years have lower emission factors (e.g., MOBILE6.2 2025 idle emission factor is 63.6 g/hr and is 63.1 g/hr in 2030, the new analysis year).

Due to these factors, it was determined that, since the 2025 CO predictions did not exceed the 1-hour or 8-hour CO standards, any predicted 2030 levels would not exceed the NAAQS. The two highest traffic volume intersections that produced the highest predicted CO levels in the 2003 FEIS were re-modeled for the FEIS Selected Alternative and the Modified Selected Alternative using 2030 build traffic projections and LMAPCD-supplied emission factors from MOBILE6.2. The two intersections were 2nd Street/Main Street and 2nd Street/Market Street in Louisville. The comparative results are shown in Table 5.4-1.

TABLE 5.4-1
COMPARISON OF HOT SPOT ANALYSES (PREDICTED CO LEVELS IN PPM)

Intersection	Original 2025 1-Hour	Original 2025 8Hour	FEIS Selected 2030 1-Hour	FEIS Selected 2030 8-Hour	Modified Selected 2030 1-Hour	Modified Selected 2030 8-Hour
2nd/Main	8.70	7.56	4.5	4.2	4.5	4.2
2nd/Market	9.00	7.80	4.5	4.2	4.5	4.2

As indicated in the table, the predicted CO levels for the two highest traffic volume intersections exhibited a 45% reduction from the levels in the 2003 FEIS. The predicted CO concentrations for the FEIS Selected Alternative and the Modified Selected Alternative are below (i.e., in compliance with) both the 1-hour standard of 35 ppm and the 8-hour standard of 9 ppm.

5.4.2 Ozone

As stated in SDEIS Section 4.4.1, in June 2004, Clark and Floyd counties in Indiana, and Bullitt, Jefferson, and Oldham counties in Kentucky were designated as a basic nonattainment area under the 8-hour standard for the pollutant ozone. The area was re-designated as an attainment area for ozone with a maintenance status in July, 2007.

Because the Louisville metropolitan area is in "maintenance" status for ozone, an air quality conformity determination is required for ozone each time the region updates or amends its long-range regional transportation plan (RTP) and Transportation Improvement Program (TIP). A conformity determination is a finding that the RTP or TIP is consistent with the State's plan for maintaining compliance with the air quality standard for ozone. Conformity requirements also apply to individual transportation projects. For ozone, the conformity requirements for an

individual project are satisfied as long as the project is included in the regions approved RTP and TIP. See Chapter 4.4.1, *Regulatory Setting*, for further information.

The LSIORB Project is included in the Louisville MPO's *Horizon 2030: The Metropolitan Transportation Plan for the Louisville (KY-IN) Metropolitan Planning Area* long-range plan (p. 427), and in the *FY 2011–FY 2015 Transportation Improvement Program* (p. 162). The conformity analyses demonstrated conformity with the 8-hour ozone standard. The LSIORB project as described in this SDEIS is included in Amendment 3 of the *Horizon 2030 Metropolitan Transportation Plan* and in Amendment 3 of *FY 2011 - FY 2015 Transportation Improvement Program*.[5]

5.4.3 $PM_{2.5}$

As stated in SDEIS Section 4.4.1, in April 2005, Clark and Floyd counties and Madison Township of Jefferson County in Indiana, and Bullitt and Jefferson counties in Kentucky, were designated as a nonattainment area under the standard for particulate matter less than 2.5 microns ($PM_{2.5}$) (based on average annual concentration). The transportation conformity analysis for the long range transportation plan and the TIP demonstrated conformity under the annual $PM_{2.5}$ standard.

Based on the transportation conformity regulations found in 40 CFR 93.123(b)(1), all transportation projects in the Louisville, Kentucky/ Southern Indiana area that have been determined to be projects of air quality concern are required to address project level or "hot-spot" considerations for $PM_{2.5}$.

According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until USEPA releases modeling guidance in the *Federal Register*. On December 20, 2010, EPA published in the Federal Register notice of the issuance of guidance for conducting quantitative PM hot-spot analysis for conformity and announcing that MOVES2010a must be used for quantitative hot-spot analysis after a 2-year grace period. During the grace period, which will end on December 20, 2012, project sponsors may continue to use a qualitative hot-spot analysis to assess whether the project will cause or contribute to any new localized $PM_{2.5}$ violations, increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS. The LSIORB Project was determined to be a project of air quality concern according to 40 CFR 93.123(b)(1). A qualitative PM2.5 hot-spot analysis was completed according to the USEPA/FHWA guidance.

The qualitative hot-spot analysis was based on two types of comparisons. First, a build versus no-action comparison was made. Second, a surrogate analysis was used. A "surrogate" (or substitute) site is a site for which the current levels of Annual Average Daily Traffic (AADT) and truck traffic are comparable to or greater than those of the future worst-case build scenario. If, additionally, the surrogate site has a monitor in the vicinity with current $PM_{2.5}$ design values

[5] At KYTC and INDOT's request, the Louisville MPO is in the process of updating *Horizon 2030* to include the current design and scope of the LSIORB project. The MPO has conducted an air quality conformity analysis for this proposed update to its long-range plan, and that analysis found that the plan conforms to the applicable emissions budgets. The MPO is scheduled to vote on this update to its long-range plan at its November meeting, shortly after this SDEIS is published. If the update is approved, the project as described in this SDEIS will be included in a conforming long-range plan.

less than the standards, then one can logically conclude that the worst-case build scenario will not cause or add to an existing $PM_{2.5}$ violation, or delay the timely attainment of the PM2.5 NAAQS.

For the Downtown analysis it was determined that the worst-case AADT for the Downtown area is lower that both surrogate sites 1 and 2. Both surrogate sites 1 and 2 had monitor design values that were less than the 24-hour standard for PM2.5. It was also determined that a build alternative will result in less total traffic and truck volumes at the Downtown area location in 2020 as compared to the No-Action Alternative, resulting in lower roadway emissions and lower $PM_{2.5}$ concentrations.

For the East End analysis it was determined that the worst-case AADT for the Downtown area is considerably lower that both surrogate sites 1 and 2. Both surrogate sites 1 and 2 had monitor design values that were less than the 24-hour standard for PM2.5. As compared to the conformity rule example the East End worst-case AADT is less than one third of the example cited in the preamble to March 10, 2006 rule (71 FR 12491) which cited as "significant" a project on a new highway or expressway with 125,000 AADT and 8 percent trucks.

Based on the analysis, it was determined that the project will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, or increase the frequency or severity of a violation, or delay timely attainment of the PM2.5 NAAQS. The qualitative study is presented in Appendix B1.1, thereby making it available for agency and public review and comment prior to the publication of the SFEIS. An FHWA project level PM2.5 hot-spot conformity determination will also be made prior to the publication of the SFEIS.

5.4.4 Mobile Source Air Toxics

On February 3, 2006, the FHWA released *Interim Guidance on Air Toxic Analysis in NEPA Documents*.[6] This guidance was superseded on September 30, 2009, by FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents*.[7] The purpose of FHWA's guidance is to advise on when and how to analyze Mobile Source Air Toxics (MSATs) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, FHWA will update the guidance.

The qualitative analysis presented here provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The assessment is derived in part from a study conducted by the FHWA, entitled *A Methodology for*

6 *Interim Guidance on Air Toxic Analysis in NEPA Documents*, FHWA, February 3, 2006. http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm

7 *Interim Guidance Update on Air Toxic Analysis in NEPA Documents*, FHWA, September 30, 2009. http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm

Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternative.[8] Additional information regarding MSATs is provided in Appendix B1.2.

FHWA's *Interim Guidance* groups projects into the following categories:

- Exempt Projects and Projects with no Meaningful Potential MSAT Effects
- Projects with Low Potential MSAT Effects
- Projects with Higher Potential MSAT Effects

FHWA's guidance on identifying "Projects with Higher Potential MSAT Effects" indicates that this category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. To fall into this category, a project must:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the average annual daily traffic (AADT) is projected to be in the range of 140,000 to 150,000 or greater by the design year; and
- Also be proposed to be located in proximity to populated areas.

Design year traffic projections on the build alternatives are projected to be 388,000 vehicles per day (vpd). These volumes are for the entire project area. The AADT volumes for the project are given in Table 5.4-2. While these project area volumes are higher than the FHWA criterion, the AADT on the portion of the project that is located on the new urban highway (the East End area) is only 52,000 vpd and the remainder of the traffic volume is on the existing urban highway facilities, where significant new capacity is not being added. The LSIORB project meets the definition of a "Project with Higher Potential MSAT Effects" from above based on total project area AADT and location, however the increase in AADT from a build alternative (the new and significant capacity) in relation to the No-Action Alternative is only 14,000 (the project area wide AADT increase). These, and other factors discussed here contribute to the project's consideration as a project that will have minimal MSAT effect.

For the FEIS Selected Alternative, Modified Selected Alternative, and No-Action Alternative, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same. The VMTs for the No-Action and the two build alternatives were determined for the affected roadway network as shown in Table 5.4-2. As shown, the projected VMT total for the No-Action Alternative is 35,297,000 miles. The projected VMT total for the FEIS Selected Alternative is 35,826,000 miles, for an increase of 1.5%, and the Modified Selected Alternative is 35,740,000 miles, for an increase of 1.3%.

[8] Claggett, M., et al., *"A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives,"* FHWA, Resource Center.

Therefore, it is expected that there would be no appreciable difference in overall MSAT emissions among the alternatives, in comparison to the No Action Alternative.

TABLE 5.4-2
AADT AND VMT PROJECTIONS ON THE ROADWAY NETWORK (IN THOUSANDS)

Project Area	Current Facility and No-Action Alternative		FEIS Selected Alternative	Modified Selected Alternative
	2010	2030	2030	2030
AADT for Project				
Downtown	305,800	374,800	336,000	336,000
East End	0	0	52,000	52,000
Total	**305,800**	**374,000**	**388,000**	**388,000**
VMT for Project—Total	**28,799,000**	**35,297,000**	**35,826,000**	**35,740,000**

Construction of the project would lead to higher MSAT emissions for either of the two build alternatives (due to higher VMT than the No-Action Alternative), a portion of which will be constructed on new alignment. Consideration for the project as a project that will have minimal MSAT effects is due to the following factors:

- Though the project creates a new interstate facility in the project area and the AADT is above the "Low Potential MSAT Effects" threshold, the AADT increases by only 3.7% and the AADT on the new interstate facility (the East End area) is 52,000 vpd. The project area AADT only increases by 14,000 vpd in comparison to the No-Action Alternative.

- As noted in SDEIS Section 2.2.3, the demand for cross-river trips between the areas upstream of the Kennedy Bridge is projected to grow at a greater rate than the overall demand for cross-river trips in the LMA. This traffic will no longer have to travel to downtown Louisville or Jeffersonville for cross-river mobility and this will reduce the concentration of vehicles in the Downtown area which aids region wide MSAT emissions.

- Emissions increases may be offset somewhat by lower MSAT emission rates due to increased travel speeds within the LMA as a result of reduced congestion. In 2030 the number of Kennedy Interchange segments, for the No-Action Alternative, functioning at a LOS E or F, is projected to be 22 (up from 7 in 2010). (See SDEIS Figure 2.2-7, *2010 and 2030 A.M./P.M. Levels of Service, Kennedy Interchange.*)

- Increased speeds for cross-river traffic travelling on an Interstate facility for the Build Alternatives. Travel speeds in the Build Alternatives are expected to be higher than for the No-Action Alternative. The No Action Alternative has 1,069,000 VHT while the Build Alternatives have 1,023,000 VHT for a 4.3% reduction. According to EPA's MOBILE6.2 emissions model, emissions of all of the priority MSATs except diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decrease will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

The project only increases future AADT by 14,000 vpd (with the new facility carrying an AADT of 52,000 vpd) while reducing congestion and improving vehicle speeds (> 4% reduction in VHT and >12% reduction in VHD) within the project area.

Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 72% between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the USEPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The construction of either of the Build Alternatives will have the effect of moving some cross-river traffic closer to nearby communities including Prospect, Kentucky, and Sellersburg and Utica, Indiana; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the Build Alternatives than with the No-Action Alternative. The localized increases in MSAT concentrations would likely be most pronounced at locations near the areas that will be constructed on new alignment. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-Action Alternative cannot be accurately quantified due to the inherent deficiencies of current models.

In sum, under the FEIS Selected and Modified Selected alternatives in the design year, it is expected there would be higher MSAT emissions in some areas, relative to the No-Action Alternative, due to increased VMT. There could be slightly elevated but unquantifiable changes in MSATs to residents and others in localized areas where VMT increases, which may be important particularly to any members of sensitive populations (i.e., those whose have health problems). Conversely, lower MSAT emissions would be expected along the existing roadway network in its entirety due to reduced congestion and improved VHT.

On a regional basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Substantial construction-related MSAT emissions are not anticipated for this project as construction is not planned to occur over an extended building period (more than five years) in any one localized area. However, construction activity may generate temporary increases in MSAT emissions in the project area.

5.4.5 Construction Related Air Quality Mitigation

Section 5.4.4 in the 2003 FEIS discussed the construction phase of the proposed project and the potential of temporarily impacting ambient air quality due to emissions from construction equipment and fugitive dust from construction activities. The FEIS outlined measures that would be taken to reduce fugitive dust and other emissions generated during construction. The measures presented in that discussion are still applicable and are not repeated herein (see Section 5.4.4 on page 5-274 of the 2003 FEIS).

5.4.6 Greenhouse Gases and Climate Change

Carbon dioxide emissions, together with other greenhouse gases (GHG), contribute to climate change. USEPA website's "Climate Change – Science: State of Knowledge" section notes that it is virtually certain that human activities such as the burning of fossil fuels to power cars, industries, utilities, etc., have added to the amount of GHG in the atmosphere, "enhancing the natural greenhouse effect, and likely contributing to an increase in global average temperature and related climate changes." What is not certain, according to the USEPA site, is …

> *…how much warming will occur, how fast…and how the warming will affect the rest of the climate system. Answering these questions will require advances in scientific knowledge in a number of areas:*
>
> - *Improving understanding of natural climatic variations, changes in the sun's energy, land-use changes, the warming or cooling effects of pollutant aerosols, and the impacts of changing humidity and cloud cover.*
> - *Determining the relative contribution to climate change of human activities and natural causes.*
> - *Projecting future greenhouse emissions and how the climate system will respond within a narrow range.*
> - *Improving understanding of the potential for rapid or abrupt climate change.*
>
> *Source: www.epa.gov/climatechange/science/stateofknowledge.html*

From a policy standpoint, FHWA's current approach on the issue of global warming is as follows: On April 2, 2007, the Supreme Court issued a decision in *Massachusetts et al. v. Environmental Protection Agency et al.* that the USEPA has authority under the Clean Air Act to establish motor vehicle emissions standards for GHG emissions. USEPA has undertaken a range of rulemaking activities as a result of the Supreme Court decision, including adopting regulations establishing GHG emissions standards for light-duty vehicles (passenger vehicles and light trucks) as well as GHG emissions standards for medium- and heavy-duty trucks; in addition, USEPA is currently engaged in another rulemaking process to establish even more stringent GHG emission requirements for light-duty vehicles.[9] These EPA regulations will help to reduce GHG emissions from the transportation system by reducing emissions at the tailpipe. EPA has not adopted any new requirements limiting overall GHG emissions from the transportation

[9] For additional information on USEPA rulemaking activities that will help to reduce GHG emissions from motor vehicles, refer to EPA's website at: http://epa.gov/otaq/climate/regulations.htm.

system, at the national, State, or regional levels. Therefore, while GHG emissions are now subject to regulation by EPA, the EPA regulations do not directly affect the requirements applicable to the development of transportation projects.[10]

FHWA does not believe it is informative at this point to consider greenhouse gas emissions in an Environmental Impact Statement (EIS). The climate impacts of GHG emissions are global in nature. Analyzing how alternatives evaluated in an EIS might vary in their relatively small contribution to a global problem will not better inform decisions. Further, due to the interactions between elements of the transportation system as a whole, emissions analyses would be less informative than ones conducted at regional, state, or national levels. Because of these concerns, FHWA concludes that we cannot usefully evaluate GHG emissions in this EIS in the same way that we address other vehicle emissions.

FHWA is actively engaged in many other activities with the DOT Center for Climate Change to develop strategies to reduce transportation's contribution to GHGs—particularly CO_2 emissions—and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. FHWA will review and update its approach to climate change at both the project and policy level as more information emerges and as policies and legal requirements evolve.

5.5 Noise

Section 5.5 of the 2003 FEIS provided information regarding impacts, as well as mitigation considered and recommended for the preferred alternative at that time. The noise impacts and mitigation described for the preferred alternative in the FEIS are the same for the FEIS Selected Alternative that is being evaluated in this SDEIS. Noise impacts and mitigation considered for that alternative have been updated in the SDEIS due to a new design year of study (2030), new traffic projections for that design year and the use of a new noise prediction model (Traffic Noise Model [TNM] version 2.5) that is currently required for use on Federal-aid projects by FHWA. In addition, noise impacts and mitigation associated with the Modified Selected Alternative are presented. The findings associated with both alternatives are also compared to the noise impacts associated with the No-Action Alternative.

5.5.1 Noise Impact and Abatement Criteria

As stated in Section 4.5 of this SDEIS, traffic noise level predictions for the FEIS Selected Alternative and the Modified Selected Alternative were made using the TNM2.5 computer model (*FHWA Highway Traffic Noise Prediction Model, Report No. FHWA-PD-96-010,* including Revision No. 1, dated April 14, 2004). The model is designed for calculation of traffic noise emissions for constant speed and accelerating traffic flows comprising a mix of vehicle types. The sound level emissions measured and those generated by TNM2.5 are expressed in terms of dBA Leq. The existing field measured noise level or the existing predicted noise level

[10] The Council on Environmental Quality issued draft guidance regarding the consideration of GHG emissions in NEPA documents on February 18, 2010, but that guidance has not been finalized.

was compared to the predicted noise level to assess highway traffic noise impacts at each receptor.

The assessment of traffic noise impacts at modeled receivers was performed in accordance with the noise policies of each state. The policies for impact identification are outlined in the Kentucky Transportation Cabinet's (KYTC) *Noise Analysis and Abatement Policy* (July 13, 2011) and the Indiana Department of Transportation's (INDOT) *Traffic Noise Analysis Procedure* (June 2, 2011).

Under FHWA regulations (23 CFR Part 772), traffic noise impacts occur if either of two conditions is met:

- The noise level increase predicted for the design year is a substantial increase over the existing noise levels; and/or
- The noise level predicted for the design year approaches (within one (1) dBA Leq) or exceeds the Noise Abatement Criteria (NAC) for the land use category affected. As an example, the NAC for Activity B and C land uses is 67 dBA. An impact would occur if the design year noise level is predicted to be 66 dBA or higher at a point of frequent exterior human use for a land use in either category.

Part 772 allows each State to adopt a noise policy that defines a "substantial increase" in noise levels (23 CFR 772.7(b)). KYTC defines a substantial increase as a predicted noise level that is 10 dBA or greater than the existing level, while INDOT defines a substantial increase as 15 dBA or greater than the existing level.

Part 772 establishes Noise Abatement Criteria (NAC) for various land use/activity categories and specifies the activity categories, descriptions of the activity categories (land uses), and NAC (in Leq(h)) for each activity category. These criteria were used in the evaluation of the sound level results predicted by the FHWA TNM2.5 program for this analysis, and in the identification of noise impacts under design year (2030) no-build and build conditions. For category D receptors, the exterior noise was modeled and 25 dBA was subtracted for building attenuation for a closed-window, air-conditioned building, per FHWA's guidance[11]. This provides for an interior comparison to assess potential impacts under NAC D. For this SDEIS it is assumed that all NAC D properties have climate control and will be assessed using this factor. If during the public involvement process it is determined that a NAC D property does not meet the criteria for this factor then interior noise and its applicability in both states' policies will be evaluated and reported for the SFEIS. The criteria are outlined in Table 5.5-1.

[11] *Highway Traffic Noise: Analysis and Abatement Guidance*, FHWA, January 2011

TABLE 5.5-1
FHWA NOISE ABATEMENT CRITERIA (23 CFR 772)

Activity Category	Activity Criteria dBA Leq(h)*	Description of Activity Category
A	57	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue its intended purpose.
B**	67	Residential.
C**	67	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E**	72	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A, B, C, D or F.
F	----------	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	----------	Undeveloped lands that are not permitted.

**The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.*

***Includes undeveloped lands permitted for this activity category.*

According to the FHWA regulations (Part 772) and both states' noise policies, noise abatement needs to be evaluated when impacts are predicted to occur. In general, noise abatement measures may include noise barriers, alteration of horizontal and vertical alignment, and traffic management measures (such as reducing speed limits or prohibition of heavy trucks)

For those areas along the proposed LSIORB Project alternatives where noise impacts would occur, alteration of the horizontal or vertical alignments or implementation of traffic management measures are not feasible as mitigation for this project because the alignment of the existing facilities that the proposed project would connect or upgrade/replace are currently fixed (this includes sections of current roadway and bridges) and the proposed location of the alternatives are designed to avoid, or minimize impacts to a wide range of environmental resources. The current and future facilities are major truck routes, and reduced speeds would increase travel times for the transport of goods within the project area and would not be consistent with the purpose of the proposed facility. Therefore, noise barriers were determined to be the only available potential abatement measure to reduce noise levels for impacted areas for this project. Noise barriers were studied at all areas where impacts were predicted, first for "feasibility" and, if feasible, then for "reasonableness" in accordance with criteria in the KYTC and INDOT noise policies. All barrier analyses presented in this SDEIS were assessed for acoustic feasibility and reasonableness according to the policy for the state in which they would be located. The criteria for feasibility and reasonableness for each state are described below.

Kentucky Criteria for Noise Barrier Feasibility and Reasonableness

When determining the acoustic feasibility of a proposed abatement measure, KYTC considers whether the measure provides a substantial reduction (5 dBA) for a reasonable percentage of impacted receptors to warrant consideration. If a proposed barrier wall provides a minimum 5 dBA reduction for more than 50% of the impacted receptors, it will be considered acoustically feasible. Engineering or constructability issues may render an abatement measure infeasible if the barrier would pose overriding safety (visibility issues) or maintenance (drainage and right-of-way access) problems as determined by the AASHTO *Green Book, Roadside Design Guide,* or *Manual of Uniform Traffic Control Devices* (MUTCD).

If a barrier is determined to be feasible, then the barrier is assessed for reasonableness in accordance with the criteria in KYTC's noise policy. All proposed noise abatement must meet the three criteria below to be considered reasonable by KYTC. If any of the criteria are unmet, noise abatement measures would not be constructed.

1. Desires of Benefitted Receptors: The views of the benefitted receptors and property owners will be considered in determining the reasonableness of noise barriers. When the majority of benefitted receptors and property owners engaged through the public involvement process are opposed to construction of a noise barrier, KYTC will give deference to these opinions in making a final determination regarding the reasonableness of the measure regardless of whether the proposal satisfies all other criteria for consideration. Similarly, where the majority of the benefitted receptors and property owners involved in the public involvement process are in support of noise barrier construction, and the proposal satisfies all other criteria for consideration outlined in this policy, KYTC shall incorporate the abatement measures into the project.
2. Cost-Effectiveness: If the estimated cost of constructing a noise barrier (including design, right-of-way, utilities and construction) divided by the number of benefitted receptors (those who would receive a reduction of at least 5 dBA) is currently $35,000 or less per benefitted receiver, a barrier is considered to be cost-effective. For initial considerations, a unit cost of $30 per square foot of barrier wall is used in this cost-effectiveness calculation.
3. Design Goal for Noise Abatement: Traffic noise abatement must achieve at least a 7 dBA reduction for a minimum of 40% of all benefitted receptors.

Indiana Criteria for Noise Barrier Feasibility and Reasonableness

In accordance with INDOT policy, acoustical feasibility means that a noise barrier would provide at least a five decibel (5 dBA) reduction in the one-hour equivalent sound level at a majority (greater than 50%) of the impacted receptors. If a barrier cannot meet this criterion, abatement is considered to be not feasible. In addition, the noise barrier should be feasible from an engineering perspective. Engineering feasibility takes into account topography, drainage, safety, barrier height, utilities, and access and maintenance needs (which may include right-of-way considerations). If a barrier poses engineering problems, it may be judged as not feasible even if it meets the acoustical feasibility criterion. If a barrier is considered feasible, then a reasonableness assessment is performed.

If a barrier is determined to be feasible, then the barrier is assessed for reasonableness in accordance with the criteria in INDOT's noise policy. All proposed noise abatement must meet the three criteria below to be considered reasonable by INDOT. If any of the criteria are unmet, noise abatement measures would not be constructed.

1. Consideration and Obtaining Views of Residents and Property Owners: The viewpoints of the affected property owners and residents are important. For those barriers found to be reasonable by the Cost-Effectiveness and Design Goal criteria below, viewpoints of the benefitted receptors and affected property owners would be sought. Noise abatement would be provided if a majority of the benefited residents and property owners are in favor of abatement and the abatement measure is otherwise feasible and reasonable.
2. Cost-Effectiveness: If the estimated cost of constructing a noise barrier (including installation and additional necessary construction, such as foundations or guardrails) divided by the number of benefitted receptors (those who would receive a reduction of at least 5 dBA) is currently $25,000 or less per benefitted receiver, a barrier is considered to be cost-effective. If more than 50% of the receptors were in place prior to the initial construction of the roadway, the cost-effectiveness criterion is raised to $30,000 per benefitted receptor. Placing noise barriers on structures creates additional challenges, since reinforcement of the structure may be necessary to support the increased load. In these situations, other options should be assessed to determine whether cost-effective abatement can be provided without requiring complicated and expensive structural modifications. These could include lighter-weight barriers, shorter barriers, or other considerations. For initial considerations, a unit cost of $30 per square foot of barrier wall is used in this cost-effectiveness calculation.
3. Design Goal for Noise Abatement: Traffic noise abatement must achieve at least a 7 dBA reduction for a majority (greater than 50%) of the benefitted first row receptors.

5.5.2 Assessment of Impacts and Proposed Mitigation by Study Area

As discussed in SDEIS Section 4.5, the project area was divided into four study areas for the assessment of highway traffic noise. Each study area was assessed as a "stand-alone" section of the project and contains a receiver set, impact analysis and proposed mitigation. The study areas are as follows:

- Study Area 1—Downtown Louisville, Kentucky
- Study Area 2—Downtown Jeffersonville, Indiana
- Study Area 3—East End Louisville, Kentucky;
- Study Area 4—East End Utica and Sellersburg, Indiana.

Each study area is further subdivided into noise sensitive areas. These noise sensitive areas are a group of receptors that are exposed to similar noise sources, traffic volumes, vehicle mix and speed, and topographic features. The analysis of highway traffic noise impacts is presented here by study area. Each study area analysis presents the following:

- Identification of receptors within each study area and noise sensitive area

- Model validation results
- Determination of existing noise levels
- Receptor impact determinations for the two build and the no-action alternatives
- Noise abatement evaluations

More detailed information on each study area, including detailed modeling, feasibility data and reasonableness criteria assessment is available in the technical reports generated as a part of this project and are available for viewing at the KYTC and INDOT.

STUDY AREA 1

Study Area 1 Noise Sensitive Areas

Study Area 1 is located in downtown Louisville and comprises the Kennedy Interchange. This study area was subdivided into 14 noise sensitive areas. Noise sensitive areas are common noise environments (similar noise sources) where frequent human use could be impacted by highway traffic noise. The noise sensitive areas are described below.

Noise Sensitive Area 1: This noise sensitive area is located along the west side of I-65, between I-65 and 2nd Street and from East Jefferson Street south to East Broadway (approximate south terminus of the FEIS Selected Alternative and the Modified Selected Alternative). This noise sensitive area contains the Martha Ellison International Peace Green park, the Jefferson Technical College, the Old Louisville Medical School Building, the Theodore Ahrens Trade School, the J. Graham Brown School, a YMCA, and a Ronald McDonald House (Activity Category C and C/D); several office buildings/motels (Activity Category E); and several large parking lots (Activity Category F). Receiver 71 is located at the corner of Brook Street and Muhammad Ali Boulevard in a parking lot and represents a first row medical building. Receiver 1a is located at the corner of 1st Street and Muhammad Ali Boulevard and represents the Martha Ellison International Peace Green Park. Receiver H80 is located along 1st Street and represents the historic Old Louisville Medical School Building, the Ronald McDonald House, and the Jefferson Technical College. Receiver H81 represents the historic Theodore Ahrens Trade School, the J. Graham Brown School, and two second row medical buildings.

Noise Sensitive Area 2: This noise sensitive area is located along the west side of I-65, between I-65 and Brook, Floyd and Preston Streets, and from East Jefferson Street north to the Kennedy Interchange. This area contains General William Booth Park and Louisville Slugger Field (both Activity Category C), a firehouse, and several large parking lots and commercial/retail establishments (Activity Category E and F). A portion of Noise Sensitive Area 2 lies within the Phoenix Hill Historic District (Activity Category C). Receiver 69 is located at the corner of Market Street and Jackson Street in a parking lot and represents a McDonald's restaurant (with outdoor seating) and second row commercial buildings in the Phoenix Hill Historic District. Receiver H39 is located along East Main Street in the Phoenix Hill Historic District and represents first row commercial buildings in the district. Receiver 2a represents the General William Booth Park. Receiver 2b represents third row commercial buildings in the Phoenix Hill Historic District. Receivers 2c and 2d represent plaza areas in Louisville Slugger Field.

Noise Sensitive Area 3: Noise Sensitive Area 3 is located along the south side of I-64, from Preston Street to just west of 2nd Street (approximate west terminus of the FEIS Selected

Alternative and the Modified Selected Alternative). This noise sensitive area contains the KFC Yum! Center (basketball arena) and a number of office/commercial buildings (Activity Category E); several large parking lots (Activity Category F); one high rise condominium (Activity Category B); and a small portion of the Waterfront Park (Activity Category C). Receiver 3a is located near the corner of a parking lot adjacent to a high rise condominium and represents the condominium building (no common exterior area of frequent human use). Receiver 3b represents Waterfront Park south of I-64. Receiver H41 was included in the 2001/2003 Noise Impact Analysis to represent receptors in the West Main Historic District, which is located in downtown Louisville to the west of the Kennedy Interchange. Receiver H41 is located on East Witherspoon Street at 2nd Street and for this analysis represents a second row office/commercial building. Receiver H40 was also included in the 2001/2003 Noise Impact Analysis to represent receptors in the adjacent West Main Historic District. For this analysis, Receiver H40 represents a third row office/commercial building.

Noise Sensitive Area 4: Noise Sensitive Area 4 is located along the north side of I-64, from I-65 to just west of 2nd Street (approximate west terminus of the FEIS Selected Alternative and the Modified Selected Alternative). This noise sensitive area contains the historic Belle of Louisville (Activity Category C); and Waterfront Park (Activity Category C), which includes a restaurant near the Clark Memorial Bridge, and the Riverwalk/River Road trail. Receiver H42 represents the Belle of Louisville. Receiver 4a represents the Great Lawn area of Waterfront Park (including the adjacent restaurant). Receiver 4b represents the Riverwalk/River Road trail. Receiver 67 represents Waterfront Park near the I-65 Kennedy Bridge.

Noise Sensitive Area 5: This noise sensitive area is located along the north side of I-64/I-71, from I-65 east to Frankfort Avenue. This noise sensitive area contains a portion of Waterfront Park (Activity Category C); the Riverwalk/River Road trail (Activity Category C); and two large, predominantly undeveloped areas with several small commercial/industrial facilities (Activity Category F). Receiver 66 represents Waterfront Park. Receiver 5a represents Waterfront Park near the I-65 Kennedy Bridge. Receiver 5b represents the Riverwalk/River Road trail. Receiver 5c represents the boat dock/amphitheater area near the east end of Waterfront Park.

Noise Analysis Area 6: This area is located along the north side of I-71, from Frankfort Avenue east to the approximate east terminus of the FEIS Selected Alternative and the Modified Selected Alternative. This area contains rail corridors and primarily undeveloped fields and woodland areas (Activity Category F/G). No noise sensitive receptors are located in this area.

Noise Analysis Area 7: This area is located along the south side of I-71, from Story Avenue east to the approximate east terminus of the FEIS Selected Alternative and the Modified Selected Alternative. This area contains three residences (Activity Category B) that are more than 500 feet from the proposed alternatives; and a utility facility, a truck yard, and undeveloped fields and woodland areas (Activity Category F/G). No noise sensitive receptors are located in this area.

Noise Sensitive Area 8: Noise Sensitive Area 8 is located along the south side of I-71 and the east side of I-64 (to Story Avenue). This noise sensitive area contains a large salvage yard, a large industrial property, and a mix of industrial/retail sites along Mellwood Avenue (Activity Category F). This noise sensitive area also contains a portion of the Butchertown Historic District (Activity Category C). Receiver 64 represents the industrial site/salvage yard along I-65 and I-71, and Receiver H29 represents first and second row residential and commercial buildings

between I-64 and Frankfort Avenue in the Butchertown Historic District. Receivers 8a, 8b, and 8c represent third row residential and commercial buildings in the Butchertown Historic District.

Noise Sensitive Area 9: This noise sensitive area is located along the east side of I-64 from Mellwood Avenue to just south of Payne Street (approximate south terminus of the FEIS Selected Alternative and the Modified Selected Alternative). This noise sensitive area contains numerous residences (Activity Category B), Clifton Park (Activity Category C), a Salvation Army building (Activity Category C), two industrial/commercial retail areas (Activity Category F), and an undeveloped wooded hillside along I-64 (Activity Category G). Receiver 9a is located in Clifton Park and represents the park. Receivers 9b to 9i represent numerous residences and the Salvation Army building along the east side of I-64.

Noise Sensitive Area 10: This noise sensitive area is located along the west side of I-64 from Mellwood Avenue to just south of Payne Street (approximate south terminus of the FEIS Selected Alternative and the Modified Selected Alternative). This noise sensitive area contains numerous residences (Activity Category B), a restaurant with outside seating (Activity Category E), industrial/commercial/retail areas (Activity Category F), and the Beargrass Creek Trail (Activity Category C). Ball fields that were in this area have been replaced by commercial storage buildings. Receiver 10a is located in a predominantly industrial area and represents one residence and the restaurant. Receiver 10b represents the Beargrass Creek Trail and two residences. Receivers 10c to 10f represent numerous residences along the west side of I-64.

Noise Sensitive Area 11: This noise sensitive area is located along the west side of I-64 between I-64 and Adams/Spring Street, and from Mellwood Avenue north to I-71. This noise sensitive area is primarily composed of the Butchertown Historic District, containing a mix of residential and commercial land uses (Activity Category B or E), as well as the Story Avenue Park and the on-street section of Beargrass Creek Trail. Noise Sensitive Area 11 also contains one area outside of the historic district that contains a small salvage yard (Activity Category F). Receiver H27 is located at the corner of Spring Street and Story Avenue and represents the Beargrass Creek Trail south of Story Avenue and three commercial buildings in the Butchertown Historic District. Receiver H28 represents a commercial building and a (vacant) community building located next to the Story Avenue Park. Receiver 65 represents first and second row residential and commercial buildings in the historic district. Receiver 11a represents the Story Avenue Park. Receivers 11b and 11c, and 11f through 11g represent numerous second and third row residential and commercial buildings along Adams Street and Mellwood Avenue in the historic district. Receiver 11b also represents the Beargrass Creek Trail north of Story Avenue.

Noise Sensitive Area 12: Noise Sensitive Area 12 extends from I-64/I-71 south to approximately East Liberty Street, and from Adams/Spring Street west to South Clay Street. This large noise sensitive area contains the majority of the Butchertown Historic District (Activity Category B), a portion of the Phoenix Hill Historic District (Activity Category B and evaluated as a part of NSA 2 because it is closer to the alternatives within that NSA), and a large commercial/industrial area between I-64/I-71 and the Butchertown Historic District boundary (Activity Category F). Receivers in this noise sensitive area (H75, H76, H77, and H78) represent a number of residential and commercial receptors in the Butchertown Historic District that are located more than two blocks away from I-65, I-71, and I-64. Receiver H75 is located at a firehouse on Washington Street. Receiver H76 is located at an elementary school on the south edge of the

Butchertown Historic District. Receiver H77 is located at the corner of East Washington Street and South Campbell Street in the Butchertown Historic District. Receiver H78 is located on East Main Street along the south edge of the Butchertown Historic District. Receivers 11d and 11e represent numerous residences in the vicinity of East Washington Street and Adams Street in the Butchertown Historic District, and Receiver 12a represents residential and commercial buildings along Geiger Street in the district. Receiver H89 is located in the northwest corner of the Butchertown Historic District, and represents residential and commercial buildings in the district along Franklin Street.

Noise Sensitive Area 13: Noise Sensitive Area 13 is located along the east side of I-65 (from I-65 to South Clay Street), and from the Kennedy Interchange south to approximately Muhammad Ali Boulevard. This noise sensitive area contains the Extreme Sports Park (a skateboard park; Activity Category C), portions of the Butchertown and Phoenix Hill historic districts (Activity Category B), apartment/townhouse complexes (Activity Category B), commercial/retail buildings/vacant lots (Activity Category F/G), St. Boniface Catholic Church and The Church of Our Lord Jesus Christ (Activity Category C/D), and several hospital/medical buildings (Activity Category C/D). Receiver 68 is located near the corner of East Washington Street and South Hancock Street and represents first and second row residential and commercial buildings in the Butchertown Historic District. Receiver H38 is located along I-65 between East Main Street and East Market Street and represents two first row commercial buildings in the Phoenix Hill Historic District. Receiver H79 is located along I-65 between East Market Street and East Jefferson Street and represents a 30-unit apartment complex (with a common exterior area of frequent human use) and a townhouse building (with no common exterior area of frequent human use). Receiver 70 is located at the corner of East Liberty Street and Preston Street and represents a high rise apartment building and a first row medical building. Receiver 13a represents one first row commercial building, while Receiver 13b represents a courtyard area in the high rise apartment complex (adjacent to Receiver 70 that is a common exterior area of frequent human use at this apartment complex). Receiver 13c represents the St. Boniface Catholic Church, and Receiver 13d represents a townhouse building (no common exterior area of frequent human use). Receiver 13e represents The Church of Our Lord Jesus Christ and two commercial buildings in the Phoenix Hill Historic District. Receivers 13f, 13g, and 13h represent residential and commercial buildings in the Phoenix Hill and Butchertown historic districts. Receiver 13i represents the Extreme Sports Park.

Noise Sensitive Area 14: Noise Sensitive Area 14 is located along the east side of I-65, from Muhammad Ali Boulevard south to East Broadway (approximate south terminus of the FEIS Selected Alternative and the Modified Selected Alternative). This noise sensitive area contains numerous large (high-rise) hospital/medical buildings (Activity Category C/D) and large parking garages (Activity Category F). Receiver 72 is located within the hospital complex and represents an exterior area surrounded by hospital buildings (Activity Category C/D). Receiver 14a is an exterior area along I-65 at the corner of East Chestnut Street and South Brook Street (Activity Category C/D). This area has no exterior areas of frequent human use and was not assessed for barrier abatement.

Study Area 1 Receivers

To get an accurate appraisal of the existing noise levels within each study area, noise readings were measured at select receptors within each study area. In addition to the field measurements, additional noise receivers were modeled using TNM2.5 to assess the total impacts and to provide the number of benefitted receptors during the barrier abatement assessments. Equivalent receptors for parks and recreational facilities (utilized in the reasonableness assessments for barrier abatement) were calculated in accordance with KYTC's current noise policy and usage data was obtained through correspondence with local administrative officials for each resource.

A summary of the noise measurements in Study Area 1, including the existing noise levels and NAC criteria, is provided in Table 5.5-2. The individual receiver locations in each noise sensitive area are depicted in Figure 5.5-1.

TABLE 5.5-2
RECEIVERS IN STUDY AREA 1

Receiver Name/Description		Existing Noise Level (dBA)	Applicable Noise Abatement Criteria
64	Commercial/Industrial	75	F (NA)
65	Butchertown HD	62	B/E (67 dBA)
66	Waterfront Park	68	C (67 dBA)
67	Waterfront Park	61	C (67 dBA)
68	Butchertown HD	68	B/E (67 dBA)
69	Commercial/Phoenix Hill HD	71	B/E (67 dBA)
70	Residential	70	B (67 dBA)
71	Medical/Commercial	69	C/D (67 dBA)
72	Hospital	74	C/D (67 dBA)
H27	Butchertown HD/Trail	71	B/C (67 dBA)
H28	Butchertown HD	70	B/E (67 dBA)
H29	Butchertown HD	73	B/E (67 dBA)
H38	Phoenix Hill HD	65	B/E (67 dBA)
H39	Phoenix Hill HD	70	B/E (67 dBA)
H40	West Main Street	69	E (72 dBA)
H41	L&N Railroad Office	66	E (72 dBA)
H42	Belle of Louisville	71	C (67 dBA)
H75	Butchertown HD	61	B/E (67 dBA)
H76	Butchertown HD	70	B/E (67 dBA)
H77	Butchertown HD	71	B/E (67 dBA)
H78	Butchertown HD	66	B/E (67 dBA)
H79	Residential	63	B (67 dBA)
H80	Old Louisville Medical	70	C/D (67 dBA)
H81	Ahrens Trade School	71	C/D (67 dBA)
H89	Butchertown HD	56	B/E (67 dBA)
1a	Martha Ellison Peace Green Park	69	C (67 dBA)
3a	Residential	69	B (67 dBA)
4a	Waterfront Park	66	C (67 dBA)
9a	Clifton Park	66	C (67 dBA)
10a	Residential/Commercial	66	B/E (67 dBA)
11a	Story Avenue Park	66	C (67 dBA)
13a	Commercial	64	E (72 dBA)

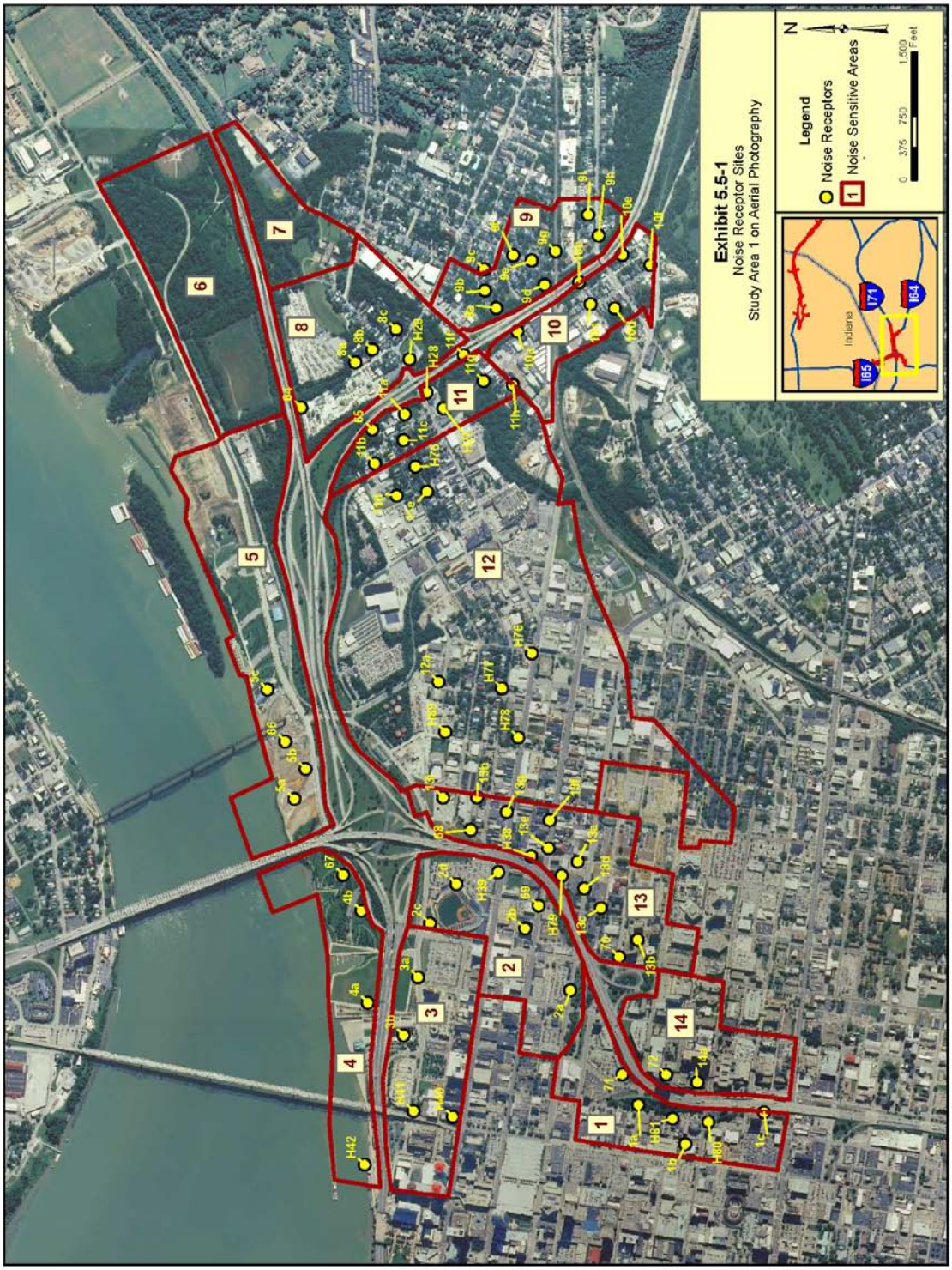


Exhibit 5.5-1
Noise Receptor Sites
Study Area 1 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
1
N
0 375 750 1,500 Feet
Indiana
I-71
I-64
I-65

Study Area 1 Model Validation

As discussed in SDEIS Section 4.5.2, the TNM2.5 noise model used for the prediction of existing as wells as future build, and No-Action Alternatives' noise levels and is validated for the study areas where existing highway facilities exist. Validation involves making noise measurements at a few selected points near the existing roadway while making simultaneous vehicle classification counts of the traffic and estimating travel speed. Then the traffic counts are converted to hourly volumes, and along with the speeds, are entered into a TNM2.5 model that has been created for the existing highway situation. The modeled levels are compared to the measured levels, and if they are within 3 dBA of the measured levels, the model is said to be validated. Receptors 1a, 4a, 9a, 11a, and 13a were used for model validation in Study Area 1. All predicted values were found to be within 3 dBA of the field measured values for these receptors and therefore the TNM2.5 model was validated.

Study Area 1 Noise Impacts

The TNM2.5 model was used to predict the noise level impacts for each of the three alternatives being considered in Study Area 1—the FEIS Selected Alternative, the Modified Selected Alternative, and the No-Action Alternative. The 2030 predicted values were compared to the existing measured or predicted noise levels to assess the potential NAC and/or substantial increase impacts from the project on Study Area 1 receivers. A series of impact assessment tables for each of the alternatives is provided in Appendix B.2.1. Each of these tables presents existing noise level, 2030 alternative-specific noise level, the difference between the existing and the 2030 noise level, applicable noise abatement criteria level, and the type of impact, if any, for each noise sensitive area and each receiver studied within Study Area 1.

For category D receptors, the exterior noise was modeled and 25 dBA was subtracted for building attenuation for a closed-window, air-conditioned building. No receptors had impacts based on NAC D, once this factor was applied. The reported values are for the external levels.

For the FEIS Selected Alternative, TNM2.5 predicts NAC or substantial increase impacts at 930 of the receptors evaluated.

For the Modified Selected Alternative, TNM2.5 predicts NAC or substantial increase impacts at 860 of the receptors evaluated.

Study Area 1 Noise Abatement Evaluation

Barriers were evaluated for acoustic feasibility in accordance with KYTC's current noise policy. Barriers that were not feasible were not given further consideration. For barriers that met the KYTC feasibility requirement, a reasonableness assessment was performed. The cost per benefitted receptor was determined and evaluated against the KYTC policy for reasonableness. In addition, as a part of the reasonableness assessment, the KYTC design goal was evaluated for any barrier that was determined to meet the cost per benefitted receptor criteria. For the purposes of determining cost effectiveness of a noise barrier, benefitted receptors are those that would receive a minimum of 5 dBA noise reduction (based solely on the TNM results). Receptors receiving less than a 5 dBA reduction from a proposed abatement barrier shall not be considered as a benefitted receptor for the purpose of calculating barrier cost effectiveness. In addition, structures beyond 500 feet from the edge of pavement shall not be considered as benefitted receptors for the purposes of calculating cost-effectiveness.

Considering the receptor analysis and the predicted noise impacts at receptors in the project area (as summarized in the impact tables), conceptual noise abatement barrier designs were developed and analyzed for 11 of the 12 noise sensitive areas included in this Study Area 1. At each of these sites, noise abatement barriers were designed for placement along select roadway segments in predicted noise impact areas for the FEIS Selected Alternative and the Modified Selected Alternative in an attempt to provide attenuation of the noise impacts. Barrier designs for these 11 sites were analyzed and, in most cases, included a combination of two or more barriers placed along multiple proposed roadway segments in an attempt to provide the maximum amount of sound level reduction at receptors with predicted design year (2030) noise impacts. The height and length of the barrier designs were modified and refined to determine which (if any) could provide cost-effective noise impact mitigation. A summary of the criteria used in this analysis and the results of this analysis is presented in Table 5.5-3. The locations of all noise barriers determined to; be acoustically feasible, cost-effective and meet the KYTC design goal in Study Area 1 are shown in figures 5.5-2 and 5.5-3 for the FEIS Selected Alternative and Modified Selected Alternative, respectively.

TABLE 5.5-3
STUDY AREA 1 NOISE ABATEMENT SUMMARY

Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets KYTC Design Goal
Noise Sensitive Area 1	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 2	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 2/3	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 4	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 5	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 6	FEIS Selected Modified Selected	NA	NA	NA
Noise Sensitive Area 7	FEIS Selected Modified Selected	NA	NA	NA
Noise Sensitive Area 8	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 9	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 10	FEIS Selected	**Yes**	**Yes**	Yes
	Modified Selected	**Yes**	**Yes**	Yes
Noise Sensitive Area 10/11	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 11	FEIS Selected	No	NA	NA

Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets KYTC Design Goal
	Modified Selected	No	NA	NA
Noise Sensitive Areas 12/13	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 13	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 14*	FEIS Selected Modified Selected	NA*	NA*	NA*

** No barrier analysis performed for the high-rise hospital/medical buildings in Analysis Site 14 due to the lack of exterior uses.*

As indicated in Table 5.5-3, it was determined based on the results that it is not possible to obtain the amount of noise attenuation required to be considered acoustically feasible in accordance with KYTC noise policy for most of the Study Area 1 noise sensitive areas assessed for either the FEIS Selected Alternative or the Modified Selected Alternative. Although the barrier abatement analysis was performed for various barrier combinations, it was concluded that structural noise barriers do not warrant consideration for reasonableness for Noise Sensitive Areas 1, 2, 3, 4, 5, 8, 10 (portion), 11, 12 and 13 because abatement is not acoustically feasible.

Noise Sensitive Area 9 was assessed for noise abatement using a combination of barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicate that for the FEIS Selected Alternative, a combination of three feasible barriers with a total cost of $400,332 would benefit 40 receptors for a cost-effectiveness ratio of $10,008 per benefitted receptor. The 7dBA KYTC design goal was met for 100% of the benefitted receptors. Therefore, feasible and reasonable structural noise barriers are warranted for further consideration for the FEIS Selected Alternative. For the Modified Selected Alternative, a combination of three feasible barriers with a total cost of $485,276 would benefit 40 receptors for a cost-effectiveness ratio of $12,132 per benefitted receptor. The 7dBA KYTC design goal was met for 100% of the benefitted receptors. Therefore, feasible and reasonable structural noise barriers are warranted for further consideration for the Modified Selected Alternative. The final decision regarding abatement measures would be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process would be considered.

Noise Sensitive Area 10 was assessed for barrier abatement through a combination of barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicate that for the FEIS Selected Alternative, a combination of three feasible barriers with a total cost of $835,209 would benefit 57 receptors for a cost-effectiveness ratio of $14,653 per benefitted receptor. The 7dBA KYTC design goal was met for 100% of the benefitted receptors. Therefore, feasible and reasonable structural noise barriers are warranted for further consideration for the FEIS Selected Alternative. For the Modified Selected Alternative, a combination of three feasible barriers with a total cost of $961,217 would benefit 80 receptors for a cost- effectiveness ratio of $12,015 per benefitted receptor. The 7dBA KYTC design goal was met for 71.25% of the benefitted receptors. Therefore, feasible and reasonable structural noise barriers are warranted for further consideration for the Modified Selected Alternative. The final decision

regarding abatement measures will be made during detailed design, at which time, additional design and cost information, as well as information gathered during the public involvement process will be considered.

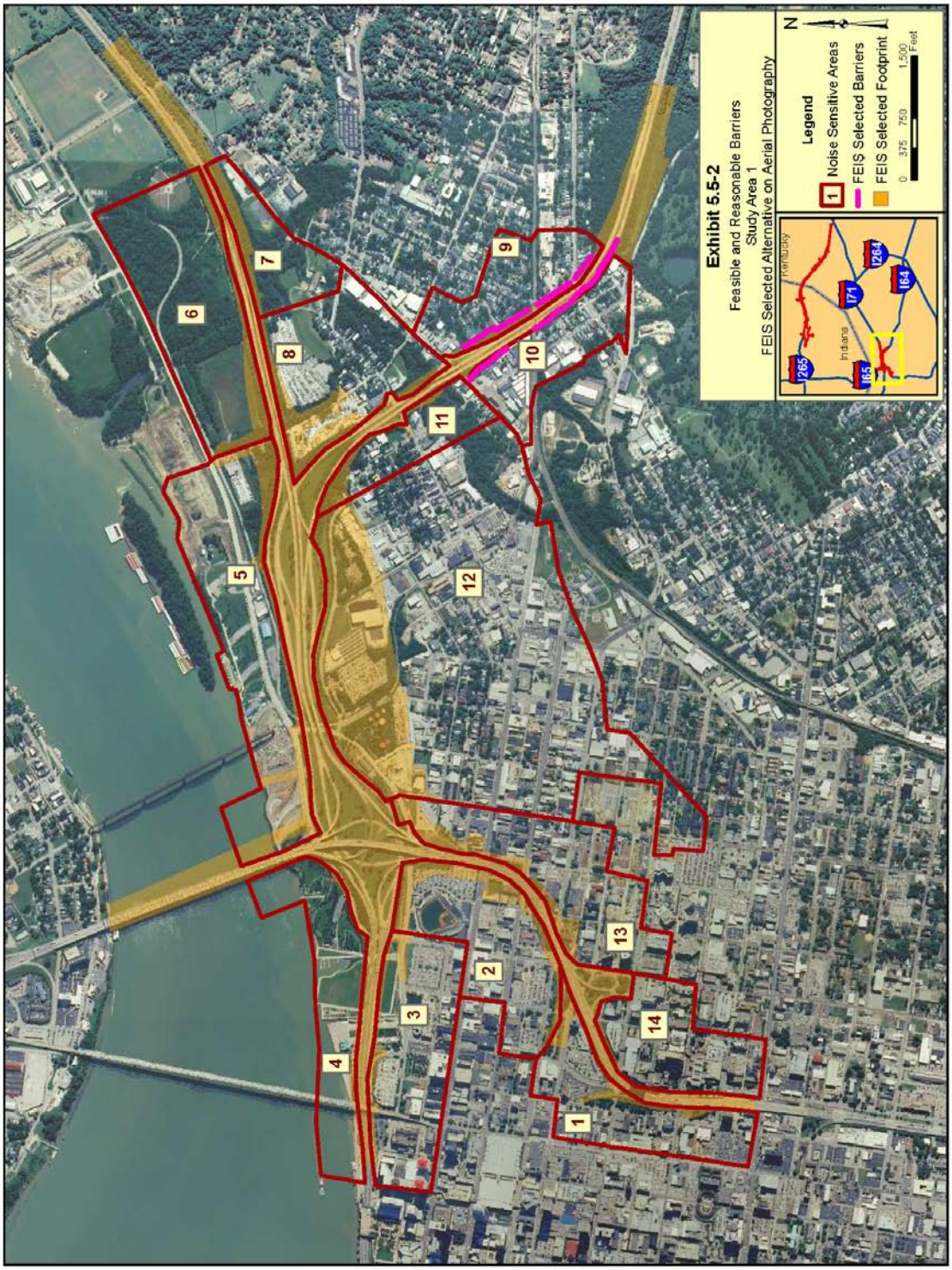


Exhibit 5.5-2
Feasible and Reasonable Barriers
Study Area 1
FEIS Selected Alternative on Aerial Photography
N
Legend
Noise Sensitive Areas
FEIS Selected Barriers
FEIS Selected Footprint
0 375 750 1,500 Feet
Kentucky
Indiana
I-264
I-71
I-64
I-265
I-65
1
2
3
4
5
6
7
8
9
10
11
12
13
14

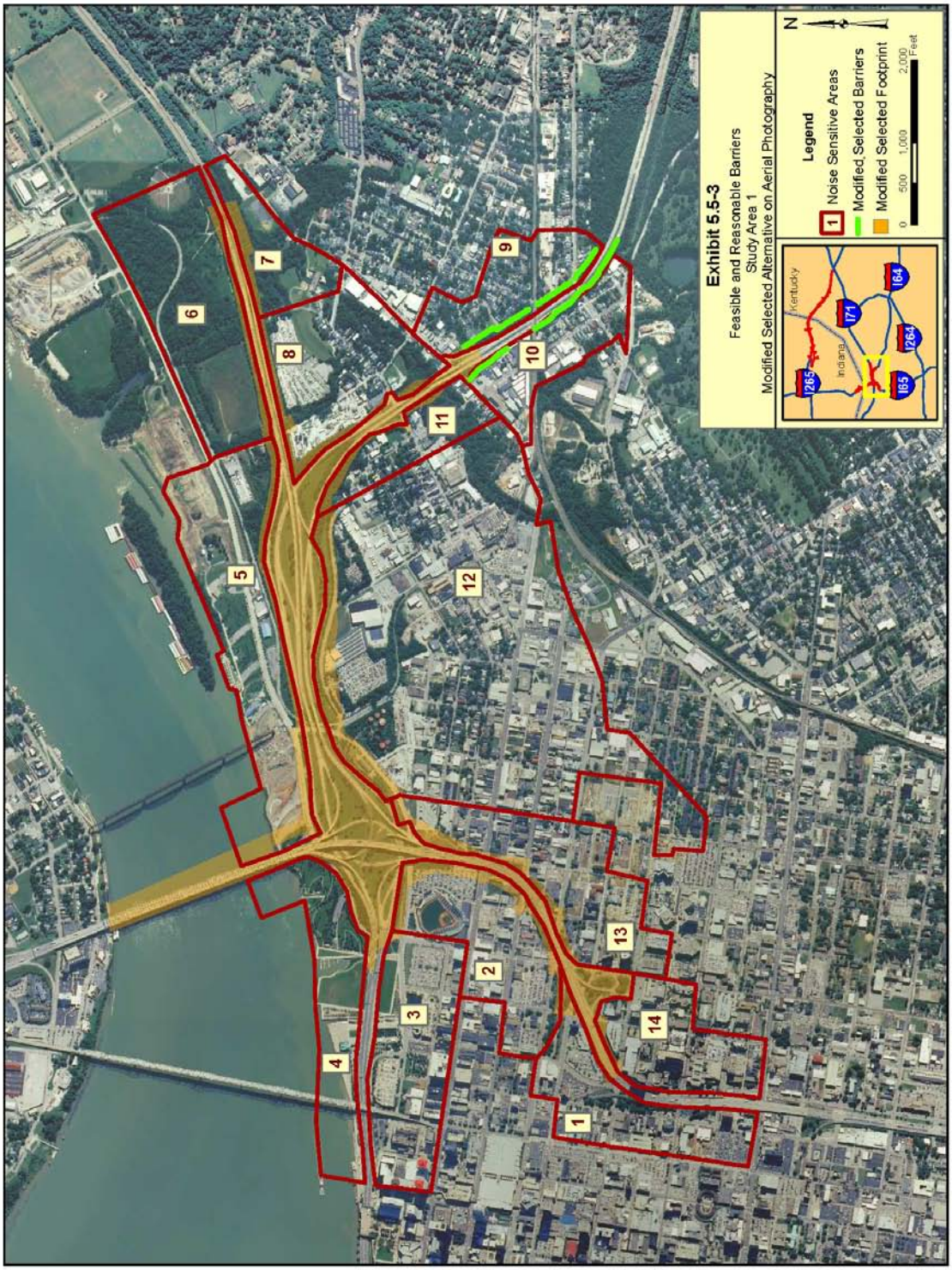


Exhibit 5.5-3
Feasible and Reasonable Barriers
Study Area 1
Modified Selected Alternative on Aerial Photography
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Legend
1 Noise Sensitive Areas
Modified Selected Barriers
Modified Selected Footprint
0 500 1,000 2,000 Feet
Kentucky
Indiana
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71
264
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265
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STUDY AREA 2

Study Area 2 Noise Sensitive Areas

Study Area 2 consists of Jeffersonville and Clarksville, Indiana, in the proposed Downtown Bridge portion of the project. This study area was subdivided into the ten noise sensitive areas described below.

Noise Sensitive Area 1: This noise sensitive area is east of I-65 and includes as noise study receivers the exteriors of residences in the Old Jeffersonville Historic District (Activity Category B), plus Riverfront Park along the river (Activity Category C). Within Riverfront Park, there is a lower trail near the shoreline of the Ohio River, an upper trail along West Riverside Drive, and a seating area near the upper trail located approximately 490 feet from the existing Kennedy Bridge and 330 feet from the proposed Downtown Bridge. The trails run roughly perpendicular to the bridge, approximately 800 feet from the bridge east to the Big Four Bridge, and continue past that bridge to the Riverstage outdoor amphitheater (which is outside the study area).

Because the Jeffersonville Parks and Recreation Department and Ohio River Greenways Commission had no usage data on the park, usage counts were made on a weekday and weekend day in August 2011. These counts were used to compute an equivalent number of residential receptors for abatement reasonableness assessment based on the algorithm in the INDOT noise policy.

Noise Sensitive Area 2: This noise sensitive area is south of West Market Street on the west side of I-65. The noise study receivers include residential units in the eleven-story building for The Harbours Condominiums, four restaurants along West Riverside Drive with outdoor seating, and a single residence just west of US 31. Other establishments along West Riverside Drive, including the Sheraton Hotel and several restaurants, are Activity Category E land uses, but do not have exterior activity areas and are not included in the noise impact analysis.

The Harbours Condominiums building (Activity Category B) consists of an eastern section adjacent to the bridge that faces south, a center section that faces to the southwest, and a short western section that also faces to the south. The first two floors of The Harbours Condominiums building consist of two-story residential townhouse units with patios on the first floor and open-rail balconies on the second floor. Floors 3 through 11 consist of single-story residential condominium units. All of the condominium units have balconies, with outdoor walls separating the balconies of adjacent units. On the back sides of each section of the building are common-area hallways that provide interior access to the condominiums.

There are 89 residential units in the eastern section of the building, which was the focus of the noise study because of its exposure to the project: nine ground-level townhouses accounting for Floors 1 and 2, 75 condominiums on Floors 3-10, and five penthouses on the top floor. The noise analysis addressed noise levels on the patios and balconies, as well as an outdoor pool and gazebo on the western side of the ground floor area.

Noise Sensitive Area 3: This noise sensitive area is on the east side of I-65. The noise study receivers include the exteriors of residences on West Maple Street and the 28-unit Beverly

Manor apartments on West Maple Street (two stories with a total of 14 units facing west toward I-65 (7 up, 7 down) and 14 units facing east away from I-65 (7 up, 7 down). These receptors are Activity Category B. The only external use for the apartments is a picnic table with benches on the south end adjacent to West Maple Street.

Across from these apartments is a large building on the corner of Mulberry and West Maple Streets. The eastern portion of the building is a commercial catering facility. The two western wings are called the Rose Hill Residences, containing 50 very small apartments that appear to be transitional/recovery housing, based on conversations with some of the residents. There is a picnic table on the western end of each wing.

Also in Noise Sensitive Area 3 is the West Maple Baptist Church and Colston Park off Mulberry Street. The interior of the church was studied as Activity Category D because there are no outdoor activity areas. Colston Park (Activity Category C) includes a basketball court to the west, a playground in the center, and a softball field to the east. Because the Jeffersonville Parks and Recreation Department had no usage data on the park, usage counts were made on a weekday and weekend day in August 2011. These counts were used to compute an equivalent of residential receptors for abatement reasonableness assessment based on the algorithm in the INDOT noise policy. Noise Sensitive Area 3 also includes a restaurant with outdoor tables, which is an Activity Category E land use. There are also some Activity Category F businesses which have no exterior activity areas and are not noise sensitive receptors and were excluded from modeling

Noise Sensitive Area 4: This noise sensitive area is west of I-65 and north of West Market Street. Noise study receivers include the exterior patio at the Fairfield Inn and Suites, as well as the outdoor swimming pool at the TownePlace Suites. Also, within the historic Water Tower Square development off Missouri Avenue are outdoor tables at the Lunch Today restaurant, Kye's outdoor meeting room/reception tent area, two picnic areas behind The 400 Building and The 350 Building, and two medical facilities (Early Images and Metro MRI) facing Missouri Avenue. Some of the other businesses within Water Tower Square are Activity Category F (retail, warehousing) and others are Activity Category E land uses (offices, etc.). None of these have exterior activity areas and are not noise sensitive receptors and were excluded from modeling. Along Southern Indiana Avenue is a building containing the Kentuckiana Diagnostics medical facility and two restaurants with no outdoor seating that do not need to be modeled. Also on Southern Indiana Avenue are: the Southern Indiana Visitors Center, which has no exterior uses and does not need to be modeled; the Louisville Municipal Bridge Building, which houses administrative offices for the convention and tourism bureau and does not need to be modeled; and the Louisville Municipal Bridge monument, which will be studied as an Activity Category E property. One exception is the Heart Clinic, Inc., at 601 North Shore Drive (# 102) adjacent to I-65 that was studied for possible interior noise impacts as an Activity Category D land use.

Noise Sensitive Area 5: This noise sensitive area is east of I-65 between West Court Avenue and West 6th Street and includes the exterior of residences on Indiana Avenue and Ohio Avenue, including an 8-unit apartment building (two stories, with four units up and 4 units down) on the corner of Indiana Avenue and West 5th Street. It also includes a four-unit residential structure on the corner of Ohio Avenue and West 5th Street. All of these receptors are Activity Category B

land uses. There is one Activity Category D medical facility (Douglas Cotton Dentistry) on the corner of Indiana Avenue and 6th Street. There are also some Activity Category F businesses (retail), which have no exterior activity areas and are not noise sensitive receptors and were excluded from modeling

Noise Sensitive Area 6: This noise sensitive area is east of I-65 between 6th Street and West 10th Street, and includes the exterior of residences on Indiana Avenue and Ohio Avenue between West 7th and 9th Streets, including a 3-story, 12-unit apartment building on Indiana Avenue. There are also Activity Category F businesses (Bales Motor Company on Broadway, and several businesses along Spring Street) that do not need to be modeled for future noise levels or assessed for noise impacts.

The Master Plan for City of Jeffersonville's Canal District Project shows a future park bordered by I-65, Indiana Avenue, and West 7th and 9th Streets as the terminus of the planned Canal Project promenade walkway. The canal would run from near the Ohio River northward and then westward along the current location of West 8th Street to this area. Because this park and associated land development are in the conceptual stage at the time of this study, the study is focusing on the current land uses.

Noise Sensitive Area 7: This noise sensitive area is west of I-65, extending from South Clark Boulevard to just south of the Holiday Inn Lakeview. On the southern end is the Colgate Palmolive Historic District. It is currently an Activity Category F land use, but was modeled because of its historic designation. Adjacent to it is the Philadelphia Quartz Company, another Activity Category F property, which was not modeled or assessed for impacts. Farther north along Marriott Drive is a KOA campground that borders a railroad embankment between it and the West 10th Street ramps. The Derby Dinner Playhouse and Atlantis Water Park are also along Marriott Drive, but are more than 500 feet from the proposed project, and therefore were not included in the analysis, per the INDOT noise policy. On the north end is Tom Stinnett Derby City RV's, an Activity Category F business that was also not modeled or assessed for impacts.

Noise Sensitive Area 8: This noise sensitive area is east of I-65, between West 10th Street and West 14th Street (Stansifer Avenue), including project improvements at the intersection of West 10th Street and Spring Street for one of the alternatives. On the north end, this area includes residences on Akers Avenue that are adjacent to I-65, but are partially shielded from I-65 by a railroad embankment. Immediately to the south is the large campus for the Clark Memorial Hospital and related medical facilities. There are no outdoor activity areas associated with these buildings. Also on the campus is the Hillcrest Center for Health & Rehabilitation skilled nursing facility, which does have an outdoor courtyard in the center of the building, evaluated as Activity Category C.

Along West 10th Street is the historic Train Depot, Activity Category E. On Spring Street and Wall Street are two buildings that comprise the Medical Plaza of Jeffersonville. There is also an Activity Category E restaurant with no outdoor seating, which will therefore not be modeled.

Noise Sensitive Area 9: This noise sensitive area is east of I-65 and north of West 14th (Stansifer). On Homestead Avenue are several single-family residences and Serenity House, a

44-bed non-profit residential addiction rehabilitation center with outdoor porches on the northwestern and northeastern sides of the building. Also in this area at the corner of Mitchell Avenue and West 14th Street is the former home of the Kidmarx Christian Academy, which was evaluated based on its former use as a school. It has no exterior activities, and was analyzed as Activity Category D for possible interior impacts. Immediately east of this building on Mitchell Avenue are single-family residences.

Noise Sensitive Area 10: This noise sensitive area is west of I-65, extending from the Holiday Inn Lakeview on Marriott Drive to north of Stansifer Avenue (West 14th Street). On the north end, the area includes residences on State Street, East Norwood Avenue, East Harrison Avenue, Sunset Avenue, and Roy Cole Drive. There are also some City of Jeffersonville public utility buildings, which are Activity Category F and will not be modeled or accessed for impacts. On the south side of Stansifer Avenue are several residences, plus a retail facility (Brummett Pools) at the corner of Stansifer Avenue and Marriott Drive that is in Activity Category F and will not be modeled or assessed for impacts. To the south is the Holiday Inn Lakeview is in Activity Category E. It has a pool behind the buildings that is more than 500 feet from the proposed project, but has no outdoor uses within 500 feet of the project, and will therefore not be modeled.

Study Area 2 Receivers

A summary of the noise receivers measured in Study Area 2, including the existing noise levels and NAC criteria, is provided in Table 5.5-4. The individual receiver locations in each noise sensitive area are graphically depicted in Figure 5.5-4.

Additional modeled receivers are included in the impact tables for the study area. For the Harbours Condominiums, one goal was to assess the change in level with change in elevation for this 11-story building. Sites were selected on balconies of the third, sixth and ninth floor units, representing locations that were, respectively, below the pavement elevation on the bridge, at the same height, and above the pavement. Due to available access, the choice of particular units was limited to those that were currently vacant. As a result, the third-floor unit was toward the western end of the front of the building, the sixth-floor unit was on the southeastern corner closest to I-65, and the ninth-floor unit was the second unit from the southeastern end.

Study Area 2 Model Validation

Receptors located at 500 Indiana Avenue, 340 West Maple Street, Colston Park, West Maple Baptist Church, and 1003 West Market Street were used for model validation in Study Area 2. All predicted values were found to be within 3 dBA of the field measured values for these receptors and therefore the model validated.

TABLE 5.5-4
MEASURED NOISE RECEIVERS FOR STUDY AREA 2

Receiver	Noise Sensitive Area	Existing Noise Level (dBA)	NAC Category
420 W. Riverside Drive	1	68	C (67 dBA)
416 W. Riverside Drive	1	66	C (67 dBA)
502 W. Market Street	1	68	C (67 dBA)
426 W. Market Street	1	64	C (67 dBA)
920 Harbours Balcony	2	77	C (67 dBA)
621 Harbours Balcony	2	74	C (67 dBA)
315 Harbours Balcony	2	69	C (67 dBA)
600 W. Riverside Drive	2	70	C (67 dBA)
340 W. Maple Street	3	67	C (67 dBA)
336-334 W. Maple Street	3	62	C (67 dBA)
Fairfield Inn - Patio	4	62	C (67 dBA)
500 Indiana Avenue	5	65	C (67 dBA)

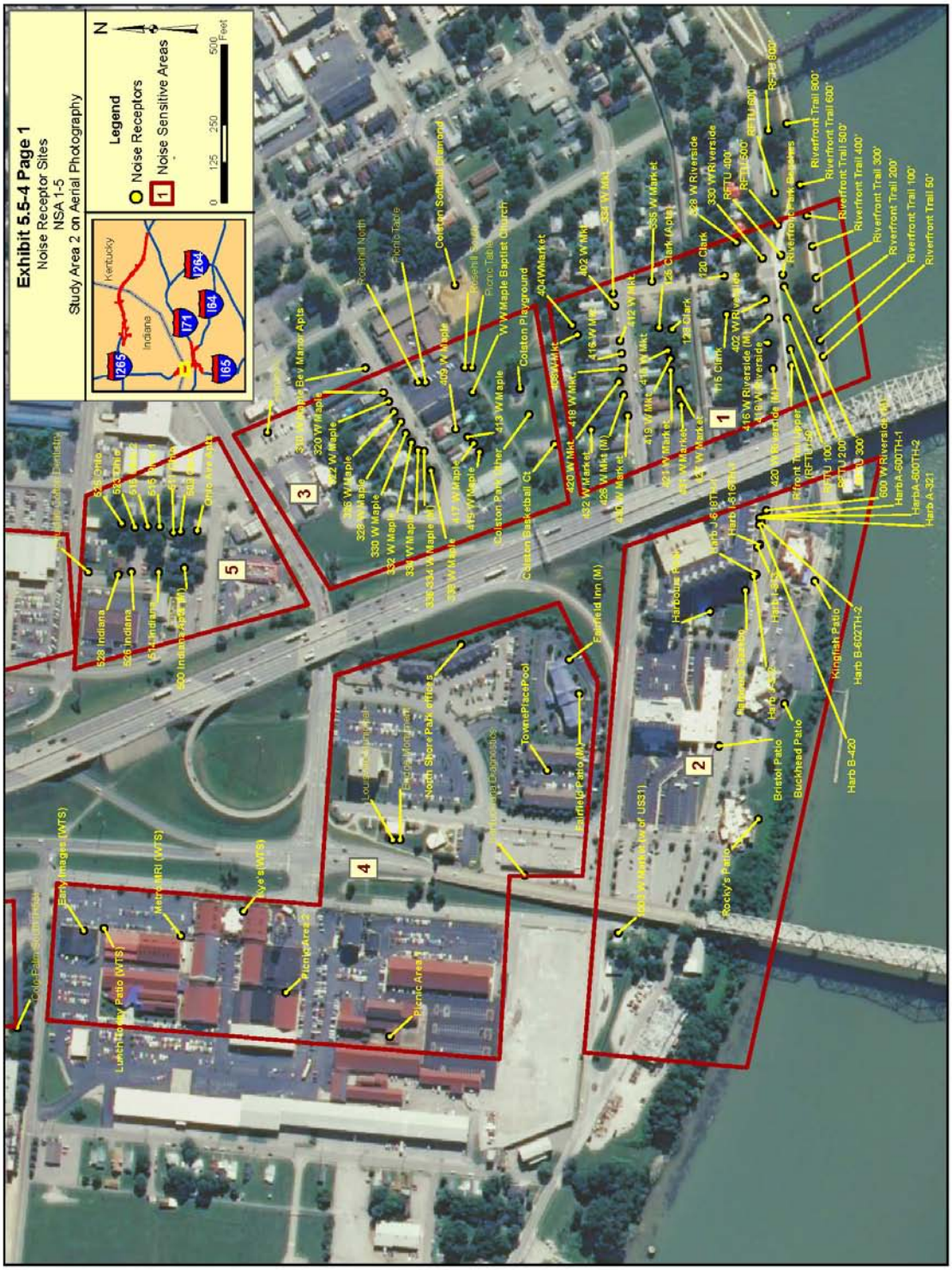
Exhibit 5.5-4 Page 1
Noise Receptor Sites
NSA 1-5
Study Area 2 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0
125
250
500
Feet
Kentucky
Indiana
1265
264
64
171
165
1
2
3
4
5
Colston Softball Diamond
Colston Playground
Colston Basketball Ct
Colston Park Shelter
Picnic Table
Rosehill North
Roseh
Fairfield Inn (M)
TownePlacePool
Harbour Pointe
Harb J-602TH
Harb I-602TH
Harb H-602TH
Harb G-602TH
Harb F-602TH
Harb E-602TH
Harb D-602TH
Harb C-602TH
Harb B-602TH-2
Harb A-602TH-1
Harb A-602TH-2
Harb A-321
Harb B-420
Harb A-420
Kingfish Patio
Bristol Patio
Buckhead Patio
Rocky's Patio
Fairfield Patio (M)
Riverfront Trail 800'
Riverfront Trail 600'
Riverfront Trail 500'
Riverfront Trail 400'
Riverfront Trail 300'
Riverfront Trail 200'
Riverfront Trail 100'
Riverfront Trail 50'
RFTU 800'
RFTU 600'
RFTU 500'
RFTU 400'
RFTU 300'
RFTU 200'
RFTU 100'
RFTU 50'
Riverfront Park Benches
Picnic Area 1
Picnic Area 2
Picnic Area 3
North Shore Path w/Hills
Ohio Falls Boathouse
Early Images (WTS)
Historic MRI (WTS)
Lutkin Tolley Patio (WTS)
Tyvek (WTS)
Ohio River Trail
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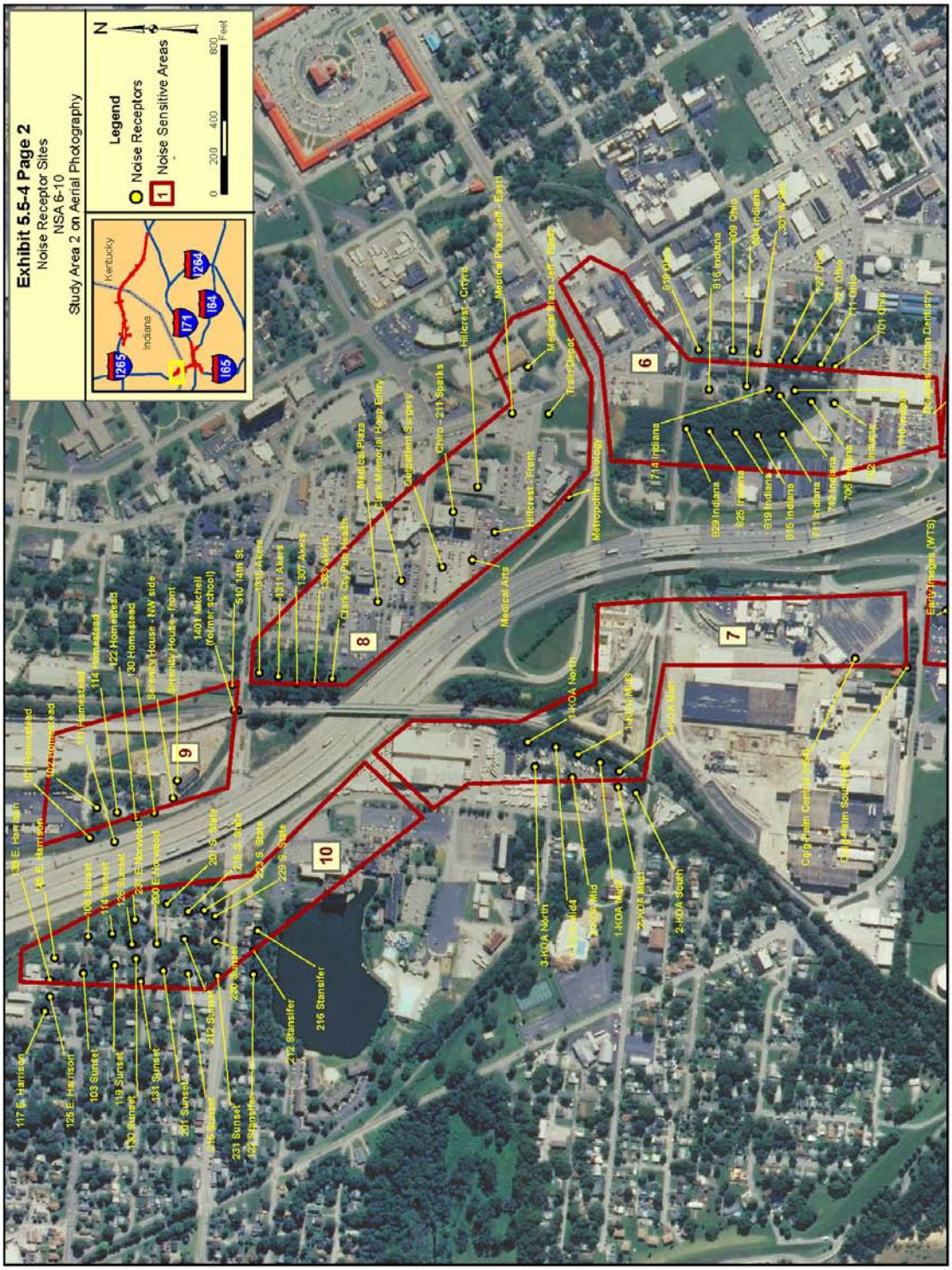
Exhibit 5.5-4 Page 2
Noise Receptor Sites
NSA 6-10
Study Area 2 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0
200
400
800
Feet
Kentucky
Indiana
265
264
64
71
65
6
7
8
9
10
Medical Arts
Medical Plaza Jeff - East
Medical Plaza Jeff - West
Hillcrest - Cryra
Hillcrest - Front
Chiro - 211 Sparks
Metropolitan Urology
Train Depot
Clark Cty Pub Health
Clark Memorial Hosp Entry
Outpatient Surgery
Medical Plaza
1-KOA North
2-KOA Mid
3-KOA North
1-KOA Mid
2-KOA North
2-KOA Mid
2-KOA South
Early Impacts (WTS)
Early Impacts South
Early Impacts Central
Dalton Dentistry
1401 Mitchell (Volmer school)
Serenity House - NW side
Serenity House - front
22 Homestead
30 Homestead
114 Homestead
117 Homestead
510 14th St
1015 Akers
1307 Akers
1313 Akers
33 E. Harrison
45 E. Harrison
125 E. Harrison
103 Sunset
108 Sunset
114 Sunset
118 Sunset
130 Sunset
131 Sunset
201 Sunset
212 Sunset
216 Sunset
231 Sunset
222 Stansifer
212 Stansifer
216 Stansifer
200 E. Norwood
204 S. State
218 S. State
228 S. State
229 S. State
714 Indiana
816 Indiana
819 Indiana
825 Indiana
829 Indiana
706 Indiana
711 Indiana
712 Indiana
701 Ohio
711 Ohio
712 Ohio
809 Ohio
816 Indiana
819 Ohio
904 Indiana

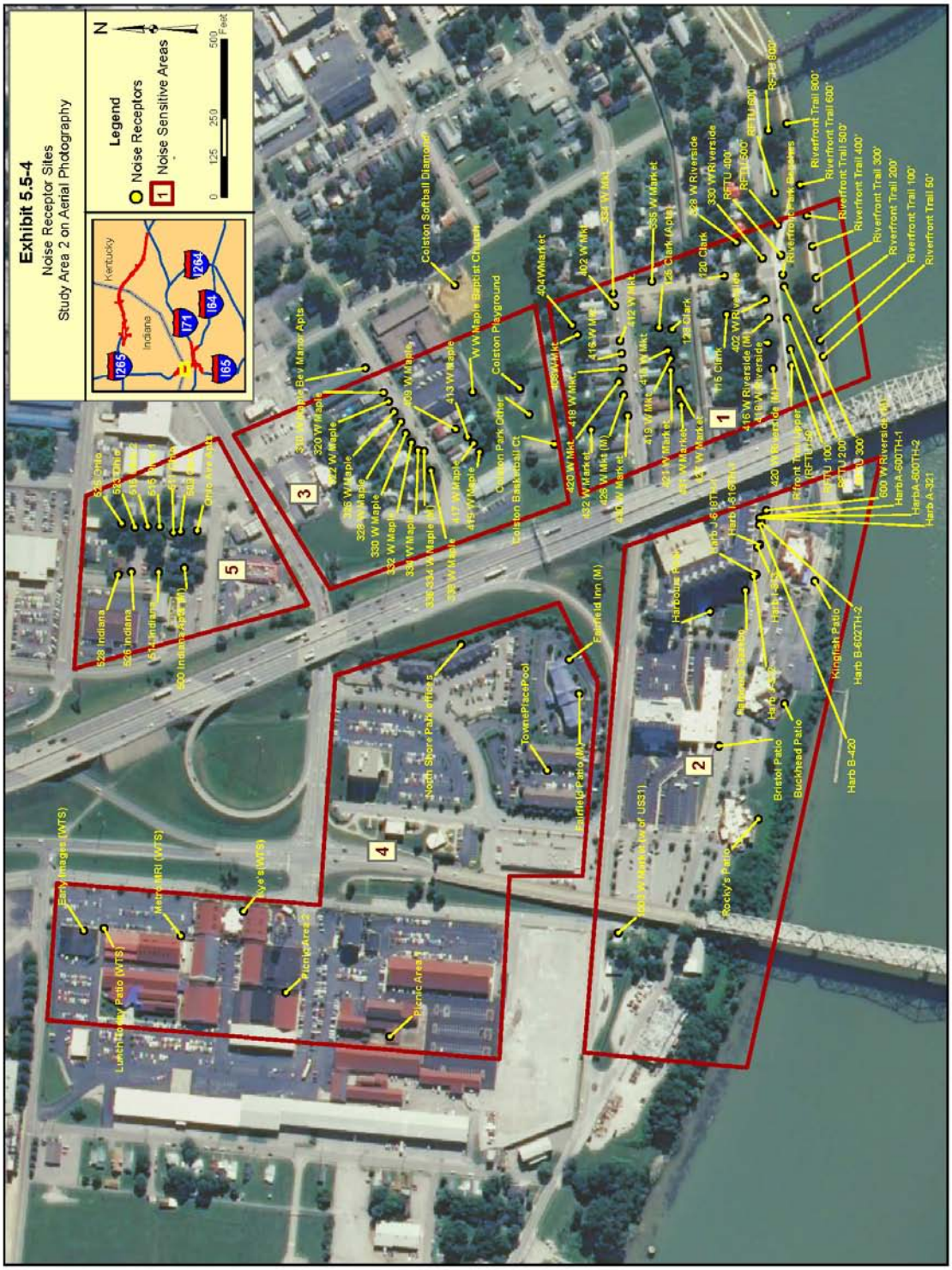
Exhibit 5.5-4
Noise Receptor Sites
Study Area 2 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0
125
250
500
Feet
Kentucky
Indiana
1
2
3
4
5
Colston Softball Diamond
Colston Playground
Colston Park Other
Colston Basketball Ct
W W Maple Baptist Church
Riverfront Park Benches
Riverfront Trail 800'
Riverfront Trail 600'
Riverfront Trail 500'
Riverfront Trail 400'
Riverfront Trail 300'
Riverfront Trail 200'
Riverfront Trail 100'
Riverfront Trail 50'
Harb A-321
Harb B-420
Harb B-602TH-2
HarbA-600TH-1
HarbA-600TH-2
Kingfish Patio
Bristol Patio
Buckhead Patio
Rocky's Patio
Harbour Pointe
Fairfield Inn (M)
TownePlaceSuites
North Shore Park entrance
Picnic Area 1
Picnic Area 2
Picnic Area 3
Lukin Toney Patio (WTS)
Marc's MRI (WTS)
Eye s (WTS)
Eagle Images (WTS)

Study Area 2 Noise Impacts

The FHWA TNM 2.5 was used to predict the noise level impacts for the FEIS Selected Alternative, the Modified Selected Alternative, and the No-Action Alternative. The 2030 predicted values were compared to the existing measured or predicted noise levels to assess the potential NAC and/or substantial increase impacts from the project on Study Area 2 receivers. Impact assessment tables for each of the three alternatives are provided in Appendix B.2.2. Each of these tables presents existing noise level, 2030 alternative-specific noise level, the difference between the existing and the 2030 noise level, applicable noise abatement criteria level, and the type of impact, if any, for each noise sensitive area and each receiver studied within Study Area 2.

For category D receptors, the exterior noise was modeled and 25 dBA was subtracted for building attenuation for a closed-window, air-conditioned building. No receptors had impacts based on NAC D, once this factor was applied. The reported values are for the external levels.

For the FEIS Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 182 of the receptors evaluated.

For the Modified Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 196 of the receptors evaluated.

Study Area 2 Noise Abatement Evaluation

Barriers were evaluated for acoustic feasibility in accordance with INDOT's current noise policy. Barriers that were not feasible were not given further consideration. For barriers that met the INDOT feasibility requirement, a reasonableness assessment was performed. The cost per benefitted receptor was determined and evaluated against the INDOT policy for reasonableness. In addition, as a part of the reasonableness assessment, the INDOT design goal was evaluated for any barrier that was determined to meet the cost per benefitted receptor criteria.

Considering the receptor analysis and the predicted noise impacts at receptors in the project area (as summarized in the impact tables), conceptual noise abatement barrier designs were developed and analyzed for the noise sensitive areas included in this study area. At each of these sites, noise abatement barriers were designed for placement along select roadway segments in predicted noise impact areas for the FEIS Selected Alternative and the Modified Selected Alternative in an attempt to provide noise attenuation for impacted receptors. Barrier designs for these noise sensitive areas were analyzed in TNM2.5 and in certain cases included a combination of two or more barriers placed along multiple proposed roadway segments in an attempt to provide the maximum amount of sound level reduction at receptors with predicted design year (2030) noise impacts. The height and length of the barrier designs were modified and refined in TNM2.5 to determine which (if any) could provide cost-effective noise impact mitigation. A summary of the criteria used in this analysis and the results of this analysis is presented in Table 5.5-5. The locations of all noise barriers determined to; be acoustically feasible, cost-effective, and meet the INDOT design goal in Study Area 2 are shown in figures 5.5-5 and 5.5-6 for the FEIS Selected Alternative and Modified Selected Alternative, respectively.

TABLE 5.5-5
STUDY AREA 2 NOISE ABATEMENT SUMMARY

Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets INDOT Design Goal
Noise Sensitive Area 1	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 2	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 3	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 4	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 5	FEIS Selected	**Yes**	No	NA
	Modified Selected	**Yes**	No	NA
Noise Sensitive Area 6	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 7	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 8	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 9	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 10	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**

The following is a summary of each noise sensitive area assessed and the results of the barrier assessment for each area.

Noise Sensitive Areas 1 and 3 were assessed for barrier abatement thorough a combination of barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. For the barrier analysis, areas 1 and 3 were combined into a single area because any noise barrier needed for one area would extend into the other area. The results indicated that with a combination of barriers, it was possible to obtain the noise attenuation to be considered acoustically feasible and reasonable in accordance with INDOT noise policy. The results indicate that for the FEIS Selected Alternative, a combination of four barriers with a total cost of $1,936,800 would benefit 137 receptors for a cost-effectiveness ratio of $14,145 per benefitted receptor. The barrier would provide 88% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. For the Modified Selected Alternative, a combination of four barriers with a total cost of $1,953,840 would also benefit 137 receptors for a cost-effectiveness ratio of $14,269 per benefitted receptor. The barrier would provide 88% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. As a result, for both alternatives, feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed

design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

Noise Sensitive Area 2 was assessed for barrier abatement via barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicated that with barriers it was possible to obtain the noise attenuation to be considered acoustically feasible and reasonable in accordance with INDOT noise policy. The results indicate that for the FEIS Selected Alternative, a barrier with a total cost of $378,000 would benefit 53 receptors for a cost-effectiveness ratio of $7,132 per benefitted receptor. The barrier would provide 60% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. For the Modified Selected Alternative, a barrier with a total cost of $378,000 would also benefit 53 receptors for a cost-effectiveness ratio of $7,132 per benefitted receptor. The barrier would provide 60% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. As a result, for both alternatives, feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

Noise Sensitive Area 4 had no NAC or substantial increase impacts from either the FEIS Selected Alternative or the Modified Selected Alternative and therefore, barrier analyses were not warranted for this noise sensitive area.

Noise Sensitive Area 5 was assessed for barrier abatement for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicated that with barriers, it was possible to obtain the noise attenuation to be considered acoustically feasible in accordance with INDOT noise policy. The TNM2.5 results indicate that for the FEIS Selected Alternative, a barrier with a total cost of $860,400 would benefit 9 receptors for a cost-effectiveness ratio of $93,400 per benefitted receptor. For the Modified Selected Alternative, a combination of four barriers with a total cost of $909,600 would benefit 11 receptors for a cost-effectiveness ratio of $82,691 per benefitted receptor. As a result, for both alternatives, the analyzed barriers do not meet the INDOT cost-effectiveness threshold and therefore, no further consideration of barrier abatement is warranted.

Noise Sensitive Area 6 had no NAC or substantial increase impacts from either the FEIS Selected Alternative or the Modified Selected Alternative and therefore, barrier analyses were not warranted for this noise sensitive area.

Noise Sensitive Area 7 had no NAC or substantial increase impacts from either the FEIS Selected Alternative or the Modified Selected Alternative and therefore, barrier analyses were not warranted for this noise sensitive area.

Noise Sensitive Area 8 was assessed for barrier abatement via barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicated that with barriers it was not possible to obtain the noise attenuation to be considered acoustically feasible and reasonable in accordance with INDOT noise policy. The results indicate that for both the FEIS Selected Alternative and the Modified Selected Alternative, 5 dB of insertion loss could not be obtained at a majority of the impacted residences. As a result, for both alternatives, the analyzed barriers do not meet the INDOT acoustic feasibility criterion and, therefore, no further consideration of barrier abatement is warranted.

Noise Sensitive Area 9 was assessed for barrier abatement via barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicated that with barriers it was possible to obtain the noise attenuation to be considered acoustically feasible and reasonable in accordance with INDOT noise policy. The results indicate that for both the FEIS Selected Alternative and the Modified Selected Alternative, a barrier with a total cost of $539,280 would benefit 9 receptors plus 44 residents of Serenity House for a cost-effectiveness ratio of $10,175 per benefitted receptor. The barrier would provide 100% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. As a result, feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

Noise Sensitive Area 10 was assessed for barrier abatement via barriers for both the FEIS Selected Alternative and the Modified Selected Alternative. The results indicated that with barriers it was possible to obtain the noise attenuation to be considered acoustically feasible and reasonable in accordance with INDOT noise policy. The results indicate that for both the FEIS Selected Alternative and the Modified Selected Alternative, a barrier with a total cost of $745,140 would benefit 31 receptors for a cost-effectiveness ratio of $24,037 per benefitted receptor. The barrier would provide 93% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. As a result, for both alternatives, feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

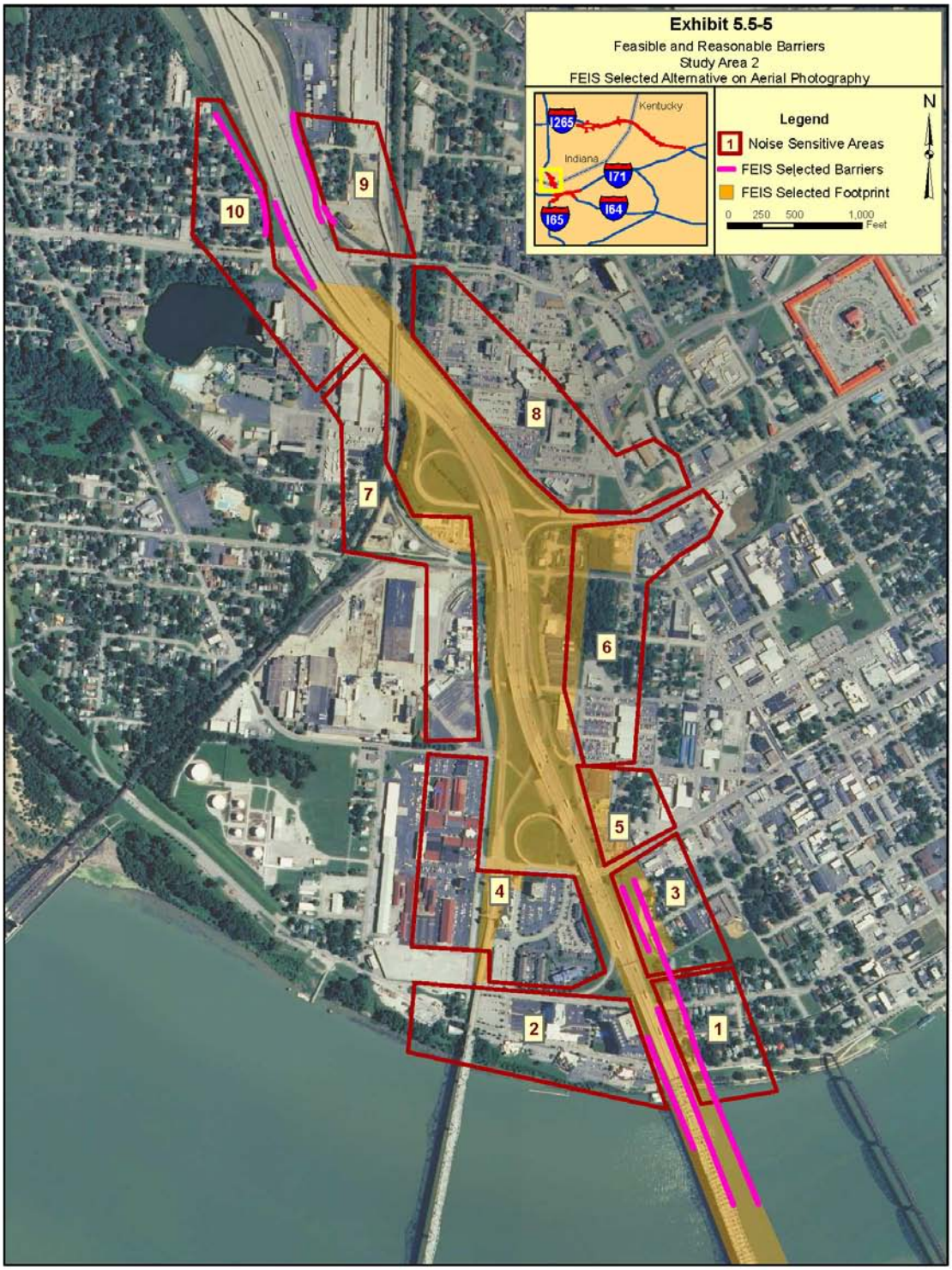
Exhibit 5.5-5
Feasible and Reasonable Barriers
Study Area 2
FEIS Selected Alternative on Aerial Photography
Kentucky
Indiana
I265
I71
I64
I65
Legend
Noise Sensitive Areas
FEIS Selected Barriers
FEIS Selected Footprint
0 250 500 1,000
Feet
N
1
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4
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10

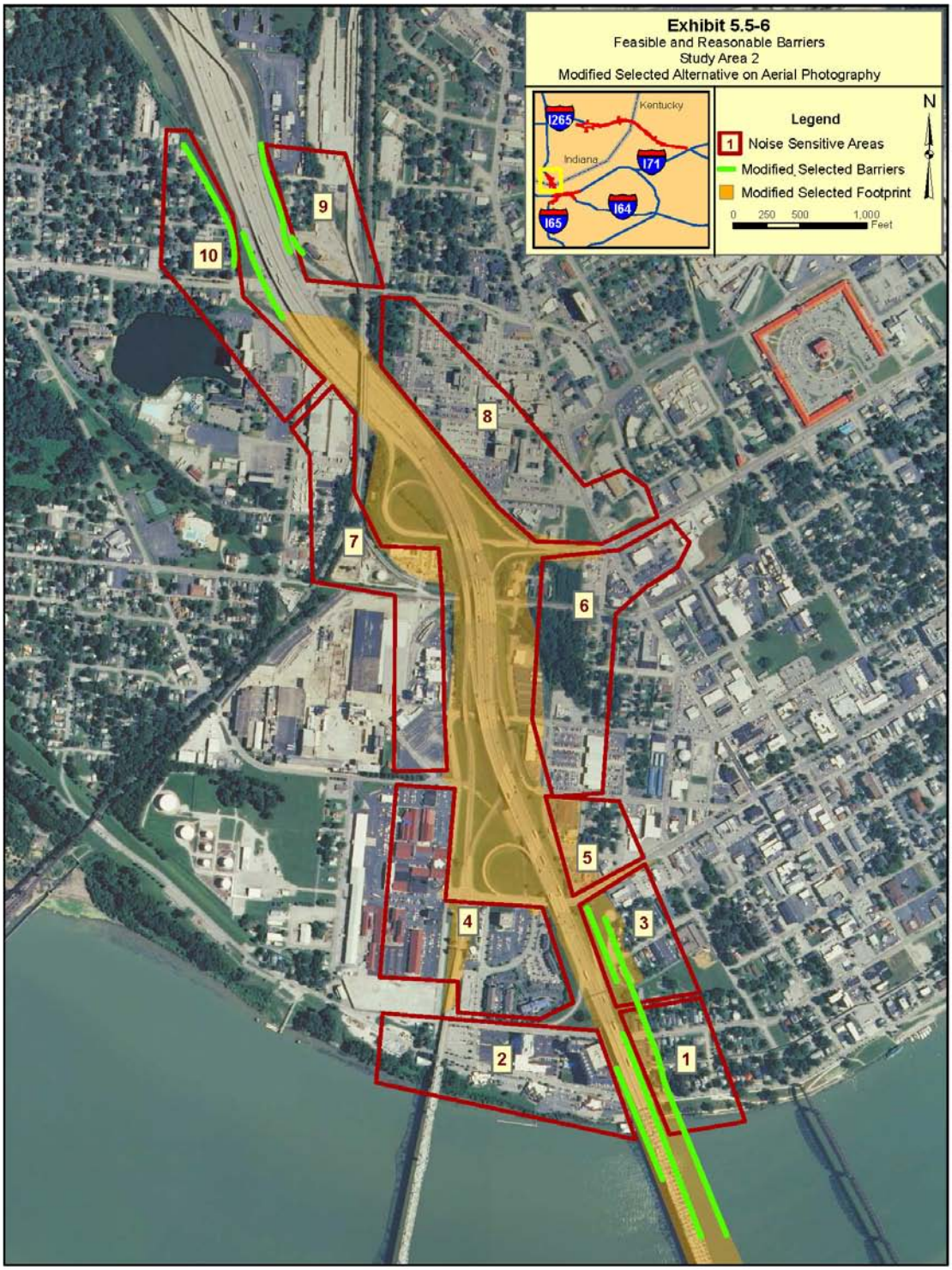
Exhibit 5.5-6
Feasible and Reasonable Barriers
Study Area 2
Modified Selected Alternative on Aerial Photography
Kentucky
Indiana
I265
I71
I64
I65
Legend
1 Noise Sensitive Areas
Modified Selected Barriers
Modified Selected Footprint
0 250 500 1,000
Feet
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STUDY AREA 3

Study Area 3 Noise Sensitive Areas

Study Area 3 is located along the proposed LSIORB Project's East End Corridor on the Kentucky side of the Ohio River. This section begins just west of the interchange of KY 841 and I-71 and continues to the proposed bridge over the Ohio River. Existing KY 841 terminates at the intersection with U.S. 42. This study area was subdivided into five noise sensitive areas, as described below.

Noise Sensitive Area 1—Green Spring/Wolf Creek Subdivisions: This noise sensitive area is located southeast of existing KY 841. The proposed alignments generally follow the KY 841 corridor; however, the proposed corridor is considerably wider than the existing facility. Most of the proposed expansion occurs on the south side of the existing roadway moving traffic closer to this noise sensitive area. This area is almost entirely residential with a neighborhood clubhouse with swimming pool/tennis courts. The entire area would fall into Activity Category B, with the exception of the clubhouse, which would be Activity Category C. Receivers R-21 through R-25 and R-41 are located in either the first or second row of houses backing up to the existing KY 841 corridor.

Noise Sensitive Area 2—Wolf Pen Woods Subdivision: This noise sensitive area is located northwest of existing KY 841. The proposed expansion mostly occurs on the south side of the existing roadway; however, some expansion to the north does move traffic slightly closer to this noise sensitive area. This area is almost entirely residential with a few larger tracts/small farms to the east of the subdivision. The great majority of the area would fall into Activity Category B. Receivers R-26, R-27, R-27a, R-27b, R-27-c and R-27d are located in either the first or second row of houses backing up to the existing KY 841 corridor.

Noise Sensitive Area 3—Bridgepoint Subdivision: Bridgepoint is also located on the northwest side of KY 841, just west of the Wolf Pen Woods Subdivision. It is also bounded by US 42 on the west end. This area is almost entirely residential, with a clubhouse being one of the few non-residential receptors (Activity Category C) close to the proposed roadway. Activity Category B applies to this noise sensitive area. Existing KY 841 is actually slightly closer to this noise sensitive area than the alignment of either of the proposed LSIORB Project alternatives along one portion of the project. The proposed facility is also at a lower elevation than the existing roadway through this area as it is going downgrade into the proposed tunnel. Receivers R-28, R-29 and R-30 are located at first and second row houses near the east end of the subdivision.

Noise Sensitive Area 4—Shadow Wood: This area is a mix of residential and commercial (Activity Categories B and E, respectively). The closest receptors to the proposed project are generally residential in nature. There are also several historic sites located in this area. Receivers R-TRC-2 and H-8 are approximately 700 to 900 feet from the centerline of the proposed highway; however, the point of closest approach for R-TRC-2 is actually inside the proposed tunnel. Like the situation in the Bridgepoint Subdivision (Noise Sensitive Area 3), a portion of the proposed facility is in a deep cut as it exits the tunnel heading west. A short fill section along the alignment transitions to the bridge over Harrods Creek. *Noise Sensitive Area 5—Harrods Creek Condos:* This area is a somewhat smaller but densely populated area with a series of four-unit condo buildings situated around two ponds. A marina along Harrods Creek is also located nearby, as well as several single family residences as the alignment moves west closer to the

Ohio River. The proposed Harrods Creek Bridge and the approach to the proposed East End Bridge keep the roadway elevation well above the existing terrain. Receivers 36, 37, 39 and 40 are located at condo units in the first or second row of units closest to the proposed alignment. Sites 36 and 37 would be partially shielded from the proposed alignment by a hillside between the condos and the proposed road. This area is mostly Activity Category B. There is a very small number of Category E sites with no exterior use, and therefore no Category E sites were actually modeled or measured in this study.

There are additional receivers shown for this study area that are not a part of any analyzed noise sensitive area. These receivers were previously analyzed in the FEIS and again as a part of the design process after the signature of the ROD in 2003. It was determined that barrier abatement was not cost-effective based on the fact that the receptors were isolated residences and/or the structural modification costs necessary for barrier placement on the bridge.

The remainder of the East End Corridor portion of the project in Kentucky is very sparsely populated, although a number of historic sites are located on either side of the proposed alignment between the Harrods Creek Bridge and the Ohio River.

Study Area 3 Receivers

The noise receivers measured in Study Area 3, including the existing noise levels and NAC criteria are listed in Table 5.5-6. Additional TNM2.5 modeled receivers are included in the impact tables for the study area. The individual receiver locations in each noise sensitive area are graphically depicted in Figure 5.5-7.

TABLE 5.5-6
RECEIVERS IN STUDY AREA 3

Receiver Name/Description		Existing Noise Level (dBA)	Applicable Noise Abatement Criteria
H-5	Residential	51	B (67 dBA)
H-8	Residential	47	B (67 dBA)
H-9	Residential	49	B (67 dBA)
H-11	Residential	45	B (67 dBA)
H-12	Residential	43	B (67 dBA)
H-13	Residential	46	B (67 dBA)
R-TRC-2	Residential	52	B (67 dBA)
40	Residential	55	B (67 dBA)
39	Residential	50	B (67 dBA)
37	Residential	50	B (67 dBA)
36	Residential	48	B (67 dBA)
R-28 Bridgepoint	Residential	50	B (67 dBA)
R-29 Bridgepoint	Residential	55	B (67 dBA)
R-30 Bridgepoint	Residential	55	B (67 dBA)
R-21 Green Spring/Wolf Creek	Residential	55	B (67 dBA)
R-22 Green Spring/Wolf Creek	Residential	58	B (67 dBA)
R-23 Green Spring/Wolf Creek	Residential	65	B (67 dBA)
R-24 Green Spring/Wolf Creek	Residential	69	B (67 dBA)
R-25 Green	Residential	54	B (67 dBA)

Receiver Name/Description		Existing Noise Level (dBA)	Applicable Noise Abatement Criteria
Spring/Wolf Creek			
R-41 Green Spring/Wolf Creek	Residential	57	B (67 dBA)
R-26 Wolf Pen Woods	Residential	59	B (67 dBA)
R-27 Wolf Pen Woods	Residential	57	B (67 dBA)
27a	Residential	55	B (67 dBA)
27b	Residential	52	B (67 dBA)
27c	Residential	43	B (67 dBA)
27d	Residential	54	B (67 dBA)

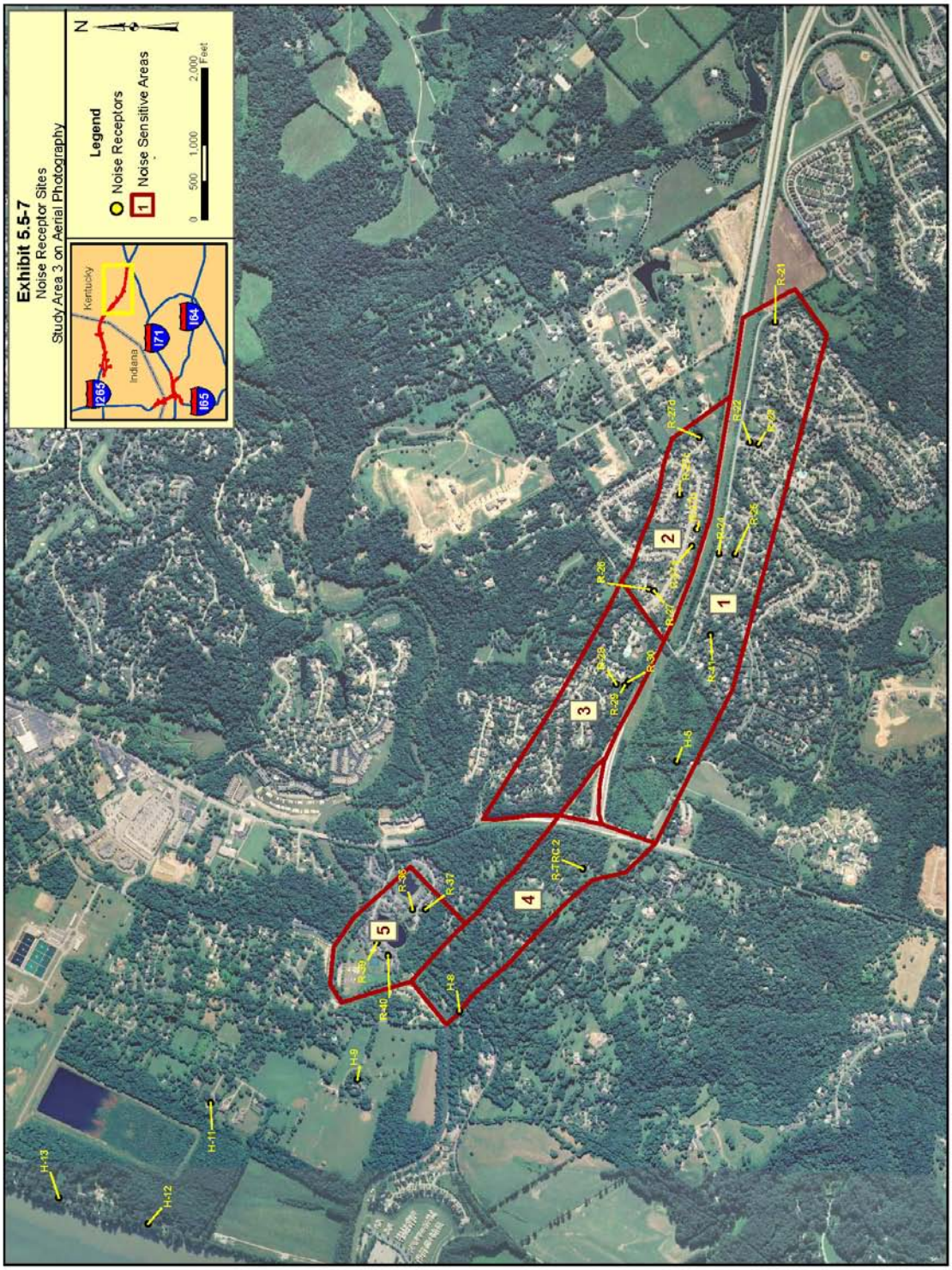
Exhibit 5.5-7
Noise Receptor Sites
Study Area 3 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0 500 1,000 2,000 Feet
Kentucky
Indiana
265
171
64
65
1
2
3
4
5
R-21
R-22
R-23
R-24
R-25
R-26
R-27
R-28
R-29
R-30
R-31
R-32
R-33
R-34
R-35
R-36
R-37
R-38
R-39
R-40
R-41
R-1 RC 2
H-5
H-6
H-8
H-9
H-11
H-12
H-13

Study Area 3 Noise Impacts

The TNM2.5 was used to predict the noise level impacts for the FEIS Selected Alternative, the Modified Selected Alternative, and the No-Action Alternative. The 2030 predicted values were compared to the existing measured or predicted noise levels to assess the potential NAC and/or substantial increase impacts from the project on Study Area 3 receivers. Impact assessment tables for each of the three alternatives is provided in Appendix B.2.3. Each of these tables presents existing noise level, 2030 alternative-specific noise level, the difference between the existing and the 2030 noise level, applicable noise abatement criteria level, and the type of impact, if any, for each noise sensitive and each receiver studied within Study Area 3.

For the FEIS Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 114 of the receptors evaluated.

For the Modified Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 114 of the receptors evaluated.

Study Area 3 Noise Abatement Evaluation

Barriers were evaluated for acoustic feasibility in accordance with KYTC's current noise policy. Barriers that were not feasible were not given further consideration. For barriers that met the KYTC feasibility requirement, a reasonableness assessment was performed. The cost per benefitted receptor was determined and evaluated against the KYTC policy for reasonableness. In addition, as a part of the reasonableness assessment, the KYTC design goal was evaluated for any barrier that was determined to meet the cost per benefitted receptor criteria. For the purposes of determining cost effectiveness of a noise barrier, benefitted receptors are those that would receive a minimum of 5 dBA noise reduction (based solely on the TNM results). Receptors receiving less than a 5 dBA reduction from a proposed abatement barrier shall not be considered as a benefitted receptor for the purpose of calculating barrier cost effectiveness. Additionally, structures beyond 500 feet from the edge of pavement shall not be considered as benefitted receptors for the purposes of calculating cost-effectiveness.

Considering the receptor analysis and the predicted noise impacts at receptors in the project area (as summarized in the impact tables), conceptual noise abatement barrier designs were developed and analyzed for all of the noise sensitive areas included in Study Area 3. At each of these sites, noise abatement barriers were designed for placement along select roadway segments in predicted noise impact areas for both the FEIS Selected Alternative and the Modified Selected Alternative in an attempt to provide noise attenuation for impacted receptors. Barrier designs for these 11 sites were analyzed in TNM2.5 and, in most cases, included a combination of two or more barriers placed along multiple proposed roadway segments in an attempt to provide the maximum amount of sound level reduction at receptors with predicted design year (2030) noise impacts. The height and length of the barrier designs were modified and refined in TNM2.5 to determine which (if any) could provide cost-effective noise impact mitigation. A summary of the criteria used in this analysis and the results of this analysis is presented in Table 5.5-7. The locations of all noise barriers determined to; be acoustically feasible, cost-effective and meet the KYTC design goal in Study Area 3 are shown in figures 5.5-8 and 5.5-9 for the FEIS Selected Alternative and Modified Selected Alternative, respectively.

TABLE 5.5-7
STUDY AREA 3 NOISE ABATEMENT SUMMARY

Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets KYTC Design Goal
Noise Sensitive Area 1 Green Spring/Wolf Creek Subdivisions	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 2 Wolf Pen Woods Subdivision	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 3 Bridgepoint Subdivision	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 4 Shadow Wood Area	FEIS Selected	No	NA	NA
	Modified Selected	No	NA	NA
Noise Sensitive Area 5 Harrods Creek	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**

Noise Sensitive Area 1 (the Green Spring/Wolf Creek Subdivisions) was assessed for barrier abatement by a single barrier for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that it is possible to obtain the amount of noise attenuation to be considered acoustically feasible in accordance with KYTC noise policy. The TNM2.5 results indicate that for the FEIS Selected Alternative a feasible barrier with a total cost of $1,794,923 would benefit 52 receptors for a cost-effectiveness ratio of $34,518 per benefitted receptor. The 7dBA KYTC design goal was met for 62% of the benefitted receptors. For the Modified Selected Alternative a feasible barrier with a total cost of $1,769,851 would benefit 51 receptors for a cost-effectiveness ratio of $34,703 per benefitted receptor. The 7dBA KYTC design goal was met for 71% of the benefitted receptors. As a result, for either alternative feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

Noise Sensitive Area 2 (Wolf Pen Woods Subdivision) was also assessed for barrier abatement by a single barrier for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that it is possible to obtain the amount of noise attenuation to be considered acoustically feasible in accordance with KYTC noise policy. The TNM2.5 results indicate that for the FEIS Selected Alternative a feasible barrier with a total cost of $430,682 would benefit 14 receptors for a cost-effectiveness ratio of $30,763 per benefitted receptor. The 7dBA KYTC design goal was met for 71% of the benefitted receptors. For the Modified Selected Alternative a feasible barrier with a total cost of $615,251 would benefit 19 receptors for a cost-effectiveness ratio of $32,381 per benefitted receptor. The 7dBA KYTC design goal was met for 79% of the benefitted receptors. As a result, for both alternatives, feasible and reasonable

structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

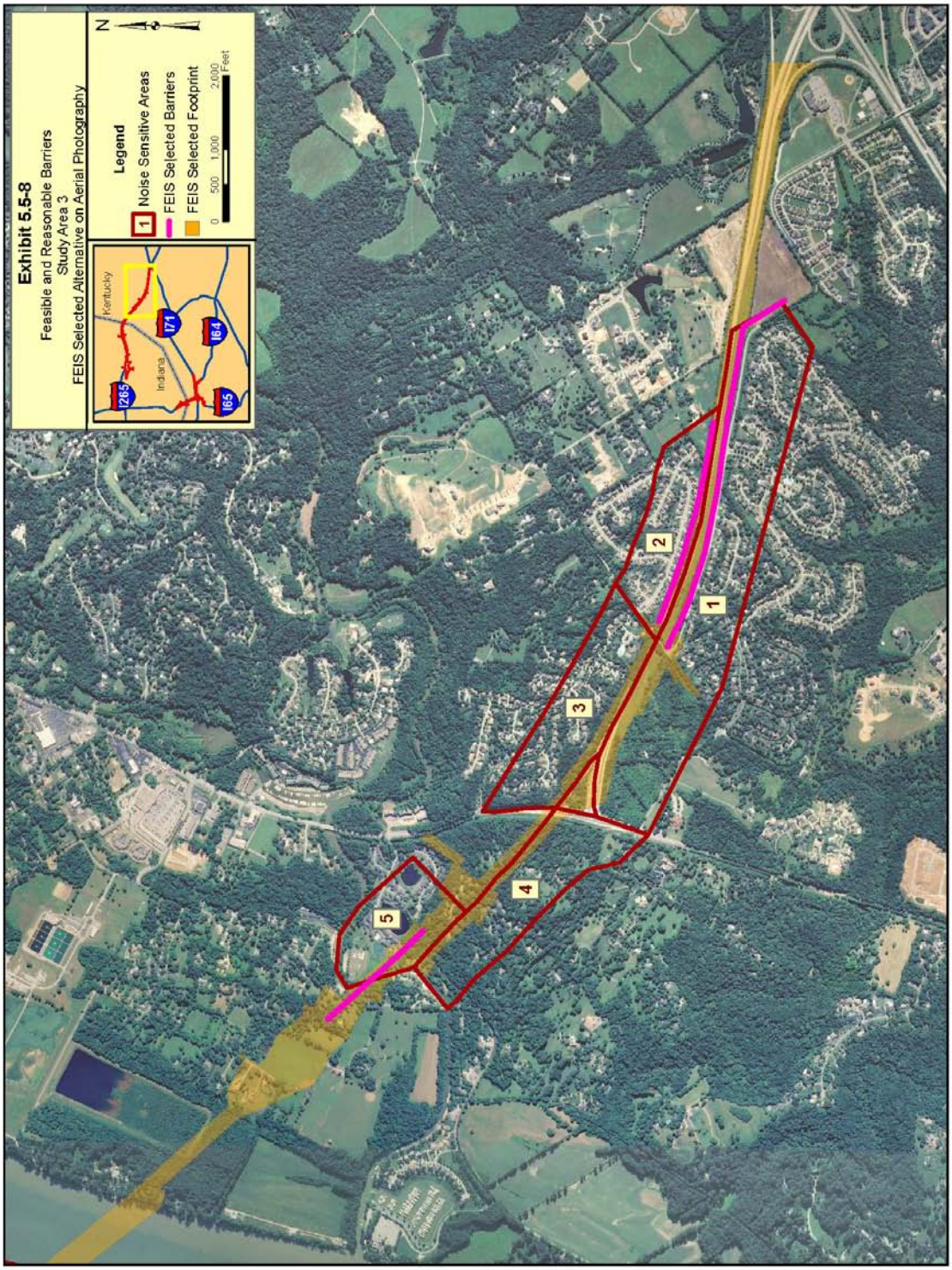
Exhibit 5.5-8
Feasible and Reasonable Barriers
Study Area 3
FEIS Selected Alternative on Aerial Photography
N
Legend
Noise Sensitive Areas
FEIS Selected Barriers
FEIS Selected Footprint
0 500 1,000 2,000 Feet
Kentucky
Indiana
I-71
I-64
I-265
I-65
1
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5

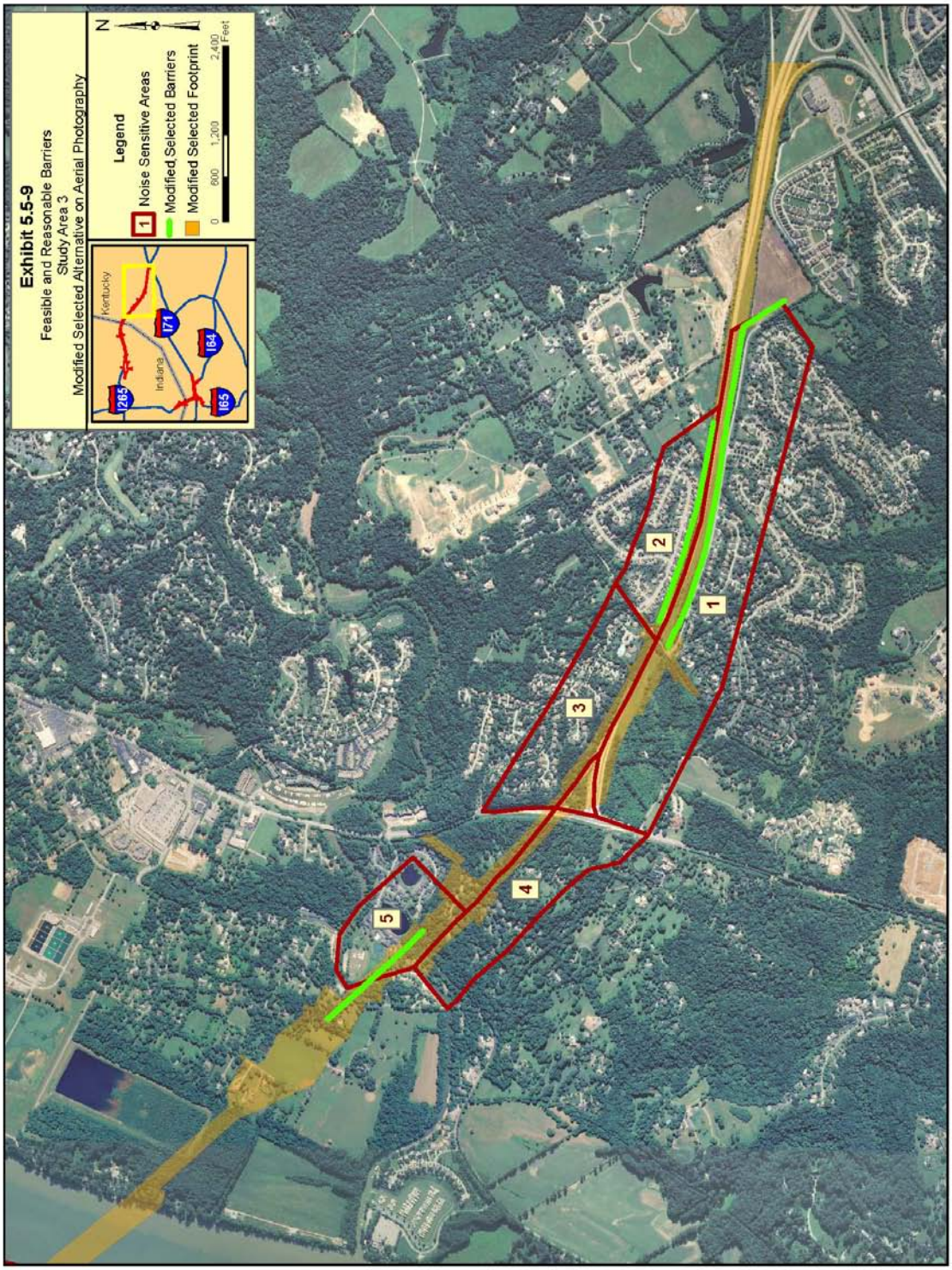


Exhibit 5.5-9
Feasible and Reasonable Barriers
Study Area 3
Modified Selected Alternative on Aerial Photography
Legend
Noise Sensitive Areas
Modified Selected Barriers
Modified Selected Footprint
N
0
600
1,200
2,400
Feet
Kentucky
Indiana
265
171
64
65
1
2
3
4
5

Noise Sensitive Area 3 (Bridgepoint Subdivision) was assessed for barrier abatement via a barrier for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that it is not possible to obtain the noise attenuation to be considered acoustically feasible in accordance with KYTC noise policy. The roadway is in a deep cut at this point in relation to the receptors; as a result, any barriers were determined to provide very little additional attenuation beyond what was already being provided by the cut, itself. Therefore, for this noise sensitive area, structural noise barriers are not warranted for further consideration.

Noise Sensitive Area 4 (The Shadow Wood area) was also assessed for barrier abatement via a barrier for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that it is not possible to obtain the noise attenuation to be considered acoustically feasible in accordance with KYTC noise policy, as the roadway is in a deep cut in a portion of this area, especially where the closest receptors lie along the proposed alignment. Similar to the situation at Bridgepoint Subdivision, any barriers were determined to provide very little additional attenuation beyond what was already being provided by the cut itself. Therefore, for this noise sensitive area, structural noise barriers are not warranted for further consideration.
Noise Sensitive Area 5 (The Harrods Creek Condo area) was assessed for barrier abatement by a single barrier for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that it is possible to obtain the amount of noise attenuation to be considered acoustically feasible in accordance with KYTC noise policy. The TNM2.5 results indicate that for the FEIS Selected Alternative a feasible barrier with a total cost of $860,191 would benefit 49 receptors for a cost-effectiveness ratio of $17,555 per benefitted receptor. The 7dBA KYTC design goal was met for 76% of the benefitted receptors. For the Modified Selected Alternative a feasible barrier with a total cost of $860,191 would benefit 42 receptors for a cost-effectiveness ratio of $20,481 per benefitted receptor. The 7dBA KYTC design goal was met for 71% of the benefitted receptors. As a result, for either alternative feasible and reasonable structural noise barriers are warranted for further consideration. Again, the final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process will be considered.

STUDY AREA 4

Study Area 4 Noise Sensitive Areas

Study Area 4 is located along the East End Corridor on the Indiana side of the Ohio River. A majority of this section is proposed to be on new alignment and, therefore, the No-Action Alternative evaluation is limited in scope. This study area was subdivided into nine noise sensitive areas, as described below.

Noise Sensitive Area 1—Morgan Trail and Alvin Drive: Twenty-one single family homes are located in the southwest quadrant of the interchange of I-265 and S.R. 62. These properties were evaluated under Activity Category B.

Noise Sensitive Area 2—Sellers Court: Four single family homes are located in the southwest quadrant of the interchange of I-265 and S.R. 62. These properties were evaluated under Activity Category B.

Noise Sensitive Area 3—New Chapel Road: Fourteen properties are located along New Chapel Road in the northeast quadrant of the Route I-265/S.R. 62 interchange. These properties were evaluated under Activity Category B.

Noise Sensitive Area 4—Utica-Sellersburg Road: Five properties are located along Utica-Sellersburg Road on the north side of I-265. These properties were evaluated under Activity Category B.

Noise Sensitive Areas 5 and 6—Old Tay Bridge, Cottage Rake, and Boulder Creek Subdivision [north]*:* Fifty-two properties are located in the Boulder Creek Subdivision, and also along Old Tay Bridge and Cottage Rake on the north side of I-265. These properties were evaluated under Activity Category B.

Noise Sensitive Area 7—Utica-Sellersburg Road, Surrey Road, and Boulder Creek Subdivision [south]: Fifty-six properties are located on the south side of I-265 along Utica-Sellersburg Road, Surrey Road, and within the Boulder Creek Subdivision. These properties were evaluated under Activity Category B.

Noise Sensitive Area 8—Upper River Road and Lime Kiln Ridge Subdivision: Fifteen single family residential sites are located south of I-265 along the Ohio River. These properties were evaluated under Activity Category B.

Noise Sensitive Area 9—Quarry Ridge Road, Ridge Road, and Upper River Road: Twenty-seven properties are located on Quarry Ridge Road, Ridge Road, and Upper River Road on the north side of I-265. These properties were evaluated under Activity Category B.

Study Area 4 Receivers

The noise receivers measured in Study Area 4, including the existing noise levels and NAC criteria, are listed in Table 5.5-8. Additional TNM2.5 modeled receivers are included in the impact tables for the study area. The individual receiver locations in each noise sensitive area are graphically depicted in Figure 5.5-10.

Model Validation for Study Area 4

Receptors located along Morgan Trail and New Chapel Road were used for model validation in Study Area 4. The LSIORB Project is proposed to be constructed mainly on new alignment and the validation consisted of only the portion of the I-265/S.R. 62 interchange. All predicted values were found to be within 3 dBA of the field measured values for these receptors and, therefore, the TNM2.5 model was validated.

TABLE 5.5-8
RECEIVERS IN STUDY AREA 4

Receiver	Noise Sensitive Area	Existing Noise Level (dBA)	NAC Category
3437 Morgan Trail	1	54	B (67 dBA)
Sellers Court	2	54	B (67 dBA)
New Chapel Road	3	57	B (67 dBA)
Utica-Sellersburg Road	4	54	B (67 dBA)
Old Tay Bridge, Cottage Rake, and Boulder Creek Subdivision (north)	5 and 6*	47-52	B (67 dBA)
Utica-Sellersburg Road, Surrey Road, Boulder Creek Subdivision (south)	7	44-58	B (67 dBA)
Upper River Road and Lime Kiln Ridge Subdivision	8	57	B (67 dBA)
Quarry Ridge Road, Ridge Road, and Upper River Road	9	57	B (67 dBA)

**Because of their close proximity, Noise Study Areas 5 and 6 are discussed as one combined area.*

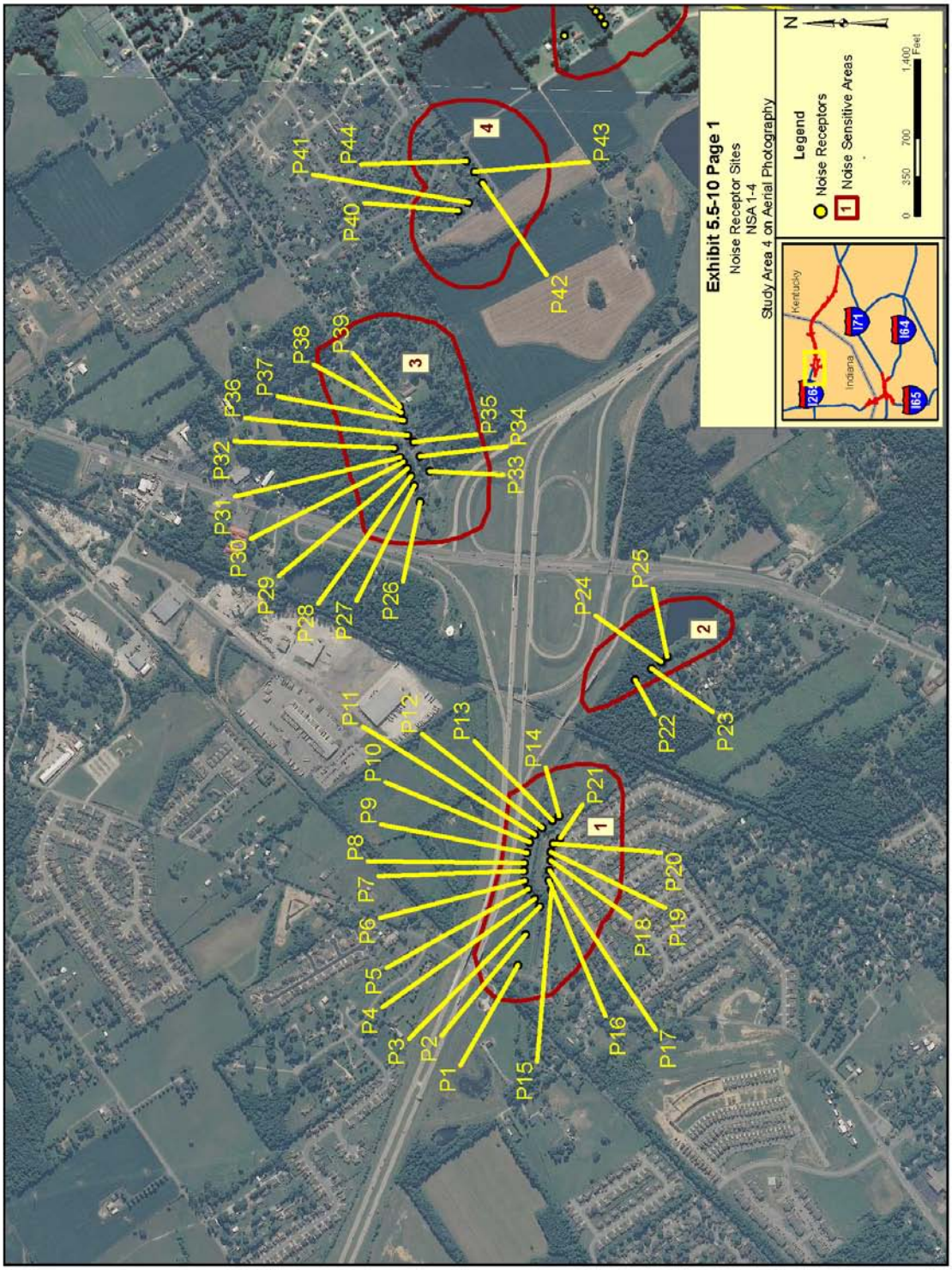


Exhibit 5.5-10 Page 1
Noise Receptor Sites
NSA 1-4
Study Area 4 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0 350 700 1,400 Feet
Kentucky
Indiana
I-71
I-64
I-65
I-265
P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16 P17 P18 P19 P20 P21 P22 P23 P24 P25 P26 P27 P28 P29 P30 P31 P32 P33 P34 P35 P36 P37 P38 P39 P40 P41 P42 P43 P44
1 2 3 4

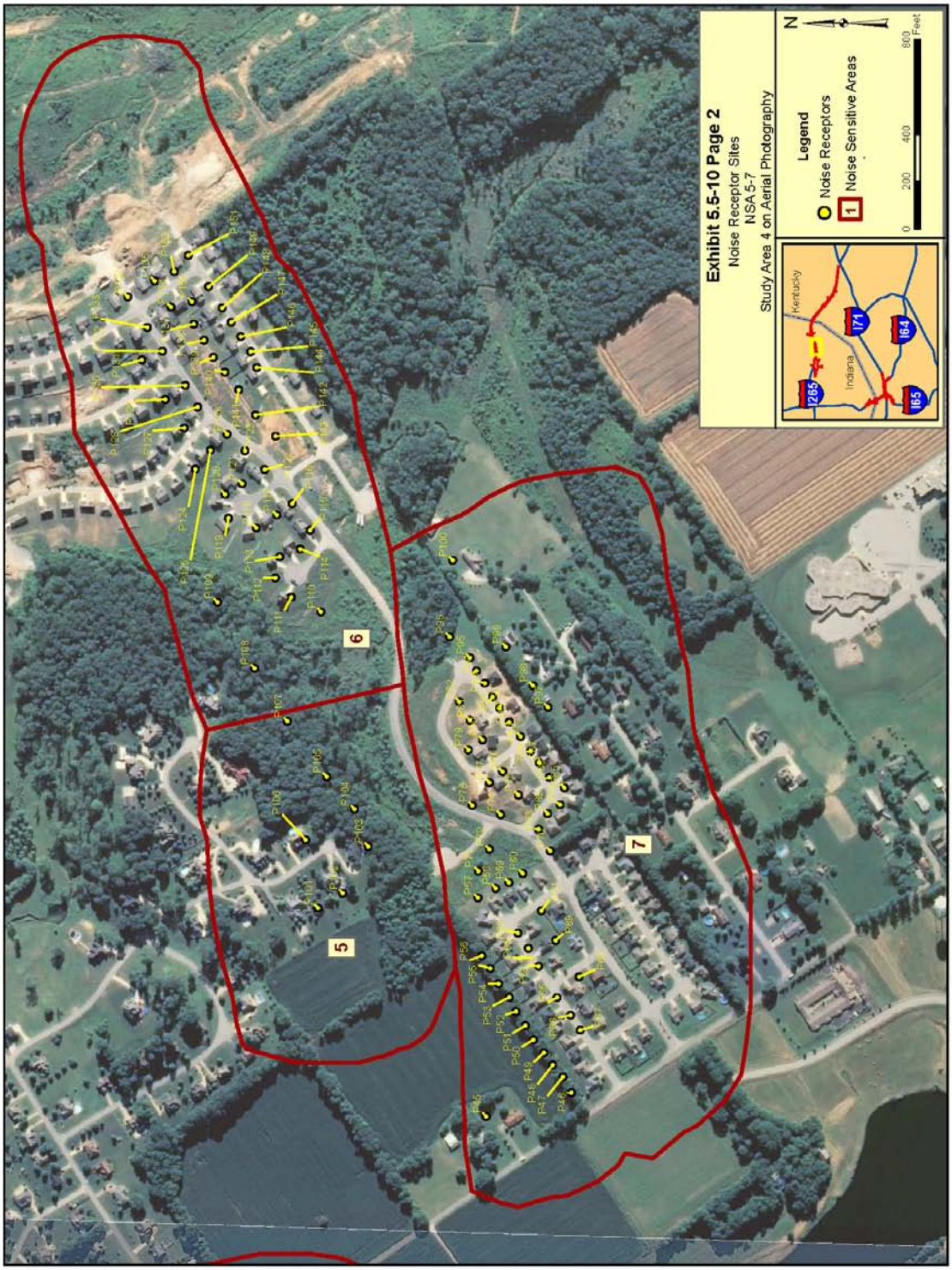


Exhibit 5.5-10 Page 2
Noise Receptor Sites
NSA 5-7
Study Area 4 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0
200
400
800
Feet
Kentucky
Indiana
I-71
I-64
I-265
I-65
5
6
7

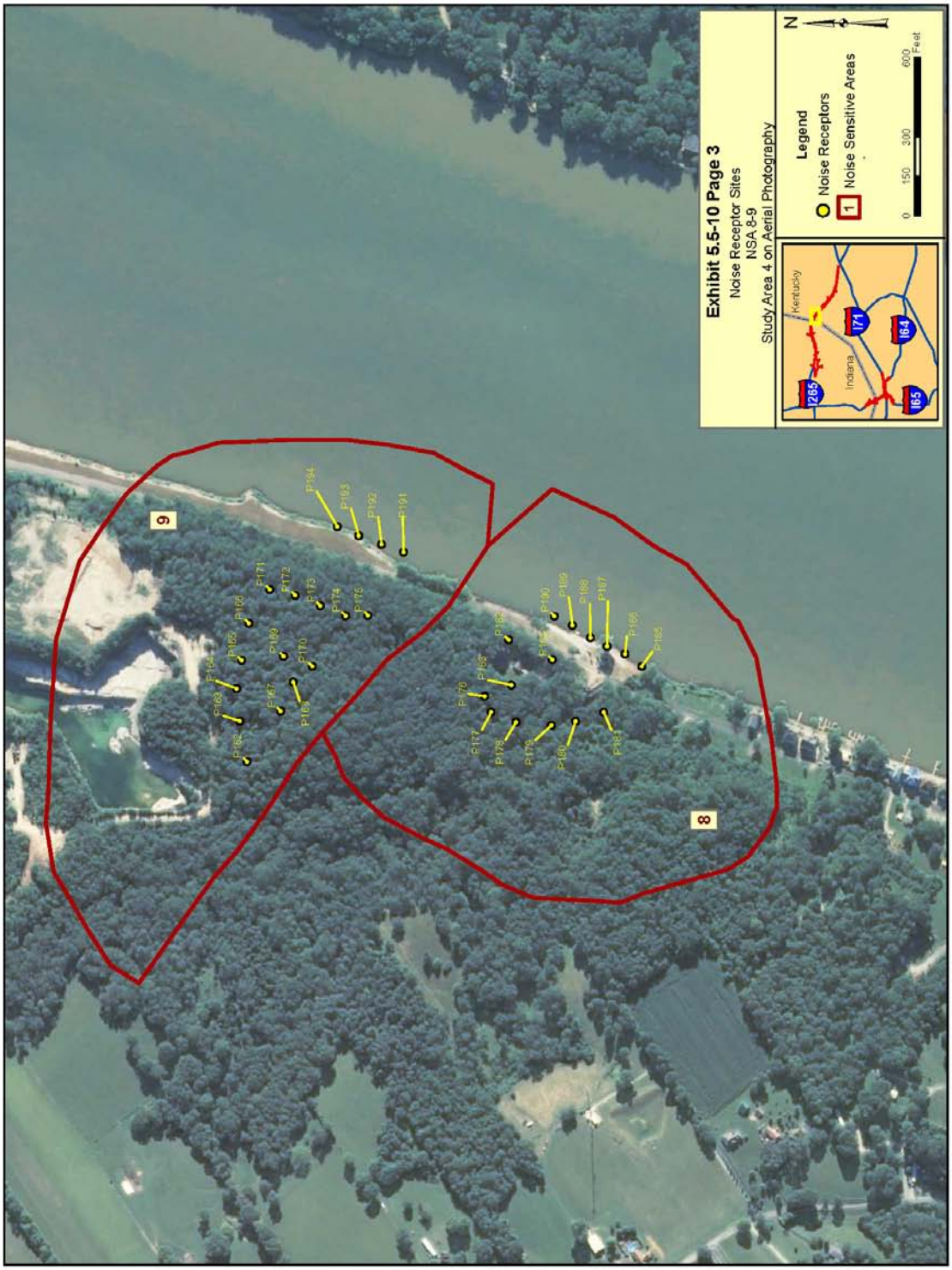


Exhibit 5.5-10 Page 3
Noise Receptor Sites
NSA 8-9
Study Area 4 on Aerial Photography
Legend
Noise Receptors
Noise Sensitive Areas
N
0
150
300
600
Feet
Kentucky
Indiana
I-71
I-64
I-265
I-65
9
8
P194
P193
P192
P191
P171
P172
P173
P174
P175
P166
P165
P169
P170
P164
P167
P163
P168
P162
P190
P189
P188
P187
P186
P185
P176
P177
P178
P179
P180
P181

Study Area 4 Noise Impacts

The TNM2.5 model was used to predict the noise level impacts for the FEIS Selected Alternative, the Modified Selected Alternative and the No-Action Alternative. The 2030 predicted values were compared to the existing measured or predicted noise levels to assess the potential NAC and/or substantial increase impacts from the project on Study Area 4 receivers. A series of impact assessment tables for each of the three alternatives is provided in Appendix B.2.4. Each of these tables presents existing noise level, 2030 alternative-specific noise level, the difference between the existing and the 2030 noise level, applicable noise abatement criteria level, and the type of impact, if any, for each noise sensitive receiver studied within Study Area 4.

For the FEIS Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 88 of the receptors evaluated.

For the Modified Selected Alternative, TNM 2.5 predicts NAC or substantial increase impacts at 79 of the receptors evaluated.

Noise Abatement Evaluation for Study Area 4

Barriers were evaluated for acoustic feasibility in accordance with INDOT's current noise policy. Barriers that were not feasible were not given further consideration. For barriers that met the INDOT feasibility requirement, a reasonableness assessment was performed. The cost per benefitted receptor was determined and evaluated against the INDOT policy for reasonableness. In addition, as a part of the reasonableness assessment, the INDOT design goal was evaluated for any barrier that was determined to meet the cost per benefitted receptor criteria.

Considering the receptor analysis and the predicted noise impacts at receptors in the project area (as summarized in the impact tables), conceptual noise abatement barrier designs were developed and analyzed for the nine noise sensitive areas included in Study Area 4. At each of these sites, noise abatement barriers were designed for placement along select roadway segments in predicted noise impact areas for the FEIS Selected Alternative and the Modified Selected Alternative in an attempt to provide noise attenuation for impacted receptors. Barrier designs for these noise sensitive areas were analyzed in TNM2.5 and, in certain cases, included a combination of two or more barriers placed along multiple proposed roadway segments in an attempt to provide the maximum amount of sound level reduction at receptors with predicted design year (2030) noise impacts. The height and length of the barrier designs were modified and refined in TNM2.5 to determine which (if any) could provide cost-effective noise impact mitigation. A summary of the criteria used in this analysis and the results of this analysis is presented in Table 5.5-9. The locations of all noise abatement barriers determined to be acoustically feasible and cost-effective are shown in figures 5.5-11 and 5.5-12 for the FEIS Selected Alternative and Modified Selected Alternative, respectively.

TABLE 5.5-9
STUDY AREA 4 NOISE ABATEMENT SUMMARY

Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets KYTC Design Goal
Noise Sensitive Area 1	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 2	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 3	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 4	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 5	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 6	FEIS Selected	**Yes**	**Yes**	**Yes**
	Modified Selected	**Yes**	**Yes**	**Yes**
Noise Sensitive Area 7	FEIS Selected	**Yes**	No	NA
	Modified Selected	**Yes**	No	NA
Noise Sensitive Area 8	FEIS Selected	NA	NA	NA
	Modified Selected	NA	NA	NA
Noise Sensitive Area 9	FEIS Selected	**Yes**	No	NA
	Modified Selected	**Yes**	No	NA

The following is a summary of each noise sensitive area assessed and the results of the barrier assessment for each area.

Noise Sensitive Areas 1 through 4 and 8: Future design-year noise levels would not approach or exceed the Category B NAC of 67 dBA Leq at any of these noise sensitive areas and no substantial increases (15 dBA or higher) are expected due to the proximity of the existing interchange for either the FEIS Selected Alternative or the Modified Selected Alternative. No noise-sensitive receptors in this area are predicted to experience noise impacts from the proposed project and no noise barrier design consideration was warranted.

Noise Sensitive Areas 5 and 6: This area was assessed for barrier abatement for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that for the FEIS Selected Alternative, a feasible barrier could be constructed. The total cost of the barrier would be $1,317,360 or $29,940 per benefitted home. This value satisfies the INDOT cost-effectiveness criterion of $30,000 per benefitted property. The barrier would provide 88% of the impacted first-row homes with at least 7 dBA of noise reduction, meeting the INDOT design goal. For the Modified Selected Alternative, a feasible barrier could also be constructed. The total cost of the barrier would be $1,314,270 or $29,870 per benefitted home. This value satisfies the INDOT cost-effectiveness criterion for homes in place prior to initial construction of the roadway. The barrier would provide 88% of the impacted first-row homes with at least 7 dBA of

noise reduction, meeting the INDOT design goal. For both alternatives, feasible and reasonable structural noise barriers are warranted for further consideration. The final decision regarding abatement measures will be made during detailed design, at which time additional design and cost information, as well as information gathered during the public involvement process, will be considered.

Noise Sensitive Area 7: This area was assessed for barrier abatement for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that for the FEIS Selected Alternative, a system of two feasible noise barriers could be constructed. However, the total cost of the barrier would be $921,960 or $34,147 per benefitted home. This value exceeds the INDOT cost-effectiveness criterion of $30,000 per benefitted residence for homes in place prior to initial construction of the roadway. For the Modified Selected Alternative, a feasible noise barrier could also be constructed. Again, however, the total cost of the barrier would be $885,690 or $32,803 per benefitted home. This value exceeds the INDOT cost-effectiveness criterion of $30,000 per benefitted residence for homes in place prior to initial construction of the roadway. Based on the inability to satisfy the reasonableness criterion (cost-effectiveness) to date, no barrier abatement is recommended.

Noise Sensitive Area 9: This area was assessed for barrier abatement for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that for the FEIS Selected Alternative, a system of two feasible noise barriers could be constructed. However, the total cost of the barrier would be $1,250,760 or $69,487 per benefitted home. This value exceeds the INDOT cost-effectiveness criterion of $30,000 per benefitted residence for homes in place prior to initial construction of the roadway. For the Modified Selected Alternative, a feasible noise barrier could also be constructed. Again, however, the total cost of the barrier would be $1,216,620 or $67,590 per benefitted home. This value exceeds the INDOT cost-effectiveness criterion of $30,000 per benefitted residence for homes in place prior to initial construction of the roadway. Based on the inability to satisfy the reasonableness criterion (cost-effectiveness) to date, no barrier abatement is recommended.

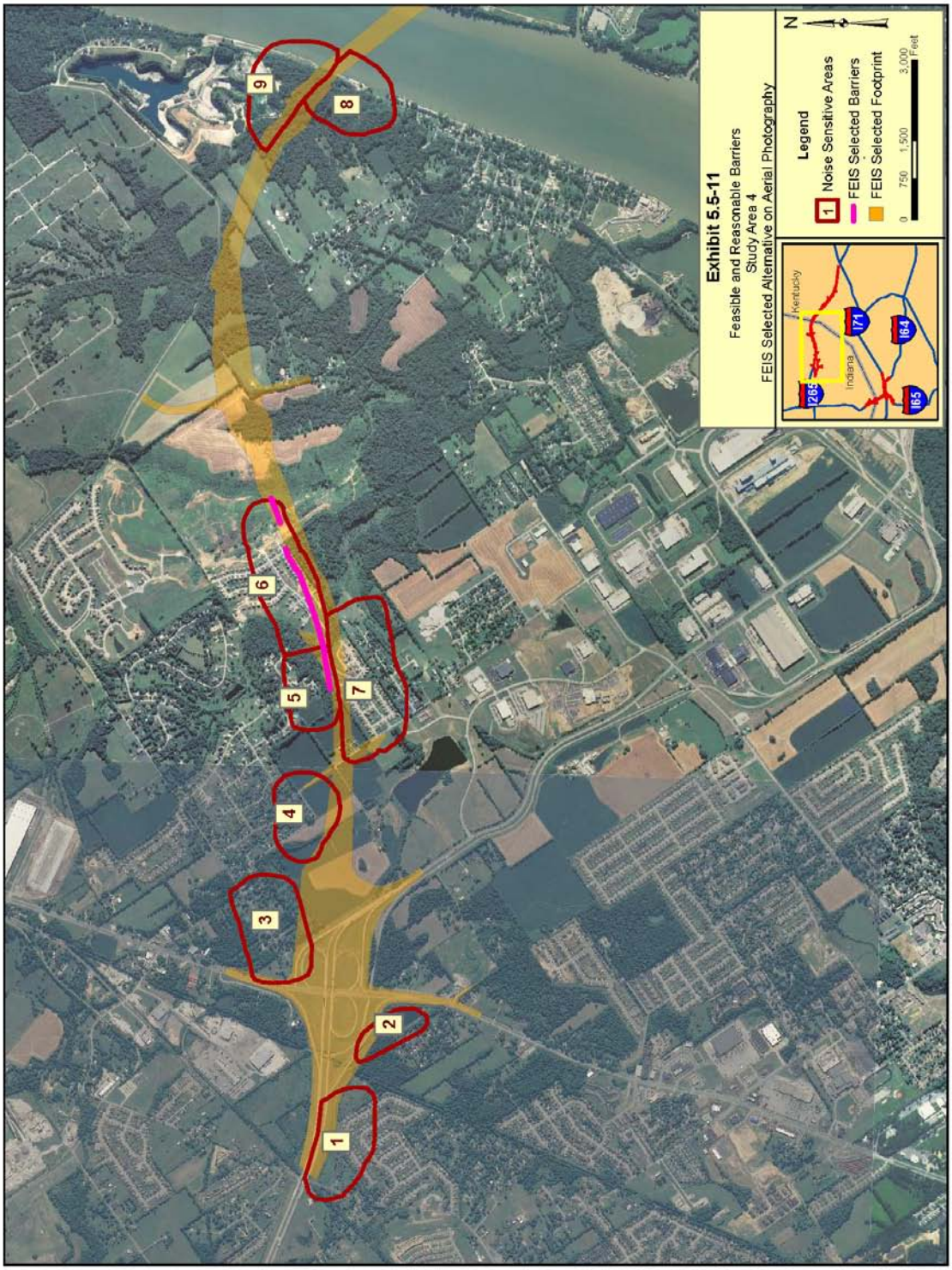


Exhibit 5.5-11
Feasible and Reasonable Barriers
Study Area 4
FEIS Selected Alternative on Aerial Photography
N
Legend
Noise Sensitive Areas
FEIS Selected Barriers
FEIS Selected Footprint
0 750 1,500 3,000 Feet
Kentucky
Indiana
I-71
I-64
I-265
I-65
1
2
3
4
5
6
7
8
9

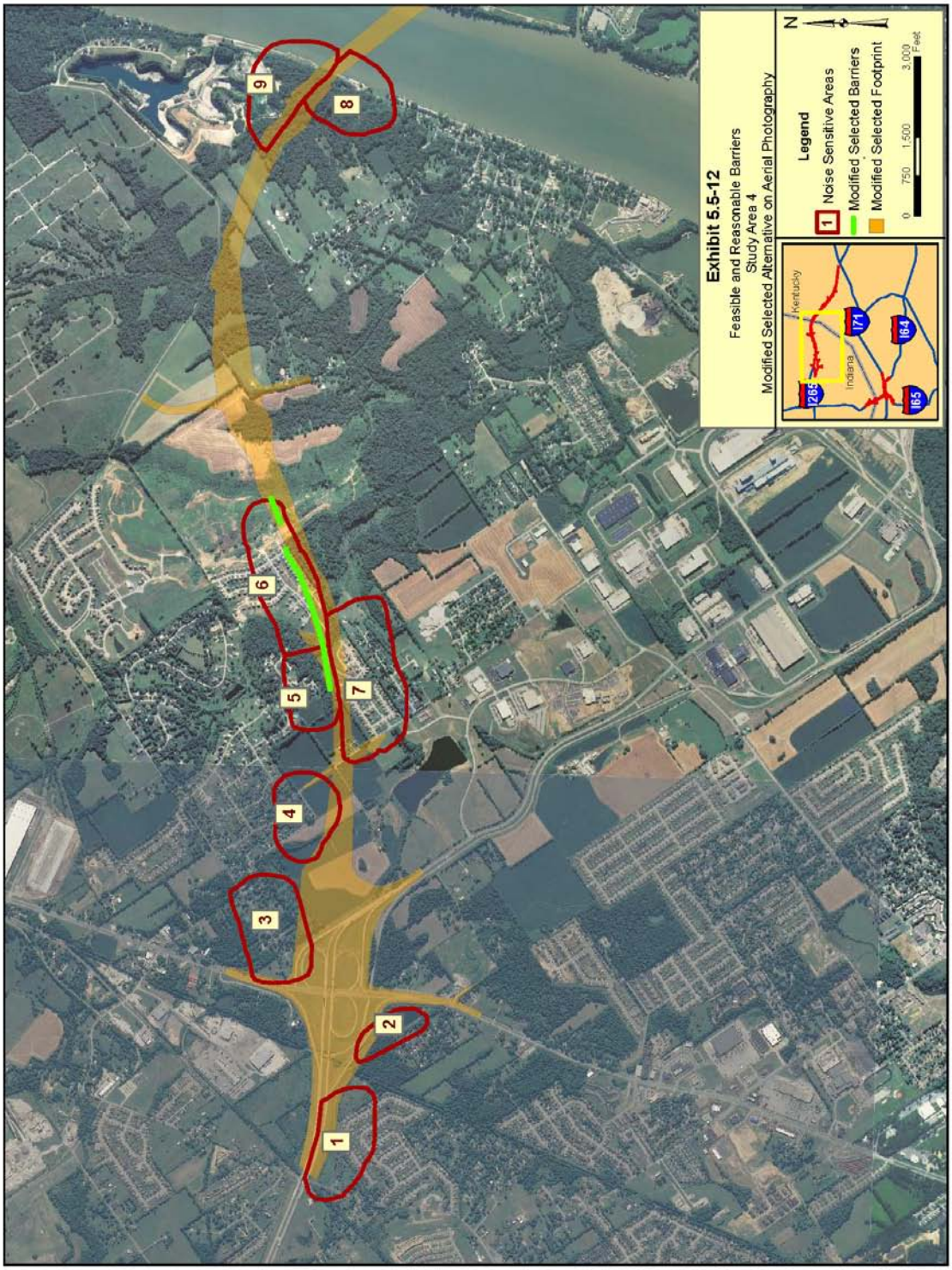


Exhibit 5.5-12
Feasible and Reasonable Barriers
Study Area 4
Modified Selected Alternative on Aerial Photography
N
Legend
Noise Sensitive Areas
Modified Selected Barriers
Modified Selected Footprint
1
0
750
1,500
3,000
Feet
Kentucky
Indiana
I-71
I-64
I-265
I-65
1
2
3
4
5
6
7
8
9

5.5.3. Historic Properties Noise Assessment

The 2003 FEIS included a highway traffic noise assessment for the historic properties within the project area. As a part of the Section 106 process, it was determined that a level of 5 dBA over existing levels would be considered to have the potential for an adverse effect, depending on contributing factors that make up National Register of Historic Places (NRHP) eligibility for the property. All historic properties within 800 feet of a proposed build alternative were evaluated in TNM2.5. Noise analysis was not conducted beyond 800 feet, as the model has not been demonstrated to be accurate beyond that distance in some cases. The noise level predictions, impact determinations, and evaluations of the 5-dBA criteria are presented in Table 5.5-10.

TABLE 5.5-10
HISTORIC PROPERTIES NOISE LEVELS

Historic Receptor		Existing Sound Level (dBA)	FEIS Selected Alternative (2030) (dBA)	Modified Selected Alternative (2030) (dBA)	Increase over Existing EIS/Modified (dBA)	Noise Impact/Type	
						5dBA Over Existing? EIS/Modified	Impacted? (NAC or Level) EIS/Modified
Downtown							
H27	Butchertown HD/Trail	71	75	72	4/1	No/No	**Yes/Yes**
H28	Butchertown HD	70	74	74	4/4	No/No	**Yes/Yes**
H29	Butchertown HD	73	77	75	4/2	No/No	**Yes/Yes**
H38	Phoenix Hill HD	65	68	65	3/0	No/No	**Yes**/No
H39	Phoenix Hill HD	70	71	72	1/2	No/No	**Yes/Yes**
H40	West Main Street	69	64	63	-5/-6	No/No	No/No
H41	L&N Railroad Office	66	66	64	0/-2	No/No	**Yes**/No
H42	Belle of Louisville	71	70	70	-1/-1	No/No	**Yes/Yes**
H75	Butchertown HD	61	62	60	1/-1	No/No	No/No
H77	Butchertown HD	71	59	57	-12/-14	No/No	No/No
H78	Butchertown HD	66	61	58	-5/2	No/No	No/No
H79	Residential	63	67	64	4/1	No/No	**Yes**/No
H80	Louisville Medical	70	70	67	0/-3	No/No	**Yes/Yes**
H81	Ahrens Trade School	71	67	64	-4/-7	No/No	**Yes**/No
H89	Butchertown HD	56	64	60	8/4	**Yes**/No	No/No
Downtown							
H31	Old Jeffersonville HD	66	69	70	3/4	No/No	**Yes/Yes**
H32	Old Jeffersonville HD	66	69	69	3/3	No/No	**Yes/Yes**
H33	War Memorial	61	65	65	4/4	No/No	No/No
H36	Train Depot	67	67	69	0/2	No/No	No/No
H50	2nd Street Bridge	60	61	61	1/1	No/No	No/No
H51	Ohio Falls Car and Locomotive Co.	49	50	49	1/0	No/No	No/No
H52	Ohio Falls Car and Locomotive Co.	65	65	63	0/-2	No/No	No/No
East End							
H7	Drumanard	52	61	61	9/9	**Yes/Yes**	No/No
H9	Belleview	49	61	61	12/12	**Yes/Yes**	**Yes/Yes**
H11	Rosewell	45	68	68	23/23	**Yes/Yes**	**Yes/Yes**
H12	Determan Houses	43	70	70	27/27	**Yes/Yes**	**Yes/Yes**
H13	J. Schildknecht House	46	64	64	18/18	**Yes/Yes**	**Yes/Yes**
East End Indiana							
No Noise Sensitive Historic Properties within 800 feet in this Study Area							

5.5.4. Construction Noise

The major construction elements of this project are expected to consist of land clearing, earth moving, hauling, grading, paving, and bridge construction. General construction noise impacts to passing traffic and those individuals living or working near the project can be expected, particularly from bridge construction, earth moving and paving operations. Motorized equipment shall be maintained with appropriate mufflers to minimize construction noise levels. During certain phases of construction (for example, land clearing) and during certain seasons of the year, there would be areas along the project where no construction activity would be taking place. Also, considering the relatively short-term nature of construction noise at any one location, impacts are not expected to be substantial. However, for brief periods of time some construction noise levels could be substantial (an increase in existing noise levels by 10 dBA or greater), even with existing interstate traffic noise levels being high. These episodes usually occur during daytime work hours. As a result, these impacts would be minimized to adjacent residents.

Also, see page 5-294 of the 2003 FEIS for additional information regarding construction noise impacts and mitigation.

5.5.5. Indirect Impacts

A comparison of the FEIS Selected Alternative and the Modified Selected Alternative was conducted to determine differences in travel patterns due to modifications (e.g., the removal of the Frankfort Avenue/I-71 Interchange) and/or the proposed tolling associated with the Modified Selected Alternative. Traffic data were used to estimate potential changes in traffic conditions and resulted in the identification of the areas where traffic-related indirect impacts could occur. With the Modified Selected Alternative more traffic is projected on S.R. 62 in Indiana, the Clark Memorial Bridge, the Sherman Minton Bridge, and on River Road in Kentucky (see Appendix H.1 Traffic Forecast). Therefore, these travel corridors have been identified as having the most potential to experience indirect impacts, such as noise.

A 3 dBA increase is the minimum change in noise that can be perceived by the human ear. It takes a doubling of the traffic volume, with the same vehicle mix (i.e., trucks, cars, motorcycles, etc.) to increase noise by 3 dBA[12]. The traffic forecasts used to identify differences in traffic volumes show that traffic volumes would increase by less than 10% at every location. The forecasts also show that the traffic volumes that are different than those associated with the FEIS Selected Alternative are mostly cars, which are quieter than medium or heavy trucks. Medium and heavy trucks are not predicted to change routes due to tolls or the absence of an I-71/Frankfort Avenue interchange. In summary, no noise impacts from difference in travel patterns are expected with the Modified Selected Alternative.

[12] http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/polguide/polguide02.cfm

5.6 Vibration

This section of the 2003 FEIS presented general vibration impacts for the full range of build alternatives being considered at that time, including the FEIS Selected Alternative. The information presented in the FEIS remains relevant to both the FEIS Selected Alternative and the Modified Selected Alternative because the construction elements that would cause vibration impacts (i.e., the tunnel, piers, and bridge abutments) are features of both alternatives. See pages 5-295 through 5-298 of the FEIS for further details. This section of the SDEIS updates the information presented in the FEIS to include a discussion of the Modified Selected Alternative.

As noted in the FEIS, a common public concern is that ground-borne vibration resulting from activities associated with the construction and operation of a highway would cause structural damage to homes. Experience has shown that blasting and pile driving are the two activities with the greatest potential to inflict damage, generally where structures are in close proximity to such activities. The effects of vibration from traffic and other typical construction and transportation sources would not be significant.

5.6.1 Criteria

This section of the FEIS discussed criteria for assessing the potential effects of vibration due to blasting. These criteria have not changed and they apply to both the FEIS Selected Alternative and the Modified Selected Alternative. For more details, see page 5-295 of the FEIS.

5.6.2 Impact Assessment

This section of the FEIS discussed three general categories of potential vibration sources—traffic, construction, and blasting—and their associated impacts. The following sections update the discussion to include potential vibrational impacts of the Modified Selected Alternative.

Traffic Vibration

Increased vibration has the potential to damage nearby structures, including historic properties. The Federal Transit Authority (FTA) *Transit Noise and Vibration Impact Assessment* manual (May 2006) identifies methodologies to define ground-borne vibration. As shown in Figure 7-3 in the FTA manual, heavy trucks and buses generate approximately 65 VdB, which is slightly below the threshold for human perception. The threshold for cosmetic damage to fragile buildings is considerably higher, estimated at around 100 VdB, similar to the impacts from blasting 50 feet away from the resource. As stated in the FEIS (p. 5-296), heavy trucks were determined to be the primary source of traffic-induced vibrations. The potential vibration levels for medium trucks, automobiles, and other vehicles would be lower than the levels projected for those types of vehicles. All of these were found to be far below the damage criteria and would not cause damage to any structures.

With the Modified Selected Alternative, traffic volumes on some streets of the existing roadway network are projected to be higher than those for the 2003 FEIS Selected Alternative. In most cases, heavy trucks are projected to account for less than 5% of the difference. Therefore, the

potential for vibration impacts from the Modified Selected Alternative to land uses along the existing roadway network is negligible. (For more information about traffic volumes and patterns, see Chapter 3, *Alternatives*.)

Construction Vibration

In the FEIS (p. 5-296), pile driving and vibratory compacting were identified as the two primary sources of vibration resulting from construction activities. The finding that these and other sources of construction vibration would be far below the threshold that could cause damage to any structures remains applicable to the FEIS Selected Alternative and applies to the Modified Selected Alternative.

Blasting Vibration

A study of blasting vibrational impact of the FEIS Selected Alternative provided in the 2003 FEIS was taken in part from an April 12, 2001 technical study entitled *Ohio River Bridges Vibration Study Technical Report*[13]. The study focused on five locations including the Drumanard property and Bridgepointe subdivision in the eastern end of the project area. Section 5.6 of the 2003 FEIS documents the results of the study which was performed according to guidelines in the Federal Transit Administration (FTA) Guidance Manual. The study concluded that blasting could be accommodated without damage to the existing structures on the property. (See Section 5.3, *Historic and Archaeological Resources*, herein, for a discussion of the Drumanard property's historical relevance and blasting vibration effects on historic properties.) The tunnel and associated blasting are also proposed as part of the Modified Selected Alternative.

A summary of the impact assessment conducted for the FEIS Selected Alternative and the Modified Selected Alternative is provided below.

Vibration Impact Assessment Summary for the Build Alternatives

Both the FEIS Selected Alternative and the Modified Selected Alternative would require a number of construction activities that could result in vibration impacts to properties adjacent to the required right-of-way. These construction activities, as described in the FEIS (see "Preferred Alternative," p. 5-289), include:

- Blasting for the construction of the depressed roadway section from I-71 to U.S. 42 in the East End Corridor in Kentucky.
- Blasting for the tunnel under U.S. 42 and the hill north of U.S. 42 in Kentucky.
- Vibratory compaction for embankments in the downtown area along the bridge approaches and the reconstructed Kennedy Interchange.
- Pile driving for bridge abutments and piers along all elements of the project.

[13] *Ohio River Bridges Vibration Study Technical Report*, HMMH Report No. 296090-1 Final Report, April 12, 2001 prepared for Community Transportation Solutions, Inc. Louisville, KY

Section 5.3 of the 2003 FEIS provides information regarding the distance where damage would be expected to potentially occur for either alternative. Based on contacts with the construction and insurance industry, the distance selected for use on this project is 500 feet. There are not any structures within 500 feet of either alternate. Furthermore, within the FEIS Selected Alternative, no structure within 500 feet of any of the construction activities where vibration could be produced was determined to be in the "extremely fragile" category. This conclusion remains valid for the Modified Selected Alternative. As a result, it is expected that vibration impacts for the build alternatives can be managed, to avoid damage, by using performance-based specifications currently in-place with the respective state DOTs.

5.6.3 Mitigation

This section of the FEIS discussed mitigation measures that can be implemented to further ensure that no damage will occur to structures during blasting operations. These same measures will be incorporated as a part of either the FEIS Selected Alternative or the Modified Selected Alternative, should a build alternative be selected. Therefore, there are no changes to this section from the FEIS. For more detailed information, see page 5-298 of the FEIS.

For cultural historic sites, site-specific mitigation for blasting and vibration impacts were developed through the Section 106 consultation process and documented within the Section 106 MOA (see Chapter 8: *Commitments and Mitigation*, Category III, subsection II, L).

5.7 Natural Resources

This section of the 2003 FEIS discussed potential impacts and mitigation for the following: Soils and Geology (Section 5.7.1), Terrestrial Wildlife and Habitat (Section 5.7.2), Federal Threatened and Endangered Species (Section 5.7.3), and Natural Areas (Section 5.7.4). This section of the SDEIS contains the following substantive updates and additions to information presented in the 2003 FEIS:

- Section 5.7.1—Provides updated data on direct impacts, based on the most current designs, to soil types by the two alternatives (Table 5.7-1).
- Section 5.7.2—Provides updated data on direct impacts, based on the most current designs, to habitat type (Table 5.7-2) and identifies measures to mitigate impacts.
- Section 5.7.3—Provides updated information on coordination with the USFWS regarding federally protected species, including the status of the amended Biological Assessment and mitigation commitments. Also adds a discussion of the 2010 Indiana Bat Conservation MOA for geotechnical drilling in the East End Corridor.
- Section 5.7.4—Adds a discussion of the Falls of the Ohio National Wildlife Conservation Area.

5.7.1 Soils and Geology

This section of the 2003 FEIS discussed impacts of the project to soils and geology, and associated mitigation. Table 5.7-1 has been updated to show impacts of the current design of the FEIS Selected Alternative and the Modified Selected Alternative. The current web-based GIS system (http://websoilsurvey.nrcs.usda.gov) for soils data provided by the Natural Resources Conservation Service was used to assess impacts. There are no other changes to this section because the information in the FEIS is still applicable to the project alternatives currently being considered in the SDEIS. For more detailed information, see page 5-299 of the FEIS.

TABLE 5.7-1
SOIL IMPACTS OF FEIS SELECTED AND MODIFIED SELECTED ALTERNATIVES (ACRES)

Alternative	Silt Loam		Urban		Urban/ Silt Loam		Urban/ Loam		Urban/ Fine Sandy Loam		Loam		Loam/ Silt Loam		Silty Clay/ Rock Outcrop		Silty Loam /Rock Outcrop		Silty Loam/ Silty Clay Loam		Total	
	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY	IN	KY
FEIS Selected	202.4	21.3	153.6	435.4	0	25.9	45.9	3.0	0	1.9	0	33.3	0	0.6	0	5.6	69.7	0	1.7	0	**473.3**	**527.0**
Modified Selected	202.4	21.3	153.6	278.5	0	23.4	45.7	2.8	0	1.9	0	33.3	0	0.6	0	5.6	69.7	0	1.7	0	**473.1**	**367.4**

The rights-of way of both alternatives are dominated by silt loam and other loamy soils, and urban land that were originally loamy soils. Some rock outcrop occurs, primarily on the east end of both alternatives.

Mitigation

The INDOT *Standard Specifications and Special Provisions* will govern construction activities in Indiana to control erosion and minimize water pollution. The KYTC *Standard Specifications for Road and Bridge Construction* will guide construction activities in Kentucky. Best Management Practices (BMPs) will be used to prevent non-source point pollution, to control storm water runoff and to minimize sediment damage to water quality and aquatic habitats. See FEIS Section 5.7.1.1 for additional details regarding mitigation measures for soil and geology impacts.

5.7.2 Terrestrial Wildlife and Habitat

This section of the 2003 FEIS discussed impacts of the project to terrestrial wildlife and habitat. Most of the information presented in the FEIS is still applicable to the alternatives being assessed in this SDEIS since impacts to wildlife have not changed significantly and, therefore, is not repeated herein. For additional information, see pages 5-302 through 5-304 of the FEIS. The changes in this section since the FEIS include revisions to Table 5.7-2 to address the current design of the two build alternatives, and changes to the environment since 2003. This section also includes updates to the mitigation measures.

TABLE 5.7-2
DIRECT IMPACTS BY HABITAT TYPE (ACRES)

Corridor - Alternative		Developed	Riparian Forest	Upland Forest	Wetlands and Streams	Upland Field	Total
East End-FEIS Selected	Indiana	287.8	13.2	69	3.1	0.2	373.3
	Kentucky	88.4	4.6	55.8	5.4	14	168.2
	Total	**376.2**	**17.8**	**124.8**	**8.5**	**14.2**	**541.5**
East End-Modified Selected	Indiana	287.8	13.2	69	3.1	0.2	373.3
	Kentucky	88.4	4.6	55.8	5.4	14	168.2
	Total	**376.2**	**17.8**	**124.8**	**8.5**	**14.2**	**541.5**
Downtown-FEIS Selected	Indiana	91.5	2.2	6.1	0	0	99.8
	Kentucky	286	12.7	59.2	4.6	0	362.5
	Total	**377.6**	**14.9**	**65.3**	**4.6**	**0**	**462.4**
Downtown-Modified Selected	Indiana	93.78	2.2	3.42	0	0	99.4
	Kentucky	170.1	2.2	29.8	1	0	203.1
	Total	**263.8**	**4.4**	**33.2**	**1**	**0**	**302.5**

** Impacts to riparian forest and wetlands/streams do not include Ohio River impacts.*

Mitigation

The following mitigation measures were taken as written from the 2003 Record of Decision (ROD) and the amended BA currently under review by the USFWS. Project specific mitigation measures, pursuant to USFWS comments and final review by state and Federal agencies, will be provided in the Supplemental Final Environmental Impact Statement (SFEIS).

- "DO NOT DISTURB" signs will be placed at the construction zone boundaries for those portions of the project within Indiana. These signs will be placed beyond the construction limits to protect re-vegetation areas and areas of existing vegetation. Trees located within the right-of-way, but outside of the construction limits, will be identified during the design phase and delineated by fencing or other measures to minimize impacts.
- "DO NOT MOW OR SPRAY" signs will be posted along the right-of-way for selected areas (areas of woody re-vegetation, wetlands and preservation of existing woody vegetation) in Indiana, in accordance with INDOT requirements; and in selected areas in Kentucky where mitigation plantings may be required.
- Invasive-free mulches, topsoil and seed mixtures, and eradication strategies to eliminate known invasive species will be incorporated into the final project.
- Provisions will be included in the final plans emphasizing the selection of construction and landscaping techniques and equipment that will minimize the spread of invasive plant species, particularly in areas where steep slopes are involved. Attention shall also be given to minimizing soil disturbance during vegetation management activities.
- KYTC will provide for replacement of trees removed by construction in those areas where dense vegetation provided a buffer for abutting properties.

- KYTC will include trees or other types of vegetation in the re-vegetation plan developed for the project in association with any noise barrier walls recommended as part of the project.
- KYTC will consult with the Bridgepointe Neighborhood Association and consider their recommendations in developing a landscape component for any wall placed along the border of the neighborhood.
- The area between Utica–Sellersburg Road and Salem Road has at least three distinct passageways that wildlife could use. The project alternatives would bridge two of the three, thereby providing corridors for wildlife passage through the area.
- A large culvert at Patrol Road is located within the drainage channel that flows from the River Ridge Commerce Center property (formerly the Indiana Army Ammunition Plant [INAAP]) toward Utica and into the Ohio River. This culvert would provide a passageway for wildlife within this area.
- A tributary of Lentzier Creek flows along the side of the Utica–Charlestown Road. The forested area on either side of the Modified Selected and FEIS Selected alternatives would be connected by a bridge that would span both the road and the stream tributary. The selection of a bridge span or culvert size will be determined in the final design and will include consideration for wildlife passage.

5.7.3 Federal Threatened and Endangered Species

The general background discussion in the introduction to Section 5.7.3 of the 2003 FEIS is still applicable, as is the discussion of indirect impacts and cumulative effects as presented on pages 5-304 and 5-305 of the FEIS. The discussion of impacts and mitigation related to state-listed species on page 5-307 of the FEIS is also still applicable. Aside from those sections, the other aspects of Section 5.7.3 in the FEIS are superseded by the updated information provided herein.

Of the 17 species listed by the U. S. Fish and Wildlife Service (USFWS) for the project area, only the Indiana bat (*Myotis sodalis)* and gray bat (*Myotis grisescens)* are known or assumed to be present in the project area (see Biological Assessment discussion below for details). For the remainder of the species, USFWS determined that the information in the Biological Assessment supporting the "May Affect – Is Not Likely to Adversely Affect" determinations was adequate. Following discussions of the Indiana bat and gray bat, detail of the latest version of the Biological Assessment are presented, followed by mitigation measures related to threatened and endangered species and a discussion of the Migratory Bird Act of 1918. The format of this section corresponds closely to that of the 2003 FEIS.

Indiana Bat

No winter hibernating Indiana bat caves are known to exist in the vicinity of the proposed project. However, Indiana bats have been documented as having used the area during the warm months for rearing young and foraging. In 1991, two female Indiana bats were recorded from the forested riparian area of an unnamed tributary near Longview, Jefferson County, Kentucky (KSNPC data). In southern Indiana, Whitaker et al. (2001) reported that Cope and Richter (1978)

caught six Indiana bats at Muddy Fork Creek. However, Whitaker and Gummer (2001) reported that no Indiana bats were captured in 37 nights of netting in 1992-1999 in nine Indiana counties in the Ohio River basin (including the project area's Clark County). They also stated that Indiana bats are apparently becoming increasingly uncommon in southern Indiana.

As indicated in the 2003 FEIS, female Indiana bats were caught from two sites in Kentucky during the 1999 field investigations conducted for this project: at Goose Creek near Orion Road and at the junction of Goose and Little Goose creeks. The maternity trees for the captured bats were not located during sampling efforts; therefore, it was not determined if the Indiana bat maternity roosts occur in the direct path of the FEIS Selected Alternative or the Modified Selected Alternative. Because lactating Indiana bats were caught foraging on Goose Creek in 1999, there is likely a maternity site in the general area. Both the FEIS Selected Alternative and the Modified Selected Alternative are proposed to be constructed within the potential maternity area, and as a result, they contain potential habitat for Indiana bat and FHWA is assuming that the species is present in the area. The FEIS Selected Alternative contains approximately 203.6 acres of potential Indiana bat habitat within the right-of-way, and the Modified Selected Alternative contains approximately 180.2 acres of potential Indiana bat habitat within the right-of-way.

Gray Bat

In Kentucky, the gray bat was previously recorded from the forested riparian area in the Little Goose Creek drainage area between U.S. 42 and River Road in eastern Jefferson County (KSNPC data). In southern Indiana a gray bat maternity colony is known from a flooded, abandoned limestone quarry at Camp Chelan near Sellersburg, Indiana (approximately nine miles from downtown Louisville); and gray bats have been mist-netted from Muddy Fork Creek and Silver Creek near the quarry (Whitaker et al., 2001). In addition, gray bats have been captured on the property of the former Indiana Army Ammunition Plant (INAAP) at Charlestown, Indiana. Another roost is also thought to exist there in one or more of the numerous caves, most likely in the upper Jenny Lind Run area (Whitaker et al., 2001). USFWS has identified gray bat habitat and the presence of a maternity colony within the Jenny Lind Run and Little Battle Creek drainages on the former INAAP property.

During the 1999 and 2000 field investigations for this project, mist-netting efforts produced a number of gray bats, including females, both in Indiana and Kentucky. Gray bats were caught in Jefferson County, Kentucky in the Goose Creek drainage and in Indiana from the Lancassange Creek drainage. Four of the captured bats were tracked to a known quarry maternity site in Sellersburg, Indiana; (approximately eight miles northwest of the capture site). Both the FEIS Selected Alternative and the Modified Selected Alternative contain potential habitat for the gray bat and FHWA is assuming that the species is present in the area. The FEIS Selected Alternative contains approximately 28.5 acres of potential gray bat habitat within the right-of-way, and the Modified Selected Alternative contains approximately 22.0 acres of potential gray bat habitat within the right-of-way.

Biological Assessment

USFWS has documented 17 federally protected species with the potential to occur within the project impact area: gray bat, Indiana bat, running buffalo clover (*Trifolium stoloniferum*), Short's goldenrod (*Solidago shortii*); 9 federally listed mussel species: American burying beetle (*Nicrophorus americanus*), Louisville cave beetle (*Pseudanopthalmus troglodytes*), interior least tern (*Sterna antillarum*), and piping plover (*Charadrius melodus*). A Biological Assessment (BA) for the LSIORB Project was completed in January 2003, and USFWS issued a finding on March 13, 2003, stating that the project is "Not Likely to Adversely Affect" endangered species.

An amended BA was submitted to USFWS on June 15, 2009. Subsequently, in a July 16, 2010 letter (see Appendix B.3.1), USFWS stated the following:

> *…in compliance with the FHWA NEPA process, an amended BA… (was produced) …to re-evaluate potential effects on federally listed species and to consider any Project modifications that were not considered during the original informal consultation.*

In the July 16, 2010 letter, USFWS agreed with the analysis and the information supporting that the "No Effects" determinations for all of the aforementioned species was adequate, with the exception of the gray bat and Indiana bat. Regarding the gray bat, USFWS indicated that it was unclear if the avoidance and minimization measures proposed within the amended BA would be adequate and/or would support a "Not Likely to Adversely Affect" determination. They requested additional discussion of the avoidance, minimization, conservation, and protective measures linked back to specific effects on the species. Regarding the Indiana bat, USFWS indicated that they could not concur with a determination of "Not Likely to Adversely Affect" the species. They also requested that, although the interior least tern was not identified during field surveys, KYTC commit to survey any suitable nesting areas for the interior least tern during subsequent nesting seasons prior to construction, and that the results of such surveys be coordinated with their office in order to determine if further consultation is required. Regarding federally listed mussel species, USFWS stated that, if bridge construction does not begin within five years, their office should be contacted to assess the need for reevaluation of the potential to adversely affect such species. USFWS also indicated that if the project requires the use of waste sites, then those sites should also be evaluated within the amended BA.

In a letter dated July 2010, KYTC responded to USFWS and indicated that the amended BA would be revised to address their comments, would be re-submitted for their review, and would include the following commitments:

- A survey of suitable nesting areas for the interior least tern within the project area will be conducted during subsequent nesting seasons and prior to construction.
- If the bridge construction does not begin in five years, USFWS will be contacted to assess the need for re-evaluation of the potential to adversely affect federally endangered mussel species.

- The BA will be revised to define avoidance and minimization measures for specific effects of the project on the gray bat, including assessment of all stream corridors on a cumulative basis.
- The BA will be revised to modify the effect determination to "May Affect – Is Likely to Adversely Affect," and KYTC will pursue entering into a Conservation Memorandum of Agreement (MOA) with the agency for the incidental take of Indiana bat summer habitat.
- If the project proposes the use of waste sites, the BA will be amended to analyze potential effects of the use of these sites on federally listed species.

In March 2011, USFWS, in scoping comments submitted to FHWA in connection with this SDEIS, stated that

> *…the Federal Highway Administration is in the process of re-evaluating the Biological Assessment for the proposed project and has not provided a final Biological Assessment and determination of effect for listed species that may occur within the project area. The final Biological Assessment should consider any project modifications that occur as a result of the SEIS; additional informal consultation will be necessary and formal consultation may be required if adverse effects to listed species will occur. Specific measures to avoid and minimize impacts to listed species may also be necessary pending our review of the specific level and type of impacts associated with the preferred alternative.*

In September 2010, KYTC and USFWS entered into an Indiana Bat Conservation Memorandum of Agreement (MOA) for geotechnical drilling (rock bores) on a portion of the project. The geotechnical information and analysis obtained from the drilling will assist in the design of the proposed twin tunnel bores under U.S. 42 and the design of the structures involved with the Kentucky approach to the East End Bridge.

A revised amended BA was developed to address USFWS comments from both July 2010 and March 2011, and has been resubmitted to USFWS for their comments or approval.

5.7.3.1 Mitigation

The revised amended BA includes mitigation measures for the Indiana bat, gray bat, federally listed mussels, and the least tern to be implemented as part of the project. The following mitigation measures, as provided in the amended BA, will be implemented, pursuant to receipt of additional comments from USFWS.

5.7.3.1 Mitigation

The revised amended BA includes mitigation measures for the Indiana bat, gray bat, federally listed mussels, and the least tern to be implemented as part of the project. The following mitigation measures, as provided in the amended BA, will be implemented, pursuant to receipt of additional comments from USFWS.

FHWA proposes to enter into a Conservation MOA with USFWS to account for the incidental take of Indiana bat summer habitat. A Conservation MOA with USFWS would allow KYTC and INDOT flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, FHWA will provide will provide a contribution to the Indiana Bat Conservation Fund, to be used for recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures that are described in the *Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky*.

- Construction limits will be minimized.
- No construction work will be permitted at night at stream crossings, with the lone exception of pouring concrete for bridge decks.
- All culverts and pipes will be designed and constructed such that the bottom (invert) is at a lower elevation than the stream bottom/bed, and the design of the culvert/pipe is such that it will allow natural stream bed material to accumulate throughout the length of the culvert. This will allow for colonization and production of macroinvertebrates within the culvert/pipe; thus minimizing the impact upon and reduction of productivity of a food resource for gray bats.
- Seasonal restrictions on the removal of trees to minimize disruption to Indiana bat maternity activities in accordance with consultation conducted with the USFWS.
- Trees greater than or equal to 5 inches diameter at breast height (dbh) will be avoided except those in the direct construction limits.
- Hollow trees, trees with sloughing bark, and other large trees that occur within the project limits will be avoided to the maximum practical extent and delineated by special notes in the plans and measures such as special fencing during construction.
- To maintain a riparian buffer zone, tree cutting will be maintained within the construction limits and will be limited to that absolutely necessary to complete the project.
- “DO NOT DISTURB” signs will be placed at the construction zone boundaries for the portions of the project within Indiana. These signs will be placed beyond the construction limits to protect re-vegetation areas and areas of existing vegetation. Trees that fall within the right-of-way, but outside of the construction limits, will be identified during the design phase and delineated by fencing or other measures to minimize impacts.
- “DO NOT MOW OR SPRAY” signs will be posted along the right-of-way for selected areas (areas of woody re-vegetation, wetlands and preservation of existing woody vegetation) in Indiana in accordance with INDOT requirements and in selected areas in Kentucky where mitigation plantings may be required.
- In Indiana, INDOT will purchase at a 1:1 ratio, existing woodland for preservation or re-vegetate upland woodland at a 1:1 ratio to mitigate forested habitat lost as a result of this project.
- Excess parcels that have been purchased as part of this project will be used for wetland mitigation or reforestation, as appropriate.

- In Kentucky, disturbed areas at stream crossings will be re-vegetated with tree species that produce sloughing bark and snags and follow the general guidelines of USFWS, Interstate Mining Compact Commission, and Office of Surface Mining (2009). Species will include a minimum of six different tree species. Species selection should be determined by site-specific characteristics (soil moisture, sun exposure, etc.) and seedling availability. A stocking success rate of not less than 300 stems per acre will be required. A minimum of four species identified as "Exfoliating Bark Species" must be planted and equal at least 40% of the minimum stems per acre. Tree species will be planted at approximately equal rates. "Exfoliating Bark Species" (suitable for planting in the project area) are sugar maple (*Acer saccharum)*, bitternut hickory (*Carya cordiformis)*, pignut hickory (*Carya glabra*), shellbark hickory (*Carya laciniosa)*, shagbark hickory (*Carya ovata)*, mockernut hickory (*Carya tomentosa*), eastern cottonwood (*Populus deltoides*), white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and slippery elm (*Ulmus rubra*). An herbaceous ground cover of native species will be established.
- As part of the Waterway and Riparian Vegetation mitigation, tree species suitable for bat habitat that produce sloughing bark and snags will be planted to the maximum extent possible in disturbed areas. These species include sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*), shellbark hickory (*Carya laciniosa*), shagbark hickory (*Carya ovata*), mockernut hickory (*Carya tomentosa*), eastern cottonwood (*Populus deltoides*), white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and slippery elm (*Ulmus rubra*).
- Frequent fording of live streams will not be permitted. Temporary bridges or other structures shall be used whenever necessary. Unless otherwise approved in writing by the project engineer and upon receipt of any required permit or other local, state or federal approval, mechanical equipment shall not be operated in live streams or in wetlands. Only coarse granular material will be permitted to be placed in live streams during construction. Any temporary river accesses built in conjunction with this project will be completely removed upon completion of construction activities. Details of the mitigation for stream impacts requiring local, state or federal permits, certifications or other approvals will be developed during final design.
- Preservation of surface water quality will be controlled by maintaining stream-crossing impacts. Channel work such as, vegetation clearing, channel widening, shaping of spill slopes and placement of riprap will be limited to the construction limits.
- Staging, refueling, and cleanup areas will not be allowed alongside streams. Equipment cleaning/staging areas will be located such that runoff from these areas will not directly enter the stream. Equipment cleaning/staging areas will be located such that effluent will be filtered through vegetated areas and proper sediment control structures located between the staging area and receiving water-bodies; thereby minimizing the potential for stream impacts such as sedimentation and pollution.

- All KYTC and INDOT Best Management Practices (BMPs) for stream protection will be in place during project construction. INDOT's *Standard Specifications* and INDOT's *Special Provisions* will govern construction activities in Indiana to control erosion and subsequent water pollution. KYTC's *Standard Specifications for Road and Bridge Construction* will guide construction activities in Kentucky. BMP will be utilized to prevent non-point source pollution, to control stormwater runoff and to minimize sediment damage to water quality and aquatic habitats. BMP will include:
  - Temporary and permanent erosion control features will be incorporated into the project at the earliest practicable time as construction progresses.
  - When seeding or sodding must be delayed, temporary erosion protection with mulches, fiber mats, matting, dust palliatives, crust-forming chemicals, or plastic sheets will be provided.
  - Erosion control measures such as berms, dikes, geotextile filter cloths, slope drains, sediment basins, mulched seeding, sodding, and riprap will be installed where appropriate. Use of sediment traps will be determined for specific streams as dictated by the construction permit process.
  - During "grade and drain" operations (occurring after initial clearing and grubbing of the corridor), mulch will be spread across all areas where no work will be conducted for a 21-consecutive-day period. Equipment needed to properly spread mulch will be located on-site.
- The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Indiana portion of the project. (See INDOT's *Standard Specifications,* Spill Response Section of the Laws and Regulations Section for further information:
  - Construction—Hazardous material releases, oil spills, fish/animal kills and radiological incidents must be reported to Office of Emergency Response (OER), IDEM (888) 233-7745.) Reporting should occur as soon as action has been taken to either contain/control the extent of the release, or protect persons, animals or fish from harm or further harm. Appropriate response actions for spills occurring on project sites should occur in the following order: identify the spilled material from a safe distance; contain the spilled material or block/restrict its flow using absorbent booms/pillows, dirt, sand or by other available means; cordon off the area of the spill; deny entry to the cordoned off area to all but response personnel; and contact OER/IDEM then Operations Support.
  - Operations—INDOT Hazardous Material Accidents/Incidents Policy, February 1992 (Revised July 1998 or most recent version).
- Pouring of concrete for piers and/or decking will be done such that spills into the stream do not occur. In the unforeseen event that spillage does occur, USFWS office will be notified and the resident engineer shall halt the activity immediately and not resume until appropriate remedial actions have been implemented.
- Borrow sites and excess material sites for disposal of construction spoil have not been determined at this time. Excess material and borrow sites will be investigated later when a determination is made on how construction phasing will progress. Further coordination with USFWS will be undertaken to address this issue at that time. Once these sites have been determined the following will help to reduce their potential impact. The contractor will be required to develop a plan detailing the source and method of transportation of

borrow/fill. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be controlled during and after completion of the work by minimizing the erosion in such a way that it will prevent sediment from entering streams or other bodies of water. Excess material areas will be located and constructed in a manner that will keep sediment from entering streams. BMPs such as diversion channels, dikes, and sediment traps will be used for this purpose. All excavated materials not utilized for roadway embankment or disposed of off-site will be hauled for storage to an upland site and secured in such a manner as to prevent runoff from entering streams.

- USFWS shall be contacted by KYTC at least one week prior to the start of construction for the proposed project.
- If bridge construction does not begin within five years of the September 2007 surveys, KYTC will contact the Frankfort, Kentucky Field Office of USFWS to assess the need for reevaluation of the potential of the project to adversely affect federally listed mussel species. This will ensure that no adverse affects to the federally listed mussel species occur.

KYTC commits to survey any suitable interior least tern nesting areas during subsequent nesting seasons prior to construction. This will ensure that suitable least tern habitat areas are not occupied and no adverse affects to the interior least tern will occur from the project. The results of such surveys will be coordinated with the Frankfort, Kentucky Field Office of USFWS to determine if further consultation is required.

State-Listed Species

This section of the FEIS discussed impacts to state-listed species from the project, and potential measures to reduce impacts. The only changes to this section of the FEIS are reflected in the paragraph directly below. For additional information, see page 5-307 of the FEIS.

No state-listed species are known to occur within the right-of-way of the FEIS Selected Alternative or the Modified Selected Alternative. However, during field investigations for this study, several of those species were observed in the project area outside of proposed right-of-way (see SDEIS Table 4.7-2), and all have the potential to occur within the project impact area. Construction activities should be planned to avoid disturbance to any nesting species such as the peregrine falcon. According to October 11, 2011, *Kentucky Peregrine Falcon Report* from Kentucky Department of Fish and Wildlife Resources, a pair of peregrine falcons are currently nesting on the Big Four Railroad Bridge, and have been documented there for the past several years. A nest box has been available on the I-65 Kennedy Bridge since 2008, but so far the birds have only been observed using it as a place to store food.

The mitigation commitments listed in Sections 5.7.2, 5.7.3.2, and 5.8.5 will help reduce potential impacts to state-listed species.

Migratory Bird Treaty Act of 1918

The Migratory Bird Treaty Act of 1918 states that it is unlawful to

> *…pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention...for the protection of migratory birds...or any part, nest, or egg of any such bird.* (16 USC 703)

This prohibition applies to birds included in the respective international conventions between the U.S. and Great Britain, the U.S. and Mexico, the U.S. and Japan, and the U.S. and Russia. The Act designates Federal responsibility for the protection of migratory birds, and sets seasons for the hunting of those birds. In addition, the Act regulates the closing of areas, both federal and non-federal, to the hunting of migratory birds.

Coordination with USFWS, IDNR and Kentucky Energy and Environment Cabinet (formerly Natural Resources and Environmental Protection Cabinet) and field investigations of the 2003 FEIS Selected Alternative and the Modified Selected Alternative did not identify any resting or nesting areas, waterfowl flyways, or habitat used by migratory waterfowl. Neither of the proposed build alternatives will entail taking, killing, or possession of any migratory birds. In accordance with the Act, no impact is anticipated to occur to any migratory waterfowl as a result of the construction of either build alternative.

As specifically requested by USFWS, KYTC commits to survey any suitable interior least tern nesting areas during subsequent nesting seasons prior to construction. This will ensure that suitable least tern habitat areas are not occupied and no adverse affects to the interior least tern will occur from the project. The results of such surveys will be coordinated with the Frankfort, Kentucky Field Office of USFWS to determine if further consultation is required.

5.7.4 Natural Areas

The 2003 FEIS discussed the Six Mile Island Nature Preserve located on an island in the Ohio River. The description in the 2003 FEIS is still valid, so that preserve is not further discussed here. For details, see page 5-308 of the FEIS. Neither the FEIS Selected Alternative nor the Modified Selected Alternative will impact the Six Mile Island Nature Preserve.

A natural area in the general vicinity of the proposed project that was not specifically discussed in the FEIS is the Falls of the Ohio National Wildlife Conservation Area, which was established by the U.S. Congress in 1981. The area consists of approximately 1,400 acres roughly bounded by the Louisville & Indiana Railroad Bridge; the K & I Railroad Bridge; the waters between Indiana and Kentucky, including the Shippingport and Sand islands; extensive fossil beds; the Portland Canal; and the McAlpine Locks and Dam. The Falls area is located approximately one-half mile west of the Clark Memorial Bridge. Neither the FEIS Selected Alternative nor the Modified Selected Alternative will impact the Falls of the Ohio National Wildlife Conservation Area.

5.8 Water Resources

5.8.1 Surface Water

This section of the 2003 FEIS discussed impacts to surface waters resulting from construction of any of the project alternatives. The information presented in FEIS Table 5.8-1 has been updated to include stream impacts of the Modified Selected Alternative and remove streams that would not be crossed by either of the build alternatives evaluated in this SDEIS. See Section 5.10 for additional information regarding water body modifications. All of the other information presented in FEIS Section 5.8.1 is still valid for the SDEIS, and is not repeated herein. For more detailed information, see pages 5-308 through 5-310 of the FEIS.

TABLE 5.8-1
STREAM IMPACTS BY ALTERNATIVE

Stream	East End		Downtown	
	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected
Ohio River(2 Crossings)*	x	x	x	x
Tributary to Ohio River	X	X		
Tributaries to Lancassage Creek (3)	x	x		
Harrods Creek*	x	x		
Tributaries to Harrods Creek (2)	x	x		
Beargrass Creek(2 crossings)*			x	x
Middle Fork Beargrass Creek			X	
Tributary to Beargrass Creek			x	x
Lentzier Creek	x	x		
Tributaries to Lentzier Creek (6)	x	x		
Muddy Fork			x	x

** Identified as a Navigable Waterway by the USACE.*

5.8.2 Groundwater

This section of the 2003 FEIS discussed impacts to groundwater. For additional information, see page 5-310 of the FEIS. This SDEIS updates information presented in this section of the FEIS to include a comparison of the Modified Selected Alternative and the 2003 FEIS Selected Alternative; and to bring up to update the following groundwater issues in the eastern portion of the project: the Kentucky Wellhead Protection Program, the Louisville Water Company (LWC) Riverbank Filtration (RBF) program, and the LWC lagoons.

Wellhead Protection Program Areas

In Indiana, neither the FEIS Selected Alternative nor the Modified Selected Alternative would impact Indiana Wellhead Protection Areas (WHPAs).

In Kentucky, the Wellhead Protection Program is administered by the Groundwater Branch of the Kentucky Division of Water (KDOW). The Louisville Water Company has designated one WHPA. The WHPA encompasses the area from Harrods Creek east to the Oldham County/Jefferson County line, and from the Indiana shore of the Ohio River south to the rock ledge east of Brownsboro Road. Refer to SDEIS Figure 4.8-1a in Section 4.8.1, which identifies water resources including the WHPA boundary in the far eastern portion of the project.

Both the FEIS Selected Alternative and the Modified Selected Alternative would be constructed through this WHPA. Any construction or disturbance to the natural aquifer within the limits of the wellhead protection area has the potential to negatively affect the quality and quantity of the drinking water supply. Therefore, in accordance with the May 26, 2009 "*Evaluation of the Impact of Bridge Piers on RBF Tunnel"* and the "*Evaluation of the Impact of Bridge Piers on RBF Collector Well Screens*" technical study conducted by LWC to prevent the release of materials that may contaminate the aquifer (see Appendix B.4.1), the contractor will be restricted from using bentonite within 400–500 feet of the collector wells and restricted from using any polymer fluids within 1,000 feet. This requirement will be explained in the Special Notes of the project specifications for pier shaft construction; alternate drilling methods and/or materials will need to be identified prior to construction and enforced during construction inspection. During construction of the bridge approach, at no time shall materials or construction equipment be stored on the LWC site other than what is immediately necessary for the construction of the project within that property.

In an effort to prevent roadway pollutants from entering the WHPA, a drainage system has been designed to contain all runoff into a storm system leading to vaults prior to releasing the runoff into Harrods Creek. A meeting was held with LWC and KDOW on March 5, 2009 to discuss the proposed design of the storm water drainage system in the Wellhead Protection Area. The concept was considered reasonable and acceptable. The final design of the drainage system will be submitted to LWC and KDOW for concurrence. The ditches associated with the roadway fills within the WHPA will be constructed with a berm to contain not only storm drainage but also materials from a spill. The ditches will drain into the storm system and to the vaults. After a spill, ditches and pipes would be cleared of material by KYTC and any materials that reach the vault

would be contained, drained, and disposed of as required under applicable laws and regulations. There will be no direct runoff from the roadway to the WHPA.

LWC Riverbank Filtration (RBF) Program

The 2003 FEIS noted that LWC had plans to implement Phase II of the RBF. Phase II was completed in 2010 and included the installation of a hard rock tunnel approximately 10 feet in diameter and 150 feet below grade with collector wells placed at select locations. Water will enter the tunnel by way of these wells and be pumped to the B.E. Payne Water Treatment Plant. The tunnel extends north of Harrods Creek to north of Mayfair Avenue. The 2003 FEIS noted Alternative A-15 "would impact the proposed tunnel and will require coordination on the placement of piers for the bridge over the Ohio River" (see FEIS page 311). Alternative A-15 shares the same location as the Modified Selected Alternative in this portion of the study area. As engineering design work progressed on the RBF and the East End Bridge, LWC and KYTC coordinated the designs to minimize impacts to the RBF and the groundwater by construction of the bridge piers or other elements of the bridge approach. A study was conducted in 2009 for LWC to evaluate the proposed bridge pier locations on both the tunnel and the collector well screens. The results of the study, which were presented in at *Technical Memorandum: Evaluation of the Impact of Bridge Piers on RBF Tunnel*, dated May 26, 2009, concluded the impact on the RBF tunnel from the bridge pier foundation would be minor, and recommended that the bridge piers be located at least 40 feet away from the tunnel in the horizontal direction (see May 26, 2009, *Technical Memorandum* appended to correspondence dated June 2, 2009, in SDEIS Appendix B.4.1). In a letter dated September 2, 2011 (see Appendix B.4.2), LWC stated it "is in agreement with the proposed alignment in that it meets requirements as specified in the June 2, 2009 letter and May 26, 2009, *Technical Memorandum.*"

The *Technical Memorandum* also evaluated the impact of construction of the pier shafts on the RBF collector well screens. The nearest pier shaft is designed to be located approximately 250 feet from the downriver lateral in Collector Well No. 3 (CW-3). In the *Technical Memorandum*, three concerns were evaluated: mechanical effects such as excavation, vibration, caving, sloughing, etc.; invasion of cement; and invasion of drilling fluids if they are used. In sum, the memorandum noted the following about these concerns:

- Mechanical effects—The mechanical effects were deemed to have no effect on the structural or hydraulic integrity of CW-3.
- Invasion of cement—Invasion of cement was determined to be "no problem.... There is no chance that these materials could move to the screen laterals in CW-3."
- Invasion of drilling fluids—To ensure the integrity of the CW-3 well screens from invasion of drilling fluids, the memorandum recommended "that no drilling fluids shall be used for construction for any pier shaft within 400 to 500 feet for bentonite and 1,000 feet for polymer fluids...."

The drainage system and containment vaults described in "Wellhead Protection Program Areas," above, would prevent storm water runoff from impacting the Riverbank Filtration tunnel and collector wells.

LWC Lagoons

The FEIS Selected Alternative and the Modified Selected Alternative would directly impact existing sludge lagoons maintained by LWC. These lagoons are used by the Crescent Hill Water Treatment Plant and the B.E. Payne Water Treatment Plant and are considered vital to the LWC operations. Removal or elimination of any part of the existing lagoons would require replacement in like size and kind in the vicinity of the treatment plant.

Since the 2003 FEIS, preliminary plans indicated the conflict is with one sludge lagoon, identified by LWC as Lagoon #3. Coordination between LWC, KYTC, and FHWA to address this issue includes right-of-way acquisition, geotechnical investigation, and utility relocation solutions.

LWC will conduct a study to determine options for replacing (or reconfiguring) a portion of Lagoon #3 without impacting LWC operations. The FHWA authorized preliminary utility engineering in October 2010. Then, on July 11, 2011, LWC and KYTC entered into an agreement to conduct the study. In addition to rebuilding the berm outside the proposed right-of-way, options for replacing the lost storage capacity of Lagoon #3 include expanding the remaining area of Lagoon #3 with a new berm, dredging the floor of the lagoon, or other solutions to be identified by the study.

Any material removed from the sludge lagoon will be disposed in accordance with the KDOW requirements and local agency permits and regulations.

5.8.3 Special Status Streams

This section of the 2003 FEIS stated there are no Wild and Scenic Rivers in the project area, and it included a discussion of impacts to navigable waters. This SDEIS updates information presented in the "Navigable Waters" section of the FEIS to include the Modified Selected Alternative and coordination with the U.S. Army Corps of Engineers (USACE); and state that the LSIORB Project would not impact navigation. For additional information, see page 5-312 of the FEIS.

Navigable Waters

Navigable waters (the Ohio River, Harrods Creek, and Beargrass Creek) would be crossed by the FEIS Selected Alternative or the Modified Selected Alternative.

Coordination with the U.S. Coast Guard, Eighth District has been ongoing since 2004 to analyze impacts of the new bridges on river and stream transportation and on the McAlpine locks. The bridges will be designed to not adversely impact navigation on these waterways. In addition, the locks will not be impacted by the project. Horizontal and vertical bridge clearances will not

impede current or future water transportation. Coordination with the Coast Guard and USACE will continue throughout the design phase to ensure that the appropriate permits will be obtained.

5.8.4 Indirect Impacts and Cumulative Effects

This section of the 2003 FEIS discussed indirect impacts and cumulative effects of the project on water resources in Kentucky and Indiana watersheds. (For additional information, see page 5-312 of the FEIS.) The information in this section of the FEIS remains valid and is applicable to both the FEIS Selected Alternative and the Modified Selected Alternative. This SDEIS adds a discussion of potential indirect and cumulative impacts to LWC resources, namely the Wellhead Protection Area (WHPA) and the Riverbank Filtration (RBF) program identified in Section 5.8.2 above.

New information in the preceding sections identifies the official determination of the WHPA and the LWC's investment in the RBF program since the 2003 FEIS. No new roadway access to the area encompassing the WHPA and the RBF program is proposed as part of the East End Bridge approach. As a result, no induced growth, diverted traffic, or other indirect impacts to this area are anticipated as a result of the proposed project. As stated in the FEIS, for the larger study area induced development will indirectly add to any impacts to water resources, and unrelated development projects would contribute to cumulative effects.

5.8.5 Mitigation

This section of the 2003 FEIS discussed mitigation measures which will be included in the project to minimize impacts to the water resources of the project area (not including wetlands, which are discussed in Section 5.10). Since the publication of the 2003 FEIS, additional project mitigation measures have been developed through continuing coordination with local, state, and federal resource agencies. The measures listed below represent current efforts to minimize impacts to the human and natural environment and will be updated for incorporation into design plans upon selection of a preferred alternative in the ROD. For more detailed information regarding project mitigation measures, see pages 5-313 through 5-317 of the FEIS. Resource agency coordination is summarized throughout SDEIS Chapter 7, *Public Involvement and Agency Coordination.*

Groundwater Protection

This section of the 2003 FEIS discussed mitigation measures that will be included in the project to minimize impacts to groundwater of the project area. Since the 2003 FEIS, additional measures have been developed to minimize potential impacts to Louisville Water Company (LWC) facilities as a result of (1) LWC's implementation of Phase II of its Riverbank Filtration Program, (2) identification of impacts to LWC's Lagoon #3 that were not anticipated in 2003, (3) project design modifications, and (4) coordination with LWC since the FEIS. The following text incorporates both the mitigation that is still applicable from the 2003 FEIS and that which has been developed or updated through agency coordination since that time.

Groundwater protection measures will be addressed during design and implemented during construction for the appropriate portions of the project in Kentucky. FHWA guidelines, and KYTC Best Management Practices (BMPs), *Standards Specifications for Road and Bridge Construction* (*Standard Specifications*, current edition), and *Generic Groundwater Protection Plan* will be followed. Specific measures have been developed to protect the Louisville Water Company's WHPA (see Figure 4.8-1b in Section 4.8, herein), the RBF tunnel and collector wells within the WHPA, and the LWC sludge lagoons (see Appendix B.4.1).

In an effort to prevent roadway pollutants from entering the WHPA, a drainage system has been designed to contain all runoff into a storm system leading to vaults prior to releasing the runoff into Harrods Creek. The design and concept was discussed with LWC and KDOW in a meeting on March, 5 2009; they considered it reasonable and acceptable. The final design of the drainage system will be submitted to LWC and KDOW for concurrence. The ditches associated with the roadway fills within the WHPA will be constructed with a berm to contain not only storm drainage but also materials from a spill. The ditches will drain into the storm system and to the vaults. After a spill, ditches and pipes would be cleared of material by KYTC and any materials that reach the vault would be contained, drained, and disposed of as required under applicable laws and regulations. There will be no direct runoff from the roadway to the WHPA.

Bridge deck drains and storm sewers will be used to collect bridge deck runoff into a storage area at the Kentucky end of the bridge. The runoff will then either be released to a surface drainage system or pumped into trucks and transported to an approved receiving facility. KYTC will continue to work with KDOW in developing and implementing Groundwater Protection Plans prior to construction through the WHPA in accordance with 401 KAR 5:037.

In addition to the temporary and permanent erosion control measures included in the KYTC *Standards Specifications*, the following additional measures are to be incorporated into construction within the Louisville Water Company WHPA:

- Work within the WHPA shall be limited to that included in the plans, unless otherwise approved by the Engineer in writing.
- Cement plants shall not be placed, nor shall equipment and materials be stored, within the WHPA other than what is immediately necessary for the construction of the project within that property.
- Equipment required for construction of the bridge piers may be located within the WHPA, provided a berm is constructed around the equipment and a liner placed within the bermed area to protect against any accidental release.
- Equipment required for construction of the bridge piers shall be moved from the WHPA at the earliest opportunity, berms and liners removed and any materials contained within the bermed area shall be transported to an approved disposal site, outside the WHPA.
- In accordance with the technical study conducted by LWC to prevent the release of materials that may contaminate the aquifer, the contractor will be restricted from using bentonite within 400–500 feet of the collector wells and restricted from using any polymer fluids within 1,000 feet. This requirement will be explained in the Special Notes of the project specifications for pier shaft construction; and alternate drilling methods

and/or materials will need to be identified prior to construction and enforced during construction inspection.

- The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Kentucky portion of the LSIORB Project:
  - *Construction*—Contractor shall prepare a spill containment plan prior to or soon after the Pre-Construction Conference for the proposed operations, and must receive approval prior to the initiation of work.
  - *Operations*—Chapter 10 of the KYTC *Operations Guidance Manual: Cleanup and Restoration Work* (71-10.0500) shall be adhered to.

Design and construction of bridge piers within the WHPA are to be developed to include the following measures, to be modified as appropriate after the final structure type is selected and the specific construction requirements of the footers and piers has been developed:

- The contractor shall minimize to the extent possible the area that must be disturbed to construct bridge piers and other elements of the bridge substructure located below the surface.
- The bridge piers will be located at least 40 feet away from the tunnel in the horizontal direction.
- Any voids left between the pier and surrounding ground shall be sealed by using bentonite clay or other approved materials, as soon as possible after completion of work on the pier; however bentonite is prohibited for use during construction of any pier shaft that is within 400–500 feet of a collector well.
- To ensure the integrity of the well screens of collector wells from invasion of drilling fluids, polymer fluids are prohibited within 1,000 feet of a collector well.
- Design and construction of bridge piers within the Ohio River shall include the use of cofferdams that minimize the amount of streambed disturbance or other construction techniques that would further limit re-suspension of streambed sediments. In addition to the provisions of Section 212 and 213 of the KYTC *Standard Specifications*, material removed from the cofferdams shall be disposed of at approved upland sites.
- Pier construction methods and the drainage system will be coordinated with the LWC and the Groundwater Protection Branch of KDOW to assure construction methods are employed to prevent contamination of the aquifer.

Regarding LWC sludge Lagoon #3, LWC and KYTC entered into an agreement on July 11, 2011 to conduct a study to determine options for replacing (or reconfiguring) a portion of the lagoon without impacting LWC operations. In addition to constructing outside the proposed right-of-way, options for replacing the lost storage capacity include expanding the remaining area of the lagoon, dredging the floor of the lagoon, or other solutions to be identified by the study. Any material removed from the sludge lagoon will be disposed of in accordance with the KDOW requirements and local agency permits and regulations.

Erosion Control Plan

This section of the 2003 FEIS discussed mitigation measures which will be included in the project as part of the erosion control plan to minimize impacts to water resources of the project area. The following text incorporates both the mitigation that is still applicable from the 2003 FEIS and that which has been developed or updated through agency coordination since that time.

Measures to control and minimize erosion and water quality impacts from construction activities will be incorporated into the project. Best Management Practices (BMPs), standard erosion control measures and other measures included in the INDOT *Standard Specifications,* INDOT *Special Provisions,* and KYTC *Standard Specifications for Road and Bridge Construction* will provide the basis of the erosion control plan.

- Construction limits will be minimized.
- Best Management Practices (BMPs) will be utilized to prevent non-source point pollution, to control storm water runoff and to minimize sediment damage impacts to water quality and aquatic habitats.
- Erosion control measures such as berms, dikes, geotextile filter cloths, slope drains, sediment basins, mulched seeding, sodding, and riprap will be installed where appropriate.
- Use of sediment traps will be determined for specific streams as dictated during the permit process.
- Temporary and permanent erosion control features will be incorporated into the project at the earliest practicable time as construction progresses.
- When seeding or sodding must be delayed, temporary erosion protection with mulches, fiber mats, matting, dust palliatives, crust-forming chemicals, or plastic sheets will be provided.
- The contractor will be required to develop a plan detailing the source and method of transportation of borrow/fill.
- When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be controlled during and after completion of the work by minimizing the erosion in such a way that it will prevent sediment from entering streams or other bodies of water.
- Excess material sites or disposal areas and construction roads will be located and constructed in a manner that will keep sediment from entering streams. BMPs such as diversion channels, dikes, and sediment traps will be used for this purpose.
- All excavated materials not utilized for roadway embankment or disposed of off-site will be hauled for storage to an upland site and secured in such a manner as to prevent runoff from entering streams.
- Implementing an approved soil erosion and sedimentation control plan will control erosion within the construction limits. All construction activities must comply with

federal and state soil erosion and sedimentation regulations. This plan will be developed in conjunction with final construction plans. The INDOT *Standard Specifications* and INDOT *Special Provisions* will govern construction activities in Indiana to control erosion and minimize water pollution. The *KYTC Standard Specifications for Road and Bridge Construction* will guide construction activities in Kentucky.

Waterways and Riparian Vegetation

This section of the 2003 FEIS discussed mitigation measures which will be included in the project to minimize impacts to waterways and riparian vegetation. The project includes two crossings of the Ohio River and crossings of Harrods Creek, Lentzier Creek, two major tributaries of Lentzier Creek, and Beargrass Creek which will require design and construction of bridge structures. The following text incorporates both the mitigation that is still applicable from the 2003 FEIS and that which has been developed or updated through agency coordination since that time.

- The bottom/invert of all culverts and pipes will be partially buried to allow stream bed material to accumulate and provide a natural stream bed for aquatic organisms.
- Physical disturbance of waterways and riparian vegetation will be limited to only that which is necessary. Notes and details will be included in the plans to further minimize the removal of trees and understory vegetation that fall within the required right-of-way, but outside the actual limits of construction. Hollow trees, trees with sloughing bark, and other large trees that occur within the project limits will be avoided to the maximum practical extent and delineated by special notes in the plans which will also include measures such as special fencing during construction.
- Disturbed areas adjacent to streams will be re-vegetated to the maximum extent possible with tree species that produce sloughing bark and snags. Species to consider include sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*), shellbark hickory (*Carya laciniosa*), shagbark hickory (*Carya ovata*), mockernut hickory (*Carya tomentosa*), eastern cottonwood (*Populus deltoides*), white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and slippery elm (*Ulmus rubra*).
- INDOT will purchase at a 1:1 ratio existing woodland for preservation or revegetate upland woodland at a 1:1 ratio to mitigate forested habitat lost in Indiana as a result of the project.
- Excess parcels that have been purchased as part of the project will be utilized for wetland mitigation or reforestation, as appropriate.
- The size, shape and stability of natural stream channels unavoidably impacted by construction will be used as the basis for designing replacement channels. Work in the low-water channel of existing streams will be minimized to the maximum practicable extent by limiting construction to the placement of required drainage structures or

structure components such as piers, pilings, footings, cofferdams, shaping of spill slopes around bridge abutments and placement of riprap.

- Staging, refueling and cleanup areas will not be allowed alongside streams. KYTC and INDOT BMP's for stream protection will be in place during project construction.
- Below low water, channel work outside of cofferdams will be avoided during the fish-spawning season between April 1 and June 30, and performed from stream banks in shallow waters or barges in deeper waters.
- A non-toxic flocculent agent will be added to the bottom water in cofferdams to prevent downstream siltation during cofferdam dewatering. Pollutants such as fuels, lubricants, bitumens, raw sewage and other harmful materials will not be discharged into or near rivers, streams and impoundments or into natural or manmade channels leading thereto. Wash water or waste from concrete mixing operations will not be allowed to enter live streams. The use of artificial bank stabilization such as riprap will be limited to those areas in Indiana unless otherwise required by final design details. A minimum average 6-inch graded stone, extended below normal low water level to provide habitat for aquatic organisms in the voids, will be used for those areas in Indiana.
- Frequent fording of live streams will not be permitted. Temporary bridges, low water crossings or other structures shall be used whenever crossing a stream is necessary. Unless otherwise approved in writing by the project engineer and upon receipt of any required permit or other local, state or federal approval, mechanical equipment shall not be operated in live streams or in wetlands. Only coarse granular material will be permitted to be placed in live streams during construction. Any temporary river accesses built in conjunction with this project will be completely removed upon completion of construction activities. Details of the mitigation for stream impacts requiring local, state or federal permits, certifications or other approvals will be developed during final design.
- The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Indiana portion of the project. See the Spill Response Section of the Laws and Regulations Section for further information:
    - *Construction*—Hazardous material releases, oil spills, fish/animal kills and radiological incidents must be reported to Office of Emergency Response (OER), IDEM (888) 233-7745.) Reporting should occur as soon as action has been taken to either contain/control the extent of the release, or protect persons, animals or fish from harm or further harm. Appropriate response actions for spills occurring on project sites should occur in the following order: identify the spilled material from a safe distance; contain the spilled material or block/restrict its flow using absorbent booms/pillows, dirt, sand or by other available means; cordon off the area of the spill; deny entry to the cordoned off area to all but response personnel; and contact OER/IDEM then Operations Support.
    - *Operations*—INDOT Hazardous Material Accidents/Incidents Policy, February 1992 (Revised July 1998 or most recent version).

- The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Kentucky portion of the LSIORB Project:
  - *Construction*—Contractor to prepare spill containment plan at the Pre Construction Conference for his proposed operations and receive approval prior to the initiation of work.
  - *Operations*—Chapter 10 of the KYTC *Operations Guidance Manual – Cleanup and Restoration Work* (71-10.0500)

There are no updates to these sections from the 2003 FEIS: Zebra Mussels, Karst Features, and Borrow and Waste Sites.

5.9 Floodplains

This section of the 2003 FEIS discussed FHWA's floodplain encroachment policy, direct impacts, indirect impacts and cumulative effects, and mitigation measures for floodplains within the project area. The discussions of FHWA's floodplain encroachment policy and general direct impacts for the Bridge/Highway Alternatives on pages 5-317 and 5-318 of the FEIS remain applicable and are not repeated herein. However, this SDEIS provides updates to the information presented in the FEIS, as follows:

- Section 5.9.1—Updates the data in tables 5.9-1 and 5.9-2 and the supporting text on specific alternatives to reflect the impacts of the FEIS Selected Alternative and to add those of the Modified Selected Alternative.
- Section 5.9.2—Provides information to describe potential indirect impacts of the two build alternatives.

5.9.1 Direct Impacts

Table 5.9-1 below provides a summary of floodplain impacts related to the FEIS Selected Alternative and the Modified Selected Alternative in the East End and the Downtown corridors. Table 5.9-2 identifies the impacts to the floodplains associated with each build alternative. Floodplain impacts presented in Tables 5.9-1 and 5.9-2 are based on right-of-way limits established for the FEIS Selected and Modified Selected alternatives.

TABLE 5.9-1
SUMMARY OF FLOODPLAIN IMPACTS

	East End		Downtown	
	FEIS Selected	**Modified Selected**	**FEIS Selected**	**Modified Selected**
Number of floodplains crossed	2	2	4	3
Longitudinal encroachment (acre)	0.00	0.00	154.52	56.22
Transverse encroachment (acre)	20.74	20.74	3.09	3.07
Total area of encroachment (acre)	20.74	20.74	157.61	59.29

TABLE 5.9-2
ANTICIPATED IMPACTS BY FLOODPLAIN

	Ohio River				Harrods Creek		Beargrass Creek		Middle Fork Beargrass Creek		Muddy Fork	
	Indiana		Kentucky									
	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected	FEIS Selected	Modified Selected
Structures within 1,000' downstream of encroachment	12	12	10	10	3	3	0	0	7	NA	0	0
Structures within 1,000' upstream of encroachment	16	16	116	116	20	20	0	0	2	NA	16	3
Total number of structures within floodplain removed	6	6	34	20	3	3	0	0	0	NA	0	0
Acreage of floodplain forest potentially impacted	0.65	0.65	47.14	23.01	4.00	4.00	0.81	0.81	6.59	NA	9.16	1.91

FEIS Selected Alternative

A total of 178.35 acres of floodplain would experience encroachment impacts from the FEIS Selected Alternative, with 20.74 acres in the East End Corridor and 157.61 acres in the Downtown Corridor. Of this total, 23.83 acres would be a transverse encroachment, including the entire impact area in the East End Corridor, while 154.52 acres would be a longitudinal encroachment; all in the Downtown Corridor (see Table 5.10-2). There would be a total of six floodplains crossed by this alternative, two of which are in the East End Corridor (Harrods Creek and Ohio River) and four in the Downtown Corridor (Beargrass Creek, Muddy Fork and Middle Fork of Beargrass Creek, and Ohio River).

Modified Selected Alternative

A total of 80.03 acres of floodplain would experience encroachment impacts from the Modified Selected Alternative, with 20.74 acres in the East End Corridor and 59.29 acres in the Downtown Corridor. Of this total, 23.81 acres would be a transverse encroachment, including the entire impact area in the East End Corridor, while 56.22 acres would be a longitudinal encroachment; all in the Downtown Corridor (see Table 5.10-2). There would be a total of five floodplains crossed by this alternative, two of which are in the East End Corridor (Harrods Creek and Ohio River) and three in the Downtown Corridor (Beargrass Creek, Muddy Fork of Beargrass Creek, and Ohio River). The smaller number of floodplains impacted and acres of floodplains impacted by the Modified Selected Alternative, as compared to the FEIS Selected Alternative, is attributed to the smaller footprint of the alternative in the Louisville portion of the Downtown Corridor.

5.9.2 Indirect Impacts and Cumulative Effects

The 2003 FEIS discussed floodplain management efforts for the Ohio River, specifically the construction of the current floodwall and levee system, and the potential for indirect impacts to interior stream floodplains. With regard to floodplain impacts discussed in this SDEIS, both the FEIS Selected Alternative and the Modified Selected Alternative would continue to have the potential for indirect impacts to floodplains, especially Harrods Creek, as a result of induced residential or commercial development that could encroach upon the floodplain or increase the overall amount of runoff to it; and cumulative effects from other major actions, residential/commercial development.

5.9.3 Mitigation

As stated in FEIS Section 5.9.3, page 5-321, the predicted floodplain impacts are limited to storage and not conveyance. Where required, compensatory storage will be provided. Piers will be placed within the floodplain as required by structural design requirements and with consideration for minimizing impacts to drainage within the floodplain and the Louisville Water Company hard-rock tunnel along Transylvania Beach Road. Mitigation of impacts to floodplain forests will be coordinated with the IDNR, KDOW and the USACE throughout the design phase of the project. In addition, the Louisville Water Company will be consulted about the possible enhancement of a wooded area within its floodplain property adjacent to Transylvania Beach Road.

5.10 Wetlands

This section of the 2003 FEIS discussed impacts to wetlands and other water bodies within the project area. Although general discussions of impacts as presented in the FEIS still apply and are not repeated herein, changes have been made to information presented in the following subsections to address specifics of the FEIS Selected Alternative and the Modified Selected Alternative. Tables 5.10-1 and 5.10-2 to show impacts to wetlands and water bodies resulting from the two build alternatives. The values in these tables identify only the area of direct impacts within the right-of-way. Table 4.10-1 in Section 4.10 identifies the total area of the wetlands that would be affected by the two alternatives. (In the case of lacustrine and riverine wetlands, Table 4.10-1 does not include the area of impact for those resources; the acreages are included in tables 5.10-1 and 5.10-2.) For more detailed information, see pages 5-322 through 5-351 of the FEIS.

Identification of potentially jurisdictional wetlands early in the development of both the FEIS and SDEIS helped guide the development of potential alternatives in order to avoid these areas as much as possible and minimize impacts where avoidance was not possible. All jurisdictional determinations were coordinated with USACE in accordance with IDEM, KDOW, and USACE policy, which is to select the least environmentally damaging practicable alternative (LEDPA). The early identification of jurisdictional wetlands facilitates compliance with the Section 404(b)(1) Guidelines (40 CFR Part 230), which require selection of the least environmentally damaging practicable alternative (LEDPA).

National Wetland Inventory (NWI) maps, preliminary windshield surveys, and field delineations were used to identify wetlands. Wetlands were classified (named) following the Cowardin

system (Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.), which is consistent with the NWI maps classification. Under this system the project area includes three types of wetlands: palustrine, riverine, and lacustrine. A description of the types of wetlands identified on the project is also provided in Section 4.10 of the 2003 FEIS.

- Palustrine wetlands associated with this project are what are generally thought of as marshes, swamps, wet meadows, etc. They include areas less than 20 acres, with no active wave-formed or bedrock shoreline features, and water depth in the deepest part less than 6.6 feet at low water.
- Riverine wetlands are what are commonly referred to as small to medium-sized streams, i.e. wetland habitats contained within a channel.
- Lacustrine wetlands associated with this project are the larger streams or portions of them (Beargrass Creek, Harrods Creek, and the Ohio River). They include dammed river channels, and channels in which the water depth in the deepest part of the channel exceeds 6.6 feet at low water.

Wetland determination and delineation (mapping) was based on the USACE guidance which was current at the time (see citation following for guidance used during 2011 wetland investigations). A field meeting was conducted August 29, 2002, with USACE to determine whether wetlands identified within the project right-of-way limits are under the jurisdiction of USACE. Additional investigations were conducted in 2011, based on the latest USACE guidance[14] for determining "waters of the United States," to delineate wetlands and streams that are within the rights-of-way of the two build alternatives and identify impacts that could result from the project. USACE will conduct field verification meetings as determined necessary to review jurisdictional determinations contained in project permit applications.

5.10.1 Temporary Construction Impacts

Short-term and temporary impacts to wetlands include the displacement of wetland dependent wildlife due to noise, temporary alteration of drainage patterns, vegetation and soil disturbance and a potential increase in sedimentation to wetland and aquatic habitats.

5.10.2 Direct Impacts

A total of 13.18 acres of wetland within the proposed right-of-way of the FEIS Selected Alternative would potentially be impacted (actual disturbance limits have not been developed).

[14] Guidance included USACE 2010 (*Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-10-9. Vicksburg, MS: U.S. Army Engineer Research and Development Center) (used for Kentucky) and USACE 2010 (*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center) (used for Indiana). These documents are two of a series of Regional Supplements to the Corps of Engineers Wetland Delineation Manual, which provides technical guidance and procedures for identifying and delineating wetlands that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

That total acreage is comprised of 4.95 acres of palustrine wetland and 8.23 acres (15,566 feet) of other water bodies (riverine and lacustrine wetland). A total of 9.58 acres of wetlands within the proposed right-of-way of the Modified Selected Alternative would potentially be impacted (actual disturbance limits have not been developed). That total acreage is comprised of 4.95 acres of palustrine wetland and 4.63 acres (10,890 feet) of other water bodies (riverine and lacustrine wetland). It should be noted, however, that not all of this acreage would actually be impacted by fill, as the impacts for each alternative are presented below.

The locations and types of these impacts are described in the paragraphs below. The direct wetland impacts associated with the FEIS Selected Alternative and the Modified Selected Alternative are also identified by alternative in Table 5.10-2, which follows Section 5.10.4; and in Table I in Appendix B.3. Appendix A shows the locations of all wetlands, streams, and water bodies within the rights-of-way of the two alternatives.

East End Corridor

The impact footprint for the FEIS Selected Alternative and the Modified Selected Alternative are the same in the East End Corridor. Either of these two alternatives would impact 24 wetlands, totaling 4.95 acres of palustrine wetlands and 3.63 acres (9,031 linear feet) of riverine and lacustrine wetlands (stream channels). This includes 13 riverine wetlands (1.14 acres, 7,883 feet), two lacustrine wetlands (including the Ohio River due to the placement of piers) (2.49 acres, 1,148 feet), two palustrine forested wetlands (1.54 acres), two palustrine scrub-shrub wetlands (0.8 acres), and five palustrine emergent wetlands (2.61 acres).

Downtown Corridor

The FEIS Selected Alternative would impact four lacustrine wetlands (including the Ohio River) totaling 2.99 acres (3,256 linear feet), and two riverine wetlands totaling 1.61 acres (3,279 feet).

The Modified Selected Alternative would impact three lacustrine wetlands (including the Ohio River) totaling 0.62 acre (921 linear feet), and two riverine wetlands totaling 0.38 acres (938 feet).

5.10.2.1 Indirect Wetland Impacts

In Section 5.10.3 of the 2003 FEIS, the several types of indirect wetland impacts are defined in detail, and it is noted that direct and indirect impacts specific to the nine build alternatives are summarized on Table III in Appendix B.3. With one exception, there is no change to the information presented in this section of the FEIS. For details see the FEIS pages 5-324 through 5-326. The exception is the “Only Practicable Alternative Finding” subsection, which appears in the FEIS but not in the SDEIS. Should a build alternative be selected, and should that alternative have impacts to wetlands, the Final SEIS must contain the finding, as required by Executive Order 11990, that there are no practicable alternatives to construction in wetlands. This subsection is not found in this SDEIS because it is applicable to the SFEIS document, only.

Wetland Impact Minimization

A total of 4.95 acres of jurisdictional wetland, excluding stream channels, within the proposed right-of-way of the FEIS and the Modified Selected Alternative would potentially be impacted. Mitigation to replace these wetland losses would be implemented, and is further detailed in Section 5.10.6. Wetland impacts would be permitted in accordance with the Clean Water Act, as appropriate.

In accordance with Executive Order 11990 (23 CFR 771.125(a)(1)), it has been determined that there are no practicable alternatives to the construction in wetlands. Several measures to entirely eliminate or minimize potential impacts to wetlands were considered during early project development of the study alternatives. Due to safety and design criteria, topography and land use, it was not possible to develop an alternative that completely avoided impacting wetlands. Wetland impacts have been minimized to the fullest feasible extent during this phase of project development. Minimization of wetland impacts would continue during the development of design should a build alternative be selected. The proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

5.10.2.3 Water Body Modifications

Water body modifications were discussed in Section 5.10.4 of the 2003 FEIS. That section identified and provided a brief description of types of water body modifications, including channel widening, enclosure, straightening, and realignment; bank shaping and stabilization; and the placement of piers within a water body. The information presented therein remains applicable and is not repeated herein. The discussion also summarized water body modifications in Table 5.10-1. See FEIS pages 5-327 through 5-329 for the detailed discussion.

SDEIS Table 5.10-1, herein, updates the information in the 2003 FEIS Table 5.10-1 to include data based on the current design of the FEIS Selected Alternative and to add data associated with the Modified Selected Alternative. Mitigation for impacts to water bodies is discussed in Section 5.10.4, below.

TABLE 5.10-1
WATER BODY MODIFICATIONS*

Alternative	Stream Channels Crossed	Area Impacted (Acres)*	Culverts Associated With Alternative	Bridges Associated With Alternative
East End				
FEIS Selected Alternative	15	3.63	9	4
Modified Selected Alternative	15	3.63	9	4
Downtown Corridor				
FEIS Selected Alternative	6	4.60	0	3
Modified Selected Alternative	5	1.00	0	3
FEIS Selected Alternative—Total	**21**	**8.23**	**9**	**7**
Modified Selected Alternative—Total	**20**	**4.63**	**9**	**7**

**This does not include the impact associated with the placement of piers within the Ohio River.*

5.10.3 Indirect Impacts and Cumulative Effects

Indirect and cumulative wetland impacts are discussed in general terms in Section 5.10.5 of the 2003 FEIS (see FEIS pages 5-329 and 5-330). No potential changes in indirect and cumulative effects are anticipated as a result of the changes associated with Modified Selected Alternative.

5.10.4 Mitigation

Section 5.10.6 of the 2003 FEIS discussed mitigation of impacts to wetlands and other water bodies within the project area (see FEIS pages 5-331 through 5-333). Most of the general information presented in that discussion remains applicable for the SDEIS, although changes have been made below to address specifics of the FEIS Selected Alternative and the Modified Selected Alternative, and to provide current information.

Jurisdictional wetlands would be impacted by both the FEIS Selected Alternative and the Modified Selected Alternative. Table 5.10-2 includes impacts to jurisdictional wetlands and streams from the FEIS Selected Alternative and the Modified Selected Alternative. Since avoidance of these wetlands is not feasible and prudent, minimization and mitigation of the impacts would be required as part of the Clean Water Act Section 404 permitting process, administered by the USACE.

Loss of wetlands would be mitigated as determined appropriate in accordance with USACE, Louisville District; Indiana Department of Environmental Management (IDEM); Kentucky Division of Water (KDOW); and the USFWS, Frankfort and Bloomington field offices. The goal of minimizing wetland impacts will continue to be pursued as design proceeds, and design

modifications such as narrowing medians and embankment slopes as well as spanning wetlands may be considered during the design of the Selected Alternative. A monitoring plan, approved by the permitting agencies, would be included with the wetland mitigation plan.

Wetland and stream mitigation for the East End Alternative in Indiana is in the process of being developed for use in the 401 and 404 permit applications. Coordination with the USACE, Louisville District, resulted in preparation of a wetland mitigation plan during the development of detailed plans. Prior to construction, the appropriate state and Federal permits would be obtained and right-of-way would be acquired for the development of mitigation sites. In this way, appropriate consideration could be given for further minimizing or avoiding project impacts to wetlands.

Prior to construction, the appropriate state and Federal permits would be obtained and right-of-way would be acquired for the development of mitigation sites.

TABLE 5.10-2
DIRECT IMPACTS TO TERRESTRIAL AND AQUATIC RESOURCES

Terrestrial and Aquatic Impacts	East End – FEIS Selected	East End – Modified Selected	Downtown – FEIS Selected	Downtown – Modified Selected
TOTAL LENGTH & AREA OF ALTERNATIVE				
Total Length in Miles	8.12	8.12	7.21	5.20
Total Area in Acres	541.5	541.5	462.3	302.5
WETLANDS: NUMBER OF WETLAND IMPACTS BY TYPE				
Forested	2	2	0	0
Scrub-Shrub	2	2	0	0
Emergent	5	5	0	0
Lacustrine	2	2	4	3
Riverine	13	13	2	2
Total Number of Wetland Direct Impacts	24	24	6	5
WETLANDS: AREA AND/OR LENGTH OF WETLAND IMPACTS BY TYPE				
Forested (Acres)	1.54	1.54	0	0
Scrub-Shrub (Acres)	0.8	0.8	0	0
Emergent (Acres)	2.61	2.61	0	0
Lacustrine (Acres - Feet)	2.49 – 1,148	2.49 – 1,148	2.99 – 3,256	0.62 - 921
Riverine (Acres - Feet)	1.14 – 7,883	1.14 – 7,883	1.61 – 3,279	0.38 - 938
Total Area of Wetland Direct Impacts	8.58	8.58	4.6	1.0
WOODLANDS				
Total Area of Woodland Direct Impacts	142.6	142.6	80.2	37.62
STREAMS				
Total Number of Stream Crossing Direct Impacts (Including Ohio River)	15	15	6	5
Total Area of Stream Crossing Direct Impacts (Acres) (Not including the Ohio River)	3.63	3.63	4.6	1
FLOODPLAIN IMPACTS				
Total Area of Encroachment (Acres)	20.74	20.74	157.61	59.29

Terrestrial and Aquatic Impacts	East End – FEIS Selected	East End – Modified Selected	Downtown – FEIS Selected	Downtown – Modified Selected
Area of Longitudinal Encroachment	0	0	154.52	56.22
Area of Transverse Encroachment	20.74	20.74	3.09	3.07
Number of Floodplains Crossed	2	2	4	3
Federal Threatened and Endangered Species	17 listed; potential impact on habitat for gray & Indiana bats	17 listed; potential impact on habitat for gray & Indiana bats	17 listed; potential impact on habitat for gray & Indiana bats	17 listed; potential impact on habitat for gray & Indiana bats
State Threatened and Endangered Species	65 listed; no direct impacts expected	65 listed; no direct impacts expected	65 listed; no direct impacts expected	65 listed; no direct impacts expected

5.11 Visual and Aesthetic Resources

Although this section of the 2003 FEIS was prepared to present general visual impacts for the full range of alternatives being considered at that time, portions of the original discussion are still applicable to the two build alternatives being evaluated in this document—the FEIS Selected Alternative and Modified Selected Alternative. In this regard, some of the subsections below, as indicated, primarily reference the original discussions from the FEIS rather than repeat the information here. The following summarizes the updates and revisions to information that was presented in Section 5.11 of the FEIS:

- Section 5.11.1—Adds discussion of the Bridge Type Selection Process and Figure 5.11-1, *East End Bridge Type Selection Process Illustration*
- Section 5.11.2—Adds the Modified Selected Alternative to the discussion of construction impacts.
- Section 5.11.3—Adds the Modified Selected Alternative to the discussion of potential direct visual impacts associated with the project; and revises and updates tables and figures as follows:
  - ✓ Revises table 5.11-1, *Visual Resource Impact Matrix: Landscape Unit/Urban District*, and 5.11-2, *Impacts Summary Matrix*, to reference only the FEIS Selected Alternative and the Modified Selected Alternative.
  - ✓ Adds updated imagery of East End and Downtown bridges and revises captions for figures 5.11-2, *East End Viewsheds*, and 5.11-3, *Downtown Bridge Crossing Viewsheds*.
- Sections 5.11.4 and 5.11.5—Add the Modified Selected Alternative to the discussion of potential indirect and cumulative effects, and mitigation, respectively.

5.11.1 Impact Assessment Methodology

This section of the FEIS presented the general approach used to assess impacts to the visual environment in the project area based on methodologies outlined in the publication entitled "*Visual Impact Assessment for Highway Projects*" (USDOT, 1981) and other related resource management publications (USDA, 1974). Criteria were developed and presented in the FEIS to address a full range of issues related to visual quality impacts. The criteria were intended to illustrate not only negative impacts, but also opportunities for enhancing the visual environment and traveling experience that would result from construction of a bridge/highway alternative. Although there are no changes to the information that was presented in this section of the FEIS, the USDOT criteria are listed below to provide context for the impacts shown in Table 5.11-1.

1. *Integration with the natural features of the area*

   The more compatible a new roadway is with the character of the existing landforms and land cover, the less it will impact the visual environment. Also, the less visually apparent the roadway is to residents in the viewsheds, the less the visual environment has been impacted. A well-integrated roadway segment has the following attributes:

   - *parallels ridge/valley lines without altering the top of a ridgeline;*
   - *graded slightly into the land, rather than filled on the top of the landform;*
   - *has cut-and-fill slopes that are not excessively high; and*
   - *does not require clearing/disturbance of woodlands (particularly those on the ridgelines) and wetlands (particularly forested wetlands).*

2. *Impacts on community fabric*

   A roadway segment will have relatively less impact on a community if it has the following characteristics:

   - *maintenance of existing physical connections between communities;*
   - *creation of new connections between currently divided communities; and*
   - *creation of new community entry points.*

3. *Impacts on areas of high visual quality*

   It is assumed that changes to the visual environment in an area with lower visual quality are more acceptable than changes to an area with high visual quality since low quality areas are already less unified, vivid or distinctive. For this criterion, a roadway segment with positive attributes does the following:

   - *is routed through areas with low levels of visual quality;*
   - *creates a low level of disturbance/impact as evaluated by criteria 1 and 2 above; and*
   - *creates opportunities for aesthetic improvements to an area of low visual quality.*

4. *Impacts on areas of high viewer sensitivity*

   A roadway, which has minimal impact on high viewer sensitivity, is characterized as follows:

   - *avoids areas containing viewers with high sensitivity to changes in the visual setting; and*
   - *is located in areas containing a minimal number of viewers or viewers with low sensitivity to change.*

5. *Impacts on the existing visual setting*

   A roadway which positively impacts the existing visual setting:

   - *results in the removal of dilapidated and/or unattractive structures; and*
   - *includes consolidation of ramps and approaches to reduce the visible roadway area;*
   - *contains buffering with berms and landscaping; and*
   - *has adequate pedestrian walkways.*

6. *Creation of viewing opportunities from the roadway*

   For example, potential aesthetic benefits for motorists and others. A roadway with positive impact on viewing opportunities does the following:

   - *contributes new scenic views of high quality aesthetic settings;*
   - *includes community "gateways" or high quality entrances; and*
   - *removes visual impediments to potentially high quality views such as overhead ramps, barrier walls, and unattractive foreground or background structures.*

7. *Impacts on scenic thoroughfares*

   Scenic thoroughfares such as Riverview Drive, Utica Pike, River Road, Wolf Pen Branch Road and portions of U.S. 42. A roadway segment has minimal impact to scenic thoroughfares if it does the following:

   - *does not cross a scenic thoroughfare or cannot be viewed from a scenic thoroughfare;*
   - *crosses a scenic thoroughfare in a location that does not modify the existing high quality views from the thoroughfare; and*
   - *creates a new segment or a connection to or within an existing scenic thoroughfare.*

Bridge Type Selection Process

The SDEIS updates the information presented in this section of the FEIS to summarize the Bridge Type Selection Process (BTSP) that was conducted following the 2003 FEIS/ROD, in

keeping with commitments made in those documents. A four-step, public involvement process was used to assist in selecting the type of bridges to be constructed across the Ohio River. The selection process applied to both the Downtown and East End bridges, and the results would be generally applicable to both alternatives considered in this SDEIS.

This one-year-long process included an extensive public involvement effort, preliminary engineering activities, architectural analysis and consideration of each bridge's site context; and tracking of environmental commitments. The review of multiple bridge types for both the Downtown and East End bridges culminated with a public vote on the bridge types. All information was then taken to a 14-person Executive Committee that included the governors of Indiana and Kentucky, six other local political representatives, and six public appointees. This committee reviewed the public input and made the final decision for the bridge selection:

East End Bridge: Median-tower, cable-stayed center cables bridge
(see Figure 5.11-2, image J)

Downtown Bridge: Three-tower, cable-stayed bridge
(see Figure 5.11-3, images K1, K2 and L)

Every step of the process included obtaining feedback from advisory groups [including the Indiana and Kentucky Historic Preservation Advisory Teams (IHPAT and KHPAT)], stakeholders, and the public, primarily through a series of meetings and via the project's website (www.kyinbridges.com). The project teams used this public feedback throughout the four-step process to ensure that the three recommended bridge types were developed with consideration of community characteristics and wishes. The selection was not based solely on the least expensive alternative, but weighed the public interest and long-term maintenance.

Figure 5.11-1 provides an example of the approach used to evaluate alternatives during the selection process for the East End Bridge type. SDEIS Appendix B.7.1 and B.7.2, *Bridge Type Selection Executive Summaries,* contains summaries from the reports prepared for both the Downtown (Design Section 2) and East End (Design Section 5) bridges.

Figure 5.11-1
EAST END BRIDGE TYPE SELECTION PROCESS ILLUSTRATION

East End Bridge Step 3 Alternatives				
Alternative	**Rendering View (Aerial)**	**Brief Description**	**Tower Cross Section**	**Advanced to Step 4**
A-1		Steel Tied Arch with Basket Handle Arch Ribs		No
A-2		Concave Diamond Tower Cable Stayed (Outside Cables)		Yes*
A-3		Convex Diamond Tower Cable Stayed (Outside Cables)		Yes*
A-4		Median Tower Cable Stayed with Variable Depth Deck (Outside Cables)		Yes
A-5		Median Tower Cable Stayed with Variable Depth Deck (Median Cables)		Yes
A-6		Median Tower Cable Stayed with Suspension Cables (Median Cables)		No

5.11.2 Construction Impacts

This section of the 2003 FEIS discussed visual impacts during construction of the project. Information presented in the FEIS continues to be generally applicable for the current alternatives being studied (i.e., No-Action Alternative, FEIS Selected Alternative and Modified Selected Alternative). However, while Alternative A-15 was mentioned in the 2003 document (see page 5-354) and is now part of the FEIS Selected Alternative, Alternative A-13, which was also mentioned, is no longer relevant. For more detailed information, see page 5-354 of the FEIS.

5.11.3 Direct Impacts

This section of the 2003 FEIS discussed the potential visual direct impacts of the No-Action Alternative and the individual components of the broad range of proposed build alternatives that were under consideration at the time. The SDEIS revises this section to compare potential visual impacts associated with the FEIS Selected Alternative and the Modified Selected Alternative; eliminates reference to alternatives that are no longer relevant; and revises tables 5.11-1 and 5.11-2. Data applicable to the FEIS Selected Alternative remains unchanged from table 5.11-1 and 5.11-2 in the FEIS. Data applicable to the Modified Selected Alternative has been added since the FEIS.

Bridge/Highway Alternatives

Generally, the East End portion of the FEIS Selected Alternative and the Modified Selected Alternative will directly affect some views within the Eastern Uplands and Eastern Bottomlands. The Downtown Bridge portion of both alternatives will directly affect some views within the Downtown Riverfront, Louisville East, Louisville Central Business District (CBD), Jeffersonville/Clarksville, Mid-East Indiana and, to a lesser extent, Louisville West. The Kennedy Interchange portion of both alternatives will directly impact the Downtown Riverfront, Louisville CBD, Louisville East and, to some extent, Jeffersonville/Clarksville and Mid-East Indiana, although the extent of the visual impact associated with the Modified Selected Alternative would be less than with the FEIS Selected Alternative.

Figure 5.11-1 illustrates the affected landscape units or urban districts (described in Section 4.11, herein). SDEIS Table 5.11-1, *Visual Resource Impact Matrix: Landscape Unit/Urban District*, replaces FEIS Table 5.11-1 to focus solely on the FEIS Selected Alternative and Modified Preferred Alternative. Data applicable to the FEIS Selected Alternative remains unchanged from Table 5.11-1 in the FEIS. Data applicable to the Modified Selected Alternative has been added since the FEIS.

TABLE 5.11-1
VISUAL RESOURCE IMPACT MATRIX
LANDSCAPE UNIT/URBAN DISTRICT

Component/ Alternative	Downtown Riverfront	Eastern Uplands	Eastern Bottomlands	Louisville CBD	Louisville East	Louisville West	Jeffersonville/ Clarksville	Mid/East Indiana
East End / FEIS Selected		●	●					
East End / Modified		●	●					
Downtown / FEIS Selected	●			●	●	●	●	●
Downtown / Modified	●			●	●	●	●	●
Kennedy Interchange / FEIS Selected	●			●	●		●	●
Kennedy Interchange / Modified	●			●	●		●	●

● = *Component/Alternative Combination Affects Landscape Unit/Urban District*

As part of the visual impact assessment, each alternative was evaluated based on the evaluation criteria referenced in Section 5.11.1. Table 5.11-2 demonstrates the overall pattern of visual impacts for each alternative as related to the criteria. Generally a "High" or "Moderate" rating for categories 1 and 6 is considered a positive impact, while a "High" or "Moderate" rating for the remaining criteria is considered a negative impact.

TABLE 5.11-2
IMPACTS SUMMARY MATRIX

Component/ Alternative	Affected Landscape Unit / Urban District	Integration with Natural Features	Impacts on Community Fabric	Impacts on Areas of High Visual Quality	Impacts on Areas of High Viewer Sensitivity	Impacts on Existing Visual Setting	Impacts Viewing Opportunities From Alternative	Impacts on Scenic Thoroughfares
Categories		1	2	3	4	5	6	7
East End / FEIS Selected	Eastern Uplands Landscape Unit	❍	❍	❍	❍	❍	❍	◗
	Eastern Bottomlands Landscape Unit	●	◗	◗	●	◗	❍	◗
East End / Modified	Eastern Uplands Landscape Unit	❍	❍	❍	❍	❍	❍	◗
	Eastern Bottomlands Landscape Unit	●	◗	◗	●	◗	❍	◗

Downtown Bridge/ FEIS Selected	Downtown Riverfront Landscape Unit	●	◗	●	◗	❍	❍	❍
	Louisville CBD Urban District	●	❍	●	◗	❍	❍	N/A
	Louisville East Urban District	●	❍	●	◗	◗	❍	N/A
	Louisville West Urban District	❍	❍	◗	◗	❍	●	N/A
	Jeffersonville/ Clarksville Urban District	●	●	◗	◗	◗	❍	◗
Downtown Bridge/ Modified	Downtown Riverfront Landscape Unit	●	◗	●	◗	❍	❍	❍
	Louisville CBD Urban District	●	❍	●	◗	❍	❍	N/A
	Louisville East Urban District	●	❍	●	◗	◗	❍	N/A
	Louisville West Urban District	❍	❍	◗	◗	❍	●	N/A
	Jeffersonville/ Clarksville Urban District	●	●	◗	◗	◗	❍	◗
Kennedy Interchange/ FEIS Selected	Downtown Riverfront Landscape Unit	●	◗	◗	◗	◗	◗	N/A
	Louisville CBD Urban District	◗	◗	◗	❍	◗	◗	N/A
	Louisville East Urban District	●	●	❍	●	●	◗	●
	Jeffersonville/ Clarksville Urban District	●	N/A	◗	◗	◗	●	◗
	Mid East Indiana Urban District	●	N/A	❍	◗	❍	●	❍
Kennedy Interchange/ Modified	Downtown Riverfront Landscape Unit	●	◗	◗	◗	◗	◗	N/A
	Louisville CBD Urban District	◗	◗	◗	❍	◗	◗	N/A
	Louisville East Urban District	●	●	❍	◗	◗	◗	●
	Jeffersonville/ Clarksville Urban District	●	N/A	◗	◗	◗	●	◗
	Mid East Indiana Urban District	●	N/A	❍	◗	❍	●	❍

● High Impact/Negative Attribute ◗ Moderate Impact/Neutral Attribute
❍ Low Impact/Positive Attribute

Visual impacts are also presented in detail below for the FEIS Selected Alternative and Modified Selected Alternative. Within the discussion of each alternative, impacts are presented according to each of the three major components of the project (i.e., the East End component, the Downtown Bridge component, and the Kennedy Interchange component).

Specific images included in figures 5.11-1 and 5.11-2 are referenced within each discussion to illustrate a range of impacts that may be encountered with the various component/project alternative combinations. Because not all of the images from the FEIS are included herein, the images' identifying letters do not correspond with those in the FEIS; and the captions of those that appear in this SDEIS have been revised to reference the Modified Selected Alternative.

FEIS Selected Alternative

East End

The Ohio River and its shorelines are the predominant natural and historic features of the East End Bridge and approaches. The bridge location is rural in character with mature native trees framing the shorelines on both sides of the river. A limestone bluff rises steeply from the alluvial plain on the Indiana shore, and a series of historic residential country estates and large historic houses characterize the Kentucky approach.

The East End component of the FEIS Selected Alternative would generally have low impacts on Kentucky's Eastern Uplands, including U.S. 42, because of the proposed tunnel under the Drumanard Estate and depressed approaches from KY 841. The Drumanard property is listed in the National Register of Historic Places. It was determined through consultation under Section 106 of the National Historic Preservation Act that the project would have adverse effects to the Drumanard property—including an adverse visual effect because the tunnel entrance would be visible from within the Drumanard property site, although not from the house. Section 5.3, *Historic and Archaeological Resources*, herein, contains a discussion of the Drumanard property's historical relevance and impacts as a result of the project. The 2003 FEIS included a Memorandum of Agreement (MOA) that identified measures, including tunneling under the site, to mitigate the impacts. One objective of the tunnel is to reduce the project's visual impacts to the historic property. The stipulations in the MOA, as they pertain to the FEIS Selected Alternative's impacts to the Drumanard property, remain applicable to this SDEIS.

The impact in the Eastern Bottomlands would be moderate to high, since the bridge's approaches would travel through the center of the Shadow Wood subdivision and would cross Harrods Creek and the Harbor of Harrods Creek subdivision. This alternative also would cross River Road. Therefore, it would have moderate impacts on this scenic thoroughfare, although the existing dense vegetation on both sides of the road could partially screen the elevated roadway.

This alternative would have relatively low impacts in Indiana due to its proposed location east of the town of Utica and the fact that the East End Bridge would land on the bluff and be screened by existing dense vegetation. However, the roadway would adversely impact the visual setting, including having some impact on the open river setting and associated long, scenic views available to riverfront residences of Utica and Transylvania Beach. The bridge crossing would provide travelers with high quality views, including a scenic overlook of the river. Also, the visual sequence of the tunnel-to-river crossing to the Indiana bluff would be a potentially positive visual experience for motorists traveling from Kentucky to Indiana. Figure 5.11-2 illustrates potential views that will likely be associated with the East End component of the FEIS Selected Alternative.

The East End component of the FEIS Selected Alternative also includes one new interchange and improvements to existing interchanges. The location and design of interchanges, including scale, elevation, lighting, signage, geometrics, and landscaping determine the visual impact to surrounding land uses. This is especially true in the more rural setting of the East End where residents have a higher level of viewer sensitivity and where fewer interchanges currently exist. Issues such as visibility from adjacent residences, increased light levels, and potential loss of existing vegetation are among the potential negative visual impacts that may be encountered by construction of the FEIS Selected Alternative. Conversely, interchanges constructed in areas that have a lower number of individuals with high viewer sensitivity may result in low or no visual impact. Figure 5.11-2, images F, H, and I (Figure 5.11-1c, images K, M, and O in the 2003 FEIS), illustrate a range of high, moderate, and low visual impacts that may be encountered due to new interchanges associated with the East End component of the FEIS Selected Alternative.

Downtown Bridge and Indiana Approach

Due to its location on the upstream side of the Kennedy Memorial Bridge, the Downtown Bridge component of the FEIS Selected Alternative would have moderate visual impacts on the Downtown Riverfront, Louisville CBD, Louisville East, and Jeffersonville/ Clarksville areas and lower impacts on Louisville West. It would likely affect the riverfront area of Jeffersonville east of the Kennedy Memorial Bridge and residences lining Indiana's scenic Riverview Drive west of Clark Memorial Bridge, as well as motorists, bicyclists, and pedestrians. It would also have an impact on the new riverfront park containing a waterfront amphitheater with direct views of the Big Four and Kennedy bridges to the east. Opportunities would exist to emphasize riverfront views and the Louisville skyline as motorists cross between Kentucky and Indiana.

In Indiana, this component of the FEIS Selected Alternative could also improve the aesthetic character of the cities of Jeffersonville and Clarksville, in particular, areas north of Court Avenue and near the 10th Avenue exit ramp. The displacement of such aesthetically poor land uses as the wastewater treatment facility at the Colgate Plant in Jeffersonville would also improve the visual setting. Figure 5.11-3, images K, L, M, N and O (Figure 5.11-2a, images A, C, E, G, and J in the 2003 FEIS), illustrates potential views associated with this component of the FEIS Selected Alternative.

Kennedy Interchange

With the FEIS Selected Alternative, the majority of the realigned Kennedy Interchange would be located primarily to the east of the existing Kennedy Bridge. As a result, it would have moderate to high visual impacts on the Downtown Riverfront, East Louisville, the Louisville CBD, and Jeffersonville/ Clarksville and lower impacts on Mid-East Indiana. This interchange would have varying impacts on each landscape unit and urban district. In East Louisville's Butchertown Historic District, an area with an industrial district forming a physical barrier between this neighborhood and the riverfront, positive aesthetic impacts would likely result from the realigned interchange through the removal of derelict structures.

Interchange improvements with the FEIS Selected Alternative may also provide the catalyst for attractive, new pedestrian connections to the riverfront, new development, and the relocation of aesthetically poor land uses such as auto salvage yards and new lands for park expansion. These positive opportunities will be countered by the potential for a highly visible interchange with flyover ramps, creating a structure of a scale similar to portions of the Louisville skyline. With the FEIS Selected Alternative the highest ramp in the I-65 stack interchange is the ramp from southbound I-65 to eastbound I-64 near the north side of Louisville's Extreme Park. The elevation of the Extreme Park is approximately 451 feet above mean sea level (MSL) while the elevation of this ramp is 538.9 feet.

Views from the Louisville and Jeffersonville riverfront parks, including the scenic overlook at the end of Spring Street in Jeffersonville, could be adversely impacted. The high point of the existing Kennedy Interchange is 500.7 feet above MSL at the south end of the existing Kennedy Bridge. Although, currently, the vegetation on Towhead Island screens the existing interchange,

the new interchange elevation would be approximately 38 feet higher and would be visible from the Indiana riverfront. Figure 5.11-3, image P (image L in the FEIS), illustrates potential visual impacts associated with the relocated Kennedy Interchange.

Modified Selected Alternative

East End

The East End component of the Modified Selected Alternative differs from the FEIS Selected Alternative only in the number of roadway lanes, i.e., the Modified Selected Alternative proposes four lanes rather than the six lanes with the FEIS Selected Alternative. Therefore, even with this minor difference, the Modified Selected Alternative would have the same general visual impacts as the FEIS Selected Alternative discussed above by virtue of the introduction of a new interstate facility and Ohio River bridge in this area.

Downtown Bridge and Indiana Approach

The Downtown Bridge component of the Modified Selected Alternative would have the same impacts as the FEIS Selected Alternative discussed above.

In Indiana, the Modified Selected Alternative would not require removal of the Colgate Plant wastewater treatment facility in Jeffersonville. The removal of the facility as a feature of the FEIS Selected Alternative has been identified as an improvement to the visual setting.

Kennedy Interchange

The impacts of this alternative—both adverse and beneficial—would be similar to those discussed in relation to the FEIS Selected Alternative, i.e., it would have moderate to high impacts on the Downtown Riverfront, East Louisville, the Louisville CBD, and Jeffersonville/ Clarksville, and lower impacts on Mid-East Indiana. The principal differences are twofold:

- While the ramps would be higher than the elevations of the current Kennedy Interchange (high point 500.7 feet), the Modified Selected Alternative has ramp elevations that are the same or lower than the FEIS Selected Alternative. With the Modified Selected Alternative, the high point in the Kennedy Interchange would be at elevation 510.8 feet on the ramp from southbound I-65 to the Jefferson Street Exit, near the Louisville Slugger Field baseball stadium parking lot (which is at elevation 447.3 feet above MSL).The high point elevation would be approximately 10 feet above that of the existing interchange, compared to 38 feet above with the FEIS Selected Alternative. This would result in reduced visual effect in comparison to the FEIS Selected Alternative.

- The benefit of the removal of derelict buildings and associated positive benefit on the viewshed of the Butchertown neighborhood would not occur with the Modified Selected Alternative. However, the adverse visual effect of constructing the interchange to the

south as part of the FEIS Selected Alternative would be minimized by constructing the interchange in place with the Modified Selected Alternative.

Figure 5.11-3, images K1 through P2, illustrates potential visual impacts associated with the relocated Kennedy Interchange for the FEIS Selected Alternative and the Modified Selected Alternative, respectively.

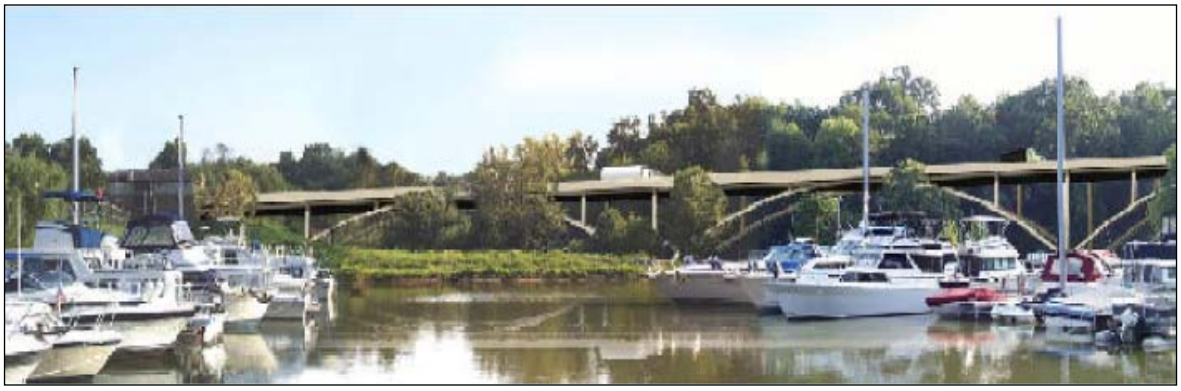
Downtown Corridor

The aesthetic setting for the Downtown Alternatives can be generally classified as "built," containing many large structures, including the four existing bridges. This extends to most of the "natural" areas in this region, including a majority of the riverfront parks and open space. Therefore, the visual assessment of the Downtown Alternatives included impacts on both natural scenery and urban architecture, and on views such as those from riverfront parks and plazas. Because of the existing riverfront parks and proposed new greenways, it is critical to consider the impacts at ground level, including the touchdown points for piers and treatments of the undersides of bridge and roadway structures. In addition, visual impacts not only from land and water but also from the other four bridges must also be considered. Figure 5.11-3 (figures 5.11-2a and 5.11-2b in the 2003 FEIS), illustrates a series of potential visual impacts associated with the alternatives.

Figure 5.11-2 East End Viewsheds

A. Long Viaduct near Historic Rosewell Property from Transylvania Beach Road, Prospect, KY (FEIS Selected and Modified

B. Prototypical view of US 42 crossing in wooded setting (FEIS Selected and Modified Selected Alternatives).



C. Long viaduct crossing in the Harbors Condominiums, Prospect, KY (FEIS Selected and Modified Selected Alternatives).

D. Prototypical view of approach on structure (FEIS Selected and Modified Selected Alternatives).

E. Prototypical view of approach on fill (FEIS Selected and Modified Selected Alternatives).

F. Modified Ramp Terminus at US 42
(FEIS Selected and Modified Selected Alternatives).

G. “Before” Wolf Pen Branch Road Bridge near Springdale Road, Prospect, KY.

H. “After” Wolf Pen Branch Road bridge near Springdale Road, Prospect, KY
(FEIS Selected and Modified Selected Alternatives).

I. “After” Wolf Pen Branch Road bridge near Springdale Road with signalized intersection
(FEIS Selected and Modified Selected

J. View from waterfront homes towards river west of Utica, IN (FEIS Selected and Modified Selected Alternatives).

Figure 5.11-3 Downtown Bridge Crossing Viewsheds

K1. View of Bridge from Waterfront Park (Modified Selected Alternative, without bike/ped path).

K2. View of Bridge from Waterfront Park (FEIS Selected Alternative, with bike/ped path on east side).

L. View of Bridge from Jeffersonville, IN (FEIS Selected and Modified Selected Alternatives).

M. View looking west on Riverview Drive (FEIS Selected and Modified Selected Alternatives).

N. New 6th Street connection between Jeffersonville and Clarksville, IN
(FEIS Selected and Modified Selected Alternatives).

O. View looking south of modifications to Missouri Street, Clarksville, IN
(FEIS Selected and Modified Selected Alternatives).

P1. View of Kennedy Interchange ramps from Slugger Field in Louisville, KY (Modified Selected Alternative)

P2. View of Kennedy Interchange ramps from Slugger Field in Louisville, KY
(FEIS Selected Alternatives).

5.11.4 Indirect and Cumulative Effects

Section 5.11.4 of the 2003 FEIS discussed indirect and cumulative effects in the project area. There are generally no changes to this section of the FEIS, as the information continues to be applicable for the SDEIS. However, two of the alternatives mentioned in that discussion are no longer relevant (alternatives A-13 and A-16, described in Section 3.1.1.2, herein), while Alternative A-15 that was referenced in the FEIS comprises the East End portion of both the FEIS Selected Alternative and the Modified Selected Alternative. Visual impacts to historic properties are discussed in Section 5.3 of this SDEIS. For more detailed information, see page 5-368 of the FEIS.

Indirect impacts from the Modified Selected Alternative, as compared to the FEIS Selected Alternative and the indirect impacts documented in the 2003 FEIS, would potentially occur due to changes in traffic patterns as a result of design differences between the two alternatives. Such differences include the removal of the I-71 interchange at Frankfort Avenue and the implementation of tolls on the Downtown bridges and the East End Bridge. Based on the analysis of changes in traffic patterns, including the vehicle type and volumes of such traffic the potential for indirect effects exist because more traffic could be added to the existing roadways. To view the *Louisville Southern Indiana Ohio River Bridges Traffic Forecast* report, see Appendix H.1

5.11.5 Mitigation

Mitigation was discussed in Section 5.11.5 of the 2003 FEIS. There are generally no changes to this section of the FEIS, as the information continues to be applicable for the SDEIS. However, only Alternative A-15 as identified in Figure 5.11-3 of the FEIS is relevant (i.e., Alternatives A-2, A-13, A-16 and B-1, have been eliminated). Alternative A-15 comprises the East End portion of both the FEIS Selected Alternative and the Modified Selected Alternative. For more detailed information, see pages 5-368 through 5-370 of the FEIS.

5.12 Hazardous Substances

This section of the 2003 FEIS addressed the potential impacts and proposed mitigation measures related to hazardous substances, based on the findings and recommendations of the Phase I Environmental Site Assessments (ESAs) conducted in 2000 for evaluation of the No-Action Alternative and the Bridge/Highway Alternatives studied at that time for the Far East, Near East, and Downtown corridors.

For the SDEIS, the information has been updated based on the Phase II ESAs that have been conducted since the FEIS was released, the results of which are discussed in SDEIS Section 4.12. In addition, this section of the SDEIS discusses the potential impacts to these Phase II ESA sites for the No-Action Alternative, FEIS Selected Alternative, and the Modified Selected Alternative. For the purpose of this study, an impact is defined as any proposed crossing of a Phase II ESA site by an alternative alignment.

No-Action Alternative

None of the Phase II ESA sites would be impacted by the No-Action Alternative.

FEIS Selected Alternative

The FEIS Selected Alternative would impact all of the 23 Phase II ESA sites in Kentucky (see Figure 4.12-1) and all of the eight Phase II ESA sites in Indiana (see figures 4.12-2a and 4.12-2b). The 23 Kentucky sites include the 13 sites for which Phase II, Step A ESAs have been conducted, the four sites for which Limited Phase II ESAs have been conducted, and the six sites for which Phase II, Step B ESAs are proposed but have not yet been conducted. The need for and extent of further investigations prior to any right-of-way acquisition and construction activity is being evaluated for most of the Kentucky and Indiana sites. However, one of the Kentucky sites (KY 23/24) and two of the Indiana sites (IN-32 and IN-34) were not recommended for further investigation because hazardous substances were either not detected or had levels below the Indiana Department of Environmental Management (IDEM) Risk Integrated System of Closure (RISC)[15] Residential Closure Levels. There would be no impacts to hazardous substances in the eastern end of this alternative.

Modified Selected Alternative

The Modified Selected Alternative would have the same impacts to all eight of the Phase II ESA sites in Indiana as the FEIS Selected Alternative. In Kentucky, however, this alternative would impact only 11 of the 23 Phase II ESA sites that would be impacted by the FEIS Selected Alternative, since the majority of the Kennedy Interchange would be constructed within the existing right-of-way as part of this alternative. The 10 Kentucky sites that would be impacted are: KY-A, KY-44, KY-46, KY-67, KY-67A, KY-68, KY-69, KY-73, KY-75 and KY-85/Vermont American Building. The extent of impact to four of these sites (KY-44, KY-46, KY-69, and KY-73) would be significantly less than the impacts associated with the FEIS Selected Alternative. Only a small portion of the northern part of these sites would be traversed by the Modified Selected Alternative, while most or all of these sites that would be crossed by the FEIS Selected Alternative. Similar to the FEIS Selected Alternative, there would also be no impacts to hazardous substances in the eastern end of this alternative.

5.12.1 Mitigation

The need for and extent of any further investigations (e.g., Phase II, Step B ESAs) at the sites containing or contaminated by hazardous substances that would be impacted by the project will be further evaluated by KYTC and INDOT based on the recommendations of the Phase II ESAs already conducted. These decisions will be made prior to any right-of-way acquisition and construction activity on these properties.

[15] RISC provides flexible procedures for conducting site assessments, consistent risk-based closure goals, and flexible cleanup alternatives for situations where removal or treatment of contamination to the closure goal is not feasible. (Source: IDEM website: www.in.gov/idem/4198.htm

Contaminated sites will be remediated in coordination with the appropriate regulatory agencies, including Kentucky Energy and Environment Cabinet (EEC), IDEM, and USEPA. Approved soil and waste management practices will address contamination that would be disturbed during construction. Contaminated soils that exceed government standards and other wastes with regulated substances that are managed off-site will be confined to approved facilities. Any contaminated material removed from the site will be handled in accordance with applicable laws and regulations. All solid waste and contamination will be properly managed in the most cost-effective manner in accordance with all state and federal regulations to ensure protection of human health and the environment. As a result, contaminated sites will be addressed in the contractor's health and safety plan.

5.13 Energy

This section of the 2003 FEIS presented energy consumption, measured in British Thermal Units (BTUs), associated with the construction, operation, and maintenance of all the alternatives that existed at that time. (For more detailed information, see pages 5-372 and 5-373 of the FEIS.)

This section of the SDEIS uses the same factors as the FEIS in calculating construction energy consumption (i.e., 17.1 billion BTUs per lane-mile for roadways, 130.4 billion BTUs per lane-mile for bridges, and 195.6 billion BTUs per lane-mile for tunnels). The SDEIS differs from the FEIS by focusing the evaluation on three alternatives carried forward herein: No-Action, FEIS Selected, and Modified Selected alternatives. SDEIS Section 5.13 also contains the following substantive changes to the information presented in the FEIS:

- Section 5.13.1—Adds an evaluation of construction energy consumption for the Modified Selected Alternative. There are no changes to these energy consumption levels for the No-Action and FEIS Selected alternatives since the FEIS. In addition, revises Table 5.13.1 to show the construction energy consumption levels for the No-Action, FEIS Selected, and Modified Selected alternatives. (Note: In Table 5.13.1 of the FEIS, p. 5-375, the FEIS Selected Alternative was represented as the A15HALF+C1-D18 Alternative under the Two Bridge Alternative category.).

- Section 5.13.2—Updates operational energy consumption levels for the No-Action and FEIS Selected alternatives based on updated VMT and average speed data. In addition, adds an evaluation of operational energy consumption for the Modified Selected Alternative. The SDEIS uses the same method as the FEIS for calculating operational energy consumption.

- Section 5.13.3—Adds text related to expected energy consumption for maintenance of the build alternatives.

5.13.1 Construction Energy Consumption

Both of the build alternatives require substantial one-time energy expenditures related to the manufacture of construction materials, transporting the materials to the site, and construction of the new facility. Table 5.13-1 provides the updated results of the construction energy analysis in

terms of equivalent annual energy consumption for the No-Action Alternative, FEIS Selected Alternative, and the Modified Selected Alternative, annualized over a 25-year period. As shown in this table, the Modified Selected Alternative would require about 83 billion fewer BTUs annually for construction than would the FEIS Selected Alternative. This reduction in BTUs is directly associated with the reduction in lane-miles to be constructed for the Modified Selected Alternative (i.e., 4 lanes, rather than the 6 lanes with the FEIS Selected Alternative). Because there would be no construction associated with the No-Action Alternative, there would be no associated energy consumption for this alternative.

TABLE 5.13-1
CONSTRUCTION ENERGY CONSUMPTION

Alternative	Lane-Miles of Roadway	Lane-Miles of Bridge	Lane-Miles of Tunnel	Total Lane-Miles	Annual Construction Energy Consumption (Billions of BTUs)*
No-Action	No Construction			0	0
FEIS Selected Alternative	99.40	36.88	1.86	138.14	274.80
Modified Selected Alternative	89.35	22.87	1.48	113.70	191.99

** Annualized over a 25 year period*

Construction Energy Consumption Factors:

17.1 billion BTUs/lane-mile for roadways

130.4 billion BTUs/lane-miles for bridges

195.6 billion BTUs/lane-mile for tunnels

5.13.2 Operational Energy Consumption

For each alternative, operational energy consumption was based on vehicle miles traveled (VMT), the average operating speeds, and the fuel consumption rates by type of vehicle adjusted by a fuel economy factor.

The No-Action Alternative was estimated to have an annual operational energy consumption of 50.6 trillion BTUs. The FEIS Selected Alternative and the Modified Selected Alternative were estimated to have annual operational energy consumptions of 50.9 and 50.6 trillion BTUs. As a result, the Modified Selected Alternative and the No-Action Alternative would have the same operational energy consumption while the FEIS Selected Alternative's operational energy consumption would be 0.7% greater than the No-Action Alternative. When comparing the two build alternatives, the Modified Selected Alternative's operational energy consumption is 0.6% less than the FEIS Selected Alternative. The operational energy consumption for all three alternatives is similar because they are projected to have similar VMT's and average operating speeds.

5.13.3 Maintenance Energy Consumption

The energy necessary to maintain the facility over the design life is comprised of many factors, including the direct energy consumed during the maintenance and repair activities and the energy consumed by vehicles experiencing greater delays due to lanes being closed. Maintenance energy requirements are also directly related to the length and number of lanes of any new facilities.

Though it is difficult to calculate with certainty the actual energy consumption for maintenance of either of the build alternatives, it is expected that the energy consumed to maintain the Modified Selected Alternative would be somewhat less than the FEIS Selected Alternative because the Modified Selected Alternative would have fewer lane-miles that would require maintenance.

5.14 Construction Impacts

This section of the 2003 FEIS discussed construction impacts and mitigation (Section 5.14.1) and maintenance of traffic (Section 5.14.2) for the various One Bridge/Highway Alternatives and the Two Bridges/Highway Alternatives being considered at that time. The information presented in Section 5.14.1 of the FEIS is still valid and is applicable to the FEIS Selected Alternative and the Modified Selected Alternative. However, Section 5.14.2 has been revised in this SDEIS to specifically address maintenance of traffic for these two build alternatives. For detailed information, see page 5-377 of the FEIS.

A construction-phasing plan that includes provisions for the maintenance of traffic would be prepared if a build alternative is selected.

5.14.1 Mitigation of Construction Adverse Effects

This section of the 2003 FEIS noted that many of the potential construction impacts are addressed in each of the State's Standard Specifications and that appropriate mitigation measures will be incorporated into the design plans. It also discussed general mitigation measures that will be incorporated during construction to minimize the amount of pollutants entering streams, waterways, and the Wellhead Protection Area within the project area, as well as the process of identifying archaeological resources that might be located within sites used for borrow material. As indicated above, the information presented in the FEIS is still valid and is applicable to the two build alternatives being considered in this SDEIS. For more detailed information, see pages 5-377 and 5-378 of the FEIS.

5.14.2 Maintenance of Traffic

In the 2003 FEIS, this section provided a general discussion of maintenance of traffic related to the "One Bridge/Highway Alternative" and all of the "Two Bridges/Highway" alternatives being considered at the time. This section of the SDEIS addresses maintenance of traffic issues related to the FEIS Selected Alternative and the Modified Selected Alternative.

For both build alternatives, simultaneous construction of the three Downtown Design Sections (i.e., Kennedy Interchange, the Downtown Bridge, and the Downtown Indiana Approach) would minimize traffic maintenance requirements during the construction period. Both of the build alternatives would involve the same general maintenance of traffic procedures and impacts related to staging during construction. However, there are differences in maintenance of traffic specifics for the Kennedy Interchange design section, including:

- Because the FEIS Selected Alternative would be constructed at a higher elevation, and the Modified Selected Alternative would be constructed at the existing roadway elevation, the maintenance of traffic cost for the Modified Selected Alternative would be approximately $10M less than the FEIS Selected Alternative.
- The FEIS Selected Alternative would require more temporary street closures, including the temporary closure of a railroad spur. The Modified Selected Alternative would require more temporary ramp closures, but fewer temporary street closures and avoids the temporary closure of the railroad spur.

Construction of the new Downtown Bridge adjacent to the existing Kennedy Bridge would likely necessitate an extended closure of the existing ramp from I-65 Kennedy Bridge southbound to I-64 and I-71. During this extended period of closure, alternative routes for traffic originating in southern Indiana and destined for Louisville or other points in Kentucky may be required. Depending on the specific location of an intended destination south of the river, the alternative routes that could be used include the Clark Memorial Bridge, the Sherman Minton Bridge, or possibly, the new East End Bridge. In addition, southbound traffic crossing the Kennedy Bridge could continue south on I-65 to the next exit at East Jefferson Street/Brook Street to access downtown local roadways directly, and then use these roadways to access either I-64 or I-71, as appropriate. The Kennedy Bridge itself will not be closed or otherwise impacted for any extended periods during construction.

Initiating construction of the new East End Bridge and approaches prior to the construction of the Downtown Bridge and approaches would provide an opportunity for the East End Bridge to serve as a temporary alternate route for I-65 cross-river traffic. If construction of the new bridge at the East End is initiated one or two years earlier than construction of the Downtown Bridge, then the new bridge could be sufficiently constructed to temporarily accommodate some of the I-65 cross-river traffic. This alternate routing would especially serve traffic originating in Indiana that is destined for Kentucky locations east of downtown Louisville and vice versa.

For either build alternative, the development of the maintenance of traffic plans will be coordinated with police, fire, and rescue services, as appropriate. Signs will be used as appropriate to provide notice of road closures, detours and other pertinent information to the motoring public. In addition, the local news media will be notified in advance of construction related activities that could be an inconvenience to the community such that motorists, residents and businesses can plan their day and travel routes in advance. Finally, signs providing a hotline phone number that people can call with questions or concerns about the schedule and nature of the construction activities will be posted in the project vicinity.

Upon completion of the project, all northbound I-65 traffic crossing the river into Indiana would use the new Downtown Bridge adjacent to the Kennedy Bridge, while the Kennedy Bridge would be configured to carry only southbound I-65 traffic.

5.15 Permits

This section of the 2003 FEIS listed the Federal and state permits that are likely to be required for the project. The information presented in the FEIS is still valid and is applicable to the two build alternatives being considered. For more detailed information, see pages 5-380 and 5-381 of the FEIS.

5.16 Short-Term Use of Environment versus Long-Term Productivity

This section of the 2003 FEIS discussed short-term impacts resulting from the project in comparison to the long-term benefits, and the fact that the long-term benefits are greater than the short-term impacts. This SDEIS presents no updates or additions to that discussion, as the information presented in the FEIS is still valid and applicable to the project alternatives currently being considered. For more detailed information, see page 5-381 of the FEIS.

5.17 Irreversible and Irretrievable Commitments of Resources

This section of the original FEIS discussed the commitment of natural, physical and financial resources that once they are expended, cannot be reversed or retrieved. This SDEIS presents no updates or additions to that discussion, as the information presented in the FEIS is still valid and applicable to the project alternatives currently being considered. For more detailed information, see page 5-381 of the FEIS.

5.18 Summary of Impacts

This section of the 2003 FEIS originally summarized the impacts for all the alternatives that were considered at that time. For the SDEIS, this section summarizes the impacts for the FEIS Selected Alternative and the Modified Selected Alternative.

Table 5.18-1 summarizes the impacts associated with the FEIS Selected Alternative and the Modified Selected Alternative. As the table indicates, both alternatives would result in the same impacts to prime farmland, Section 4(f) property, cultural resources, and agricultural properties. In addition, both alternatives would have no impacts to air quality and community resources. The Modified Selected Alternative would result in fewer impacts with regard to noise (including historic properties), terrestrial/wildlife habitat, wetlands, streams, floodplains, and residential and commercial displacements. The most notable differences are that the Modified Selected Alternative would result in 10 and 56 fewer residential and commercial displacements, respectively, and would impact about 98 fewer acres of floodplains and 43 fewer acres of terrestrial/wildlife habitat compared to the FEIS Selected Alternative.

TABLE 5.18-1
SUMMARY OF IMPACTS

Quantitative Impacts To	FEIS Selected Alternative	Modified Selected Alternative
Agricultural Resources Acres of prime farmland converted	57	57
Section 4(f) Properties used	8	8
Cultural Resources Number of historic districts impacted Number of historic sites impacted Number of archaeological sites impacted	 11 16 11	 11 16 11
Air Quality Impacts	None	None
Noise Number of impacted receptors Number of impacted Historic Properties	 1,314 18	 1,249 13
Natural Resources Acres of terrestrial wildlife/habitat impacted	237.3	194.4
Wetlands Acres of wetlands impacted	13.18	9.58
Water Resources Number of stream impacts (including Ohio River)	21	20
Floodplains Number of floodplains crossed Total acres of encroachment	 6 178.35	 5 80.03
Number of Residential Displacements	80	70
Number of Commercial Displacements	80	24
Number of Agricultural Properties Impacted	18	18
Number of Community Resources Displaced	0	0

CHAPTER 6: SECTION 4(f) EVALUATION

In general, Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 requires that prior to the use of any of the resource types listed below, it must be determined either (1) that there is no prudent and feasible alternative that avoids such use and that the project includes all possible planning to minimize harm resulting from such use, or (2) that the use will result in a *de minimis* impact on the resource protected under Section 4(f). Resources protected under Section 4(f) include:

- A publicly owned and officially designated park
- A publicly owned and officially designated recreation area
- A publicly owned and officially designated wildlife or waterfowl refuge
- A historic property, either publicly or privately owned, that is listed in or eligible for inclusion in the National Register of Historic Places (NRHP), except for archeological resources that are important chiefly because of what can be learned by data recovery and have minimal value for preservation in place [CFR 774.13(b)(1)]

In its Section 4(f) regulations, FHWA has recognized three different situations in which a "use" of Section 4(f) property can occur. First, a use occurs when a project permanently incorporates land from a Section 4(f) property, even if the amount of land used is very small. Second, a use can result from a temporary use of land within a Section 4(f) property, unless the temporary use meets specific criteria that allow an exception to a use. Third, a use can result from proximity effects (such as noise, visual impacts, or vibration) if those effects "are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired" (23 CFR Part 774.15(a)(a)). A use that results from proximity effects is known as a "constructive use."

Chapter 6 of the 2003 FEIS included a detailed evaluation of impacts to Section 4(f) protected resources. The introduction to the Section 4(f) Evaluation in Chapter 6 of the 2003 FEIS presented information about the Section 4(f) evaluation process (see pages 6-1 and 6-2 of the FEIS). This section of the SDEIS identifies changes to Section 4(f) policies since the publication of the FEIS, and updates project-related information that was presented in the FEIS, as follows:

- Summarizes changes to the Section 4(f) statute and also to FHWA's Section 4(f) regulations since the publication of the 2003 FEIS.
- Updates information regarding Section 4(f) uses of protected resources associated with the FEIS Selected Alternative and the Modified Selected Alternative.
- Updates information about previously identified historic resources: including the change in status of the Swartz Farm Rural Historic District (Indiana) due to a loss of historic integrity, the expansion of the boundaries of the four Utica lime kilns to include the quarries associated with the kilns and the potential for constructive uses, and the identification of the MPDF River Camps Group Resources.

6.1 Proposed Action

The purpose and need for this project is described in Chapter 2 of the SDEIS. The alternatives under consideration for implementation in this SDEIS are described in detail in Chapter 3 of the SDEIS.

6.2 Section 4(f) Evaluation

Since the approval of the 2003 FEIS, the FEIS Selected Alternative has been designed in greater detail (see Chapter 3) and the Modified Selected Alternative has been developed. The Section 4(f) analysis that follows is based on an analysis of the current designs of the two build alternatives and the current status of the Section 4(f) properties associated with these two build alternatives. Since the 2003 FEIS, additional Section 4(f) properties have been identified, and one property (the Swartz Farm) has lost its Section 4(f) status. This chapter provides an updated analysis of the alternatives' impacts on Section 4(f) properties, based on current information about the alternatives and Section 4(f) properties in the project area. This chapter is not intended to be a new Individual Section 4(f) Evaluation, but rather, a supplement to the Individual Section 4(f) Evaluation presented in the 2003 FEIS based on the changes described above.

In addition, since the 2003 FEIS, Section 4(f), itself, has been amended and new Section 4(f) regulations have been issued. In SAFETEA-LU (2005), Congress amended Section 4(f) to provide an alternative method to approving the use of protected properties where the impact is *de minimis*. The *de minimis* impact determination provides the basis for USDOT to approve the minor use of a Section 4(f) property without identifying and evaluating avoidance alternatives—thus streamlining the approval process. In SAFETEA-LU, Congress directed USDOT to revise their Section 4(f) regulations to clarify the application of the "feasible and prudent" standard used in Section 4(f) analyses. In March 2008, FHWA and the Federal Transit Administration (FTA) complied with this requirement by issuing revised Section 4(f) regulations. The revised regulations clarified the "feasible and prudent" standard and also updated many other aspects of the regulations, including the standards for choosing among alternatives that all use Section 4(f) properties—commonly known as the "least overall harm" analysis. The new regulations were also codified, for the first time, in a stand-alone section of the regulations—23 CFR Part 774. As a result of both the changes to the project scope and the revised regulations, this chapter has been updated to reflect the changes to the Section 4(f) statute and regulations.

In Chapter 6 of the FEIS, descriptions of each of the Section 4(f) properties within the Downtown and East End corridors were provided. For each of the properties, Chapter 6 of the FEIS included an identification of potential impacts, a description of avoidance alternatives, measures to minimize harm to the protected properties, potential constructive uses, coordination efforts with agencies responsible for the properties, and a conclusion. With the modification of the alternatives under consideration (i.e., FEIS Selected Alternative, Modified Selected Alternative, and No-Action Alternative), only those specific portions of the 2003 FEIS sections that have changed—either by potential use by a build alternative or by a change in Section 4(f) status—will be addressed in this chapter. Figures 6.2-1 through 6.2-10b, located in the back of this chapter, show the locations of all Section 4(f) properties relative to both the FEIS Selected Alternative and the Modified Selected Alternative.

6.2.1 Historic Section 4(f) Properties

Table 6.2-1 lists the Section 4(f)-protected historic properties within the project's Area of Potential Effect (APE) that may be "used" by one or both of the build alternatives.[1] The table also summarizes pertinent information about each resource. Coordination with the Indiana and Kentucky State Historic Preservation Officers (SHPOs) and with the Advisory Council on Historic Preservation (ACHP) has occurred, in both 2003 and as part of this SDEIS process, regarding the historic properties' listing in or potential eligibility for listing in the NRHP. That coordination resulted in determinations of eligibility for each resource not already listed in the NRHP, as previously defined in Chapter 4.3. That information was used to identify historic Section 4(f) properties included in Table 6.2-1.

TABLE 6.2-1
SECTION 4(f) USE IMPACTS—HISTORIC PROPERTIES

Alternative	Resource Name	Alpha-Numeric Code	Ownership	Function or Available Activities	Relationship with Similar Properties	Unusual Characteristics	Resource Size (acres)	2003 FEIS Amount of Use (acres)	SDEIS Amount of Use (acres)
FEIS Selected Alt.	Old Jeffersonville Historic District (IN)	ID-HC-5	Multiple	Mixed Land Use	None	None	192.2	3.0	3.0
Modified Selected Alt.									3.0
FEIS Selected Alt.	George Rogers Clark Memorial Bridge and Administration Building (IN)	KD-HC-55023	Public	Transportation	None	Pylons	0.73 site plus the bridge	0.1	0.1
Modified Selected Alt.									0.1
FEIS Selected Alt.	Utica Lime Kilns (IN) IN-IE-HC-	48003	Private	Former Mining Use	None	Kilns and Quarries (the use is from associated quarries, only)	6.7*	N/A	.22
		48004							.84
Modified Selected Alt.		48003							.22
		48004							.84
FEIS Selected Alt.	Phoenix Hill Historic District (KY)	KD-HC-5	Multiple	Urban Setting	None	None	142	2.2	2.5**
Modified Selected Alt.									2.5
FEIS Selected Alt.	Butchertown Historic District (KY)	KD-HC-4	Multiple	Urban Setting	None	None	197.9	1.29	1.12**
Modified Selected Alt.									0.97
FEIS Selected Alt.	Swartz Farm Rural Historic District***	IE-HC-45026, 45026A & 45027	Private	Agricultural	None	None	203	55.4	N/A
Modified Selected Alt.									N/A

** The 6.7 acres represents all four lime kilns.*

*** The increase from 2.2 acres in 2003 to 2.5 acres in Phoenix Hill Historic District (HD), and the decrease from 1.29 acres to 1.12 acres in Butchertown HD, are due to the results of the right-of-way acquisition process.*

**** This site was a Section 4(f) resource in the 2003 FEIS but is no longer, as described below.*

[1] In this SDEIS, the APE has two parts: (1) the Original APE, which consists of the Alternative-Specific APE as defined in the 2003 FEIS, and (2) the Extensions to the Original APE, which consists of an additional area within which the Modified Selected Alternative has the potential to cause indirect and cumulative impacts because of traffic diversion.

Changes since the 2003 FEIS

In SDEIS Table 6.2-1, the columns "2003 FEIS Amount of Use" and "SDEIS Amount of Use" contain data to illustrate the estimated acreage to be used by the preferred alternative documented in the 2003 FEIS, and by the two build alternatives under consideration in this SDEIS, respectively. Differences between the acres shown in the two columns are attributable to the FEIS Selected Alternative having undergone further design since 2003, as described in SDEIS Section 3.1.1. In each case, the current acres of use by both of the build alternatives are the same or are less than the acres of use attributed to the 2003 Selected Alternative as described in the FEIS.

There are four changes in the Section 4(f) protected historic properties in the East End Corridor since the 2003 FEIS. These changes described below are because either the status of the sites, themselves, has changed, or the build alternatives' alignment at the site has changed. There are no changes to the historic properties in the Downtown Corridor. None of the following changes result in changes to the conclusions in the 2003 Section 4(f) evaluation.

- **Drumanard Estates Historic District**

  The 2003 FEIS and Memorandum of Agreement (MOA) Stipulation III.N.1, contained a commitment to avoid Section 4(f) use and minimize impacts to the Drumanard Estate Historic District by tunneling under the property. That commitment remains valid for this SDEIS. As stated in Chapter 3, the Modified Selected Alternative differs from the 2003 FEIS Selected Alternative within the tunnel by reducing the number of travel lanes from six to four. FHWA has not proposed to change the Section 106 adverse effect determination for this Section 4(f) property based on this minor change. That conclusion will be coordinated with the Section 106 Consulting Parties before a final effect determination is made, and will be documented in the SFEIS. Since the 2003 FEIS an analysis of construction options for the tunnel under U.S. 42 and this property has been prepared and is documented in SDEIS Appendix D.5.

- **Determan House (KY-HC-JF843) \ Schildknecht House \ MPDF River Camps Group Resources—Transylvania Beach**

  The Determan House and Schildknecht houses are located along Transylvania Beach Road. In the 2003 FEIS, these properties were determined eligible for listing in the NRHP under Criterion A. Since 2003, the Transylvania Beach Road area has been included in a Multiple Property Documentation Form (MPDF) for a River Camps Group Resource, which is also eligible under Criterion A. Of that group, the Determan House and a house at 6212 Transylvania Beach Road were identified as the two NRHP-eligible properties closest to the alignment of Alternative A-15. The Determan House would be south of the alignment; and the house at 6212 would be north of the alignment, but south of and closer to the Alternative A-15 than the Schildknecht House. There would be no direct use of property from either site.

In the 2003 FEIS, the Section 4(f) evaluation determined there would be no constructive uses with Alternative A-15. This determination was based on predicted impacts, such as noise and vibration, from a forecasted year 2025 average daily traffic volume of 70,000 vehicles per day (vpd) on the East End Bridge. For this SDEIS, the updated 2030 traffic forecast for the East End Bridge for the FEIS Selected Alternative is 60,000 vpd; that for the Modified Selected Alternative is 52,000 vpd. Further, even though the future traffic volumes are expected to be lower, the commitment to the minimization measures identified for the Determan House and other resources in Chapter 6, page 6-26, of the 2003 FEIS, (e.g., context sensitive design; noise abatement; and roadway light, blasting and vibrations plans) remains valid. By virtue of the traffic forecast being lower, the general visual and construction aspects being the same, and the commitments remaining the same, the possibility of a constructive use by either of the current build alternatives (which both follow the A-15 alignment evaluated in the 2003 FEIS) to these historic sites is no greater, and is likely less, than it was in 2003. Therefore, for the FEIS Selected Alternative and the Modified Selected Alternative, the conclusion in the 2003 FEIS that there would be no constructive use remains valid for these historic sites. Because the Determan House and 6212 Transylvania Beach Road are the two properties within the MPDF River Camps Group that are closest to Alternative A-15, they represent the worst-case scenarios for impacts to properties within the MPDF River Camps Group. And since there would be no constructive use to either of these sites, there would be no constructive use of the MPDF River Camp Group Resources.

- **Swartz Farm Rural Historic District—Indiana**

  Since the 2003 FEIS, the Swartz Farm Rural Historic District in Indiana (IE-HC-45026/45026A/45027) is no longer eligible for listing in the NRHP and, therefore, is no longer considered a Section 4(f) property. In October 2007, the Swartz Farmhouse, Central Passage House, and other contributing buildings on the farmstead were razed by the property owner. As a result, in a letter dated October 14, 2011, the Indiana SHPO concurred that the Swartz Farm Rural Historic District had lost its historic integrity and was no longer eligible for listing in the NRHP (see Appendix D.9).

- **The Utica Lime Kilns *(#48001-#48004)*—Indiana**

  At the time of the 2003 FEIS, the Utica lime kiln resources, which were determined eligible for NRHP listing under criteria A and D, were only known to consist of four kilns, which were located outside the right-of-way limits of the preferred alternative. Therefore, there was no use of this resource. However, during the 2003 Section 106 process, an adverse effect to the property under Section 106 was found due to proximity impacts (vibration from traffic, construction, and blasting). As a result, the MOA in the 2003 FEIS included mitigation for the lime kilns (Stipulation III.H.1-8). The MOA included commitments to prepare a Historic Preservation Plan (HPP) and Condition Report and also to seek NRHP nomination of the resource, among other actions. Since the 2003 FEIS, the preparation of the HPP and the NRHP nomination has been underway. This work resulted in the identification of the quarries associated with the kilns and the subsequent expansion of the historic boundary of each kiln to include the associated quarries. In addition, each kiln, together with its associated quarry, is now considered a separate historic district. The

boundaries of two of the kiln districts (48003 and 48004) have been extended into the footprint of Alternative A-15, which was part of the preferred alternative in the FEIS and also is part of the FEIS Selected Alternative and the Modified Selected Alternative. Therefore, the 2003 mitigation is being revisited during the on-going Section 106 process as part of this SDEIS. Furthermore, because Alternative A-15 would pass within the expanded boundaries associated with the two quarries, it is necessary to evaluate whether there is a "use" within the meaning of Section 4(f), as described herein.

Photographs of Lime Kiln #48002 (left) and Lime Kiln #48003 (right)

Both the FEIS Selected Alternative and Modified Selected Alternative would require approximately 0.84 acre of the quarry that is associated with the Kiln 48004 historic district and approximately 0.22 acre of the quarry that is associated with the Kiln 48003 historic district, for a total of approximately 1.06 acre from these two historic districts. This right-of-way acquisition would not include use of any of the four kilns themselves. Recent coordination correspondence from the Indiana SHPO dated October 25, 2011, stated that the quarries would not warrant preservation in place (see Appendix D.9). A Section 106 adverse effect (Encroachment, Visual, Vibration, and Construction) determination for this resource has been proposed as part of the on-going Section 106 process (see SDEIS Section 5.3).

Because the quarries themselves are not valuable for preservation in place, they qualify for an exemption under FHWA's Section 4(f) regulations as stated in 23 CFR 774.13(b)(1). Consideration of the quarries as distinct from the kilns themselves is appropriate because, in a historic district, determinations of use are made with respect to each contributing or non-contributing element of the district. See FHWA Section 4(f) Policy Paper, Response to Question 3.C.

FHWA also has considered the potential for a constructive use of the lime kiln historic districts, based on the proximity of the construction project to the kilns themselves. While the project would have an adverse effect on the kilns due to encroachment, visual, construction and vibration effects, it would not substantially impair the historically significant features of the lime kiln historic districts. This conclusion, and the analyses conducted to reach it, are documented in the an addendum to the 2003 FEIS titled *An Evaluation Of Proximity Impacts To The Nearby Lime Kilns Included In The Utica*

Limekiln Multiple Property Listing And Located Near The Preferred Alternative (August 2003). This analysis was developed in response to public comments on the 2003 FEIS, and noted that Kiln 84004 had the highest potential to experience adverse effects and a constructive use from the project. The report noted that Kiln 84004 would be located approximately 50 feet from the right-of-way limit, and approximately 90 feet below the bridge, and included the profile image below—Kiln 84004 is located at the same elevation as Utica Pike (see Figure 6.2-1). The report concluded that "blasting vibration impacts from Alternative A-15 would not cause a 'constructive use' of the lime kiln identified as Site IE-HC-48004."

In short, there is no use of the lime kiln historic districts because (1) the direct impact to the quarries is not a use because the quarries are archaeological resources that are important chiefly because of what can be learned from data recovery, and therefore have minimal value for preservation in place, and therefore are exempt from Section 4(f) under 23 CFR 774.13(b)(1), and (2) there is no constructive use of the lime kiln historic districts because the proximity of the project would not substantially impair the protected activities, features, or attributes of those districts.

The image in Figure 6.2-1 is a cross-section illustration of the elevation differences between the topography, the proposed project, and Utica Pike. Kiln 84004 is located at the same elevation as Utica Pike. There is a large hill behind (or north of) Utica Pike extending approximately 131 feet above the road. The proposed project would be about 90 feet above Utica Pike and Kiln 84004 before cutting into the hill.

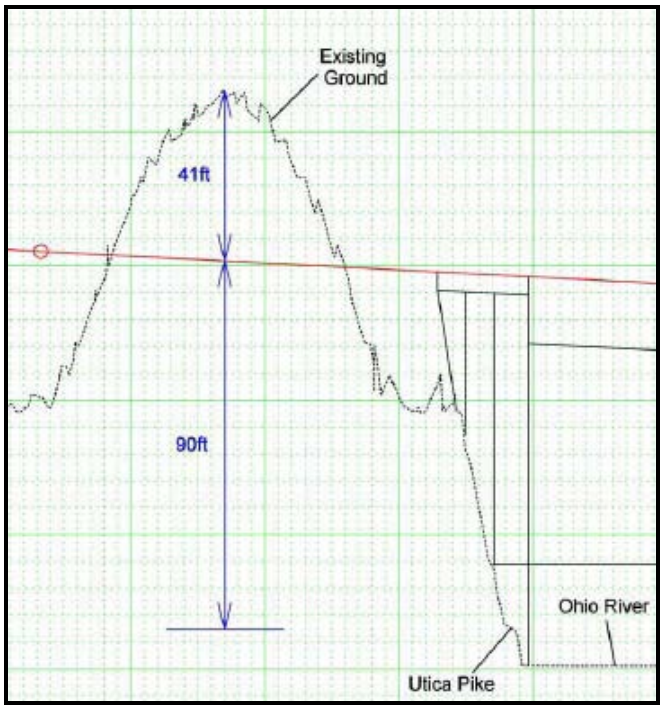


FIGURE 6.2-1 ELEVATION VIEW OF ALTERNATIVE A-15

While there is no use of the Utica lime kilns historic districts, the build alternatives would have an adverse effect on Kiln 48003 and Kiln 48003 due to the impacts on the quarries within these districts. Mitigation measures for these adverse effects are outlined in the 2003 MOA Stipulation III.H.1-8, Items 1, 2, and 8. The mitigation measures include the development of the HPP, Condition Report, and the NRHP nomination, respectively, each of which have been initiated. A summary of items 3 through 7 follows:

3. Develop and implement a blasting/vibration plan
4. Develop a "no-work zone"
5. Repair any damage to the sites caused during project construction
6. Make a reasonable effort to acquire Kiln 48004 (it has since been determined that this kiln is within the county-owned right-of-way of Utica Pike and cannot be acquired)
7. Place interpretive markers along Utica Pike

These measures are described in more detail in the 2003 MOA. Further, as stated above, additional mitigation measures for these resources will be considered as the site is revisited during the on-going Section 106 process and presented in the SFEIS. For example, in the October 25, 2011 correspondences with the Indiana SHPO about the property, it was requested that the following documentation about the quarries be provided before they are impacted by construction:

- *A site plan of the quarry walls to be destroyed, including measurements;*
- *Photographs, similar to those typically required by the Historic American Engineering Record, of walls and floors of the quarries to be impacted and photographs showing the context of each of the quarries to be impacted; and*
- *A written description of the quarry walls being impacted (including visible evidence of human activity, such as blasting or cutting).*

Potential for Constructive Use

The conclusion in the 2003 FEIS that there would be no constructive use of any Section 4(f) historic resource remains valid for this SDEIS. This updated evaluation of potential constructive uses includes an updated assessment of direct highway noise impacts, visual impacts, vibration impacts, and indirect impacts from differences in traffic patterns between the FEIS Selected Alternative and the Modified Selected Alternative, all of which are presented in Chapter 5 of this SDEIS. While adverse effects from these and other impacts have been proposed for historic properties through the on-going Section 106 process (see SDEIS Section 5.3), they would not impair the use of the properties to the extent that they would no longer be eligible for NRHP listing; and therefore, they would not result in a constructive use for any historic property or district.

6.2.2 Parks, Wildlife Refuges, and Recreational Section 4(f) Properties

In the Downtown Corridor, there are three significant publicly owned parks/recreational areas and one wildlife refuge within the proposed project area. These Section 4(f) resources and the impacts that they would experience due to either the FEIS Selected Alternative or the Modified Selected Alternative are summarized in Table 6.2-2. It should be noted that the impacts to these properties as a result of the FEIS Selected Alternative are based on a more detailed level of design than existed at the time of the 2003 FEIS and Section 4(f) Evaluation and, therefore, the level of impact to each property, summarized in Table 6.2-2, is different from the impact identified in those documents.

In the East End Corridor, there are no Section 4(f) parks, recreation areas, or wildlife/waterfowl refuges in either the Indiana or Kentucky portion of the project; therefore, there would be no Section 4(f) uses of these types of properties in this portion of the project. The only wildlife refuge in the project area is the Six Mile Island Nature Preserve (KE-PR-1), which was included in the 2003 FEIS and Section 4(f) Evaluation. However, this property would not be impacted by the FEIS Selected Alternative or the Modified Selected Alternative, as it is located in the Ohio River approximately two miles downstream of either alternative. Therefore, it is not included in Table 6.2-2 nor is there is any further discussion of that Section 4(f) property in this chapter.

TABLE 6.2-2
SECTION 4(f) RESOURCES
PARKS, REFUGES, AND RECREATIONAL AREAS

Alternative	Resource Name	Alpha-Numeric Code	Resource Type	Ownership	Access*	Approximate Number of Users/Visitors	Relationship with Similarly Used Lands	Unusual Characteristics	Resource Size (acres)	2003 FEIS Amount of Use (acres)	SDEIS Amount of Use (acres)
FEIS Selected Alt.	Greenway Corridor (IN)	ID-PR-9	Park	City of Jeffersonville	P, V, B	No record of data	Contains Riverfront and Ashland Parks	None	170	0.4	0.4
Modified Selected Alt.											0.4
FEIS Selected Alt.	Waterfront Park (KY	KD-PR-11/12	Park	City of Louisville	P, V, B	1,500,000+ (2010)	None	Located within Ohio River Floodplain	55.1 (2003) 85.0 (2010)	5.3	6.86**
Modified Selected Alt.											4.55
FEIS Selected Alt.	Extreme Sports Complex (KY)	KD-PR-13	Park	City of Louisville	P, V	Unavailable	None	Developed for extreme sports	2.36	1.8	1.8
Modified Selected Alt.											0.65

* P- pedestrian, V- vehicle, B- Boat

** The increase in acres of use is due to the expansion of the park. The footprint of the 2003 design of this portion of the project has not changed.

Changes since the 2003 FEIS

In Table 6.2-2, above, the columns "2003 FEIS Amount of Use" and "SDEIS Proposed Amount of Use" contain data to illustrate the estimated acreage to be used by the preferred alternative (Alternative C-1) documented in the 2003 FEIS, and by the two build alternatives under consideration in this SDEIS, respectively. Differences between the acres shown in the two columns are attributable to the FEIS Selected Alternative having undergone further design since 2003, as described in SDEIS Chapter 3. In each case, the current acres of use by both of the build alternatives are the same or less than the acres of use attributed to the 2003 Selected Alternative as described in the FEIS.

Changes to the properties and/or to the proposed use of the sites since the 2003 FEIS are presented below. The resources are illustrated on Figures 6.2-9a through 10b (located at the end of this chapter), and are described in more detail in the 2003 FEIS Section 6.2.2.

- **Greenway Corridor (Includes Riverfront Park), Jeffersonville, Indiana**

  The only major change since the 2003 FEIS is that much of this corridor has been developed. The use of this property would result from the acquisition of right-of-way associated with the new bridge span over the park. The right-of-way would encompass 0.4 acre of the resource. Current plans indicate that bridge support piers and footings would physically occupy approximately 0.03 acre of park property. These uses are the same for both build alternatives because they require the same right-of-way at this location. No park facilities or functions would be directly impacted, and no restriction of access between the portion of the park located to the east of the existing Kennedy Bridge and the proposed new bridge and areas of the Greenway Corridor to the west would be necessary. After construction, the area under the new bridge would also remain accessible, except for the 0.03 acre actually occupied by bridge support piers and footings. Avoidance alternatives and measures to minimize harm are presented in FEIS Chapter 6. Avoidance of the park by minor shifts in the alignment would not be possible because it is a linear park located parallel to the Ohio River, and extends east and west of the proposed perpendicular crossing of the new Downtown Bridge.

- **Waterfront Park, Louisville, Kentucky**

  Details regarding usage and facilities associated with the Waterfront Park are provided on pages 6-78 and 6-79 of the Section 4(f) Evaluation included in the 2003 FEIS. The only major change to the resource since 2003 is that the two separate phases of park development as discussed in that document have been completed. As shown in Table 6.2-2, the Modified Selected Alternative would require less acreage from this resource: 4.55 acres versus 6.86 acres for the FEIS Selected Alternative. In the 2003 FEIS the amount of land to be acquired from the park was 5.3 acres. The increase of the acres is due to the expansion of the park further into the project's proposed right-of-way. The piers for each alternative would physically occupy approximately 0.5 acre of park property. This overall

reduction is associated with the elimination of the widening of I-64 over the Great Lawn, from River Road to the western edge of the park, which was proposed as part of the FEIS Selected Alternative but has been omitted from the Modified Selected Alternative. The area of the park below the new bridge would remain accessible to the public, and there would not be any restrictions on pedestrian access between portions of the park to the east and west of the new bridge. Avoidance alternatives, measures to minimize harm, and a least harm analysis are provided in the 2003 FEIS. Avoidance of the park by minor shifts in the alignment would not be possible because the park is located under the current Kennedy Interchange Complex.

Figure 6.2-12 depicts the location of the Waterfront Park in relation to both the FEIS Selected Alternative and the Modified Selected Alternative.

- **Extreme Sports Complex, Louisville, Kentucky**

  Details regarding usage and facilities associated with the 2.36-acre Extreme Sports Complex are provided on page 6-87 of the Section 4(f) Evaluation included in the 2003 FEIS. One major change since the 2003 FEIS is that the two separate phases of park development as discussed in that document have now been completed. Figure 6.2-12 depicts the location of the Extreme Sports Complex in relation to both the FEIS Selected Alternative and the Modified Selected Alternative.

  Property acquisition from the Extreme Sports Complex for the FEIS Selected Alternative would total 1.06 acres of right-of-way, whereas the Modified Selected Alternative would require 0.65 acre. Both alternatives would involve spanning over the complex, and would result in the loss of approximately 0.12 acre due to the construction of bridge support piers within the footprint of the park. Based on the current design plans, the piers would be placed within the site, but outside its recreational elements. During construction, it is anticipated that temporary closure of the park would need to occur. After construction given the limited loss of property, piers and the Extreme Sports Complex could co-exist without any loss of the park's recreational use. If such a loss were unavoidable, a redesign of the complex beneath the highway structures, or somewhere nearby, would be undertaken. For purposes of this Section 4(f) Evaluation, the property use is based on the proposed right-of-way acquisition of parkland. Avoidance of the park by minor shifts in the alignment would not be possible because the park is located under the current I-65 at the southern portion of the Kennedy Interchange Complex.

  Information on avoidance alternatives and measures to minimize harm can be found in the 2003 FEIS. That analysis remains applicable to the current build alternatives.

6.3 Coordination

This project has been coordinated with the agencies and officials having jurisdiction over the Section 4(f) properties that would be impacted. Agency coordination is described in Chapter 7 of the SDEIS. Archaeological and historical reports were coordinated with the Indiana and Kentucky SHPOs for determinations of eligibility and assessment of impacts (see SDEIS sections 4.3 and 5.3). A summary of the formal coordination efforts follows.

1. Early Coordination
   Resource agencies and cooperating agencies were contacted on April 28, 2011, to confirm their willingness to continue involvement on the project. Agencies were invited to join the consultation process for the project as either a cooperating or participating agency pursuant to 23 USC 139(d). A draft of the project Coordination Plan was sent to the agencies.

   The following agencies with jurisdiction over potential Section 4(f) properties were contacted. Specific responses and correspondence related to Section 4(f) properties are listed below by date of comments. A copy of each response is included in Appendix C and Appendix D.

   a. U.S. Department of the Interior, National Park Service—April 28, 2011.
   b. U.S. Army Corps of Engineers (USACE)—May 11, 2011, and June 29, 2011.
   c. Indiana SHPO—May 2, 2011, June 29, 2011, July 6, 2011, August 8, 2011, August 23, 2011, September 6, 2011, and October 25, 2011.
   d. Kentucky SHPO—May 11, 2011, August 1, 2011, and August 25, 2011.
   e. Louisville Waterfront Development Corporation—No response received, but representatives attended Section 1 Area Advisory Team meeting on June 20, 2011.
   f. Kentucky State Nature Preserves Commission (KSNPC) —May 16, 2011.
   g. Early coordination was also initiated with the various city, county, and other local officials, agencies and organizations within the project area. A detailed description of agency coordination and public involvement activities is included in Chapter 7 of the SDEIS.

2. Resource Agency Coordination Meeting of May 26, 2011
   The Resource Agency Coordination meeting was held on May 26, 2011, at the Crowne Plaza Hotel in Louisville, Kentucky. FHWA, KYTC, and INDOT updated the data on which the Purpose and Need Statement for the project was based, and reviewed the alternatives screening process that would be used to determine whether the decisions documented in the 2003 FEIS for the project remained valid, and whether additional alternatives should be considered as a result of the proposed project modifications, including the potential use of tolling. The environmental analysis methodology detailed the process to be followed to evaluate impacts associated with changes in the project area. Drafts of the Coordination Plan and of the Environmental Analysis Methodology were distributed for review and comment.

Attendance at the Agency Coordination Meeting included representatives from the KSNPC, the USACE, the Indiana SHPO, and the Louisville Waterfront Development Corporation. Their correspondence, including those related to Section 4(f) resources, is included in Appendix C of the SDEIS.

3. Section 106 Consultation
   FHWA, with the assistance of KYTC and INDOT, has engaged in Section 106 consultation with the SHPOs of Indiana and Kentucky, the Advisory Council, as well as other consulting parties in conjunction with the preparation of this SDEIS. As described in Section 5.3 of this SDEIS, the Section 106 process is still ongoing. Consulting parties have provided input on the area of potential effects and on eligibility determinations, and have received proposed findings of effect for comment. In addition, because effect findings have not yet been finalized, consulting parties have not yet been engaged in consultation to resolve adverse effects. FHWA anticipates that Section 106 consultation will be concluded, or nearly concluded, by the time the SFEIS is issued. If there are changes in the eligibility or effects analyses as a result of further Section 106 consultation, those changes will be reflected in the final Section 4(f) evaluation, which will be included in the SFEIS.

4. Review of SDEIS
   This update to FEIS Chapter 6 will be provided to the following agencies and officials with jurisdiction over Section 4(f) properties, who have the opportunity to review and comment on the updated information regarding Section 4(f) involvement. For a complete list of agencies that will receive this SDEIS, see Chapter 10.

   a. Advisory Council on Historic Preservation (ACHP)
   b. U. S. Department of Interior, National Park Service
   c. Kentucky Natural Resources and Environmental Protection Cabinet
   d. Kentucky SHPO
   e. Indiana Department of Environmental Management (IDEM)
   f. Indiana Department of Natural Resources (IDNR)
   g. Indiana SHPO
   h. USACE
   i. Louisville Metro, Kentucky
   j. City of Jeffersonville, Indiana
   k. Louisville Waterfront Development Corporation
   l. Ohio River Greenway Commission

6.4 Section 4(f) Conclusions

The potential for a Section 4(f) use has been considered separately with regard to the Downtown Corridor and the East End Corridor. These corridors have been considered separately because the alignment decisions within each corridor involved largely separate considerations. The findings with regard to each corridor are summarized below. Based on the analysis of each corridor, this

Section 4(f) evaluation concludes that the Modified Selected Alternative would result in the least overall harm to Section 4(f)-protected resources and is therefore approvable under Section 4(f).

Downtown Corridor

Based on the current assessment of Section 4(f) properties, there is no feasible and prudent avoidance alternative to the use of Section 4(f) properties in the Downtown Corridor. This conclusion was reached for the 2003 FEIS and remains valid for this SDEIS. Opportunities to avoid Section 4(f) properties, including minor shifts in alignments, were not found to be feasible or prudent.

As was found in the 2003 FEIS, Alternative C-1 (which was the preferred alternative in the FEIS and is part of both build alternatives in this SDEIS) would cause the least harm to Section 4(f) resources and the least overall harm. In addition, this alternative would incorporate appropriate measures to minimize harm to Section 4(f) resources. All of the measures to minimize harm that were identified in the FEIS remain part of the build alternatives and will be implemented if a build alternative is approved.

East End Corridor

In the East End Corridor, Alternative A-15 was determined in the 2003 FEIS to be the least harm option with respect to Section 4(f) resources. At that time, it was assumed that A-15 would require the use of one Section 4(f) resource: the Swartz Farm. Based on the current reassessment of Section 4(f) resources in the East End Corridor, the Swartz Farm is no longer eligible, and thus Alternative A-15 would not involve a Section 4(f) use of that property. The current assessment has identified larger historic district boundaries associated with each of the Utica lime kilns, and has found impacts on quarries within those boundaries for two kilns, but the impacts do not result in a Section 4(f) use for the reasons discussed above. Therefore, both build alternatives in the East End Corridor—the Modified Selected Alternative and the FEIS Selected Alternative—completely avoid the use of Section 4(f) resources and, therefore, do not require a Section 4(f) approval.

Overall Conclusion

As stated above, the Modified Selected Alternative will not require the use of any Section 4(f) resources in the East End corridor, but it will require the use of Section 4(f) resources in the Downtown Corridor. Therefore, approval of the Modified Selected Alternative would require a Section 4(f) approval, pursuant to Section 774.3 of FHWA's Section 4(f) regulations.

Under Section 774.3, FHWA can approve the use of a Section 4(f) resource either by (1) determining the alternative causes a *de minimis* impact on the Section 4(f) resource, or (2) determining that there is no feasible and prudent avoidance alternative and that the alternative includes all possible planning to minimize harm to the property resulting from such use [23 C.F.R. § 774.3(a)-(b)].

In this case, FHWA is not proposing a finding of *de minimis* impact for either the Modified Selected Alternative or the FEIS Selected Alternative. A finding of *de minimis* impact can be made for the public owned parks where a use would occur only if the agency responsible for them concurs that the impacts will have no adverse effect on the property.

Based on the analysis in the Section 4(f) Evaluation in the 2003 FEIS, as supplemented by the additional information contained in this Section 4(f) Evaluation, FHWA concludes that:

1. There is no prudent and feasible alternative that completely avoids the use of all Section 4(f) properties. Alternatives such as No-Action and TSM would avoid the use of Section 4(f) resources, but they do not meet the purpose and need of the project and therefore are not prudent. There are no alternatives that meet the purpose and need and, on a project-wide basis, completely avoid the use of all Section 4(f) resources. Therefore, it is necessary to select the feasible and prudent alternative that causes the least overall harm and to ensure that that alternative includes all possible planning to minimize harm pursuant to 23 CFR 774.3(c)(2).

2. The Modified Selected Alternative is the alternative that causes the least overall harm, according to the criteria defined in 23 CFR 774.3(c)(1).[2] The two build alternatives considered in this DSEIS are the FEIS Selected Alternative and the Modified Selected Alternative. As shown in Tables 6.2-1 and 6.2-2 in this chapter, these two alternatives have similar impacts on Section 4(f) resources, but the impacts of the Modified Selected Alternative are slightly less because the alternative incorporates cost-saving design changes that also reduce the alternative's direct impacts on Section 4(f) properties. The Modified Alternative also has lower impacts on Section 4(f) properties that would be affected but would not actually be used by the alternatives. For example, as discussed above, the Modified Selected Alternative would involve a four-lane rather than six-lane tunnel under the Drumanard Estate, and it would involve lower traffic volumes in proximity to historic resources in the East End Corridor. (Traffic volume on the East End Bridge for the FEIS Selected Alternative is 60,000 vehicles per day (vpd); for the Modified Selected Alternative, it 52,000 vpd.) Despite its somewhat lower impacts on Section 4(f) properties, the Modified Selected Alternative would include the same measures to minimize harm to Section 4(f) properties as the FEIS Selected Alternative. Thus, taken as a whole, the Modified Selected Alternative would cause less harm to Section 4(f) resources. It also would perform similarly in its ability to meet purpose and need, it would have similar or lower impacts on non-Section 4(f) resources, and it would be substantially less costly. For all of these reasons, the Modified Selected Alternative meets the criteria for designation as the alternative that causes "least overall harm" and has been identified in Chapter 3 as the preferred alternative.

[2] Section 774.3(c)(1) states that: "The least overall harm is determined by balancing the following factors: (i) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property); (ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection; (iii) The relative significance of each Section 4(f) property; (iv) The views of the official(s) with jurisdiction over each Section 4(f) property; (v) The degree to which each alternative meets the purpose and need for the project; (vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and (vii) Substantial differences in costs among the alternatives."

3. The Modified Selected Alternative includes all possible planning, as defined in 23 U.S.C. §774.17, to minimize harm to Section 4(f) property.[3] The Modified Selected Alternative incorporates all of the avoidance, minimization, and mitigation commitments that were adopted in the 2003 ROD for the FEIS Selected Alternative. These commitments include the extensive set of mitigation measures that were adopted for historic properties and included in the Section 106 MOA. Moreover, to the extent that the Modified Selected Alternative includes any additional or different adverse effects that were not addressed by the 2003 ROD or Section 106 MOA, those adverse effects can be addressed as part of the ongoing Section 106 consultation process and NEPA process. Further refinements to the mitigation commitments for the Modified Selected Alternative may be made following the publication of this DSEIS, in order to ensure that this alternative satisfies the "all possible planning" requirement.

In conclusion, based on an updated analysis of the Section 4(f) resources and the most current designs of the proposed build alternatives, as described throughout this chapter, approval of the Modified Selected Alternative is consistent with Section 4(f), 49 U.S.C. § 303(c), and the implementing regulations in 23 C.F.R. Part 774.

As there is a proposed use of Section 4(f) land, this draft Section 4(f) Evaluation will be circulated for comment with the officials having jurisdiction over those resources, as well as the U.S. Department of the Interior (DOI) and other Federal agencies. A minimum of 45 days will be allowed for comments to be returned. If comments are received, they will be addressed, as appropriate, to resolve outstanding issues. After all concerns have been addressed, the final Section 4(f) Evaluation will be prepared and included in the FSEIS.

[3] As defined in 23 C.F.R. § 774.17, "all possible planning" means "that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects must be included in the project." The definition of "all possible planning" also states that "[w]ith regard to historic sites, the measures normally serve to preserve the historic activities, features, or attributes of the site as agreed by the Administration and the official(s) with jurisdiction over the Section 4(f) resource in accordance with the consultation process under 36 CFR part 800."

Indiana East End Section 4(f) Properties Within the Project Area

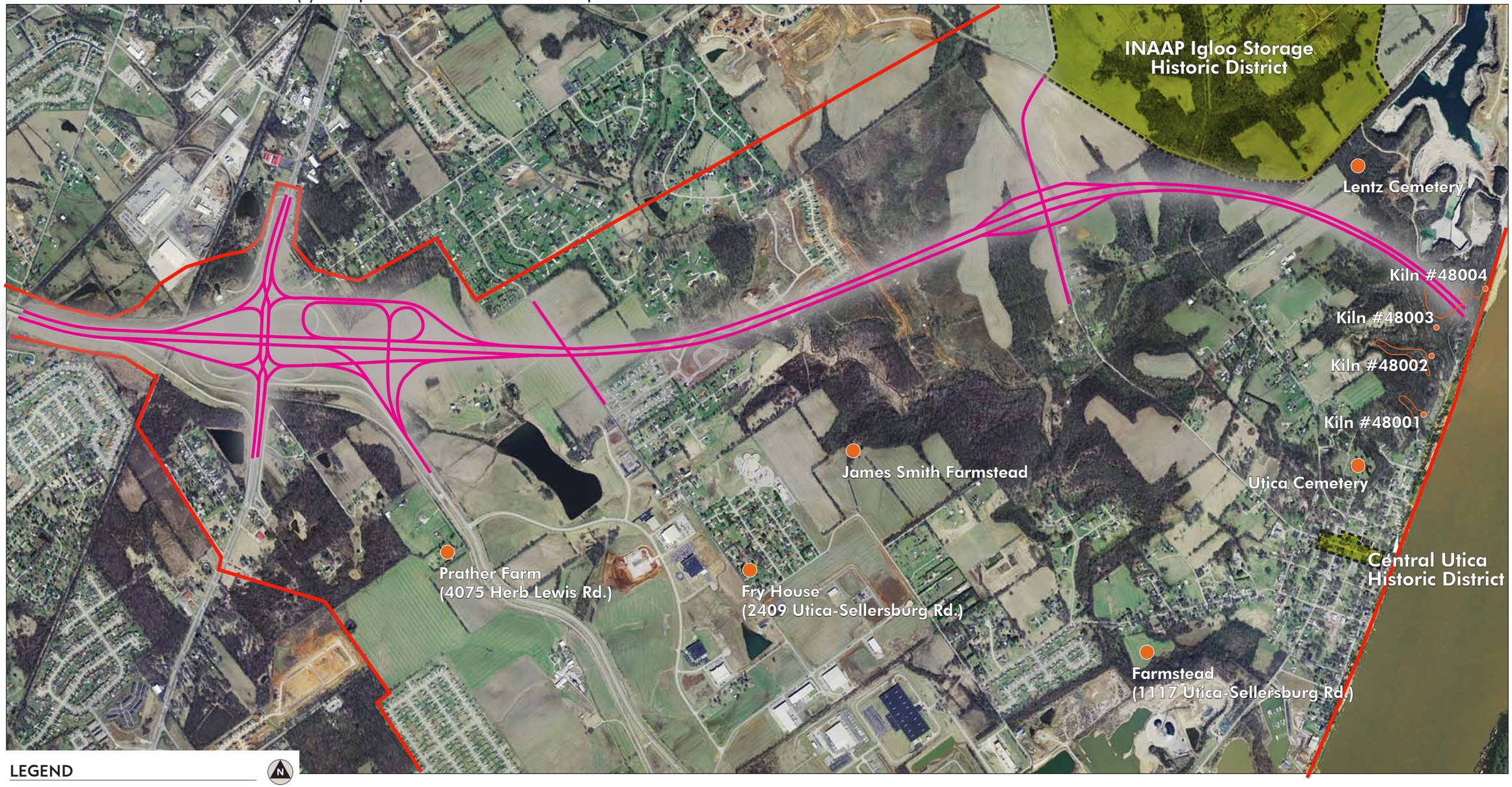


Figure 6.2-1

Indiana Downtown Section 4(f) Properties Within the Project Area

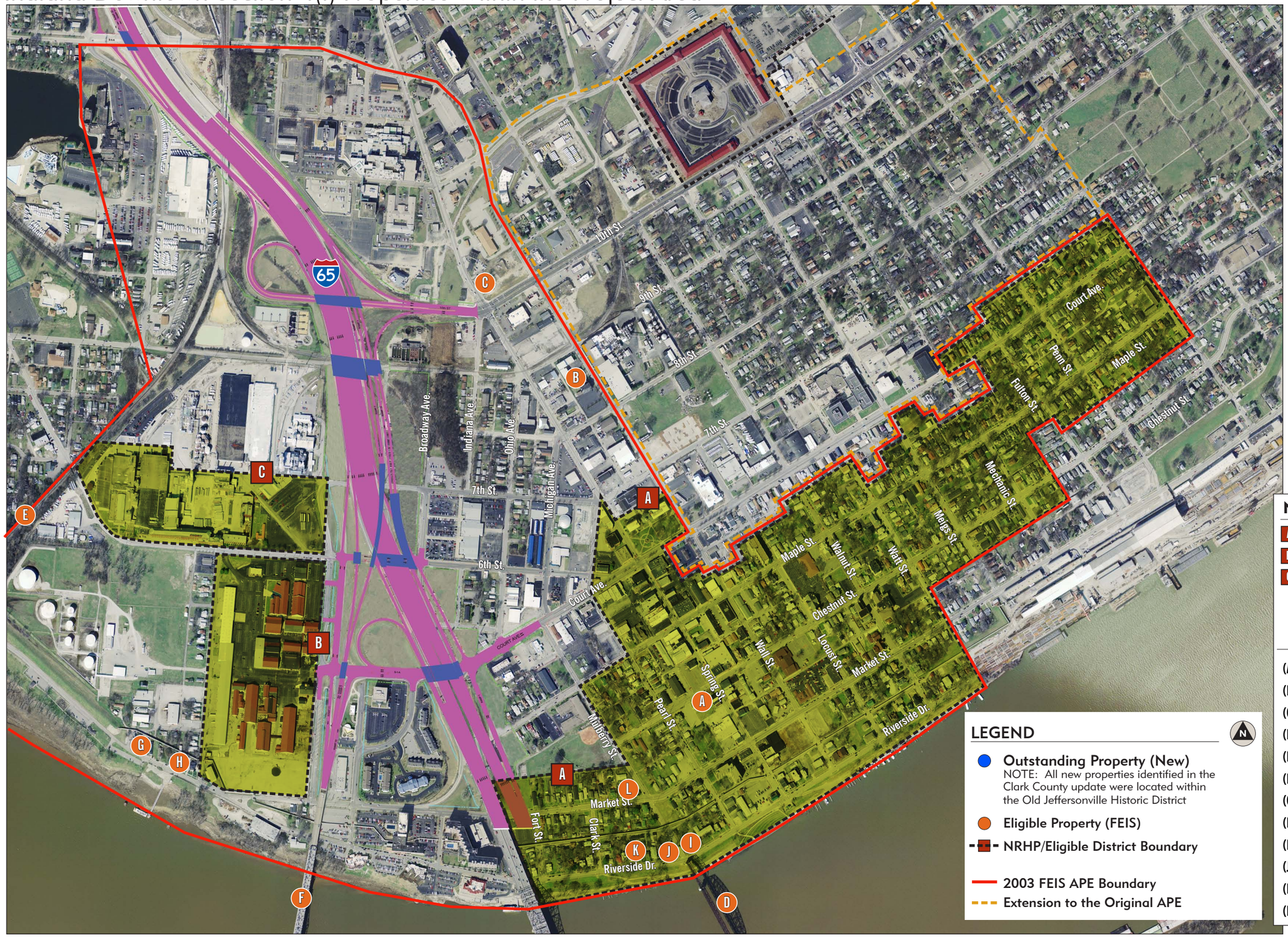


Figure 6.2-2

Kentucky Downtown Section 4(f) Properties Within the Project Area

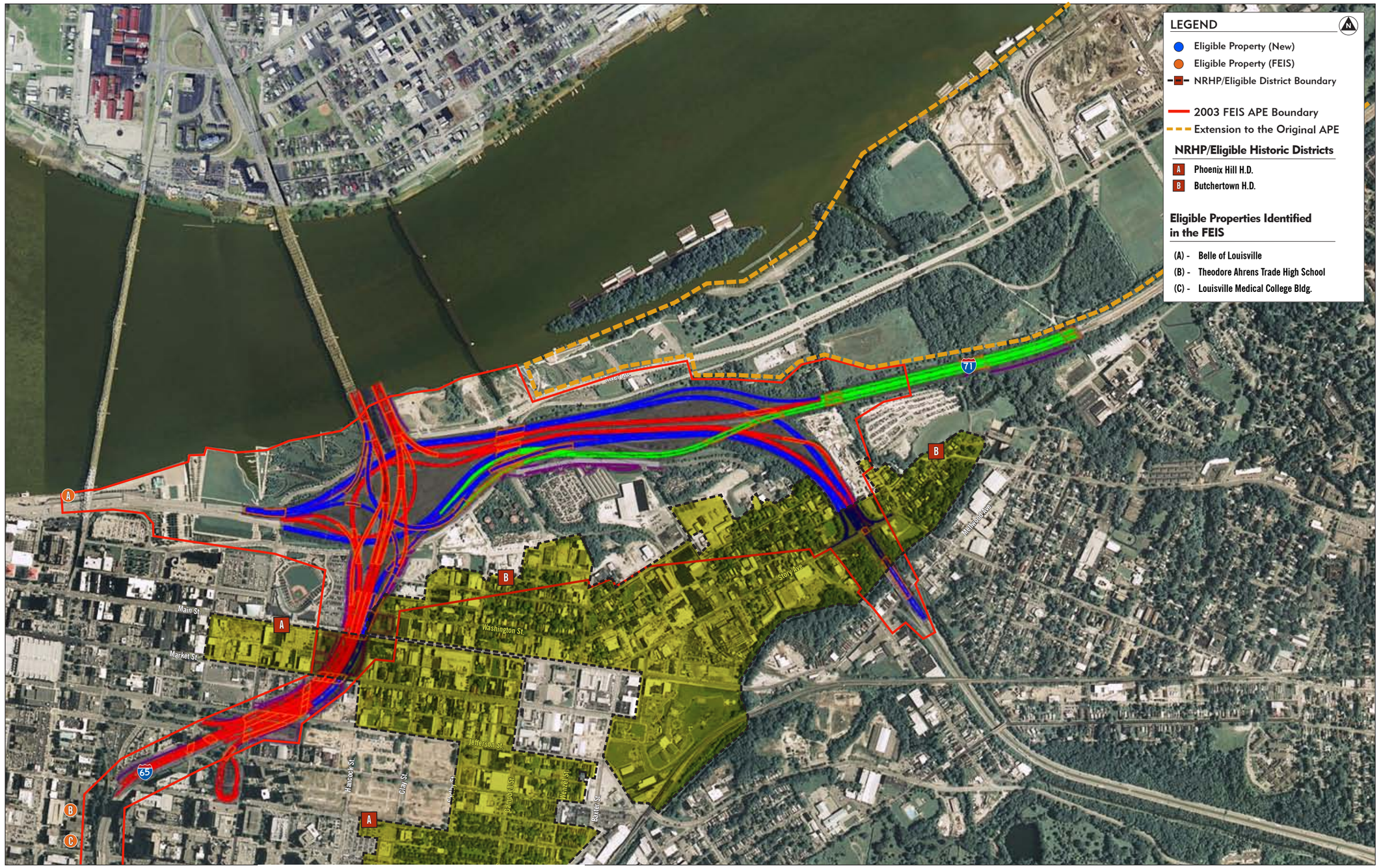
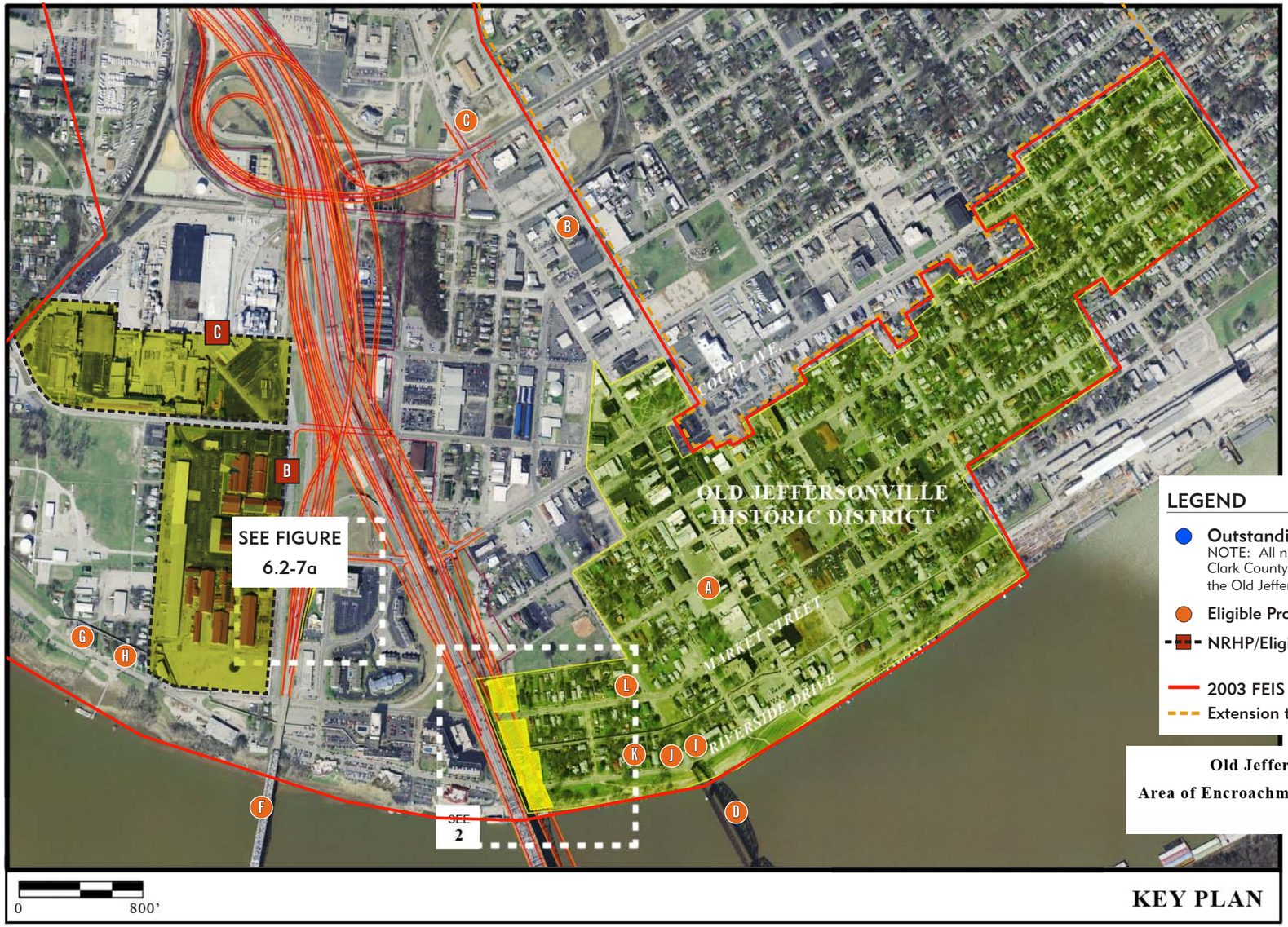


Figure 6.2-3

Old Jeffersonville Historic District - FEIS Selected Alternative



LEGEND

- Outstanding Property (New)
  NOTE: All new properties identified in the Clark County update were located within the Old Jeffersonville Historic District
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

Old Jeffersonville Historic District

Area of Encroachment into Historic District

NRHP/Eligible Historic Districts

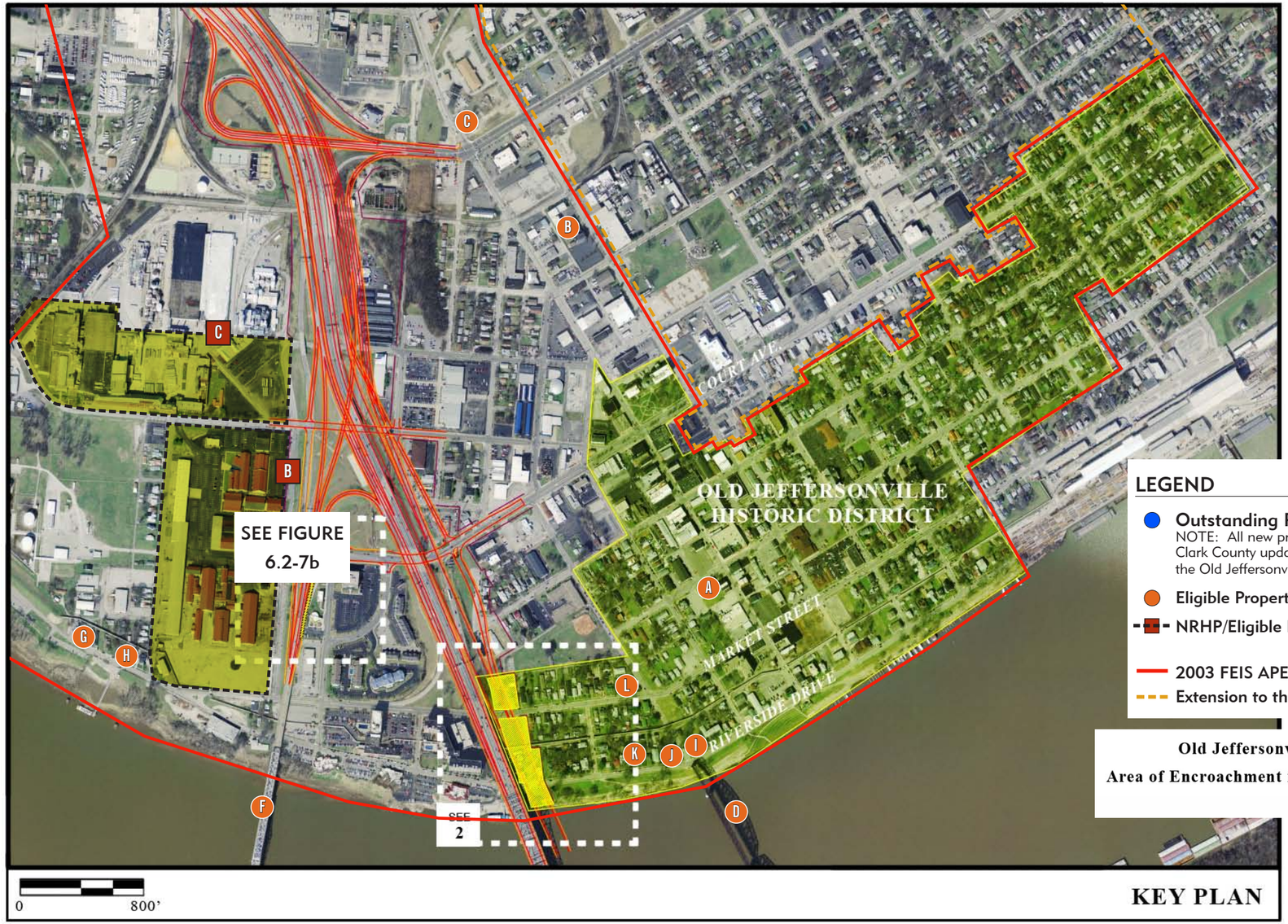
- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

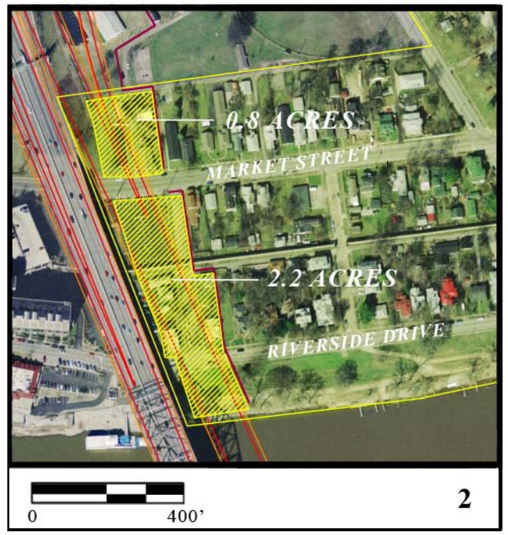
"Outstanding" Properties Identified in the FEIS

- (A) - Grisamore House
- (B) - City School
- (C) - Spring St. Freighthouse (Train Depot)
- (D) - Big Four Railroad Bridge
- (E) - Pennsylvania Railroad Bridge
- (F) - George Rogers Clark Memorial Bridge
- (G) - House - 519 Riverside Dr. (Clarksville)
- (H) - House - 527 Riverside Dr. (Clarksville)
- (I) - House - 228 Riverside Dr.
- (J) - House - 304 Riverside Dr.
- (K) - House - 416 Riverside Dr.
- (L) - House - 318 Market St.

Figure 6.2-4a

Old Jeffersonville Historic District - Modified Selected Alternative





LEGEND

- Outstanding Property (New)
  NOTE: All new properties identified in the Clark County update were located within the Old Jeffersonville Historic District
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

Old Jeffersonville Historic District

Area of Encroachment into Historic District

NRHP/Eligible Historic Districts

- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

"Outstanding" Properties Identified in the FEIS

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- (E) - Pennsylvania Railroad Bridge
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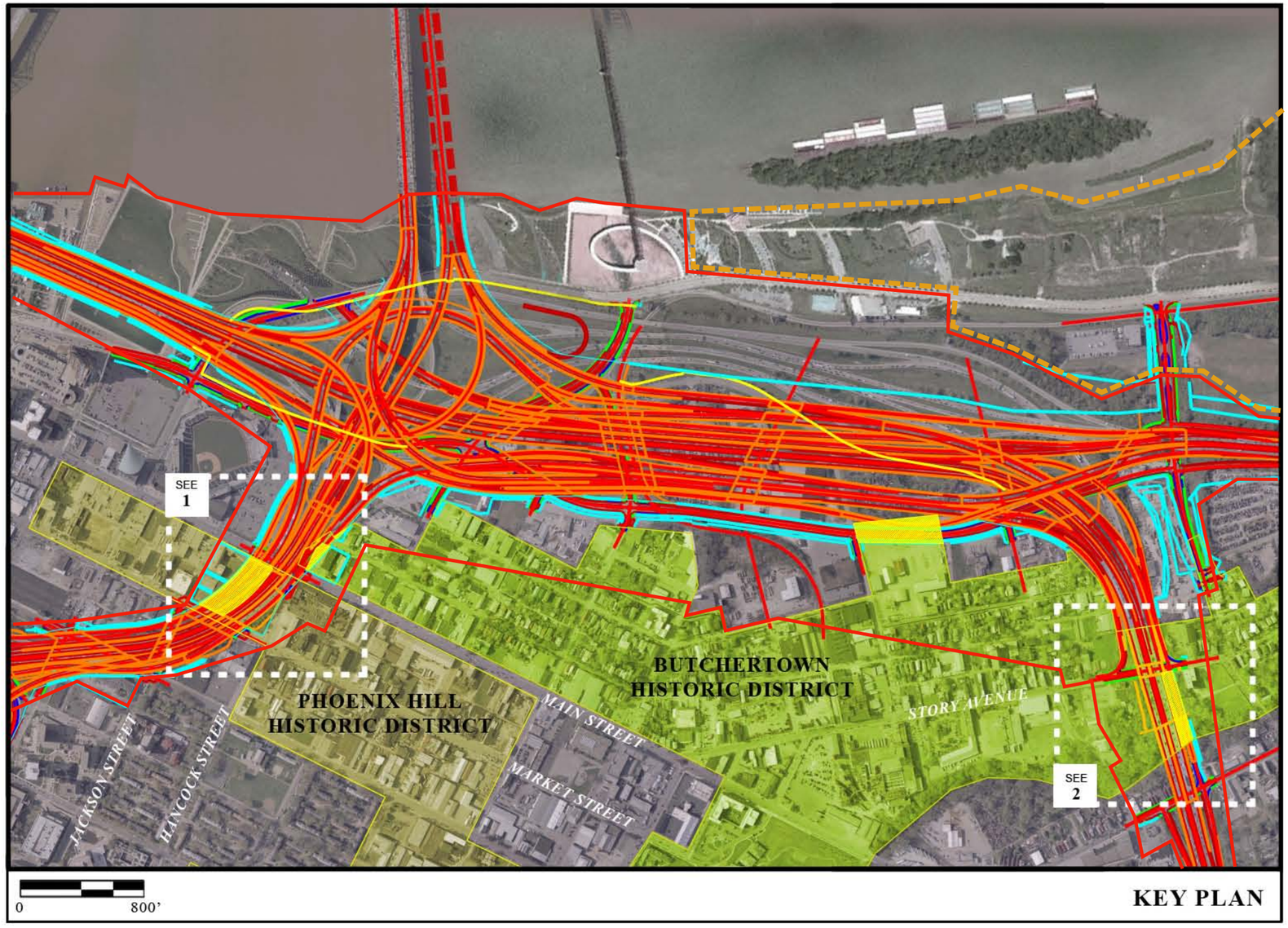
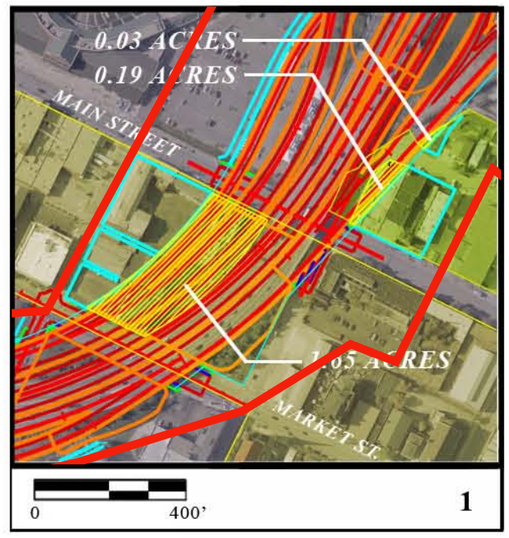
- (K) - House - 416 Riverside Dr.
- (L) - House - 318 Market St.

Figure 6.2-4b

Butchertown & Phoenix Hill Historic Districts - FEIS Selected Alternative



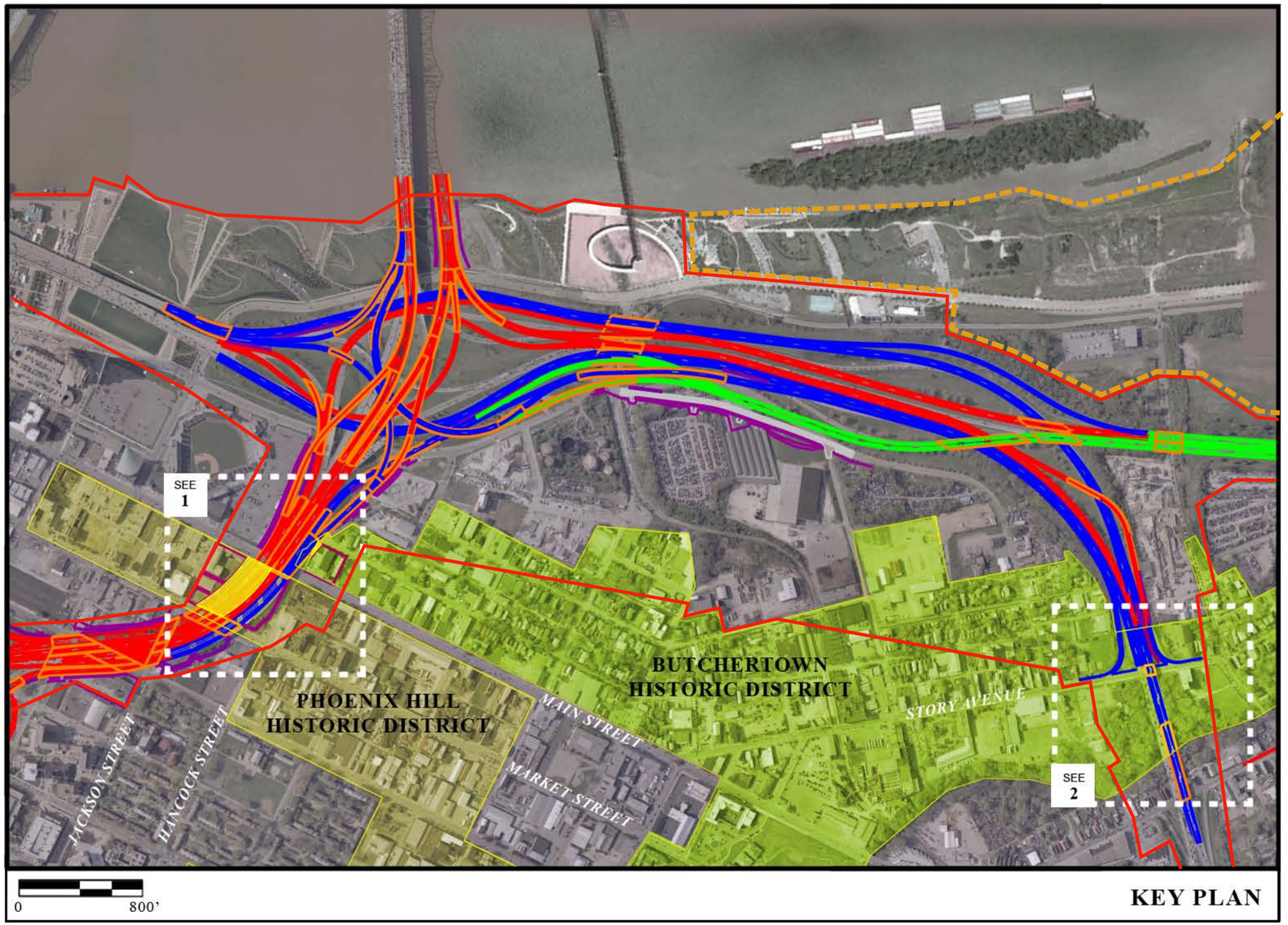


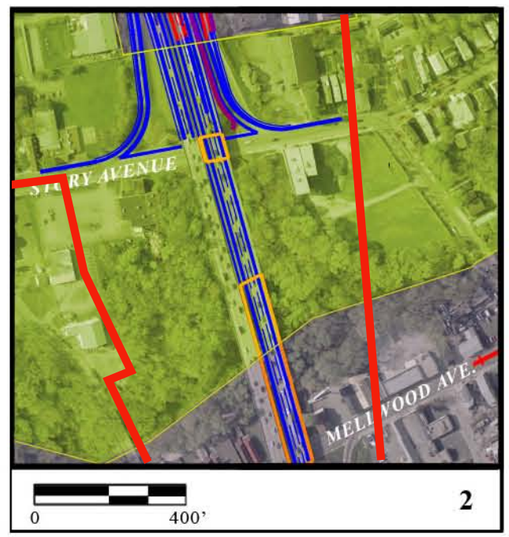
LEGEND

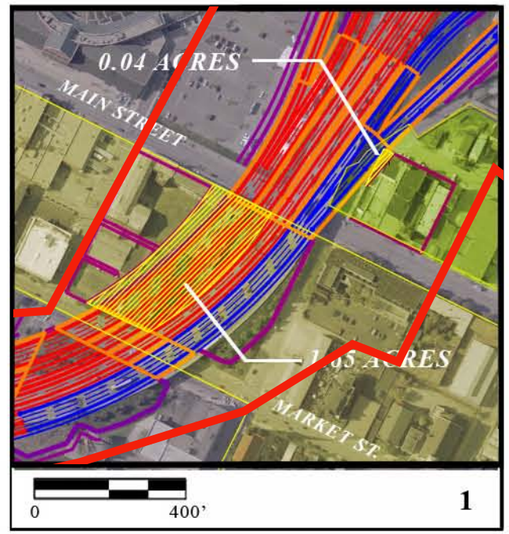
- Phoenix Hill Historic District
- Butchertown Historic District
- Area of Encroachment into Historic Districts
- 2003 FEIS APE Boundary
- Extension to the Original APE

Figure 6.2-5

Butchertown & Phoenix Hill Historic Districts - Modified Selected Alternative





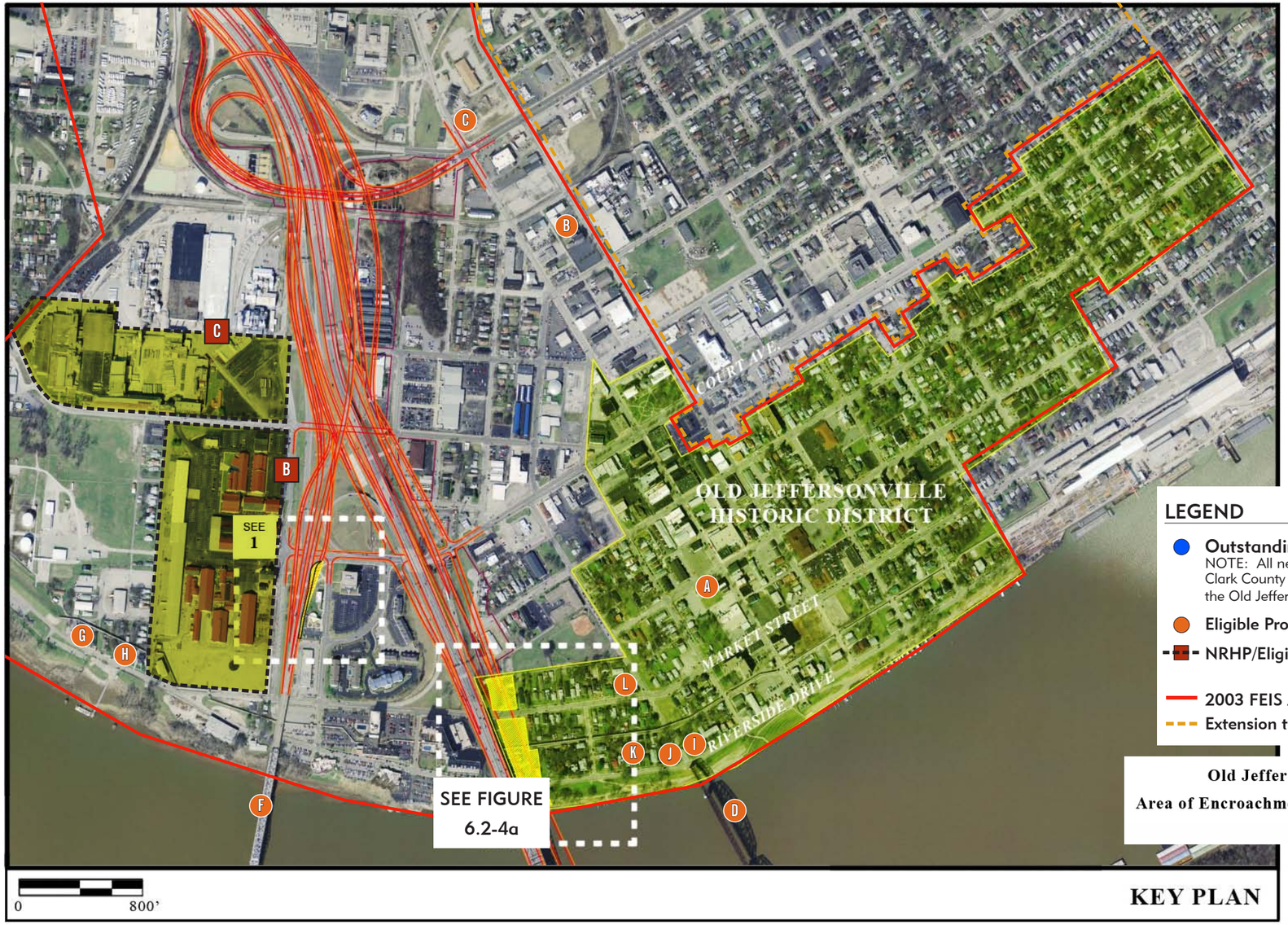


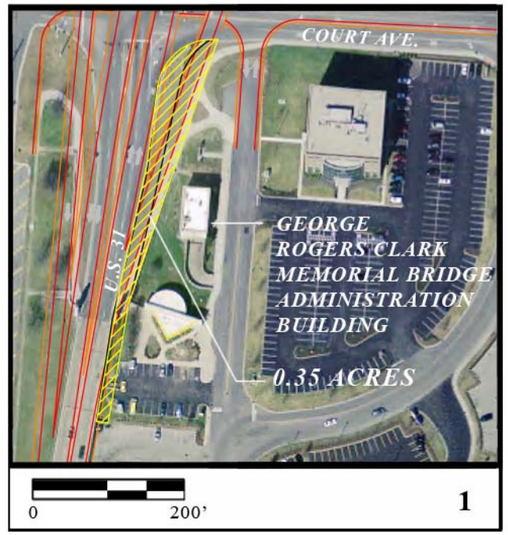
LEGEND

- Phoenix Hill Historic District
- Butchertown Historic District
- Area of Encroachment into Historic Districts
- 2003 FEIS APE Boundary
- Extension to the Original APE

Figure 6.2-6

George Rogers Clark Memorial Bridge and Administration Building - FEIS Selected Alternative





LEGEND

- Outstanding Property (New)
  NOTE: All new properties identified in the Clark County update were located within the Old Jeffersonville Historic District
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

Old Jeffersonville Historic District

Area of Encroachment into Historic District

NRHP/Eligible Historic Districts

- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

"Outstanding" Properties Identified in the FEIS

- (A) - Grisamore House
- (B) - City School
- (C) - Spring St. Freighthouse (Train Depot)
- (D) - Big Four Railroad Bridge
- (E) - Pennsylvania Railroad Bridge
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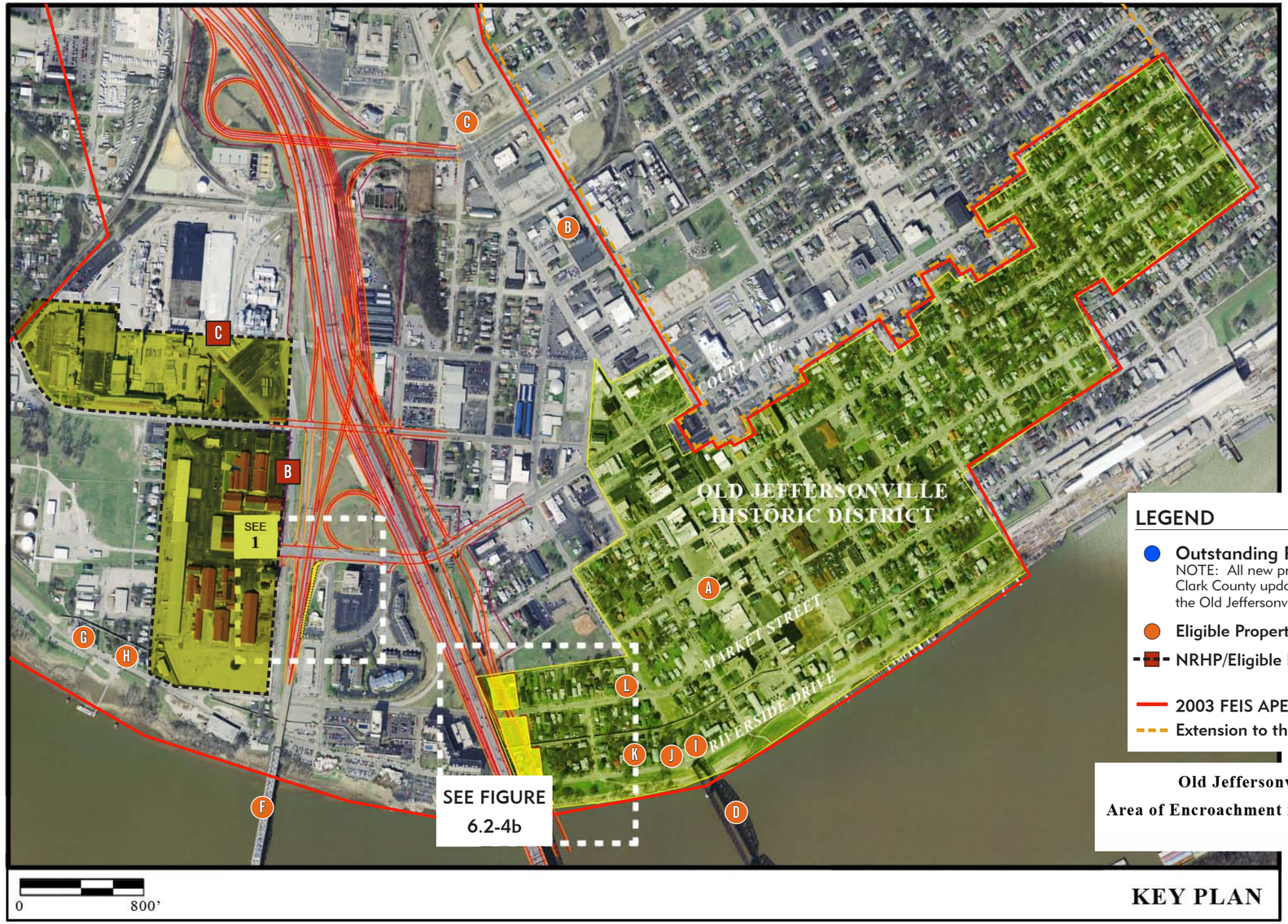
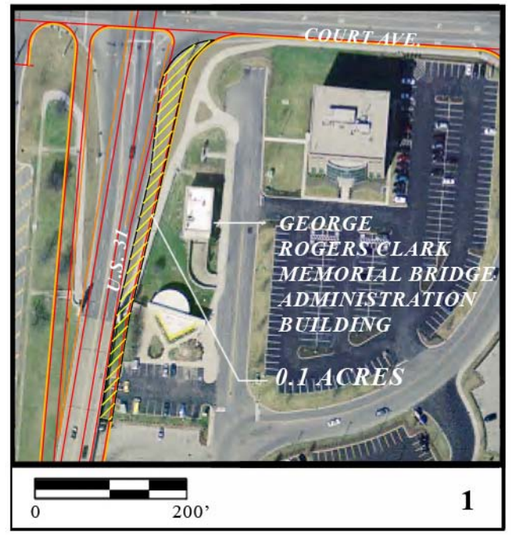
- (J) - House - 304 Riverside Dr.
- (K) - House - 416 Riverside Dr.
- (L) - House - 318 Market St.

Figure 6.2-7a

George Rogers Clark Memorial Bridge and Administration Building - Modified Selected Alternative





LEGEND

- Outstanding Property (New)
  NOTE: All new properties identified in the Clark County update were located within the Old Jeffersonville Historic District
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

Old Jeffersonville Historic District

Area of Encroachment into Historic District

NRHP/Eligible Historic Districts

- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

"Outstanding" Properties Identified in the FEIS

- (A) - Grisamore House
- (B) - City School
- (C) - Spring St. Freighthouse (Train Depot)
- (D) - Big Four Railroad Bridge
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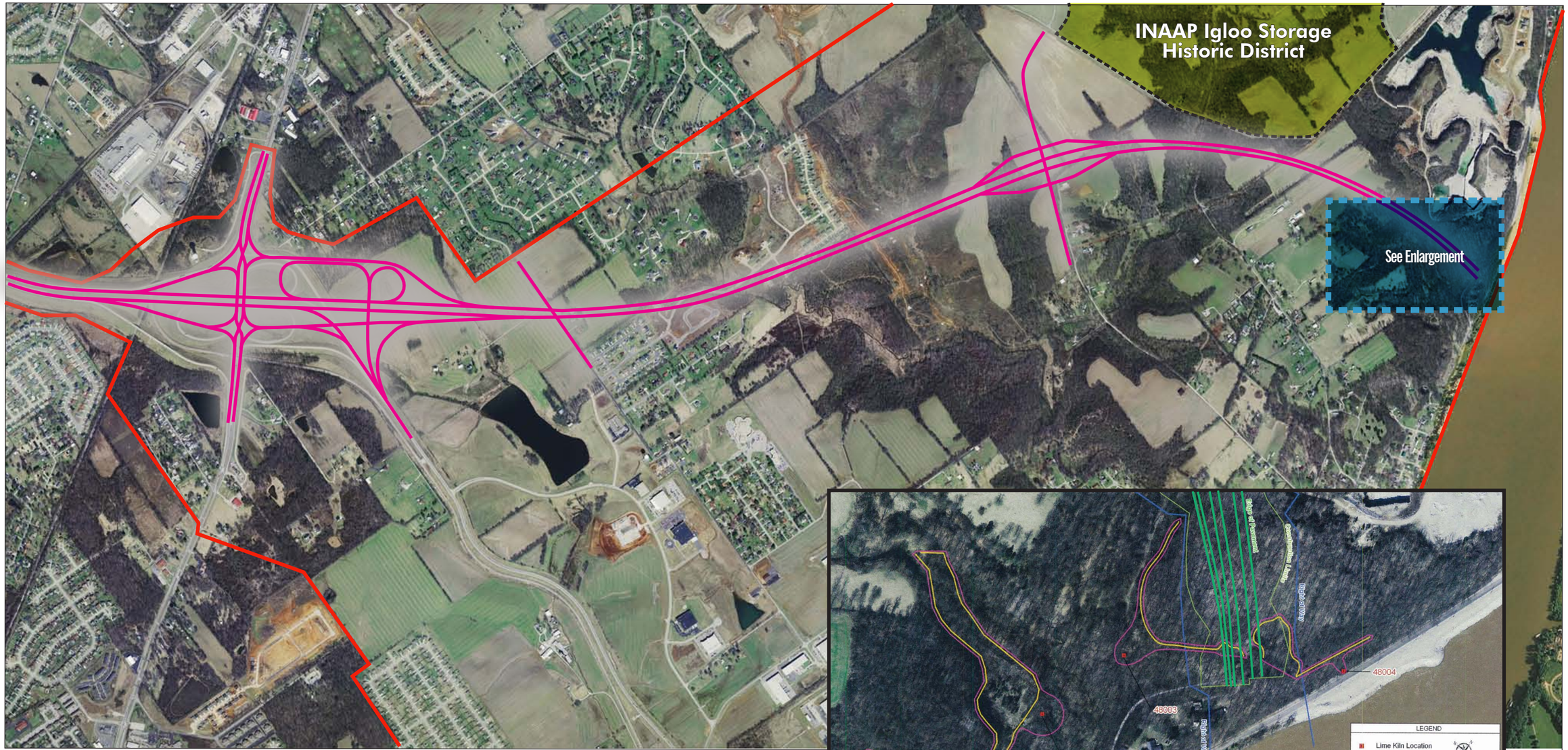
- (K) - House - 416 Riverside Dr.
- (L) - House - 318 Market St.

Figure 6.2-7b

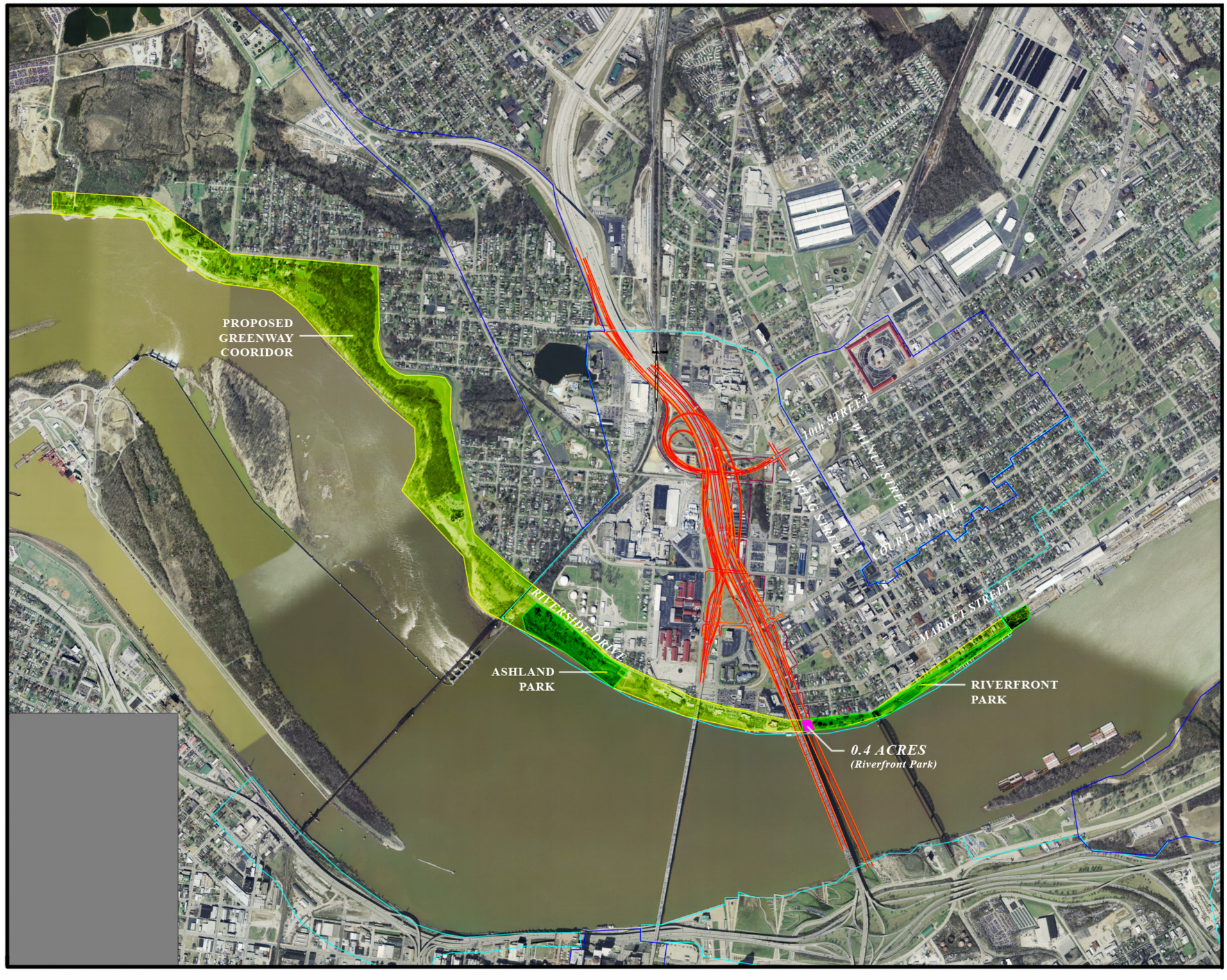
Utica Lime Kilns - FEIS Selected Alternative / Modified Selected Alternative



LEGEND

- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

Figure 6.2-8



LEGEND

- Ashland Park & Riverfront Park
- Proposed Greenway Cooridor
- Area of Direct Encroachment

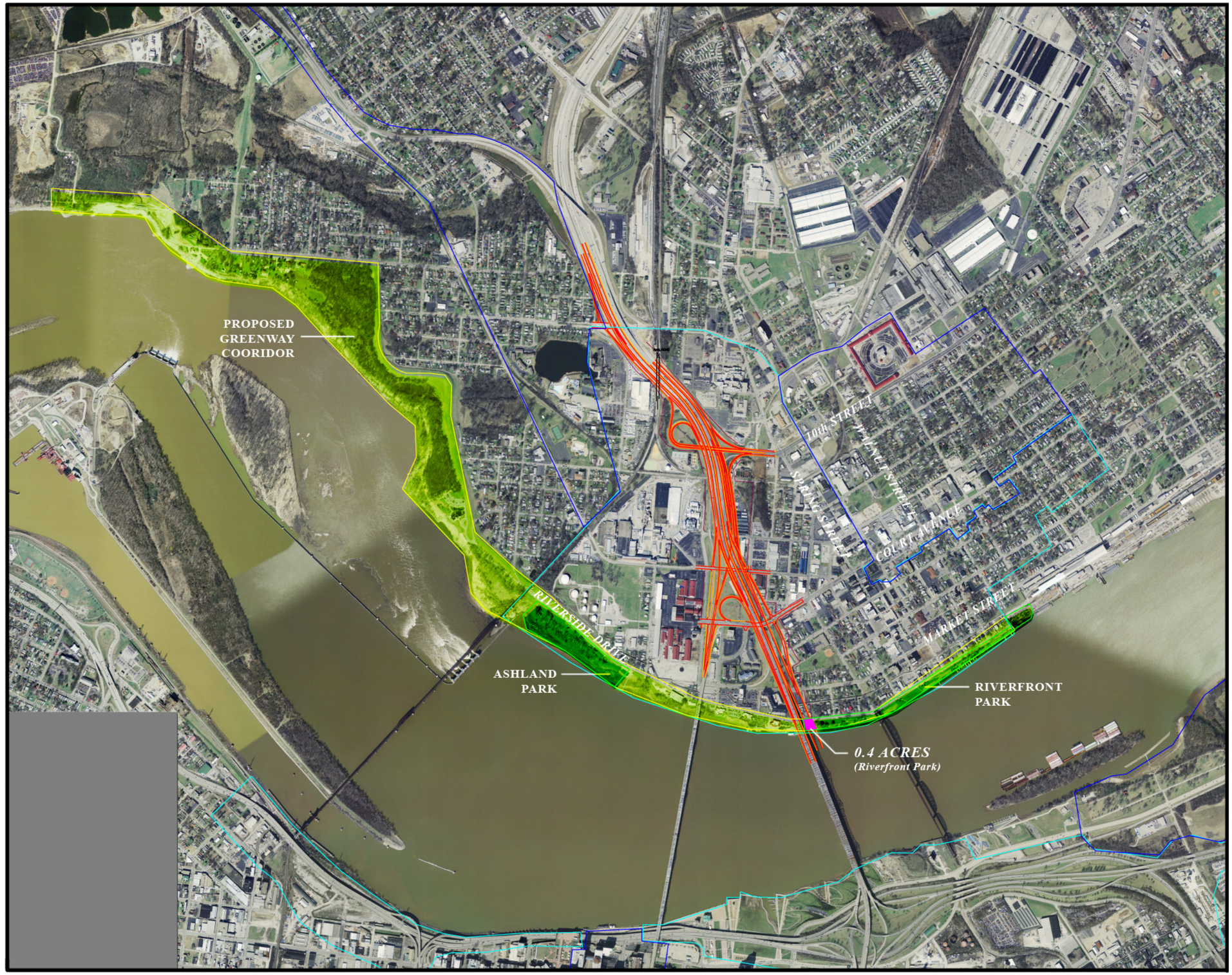
THE OHIO RIVER BRIDGES

Supplemental Environmental Impact Statement

ASHLAND PARK, RIVERFRONT PARK, & THE GREENWAY COORIDOR WITH FEIS SELECTED ALTERNATIVE (2010)

0 2000'

FIGURE 6.2-9a



LEGEND

- Ashland Park & Riverfront Park
- Proposed Greenway Cooridor
- Area of Direct Encroachment

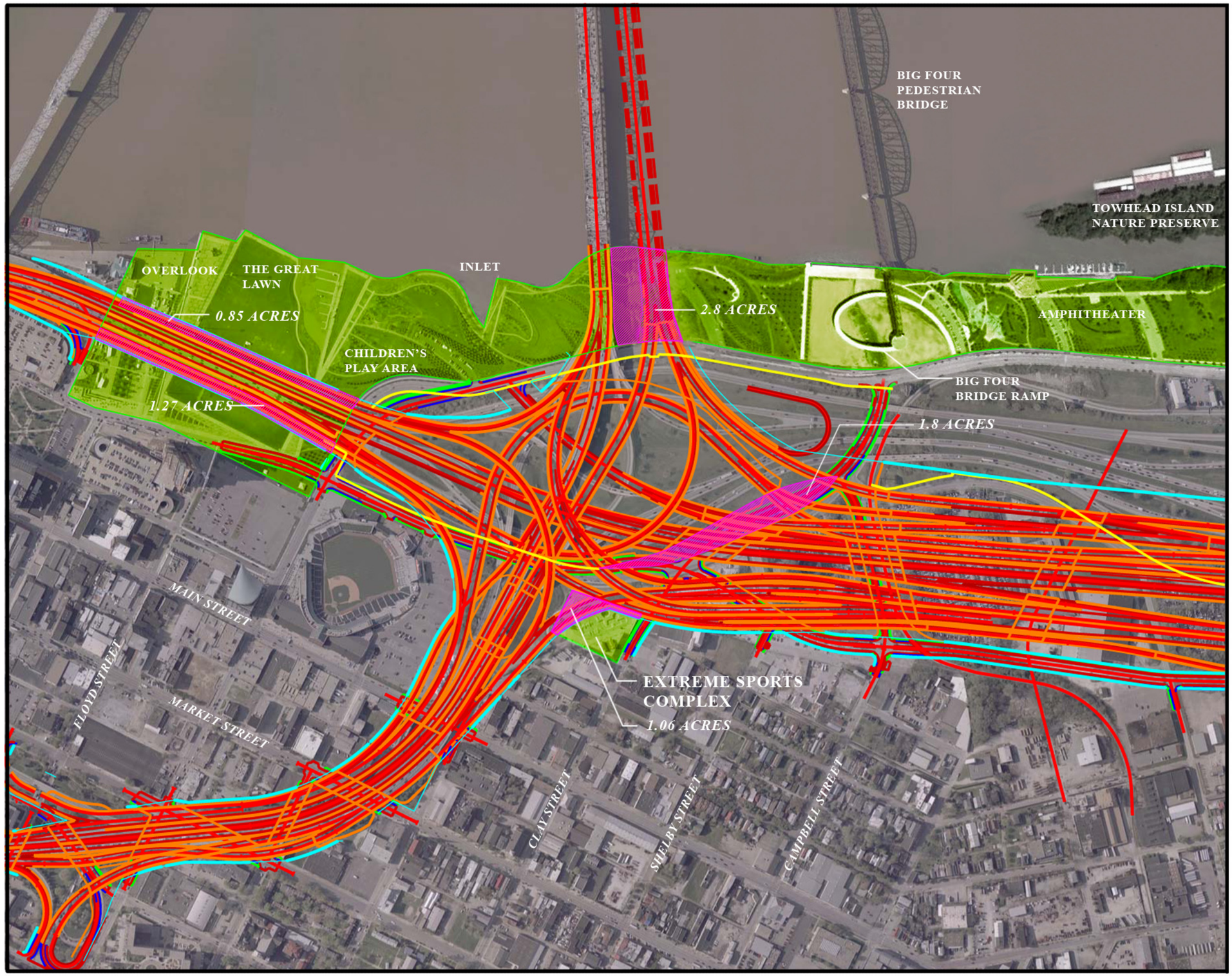
THE OHIO RIVER BRIDGES

Supplemental Environmental Impact Statement

ASHLAND PARK, RIVERFRONT PARK, & THE GREENWAY COORIDOR WITH MODIFIED SELECTED ALTERNATIVE

0 2000'

FIGURE 6.2-9b



LEGEND

- Waterfront Park & Extreme Sports Complex Boundaries
- Area of Direct Encroachment

THE OHIO RIVER BRIDGES

Supplemental Environmental Impact Statement

WATERFRONT PARK & EXTREME SPORTS COMPLEX WITH FEIS SELECTED ALTERNATIVE (2010)

0 600'

FIGURE 6.2-10a

LEGEND

- Waterfront Park & Extreme Sports Complex Boundaries
- Area of Direct Encroachment

THE OHIO RIVER BRIDGES

Supplemental Environmental Impact Statement

WATERFRONT PARK & EXTREME SPORTS COMPLEX WITH MODIFIED SELECTED ALTERNATIVE

0 600'

FIGURE 6.2-10b

CHAPTER 7: PUBLIC INVOLVEMENT AND AGENCY COORDINATION

Chapter 7 of the 2003 FEIS addressed in detail the public involvement and agency coordination activities that were undertaken as part of the development of both the DEIS and the FEIS for the LSIORB Project. This chapter of the SDEIS describes public involvement and agency coordination undertaken as part of the development of the SDEIS for the project.

On February 15, 2011, FHWA, KYTC, and INDOT published in the *Federal Register* a Notice of Intent (NOI) to prepare a Supplemental Environmental Impact Statement (SEIS) to evaluate changes to the LSIORB Project since the 2003 FEIS that would be associated with proposed tolling options, cost-reducing design modifications to the FEIS Selected Alternative, and changes in the project area.

Although extensive public involvement and agency coordination have occurred since the 2003 FEIS/ROD; and further development and design of the FEIS Selected Alternative and development of the Modified Selected Alternative also have taken place. This chapter of the SDEIS is specific to the public involvement and agency coordination that have occurred since the February 2011 publication of the NOI. Public involvement activities that preceded the NOI pre-date the initiation of the SEIS for this project and, therefore, are not included in this chapter.

7.1 Public Involvement

In April 2011, following the issuance of the NOI, FHWA made contact with agencies that had previously been involved in the project and asked whether they wanted to continue to be involved during the SEIS development process. Invitations were sent to the regulatory agencies identified in a *Draft Coordination Plan* on April 28, 2011, inviting their participation in the SEIS development process. Invitations also were sent on April 18, 2011, to the consulting parties who participated in the Section 106 consultation process that led to the 2003 ROD and MOA, inviting them to participate in renewed consultation to take into account the potential effects of the proposed project modifications on historic properties. See Appendix C.2 for a copy of the *Coordination Plan* and Appendix C.3 for a list of resource agencies. See Appendix D.1 for a list of Section 106 consulting parties.

Public involvement opportunities have also been available to the general public. Media coverage and communication tools provided information in the form of newspaper articles, television and radio news stories, and the project website (kyinbridges.com) to give the public up-to-date details about the project and opportunities to provide comment (see Section 7.1.1, below).

Key ongoing elements of the public involvement program, similar to those used during the 2003 FEIS process (see FEIS p. 7-3), are explained in greater detail in the remainder of this chapter and include the following:

- Public Meetings
- Regional Advisory Committee Meetings
- Area Advisory Teams / Area Work Groups

- Public Workshops
- Stakeholder Communications
- Environmental Justice Initiatives
- Indirect and Cumulative Effects Analysis
- Communication Tools
- Media Relations
- Section 106 Historic Properties Review Public Involvement
- SDEIS Circulation and Public Hearing

7.1.1 Public Meetings/*Purpose and Need White Paper* and Range of Alternatives

Purpose and Need White Paper and Project Alternatives—Public Comments

As part of the public involvement process for the LSIORB Project, KYTC and INDOT hosted two public meetings to explain and seek input on (1) the potential changes in the project approved in the 2003 ROD, including the alternatives, and (2) the *Purpose and Need White Paper* (see Appendix A.1).

The public meetings were held on June 27, 2011, at the Holiday Inn Lakeview in Clarksville, Indiana, and on June 28, 2011, at the Holiday Inn Hurstbourne in Louisville, Kentucky.

The public meetings were advertised in the Louisville *Courier Journal* and Clark County *News and Tribune* on May 31, 2011, and again on June 20, 2011, inviting all citizens to comment on alternatives being studied as part of the ongoing SEIS process.

The meetings were scheduled from 4:00 p.m. to 8:00 p.m. and were conducted as an open house format with exhibits and project staff available to explain the project and alternatives being considered. From 4:00 p.m. to 6:30 p.m. the public had the opportunity to view the exhibits, read the *Purpose and Need White Paper*, ask questions, and document their comments. The 6:30 p.m. to 8:00 p.m. period of each meeting was dedicated to a video presentation and an opportunity for the public to address the audience with project-related comments.

A total of 292 members of the public signed in at the Indiana public meeting and 304 signed in at the Kentucky public meeting. The public was invited to attend either or both meetings, regardless of their state of residence.

Display boards were on exhibit for each of the six project design sections to show the alternatives being recommended for further analysis. Project engineers and project representatives were available to answer questions on a one-on-one basis. Copies of the *Purpose and Need White Paper* were available for review and the public was encouraged to take the time to view the document.

In the presentation and on the boards, the following three alternatives were presented:

- No-Action Alternative

- 2003 Selected Alternative with tolls[1]
  - New Downtown I-65 Bridge (with bike/pedestrian lane)
  - New East End Bridge and I-265 linkage (6 lanes)
  - Rebuild Kennedy Interchange to the south
  - I-71 interchange with Frankfort Avenue

- 2011 Modified Alternative with tolls
  - New Downtown I-65 Bridge (without bike/pedestrian lane)
  - New East End Bridge and I-265 linkage (reduced to 4 lanes)
  - Rebuild Kennedy Interchange in place
  - No I-71 interchange with Frankfort Avenue

Comments on the alternatives and on the *Purpose and Need White Paper* were solicited in a variety of forms. The public was invited to: (1) provide their comments in writing, (2) sign up to speak at the public meeting, (3) have comments recorded by a court reporter at the public meeting, and/or, (4) enter their comments online on the project website. The public was given a 15-day comment period following the second public meeting in which to submit their comments.

There were a total of 1,231 comments received from the public in response to the public meetings. The comments represent 1,136 individuals or organizations (respondents). Of this total, there were 468 respondents who provided a comment specific to the project alternatives, including 29 who commented on mass transit.

Although the alternatives as presented, were intended to be considered project wide, covering both the downtown bridge and the east end bridge, most comments about the alternatives mention either one or the other bridge. Therefore, for the purpose of explaining the public comments, the alternatives comments were summarized by Downtown Alternatives comments and East End Alternatives comments.

Downtown

There were a total of 367 respondents who identified a preference regarding a new downtown bridge and approaches–330 in favor of No-Action downtown or build East End Bridge only, six in favor of the FEIS Selected Alternative, and 30 in favor of the Modified Selected Alternative).

Downtown Bridge and Approaches		
Alternatives	Respondents	Percent
FEIS Selected Alternative	7	0.5%
Modified Selected Alternative	30	2.6%
No Action (includes East End only)	330	29.0%
	367	32.2%

[1] Since the *Purpose and Need White Paper* was prepared, consideration of tolls with the 2003 Selected Alternative has been eliminated. The 2003 Selected Alternative without tolls is referred to herein as the "FEIS Selected Alternative." In addition, the 2011 Modified Alternative with tolls has been renamed as the "Modified Selected Alternative."

Of the 367 respondents, many were particularly critical of the Kennedy Interchange. Eighty-three percent of these comments (266 respondents) were generated by a campaign where the same, or virtually the same, comment was submitted on-line from the website by different individuals who favored building the East End Bridge first and then "removing or realigning interstates away from spaghetti junction."

East End

East End Bridge. The most common comment received involved building the East End Bridge first (413 respondents). A total of 74 respondents identified a preference regarding an East End Bridge alternative (18 in favor of the No-Action Alternative, 30 in favor of the FEIS Selected Alternative, and 26 in favor of the Modified Selected Alternative).

East End Bridge and Approaches		
Alternatives	Respondents	Percent
FEIS Selected Alternative	30	2.6%
Modified Selected Alternative	26	2.3%
No Action	18	1.6%
	74	6.5%

Among the comments about the East End Bridge were comments opposed to the proposed tunnel. Twenty-six (26) respondents specifically noted the East End Bridge should be constructed with no tunnel.

Mass Transit. There were twenty-nine (29) respondents that specifically mentioned being in favor of some form of improved mass transit (i.e. light rail, enhanced bus service, bike lanes, trains). Twelve of these respondents also selected the No Action Downtown Alternative, preferring nothing done downtown until improvements are made to mass transit. Some support the Big Four pedestrian/bicycle bridge as part of the solution, while others did not consider it to be an acceptable alternative to the pedestrian bridge designed with the FEIS Selected Alternative.

Because the public comments were open response, a variety of topics other than the project alternatives and *Purpose and Need White Paper* were submitted. Many respondents provided comments on multiple topics, therefore the following percentages in the listed summary do not add to 100. Key comments and the corresponding number of respondents included:

- East End Bridge Priority: 413 respondents (36.0% of all respondents)
- No Action Downtown: 330 respondents (29.0% of all respondents)
- Support for the Project: 304 respondents (26.8% of all respondents)
- No Tolls: 290 respondents (25.5% of all respondents)
- Build It Now or ASAP: 163 respondents (14.3% of all respondents)

Four organizations—National Trust for Historic Preservation, Hoosier Environmental Council, Sierra Club, Cumberland Chapter, and River Fields, Inc.—provided detailed comments on the alternatives and on the *Purpose and Need White Paper*. See Appendix F.2 for their comments.

Five agencies provided comments on the Purpose and Need White Paper. See Appendix C.7 for their comments and Section 7.2.7 for a summary.

All substantive comments were reviewed and considered in preparation of the SDEIS, and in finalizing the *Purpose and Need White Paper*. See Appendix F.1 for the *Louisville-Southern Indiana Ohio River Bridges Project Public Comments Report June 27, 2011 - July 15, 2011*.

***Draft Range of Alternatives Document*—Public Comments**

On August 10, 2011, following the public meetings, the *Louisville-Southern Indiana Ohio River Bridges Project (LSIORB) Supplemental Environmental Impact Statement Draft Range of Alternatives Document*, dated August 5, 2011, was mailed to the Resource Agency Coordination Team, Regional Advisory Committee members, and Section 106 consulting parties, along with a comparison document showing the differences between the FEIS Selected Alternative and the Modified Selected Alternative and the estimated cost savings for each of the six project design sections. (Information about Resource Agencies Coordination is presented in SDEIS Section 7.2.7, below.)

The documents were made available to the public on the project website (kyinbridges.com) on August 10, 2011. The following two weeks, information was shared through television news coverage and newspaper articles explaining the comment period and directing the public to the website. Comments were received for a 15-day period from August 11–August 25, 2011, from the Regional Advisory Committee, Section 106 consulting parties and the general public. The comment period was open until September 12, 2011, for the resource agencies.

One hundred thirteen comments were received by e-mail from 102 respondents (11 respondents submitted more than one e-mail); and another 13 respondents provided comments in a letter, for a total of 115 respondents. Following the review of comments, the *Draft Range of Alternatives Document* was revised and finalized as the *Alternatives Evaluation Document*, available for review in Appendix A.3.

The *Draft Range of Alternatives Document* described the process used in screening alternatives and proposed evaluating the following range of alternatives in the SEIS: No-Action Alternative, FEIS Selected Alternative, and Modified Selected Alternative. Although the comment period was intended to obtain input on the alternatives screening process and identified alternatives, the majority of comments (87.8%) were on the project in general.

Document-related comments from the Regional Advisory Committee, Section 106 consulting parties, and resource agencies were reviewed and considered in the finalization of the *Alternatives Evaluation Document* and in development of the SDEIS. Their comments are summarized in the *Alternatives Evaluation Document Public Comments Report, October 2011* of Appendix F.4.

7.1.2 Regional Advisory Committee

The Regional Advisory Committee (RAC) (referenced in the 2003 FEIS as the Regional Advisory Council) members represent government agencies; business groups; civic, cultural and environmental organizations: and major employers throughout the Louisville Metropolitan Area (LMA). The RAC consists of approximately 50 member organizations that were involved with the project during development of the 2003 FEIS.

The original members of the RAC were invited to attend a meeting on June 15, 2011, with KYTC, INDOT, FHWA, and the project design consultants. The purpose of the meeting was to provide the members with updated information on the project and give them an opportunity to provide input and ask questions. All of the initial member organizations were sent meeting invitation letters and 15 representatives from member organizations participated in the meeting. In addition, 3 alternate representatives and 13 members of the public attended. The member organizations with representation in attendance included:

City of Prospect
Clark County Planning, Zoning & Bldg. Commission
Clark-Floyd County Convention and Tourism Bureau
Coalition for the Advancement of Regional Transportation (CART)
Greater Louisville Inc. (GLI)
Hoosier Environmental Council (HEC)
Kentuckiana Regional Planning and Development Agency (KIPDA)
Kentuckians for Better Transportation (KBT)
Kentucky Center for African American Heritage (KCAAH)
Knob & Valley Audubon Society
LIUNA, Greater Louisville Central Labor Council
Louisville Codes and Regulations
Louisville Metro Air Pollution Control District (APCD)
Louisville Metro Public Works
River Fields, Inc.

The meeting included a PowerPoint presentation of the project history, an explanation of the need for the SEIS, and a section-by-section explanation of the three alternatives under consideration: No-Action Alternative, FEIS Selected Alternative, and the Modified Selected Alternative. Section Design Consultants (SDCs) described the alternatives in detail and provided graphics for each alternative in their respective section. The six design sections are listed in SDEIS Section 1.5.

Questions and comments were taken from the RAC member representatives and answers were provided by the project officials. Discussion at the meeting included questions about: right-of-way status, public transportation funds, TARC service, impact on tolls, and opportunities for future public comments. The Clark/Floyd Counties Convention and Tourism Bureau representative expressed concerns regarding access for visitors from I-65. In addition there were suggestions regarding potential funding sources (a casino-funded bridge between Indiana and

Illinois was referenced), as well as comments regarding the cost effectiveness of a bridges project versus mass transit options such as light rail and bus system improvements.

Also, by request of the RAC, an exhibit was later prepared showing the comparisons between the two build alternatives, for each of the six design sections. A copy was made available on the project website and is provided in Appendix A.2 of this SDEIS, labeled "Alternatives Comparison Exhibit."

A copy of the meeting summary including the all the questions, comments and responses are available in Appendix F.3.

The RAC was also provided a copy of the *Draft Range of Alternatives Document* on August 10, 2011, with a 15-day comment period (August 11–August 25, 2011). A copy of the comment letters, including those received from the following RAC members are provided in Appendix F.6: Hoosier Environmental Council, Town of Clarksville, Indiana; city of Prospect, Kentucky; River Fields, Inc. and Sierra Club, Cumberland Chapter; and Transit Authority of River City (TARC).

7.1.3 Area Advisory Teams

Area Advisory Teams (AATs) were originally formed as Area Work Groups (like those that were active during the 2003 FEIS process) to focus on local concerns and specific issues in the vicinities of the four possible Ohio River bridge termini. The AATs represent stakeholders in the following four geographic areas associated with the corresponding design sections of the project: Downtown Louisville (Section 1); Jeffersonville/Clarksville, Indiana (Section 3); Eastern Jefferson County, Kentucky (Section 4); and Eastern Clark County/Charlestown/Utica, Indiana (Section 6).

The SDCs made contact with the original AAT members in their sections and updated the list of representatives, and then KYTC and INDOT officials invited them to attend a meeting with project officials. The meetings, one for each of the four sections, were held in June 2011. Representatives from KYTC, INDOT, FHWA, the Bridges Authority, and the SDCs attended each meeting.

The AAT meetings followed a format similar to that of the RAC meeting; i.e., a PowerPoint presentation of the project history, an explanation of the need for the SEIS, and a detailed description of the three alternatives under consideration, followed by an open discussion period. The SDCs described the alternatives in detail and provided graphics for each alternative in a specific section. In addition, the adjoining design consultants responsible for design of the Ohio River bridges (Sections 2 and 5) were present to discuss the alternatives' relationship with the bridge design. A copy of the "Alternatives Comparison Exhibit" for each section is provided in Appendix A.2.

The ***Section 1 AAT*** meeting was held on June 20, 2011, at the Mellwood Arts Center in Louisville, Kentucky. Eleven representatives from nine area groups participated. The SDC 1 team described the Modified Selected Alternative (re-building the interchange in-place) and

showed the comparison to the FEIS Selected Alternative (building a new interchange to the south), with a potential savings of $800 million. The SDC 2 team attended and provided Ohio River bridge design details of the Modified Selected Alternative, which eliminates the 17-foot-wide pedestrian walkway and bikeway, for an estimated cost savings of $37 million. The pedestrian walkway and bikeway, a feature of the FEIS Selected Alternative, is proposed to be eliminated with the Modified Selected Alternative due to the development of the Big Four Bridge pedestrian/bicycle project nearby (as discussed in SDEIS sections 2.1 and 4.1.4). AAT member groups represented at the meeting included:

Phoenix Hill
Clifton Community Council
Butchertown Neighborhood Association
Downtown Development Corp
Louisville Downtown Management District
Louisville Waterfront Development Corp
Louisville Metro Public Works
Louisville Metro Planning and Design Services
Louisville Metro Housing Authority

A sample of topics included questions about the Big 4 Bridge pedestrian/bicycle path project, a noise wall in the Clifton area, the project delivery schedule, traffic studies, context sensitive design in the Waterfront Park area, and the Section 106 process. The Section 1 AAT Meeting Summary, including all the questions, comments and responses, is located in Appendix F.5.1.

The ***Section 3 AAT*** meeting was held on June 21, 2011, at the McCauley Nicolas Building in Jeffersonville, Indiana. Five representatives from five neighborhood groups participated. The SDC 3 team described the Modified Selected Alternative (a collector-distributor network that minimizes weaving) and compared it to the FEIS Selected Alternative (a complex network of bridges that eliminates weaving), with a potential cost savings of $215 million. Representatives of SDC 2 (Downtown Ohio River Bridge) attended and provided bridge-related details of the Modified Selected Alternative. AAT member groups represented at the meeting included:

Greater Clark County School
Clark Memorial Hospital
Southern Indiana Realtors Association
Jeffersonville Planning and Zoning
Jeffersonville City Pride

There were no questions from the audience, but a representative of the City of Jeffersonville provided a statement noting the City's appreciation for project-related work to resolve a design issue. The Section 3 AAT meeting summary, including the questions and responses, is located in Appendix F.5.2.

The ***Section 4 AAT*** meeting was held on June 16, 2011, at Gingerwoods, 7611 Rose Island Road in Prospect, Kentucky. Sixteen representatives from fifteen area groups participated. SDC 4 and

SDC 5 representatives compared the Modified Selected Alternative (4-lane initial/ roadway, tunnel, and bridge) to the FEIS Selected Alternative (6-lane roadway, tunnel, and bridge), with a potential cost savings of $90 million, including changes to the roadway profile through and south of the tunnel. The SDC 5 team also provided details of a reduced roadway section which also includes reduction of the pedestrian/bikeway width on the East End Bridge with the Modified Selected Alternative, for an overall estimated savings of $80 million. AAT member groups represented at the meeting included:

Bridgepointe Homeowners Association
City of Green Spring
City of Prospect
Harrods Creek Fire Protection District
Ken Carla Vista Neighborhood Association
Louisville Metro Council
Louisville Metro Planning and Design Services Division
Louisville Metro Public Works Assets
Prospect / Harrods Creek Neighborhood Association
Shadow Wood Neighborhood Association
Transylvania Avenue Neighborhood
Transylvania Beach Neighborhood Association
Wolf Creek Community Association
Wolf Pen Preservation Association
Wolf Pen Woods Community Association

Questions from the audience related to bridge deck design, potential noise impacts, the duration of tolling, birds nesting under the bridges, public involvement, drilling, access to U.S. 42 during construction, the grade under Wolf Pen Branch Road; and the right-of-way status. Section 4 AAT meeting summary, including all the questions and responses, is located in Appendix F.5.3.

The ***Section 6 AAT*** meeting was held on June 23, 2011, at the Utica Community Center in Utica, Indiana. Six representatives from five area groups participated. SDC 6 and SDC 5 representatives compared the Modified Selected Alternative (4-lane roadway, tunnel, and bridge) compared to the FEIS Selected Alternative (6-lane roadway, tunnel, and bridge), with a potential cost savings of $3 million. The SDC 5 team also provided details of the East End Bridge with the Modified Selected Alternative. AAT member groups represented at the meeting included:

Port of Indiana-Jeffersonville
Charlestown Chamber of Commerce
Fox Run Homeowners Association
Crystal Springs Subdivision
River Ridge Commerce Center

Questions from the audience related to bridge design and public involvement. The Section 6 AAT meeting summary, including the questions and responses, is located in Appendix F.5.4.

7.1.4 Public Workshops

Public workshops were held during development of the 2003 FEIS to explore specific issues associated with the project affecting key project decisions, project milestones, and long-term goals. While no public workshops have been held since the publication of the NOI, the public meetings, as described in Section 7.1.1, above, provided a similar opportunity for public involvement.

7.1.5 Stakeholder Communications

In addition to meetings with the advisory groups and the general public regarding the SDEIS, individual meetings and group presentations were held with elected officials, associations, and other stakeholders upon request. A sample of stakeholder meetings and presentations explaining the SEIS process and providing updated project information includes:

- Presentation to the Louisville Metro Council on April 21, 2011.
- Meeting with Transit Authority of River City (TARC) on May 11, 2011, to review their long-range transit plan and to discuss cross-river routes serving southern Indiana. Enhanced bus service is included in both the FEIS Selected Alternative and the Modified Selected Alternative. Options to enhance the bus service were discussed.
- Meeting with Councilman Jon Ackerson, who represents Louisville Metro's 18th District, on June 21, 2011, followed by a presentation at the councilman's Town Hall meeting on June 30, 2011.
- Presentation to the Main Street Association on July 12, 2011.
- Presentation to the Oldham County Chamber of Commerce on July 28, 2011.
- Presentation at the Southeastern Association of State Highway and Transportation Officials (SASHTO) annual conference on August 23, 2011.
- Presentation to the Kentucky Society of Professional Engineers (KSPE) on September 16, 2011.

7.1.6 Environmental Justice Initiatives

In accordance with Executive Order 12898, FHWA Directive 6640.23, and USDOT Order 5610.2, the LSIORB Project was evaluated for potential disproportionate impacts to minority and low-income populations.

U.S. Census data was used to identify Environmental Justice (EJ) populations in the project area by census blocks within the LMA. A proposal for reaching out to EJ populations living in the general area of the proposed LSIORB project was developed and implemented, and included the following elements: a traffic survey to identify bridge crossing patterns in the five county area to determine if differences exist in usage between race and income levels; group discussions among low-income residents, and special outreach efforts for public meetings. The criteria used to

identify the EJ populations and more information about the outreach process is provided in SDEIS Section 5.1.7.1.

7.1.7 Communication Tools

Project Website

The project website, www.kyinbridges.com, was a primary means by which information about the project was made available to the public. It contains information on the project schedule and cost, features of each project section, historic and environmental documents, Disadvantaged Business Enterprise program, and the proposed right-of-way impacts. There are links to the project newsroom; public involvement groups and their meetings; the Bridges Authority website; the project Ombudsmen and a gallery of pictures. Downloadable files are available ranging from meeting summaries to detailed engineering plans. In addition, the site has interactive maps showing the roadway and bridges overlays on aerial photography, and the Bridges Project Update video prepared for the June 2011 public meetings. Information is updated as the project proceeds.

The website has posted information about:

- Public meetings
- *Purpose and Need White Paper*
- *Range of Alternatives Document*
- Comparison chart between the Selected Alternative and the Modified Alternative ("Alternatives Comparison Exhibit")
- *Section 106 Identification of Properties Workbook*
- Other project related documents and information

The video (described in more detail below) comparing the 2003 FEIS Selected Alternative with the Modified Selected Alternative used at the June 27 and 28, 2011, public meetings was posted on the website, along with a link to provide comments during the public-comment period. The graphics for the 31 presentation boards, which were used during the public meetings, are located on the website at *http://www.kyinbridges.com/pdfs/presentation-boards-june-2011-public-meetings.pdf*. In addition, the website provides a slide-show comparing the two build alternatives.

There were 689 comments submitted through the website during the public meeting comment period of June 27–July 15, 2011. The comments were counted and analyzed as part of the Public Meeting Comments in 7.1.1, above.

Video

The LSIORB Project is inherently complicated, making it difficult to explain to a general audience within the constrained timeframe of public meetings. Therefore, the KYTC and INDOT made the decision to produce a video providing an overview of the project. The video was

presented to the public at the public meetings of June 27 and June 28, 2011, and is now available on the project website. The content includes the following:

- History of all Louisville bridges
- Current problems of overcapacity, poor design and incomplete highway linkage
- Basic purpose of the Ohio River Bridges Project—to improve cross-river mobility between Jefferson County, Kentucky, and Clark County, Indiana
- Comparisons between the FEIS Selected Alternative and the Modified Selected Alternative
- Cost
- Tolling
- Future steps

E-mail

Since February 15, 2011, when the NOI to develop the SEIS was published, nearly 750 comments have been received by e-mail from the project website as part of the public involvement process: 689 were received within a 15-day period in response to the public meetings of June 27 and 28, 2011; and approximately 60 were submitted directly from the website either before or after the public meeting comment period.

When comments or questions are submitted directly through the website, the sender is asked if he/she would like a response. The project manager typically responds in less than 24 hours with a message catered specifically to the question or concern raised. Persons who submit comments/questions are also asked if they would like e-mail updates, which are sent periodically to the individuals in the public involvement database. During the SDEIS phase, the following e-mail notices have been sent:

- April 6, 2011—Bridges Project begins final review process with series of public meetings
- April 18, 2011—Conflict of interest guidelines issued for Louisville - Southern Indiana Ohio River Bridges Project
- June 6, 2011—Cost-saving alternatives would cut $1.2 billion from the LSIORB Project
- September 13, 2011—Request for Information issued by the Bridges Authority

7.1.8 Media Relations

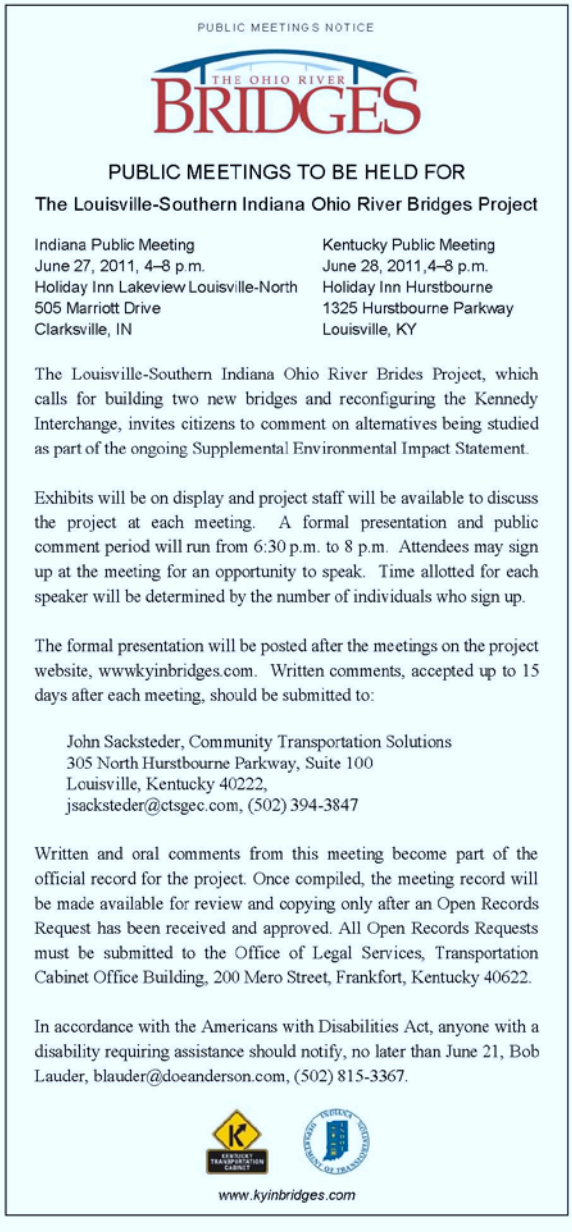
Since the announcement of the SEIS in mid-February of 2011 until the end of September 2011, there has typically been daily coverage in the media. Some days, as many as 20 media outlets have reported on the project. When the public meetings were underway in late June 2011, the LSIORB Project was often the lead story and front page news, as indicated by the following news headline examples:

- "New Hearings Set On Bridges: Public Asked For Comments," June 26, 2011, *Courier-Journal*, Louisville, Kentucky
- "Public Gets Chance To Weigh In On Bridges Project," June 27, 2011, MSNBC.com
- "Bridges Project Public Comment Hearings Today And Tomorrow," June 27, 2011, WFPL-FM (public radio), Louisville, Kentucky
- "Public Hearing In Louisville For New Bridge Design," June 27, 2011, WHAS TV
- "Project Hearings On Massive Project Set To Begin," June 27, 2011, *Inside Indiana Business*
- "Comment Period For Bridges Project," June 27, 2011, WEKU, Richmond, Kentucky
- "Public Has Their Say: Concerns Of Tolling, Safety Voiced At Indiana Meeting On Ohio River Bridge," June 27, 2011, *News & Tribune*, Jeffersonville, Indiana
- "Second Bridges Project Meeting In Louisville Tuesday Night," June 28, 2011, *Courier-Journal*, Louisville, Kentucky
- "Second Bridges Project Meeting Attracts 250 In Louisville," June 28, 2011, *Courier-Journal*, Louisville, Kentucky

Ongoing contact is kept with local news media in Kentucky and Indiana to disseminate information about the project and notify the public about upcoming meetings and events. Media inquiries are directed to appropriate personnel, stories are monitored by the LSIORB team, and media is provided with information on an ongoing basis.

Paid Advertising

To inform the public of the late June 2011 public meetings, in accordance with legal notification requirements, advertisements were placed in the



PUBLIC MEETINGS NOTICE

THE OHIO RIVER BRIDGES

PUBLIC MEETINGS TO BE HELD FOR

The Louisville-Southern Indiana Ohio River Bridges Project

Indiana Public Meeting
June 27, 2011, 4–8 p.m.
Holiday Inn Lakeview Louisville-North
505 Marriott Drive
Clarksville, IN

Kentucky Public Meeting
June 28, 2011,4–8 p.m.
Holiday Inn Hurstbourne
1325 Hurstbourne Parkway
Louisville, KY

The Louisville-Southern Indiana Ohio River Brides Project, which calls for building two new bridges and reconfiguring the Kennedy Interchange, invites citizens to comment on alternatives being studied as part of the ongoing Supplemental Environmental Impact Statement.

Exhibits will be on display and project staff will be available to discuss the project at each meeting. A formal presentation and public comment period will run from 6:30 p.m. to 8 p.m. Attendees may sign up at the meeting for an opportunity to speak. Time allotted for each speaker will be determined by the number of individuals who sign up.

The formal presentation will be posted after the meetings on the project website, wwwkyinbridges.com. Written comments, accepted up to 15 days after each meeting, should be submitted to:

John Sacksteder, Community Transportation Solutions
305 North Hurstbourne Parkway, Suite 100
Louisville, Kentucky 40222,
jsacksteder@ctsgec.com, (502) 394-3847

Written and oral comments from this meeting become part of the official record for the project. Once compiled, the meeting record will be made available for review and copying only after an Open Records Request has been received and approved. All Open Records Requests must be submitted to the Office of Legal Services, Transportation Cabinet Office Building, 200 Mero Street, Frankfort, Kentucky 40622.

In accordance with the Americans with Disabilities Act, anyone with a disability requiring assistance should notify, no later than June 21, Bob Lauder, blauder@doeanderson.com, (502) 815-3367.

www.kyinbridges.com

FIGURE 7-1: Public Meeting Advertisement

Courier-Journal and the *News and Tribune*. The quarter-page ads (approximately 8" x 11") ran in the Metro section of each newspaper on May 31, 2011, and again on June 20, 2011. A sample of the ad is provided as Figure 7-1, above.

News Releases

During the development of the SDEIS, news releases were produced to inform the media and public about the proposed changes in the project as well as to notify them of public meetings. The news releases were posted on the project website, including the following:

- April 6, 2011—"Bridges Project Begins Final Review Process With Series of Public Meetings"
- May 11, 2011—"Bridges Project Sets Dates for Public Meetings"
- June 2, 2011—"Cost-Saving Alternatives from Governors, Mayor Would Cut $1.2 Billion from Bridges Project"

7.1.10 Section 106 Historic Resources Review Public Involvement

During the 2003 FEIS process, a public involvement plan specifically to address Section 106 of the National Historic Preservation Act was developed by FHWA, KYTC, and INDOT. The plan included inviting local governments, state historic preservation agencies, Native American Tribes with ties to the project area, and members of the public to become consulting parties in the Section 106 process.

For this SDEIS, the Section 106 consulting party process activities were reinitiated. The Section 106 process is summarized in Section 4.3 and 5.3 of this SDEIS, and will remain ongoing through the development of this project.

The *Draft Range of Alternatives Document,* dated August 5, 2011, was mailed to the Section 106 consulting parties on August 10, 2011, along with a comparison document showing the differences between the FEIS Selected Alternative and the Modified Selected Alternative and the estimated cost savings for each of the six project design sections. Comments were received during the 15-day period (August 11–August 25, 2011). Comments by the following agencies and organization are provided in Appendix F.6: Kentucky Heritage Council; Indiana Department of Natural Resources (Indiana SHPO); National Trust for Historic Preservation (NTHP); Town of Clarksville, Indiana; and River Fields, Inc.

For review and comment by the consulting parties and the general public, the *Identification Workbook for the LSIORB Section 106 Process* was posted on the website on September 14, 2011. Other Section 106-related materials will be posted for public review and comment as they become available. In addition, the general public also has the opportunity to provide comments on this SDEIS, including the Section 106 information presented in sections 4.3 and 5.3 (both titled *Historic and Archaeological Resources*).

7.1.10 SDEIS Circulation and Public Hearing

The publication of the Notice of Availability of the SDEIS in the *Federal Register* will begin a 45-day period during which the public can comment on the draft document. During the comment period, Public Hearings will be held to allow the public to review the SDEIS, including displays depicting the build alternatives evaluated in this document, and provide their verbal or written comments. Project staff will be available to discuss the project one-on-one with the public. All substantive comments received on the SDEIS during the 45-day comment period will be considered, become part of the project administrative record, and will be incorporated into the FSEIS, along with FHWA/KYTC/INDOT responses to the comments.

The public will be able to view the SDEIS on the project website (www.kyinbridges.com), at several regional libraries, including the Louisville Free Public Library, 301 York Street, Louisville, Kentucky, and the Jeffersonville Township Public Library, 211 East Court Avenue, Jeffersonville, Indiana. The Public Hearings will be held in Jeffersonville, Indiana and Louisville, Kentucky and will be advertised in the local newspapers and through news organizations.

During the 45-day comment period, comments will be accepted in various forms. The public can: (1) provide their comments in writing or e-mail, (2) sign up to speak at the Public Hearing(s), (3) have comments recorded by a court reporter at the Public Hearing(s), and/or (4) enter comments online on the project website.

7.1.11 Summary

The public involvement process that has been developed and implemented in conjunction with the SDEIS has followed the NEPA process for communicating with resource agencies, stakeholders, including meetings with the Regional Advisory Committee, Area Advisory Teams, consulting parties, and the general public. The project team was open and available throughout the SDEIS process to update the public, solicit input, provide interviews, and communicate with the media as requested.

In addition, two Public Hearings will be scheduled for review of the SDEIS. A summary of the Public Hearings, along with comments and responses will be incorporated into the FSEIS.

7.2 Resource Agency Coordination

There was extensive resource agency coordination throughout the 2003 FEIS documentation process that culminated with the 2003 ROD. The coordination process with resources agencies for this SDEIS has involved publication of legal notices, agency briefings and coordination meetings, and solicitation of agency jurisdictional concerns. At the beginning of the SDEIS process in 2011, the agencies were contacted and given the opportunity to continue their involvement as either a cooperating agency or participating agency. A *Draft Coordination Plan*; a *Draft Purpose and Need White Paper*; and a *Draft Range of Alternatives Document* have been prepared and provided to resource agencies for review and comment, the following subsections

summarize this effort. A meeting was held on May 26, 2011 with the Resource Agencies to brief them on the development of the SEIS. A summary of this meeting is contained in Appendix C.5.

7.2.1 Notice of Intent (NOI)

As noted above, FHWA issued a Notice of Intent on February 15, 2011, advising the public that an SEIS was to be prepared for the Louisville–Southern Indiana Ohio River Bridges Project. The notice was given based on a proposal by INDOT and KYTC to modify the Selected Alternative identified in the FEIS of April 8, 2003, and the ROD issued on September 6, 2003. The proposed modifications include revising several design elements and using innovative financing sources, including collecting tolls. A copy of the NOI is included as Appendix C.1.

7.2.2 Federal Stakeholders Executive Briefing

The Federal Stakeholders Executive Briefing took place in October 1998 at the beginning of the 2003 FEIS process. Another briefing was not necessary for the SEIS because the Federal agencies were already familiar with the LSIORB Project.

7.2.3 Early Coordination

Resource agencies were contacted on April 28, 2011, to determine their willingness to continue involvement on the project. Agencies were invited to join the consultation process for the project as either a cooperating or a participating agency pursuant to Section 6002 of SAFETEA-LU. A *Draft Coordination Plan* (Appendix C.2) was sent to the agencies for review and comment. Thirteen agencies accepted the invitation to continue involvement on the project. Two agencies declined.

Invitation letters were mailed on May 3, 2011, for the Resource Agency Coordination Meeting scheduled for May 26, 2011 in Louisville, Kentucky. The FHWA, KYTC, and INDOT updated the data on which the Purpose and Need Statement for the project was based, and reviewed the previous alternatives screening process to determine whether (1) the decisions documented in the 2003 FEIS remained valid, and (2) whether additional alternatives should be considered as a result of the proposed project modifications, including the potential use of tolling. The *Environmental Analysis Methodology* (Appendix A.4) detailed the process to be followed to evaluate impacts associated with changes in the project area since the 2003 FEIS. Drafts of the *Coordination Plan* and of the *Environmental Analysis Methodology* were distributed for review and comment.

The only question from the resource agencies at the meeting pertained to the SEIS schedule. However, USEPA Region 4 followed up in a letter dated June 8, 2011, with questions about the wetlands. The U.S. Coast Guard also followed up, by letter dated June 9, 2011, asking how the project crossed Harrods Creek, and providing a comment about the Migratory Bird Treaty Act of 1918. FHWA replied to both on June 10, 2011. On June 21, 2011, the U.S. Army Corps of Engineers (USACE) submitted a comment on the *Environmental Analysis Methodology*, providing a minor correction to the text.

A list of all resource agencies (including lead agencies, cooperating agencies, and participating agencies) identified as having an interest in the project area is provided in Appendix C.3. The agencies' letters accepting/declining the invitation to the coordination meeting are also available in Appendix C.4.

7.2.4 INDOT–State Agency Coordination Meeting

The INDOT–State Agency Coordination Meeting occurred during the development of the FEIS to acquaint Indiana resource agencies with information about the project history, schedule, and impact issues and to further define the collaborative, interagency coordination process. This meeting was not necessary to the SEIS process because the Indiana resource agencies had become familiar with the LSIORB Project during the FEIS process. As noted in discussions in Section 7.2, *Resource Agency Coordination*, and throughout this SDEIS, coordination with resource agencies has been on-going since the April 2011 Resource Agency Coordination Meeting.

7.2.5 KYTC–State Agency Coordination Meeting

This coordination meeting was not necessary in the SDEIS process because the Kentucky resource agencies had become familiar with the LSIORB Project during the FEIS process, and coordination has been on-going since the initiation of the SDEIS process.

7.2.6 Agency Scoping Meeting

An Agency Scoping Meeting occurred during the FEIS process to provide preliminary information about the project, identify issues of potential concern, and review the Draft Purpose and Need Statement, among other tasks. As noted above, Federal and state agencies had become familiar with the LSIORB Project during the FEIS process. In addition, the Resource Agency Coordination Meeting (see Section 7.2.3, above) presented agencies with the opportunity to discuss and comment on the proposed methodology to be used during the environmental analysis associated with the current project, and agencies' review and comment on the project purpose and need, alternatives development, Section 106 process, and other tasks are on-going.

7.2.7 *Purpose and Need White Paper* and *Draft Range of Alternatives Document* Coordination

***Purpose and Need White Paper*—Resource Agency Comments**

This SDEIS has been prepared as a result of proposed design changes to the Selected Two Bridges/Highway Alternative (FEIS Selected Alternative) since the 2003 FEIS/ROD. As part of the SDEIS process, and due to the passage of time since the FEIS/ROD were completed, the original purpose and need of the project were reevaluated and the supporting data updated to confirm whether or not they remain applicable.

The *Draft Purpose and Need White Paper* concluded the original purpose and need for the project was still valid. A copy was provided to the cooperating and participating agencies on June 3, 2011, with a 30-day comment period.

Five agencies responded to the request for comment on the document, summarized as follows:

- United States Coast Guard: Proposed no changes.
- Indiana Department of Natural Resources (IDNR): Had no questions or recommended changes, but did comment on the traffic projections on the Sherman Minton Bridge and the Clark Memorial Bridge with respect to proposed tolling.
- Kentuckiana Planning and Development Agency (KIPDA): Offered suggestions and clarifications to references to KIPDA in the document; but had no recommended changes to the five purpose and need factors.
- Transit Authority of River City (TARC): Stated they had no objections.
- U.S. Environmental Protection Agency (USEPA): Region 4 had a question about wetlands, but no recommended changes to the purpose and need.

The agency comments on the purpose and need are provided in Appendix C.7.

The draft document was made available to the public on June 27 and June 28, 2011, as part of the public meetings for the project and was also made available on the project website.

As reported in Section 7.1.1, above, 3 letters and 1 comment form regarding the *Draft Purpose and Need White Paper* were received from the public during the public comment period following the public meetings. An additional 14 comments were received during the *Draft Range of Alternatives Document* comment period. A summary of those comments can be found in 7.1.1.

The agency and public comments were reviewed and considered in preparation of the SDEIS, and in finalizing the *Purpose and Need White Paper*. There was no information provided that changed the five factors of the projects purpose and need.

See Appendix A.1 for a copy of the *Purpose and Need White Paper* and Chapter 2 of this SDEIS for details related to the purpose and need for the project.

***Draft Range of Alternatives Document*—Resource Agency Comments**

The *Draft Range of Alternatives Document* was mailed for review and comment to cooperating and participating agencies on August 10, 2011, with a 30-day comment period. The document was also mailed to the Section 106 consulting parties and the Regional Advisory Committee members on August 10, 2011, with a 15-day comment period.

A total of 115 comments were received. A total of 14 comments were detailed responses specific to the Range of Alternatives development process, of which 12 were from resource agencies (USEPA and U.S. Coast Guard), nine from Section 106 consulting parties, or RAC members, and 3 were from members of the public who are not part of the member groups. A summary of comments are provided in the *Alternatives Evaluation Document Public Comments Report, October 2011* in Appendix F.4.

Specific comments can be found in Appendix C.8 for resource agencies and Appendix F.6 for others.

Following the review of comments, the *Draft Range of Alternatives Document* was revised and finalized as the *Alternatives Evaluation Document*, available for review in Appendix A.3.

7.2.8 Agency Coordination Meeting on Indirect and Cumulative Effects Analysis

Agency coordination on indirect and cumulative effects occurred during the development of the 2003 FEIS, the results of which are still applicable to this SDEIS process. In addition, the potential indirect impacts associated with the Modified Selected Alternative are being discussed in the Section 106 process, including consultation with the Kentucky and Indiana State Historic Preservation Officers (SHPOs). (See SDEIS sections 4.3. and 5.3 for a discussion of the indirect effects to historic resources.)

7.2.9 U.S. Fish and Wildlife Service Coordination for Threatened and Endangered Species

Coordination with the U.S. Fish and Wildlife Service (USFWS) occurred following the 2003 FEIS, per Section 7 of the Endangered Species Act (ESA) regarding the preparation of the Biological Assessment (BA) (see Section 5.7-3, herein). Amendments were proposed and a revision was being reviewed at the time of the publication of the NOI to prepare a SEIS. In March 2011, USFWS advised in a letter that the effects of the project modifications to federally protected species should be considered in the amended BA. Thus, a revised amended BA has been prepared and will be resubmitted to USFWS for their comments or approval. The conclusion to the coordination will be documented in the Final SEIS.

7.2.10 U.S. Army Corps of Engineers Wetland Coordination

USACE was a cooperating agency through the 2003 FEIS and ROD. On April 6, 2011, USACE was asked to continue to be a cooperating agency providing decisions that guide the project in development of the SDEIS. In letter dated May 11, 2011, the agency agreed to continue to serve in that role, and then attended the May 26, 2011, Resource Agency Coordination Meeting.

FHWA, INDOT, KYTC, and project managers met with USACE on April 26, 2011, regarding coordination of the permit approval process. In consideration of the accelerated schedule, USACE agreed to review a draft permit application in advance of the publication of the SDEIS. The draft permit application is expected to be sent to USACE in the fourth quarter of 2011 for advance review purposes. An official permit will be submitted for approval following the Record of Decision on the SEIS. The agency provided a response to the *Environmental Analysis Methodology* on June 29, 2011, requesting the *Eastern Mountains and Piedmont Region (Kentucky) Regional Supplement* for the performance of jurisdictional wetland delineations in Kentucky be added to the *Environmental Analysis Methodology*. The supplement was incorporated and used in development of the SDEIS.

The *Draft Range of Alternatives Document* was submitted to USACE for review on August 10, 2011. The agency did not provide a comment.

7.2.11 Coordination with Waterfront Development Corporation

Extensive coordination with the Waterfront Development Corporation in Louisville, Kentucky, occurred following the 2003 ROD and through the design of the FEIS Selected Alternative. Since the NOI the Waterfront Development Corporation was invited to become a participating agency; they replied with acceptance on April 22, 2011. The representatives for the Waterfront Development Corporation attended the previously discussed Section 1 AAT meeting that was held on June 20, 2011.

On July 12, 2011, the president of the Waterfront Development Corporation attended a presentation made to the Main Street Association at which the need for the SEIS was explained and a detailed description of the three alternatives associated with the project was provided.

The Waterfront Development Corporation was mailed a copy of the *Draft Purpose and Need White Paper* on June 3, 2011. They had no comments. Coordination with the Waterfront Development Corporation is expected to occur once again should a build alternative be selected as the preferred alternative.

7.2.12 Consulting Party Coordination under Section 106

Early in the SDEIS process, the original (2003 FEIS) Section 106 consulting parties, including the State Historic Preservation Officers in Indiana and Kentucky, were contacted to determine their interest and willingness to continue to participate as a consulting party in the renewed Section 106 process. Letters were mailed on April 18, 2011, and a follow up letter sent on June 13, 2011, to those who did not respond. For a list of consulting parties, see Appendix D.1.

The initial meeting for the Section 106 consulting parties for this SDEIS was held on June 1, 2011, at the McCauley Nicolas Building in Jeffersonville, Indiana. Seven consulting party representatives attended along with 25 representatives from KYTC, INDOT, FHWA, the Bridges Authority, and project design consultants. Three individuals from the public attended, including a reporter for the *Courier Journal*. This meeting initiated the Section 106 process by introducing the consulting parties to information about the development of the SDEIS, changes to the project, and the steps to be taken to address issues related to historic and archaeological resources. See Appendix D.3.2 for the meeting summary.

The Section 106 Identification of Historic Properties meeting was held on September 29, 2011. On September 14, 2011, the draft workbook identifying historic resources (*Identification Workbook for the LSIORB Section 106 Process*) was made available to the consulting parties and the public via the mail and the project website, respectively. The workbook was reviewed at the meeting, and discussions identified those historic properties in the Original APE and in the Extensions to the Original APE. The consulting parties suggested additional areas to be included in the Extensions to the Original APE and additional properties to be assessed for NRHP eligibility. See Appendix D.4.1.3 for a copy of the *Identification Findings Report,* and Appendix

D.4.1.4 for a copy of the meeting summary. Sections 4.3 and 5.3 in this SDEIS discuss in detail the Section 106 process and the consultation with consulting parties.

The Section 106 consultation parties will be engaged in additional meetings as necessary during completion of the Section 106 process. Documentation developed during the process will be made available on the website.

7.3 Listing of Comments and Responses

All substantive comments received on the SDEIS during the 45-day period of public comment on the document, including those received during or following the Public Hearings, will become part of the project administrative record and will be incorporated into the FSEIS, along with FHWA/KYTC responses to the comments. (See Section 7.1.11, above, for details regarding the Public Hearings and comment period.)

CHAPTER 8: COMMITMENTS AND MITIGATION

Since approval of the 2003 FEIS, additional mitigation measures have been developed for the Modified Build Alternative. ***These additional measures are identified below in italics***. Those measures that have not changed since the FEIS are not italicized.

8.1. Mitigation Commitments

These mitigation measures will be implemented during the design and construction phases of project development.

Endangered Species

The following is a summary of the mitigation measures and commitments identified in the Biological Assessment (See Section III of this Chapter) for the Indiana bat, gray bat, federally listed mussels and the least tern. For additional information, please refer to the Biological Assessment.

- *FHWA proposes to enter into a Conservation MOA with USFWS to account for the incidental take of Indiana bat summer habitat. A Conservation MOA with USFWS would allow KYTC and INDOT flexibility in project timing with regard to the removal of suitable Indiana bat habitat. In exchange for this flexibility, FHWA will provide will provide a contribution to the Indiana Bat Conservation Fund, to be used for recovery-focused conservation benefits to the Indiana bat through the implementation of minimization and mitigation measures that are described in the "Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky".*
- Construction limits will be minimized.
- *No construction work will be permitted at night at stream crossings, with the lone exception of pouring concrete for bridge decks.*
- *All culverts and pipes will be designed and constructed such that the bottom (invert) is at a lower elevation than the stream bottom/bed, and the design of the culvert/pipe is such that it will allow natural stream bed material to accumulate throughout the length of the culvert. This will allow for colonization and production of macroinvertebrates within the culvert/pipe; thus minimizing the impact upon and reduction of productivity of a food resource for gray bats.*
- *Seasonal restrictions on the removal of trees to minimize disruption to Indiana bat maternity activities in accordance with consultation conducted with the USFWS.*
- *Trees greater than or equal to 5 inches diameter at breast height (dbh) will be avoided except those in the direct construction limits.*
- Hollow trees, trees with sloughing bark, and other large trees that occur within the project limits will be avoided to the maximum practical extent and delineated by special notes in the plans and measures such as special fencing during construction.

- To maintain a riparian buffer zone, tree cutting will be maintained within the construction limits and will be limited to that absolutely necessary to complete the project.
- "DO NOT DISTURB" signs will be placed at the construction zone boundaries for the portions of the project within Indiana. These signs will be placed beyond the construction limits to protect re-vegetation areas and areas of existing vegetation. Trees that fall within the right-of-way, but outside of the construction limits, will be identified during the design phase and delineated by fencing or other measures to minimize impacts.
- "DO NOT MOW OR SPRAY" signs will be posted along the right-of-way for selected areas (areas of woody re-vegetation, wetlands and preservation of existing woody vegetation) in Indiana in accordance with INDOT requirements and in selected areas in Kentucky where mitigation plantings may be required.
- In Indiana, INDOT will purchase at a 1:1 ratio, existing woodland for preservation or re-vegetate upland woodland at a 1:1 ratio to mitigate forested habitat lost as a result of this project.
- Excess parcels that have been purchased as part of this project will be used for wetland mitigation or reforestation, as appropriate.
- *In Kentucky, disturbed areas at stream crossings will be re-vegetated with tree species that produce sloughing bark and snags and follow the general guidelines of USFWS, Interstate Mining Compact Commission, and Office of Surface Mining (2009). Species will include a minimum of six different tree species. Species selection should be determined by site-specific characteristics (soil moisture, sun exposure, etc.) and seedling availability. A stocking success rate of not less than 300 stems per acre will be required. A minimum of four species identified as "Exfoliating Bark Species" must be planted and equal at least 40% of the minimum stems per acre. Tree species will be planted at approximately equal rates. "Exfoliating Bark Species" (suitable for planting in the project area) are sugar maple (Acer saccharum), bitternut hickory (Carya cordiformis), pignut hickory (Carya glabra), shellbark hickory (Carya laciniosa), shagbark hickory (Carya ovata), mockernut hickory (Carya tomentosa), eastern cottonwood (Populus deltoides), white oak (Quercus alba), shingle oak (Quercus imbricaria), northern red oak (Quercus rubra), post oak (Quercus stellata), black oak (Quercus velutina), sassafras (Sassafras albidum), and slippery elm (Ulmus rubra). An herbaceous ground cover of native species will be established.*
- As part of the Waterway and Riparian Vegetation mitigation, tree species suitable for bat habitat that produce sloughing bark and snags will be planted to the maximum extent possible in disturbed areas. These species include sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*), shellbark hickory (*Carya laciniosa*), shagbark hickory (*Carya ovata*), mockernut hickory (*Carya tomentosa*), eastern cottonwood (*Populus deltoides*), white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and slippery elm (*Ulmus rubra*).

- Frequent fording of live streams will not be permitted. Temporary bridges or other structures shall be used whenever necessary. Unless otherwise approved in writing by the project engineer and upon receipt of any required permit or other local, state or federal approval, mechanical equipment shall not be operated in live streams or in wetlands. Only coarse granular material will be permitted to be placed in live streams during construction. Any temporary river accesses built in conjunction with this project will be completely removed upon completion of construction activities. Details of the mitigation for stream impacts requiring local, state or federal permits, certifications or other approvals will be developed during final design.
- Preservation of surface water quality will be controlled by minimizing and maintaining stream-crossing impacts. Channel work such as, vegetation clearing, channel widening, shaping of spill slopes and placement of riprap will be limited to the construction limits.
- *Staging, refueling, and cleanup areas will not be allowed alongside streams. Equipment cleaning/staging areas will be located such that runoff from these areas will not directly enter the stream. Equipment cleaning/staging areas will be located such that effluent will be filtered through vegetated areas and proper sediment control structures located between the staging area and receiving water-bodies; thereby minimizing the potential for stream impacts such as sedimentation and pollution.*
- All KYTC and INDOT Best Management Practices (BMPs) for stream protection will be in place during project construction. INDOT's *Standard Specifications* and INDOT's *Special Provisions* will govern construction activities in Indiana to control erosion and subsequent water pollution. KYTC's *Standard Specifications for Road and Bridge Construction* will guide construction activities in Kentucky. BMPs will be utilized to prevent non-point source pollution, to control stormwater runoff and to minimize sediment damage to water quality and aquatic habitats. BMPs will include:
    - Temporary and permanent erosion control features will be incorporated into the project at the earliest practicable time as construction progresses.
    - When seeding or sodding must be delayed, temporary erosion protection with mulches, fiber mats, matting, dust palliatives, crust-forming chemicals, or plastic sheets will be provided.
    - Erosion control measures such as berms, dikes, geotextile filter cloths, slope drains, sediment basins, mulched seeding, sodding, and riprap will be installed where appropriate. Use of sediment traps will be determined for specific streams as dictated by the construction permit process.
    - *During grade and drain operations (occurring after initial clearing and grubbing of the corridor), mulch will be spread across all areas where no work will be conducted for a 21-consecutive-day period. Equipment needed to properly spread mulch will be located on-site.*
- *The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Indiana portion of the project. (See INDOT's*

Standard Specifications, Spill Response Section of the Laws and Regulations Section for further information:

- *Construction—Hazardous material releases, oil spills, fish/animal kills and radiological incidents must be reported to Office of Emergency Response (OER), IDEM (888) 233-7745.) Reporting should occur as soon as action has been taken to either contain/control the extent of the release, or protect persons, animals or fish from harm or further harm. Appropriate response actions for spills occurring on project sites should occur in the following order: identify the spilled material from a safe distance; contain the spilled material or block/restrict its flow using absorbent booms/pillows, dirt, sand or by other available means; cordon off the area of the spill; deny entry to the cordoned off area to all but response personnel; and contact OER/IDEM then Operations Support.*
- *Operations—INDOT Hazardous Material Accidents/Incidents Policy, February 1992 (Revised July 1998 or most recent version).*

- *Pouring of concrete for piers and/or decking will be done such that spills into the stream do not occur. In the unforeseen event that spillage does occur, USFWS office will be notified and the resident engineer shall halt the activity immediately and not resume until appropriate remedial actions have been implemented.*
- *Borrow sites and excess material sites for disposal of construction spoil have not been determined at this time. Excess material and borrow sites will be investigated later when a determination is made on how construction phasing will progress. Further coordination with USFWS will be undertaken to address this issue at that time. Once these sites have been determined the following will help to reduce their potential impact. The contractor will be required to develop a plan detailing the source and method of transportation of borrow/fill. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be controlled during and after completion of the work by minimizing the erosion in such a way that it will prevent sediment from entering streams or other bodies of water. Excess material areas will be located and constructed in a manner that will keep sediment from entering streams. BMPs such as diversion channels, dikes, and sediment traps will be used for this purpose. All excavated materials not utilized for roadway embankment or disposed of off-site will be hauled for storage to an upland site and secured in such a manner as to prevent runoff from entering streams.*
- *USFWS shall be contacted by KYTC at least one week prior to the start of construction for the proposed project.*
- *If bridge construction does not begin within five years of the September 2007 surveys, KYTC will contact the Frankfort, Kentucky Field Office of USFWS to assess the need for reevaluation of the potential of the project to adversely affect federally listed mussel species. This will ensure that no adverse affects to the federally listed mussel species occur.*
- *KYTC commits to survey any suitable interior least tern nesting areas during subsequent nesting seasons prior to construction. This will ensure that suitable least tern habitat*

areas are not occupied and no adverse affects to the interior least tern will occur from the project. The results of such surveys will be coordinated with the Frankfort, Kentucky Field Office of USFWS to determine if further consultation is required.

Terrestrial Wildlife and Habitat

The following mitigation measures for impacts to terrestrial wildlife and habitat are proposed to be incorporated into the project:

- DO NOT DISTURB signs will be placed at the construction zone boundaries for those portions of the Project within Indiana. These signs will be placed beyond the construction limits to protect re-vegetation areas and areas of existing vegetation. Trees that occur within the right-of-way, but outside of the construction limits, will be identified during the design phase and delineated by fencing or other measures to minimize impacts.
- In order to maintain a riparian buffer zone, tree cutting will be minimized within the construction limits and will be limited to that absolutely necessary to complete the Project.
- Hollow trees, trees with sloughing bark, and other large trees that occur within the Project limits will be avoided to the maximum practical extent and delineated by special notes in the plans and measures such as special fencing during construction.
- DO NOT MOW OR SPRAY signs will be posted along the right-of-way for selected areas (areas of woody re-vegetation, wetlands and preservation of existing woody vegetation) in Indiana in accordance with INDOT requirements and in selected areas in Kentucky where mitigation plantings may be required.
- INDOT will purchase existing woodland at a 1:1 ratio for preservation, or will re-vegetate upland woodland at a 1:1 ratio to mitigate forested habitat lost as a result of this Project.
- Excess parcels that have been purchased as part of this Project will be utilized for wetland mitigation or reforestation, as appropriate.
- Invasive-free mulches, topsoil and seed mixtures, and eradication strategies to eliminate known invasive species will be incorporated into the final Project.
- Provisions will be included in the final plans emphasizing the selection of construction and landscaping techniques and equipment that will minimize the spread of invasive plant species, particularly in areas where steep slopes are involved. Attention shall also be given to minimizing soil disturbance during vegetation management activities.
- Disturbed areas will be re-vegetated to the maximum extent possible with tree species that produce sloughing bark and snags. Species to consider include White oak (*Quercus alba*), Northern red oak (*Quercus rubra*), White ash (*Fraxinus americana*), Shagbark hickory (*Carya ovata*), Slippery elm (*Ulmus rubra*), Black locust (*Robinia pseudoacacia*), American elm (*Ulmus americana*), Shellbark hickory (*Carya laciniosa*), eastern cottonwood (*Populus deltoides*) and sycamore (*Platanus occidentalis*).

- KYTC will provide for replacement of trees removed by construction in those areas where dense vegetation provided a buffer for abutting properties.
- KYTC will include trees or other types of vegetation in the re-vegetation plan developed for the Project in association with any noise barrier walls recommended as part of the Project.
- KYTC will consult with the Bridgepointe Neighborhood Association and consider their recommendations in developing a landscape component for any wall placed along the border of the neighborhood.
- *The area between Utica – Sellersburg Road and Salem Road has at least three distinct passageways that wildlife could use. The project alternatives would bridge two of the three, thereby providing corridors for wildlife passage through the area.*
- *A tributary of Lentzier Creek flows along the side of the Utica – Charlestown Road. The forested area on either side of the Modified Selected and FEIS Selected Alternatives would be connected by a bridge that would span both the road and the stream tributary. The selection of a bridge span or culvert size will be determined in the final design and will include consideration for wildlife passage.*

Waterways and Riparian Vegetation

Mitigation measures have been developed to minimize impacts to waterways and riparian areas within the project area. The following measures will be incorporated into the project to protect existing vegetation as well as areas to be re-vegetated after construction.

- Physical disturbance of waterways and riparian vegetation will be limited to only that which is necessary. Notes and details will be included in the plans to further minimize the removal of trees and understory vegetation that fall within the required right-of-way, but outside the actual limits of construction. Hollow trees, trees with sloughing bark, and other large trees that occur within the project limits will be avoided to the maximum practical extent and delineated by special notes in the plans which will also include measures such as special fencing during construction.
- Disturbed areas will be re-vegetated to the maximum extent possible with tree species that produce sloughing bark and snags. Species to consider include sugar maple (*Acer saccharum*), bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*), shellbark hickory (*Carya laciniosa*), shagbark hickory (*Carya ovata*), mockernut hickory (*Carya tomentosa*), eastern cottonwood (*Populus deltoides*), white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), sassafras (*Sassafras albidum*), and slippery elm (*Ulmus rubra*).
- INDOT will purchase at a 1:1 ratio existing woodland for preservation or re-vegetate upland woodland at a 1:1 ratio to mitigate forested habitat lost as a result of this project.
- Excess parcels that have been purchased as part of this project will be utilized for wetland mitigation or reforestation as appropriate.

- The size, shape and stability of natural stream channels unavoidably impacted by construction will be used as the basis for designing replacement channels. Work in the low-water channel of existing streams will be minimized to the maximum practicable extent by limiting construction to the placement of required drainage structures or structure components such as piers, pilings, footings, cofferdams, shaping of spill slopes around bridge abutments and placement of riprap.
- Frequent fording of live streams will not be permitted. Temporary bridges or other structures shall be used whenever necessary. Unless otherwise approved in writing by the project engineer and upon receipt of any required permit or other local, state or federal approval, mechanical equipment shall not be operated in live streams or in wetlands. Only coarse granular material will be permitted to be placed in live streams during construction. Any temporary river accesses built in conjunction with this project will be completely removed upon completion of construction activities. Details of the mitigation for stream impacts requiring local, state or federal permits, certifications or other approvals will be developed during final design.
- A non-toxic flocculent agent will be added to the bottom water in cofferdams to prevent downstream siltation during cofferdam dewatering. Pollutants such as fuels, lubricants, bitumen, raw sewage and other harmful materials will not be discharged into or near rivers, streams and impoundments or into natural or manmade channels leading thereto. Wash water or waste from concrete mixing operations will not be allowed to enter live streams. The use of artificial bank stabilization such as riprap will be limited to those areas in Indiana unless otherwise required by final design details. A minimum average 6-inch graded stone, extended below normal low water level to provide habitat for aquatic organisms in the voids, will be used for those areas in Indiana.
- *The bottom/invert of all culverts and pipes will be partially buried to allow stream bed material to accumulate and provide a natural stream bed for aquatic organisms.*
- Preservation of surface water quality will be controlled by minimizing and maintaining stream-crossing impacts. Channel work such as, vegetation clearing, channel widening, shaping of spill slopes and placement of riprap will be limited to the construction limits.
- Below low water, channel work outside of cofferdams will be avoided during the fish-spawning season between April 1 and June 30, and performed from stream banks in shallow waters or barges in deeper waters.
- *Staging, refueling and cleanup areas will not be allowed along-side streams. Equipment cleaning/staging areas will be located such that runoff from these areas will not directly enter the stream. Equipment cleaning/staging areas will be located such that effluent will be filtered through vegetated areas and proper sediment control structures located between the staging area and receiving water-bodies; thereby minimizing the potential for stream impacts such as sedimentation and pollution.*
- *The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Indiana portion of the project. See the Spill Response Section of the Laws and Regulations Section for further information.*

- *Construction – Hazardous material releases, oil spills, fish/animal kills and radiological incidents must be reported to Office of Emergency Response (OER) IDEM (888) 233-7745. This should occur as soon as action has been taken to either contain/control the extent of the release, or protect persons, animals or fish from harm or further harm. Appropriate response actions for spills occurring on project sites, in order: (1) Identify the spilled material from a safe distance, (2) Contain the spilled material or block/restrict its flow using absorbent booms/pillows, dirt, sand or by other available means, (3) Cordon off the area of the spill, (4) Deny entry to the cordoned off area to all but response personnel, and (5) Contact OER/IDEM then Operations Support.*
- *Operations – INDOT Hazardous Material Accidents/Incidents Policy, February 1992 (Revised July 1998 or most recent version.)*

- *The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Kentucky portion of the LSIORB Project:*
  - *Construction – Contractor to prepare spill containment plan at the Pre Construction Conference for his proposed operations and receive approval prior to the initiation of work.*
  - *Operations – Chapter 10 of the KYTC Operations Guidance Manual – Cleanup and Restoration Work (71-10.0500)*
- All KYTC and INDOT Best Management Practices (BMPs) for stream protection will be in place during project construction. The INDOT *Standard Specifications and Special Provisions* will govern construction activities in Indiana to control erosion and subsequent water pollution. The KYTC *Standard Specifications for Road and Bridge Construction* will guide construction activities in Kentucky. BMPs will be utilized to prevent non-point source pollution, to control storm water runoff and to minimize sediment damage to water quality and aquatic habitats. BMPs to be utilized are located in the *Erosion Control* section of this chapter.

Floodplain

The predicted floodplain impacts are limited to storage and not conveyance. Where applicable, compensatory storage will be provided. In addition, the following mitigation measures will be incorporated into the Project.

- *Piers will be placed within the floodplain as required by structural design requirements and with consideration for minimizing impacts to drainage within the floodplain and the planned placement of a hard rock tunnel along Transylvania Beach Road.*
- *Mitigation of impacts to floodplain forests will be coordinated with the IDNR, KY Division of Water and the USACE throughout the design phase of the project.*

- *The Louisville Water Company will be consulted about the possible enhancement of a wooded area within their floodplain property adjacent to Transylvania Beach Road.*

Wetlands

Minimization and mitigation of wetland and stream impacts would be required as part of the Clean Water Act Section 404 permitting process, administered by the USACE. Loss of wetlands would be mitigated as determined appropriate in accordance with USACE, Louisville District; Indiana Department of Environmental Management (IDEM); Kentucky Division of Water (KDOW); and the USFWS, Frankfort and Bloomington field offices. The following mitigation measures and permit coordination will be incorporated into the Project.

- Impacts to wetlands will be minimized during the design process by narrowing medians and embankment slopes as well as spanning wetlands where feasible.
- Coordination with the USACE, Louisville District, resulted in preparation of a wetland mitigation plan during the development of detailed plans. A monitoring plan, approved by the permitting agencies, would be included with the wetland mitigation plan.
- Prior to construction, the appropriate state and Federal permits would be obtained and right-of-way would be acquired for the development of mitigation sites. In this way, appropriate consideration could be given for further minimizing or avoiding project impacts to wetlands.

Erosion Control

Measures to control and minimize erosion and water quality impacts from construction activities will be incorporated into the project. Best Management Practices (BMPs), standard erosion control measures and other measures included in the INDOT *Standard Specifications and Special Provisions* and the KYTC *Standard Specifications for Road and Bridge Construction* will provide the basis of the erosion control plan. The following text incorporates both the mitigation that is still applicable from the 2003 FEIS and that which has been developed or updated through agency coordination since that time.

- Construction limits will be minimized.
- Best Management Practices (BMPs) will be utilized to prevent non-source point pollution, to control storm water runoff and to minimize sediment damage to water quality and aquatic habitats.
- Erosion control measures such as berms, dikes, geotextile filter cloths, slope drains, sediment basins, mulched seeding, sodding, and riprap will be installed where appropriate.
- Use of sediment traps will be determined for specific streams as dictated by the construction permit process.

- Temporary and permanent erosion control features will be incorporated into the project at the earliest practicable time as construction progresses.
- When seeding or sodding must be delayed, temporary erosion protection with mulches, fiber mats, matting, dust palliatives, crust-forming chemicals, or plastic sheets will be provided.
- The contractor will be required to develop a plan detailing the source and method of transportation of borrow/fill. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be controlled during and after completion of the work by minimizing the erosion in such a way that it will prevent sediment from entering streams or other bodies of water.
- Excess material areas and construction roads will be located and constructed in a manner that will keep sediment from entering streams. BMPs such as diversion channels, dikes, and sediment traps will be used for this purpose.
- All excavated materials not utilized for roadway embankment or disposed of off-site will be hauled for storage to an upland site and secured in such a manner as to prevent runoff from entering streams.
- *During grade and drain operations (occurring after initial clearing and grubbing of the corridor), mulch will be spread across all areas where no work will be conducted for a 21-consecutive-day period. Equipment needed to properly spread mulch will be located on-site.*
- Implementing an approved soil erosion and sedimentation control plan will control erosion within the construction limits. All construction activities must comply with federal and state soil erosion and sedimentation regulations. This plan will be developed in conjunction with final construction plans.

Groundwater Protection

Groundwater protection measures will be addressed during design and implemented during construction for the portion of the project within the proposed Louisville Water Company (LWC) Wellhead Protection Area (WHPA) in Kentucky. The project does not encroach into the Hertzsch and Babb wellfields located within the vicinity of the Indiana portion of the project. In Kentucky, FHWA guidelines, and KYTC guidelines including Best Management Practices, Standard Specifications for construction, and a Generic Groundwater Protection Plan will be followed. Additional measures have been developed to protect the LWC's WHPA and the RBF tunnel and collector wells within the WHPA and the LWC sludge lagoons.

The KYTC *Standards for Road and Bridge Construction* and the INDOT *Standard Specifications* provide standard temporary and permanent erosion measures required in the construction of highway facilities. In addition to these standard measures, other protection measures are recommended for that portion of the project within the proposed Louisville Water Company Wellhead Protection Area (WHPA). These measures include:

- Work within the WHPA shall be limited to that included in the plans, unless otherwise approved by the Engineer in writing.
- Cement plants shall not be placed nor shall equipment and materials be stored within the WHPA other than what is immediately necessary for the construction of the project within that property.
- Equipment required for construction of the bridge piers may be located within the WHPA, provided a berm is constructed around the equipment and a liner placed within the bermed area to protect against any accidental release.
- Equipment required for construction of the bridge piers shall be moved from the WHPA at the earliest opportunity, berms and liners removed and any materials contained within the bermed area transported to an approved disposal site, outside the WHPA.
- *In accordance with the technical study conducted by LWC to prevent the release of materials that may contaminate the aquifer, the contractor will be restricted from using bentonite within 400–500 feet of the collector wells and restricted from using any polymer fluids within 1,000 feet. This requirement will be explained in the Special Notes of the project specifications for pier shaft construction; and alternate drilling methods and/or materials will need to be identified prior to construction and enforced during construction inspection.*
- *The following provisions shall apply to the spillage or release of hazardous materials during construction or operation of the Kentucky portion of the LSIORB Project:*
    - *Construction - Contractor to prepare spill containment plan at the Pre- Construction Conference for the proposed operations and receive approval prior to the initiation of work.*
    - *Operations - Chapter 10 of the KYTC Operations Guidance Manual: Cleanup and Restoration Work (71-10.0500).*

Design and construction of bridge piers within the WHPA also must be developed with attention to the WHPA. Some general recommendations can be provided at this time, however these should be reviewed and modified as appropriate after the final structure type is selected and the specific construction requirements of the footers and piers have been developed.

- The contractor shall minimize to the extent possible the area that must be disturbed to construct bridge piers and other elements of the bridge substructure located below the surface.
- *The bridge piers will be located at least 40 feet away from the LWC RBF tunnel in the horizontal direction.*
- Any voids left between the pier and surrounding ground shall be sealed by using bentonite clay or other approved materials, as soon as possible after completion of work

on the pier; however bentonite is prohibited for use during construction of any pier shaft that is within 400–500 feet of a collector well.

- *Polymer fluids are prohibited within 1,000 feet of a collector well to ensure the integrity of collector wells from invasion of drilling fluids,*
- *Design and construction of bridge piers within the Ohio River shall include the use of cofferdams that minimize the amount of streambed disturbance or other construction techniques that would further limit re-suspension of streambed sediments. In addition to the provisions of Section 212 and 213 of the KYTC Standard Specifications for Road and Bridge Construction (current edition) and INDOT Standard Specification (current edition), material removed from the cofferdams shall be disposed of at approved sites outside the Ohio River and its floodplain.*
- Pier construction methods and the drainage system will be coordinated with the LWC and the Groundwater Protection Branch of KDOW to assure appropriate construction methods are employed to prevent contamination of the aquifer.

In additional efforts to prevent roadway pollutants from entering the WHPA, a drainage system has been designed to contain all runoff into a storm system leading to vaults prior to releasing the runoff into Harrods Creek. A meeting was held with LWC and KDOW on March 5, 2009 to discuss the proposed design of the storm water drainage system in the Wellhead Protection Area. The concept was considered reasonable and acceptable. The final design of the drainage system will be submitted to LWC and KDOW for concurrence. The ditches associated with the roadway fills within the WHPA will constructed with a berm to contain not only storm drainage but also materials from a spill. The ditches will drain into the storm system and to the vaults. After a spill, ditches and pipes would be cleared of material by KYTC and any materials that reach the vault would be contained, drained, and disposed of as required under applicable laws and regulations. There will be no direct runoff from the roadway to the WHPA.

Bridge deck drains and storm sewers will be utilized to collect bridge deck runoff into a storage area at the Kentucky end of the bridge. The runoff will then either be released to a surface drainage system or pumped into trucks and transported to an approved receiving facility. KYTC will continue to work with KDOW in developing and implementing Groundwater Protection Plans prior to construction through the WHPA in accordance with 401 KAR 5:037.

Regarding LWC sludge Lagoon #3, in June 2011 LWC and KYTC entered into an agreement to conduct a study to determine options for replacing (or reconfiguring) a portion of the lagoon without impacting LWC operations. In addition to constructing outside the proposed right-of-way, options for replacing the lost storage capacity include expanding the remaining area of the lagoon, dredging the floor of the lagoon, or other solutions to be identified by the study. Any material removed from the sludge lagoon will be disposed of in accordance with the KDOW requirements and local agency permits and regulations.

8.2. Biological Assessment (BA)

A revised amended BA was developed to address USFWS comments, and has been resubmitted to USFWS for their comments or approval. A copy, as submitted to the USFWS, is provided in Appendix B.3.2.

8.3. Section 106 Memorandum of Agreement (MOA)

The Section 106 process for the 2003 FEIS resulted in a Memorandum of Agreement (MOA) to mitigate Adverse Effects to historic properties. The MOA was executed on April 1, 2003. An amended MOA will be prepared, as appropriate, following the assessment of effects on historic and archaeological resources as a part of the mitigation process. The amendment will be included in the SFEIS. Since the release of the ROD, the following mitigation measures identified in the (March 2003) MOA and ROD have been completed or are in the process of being completed.

- The Indiana Historic Sites and Structures Inventory of Clark County, Indiana Survey Update was completed and is available for use. Instead of publication of a hard copy Interim Report, the data is available in the Indiana State Historic Architectural and Archaeological Research Database (SHAARD).[1]
- A Survey Update of Butchertown, Phoenix Hill, Downtown Louisville and River Road (Jefferson County Inventory and Survey of Historic Sites in Kentucky) was completed and is available for use.
- A Smart Growth Conference was convened on September 18 to September 20, 2006 at the Louisville Downtown Marriot located in Louisville, Kentucky.
- The Minority Historic Rehabilitation Craftsman Training Program is under development.
- Train Depot (Spring Street Freight House) – Indiana
    - INDOT acquired the property in 2005 and is in the process of rehabilitating the building.
    - INDOT is in the process of developing a preservation easement for the property.
    - INDOT developed a NRHP nomination for the property, and the property was listed in 2007.
- INDOT developed a NRHP eligibility report for the Colgate-Palmolive Historic District and it was accepted by the IN SHPO in 2007, in lieu of a NRHP nomination, due to property objections.
- INDOT developed a NRHP nomination for the Ohio Falls Car and Locomotive Company Historic District; the district was determined eligible for the NRHP in 2009, but it was not listed due to objections from the property owners.
- Old Jeffersonville Historic District

[1] SHAARD can be accessed at the following website: https://secure.in.gov/apps/dnr/shaard/welcome.html.

  - INDOT developed an HPP for the property in 2009. The HPP provides a context and other information for use in developing streetscape improvements, relocating contributing houses, and designing pedestrian friendly facilities under the bridges. The HPP was presented to the City of Jeffersonville and KIPDA for future planning efforts.
  - The INDOT and KYTC have minimized spacing between the proposed new downtown bridge and the existing John F. Kennedy (I-65) Bridge consistent with prudent engineering principles.

- Lime Kilns within the Utica Lime Industry Multiple Property Listing
  - INDOT developed a Context Study focusing on the development of the lime industry within the region. This Context Study is to be a part of the HPP that is under development. The HPP will include the identification of significant lime industry structures with recommendations for preservation of the history of the lime industry in Utica Township/Southern Indiana.
  - INDOT prepared a Condition Report of the Lime Kilns resources that includes photographs to serve, in part, as a baseline to measure any construction related damage that may occur to the kilns.

- Swartz Farm Rural Historic District
  - INDOT developed a thematic context study for agriculture in Clark County, Indiana, and surrounding counties to assist with future nominations in the region.
  - INDOT prepared archival photographic documentation of the Central Passage House, in consultation with the INSHPO.
  - In October 2007, the Swartz Farmhouse and other contributing buildings on the farmstead were razed by the property owner. As a result, the Indiana SHPO, in a letter dated June 9, 2009, determined that the Swartz Farm Rural Historic District had lost its historic integrity as a result of this demolition. This determination was re-affirmed by the Indiana SHPO in a letter dated October 14, 2011. Therefore, this resource is no longer NRHP eligible. Therefore, no further mitigation will be undertaken. Changes in the MOA related to the Swartz Farm Rural Historic District would be discussed during the mitigation phase of the Section 106 process for the SEIS.
  - The property owner refused donation of that portion of the James Smith Farm (#45024) that was determined eligible for the NRHP; therefore, none of the other stipulations related to this property were pursued.

- KYTC rehabilitated the Louisville Railway Complex Trolley Barn in consultation with the KY SHPO.

- Butchertown Historic District
  - KYTC is in the process of developing an HPP for the property. The HPP shall include recommended measures for context sensitive design, noise abatement, streetscape improvements, connectivity to the river, and interpretive signage

which shall be implemented as part of the Project to mitigate adverse effects to the historic district and to provide additional strategies for rehabilitation and reuse of buildings and grounds that could enhance the district.

- KYTC developed the Witherspoon Extension in accordance with provisions of the HPP as the principal east-west route through the historic district.
- KYTC is in the process of developing plans to rehabilitate the exterior of the Edison House to ensure long-term preservation of its exterior.
- KYTC is in the process of developing plans to rehabilitate the exterior of portions of the Wesley House property to ensure long term preservation of its exterior.
- In consultation with the KY SHPO, KYTC developed a plan that supports the adaptive reuse of the Grocers Ice and Cold Storage Company property.
- KYTC conducted a study of the Mellwood Avenue – Story Avenue Connector in order to evaluate the elimination of this proposed connector and restoration of two-way traffic flow on Mellwood Avenue and Story Avenue.

- Phoenix Hill Historic District
  - KYTC developed an HPP for the Phoenix Hill Historic District in 2009. The HPP was presented to Louisville Metro Government and KIPDA for future planning efforts.
  - A reasonable effort was made to relocate Baer Fabrics to another historic property within the Phoenix Hill neighborhood. The property owner indicated that he had no interest in reopening in another historic building in the district, as there was not a business to relocate. The building was acquired for demolition and Kentucky State Level Documentation completed.
- KYTC is in the process of developing a treatment plan for rehabilitation of the Vermont American Buildings and to explore options for re-uses.
- KYTC developed an HPP for the Country Estates Historic District/River Road Corridor in 2011. The HPP identified the context and provided recommended measures for context sensitive design, noise abatement, roadway lighting, blasting and vibration plans, and interpretive signage to be implemented as part of the Project. The HPP was presented to Louisville Metro Government and KIPDA for future planning efforts.
  - Drumanard
    - The Project through this property is contained in a tunnel to limit adverse effects to the historic property.
    - Blasting and vibration plans were prepared and implemented for the initial blast for the geotechnical tunnel bore.
    - The FHWA is in the process of acquiring/establishing an historic preservation easement for the entire Drumanard historic property. The easement is to be held by the KY SHPO.

- KYTC is in the process of acquiring a preservation easement on the tract of land within the NRHP boundary of the Allison-Barrickman House. Coordination with the property owner is continuing for the placement of the easement.
- KYTC developed a Treatment Plan in consultation with the FHWA, KY SHPO and KHPAT to minimize damage to the Rosewell historic property.
- A step-by-step protocol for human remains encountered during archaeological testing was developed in 2007 in line with the MOA and in coordination with the consulting Native American Tribes and three FHWA offices (Project Office, Kentucky Division, and Washington, DC). The protocol is to be utilized for both the Kentucky and Indiana sides of the project.
- An Artifact Curation Policy was put into practice by all state consulting firms.
- Native American Consultation is to be handled in the same manner for both Indiana and Kentucky Project archaeological reports. Only those reports describing prehistoric sites or materials will be subject to Native American Consultation.

CHAPTER 9: LIST OF PREPARERS

The following are brief resumes of the individuals involved with the preparation of this Supplemental Environmental Impact Statement.

Name	Education and Experience	Primary Responsibilities
Federal Highway Administration		
Janice Osadczuk *Engineering Services Team Leader*	B.A., Biology M.A., Ecology 38 years NEPA, Environmental-related experience.	NEPA Project Management and Coordination, Document Review, Agency Coordination for FHWA, Indiana and Kentucky Division.
Duane Thomas *Federal Project Manager*	BS in civil engineering P.E. 25 years experience in traffic operations and transportation project management.	Document Review
Indiana Department of Transportation		
Paul Boone *Project Manager*	Bachelors and Masters of Civil Engineering 20 years experience in Transportation	SEIS manager for federal state and agency reviews
Kevin Hetrick *Deputy Project Manager*	BS - Civil Engineering	SEIS manager for state and agency reviews
Ben Lawrence	BS Chemical Engineering, 13 years Environmental experience.	Document Review
Laura Hilden Director of Environmental Services	BA Liberal Arts, MS Biological Sciences, MPA Public Affairs 12 years government and environmental experience	Document Review
Chris Andrews, LPG	B.A. Geology 37 years of experience in NEPA document preparation and review, soils and shale investigation and landslide investigation	Document Review
Mary Kennedy *Architectural Historian*	B.A. History; M.S. Historic Preservation; M. Library Science 11 years experience in historic property research and Section 106 documentation	Document/Section 106 Review
Staffan Peterson	B.A., M.A., Ph.D. – Anthropology; 14 years experience in cultural resources and historic preservation	Document Review

Kentucky Transportation Cabinet		
Gary Valentine *Assistant State Highway Engineer* *KYTC Project Manager*	B.S. Civil Engineering 22 years experience in Transportation/project development	SEIS manager for federal and state reviews
Andy Barber *Assistant Project Manager*	B.S. Civil Engineering 10 years experience in transportation engineering	SEIS Coordinator for state and agency reviews
David Waldner	B.S Civil Engineering; 27 years experience in transportation and environmental project management	Document Review
Tim Foreman	A.S. Environmental Science 13 years experience in transportation environmental project management	Document Review
Amanda Abner *KYTC-DEA*	B.A. Art History, M.H.P. Historic Preservation 8 years experience in historic preservation	Document/Section 106 Review
Chad Carlton	B.A., Journalism and Government; M.A., Public Affairs Reporting; 13 years' experience in public involvement	Public Involvement

Community Transportation Solutions, Inc.		
John Sacksteder, P.E. *Project Manager*	B.S., Civil Engineering 41 years in design and environmental	SEIS management, environmental design coordination & review; federal, state & agency coordination.
James Hilton, P.E. *Deputy Project Manager*	B.S., Civil Engineering 40 years in transportation planning and design	SEIS management, environmental design coordination and review; state & agency coordination.
Cindy Kowalski, PMP *Project Coordinator*	B.S. Business Management A.A.S. Civil Engineering Technology 30 years in Civil Engineering environments	Public Involvement Public Comments Reports Chapter 7 development SEIS coordination and production
Kevin Villier, P.E. *Section Design Manager, KY Approaches*	B.S.; 36 years in transportation design and project management	Engineering design review & coordination
Paul Hilton, P.E. *Section Design Manager, IN Approaches*	B.S., Civil Engineering 11 years of transportation background	Engineering design review & coordination
Phillip Banton, P.E., P.S. *Engineering Coordinator*	B.S. in Civil Engineering M.S. in Civil Engineering 33 years in transportation planning and design	Engineering design review & coordination Chapters 9, 10, 11

Beam Longest and Neff, LLC		
Brian Shaw	B.S. Environmental Science; 19 years of experience in preparation of environmental impact analyses and related NEPA documentation for various public works improvement projects	Social and Economic Analyses
Elayna Stoner-Phillips	B.S. Environmental Management; 12 years of experience in preparation of environmental impact analyses and related NEPA documentation for various public works improvement projects	Social and Economic Analyses
Jeffrey A. Vlach *Environmental Analysis Manager*	B.S., Natural Resources and Environmental Sciences 36 years experience in the preparation of environmental impact analyses and related NEPA documentation for various public works improvement projects.	Environmental Analysis Manager in the development, preparation and QA/QC of all studies related to the SEIS.
Doe Anderson, Inc.		
Bob Lauder *Public Involvement Manager*	B.A, Communications Public Relations, 21 years Journalism, 8 years	Management of public involvement and information: public involvement groups, stakeholder and public communication, public meetings, media relations, web site, and newsletter.
Kathy Francis	B.A., Communications Public Relations, 5 years Journalism, 24 years	Public involvement and information, web site management.
Rachel Feldman	B.A., Communications	Public involvement and information.
Frost Brown Todd LLC		
Timothy J. Hagerty *Partner*	B.A., Political Science, JD 7 years in environmental law, including review of NEPA documentation.	Legal counsel, Kentucky
Haworth, Meyer & Boleyn, Inc.		
Rich Dutton	B.S. Civil Engineering 25+ years of transportation-related environmental analysis	Environmental Document Manager in the development, preparation and QA/QC of all studies related to the SEIS.
Mitch Green	M.S. Chemistry B.A. Chemistry 12 years experience in Environmental Science and NEPA.	Preparation of Air Quality and Highway Traffic Noise sections.

Brian Lowe	B.S. Environmental Studies M.S. + doctoral studies, Biology 8 years experience performing biological field surveys and data analysis.	Habitat assessment and GIS analysis. Preparation of Natural Resource Sections and Biological Assessment.
Steve Rice	B.S. + graduate work in Biology 30+ years of transportation-related Environmental Science and permits	Permit Coordination, Preparation of Natural Resource sections and the Biological Assessment.

Parsons Transportation Group, Inc.

Cory Grayburn *Senior Environmental Planner*	B.S., Environmental Resource Management 25 years experience in NEPA studies and documentation for transportation projects.	DSEIS document preparation and QA/QC review.
Kenneth Hess, AICP *Senior Environmental Planner*	B.A., Geography MCRP, City and Regional Planning 34 years planning and project management experience in NEPA documentation for transportation agencies.	QA/QC document review, comment revision and coordination.
Craig Moore, P.E. *Transportation Engineer*	B.S., Civil Engineering M.S., Transportation Engineering 11 years engineering experience in transportation planning, traffic operations and GIS	Microsimulation of future scenarios, traffic operations analysis, future traffic projections and data collection.
Anthony S. Pakeltis, AICP *Senior Transportation Planner*	M.S., Urban Planning and Policy B.U.P., Urban Planning B.S., Environmental Design 19 years experience in NEPA documentation, transportation planning, environmental, air quality, and noise analysis.	Alternatives analysis, EIS review, coordination and production.

Perkins Coie LLP

William G. Malley *Partner*	J.D., Yale Law School, 1992 M.Sc, Public Policy, London School of Economics, 1989 A.B., Harvard University, 1988	Legal Counsel, Indiana

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Tom Springer *Director, Planning*	B.S., Geography and Environmental Science M.P.A. - Public Administration 17 Years of experience	SEIS Editor
Jane Wehner *Senior Editor*	B.A., English 30 years of experience	SEIS Editor

Ratio Architects		
David Kroll *Director of Preservation*	B.A. Architecture M.S. Historic Preservation 27 Years Experience in Historic Preservation in both public and private sectors, meets 36 CFR Part 61.	Identification and assessment of historic (above ground) resources.
Ben Ross	B.S. Architecture M. Architecture with concentration in Historic Preservation 3 years experience, meets 36 CFR Part 61.	Identification and assessment of historic (above ground) resources.
Kevin Senninger	B.A. Environmental Design M. Urban and Regional Planning 12 years of experience	Identification and assessment of historic (above ground) resources.
Wilbur Smith Associates		
John L. Carr, P.E.	B.S., Civil Engineering M.S., Civil Engineering 39 years of transportation experience (14 years planning and environmental)	Document Review Review of technical base studies
John L. Mettille, Jr.	B.S. Geography and Political Science M.A. Urban and Transportation Geography 34 years experience	Section 106 Process Section 106 Document Review Review of technical base studies
Tim Sorenson, P.E. *Traffic Forecasting*	B.S. Civil Engineering 24 years of experience	Traffic forecast modeling and analysis; Toll revenue analysis and forecast
Rebecca Thompson P.E. Section 106 documentation	B. A. Physical Science B. S. Civil Engineering 6 years experience	Section 106 Document Preparation
Samantha Wright, P.E. Section 106 Documentation	B.S., Civil Engineering M.S., Civil Engineering 15 years transportation planning (8 years environmental and NEPA documentation)	Section 106 Document Preparation
Rob Bostrom, P.E. Traffic Forecasting	B.S. in Civil Engineering M.S. in Civil Engineering 26 in Transportation Planning/Traffic Forecasting	Traffic forecast modeling and analysis
Brad Johnson Traffic Forecasting	B.S. in Civil Engineering Master of Business Administration 12 years experience in transportation planning and traffic engineering.	Traffic forecast modeling and analysis
Jonathan Avner Traffic Forecasting	B.A. Urban Geography Professional Transportation Planner 13 years experience in travel demand modeling including model development, validation and application	Traffic forecast modeling and analysis
Robert Ball	B.A. Anthropology M.H.P. Historic Preservation 17 years experience	Cultural Historic Effects Document Review

CHAPTER 10: DISTRIBUTION OF THE SUPPLEMENTAL DRAFT EIS

The Supplemental Draft Environmental Impact Statement is being distributed to the following federal, state, regional and local agencies and other interested parties for their review and comment.

Federal

Advisory Council on Historic Preservation
Center for Disease Control - Center for Environmental Health & Injury Control
Federal Emergency Management Agency, Region 5
Federal Railroad Administration – Office of Economic Analysis
U.S. Army Corps of Engineers, Louisville District
U.S. Department of Agriculture, Natural Resources and Environment
U.S. Department of Agriculture - Indiana Natural Resources and Conservation Service
U.S. Department of Agriculture - Kentucky Natural Resources and Conservation Service
U.S. Department of Commerce, Office of Compliance and Strategic Planning
U.S. Department of Homeland Security, Indiana Division
U.S. Department of Homeland Security, Kentucky Division
U.S. Department of Housing and Urban Development (Chicago office)
U.S. Department of Housing and Urban Development (Washington office)
U.S. Department of the Interior, Office of Environmental Policy and Compliance
U.S. Department of the Interior, Fish and Wildlife Service (Indiana)
U.S. Department of the Interior, Fish and Wildlife Service (Kentucky)
U.S. Department of the Interior, National Park Service
U.S. Department of Justice, Environment and Natural Resources Division
U.S. Department of Transportation, Federal Aviation Administration (Great Lakes Region)
U.S. Department of Transportation, Federal Aviation Administration (Southern Region)
U.S. Department of Transportation, U.S. Coast Guard, Eighth District
U.S. Environmental Protection Agency, Office of Federal Activities
U.S. Environmental Protection Agency, NEPA Implementation Section
U.S. Environmental Protection Agency, Region 4 (Atlanta, GA)
U.S. Environmental Protection Agency, Region 5 (Chicago, IL)
U.S. Representative Brett Guthrie, Second Congressional District of Kentucky
U.S. Representative Geoff Davis, Fourth Congressional District of Kentucky
U.S. Representative John Yarmuth, Third Congressional District of Kentucky
U.S. Representative Todd Young, Ninth Congressional District of Indiana
U.S. Senator Daniel Coats, Indiana
U.S. Senator Mitchell McConnell, Kentucky
U.S. Senator Rand Paul, Kentucky
U.S. Senator Richard Lugar, Indiana

State

Indiana Department of Environmental Management
Indiana Attorney General – Deputy Attorney General
Indiana Department of Health
Indiana Department of Natural Resources, State Historic Preservation Officer
Indiana Department of Natural Resources, Commissioner
IDNR – Environmental Coordinator Division of Fish and Wildlife
IDNR – Division of Historic Preservation and Archaeology
Indiana Geological Survey – Environmental Section Head
Indiana Port Commission
Kentucky Heritage Council, State Historic Preservation Office
Kentucky Natural Resources and Environmental Protection Cabinet, Department of Environmental Protection, Division of Water
Kentucky Natural Resources and Environmental Protection Cabinet, Department of Fish and Wildlife Resources
Kentucky State Nature Preserves Commission
State Representative Bob DeWeese, District 48 (Kentucky)
State Representative Darryl T. Owens, District 43 (Kentucky)
State Representative Edward Clere, District 72 (Indiana)
State Representative Jim Wayne, District 35 (Kentucky)
State Representative Julie Raque Adams, District 32 (Kentucky)
State Representative Paul Robertson, District 70 (Indiana)
State Representative Reginald Meeks, District 42 (Kentucky)
State Representative Steve Stemler, District 71 (Indiana)
State Representative Terry Goodin, District 66 (Indiana)
State Representative Tom Riner, District 41 (Kentucky)
State Senator Connie Sipes, District 46 (Indiana)
State Senator Ernie Harris, District 26 (Kentucky)
State Senator Gerald Neal, District 33 (Kentucky)
State Senator James Lewis, District 45 (Indiana)
State Senator Julie Rose Denton, District 36 (Kentucky)

Regional and Local Jurisdictions

Clark County, Board of Commissioners (Indiana)
Town of Clarksville (Indiana)
Floyd County (Indiana)
City of Jeffersonville (Indiana)
City of Jeffersonville, Division of Planning and Zoning (Indiana)
Jefferson County Public Schools (Kentucky)
Jefferson County Public Works (Kentucky)
Jeffersonville Historic Preservation Commission (Indiana)
Kentuckiana Regional Planning and Development Agency (KIPDA)

Louisville and Jefferson County, Metropolitan Sewer District (MSD)
Louisville and Southern Indiana Bridges Authority
Louisville Metro Historic Preservation
Louisville Metro Public Works
Louisville Regional Airport Authority
Louisville Water Company
Louisville Waterfront Development Corporation
City of New Albany (Indiana)
Oldham County (Kentucky)
City of Prospect (Kentucky)
Transit Authority of the River City (TARC)
Town of Utica (Indiana)

Native American Tribes

Absentee Shawnee Tribe of Oklahoma
American Indian Movement (Mobile Chapter)
Cherokee Nation
Eastern Band of Cherokee Indians
Eastern Shawnee Tribe
Miami Tribe of Oklahoma
Peoria Tribe of Indians of Oklahoma
The Delaware Nation
The Shawnee Tribe
United Keetoowah Band of Cherokee Indians

Other Interested Parties

African-American Heritage Association
Bridgepointe Homeowners Association
Butchertown Neighborhood Association
Green Spring, City of
Historic Homes Foundation
Indiana Landmarks (Southern Regional Office)
Indiana Ombudsman
Jeff-Clark Preservation, Inc.
Jeffersonville Main Street Association
Kentucky Ombudsman
Louisville Historic Preservation
National Trust for Historic Preservation
New Albany Historic Preservation Commission
New Hope Services, Inc.
Phoenix Hill Historic District
Preservation Kentucky

Preservation Louisville
Prospect / Harrods Creek Neighborhood Association
River Fields, Inc.
Rose Hill Neighborhood Association
St. Francis in the Fields Episcopal Church
Transylvania Beach Association

Hardcopies will be placed at the thirty-four (34) public library branches within the 5-county project area.

CHAPTER 11: LITERATURE CITED

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- Christ Church Cathedral
- Howard-Hardy House
- J.T.S. Brown & Sons Complex
- Kaufman-Straus Building
- Levy Brothers Building
- Louisville & Nashville Railroad Office / Trade Mart Building
- Louisville Medical College Building
- Madrid Building
- Main Street District (expanded)
- Municipal Bridge, Pylons and Administration Building
- Old Customs House and Post Office and Fireproof Storage Warehouse
- Old Presbyterian Theological Seminary
- Paget House – Heigold House Facade
- Pendennis Club
- St. Bonifacius Kirche Complex
- Speed Building
- Starks Building
- Weissinger-Gaulbert Apartments – Third Street Annex
- West Main Street Historic District (expanded)
- William Young House
- Y.M.C.A. Building

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GLOSSARY

23 CFR 772 (Title 23, Code of Federal Regulations, Part 772) "Procedures for Abatement of Highway Traffic Noise and Construction Noise": FHWA regulations for highway traffic noise analysis and abatement during the planning and design of federally aided highway projects.

Abatement: any positive action taken to reduce the impact of highway traffic noise.

Abatement Measures: measures that must be considered in a traffic noise analysis when a highway project will result in a noise impact. These measures include:
- Traffic management
- Alteration of horizontal and vertical alignments
- Acquisition of real property to serve as a buffer zone
- Insulation of public use or nonprofit institutional structures
- Construction of noise barriers

Average Daily Traffic (ADT): the average 24-hour traffic count (vehicles per day). Typically, the total amount of traffic during a stated period (normally one year) divided by the number of days in that period. The ADT is only used as the basis for determining the "Design Hourly Volume" (DHV). The DHV is used to model noise levels.

A-Weighting (dBA): an adjustment in sound meters and traffic noise modeling software to ensure sound levels are measured/calculated in a manner that approximates the sounds that can be heard by the human ear. This is accomplished by suppressing the low and very high frequencies that cannot be heard by the human ear.

Benefited Receptor: is the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5dBA, but not to exceed the highway agencies' reasonableness design goal.

CAL3QHC: is an air quality dispersion modeling program utilized for signalized intersections.

Cost Effectiveness: see "Reasonable."

Criteria Air Pollutants: Six common air pollutants regulated by the Clean Air Act. They are particle pollution (often referred to as particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead.

Decibel (dB): the basic unit for measuring sound pressure levels.

Design Hourly Volume (DHV): the traffic count (vehicles per hour) determined by applying the "Kfactor" to the "Average Daily Traffic." The DHV is used to model noise levels.

Feasible: one of two criteria (see "Reasonable") used to evaluate a noise abatement measure.

Generally, pertains to the ability of a noise abatement measure to provide a "substantial reduction"
(at least 5 dBA) in noise levels, and deals primarily with engineering considerations.

Impact: when predicted traffic noise reaches a level that requires a consideration for noise abatement.

Leq (Equivalent Noise Level): the equivalent steady-state sound level that, in a given time period, contains the same acoustic energy as a time-varying sound level during the same period.

MOBILE6.2: is an emission factor model for predicting gram per mile emissions for pollutants.

National Ambient Air Quality Standards: Federal standards that establish allowable concentrations and exposure limits criteria for air pollutants.

Noise Abatement Criteria (NAC): absolute sound levels, provided by FHWA, that are used to determine when a noise impact occurs. They are not used as a design goal for a noise abatement measure.

Noise Barrier: typically, a solid wall-like structure located between the noise source (traffic) and the impacted receiver (human activity area) to reduce noise levels. The construction of a noise barrier is one of the abatement measures that must be considered when a traffic noise analysis indicates that a highway project will result in a noise impact.

Noise Reduction Design Goal: the optimum desired dBA noise reduction determined from calculating the difference between future build noise levels with abatement, to future build noise levels without abatement. The noise reduction design goal for both states is 7dBA.

Reasonable: one of two criteria (see "Feasible") used to evaluate a noise abatement measure. Generally, pertains to the cost effectiveness of a noise abatement measure and the views/desires of the public.

Receptor: a discrete or representative location of a noise sensitive area(s), for any of the land uses listed in 23 CFR 772 Table 1.

ACRONYMS

BMPs	Best Management Practices
CTPP	Census Transportation Planning Package
Dbh	diameter at breast height
HHS	U.S. Department of Health and Human Services
IMPLAN	IMPLAN Professional 3.0 Economic Modeling Program
JCAPCD	Jefferson County Air Pollution Control District
KDOW	Kentucky Division of Water
KY-EPPC	Kentucky Exotic Pest Plant Council
MPA	Metropolitan Planning Area
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
O_3 .	Ozone
OER	Office of Emergency Response
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
RBF	Riverbank Filtration
SCUBA	self-contained underwater breathing apparatus
SE-EPPC	Southeast Exotic Pest Plant Council
TNM	Traffic Noise Model
UPS	United Parcel Service