

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

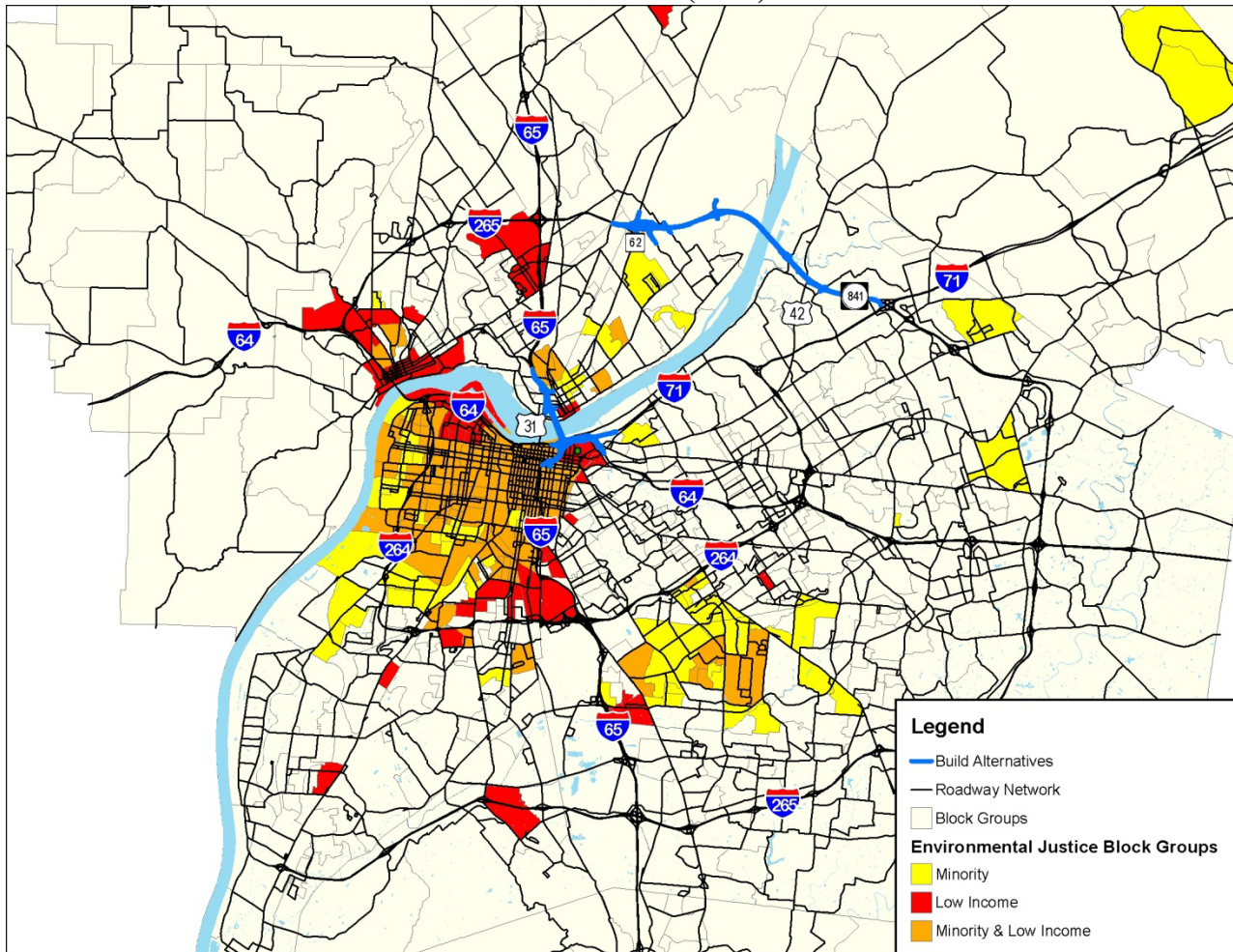
identified environmental justice populations are present primarily on the west side of downtown Louisville, and in and adjacent to New Albany and Jeffersonville.

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 time³ 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.

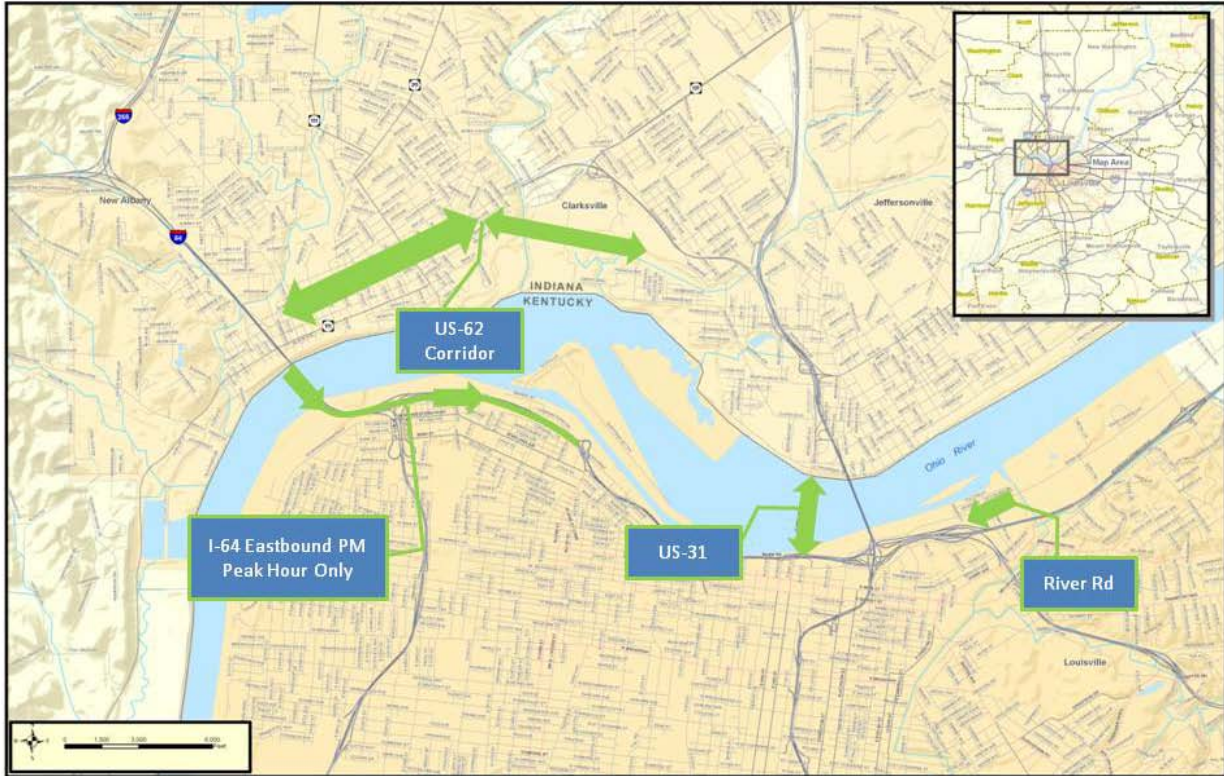
Traffic modeling was finalized in October 2011 to determine where, and to what extent, traffic patterns may be altered outside the immediate study area, shifting traffic to adjacent local roadways as a result of drivers avoiding the tolls. Altered traffic patterns could result in increased congestion 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 used⁴. 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, there 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)

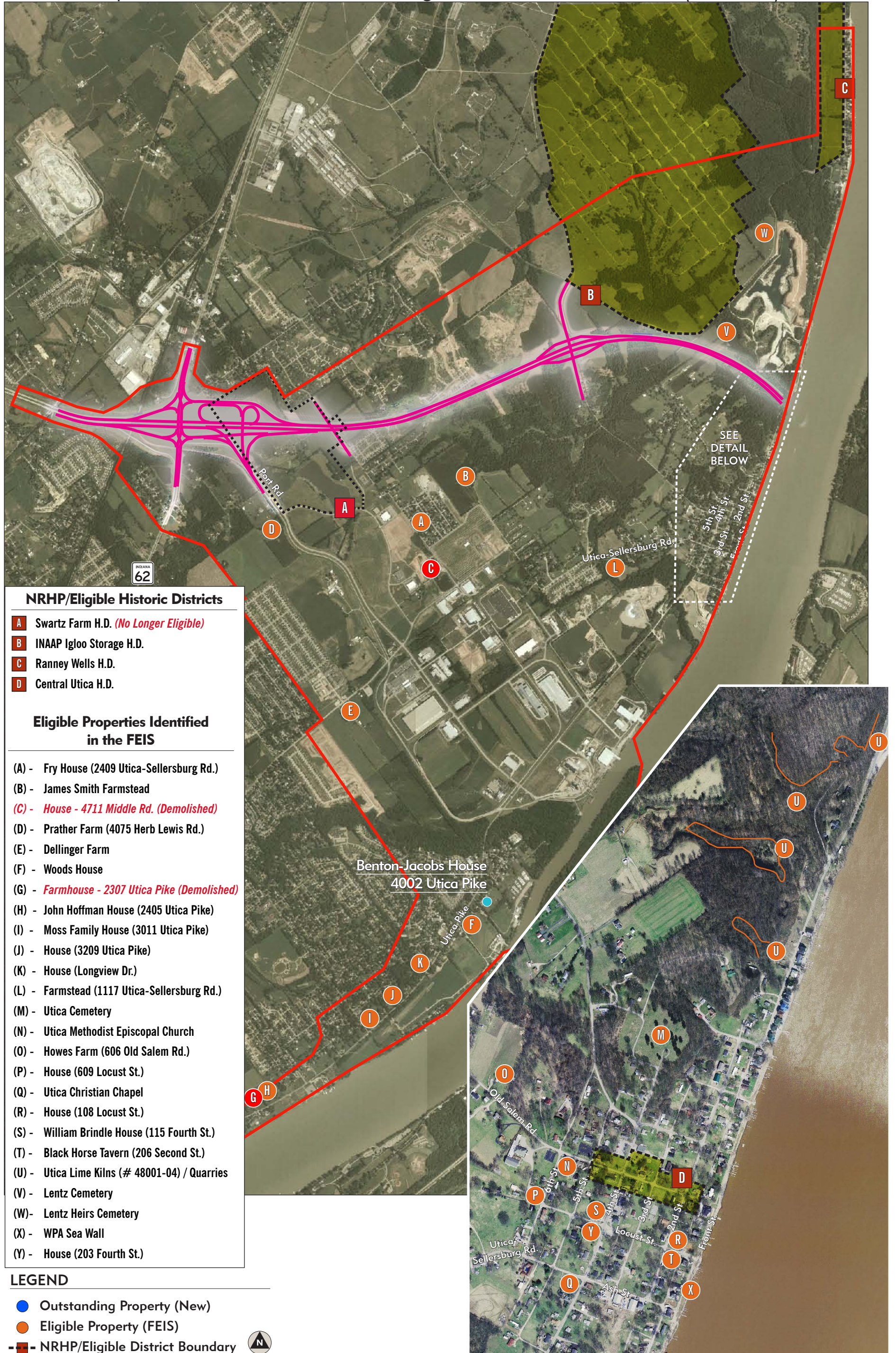


Figure 5.3-2

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
		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
		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*, which 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
		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.

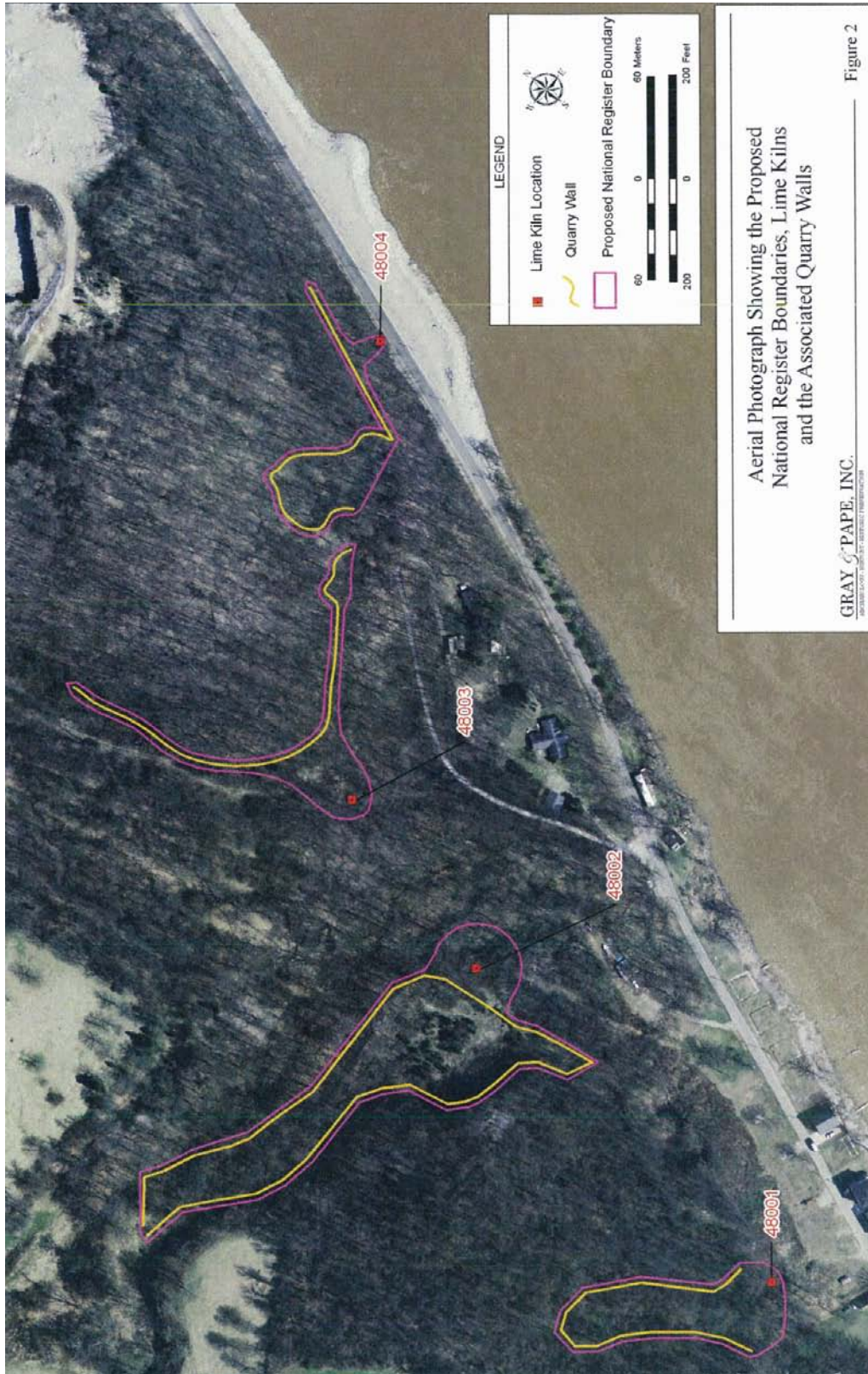


Figure 2

- ***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	
		Adverse Effect	Vibration	Adverse Effect	Encroachment, Visual, Vibration, & Construction
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 4 th 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

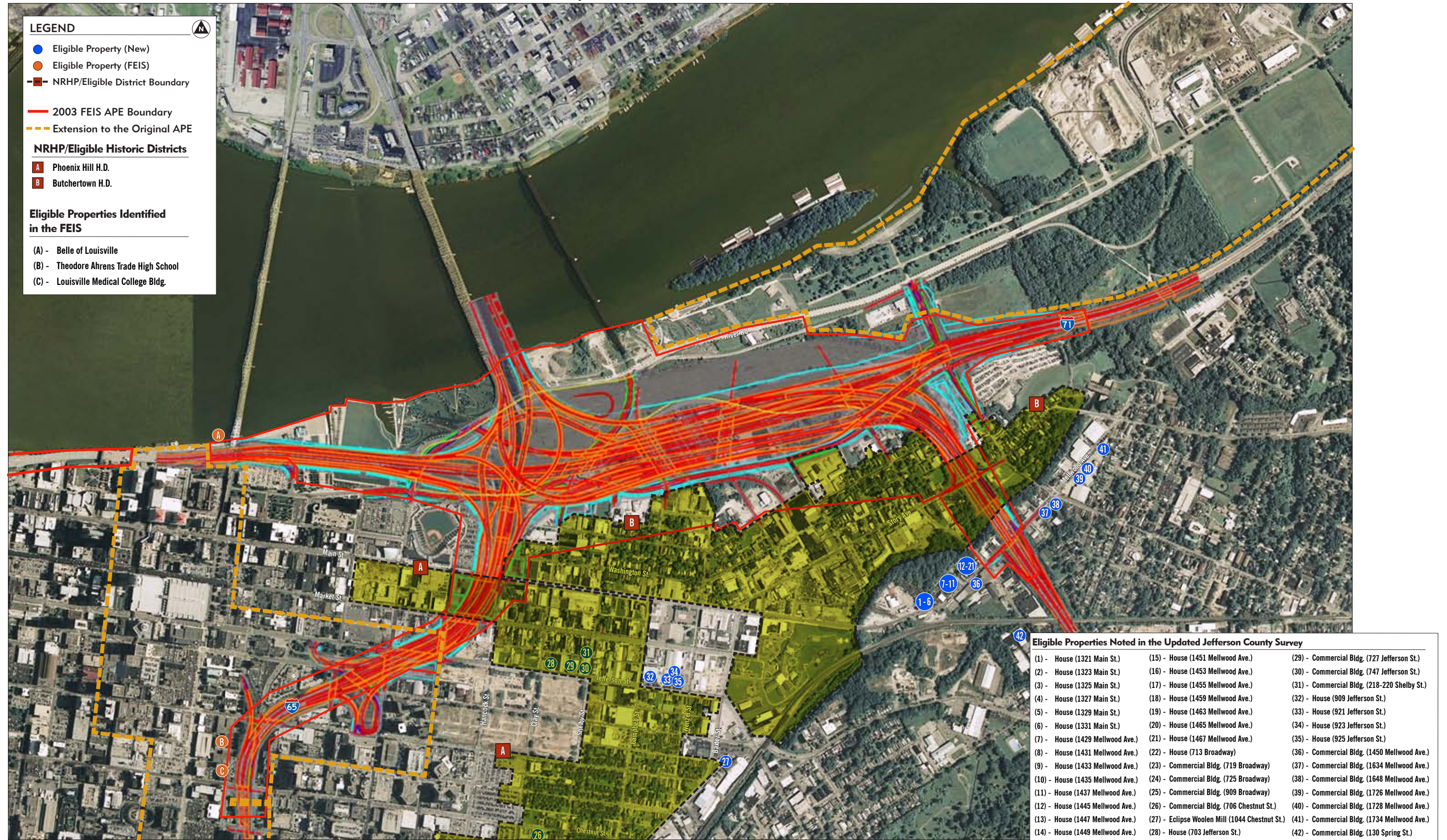


Figure 5.3-3a

Downtown Modified Selected Alternative - Louisville, Kentucky

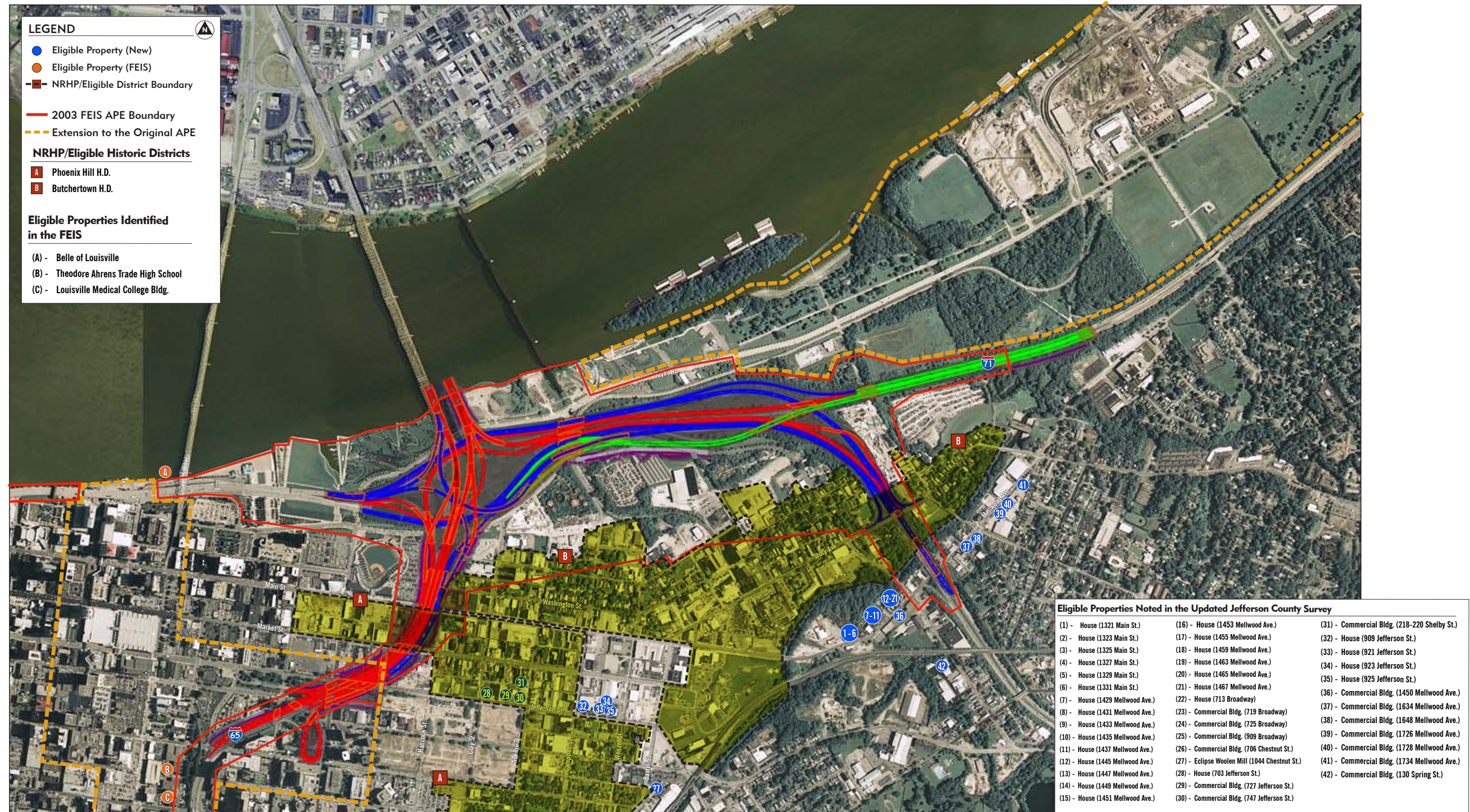
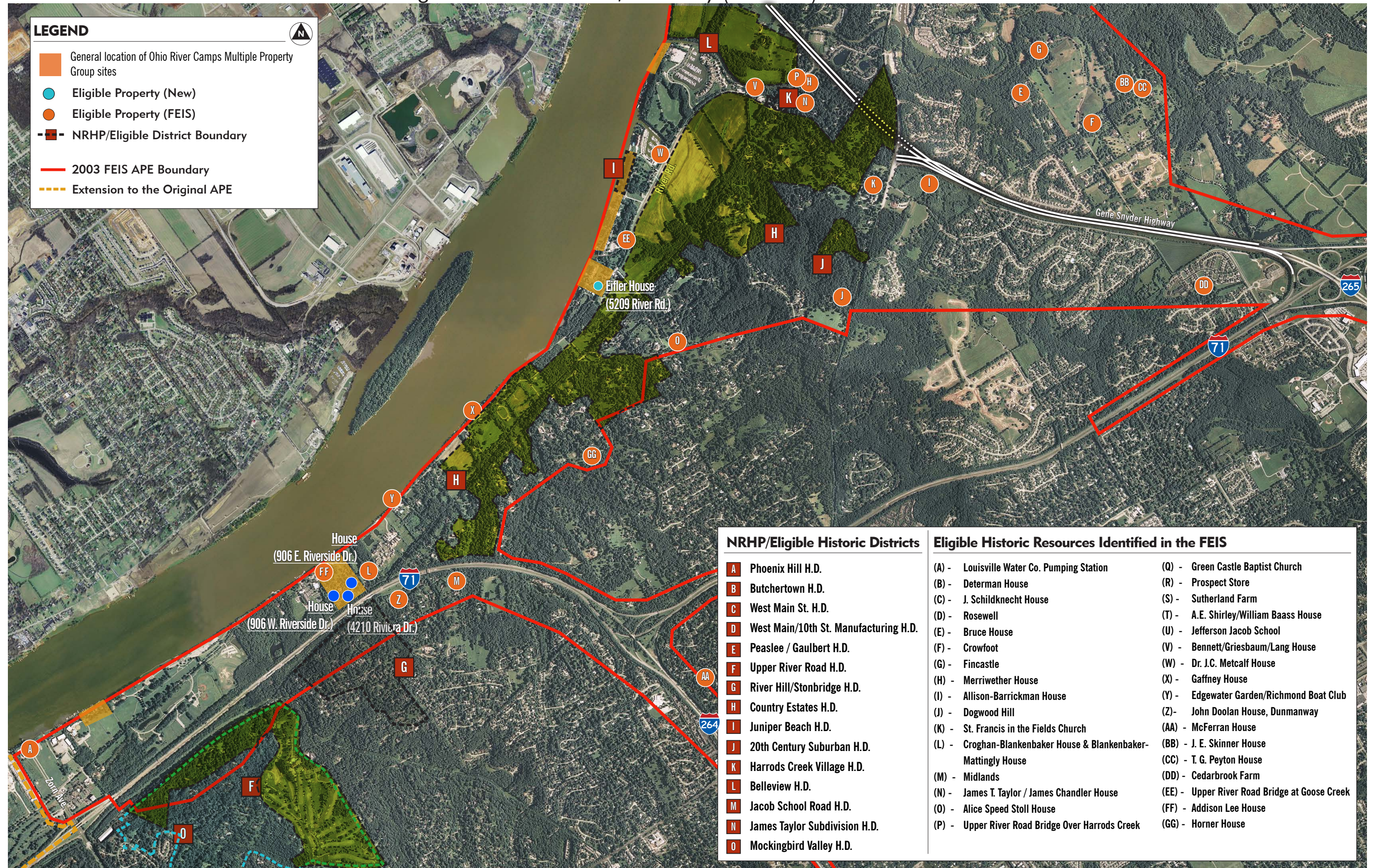


Figure 5.3-3b

Historic Resources Identified within the Original APE - Louisville, Kentucky (East End)



LEGEND

- General location of Ohio River Camps Multiple Property Group sites
- Eligible Property (New)
- Eligible Property (FEIS)
- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE

NRHP/Eligible Historic Districts		Eligible Historic Resources Identified in the FEIS	
A	Phoenix Hill H.D.	(A) -	Louisville Water Co. Pumping Station
B	Butchertown H.D.	(B) -	Determan House
C	West Main St. H.D.	(C) -	J. Schildknecht House
D	West Main/10th St. Manufacturing H.D.	(D) -	Rosewell
E	Peaslee / Gaulbert H.D.	(E) -	Bruce House
F	Upper River Road H.D.	(F) -	Crowfoot
G	River Hill/Stonbridge H.D.	(G) -	Fincastle
H	Country Estates H.D.	(H) -	Merriwether House
I	Juniper Beach H.D.	(I) -	Allison-Barrickman House
J	20th Century Suburban H.D.	(J) -	Dogwood Hill
K	Harrods Creek Village H.D.	(K) -	St. Francis in the Fields Church
L	Bellevue H.D.	(L) -	Croghan-Blankenbaker House & Blankenbaker-Mattingly House
M	Jacob School Road H.D.	(M) -	Midlands
N	James Taylor Subdivision H.D.	(N) -	James T. Taylor / James Chandler House
O	Mockingbird Valley H.D.	(O) -	Alice Speed Stoll House
		(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)

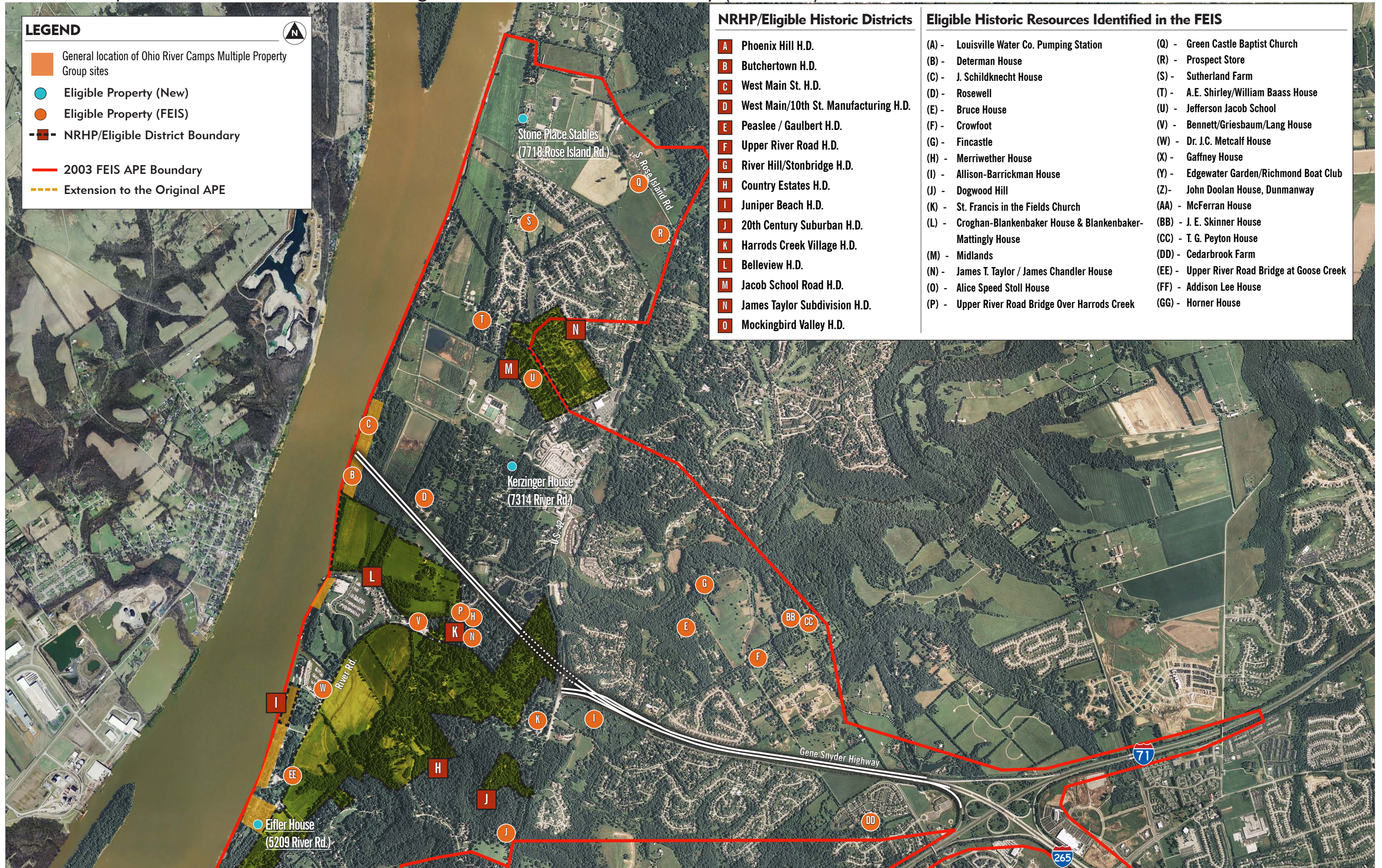


Figure 5.3-4b

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	
		Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction	Adverse Effect	Encroachment, Visual, Noise, Vibration, Construction
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 Guthrie Beach Road is a one-story topped by a side-gable roof. The house at 6212 Guthrie 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 Guthrie Beach Road	N/A	No Adverse Effect	Visual
JF-2030	6212 Guthrie 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	
			No Adverse Effect	Visual
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 ~~two-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 ongoing 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
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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	
			No Adverse Effect	Visual
JF-556	Avish Lane	N/A		

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	
		No Effect	Adverse Effect	No Effect	Adverse Effect
-	Upper River Road Historic District	No Effect		No Effect	
-	River Hill/Stonebridge Historic District	No Effect		No Effect	
-	Country Estates Historic		Adverse Effect		Adverse Effect

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	Bellevue	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, PM_{2.5}, 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

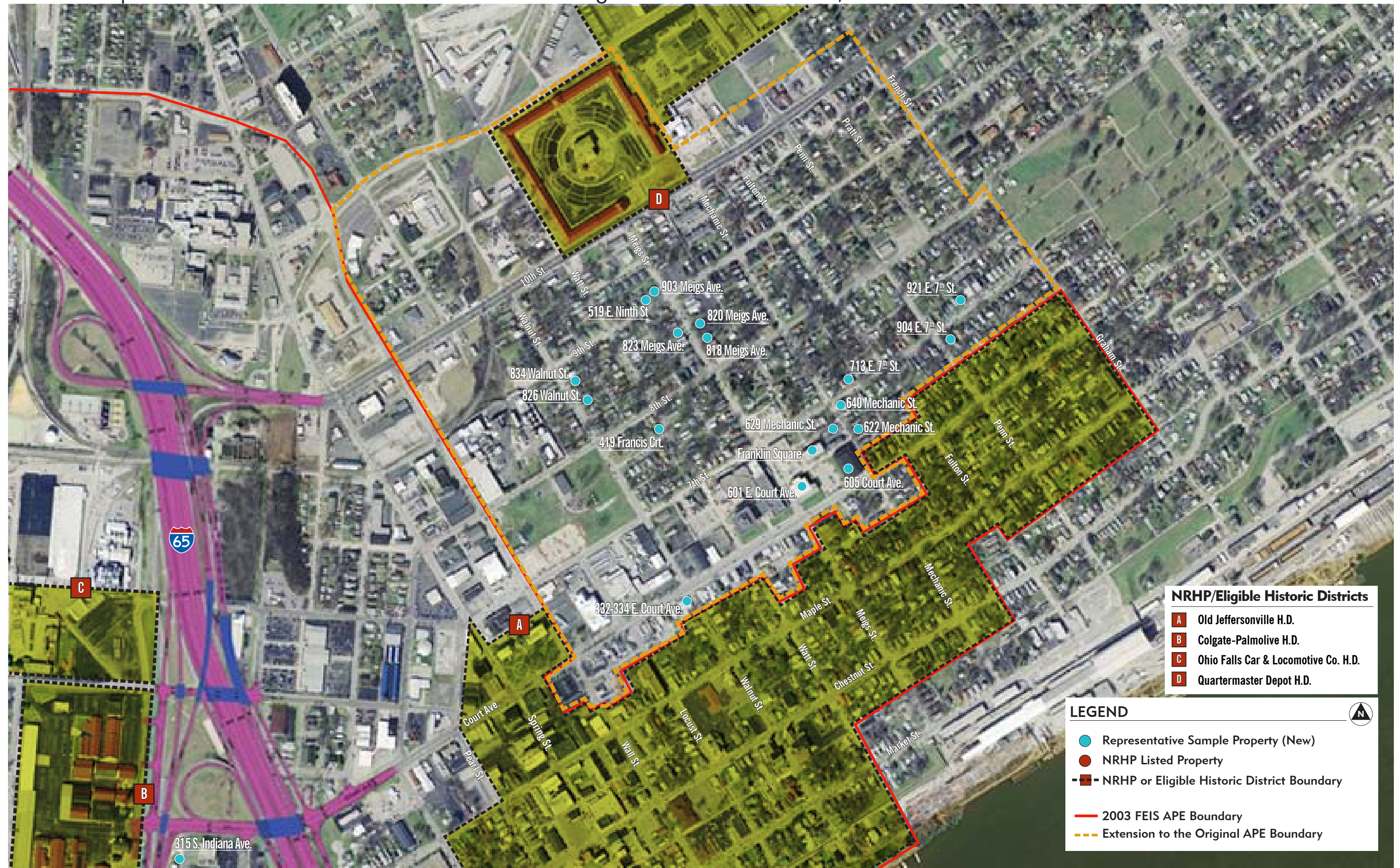


Figure 5.3-5

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

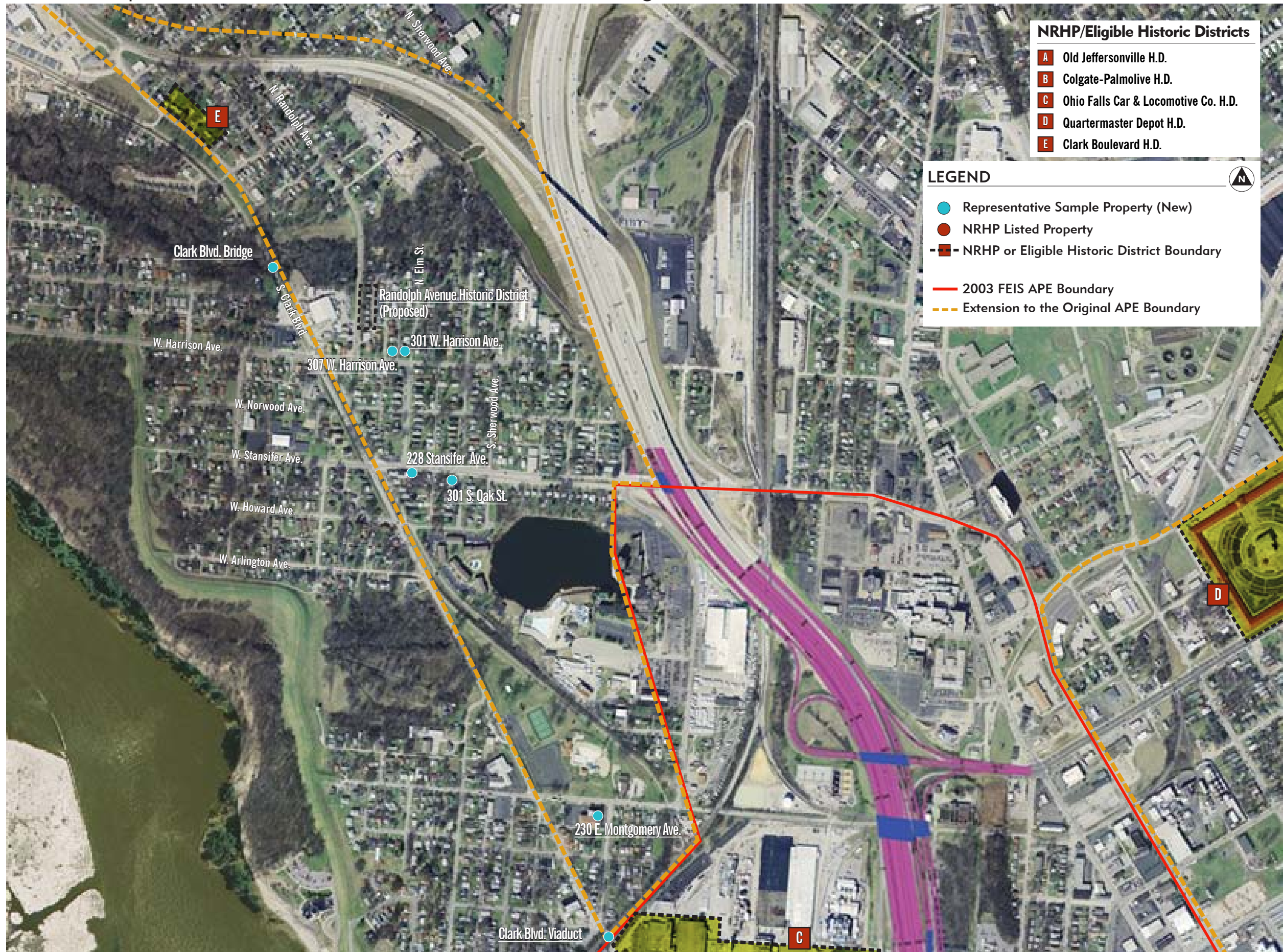


Figure 5.3-6

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

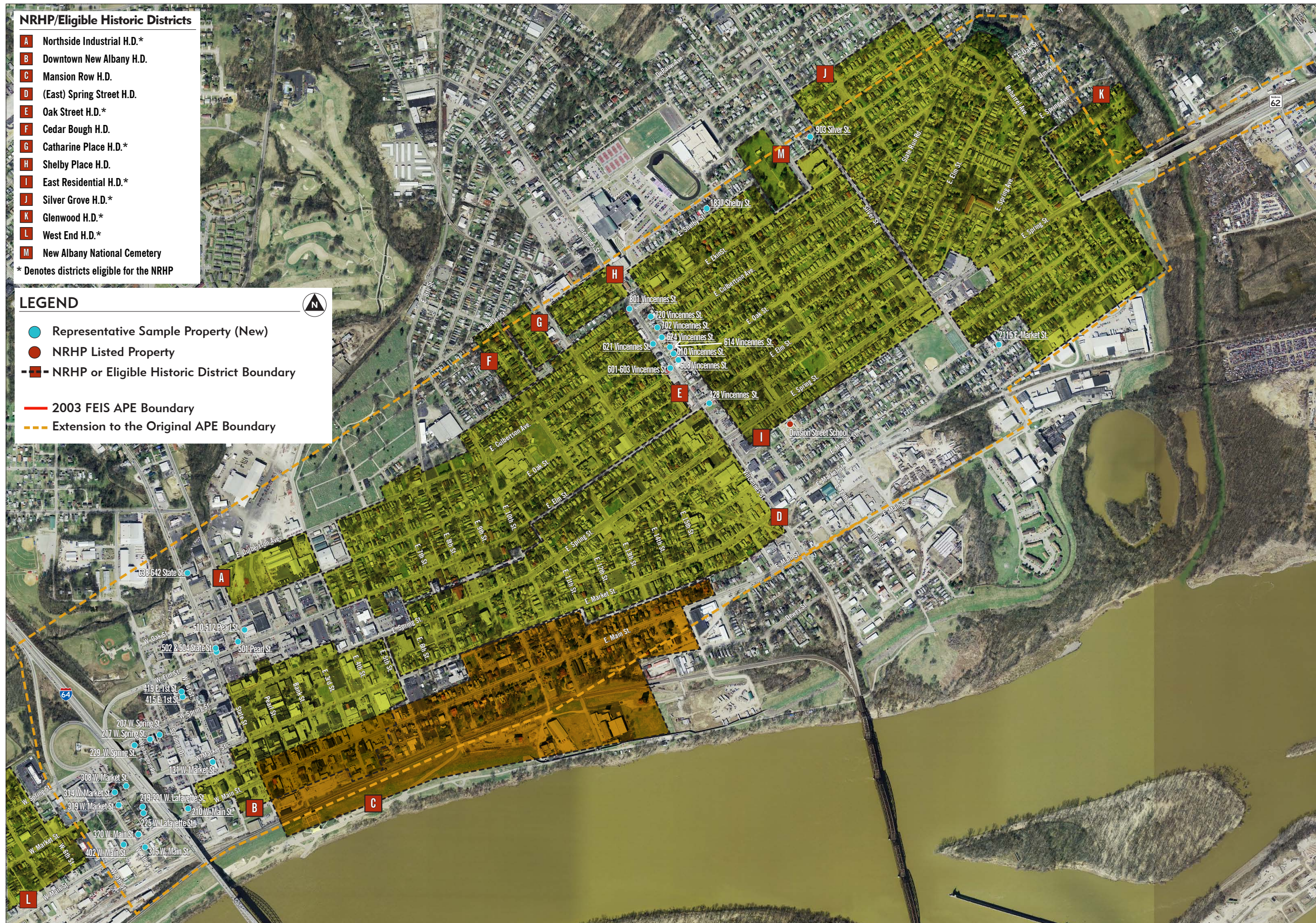


Figure 5.3-7

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)

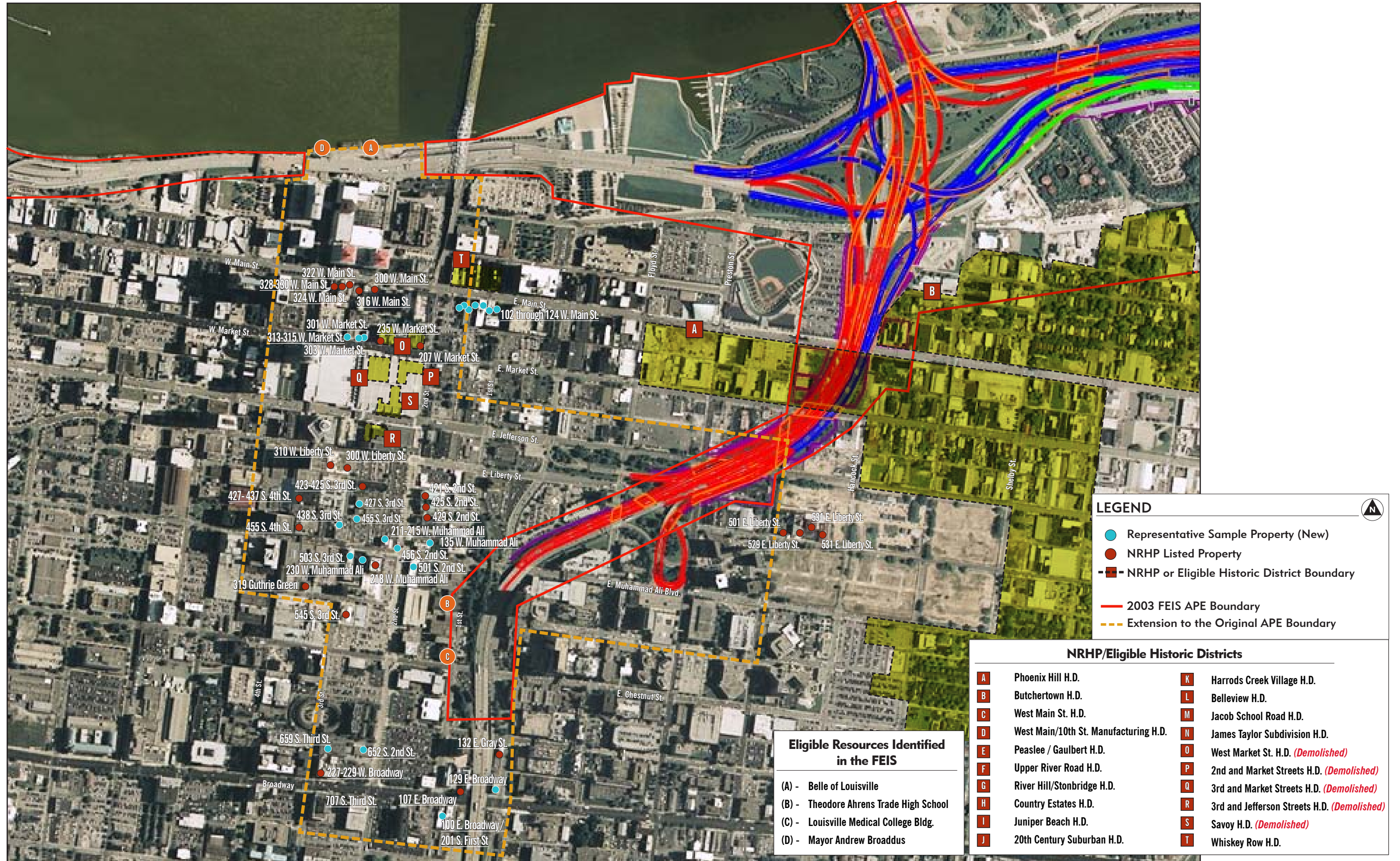


Figure 5.3-8

Historic Properties Identified within the Extensions to the Original APE - Louisville, Kentucky (River Road)

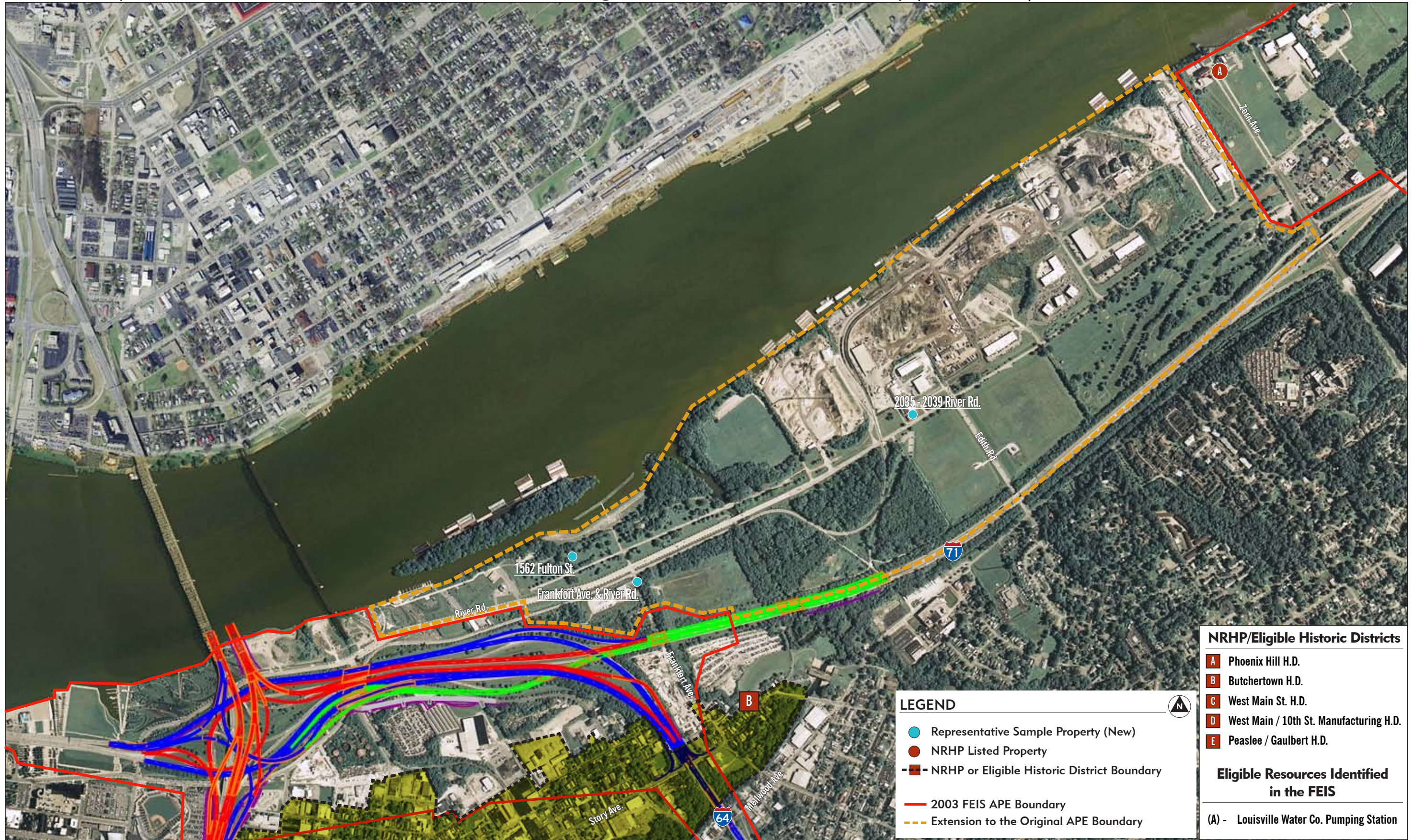


Figure 5.3-9

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 I Investigations Conducted in 2008. Site Potentially Eligible, Further Coordination Required	East End
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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-CI-762 (Indiana, Downtown Corridor) and 15Jf717 and 15Jf718 (Kentucky, Downtown Corridor) were found to be eligible for listing in the NRHP. Site 12-CI-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-CI-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-CI-516, 12-CI-525 and 12-CI-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-CI-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
2 nd /Main	8.70	7.56	4.5	4.2	4.5	4.2
2 nd /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 PM_{2.5} 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 PM_{2.5} NAAQS.

For the Downtown analysis it was determined that the worst-case AADT for the Downtown area is lower than 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 PM_{2.5}. 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 than 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 PM_{2.5}. 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 PM_{2.5} 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 PM_{2.5} 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 CO₂ 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 guidance¹¹. 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 benefitted 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.

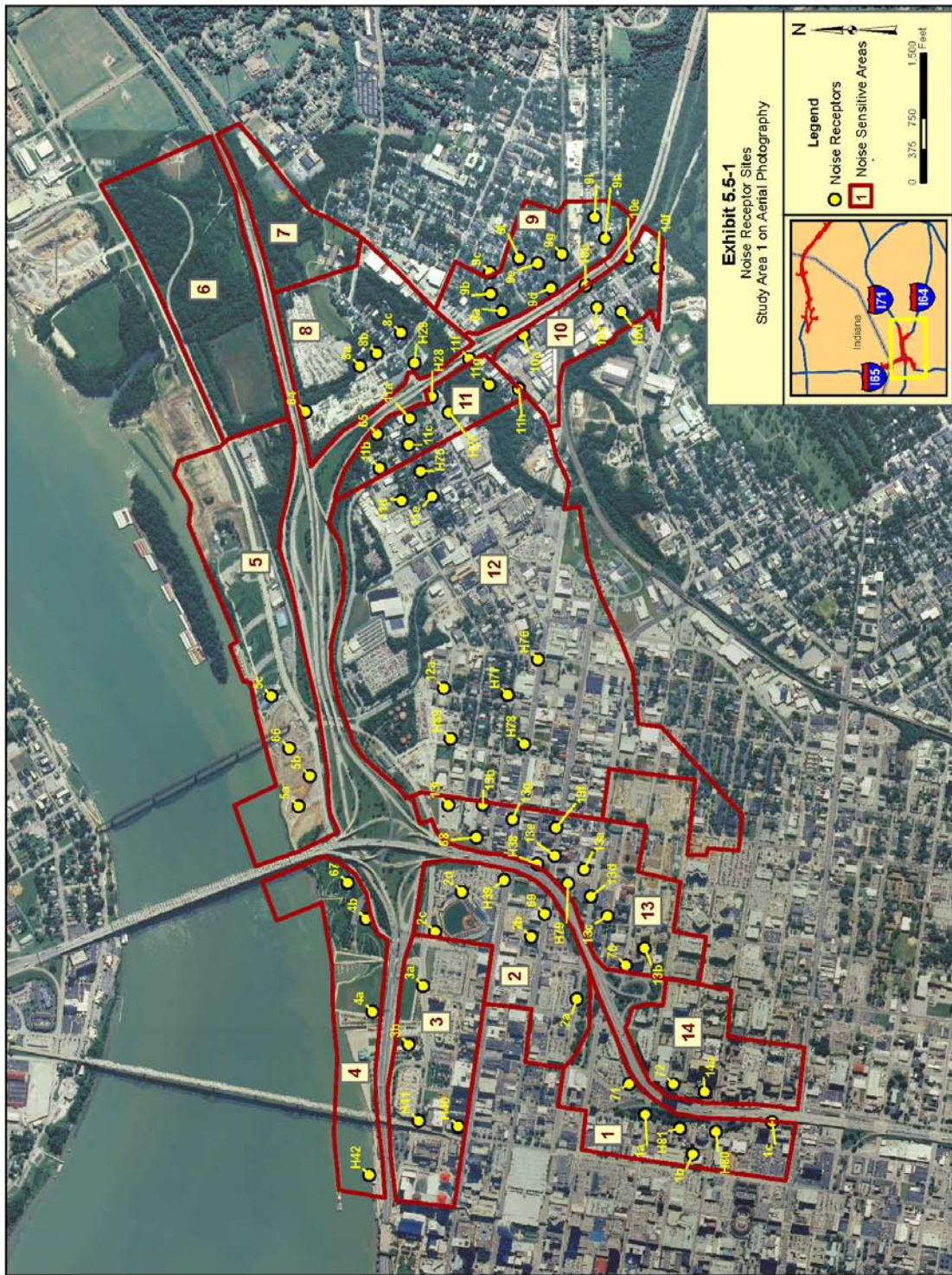
Study Area 1 Receivers

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	F (NA)
65	Butchertown HD	B/E (67 dBA)
66	Waterfront Park	C (67 dBA)
67	Waterfront Park	C (67 dBA)
68	Butchertown HD	B/E (67 dBA)
69	Commercial/Phoenix Hill HD	B/E (67 dBA)
70	Residential	B (67 dBA)
71	Medical/Commercial	C/D (67 dBA)
72	Hospital	C/D (67 dBA)
H27	Butchertown HD/Trail	B/C (67 dBA)
H28	Butchertown HD	B/E (67 dBA)
H29	Butchertown HD	B/E (67 dBA)
H38	Phoenix Hill HD	B/E (67 dBA)
H39	Phoenix Hill HD	B/E (67 dBA)
H40	West Main Street	E (72 dBA)
H41	L&N Railroad Office	E (72 dBA)
H42	Belle of Louisville	C (67 dBA)
H75	Butchertown HD	B/E (67 dBA)
H76	Butchertown HD	B/E (67 dBA)
H77	Butchertown HD	B/E (67 dBA)
H78	Butchertown HD	B/E (67 dBA)
H79	Residential	B (67 dBA)
H80	Old Louisville Medical	C/D (67 dBA)
H81	Ahrens Trade School	C/D (67 dBA)
H89	Butchertown HD	B/E (67 dBA)
1a	Martha Ellison Peace Green Park	C (67 dBA)
3a	Residential	B (67 dBA)
4a	Waterfront Park	C (67 dBA)
9a	Clifton Park	C (67 dBA)
10a	Residential/Commercial	B/E (67 dBA)
11a	Story Avenue Park	C (67 dBA)
13a	Commercial	E (72 dBA)



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 well 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	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
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	NA*	NA*	NA*
	Modified Selected	NA*	NA*	NA*

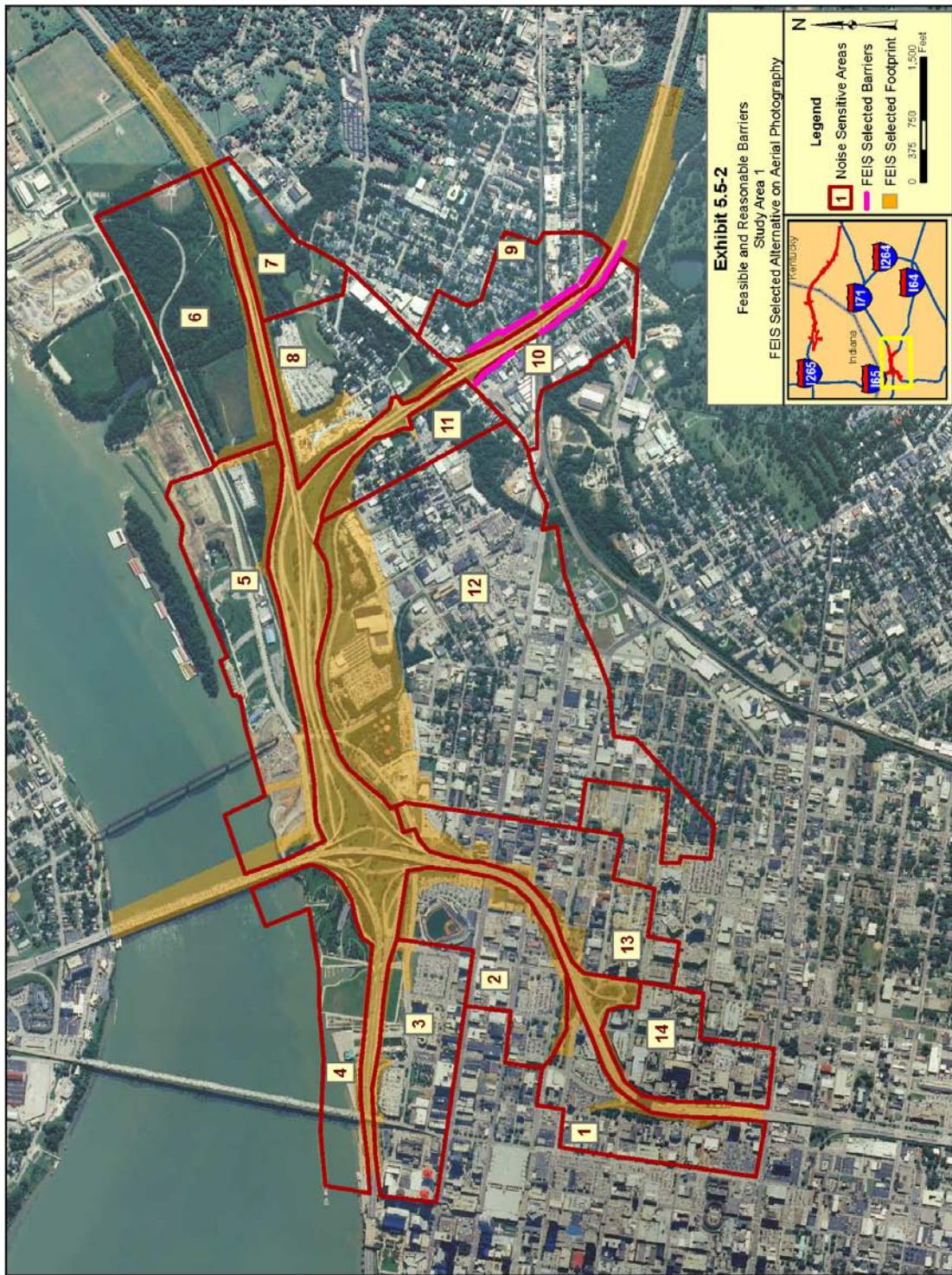
* No barrier analysis performed for the high-rise hospital/medical buildings in Analysis Site 14 due to the lack of exterior uses.

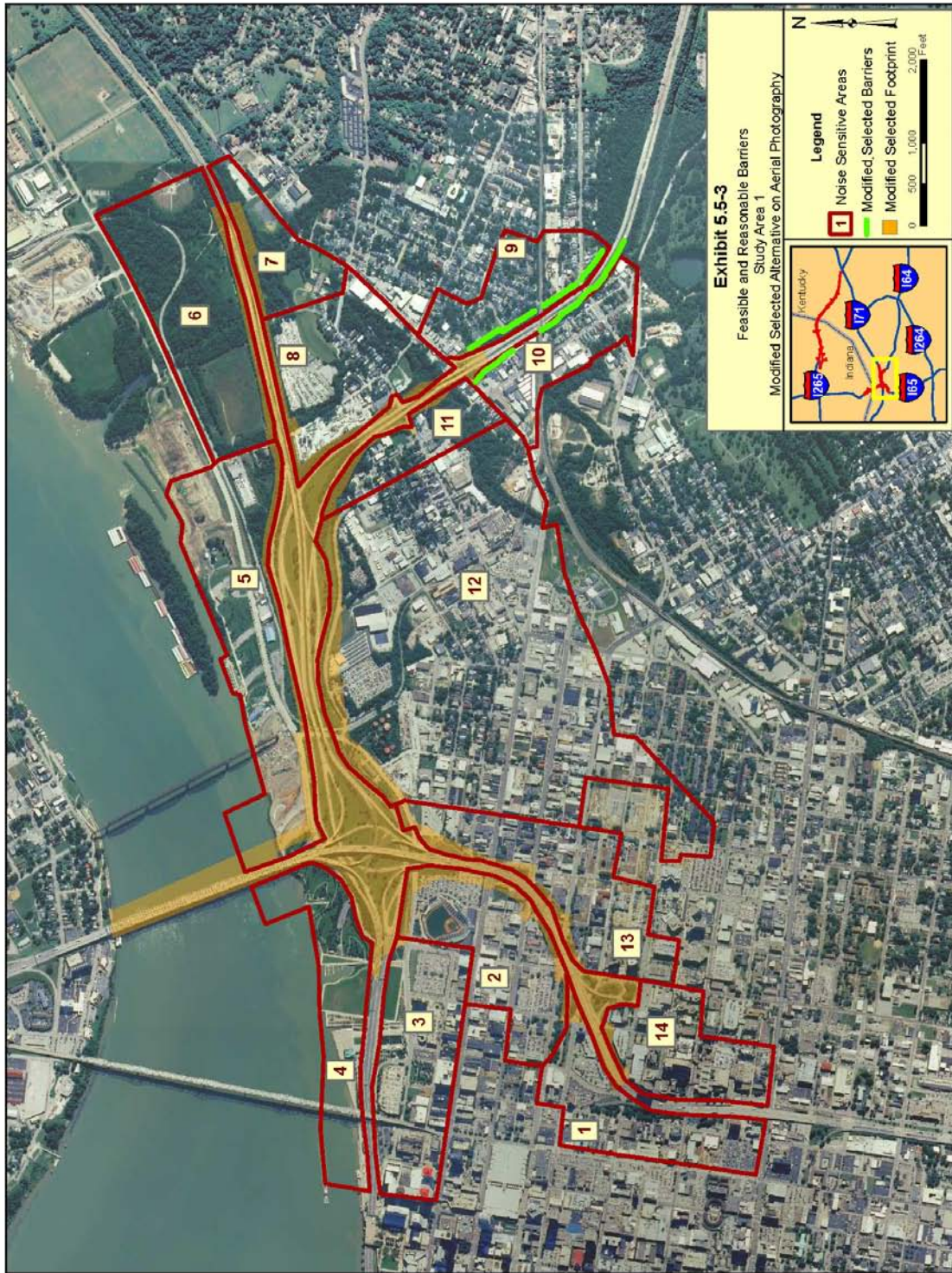
As indicated in Table 5.5-3, it was determined based on the results that it is not possible to obtain the amount of noise attenuation required to be considered acoustically feasible in accordance with KYTC noise policy for most of the Study Area 1 noise sensitive areas assessed for either the FEIS Selected 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.





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.

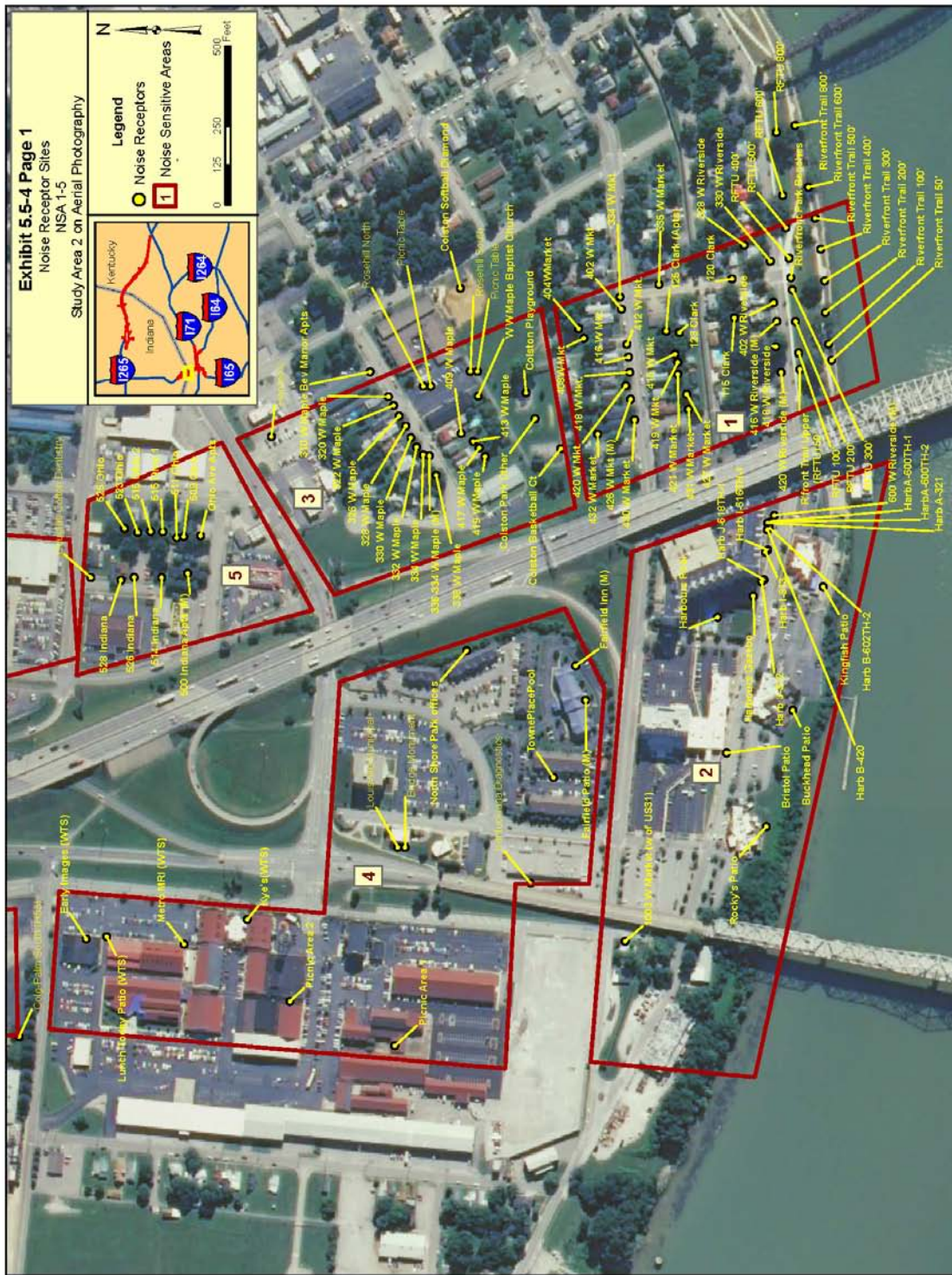
Additional modeled receivers are included in the impact tables for the study area. For the Harbours Condominiums, one goal was to assess the change in level with change in elevation for this 11-story building. Sites were selected on balconies of the third, sixth and ninth floor units, representing locations 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.

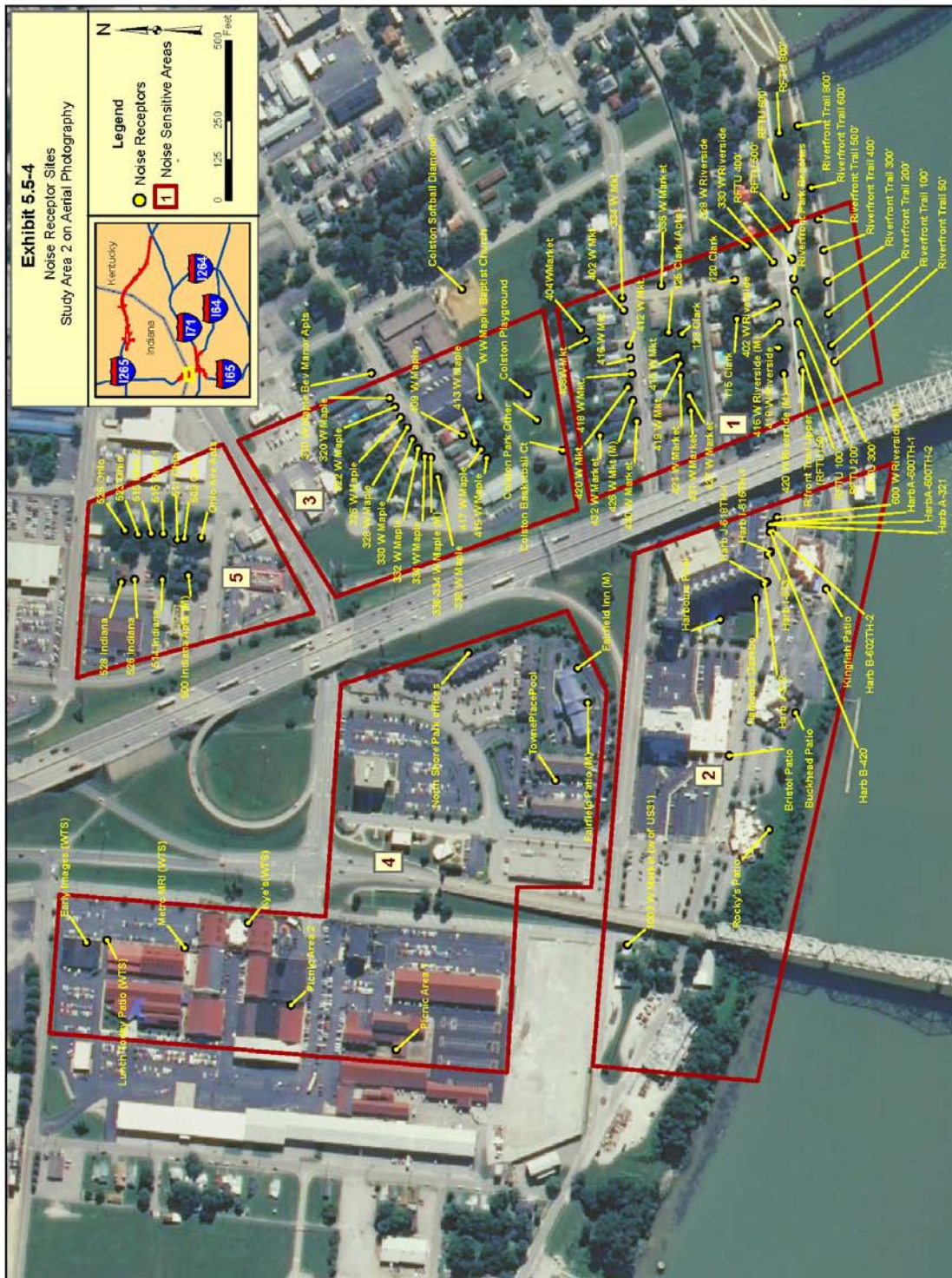
Study Area 2 Model Validation

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)





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.





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.

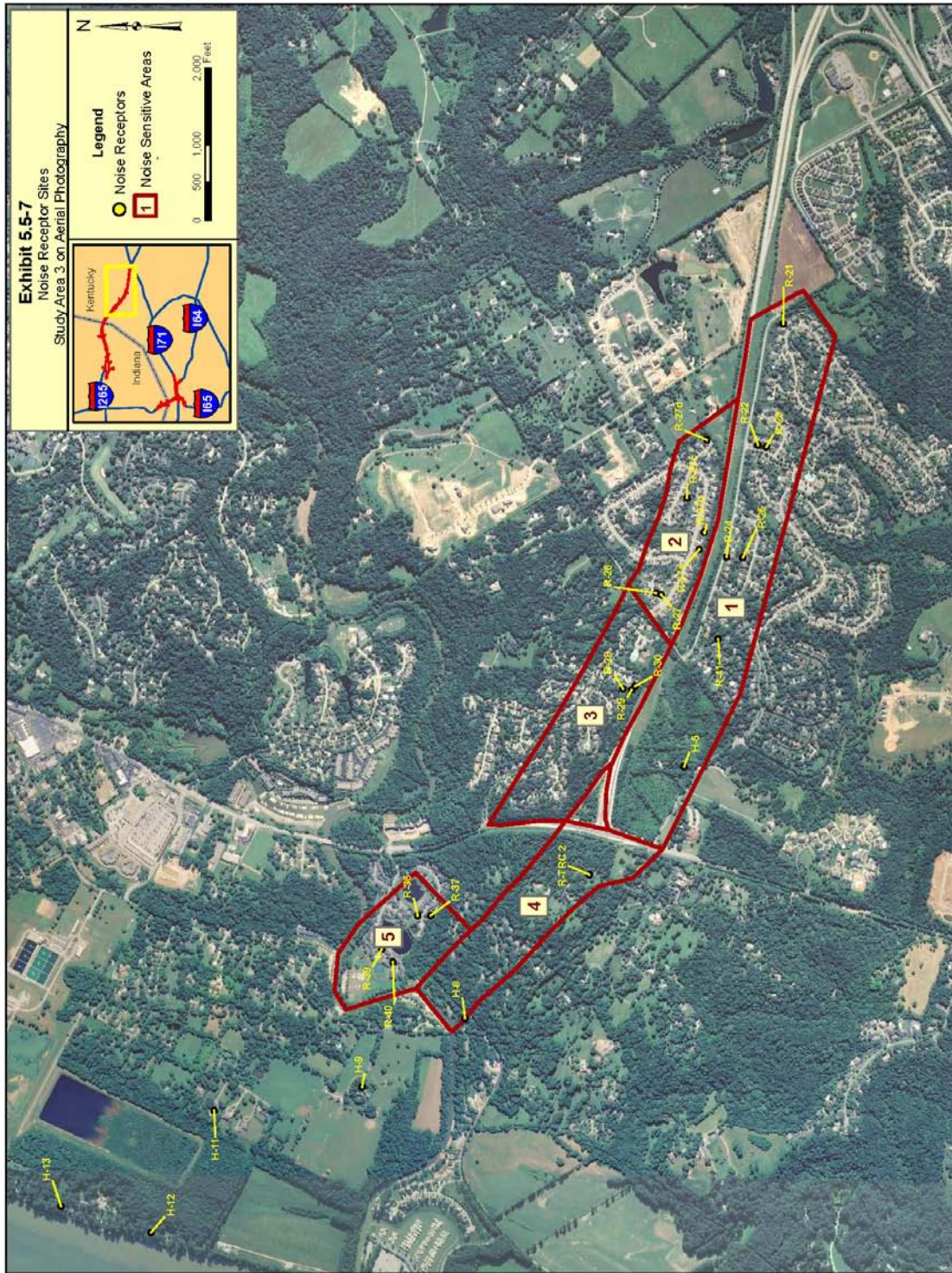
Study Area 3 Receivers

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)



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.

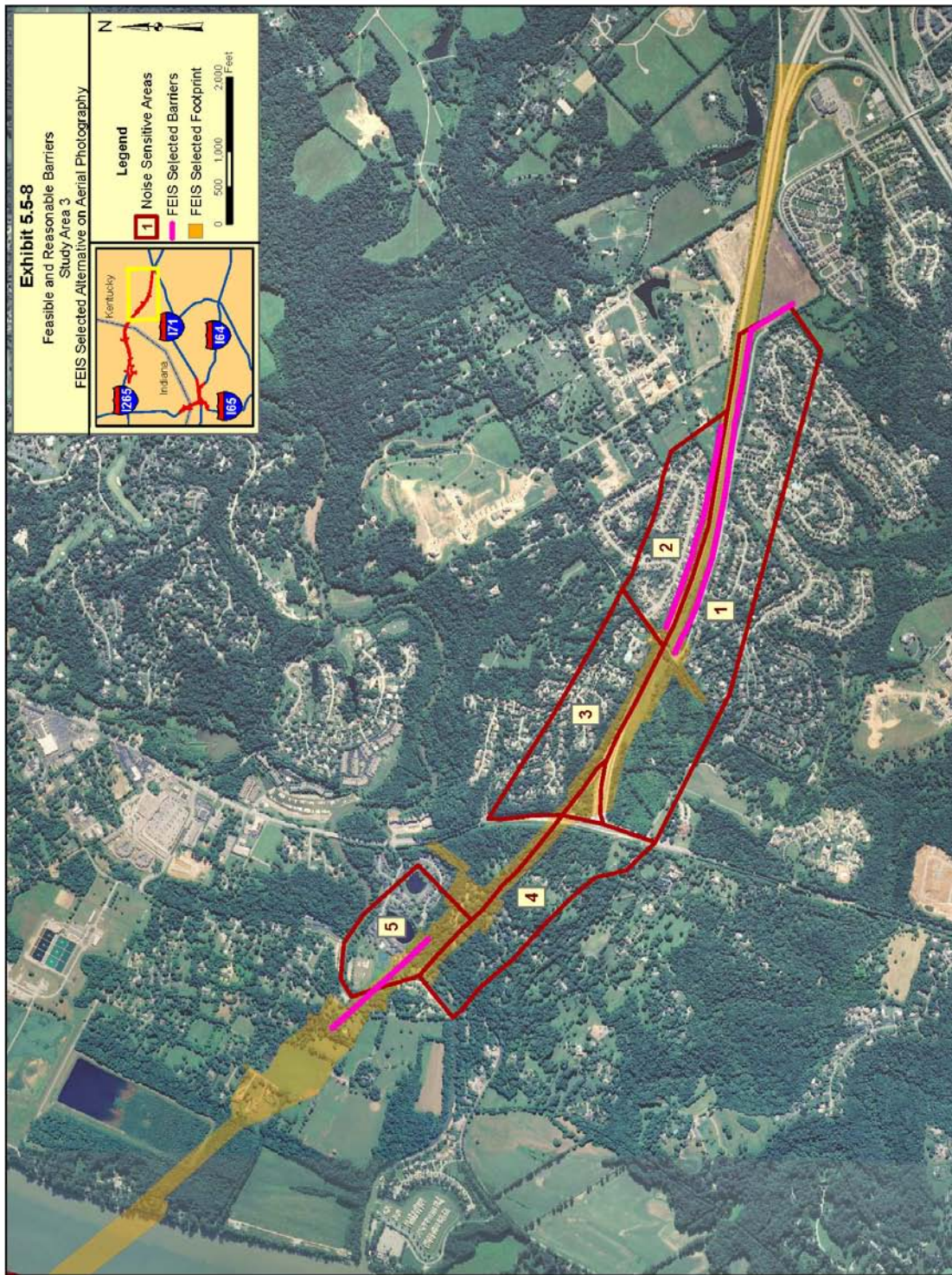
TABLE 5.5-7
STUDY AREA 3 NOISE ABATEMENT SUMMARY

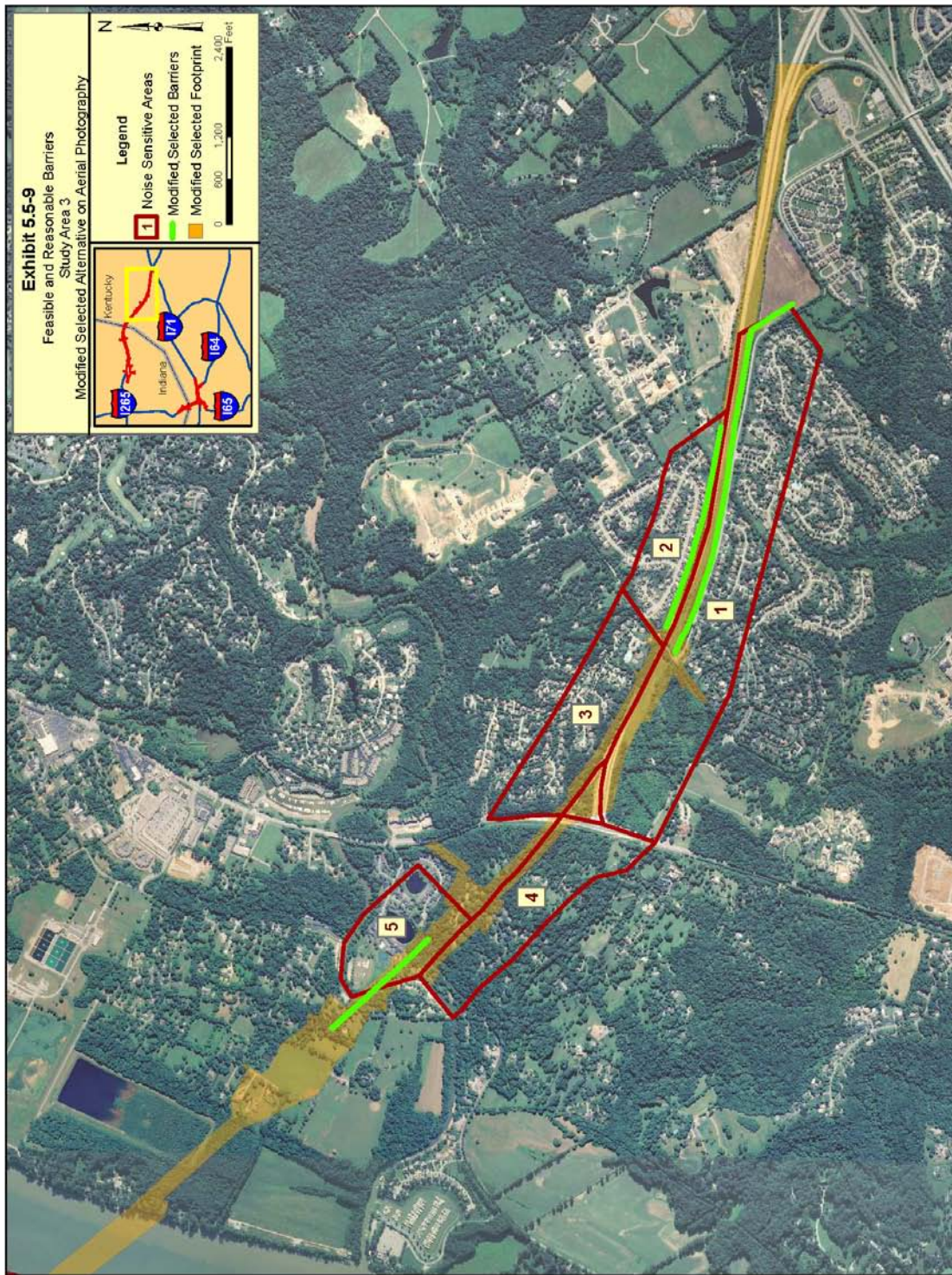
Noise Sensitive Area	Alternative	Acoustic Feasibility	Meets Cost-Effective Criteria	Meets KYTC Design Goal
Noise Sensitive Area 1 Green Spring/Wolf Creek Subdivisions	FEIS Selected	Yes	Yes	Yes
	Modified Selected	Yes	Yes	Yes
Noise Sensitive Area 2 Wolf Pen Woods Subdivision	FEIS Selected	Yes	Yes	Yes
	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.





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.

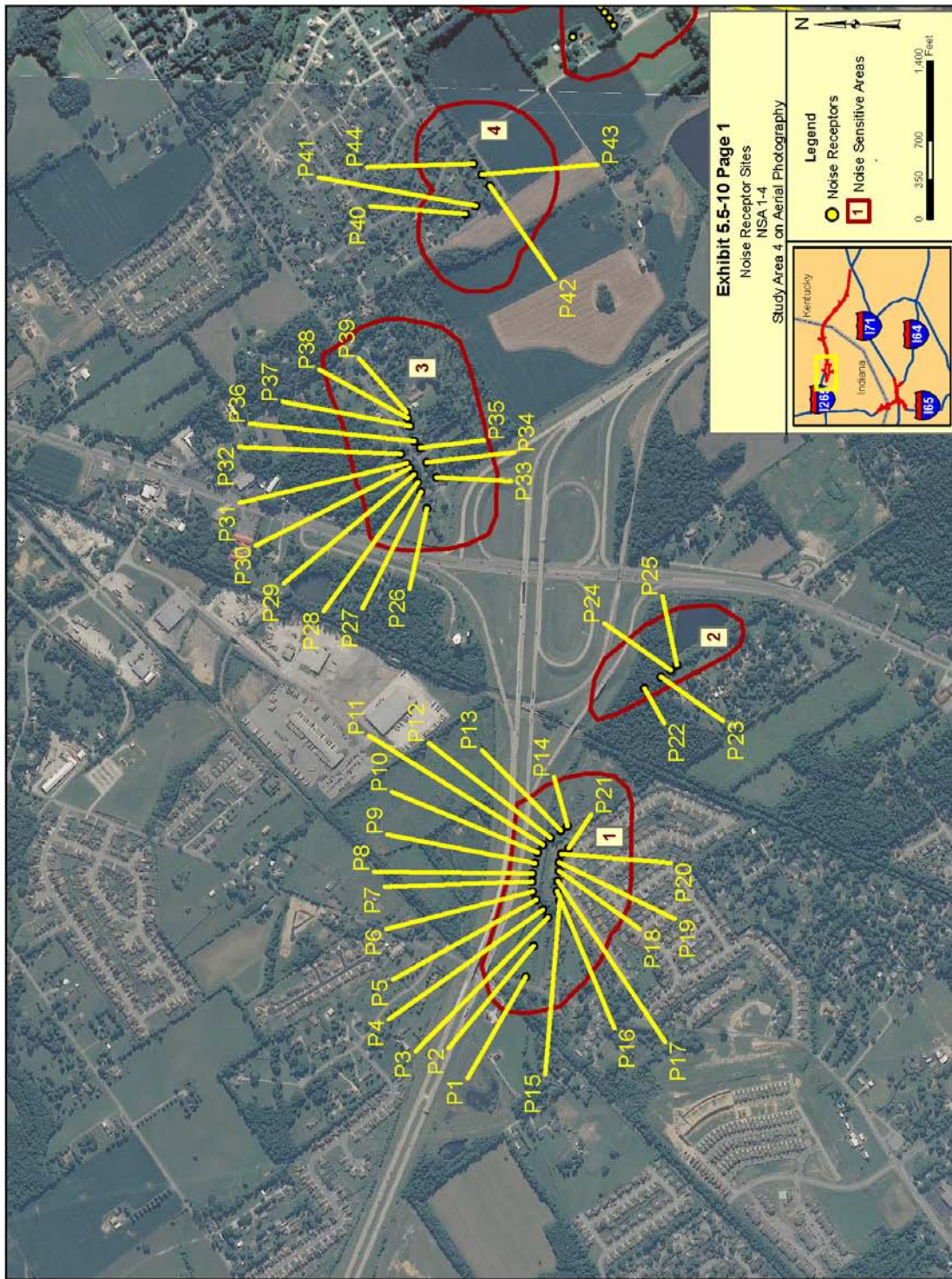
Model Validation for Study Area 4

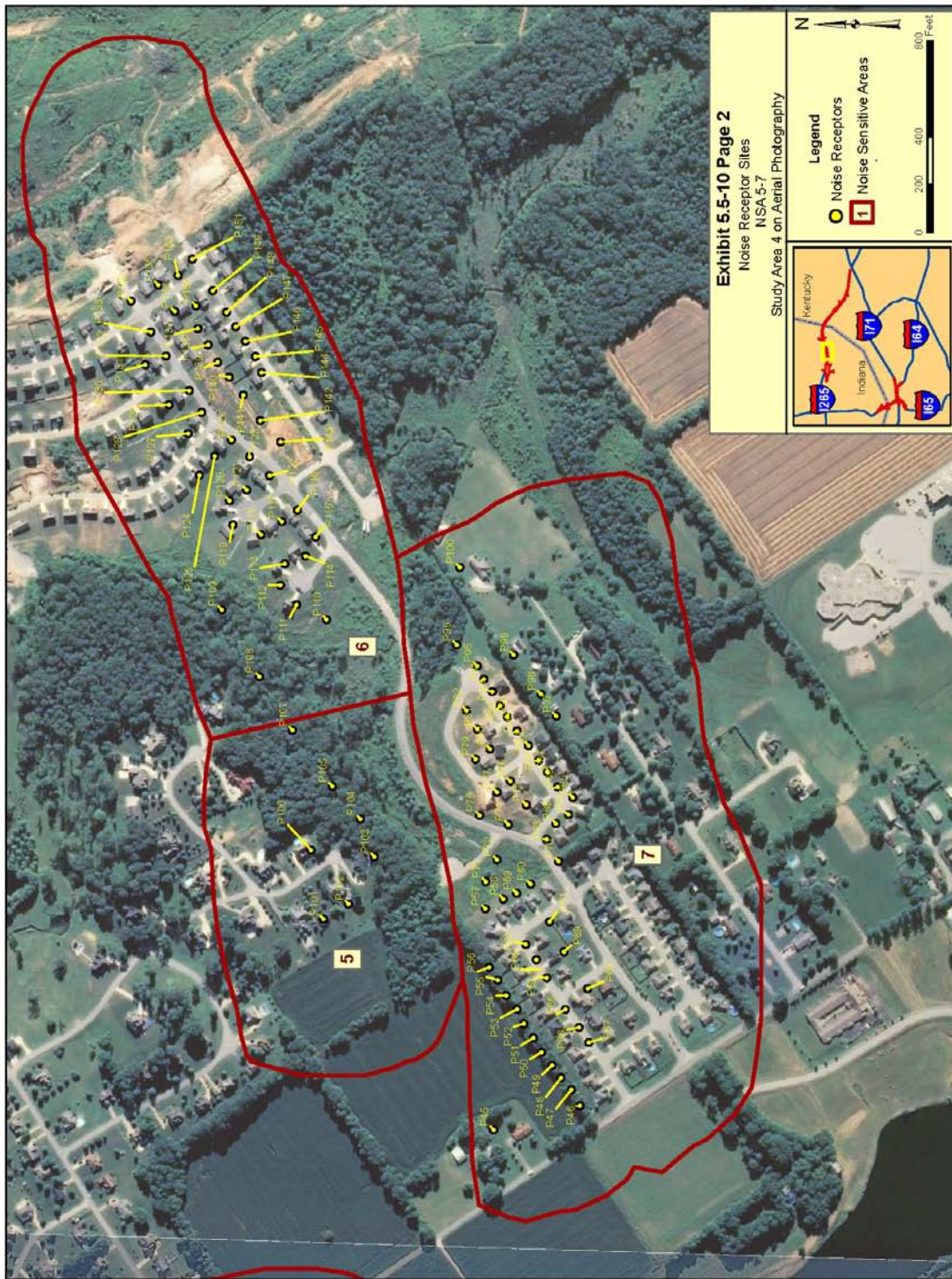
Receptors located along Morgan Trail and New Chapel Road were used for model validation in Study Area 4. The LSIORB Project is proposed to be constructed mainly on new alignment and the validation consisted of only the portion of the I-265/S.R. 62 interchange. All predicted values were found to be within 3 dBA of the field measured values for these receptors and, therefore, the TNM2.5 model was validated.

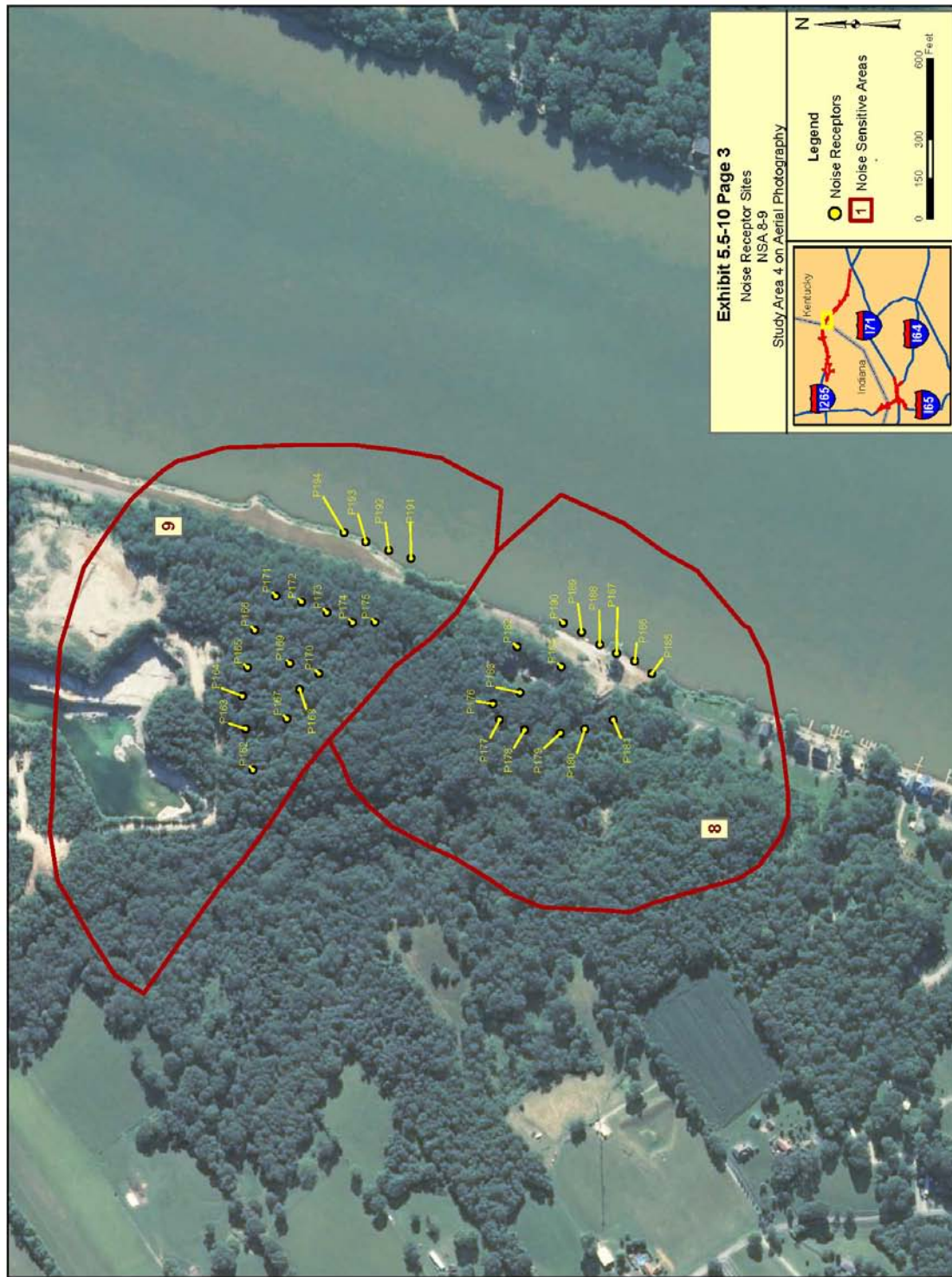
TABLE 5.5-8
RECEIVERS IN STUDY AREA 4

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.*







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.

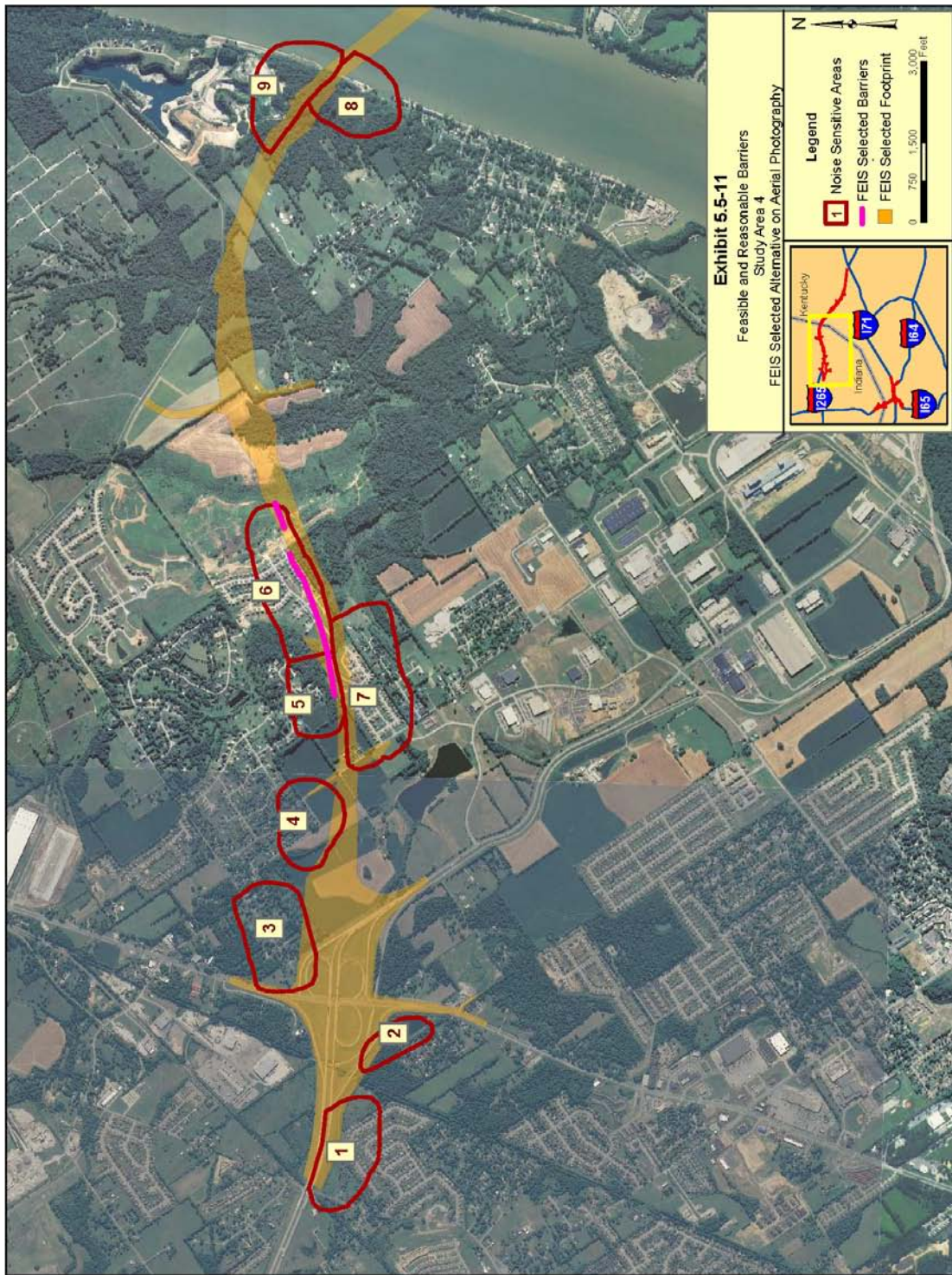
Noise Sensitive Areas 1 through 4 and 8: Future design-year noise levels would not approach or exceed the Category B NAC of 67 dBA Leq at any of these noise sensitive areas and no substantial increases (15 dBA or higher) are expected due to the proximity of the existing interchange for either the FEIS 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.

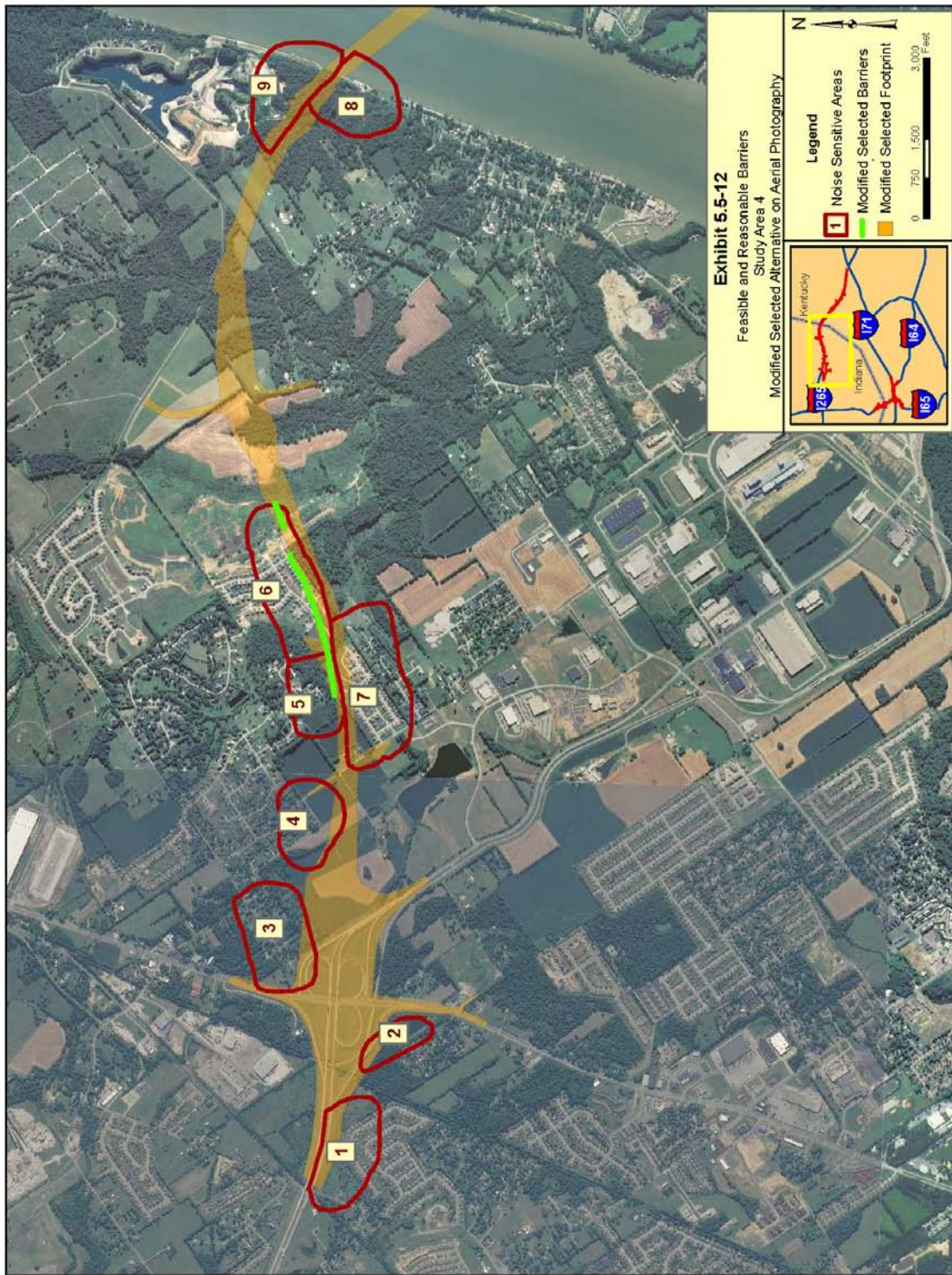
Noise Sensitive Areas 5 and 6: This area was assessed for barrier abatement for both the FEIS Selected Alternative and the Modified Selected Alternative. The TNM2.5 results indicate that for the FEIS Selected Alternative, a feasible barrier could be constructed. The total cost of the barrier would be \$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.





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	2 nd 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	Bellevue	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 dBA¹². 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 guidance¹⁴ 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	Downto wn Riverfro nt	Easter n Uplan ds	Eastern Bottomlan ds	Louisvill e CBD	Louisvil le East	Louisvil le West	Jeffersonvil le/ 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.

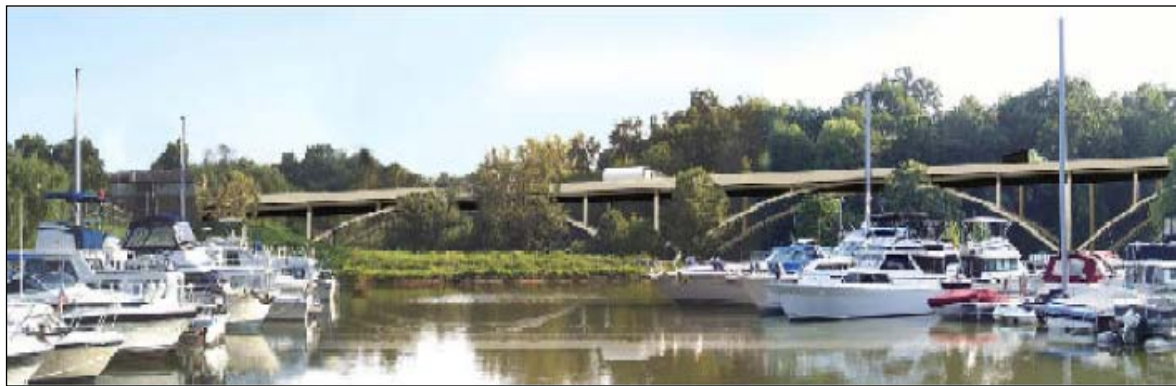
Figure 5.11-2 East End Viewsheds



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).



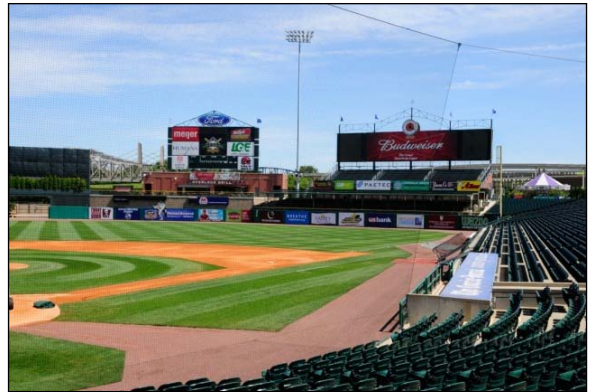
N. New 6th Street connection between Jeffersonville and Clarksville, IN
(FEIS Selected and Modified Selected Alternatives).



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)	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.

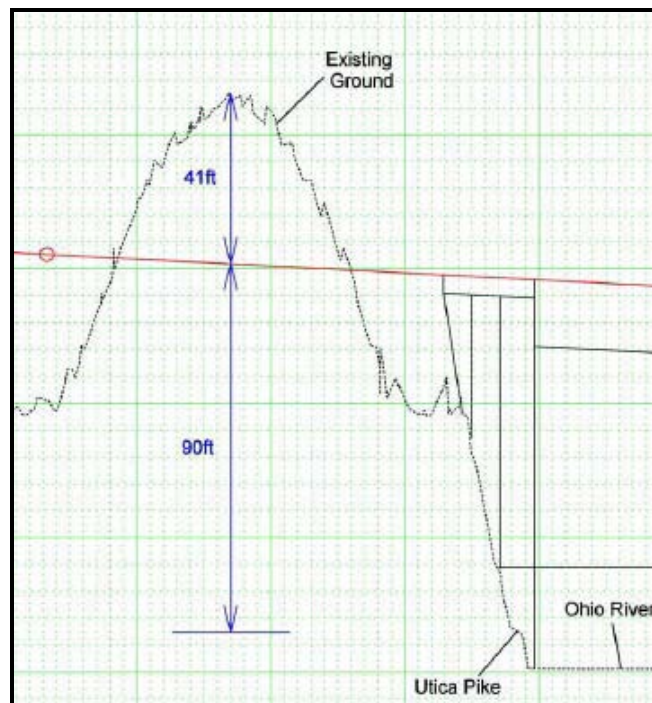


FIGURE 6.2-1 ELEVATION VIEW OF ALTERNATIVE A-15

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 48004 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."

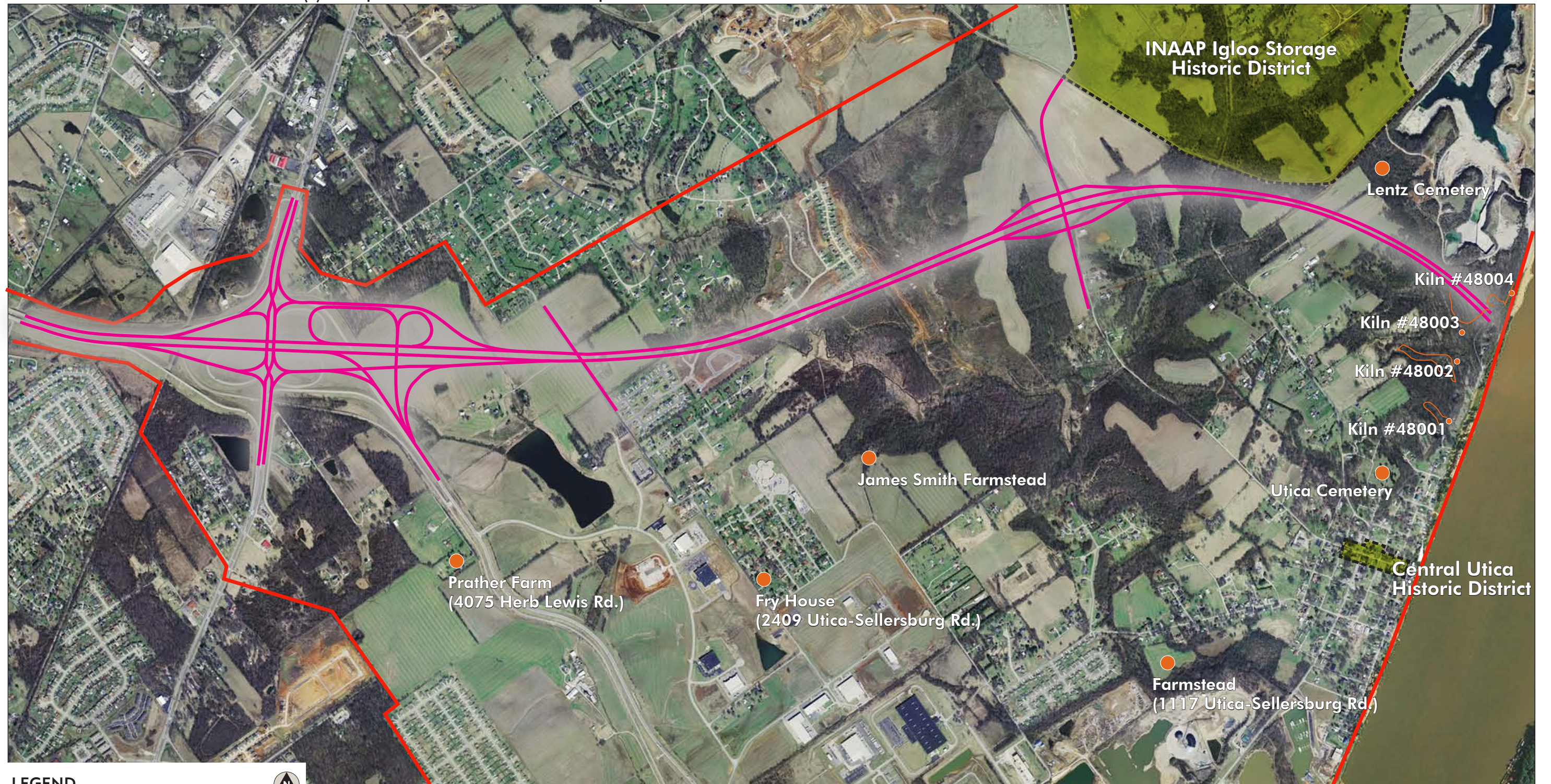
3. The Modified Selected Alternative includes all possible planning, as defined in 23 U.S.C. §774.17, to minimize harm to Section 4(f) property.³ The Modified Selected Alternative incorporates all of the avoidance, minimization, and mitigation commitments that were adopted in the 2003 ROD for the FEIS 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



- LEGEND**
- Eligible Property (FEIS)
 - ▬ NRHP/Eligible District Boundary
 - 2003 FEIS APE Boundary
 - Extension to the Original APE

Figure 6.2-1

Indiana Downtown Section 4(f) Properties Within the Project Area

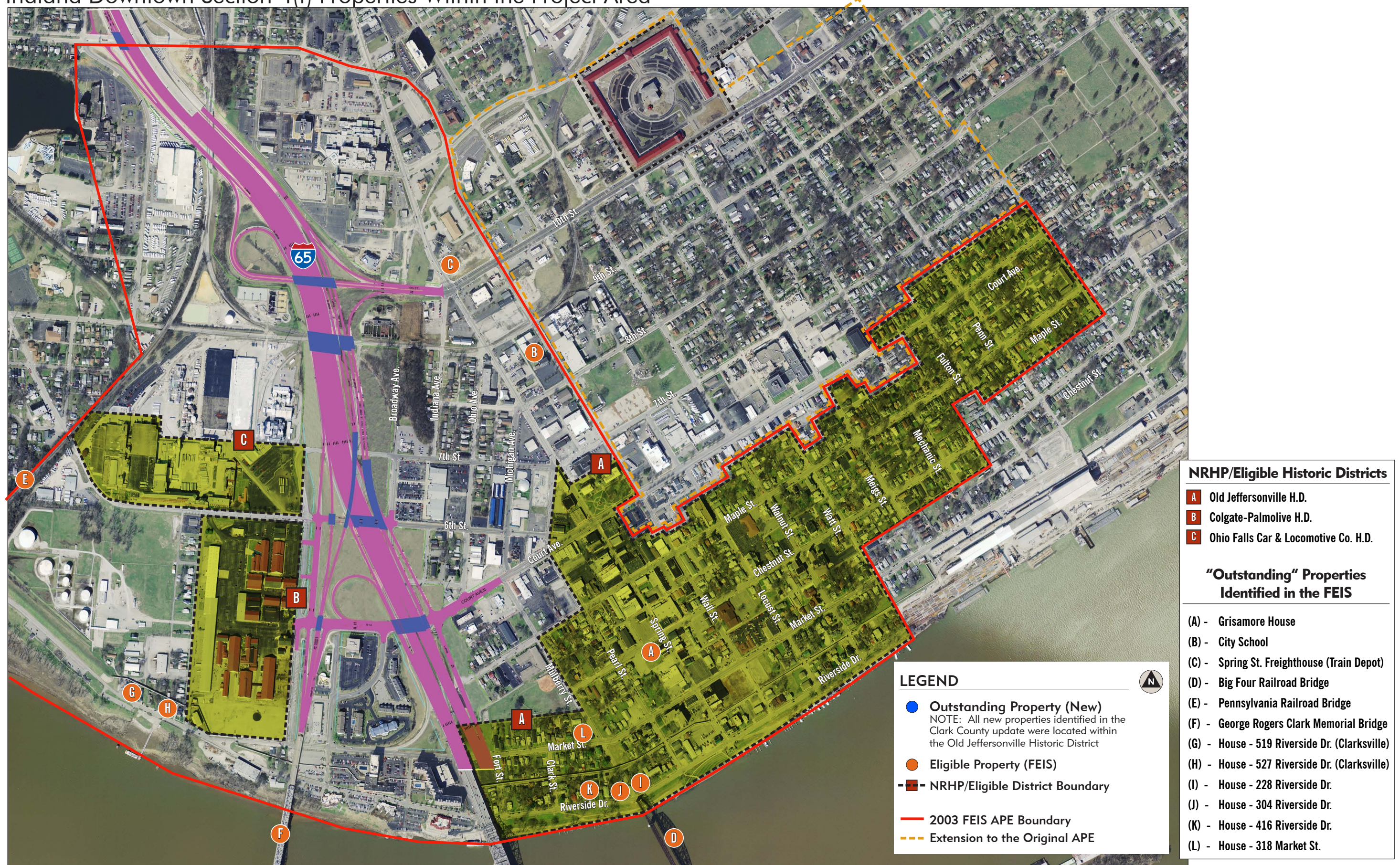


Figure 6.2-2

Kentucky Downtown Section 4(f) Properties Within the Project Area

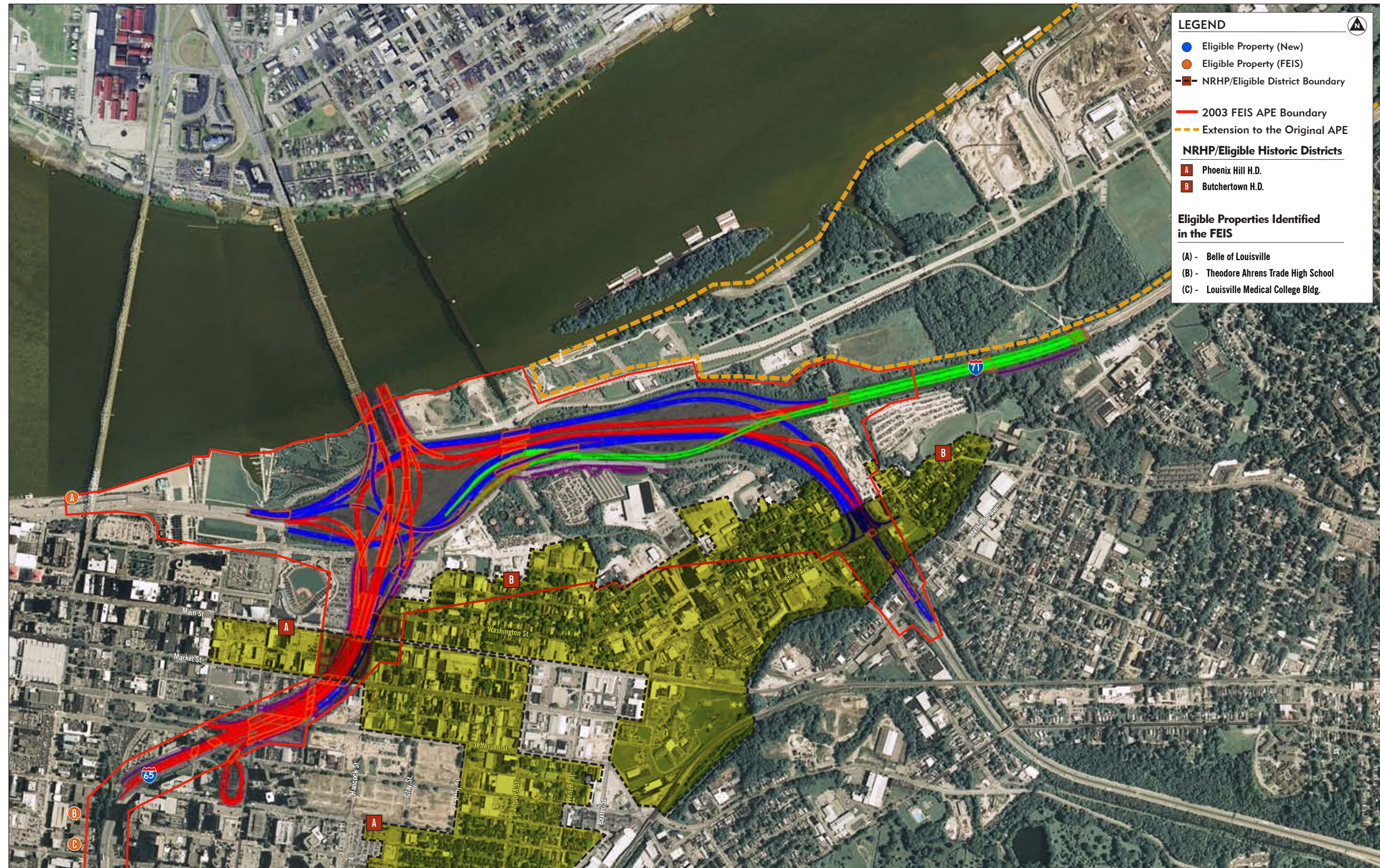
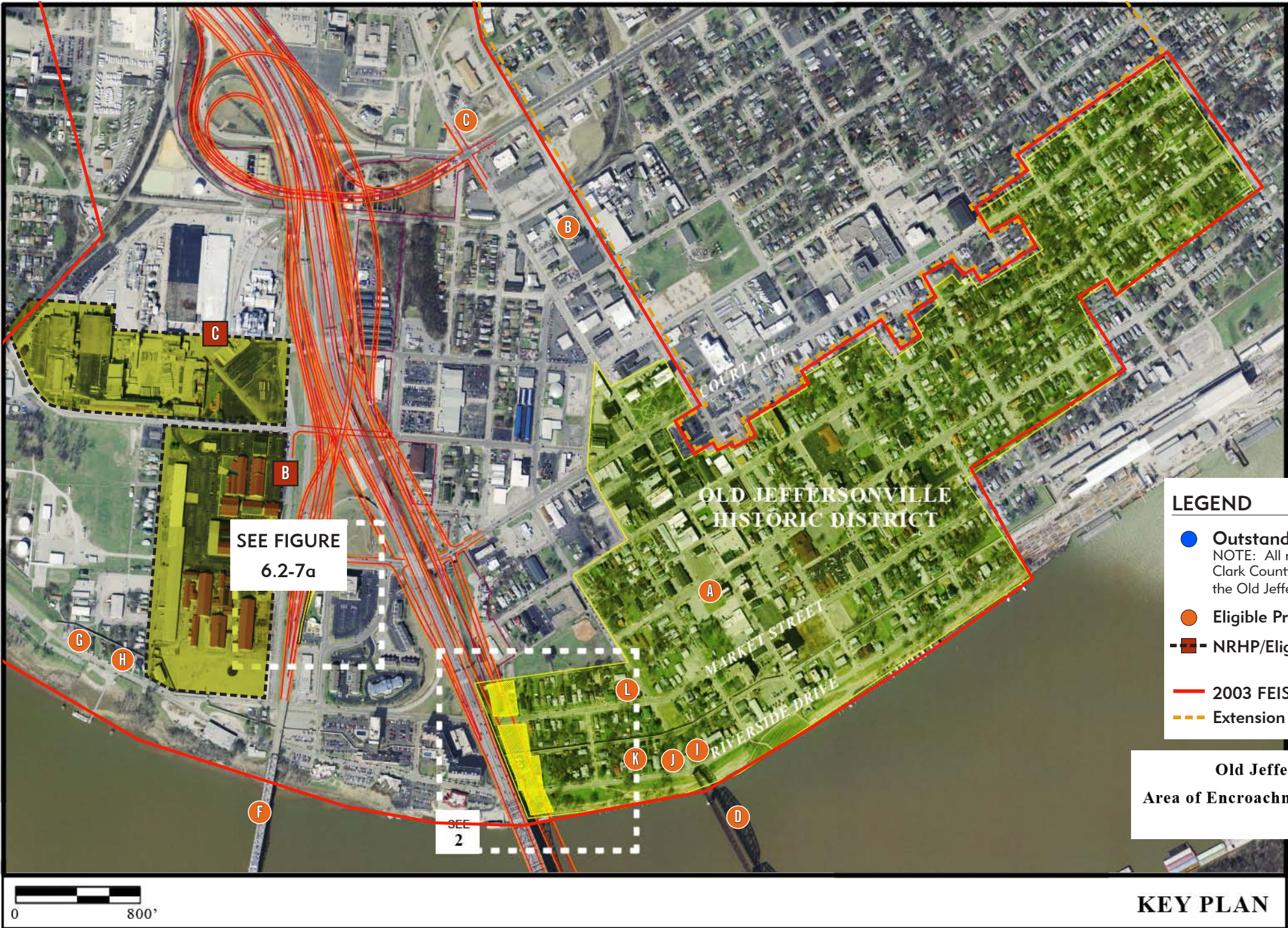


Figure 6.2-3

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.

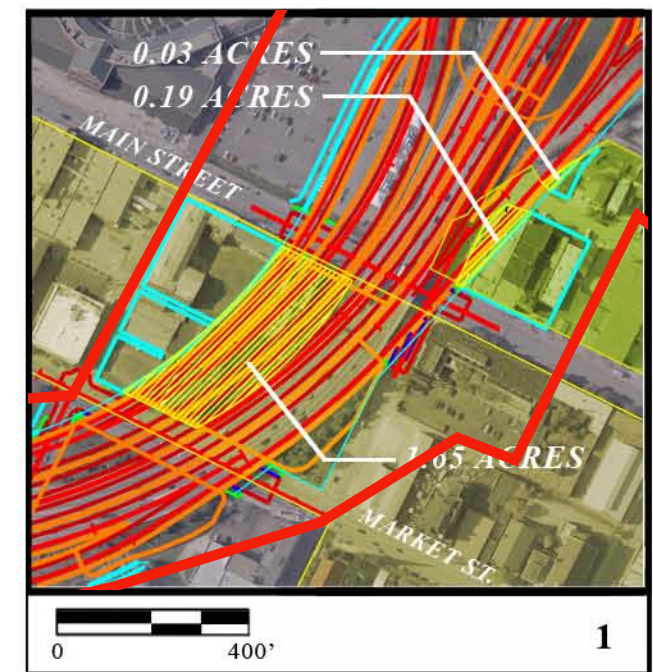
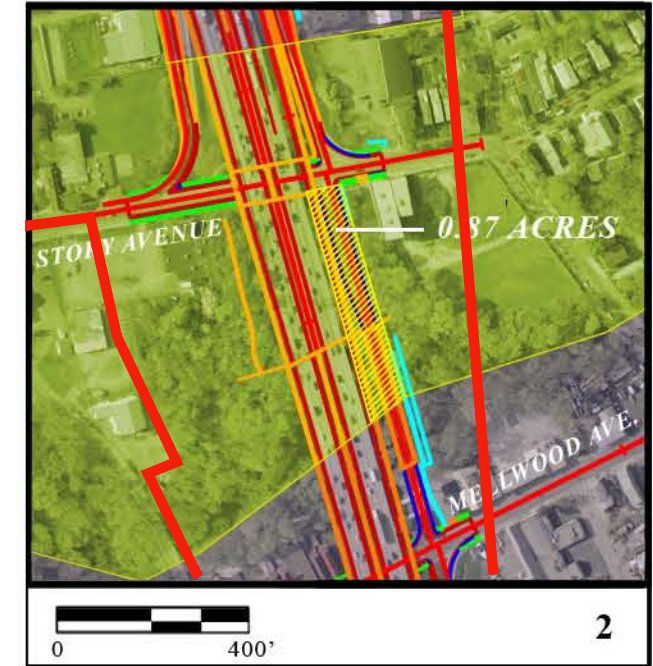
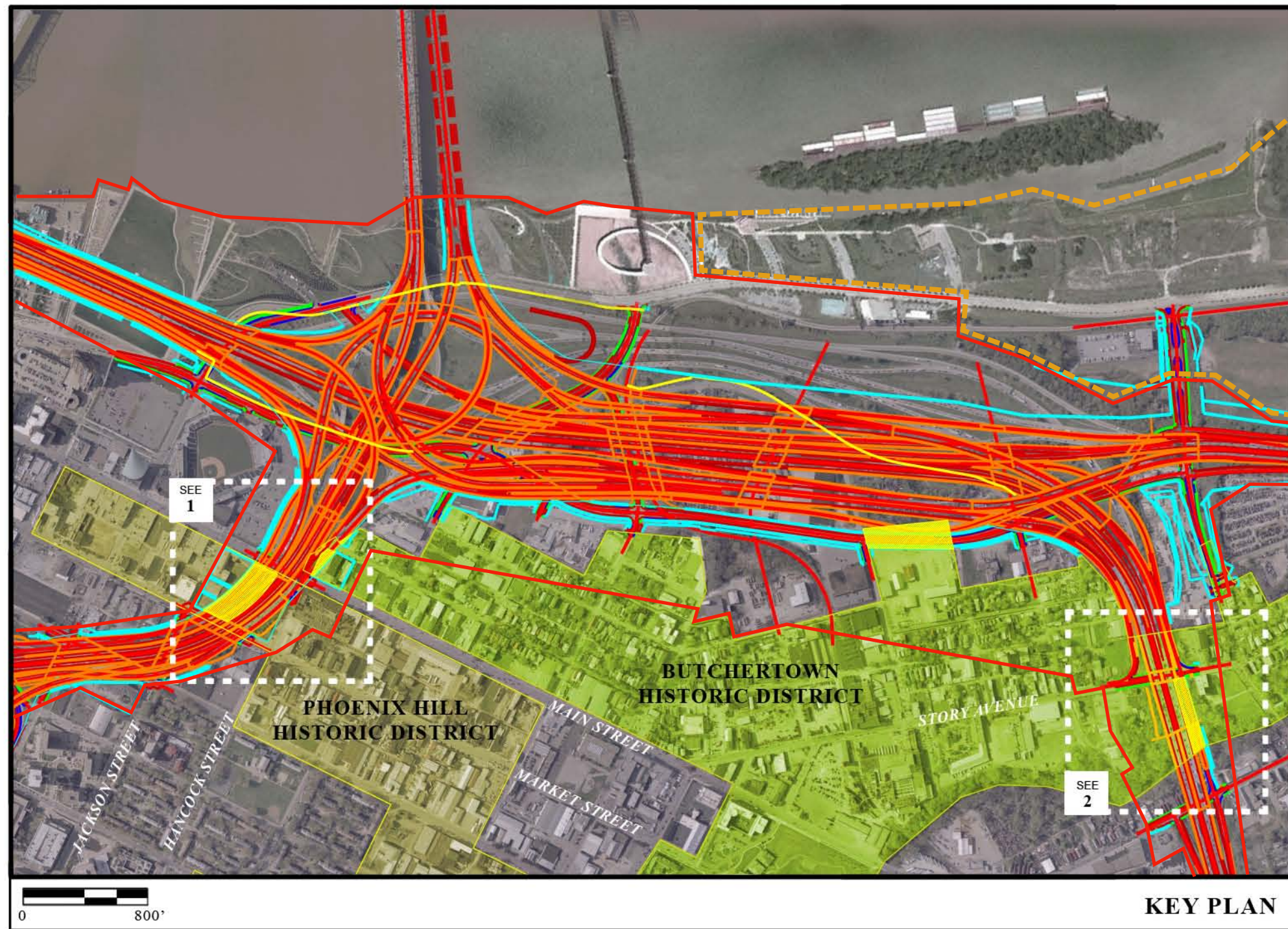
Figure 6.2-4a

Old Jeffersonville Historic District - Modified Selected Alternative



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

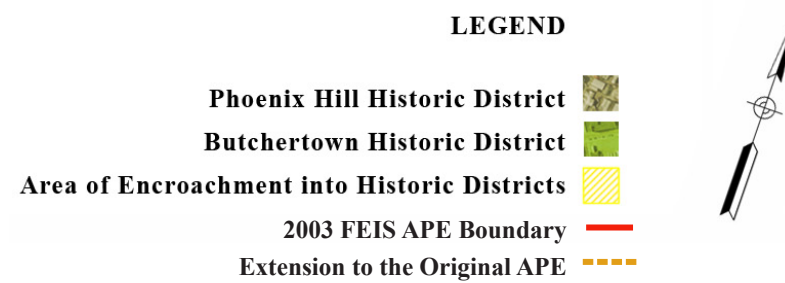
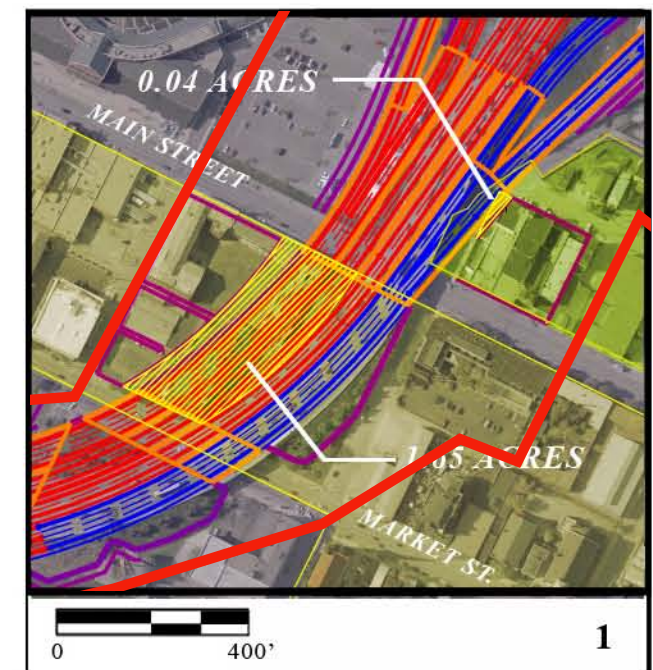
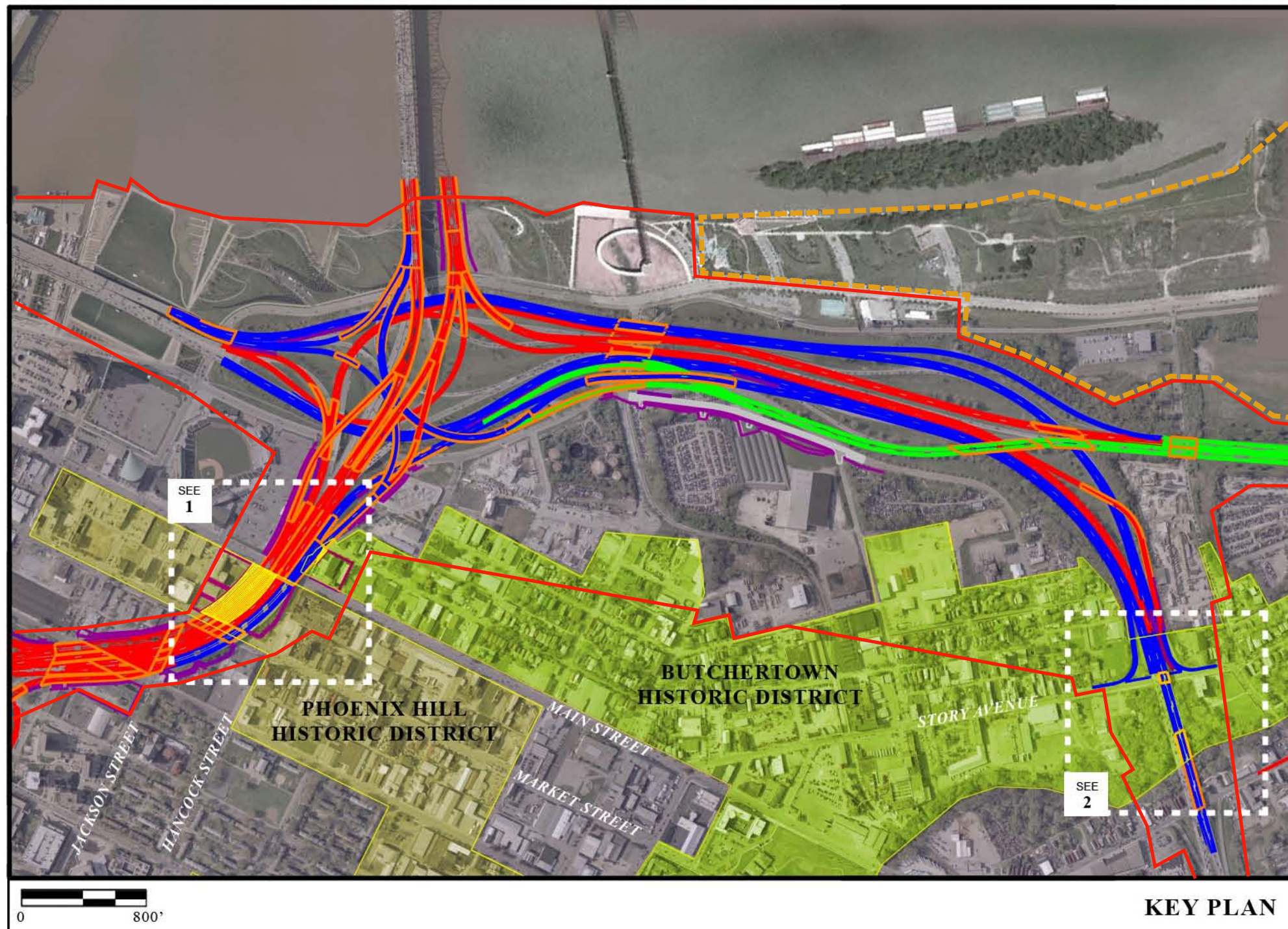
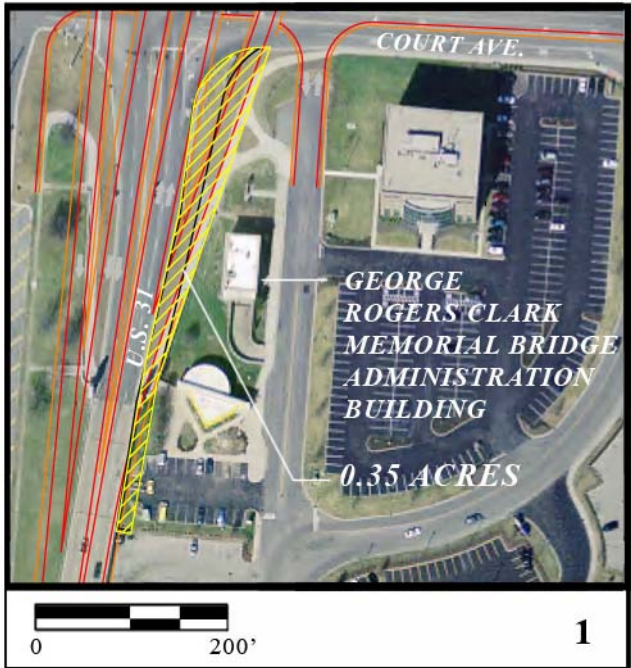
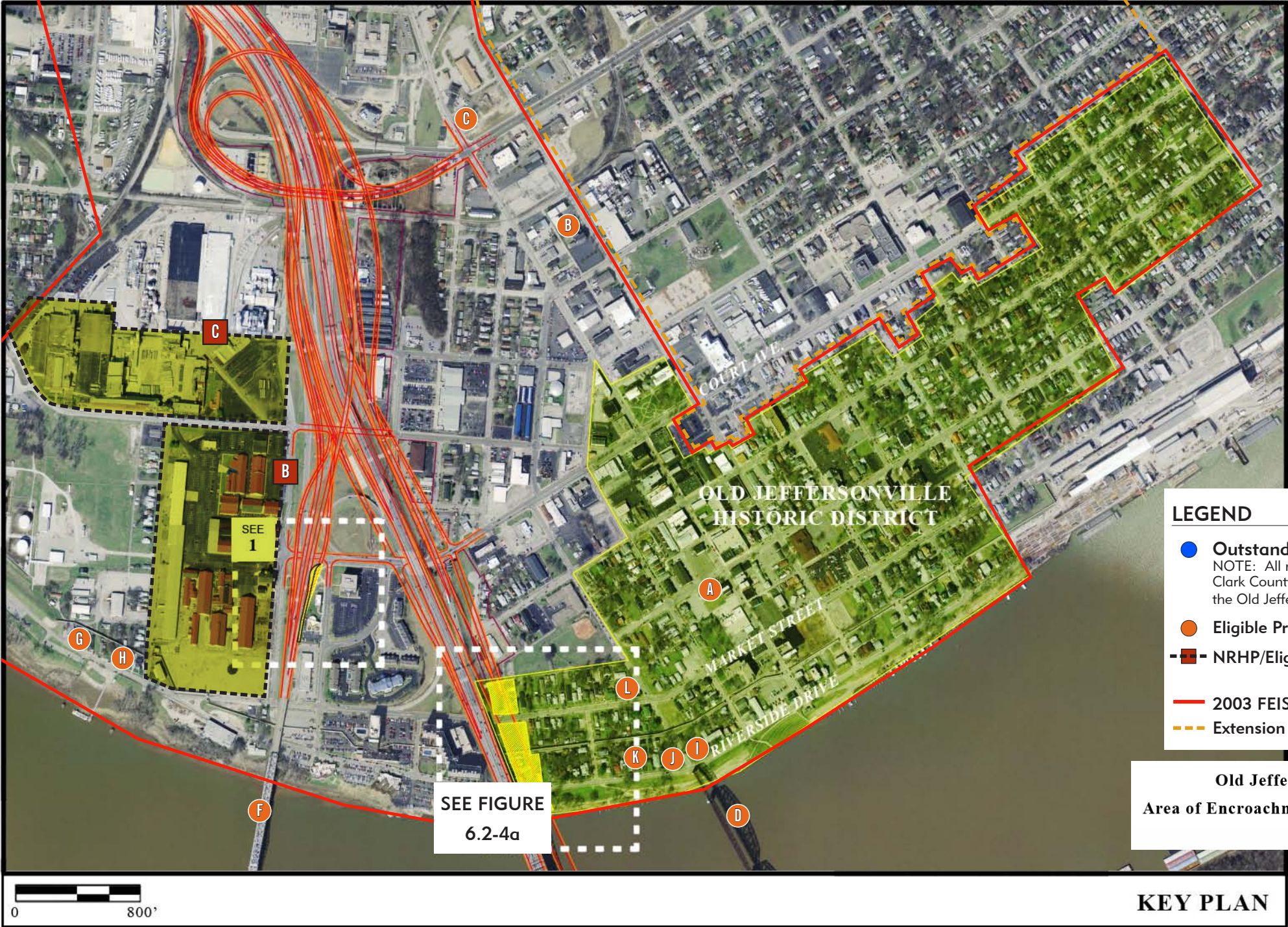


Figure 6.2-6

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

KEY PLAN



NRHP/Eligible Historic Districts

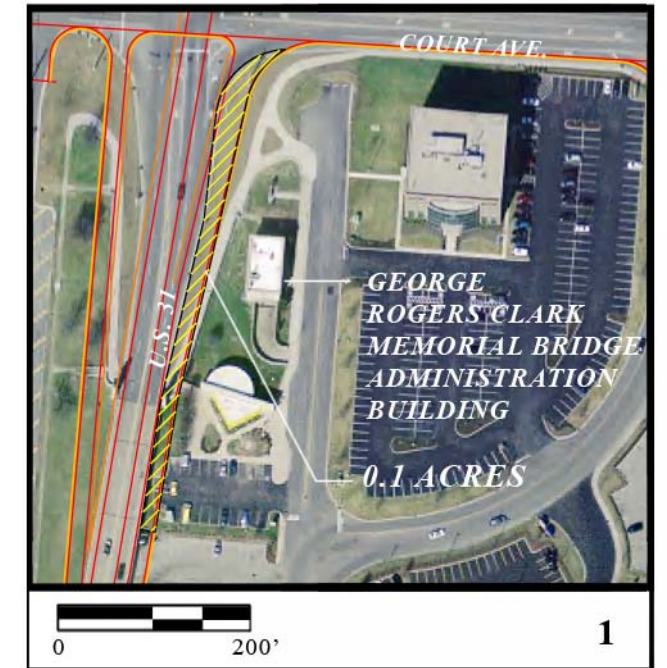
- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

"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 6.2-7a

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

KEY PLAN



NRHP/Eligible Historic Districts

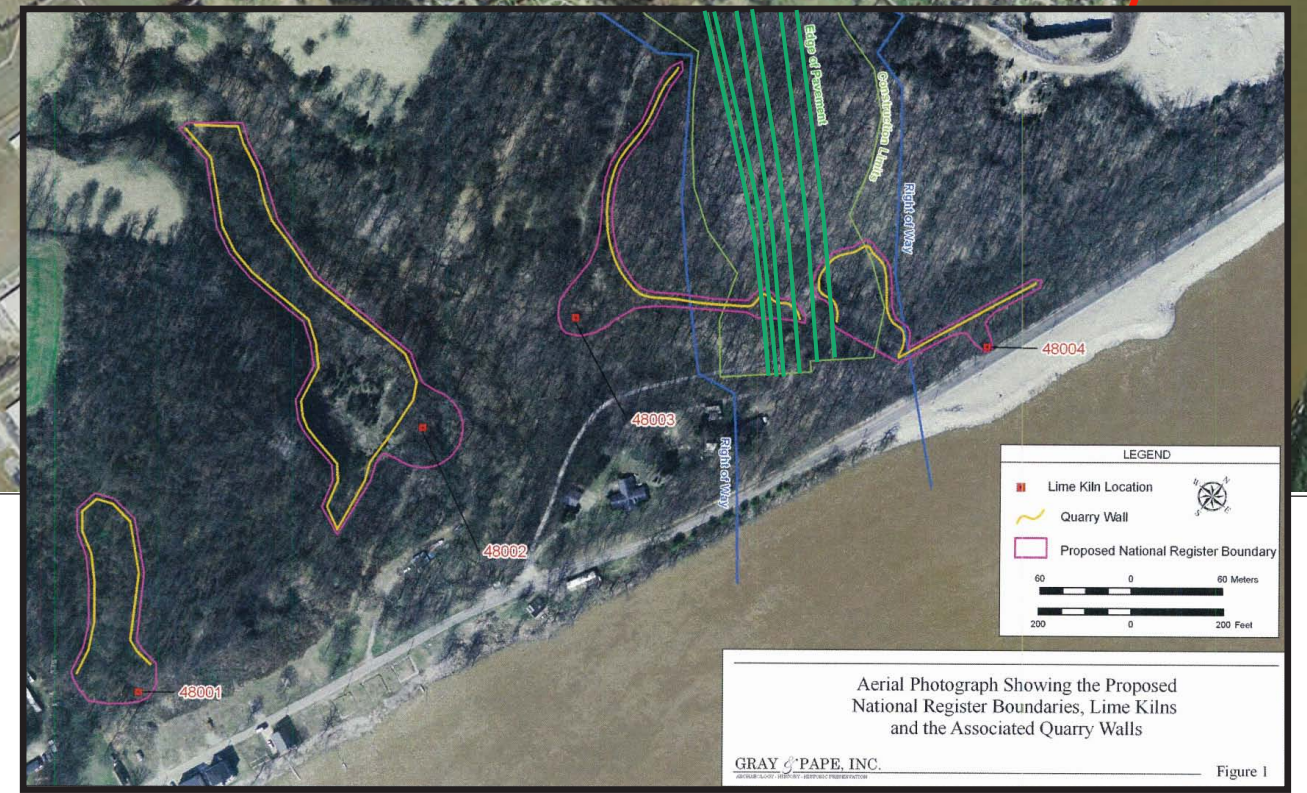
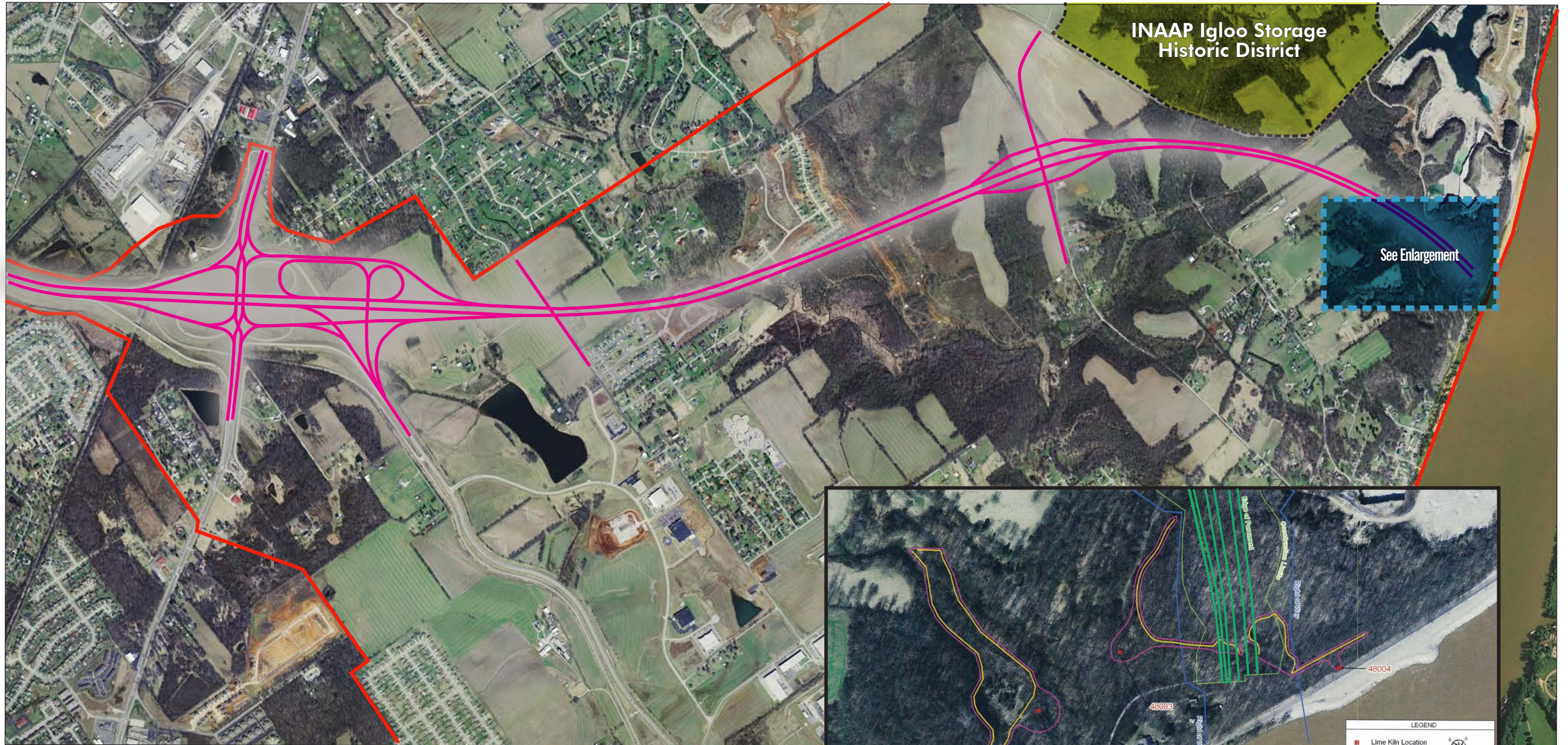
- A Old Jeffersonville H.D.
- B Colgate-Palmolive H.D.
- C Ohio Falls Car & Locomotive Co. H.D.

"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 6.2-7b

Utica Lime Kilns - FEIS Selected Alternative / Modified Selected Alternative



LEGEND

- NRHP/Eligible District Boundary
- 2003 FEIS APE Boundary
- Extension to the Original APE



LEGEND

- Lime Kiln Location
- Quarry Wall
- Proposed National Register Boundary

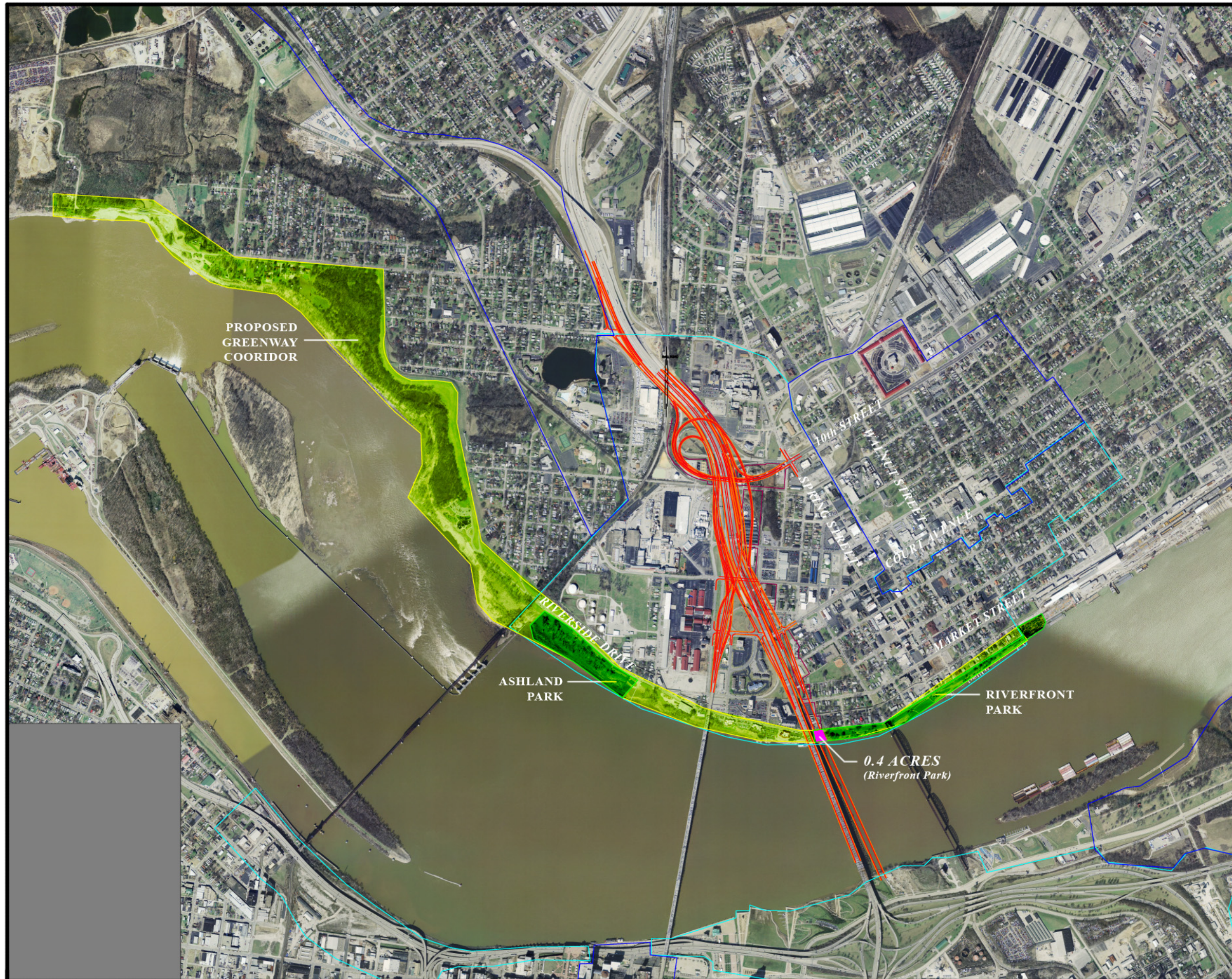
60 0 60 Meters
200 0 200 Feet

Aerial Photograph Showing the Proposed National Register Boundaries, Lime Kilns and the Associated Quarry Walls

GRAY & PAPE, INC.

Figure 1

Figure 6.2-8



LEGEND

- Ashland Park & Riverfront Park
- Proposed Greenway Corridor
- Area of Direct Encroachment

PROPOSED
GREENWAY
CORRIDOR

ASHLAND
PARK

RIVERFRONT
PARK

0.4 ACRES
(Riverfront Park)

THE OHIO RIVER
BRIDGES

Supplemental Environmental Impact Statement

ASHLAND PARK, RIVERFRONT PARK, & THE GREENWAY
CORRIDOR WITH FEIS SELECTED ALTERNATIVE (2010)



FIGURE 6.2-9a



LEGEND

- Ashland Park & Riverfront Park
- Proposed Greenway Cooridor
- Area of Direct Encroachment



ASHLAND PARK, RIVERFRONT PARK, & THE GREENWAY COORIDOR WITH MODIFIED SELECTED ALTERNATIVE



FIGURE 6.2-9b



LEGEND

- Waterfront Park & Extreme Sports Complex Boundaries
- Area of Direct Encroachment



WATERFRONT PARK & EXTREME SPORTS COMPLEX WITH FEIS SELECTED ALTERNATIVE (2010)



FIGURE 6.2-10a



LEGEND

- Waterfront Park & Extreme Sports Complex Boundaries
- Area of Direct Encroachment



WATERFRONT PARK & EXTREME SPORTS COMPLEX WITH MODIFIED SELECTED ALTERNATIVE



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 tolls¹
 - 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)	<u>330</u>	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	<u>18</u>	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

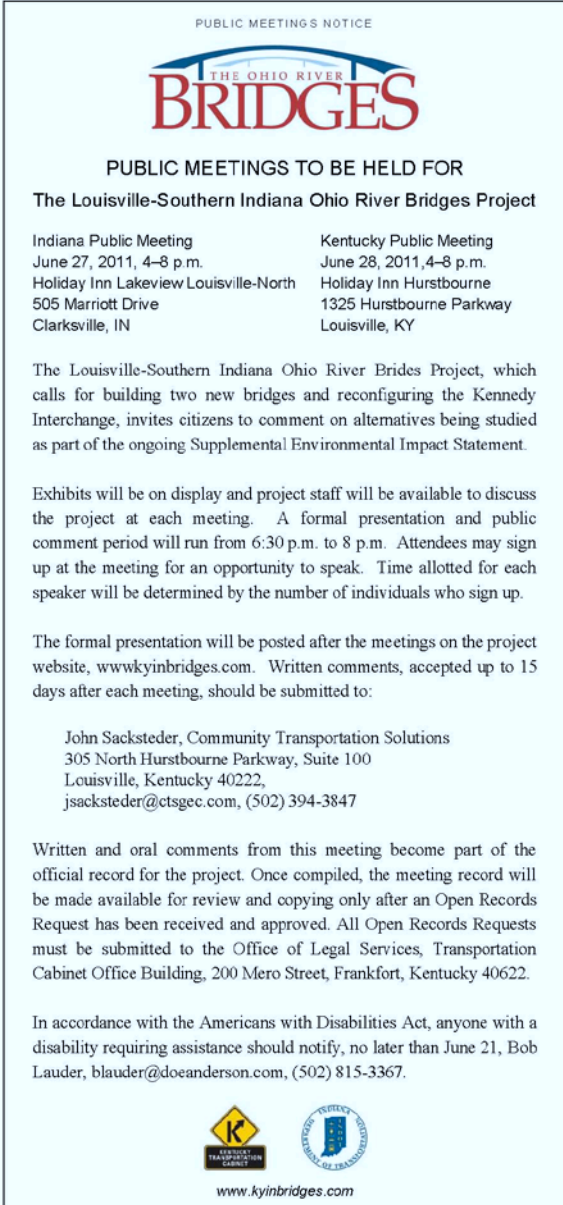
Since the announcement of the SEIS in mid-February of 2011 until the end of September 2011, there has typically been daily coverage in the media. Some days, as many as 20 media outlets have reported on the project. When the public meetings were underway in late June 2011, the LSIORB Project was often 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
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The Louisville-Southern Indiana Ohio River Bridges 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, www.kyinbridges.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 effects 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 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 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 Osadcuk <i>Engineering Services Team Leader</i>	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 <i>Federal Project Manager</i>	BS in civil engineering P.E. 25 years experience in traffic operations and transportation project management.	Document Review
Indiana Department of Transportation		
Paul Boone <i>Project Manager</i>	Bachelors and Masters of Civil Engineering 20 years experience in Transportation	SEIS manager for federal state and agency reviews
Kevin Hetrick <i>Deputy Project Manager</i>	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 <i>Architectural Historian</i>	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 <i>Assistant State Highway Engineer KYTC Project Manager</i>	B.S. Civil Engineering 22 years experience in Transportation/project development	SEIS manager for federal and state reviews
Andy Barber <i>Assistant Project Manager</i>	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 <i>KYTC-DEA</i>	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. <i>Project Manager</i>	B.S., Civil Engineering 41 years in design and environmental	SEIS management, environmental design coordination & review; federal, state & agency coordination.
James Hilton, P.E. <i>Deputy Project Manager</i>	B.S., Civil Engineering 40 years in transportation planning and design	SEIS management, environmental design coordination and review; state & agency coordination.
Cindy Kowalski, PMP <i>Project Coordinator</i>	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. <i>Section Design Manager, KY Approaches</i>	B.S.; 36 years in transportation design and project management	Engineering design review & coordination
Paul Hilton, P.E. <i>Section Design Manager, IN Approaches</i>	B.S., Civil Engineering 11 years of transportation background	Engineering design review & coordination
Phillip Banton, P.E., P.S. <i>Engineering Coordinator</i>	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 <i>Environmental Analysis Manager</i>	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 <i>Public Involvement Manager</i>	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 <i>Partner</i>	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 <i>Senior Environmental Planner</i>	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 <i>Senior Environmental Planner</i>	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. <i>Transportation Engineer</i>	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 <i>Senior Transportation Planner</i>	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 <i>Partner</i>	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 <i>Director, Planning</i>	B.S., Geography and Environmental Science M.P.A. - Public Administration 17 Years of experience	SEIS Editor
Jane Wehner <i>Senior Editor</i>	B.A., English 30 years of experience	SEIS Editor

Ratio Architects		
David Kroll <i>Director of Preservation</i>	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. <i>Traffic Forecasting</i>	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

Addendum, Expanded Area of Potential Effect, Kentucky Cultural Historic Sites, February, 2002. H. Powell & Co. 2002. Lexington, Ky.

Atlas of the City of Louisville, Ky. Louisville Abstract & Loan Association, 1876. Louisville, Ky.

The Audible Landscape: A Manual for Highway Noise and Land Use. FHWA, November, 1974. <http://www.fhwa.dot.gov/environment/audible/index.htm>

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

Census 2000. U.S. Census Bureau. Washington, D.C.

The City of Louisville, Kentucky (map). New York: J. H. Colton & Co., 1855.

Claggett, M., et al., "A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives," FHWA, Resource Center.

Community Form Areas May 30, 2002 (map). Cornerstone 2020. Louisville and Jefferson County Comprehensive Plan. City of Louisville, Ky. http://www.louisvilleky.gov/PlanningDesign/Cornerstone_2020_Core_Graphics.htm

Cope, J.B. and A.R. Richter. 1978. A survey of the bats in the Muddy Fork of Silver Creek Watershed project area in Indiana. Final report to the Soil Conservation Service. 21 pp. unpublished.

A Cultural Resource Overview for the Ohio River Bridges at Louisville, Jefferson County, Kentucky (1999 Overview). January 1999.

Entering the Quiet Zone: Noise Compatibility Land Use Planning, May, 2002. FHWA, 2002. <http://www.fhwa.dot.gov/environment/noise/quietzon>

Final PM_{2.5} Project-Level Conformity Analysis for the Ohio River Bridges Project, KYTC revised October 2011.

FY 2011–FY 2015 Transportation Improvement Program, October 2010. Louisville (KY-IN) Metropolitan Planning Organization. 2010.Louisville, Ky.

G. M. Hopkins, 1884. Atlas of the City of Louisville, Ky. and Environs. Philadelphia, Pa.

Highway Traffic Noise Analysis and Abatement Policy and Guidance, June, 1995. FHWA. 1995. Washington, D.C.

Historic Local Landmark Designation Report (Whiskey Row). June 28, 2010. Metro Historic Landmarks and Preservation Districts Commission, Louisville, Ky.

Historical and Cultural Survey – Indiana Downtown and East End Area of Potential Effect (November 2000).

Horizon 2030: The Metropolitan Transportation Plan for the Louisville (KY-IN) Metropolitan Planning Area, Adopted by the Transportation Policy Committee October 7, 2010. KIPDA. 2010. Louisville, KY.

Indiana’s Public Common and High Schools Multiple Property Documentation Form, 1998. Indiana Division of Historic Preservation and Archaeology. Indianapolis, IN

Indiana Historic Sites and Structures Inventory. Indiana Landmarks. Indianapolis, IN

- Clark County Interim Report, 1988
- Clark County Survey Update, 2011
- Floyd County Interim Report, 1978
- Floyd County Interim Report, 2008
- City of New Albany Interim Report, 1994

Interim Guidance on Air Toxic Analysis in NEPA Documents, February 3, 2006. FHWA. Washington, D.C. <http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm>

Interim Guidance Update on Air Toxic Analysis in NEPA Documents, September 30, 2009. FHWA. Washington, D.C. <http://www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm>

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. 2010. U.S. Army Engineer Research and Development Center. USACE. Vicksburg, MS

Jefferson County Inventory and Survey of Historic Sites Update (Report #181), November 2010

Louisville – Southern Indiana Ohio River Bridges Project Initial Financial Plan (IFP) 2007, FHWA approval January 2008

Louisville – Southern Indiana Ohio River Bridges Project 2003. Final Environmental Impact Statement 2003

Louisville – Southern Indiana Ohio River Bridges Project 2003. Record of Decision 2003

Mengel, Robert M. 1965. The Birds of Kentucky: Ornithological Monographs No. 3. American Ornithologists Union.

Noise Analysis and Abatement Policy, revised July 2011. Kentucky Transportation Cabinet, Frankfort, Ky.

Nominations to the National Register of Historic Places

- Bosler Fireproof Garage
- 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

Procedures for Abatement of Highway Traffic and Construction Noise, 23 CFR 772, Federal Highway Administration. Washington, D.C.

Range-wide Indiana Bat Protection and Enhancement Plan Guidelines. Interstate Mining Compact Commission, U.S. Fish and Wildlife Service and Office of Surface Mining. 2009. 40 pp.

Regional Bicycle and Pedestrian Plan, December 1998, for Floyd and Clark counties in Indiana, and Bullitt, Jefferson and Oldham counties in Kentucky. KIPDA. Louisville, Ky.

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. 2010. U.S. Army Engineer Research and Development Center. USACE. Vicksburg, MS:

Sanborn Maps of Louisville, Kentucky, The Sanborn Map Company, Inc., Colorado Springs, Co.

- 1892
- 1905
- 1906

Section 4(f) Policy Paper, FHWA Office of Planning, Environment and Realty, Project Development and Environmental Review, March 1, 2005. Washington, D.C.

<http://environment.fhwa.dot.gov/projdev/4fpolicy.asp>)

Section 106 Memorandum of Agreement (MOA) among the Federal Highway Administration, the Advisory Council On Historic Preservation, the Indiana State Historic Preservation Officer, and the Kentucky State Historic Preservation Officer, regarding the Louisville – Southern Indiana Ohio River Bridges Project in Clark County, Indiana and Jefferson County, Kentucky, March 26, 2003.

Standard Methods for Assessing Biological Integrity of Surface Waters in Kentucky. Revision 3. February 2008. Kentucky Division of Water. Frankfort, KY. 30 pp.

Traffic Noise Policy, revised 2011. Office of Environmental Services, Division of Production Management, Indiana Department of Transportation. Indianapolis, In.

Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas. (March 29, 2006). USEPA/FHWA. Washington, D.C. (http://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/pmhotspotguidmemo.cfm)

University of Louisville Digital Collections, University Libraries, University of Louisville, Louisville, Ky.

U.S. Department of Agriculture (USDA) statistics 2007, Oldham and Bullitt counties in Kentucky, and Clark and Floyd counties in Indiana.

Whitaker, J.O., Jr. and S.L. Gummer. 2001. Bats of the Wabash and Ohio River Basins of southwestern Indiana. Proceedings Indiana Academy of Science. 110: 126-140.

Whitaker, J.O., Jr., Lori Pruitt, and Scott Pruitt. 2001. The gray bat, *Myotis grisescens*, in Indiana. Proceedings Indiana Academy of Science 110: 114-122.

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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
O₃	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