Final $PM_{2.5}$ Project-Level Conformity Analysis for the Ohio River Bridges Project in Louisville, Kentucky

Document created by:
Division of Planning
Kentucky Transportation Cabinet
Division of Planning
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Updated by:
Community Transportation Solutions, Inc.
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I. Executive Summary

The Louisville Metro Area (LMA) of Louisville, Kentucky and Southern Indiana has been designated as nonattainment of the *national ambient air quality standards* (NAAQS or "standards") for fine particulate matter ($PM_{2.5}$). Based on the Transportation Conformity regulations found in 40 CFR 93.123(b)(1) all transportation projects that have been determined to be projects of air quality concern in the Louisville, Kentucky/Southern Indiana area 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 EPA 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 is required in order 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 Louisville – Southern Indiana Ohio River Bridges (LSIORB) was determined to be a project of air quality concern according to 40 CFR 93.123(b)(1). A qualitative PM2.5 hot-spot analysis was completed in 2007 to address the design and scope of the project as described in the 2003 FEIS. This update summarizes the 2007 analysis and updates the qualitative analysis for the current project design and scope as described in this ~~DSEIS~~SDEIS. This analysis was prepared in accordance with USEPA's "Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas" (March 2006) ("Qualitative Hot-Spot Guidance").[1]

The 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 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.* This methodology is utilized here for analysis of the current design and scope of the LSIORB project.

From the following analysis it is determined that the LSIORB project meets all the PM2.5 qualitative analysis requirements, and that the proposed LSIORB 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.

II. Purpose of this document

The Louisville – Southern Indiana Ohio River Bridges (LSIORB) project is within the Louisville KY-IN $PM_{2.5}$ nonattainment area; and, therefore, the project is required to meet Transportation

[1] This guidance is available on EPA's website at: http://www.epa.gov/otaq/stateresources/transconf/policy/420b06902.pdf.

Conformity requirements for a PM2.5 hot-spot analysis found in 40 CFR 93.123(b)(1). This includes a PM2.5 "hot-spot" analysis for the LSIORB project, as described in greater detail in Section V.

The Clean Air Act section 176(c) requires that federally supported highway and transit project activities are consistent with state air quality goals, found in the *state implementation plan* (SIP). The process is called Transportation Conformity. Conformity to the SIP means that transportation activities will not cause new violations of the *national ambient air quality standards* (NAAQS or "standards"), worsen existing violations of the standard, or delay timely attainment of the relevant standard.

Transportation conformity is required for federal supported transportation projects in areas that have been designated by the U.S. Environmental Protection Agency (EPA) as not meeting a NAAQS. These areas are called *nonattainment areas* if they currently do not meet air quality standards or *maintenance areas* if they have previously violated air quality standards, but currently meet them and have an approved maintenance plan as defined in Clean Air Act, Section 175A, Maintenance Plan. On January 5, 2005, the EPA designated the Louisville KY-IN area (Jefferson and Bullitt counties, Kentucky and Clark, Floyd and Jefferson (partial) counties, Indiana) as nonattainment for fine particulate matter, called $PM_{2.5}$. This designation became effective on April 5, 2005, 90 days after EPA's published action in the Federal Register. Transportation conformity for the $PM_{2.5}$ standards applied on April 5, 2006, after the one-year grace period provided by the Clean Air Act. After that time, metropolitan $PM_{2.5}$ nonattainment areas must have in place a transportation plan and transportation improvement program (TIP) that conform and federally supported projects must also be shown to conform after the end of that grace period. For $PM_{2.5}$, project-level conformity also requires an assessment of localized emissions impacts for projects that are deemed to be of air quality concern as defined in 40 CFR 93.123(b)(1). This localized assessment is called a *hot-spot analysis*.

The Final Environmental Impact Statement (FEIS) for the LSIORB project was issued in April 2003 and the Record of Decision (ROD) was issued in September 2003. At the time fo the ROD, the Louisville region had not been designated as non-attainment for PM2.5, and the regulations requiring PM2.5 hot-spot analyses had not yet been issued. Therefore the 2003 FEIS did not include a PM2.5 hot-spot analysis.

After the PM2.5 non-attainment designation was made in 2005 and the hot-spot requirements took effect in 2006, FHWA concluded that a PM2.5 hot-spot analysis was required for the project. Therefore, a PM2.5 hot-spot analysis was prepared and released for public comment. Based on that hot-spot analysis, FHWA made a project-level PM2.5 conformity determination for the project in January 2007. See Appendix D (comment on analysis 2007 PM2.5 conformity analysis); Appendix F (FHWA's 2007 conformity determination). It was determined that the project would not have a significant impact on the $PM_{2.5}$ air quality in the region for the project scope as defined in the 2003 FEIS.

This document assesses the potential PM2.5 impacts based on the current alternatives that are covered under the Draft Supplemental Environmental Impact Statement (~~DSEIS~~SDEIS) - the

FEIS Selected Alternative and the Modified Selected Alternative. The analyses in this document are based on the traffic forecasts developed as a part of the ~~DSEIS~~SDEIS process.

III. Louisville – Southern Indiana Ohio River Bridges Project Description

General Overview

The Ohio River, which has historically served as a natural, commercial, and recreational resource for the Louisville Metropolitan Area (LMA), also has served as a natural barrier to travel between the Indiana and Kentucky portions of the metropolitan area. The LSIORB project addresses the long-term, cross-river, transportation needs in the Louisville-Southern Indiana region. Several specific factors demonstrate the need for action[2]:

- Existing and planned growth in population and employment in the Downtown area and in eastern Jefferson County, Kentucky and southeastern Clark County, Indiana;
- Traffic congestion on the Kennedy Bridge (I-65) and in the Kennedy Interchange (the confluence of I-64, I-65 and I-71);
- Traffic safety problems in the Kennedy Interchange and on the Kennedy Bridge and its approach roadways;
- Lack of adequate cross-river transportation system linkage and freeway rerouting opportunities in the Eastern portion of the metropolitan area; and
- Locally-adopted transportation plans that call for two new Ohio River bridges.

After years of studies and proposals, FHWA issued a Notice of Intent in the Federal Register on March 27, 1998 indicating that FHWA, in cooperation with the Indiana Department of Transportation (INDOT) and the Kentucky Transportation Cabinet (KYTC), would prepare an Environmental Impact Statement (EIS) to evaluate alternatives for improving cross-river mobility between Jefferson County, Kentucky and Clark County, Indiana. Purpose and need for the project were documented and a wide range of potential solutions were developed. Alternatives included a No-Action Alternative, a Transportation Management (TM) Alternative (a combination of travel demand management, transportation system management, and mass transit improvements), a one bridge/highway alternative and a two bridges/highway alternative. The bridge/highway alignment alternatives were numerous.

After a detailed analysis that included extensive public outreach and involvement over several years, FHWA approved the Record of Decision (ROD) in September, 2003. The Selected Alternative included two new bridges and the reconstruction of the Kennedy Interchange. A new bridge across the Ohio River connecting KY 841/I-265 (Gene Snyder Freeway) in northeastern Jefferson County, Kentucky, with SR 265 at SR 62 in southeastern Clark County, Indiana is proposed on the East End of the project. A new interstate bridge parallel to the Kennedy Bridge is proposed for downtown as well as the reconstruction of the Kennedy Interchange to the south of its current location. The Selected Alternative also included non-motorized facility enhancements (17-foot pedestrian and bicycle paths on both bridges), expanded employer-based trip reduction programs, expanded Intelligent Transportation System (ITS) applications, expanded incident management programs and enhanced cross-river bus service.

[2] See the Final Environmental Impact Study, Purpose and Need, page 2 (see LSIORB website http://www.kyinbridges.com/)

While performing the Federally-mandated long-range plan update, it was determined that the plan, with the Ohio River Bridges project, could not provide financial demonstration. Therefore, tolling was explored in order to determine whether that could meet financial needs for the construction of the project.

As part of this effort, a Supplemental EIS is being prepared to study the inclusion of tolling and cost-saving design simplifications. The study area (see Exhibit 1) is comprised of the "Downtown" area where I-65 currently crosses the Ohio River via the Kennedy Bridge, the "East End" area about 8 miles east (up-river) from the Downtown area and all the area in between. The study includes two alternatives: the FEIS Selected Alternative and a Modified Selected Alternative. The Modified Selected Alternative includes an in-place Kennedy Interchange modification (instead of a complete reconstruction to the south of the current location), a four-lane East End Bridge, tolls on the Kennedy Bridge and new East End Bridge, and elimination of the proposed pedestrian/bikeway facility from the Downtown Bridge.

Exhibit 1

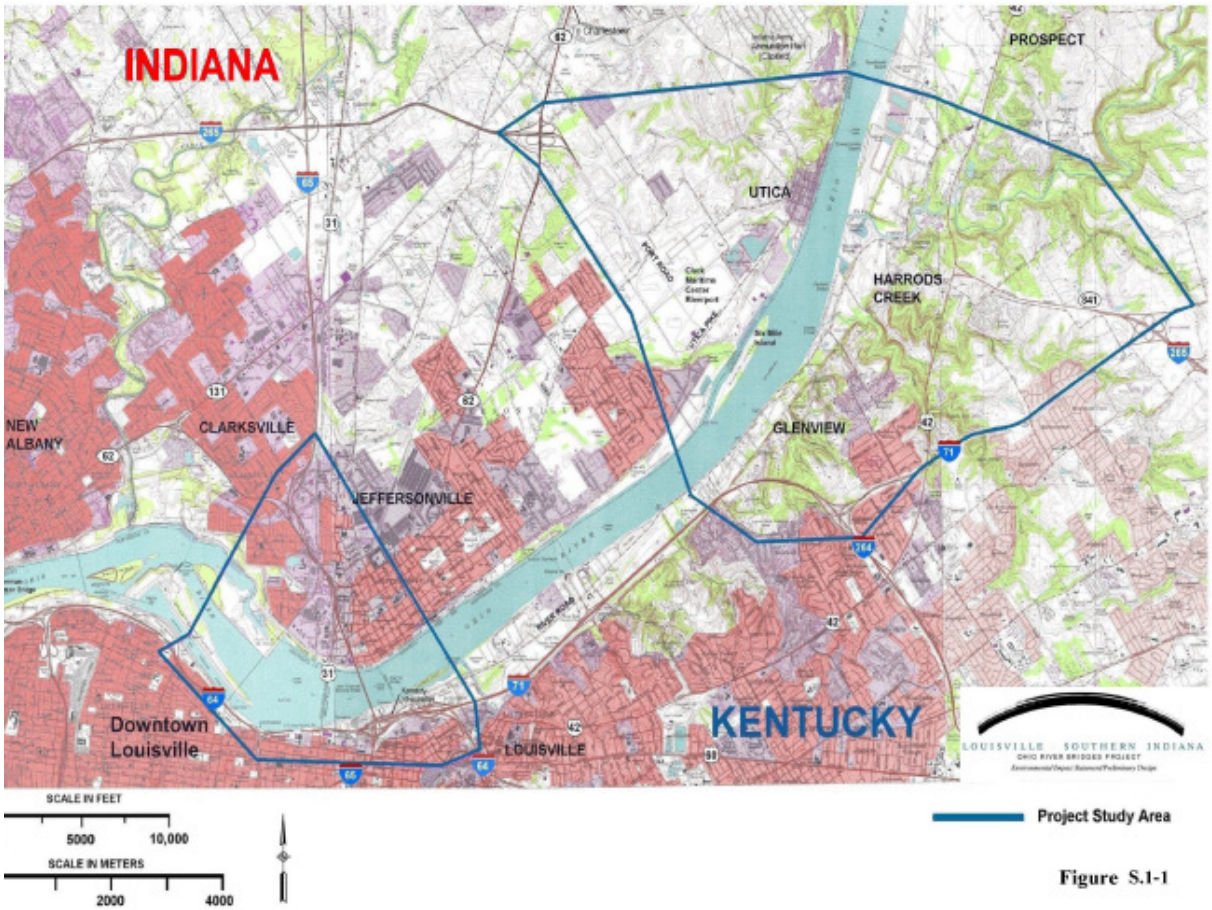


Figure S.1-1

The Downtown (Louisville, Kentucky) area is currently the economic heart of the area; however, locally-approved land use plans call for additional commercial, industrial, and residential development, with population and employment growth, in eastern Jefferson (Kentucky) and southeastern Clark (Indiana) counties in the coming years. The cross-river traffic is currently accommodated in the Downtown area by the John F. Kennedy (Kennedy) Bridge (I-65), the George Rogers Clark (Clark) Bridge (US 31) and, a few miles west, the Sherman Minton Bridge (I-64). There is no Ohio River crossing available in the East End, thus, the East End river crossing traffic currently must use the Downtown area crossings.

The project (i.e., Build Alternatives) are comprised of a new Downtown bridge just east of the Kennedy Bridge (I-65); an East End bridge about eight miles from downtown, connecting the Gene Snyder Freeway (KY 841) to the Lee Hamilton Highway (IN 265); and a rebuild of the Kennedy Interchange where I-64, I-65 and I-71 converge in downtown Louisville. A project overview is shown in Exhibit 2.

Exhibit 2

The project is now in the design phase. During this phase, decisions will include what type of bridges to build, precise right-of-way needs, aesthetic treatments such as landscapes, sound barrier locations and types, and a construction schedule. The design year for the LSIORB project is 2030 and it is expected to be open to traffic in 2020.

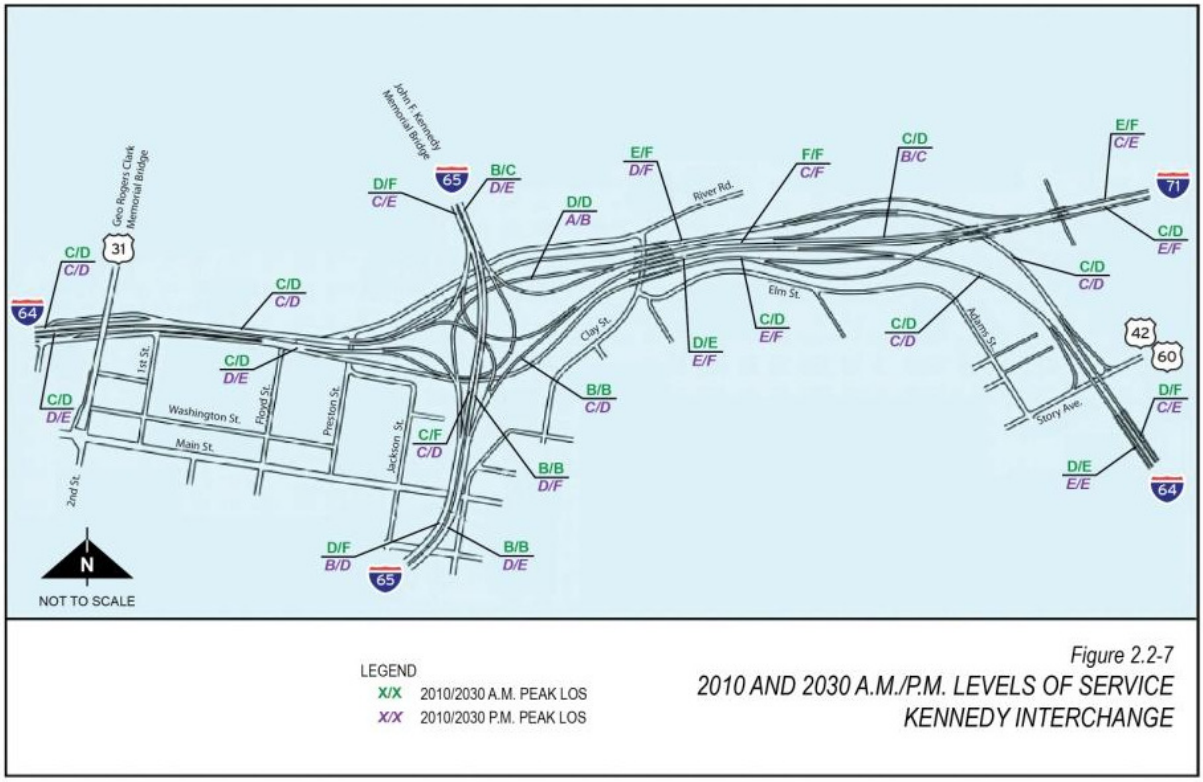
No-Action Scenario

The No-Action scenario for 2030 is based on the assumption that all the projects included within the Kentuckiana Regional Planning and Development Agency's (KIPDA) 2030 long-range transportation plan (*Horizon 2030*) will be implemented, with the exception of the two new Ohio River bridges and the rebuild of the Kennedy Interchange. *(KIPDA is the area's designated Metropolitan Planning Organization staff agency.)* Socioeconomic (population and employment) forecasts for the Louisville metropolitan area are prepared under the auspices of KIPDA. Per the ~~DSEIS~~SDEIS, on a metropolitan area-wide basis, under the no-action scenario, population is predicted to increase by 15 percent between 2007 and 2030, while employment is predicted to increase by 42 percent in the same period. At the same time, the total number of daily trips in the metropolitan area is expected to increase by 19 percent. The number of vehicle miles of travel (VMT) is expected to increase by 26 percent, the number of vehicle hours of travel is expected to increase by 52 percent, and the number of vehicle hours of delay (VHD) is expected to increase by 161 percent. Travel in the metropolitan area generally is projected to grow nearly as fast as or faster than population and employment in the same period.

The cross-river travel demand is expected to increase 29 percent from 2010 to 2030. By 2030, a total of 292,000 vehicles per day are expected to cross the three existing roadway bridges, representing a 29 percent increase over 2010 levels (an increase of approximately 1.3 percent per year). By 2030, the Kennedy Bridge, which already is nearly at its design capacity (97 percent of capacity in 2010), will be expected to handle 123 percent of its capacity, resulting in extreme congestion. Other existing Ohio River bridges will experience similar capacity issues.

In addition to traffic congestion caused simply by high traffic volumes, the complex nature of the Kennedy Interchange produces additional problems. A detailed analysis of the Kennedy Interchange and its interstate approaches performed using FHWA's computer simulation model, CORSIM demonstrated that traffic congestion in the Kennedy Interchange and its interstate approaches will increase significantly between 2010 and 2030. Average weekday peak-hour speeds will slow from 31 mph to 24 mph and the levels of service (LOS), which are currently fair to poor (C-F), will worsen by 2025. An existing (2010)/future (2030) LOS chart is shown in Exhibit 3.

Exhibit 3



The Kennedy Interchange and Kennedy Bridge have a history of high crash rates due to design geometry and a lack of shoulders. The safety problems will only get worse with increased traffic volumes and deteriorated LOS on the ramps.

Currently (2010), in the Downtown area, Annual Average Daily Traffic (AADT) is 305,800; truck percentage is 11.4 percent; daily truck volume is 34,700[3]. Under the no-action scenario, in 2020, the Downtown AADT is predicted to increase to 340,300[4] with the truck percentage and the daily truck volume increasing to 12.6 percent and 43,000, respectively[5].

AADT and truck percentage for 2010, 2016 (open to traffic date for the East End bridge), and 2020 (open to traffic date for completed LSIORB project) are shown for both the Downtown area and the East End for both the build and no-action scenarios in Appendix A.

More Detailed Project Description

As indicated above, the LSIORB project is comprised of a new Downtown bridge just east of the Kennedy Bridge (I-65); an East End bridge about eight miles from downtown, connecting the Gene Snyder Freeway (KY 841) to the Lee Hamilton Highway (IN 265); and a rebuild of the Kennedy Interchange where I-64, I-65 and I-71 converge in downtown Louisville. The Downtown element of the Modified Selected Alternative includes a new six-lane I-65 bridge immediately upstream of the existing I-65 bridge to accommodate the I-65 northbound movement. The existing I-65 bridge will be reconfigured to accommodate the six-lane southbound movement, resulting in 12 lanes of I-65 capacity over the Ohio River in the Downtown area. A Collector-Distributor (CD) system will be developed along the east and west sides of I-65 in Indiana as an important element of the project. The CD system will provide more efficient traffic operations by shifting connections (i.e., ramps) to local streets and highways from the main interstate roadway to parallel roadways that collect and distribute the local traffic to and from the interstate at designated locations. In Kentucky, I-65 will provide six lanes of through-movement south of the Kennedy Interchange: three lanes northbound, and three lanes southbound, to match the existing I-65 six lane section to the south. The Downtown element is shown in Exhibit 4.

The East End element provides for a new four-lane I-265 freeway from I-71 in Kentucky to SR 62 in Indiana. Interchanges will be provided at three points – US 42 in Kentucky, Salem Road in Indiana and SR 62 in Indiana (see FEIS Appendix A). The East End element detail is shown in Exhibit 5.

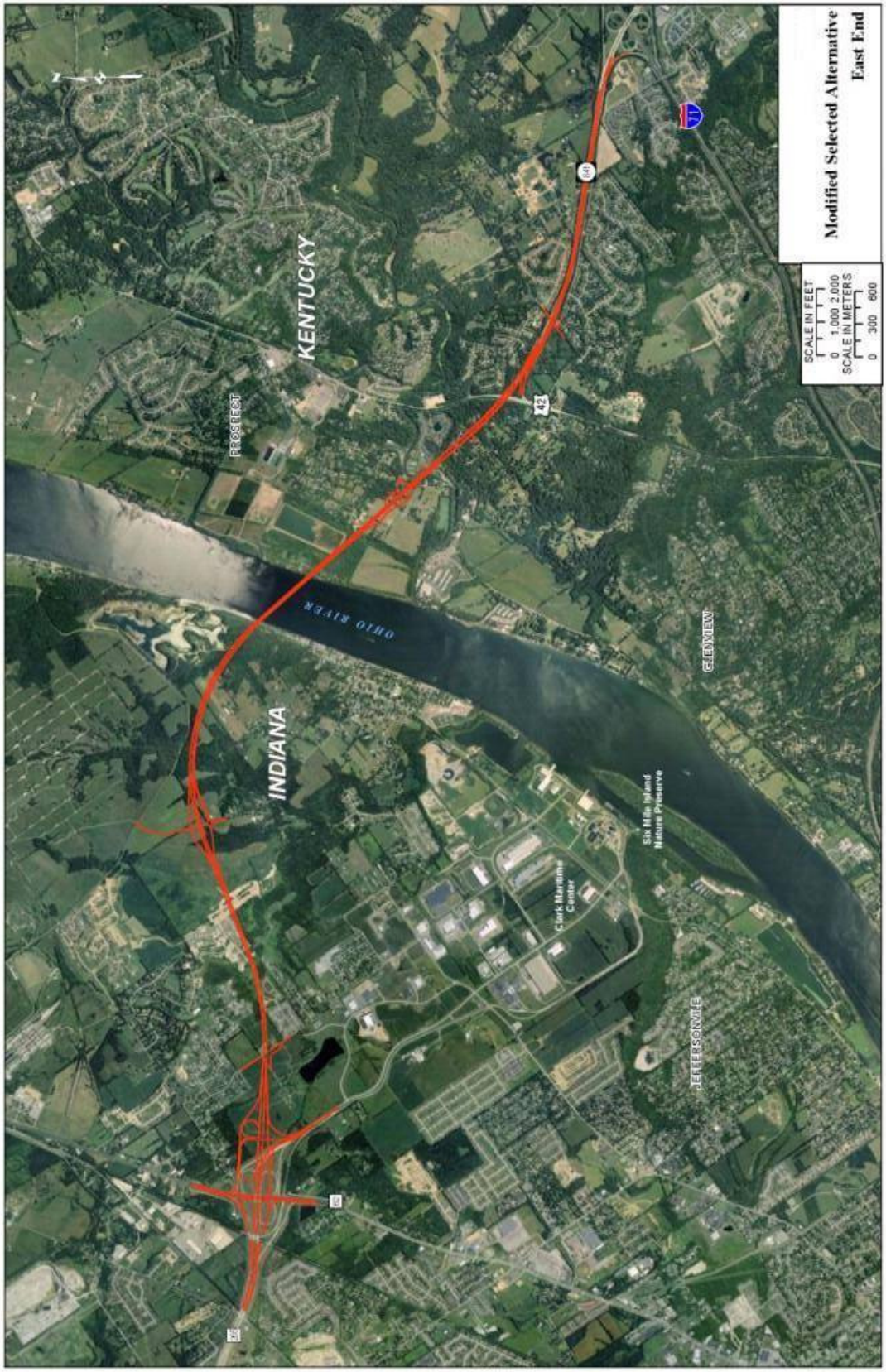
Additional project-level detail can be found at the Ohio Rivers project website http://www.kyinbridges.com.

[3] Current AADT and truck percentages are taken from 2010 Kentucky Transportation Cabinet traffic counts.
[4] Based on travel projections in the metropolitan area taken from the Project and Need Section,
[5] Future truck percentages are determined from KYTC growth rates for each highway functional class where functional class is as defined by Federal Highway Administration's Highway Performance Monitoring System (HPMS).

Exhibit 4

Modified Selected Alternative
Downtown
SCALE IN FEET
0 500 1,000
SCALE IN METERS
0 150 300
INDIANA
KENTUCKY
OHIO RIVER
JEFFERSONVILLE
LOUISVILLE
CLARKSVILLE
65
64
71
31

Exhibit 5


Modified Selected Alternative
East End
SCALE IN FEET
0 1,000 2,000
SCALE IN METERS
0 300 600
KENTUCKY
INDIANA
OHIO RIVER
PROSPECT
GLENVIEW
JEFFERSONVILLE
Clark Maritime Center
Six Mile Island Nature Preserve
42
64
11
65

IV. $PM_{2.5}$ Requirements Background

What is Fine Particulate Matter ($PM_{2.5}$)?

Particulate matter (PM) is the term for particles and liquid droplets suspended in the air. Motor vehicles (i.e., cars, trucks, and buses) emit direct PM from their tailpipes, as well as from normal brake and tire wear. Vehicles cause dust from paved and unpaved roads to be re-entrained, or re-suspended, in the atmosphere. Construction of highway and transit projects may cause dust. Finally, gases in vehicle exhaust may react in the atmosphere to form particulate matter.

Particles come in a wide variety of sizes and have been historically assessed based on size, typically measured by the diameter of the particle in micrometers. $PM_{2.5}$ or fine particulate matter refers to particles that are 2.5 micrometers or less in diameter. In comparison, a human hair is about 70 micrometers in diameter and a grain of sand is about 90 micrometers in diameter. The National Ambient Air Quality Standards for fine particulate matter include an annual standard of 15.0 micrograms per cubic meter (ug/m3) and a 24-hour standard of 35 ug/m3. The annual standard is based on a 3-year average of annual mean $PM_{2.5}$ concentrations; the 24-hour standard is based on a 3-year average of the 98th percentile of 24-hour concentrations.

Statutory and Regulatory Requirements for PM Hot-Spot Analyses

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: *$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards* (71 FR 12468)[6]. These rule amendments require the assessment of localized air quality impacts of federally-funded or approved transportation projects in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas deemed to be *projects of air quality concern*[7]. This assessment of localized impacts or "hot-spot analysis" examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act Amendment conformity requirements to support state and local air quality goals.

The LMA area is currently designated nonattainment for $PM_{2.5}$ because of violations of the annual $PM_{2.5}$ standard (15.0 ug/m3). The region is in compliance with the 24-hour standard (35 ug/m3).

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. Qualitative hot-spot analysis is required for projects of air quality concern quantitative $PM_{2.5}$ hot-spot analyses are required under 40 CFR §93.123(b)(4) after the two year grace period ends on December 20, 2012. EPA requires hot-spot findings to be based on directly emitted $PM_{2.5}$, since secondary particles take several hours to form in the atmosphere giving emissions time to disperse beyond the immediate area of concern. The conformity rule requires $PM_{2.5}$ hot-spot

[6] Since March 2006, the EPA has made additional revisions to the conformity regulations as they relate to PM2.5. For a complete list of the relevant rulemakings, refer to FHWA's website at http://www.fhwa.dot.gov/environment/air_quality/conformity/laws_and_regs/rulemakings.cfm.

[7] Criteria for identifying *projects of air quality concern* is described in 40 CFR 93.123(b)(1).

analyses to include road dust emissions only if such emissions have been found significant by EPA or the state air agency prior to the $PM_{2.5}$ state air quality implementation plan (SIP) or as part of an adequate $PM_{2.5}$ SIP motor vehicle emissions budget (40 CFR §93.102(b)(3)). Emissions resulting from construction of the project are not required to be considered in the hot-spot analysis if such emissions are considered temporary according to 40 CFR §93.123(c)(5).

V. $PM_{2.5}$ Regional Conformity Determination

Section 176(c) of the Clean Air Act Amendment and the federal conformity rule require that transportation plans and programs conform to the intent of the SIP through a regional emissions analysis in $PM_{2.5}$ nonattainment areas. The Louisville area 2030 Long Range Transportation Plan (LRTP) and the 2011-2015 Transportation Improvement Program (TIP) have been determined to conform to the intent of the SIP. The US Department of Transportation made a $PM_{2.5}$ conformity determination on the LRTP and the TIP in November 2010, and thus both the LRTP and TIP are currently conforming in accordance with 40 CFR 93.114. The current regional conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. The LSIORB project was included in the regional mobile source emissions analysis and the current design and scope are included in Amendment 3 of the *Horizon 2030 Metropolitan Transportation Plan* and in Amendment 3 of *FY 2011 - FY 2015 Transportation Improvement Program*.[8] Therefore, the project comes from a conforming plan and program in accordance with 40 CFR 93.115.

VI. $PM_{2.5}$ Hot-Spot Analysis

The LSIORB project meets the criteria set forth in 40 CFR 93. 123(b)(1) for projects of air quality concern primarily because it is a new highway facility with a significant level of diesel vehicles; thereby requiring a hot-spot analysis. The LSIORB Downtown 2020 (open to traffic date) AADT and total daily truck traffic are forecasted to be 296,250 and 36,400 (12.3 percent), respectively[9]. These AADT and total daily truck traffic are over 125,000 AADT and 10,000 trucks per day – the values cited in the preamble to the conformity rule by EPA as examples of projects of air quality concern.

Construction emissions and re-entrained road dust

40 CFR 93.123(c)(5) states *"CO, PM10, and PM2.5 hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established "Guideline" methods. Temporary increases are defined as those which occur only*

[8] At KYTC and INDOT's request, the Louisville MPO is in the process of updating *Horizon 2030* to include the Modified Selected Alternative. 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 ~~DSEIS~~SDEIS is published. If the update is approved, the Modified Selected Alternative will be included in a conforming long-range plan, and will be consistent in design concept and scope with the project as described in the plan

[9] For purposes of this analysis, it is assumed that the Downtown components of the LSIORB Project (the Kennedy Bridge and Kennedy Interchange) will be open to traffic in 2020, and the East End Bridge will be open to traffic in 2016.

during the construction phase and last five years or less at any individual site." As shown in Exhibit 2, page 7, the LSIORB project is comprised of several individual sub-projects. At a high level, the sub-projects are:

Downtown:
1) Kennedy Interchange Reconstruction,
2) Downtown Bridge,
3) Downtown Indiana Approach, and
East End
4) East End Kentucky Approach,
5) East End Bridge, and
6) East End Indiana Approach.

An approximate schedule is shown in Exhibit 6.

Exhibit 6

Louisville Southern Indiana Ohio River Bridges Project Construction Schedule Overview													
State Fiscal Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Section 1 - Kennedy Interchange													
Phase 1													
Phase 2													
Phase 3													
Phase 4													
Phase 5													
Phase 6													
Phase 7													
Phase 8													
Section 2 - I-65 Downtown Bridge													
Section 3 - I-65 Indiana Approach													
Phase 1													
Phase 2													
Phase 3													
Section 4 - East End Kentucky Approach													
Phase 1													
Phase 2													
Phase 3													
Section 5 - East End Bridge													
Section 6 - East End Indiana Approach													

It is anticipated that the construction of these sub-projects will be further divided into different individual construction sites. As such, localized construction emissions can be considered separately and temporary as construction-related emissions at each individual construction site is

anticipated to be less than 5 years. Per 40 CFR 93.123(c)(5), temporary construction-related emissions are not required to be included in the hot-spot analysis.

The conformity rule requires $PM_{2.5}$ hot-spot analyses to include road dust emissions only if such emissions have been found significant by EPA or the state air agency prior to the $PM_{2.5}$ SIP or as part of an adequate $PM_{2.5}$ SIP motor vehicle emissions budget (40 CFR §93.102(b)(3)). EPA has not approved a $PM_{2.5}$ SIP for the Louisville KY-IN $PM_{2.5}$ nonattainment area, nor has EPA or the state air agency made any significance findings related to re-entrained road dust for the $PM_{2.5}$ nonattainment area. Therefore re-entrained road dust is not considered in the analysis, per the conformity rule. In addition, as there is not an applicable $PM_{2.5}$ SIP for this area, there are no $PM_{2.5}$ control measures and the project is in compliance with 40 CFR 93.117.

Existing Conditions

The affected area for the purposes of this analysis is the LSIORB study area, as discussed in Section III of this report and further elaborated in the ~~DSEIS~~SDEIS and associated documentation. This section includes a discussion of currently available information on existing conditions related to air quality and traffic conditions in the project area.

Air Quality – Monitors

There are currently seven $PM_{2.5}$ monitors in the Louisville KY-IN $PM_{2.5}$ nonattainment area: five in the Commonwealth of Kentucky and two in the State of Indiana. The location of the Kentucky and Indiana monitors are shown in Exhibit 7 and 8.. Based on 2008-2010 air quality monitoring data, all five monitors are meeting the annual mean $PM_{2.5}$ standard (three year average of annual means) of 15.0 ug/m^3. Based on 2008-2010 air quality monitoring data, none of the monitors in the $PM_{2.5}$ nonattainment area are exceeding the 24-hour $PM_{2.5}$ standard (3-year average of the annual 98th percentile) of 35 ug/m^3 and none have exceeded this standard in past years. Appendix B provides a summary of the 2008-2010 annual averages as well as the 2008-2010 design values.

The Barret Avenue monitor (AIRS-ID number 211110048) and the Jeffersonville, Indiana monitor (180190006) are the only monitors in reasonably close proximity to the LSIORB project; both monitors are about 1.3 miles from the center of the Downtown project site. As stated above, both monitors are meeting the annual standard of 15.0 ug/m^3. The Barret Avenue monitor and the Jeffersonville, Indiana monitor annual design values have dropped by 12 percent and 18 percent, respectively, since 2002–2004 indicating that, all things being equal, there is not currently, and not expected to be, a PM2.5 hot-spot problem in this area. Exhibit 8 shows a more detailed map of the Downtown project areas with the Barret Avenue and Jeffersonville monitor locations depicted.

The Kentucky Division for Air Quality 2010 Kentucky Ambient Air Quality Annual Report and Air Quality Surveillance Network showed a downward trend in annual average $PM_{2.5}$ design values between 2000 and 2010 for Louisville area.[10]

[10] *Kentucky Division for Air Quality Fiscal Year 2010 Annual Report and other Kentucky Division for Air Quality data*

Exhibit 7 - PM2.5 Monitor Sites in the Louisville Metropolitan Area in Indiana and Kentucky

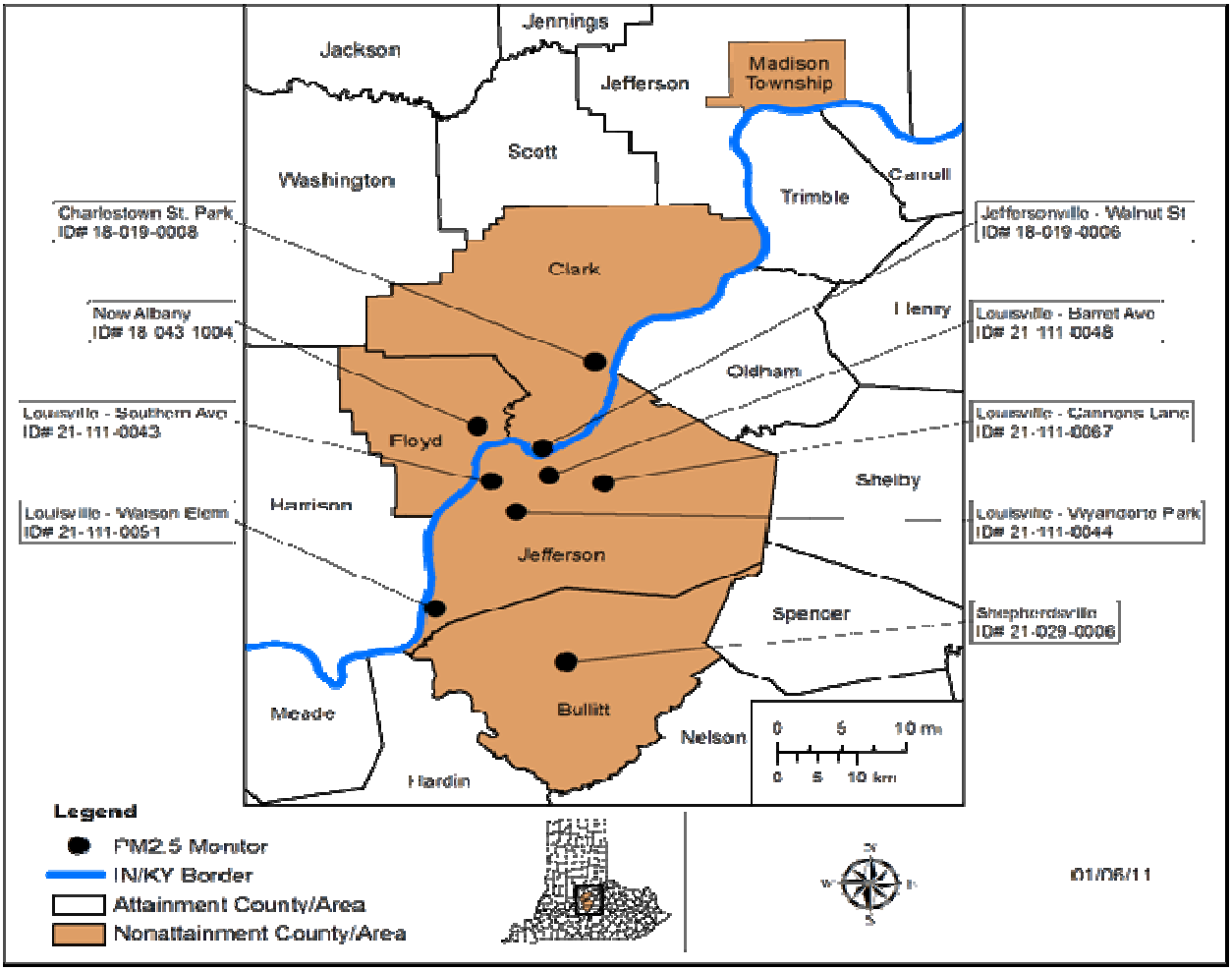
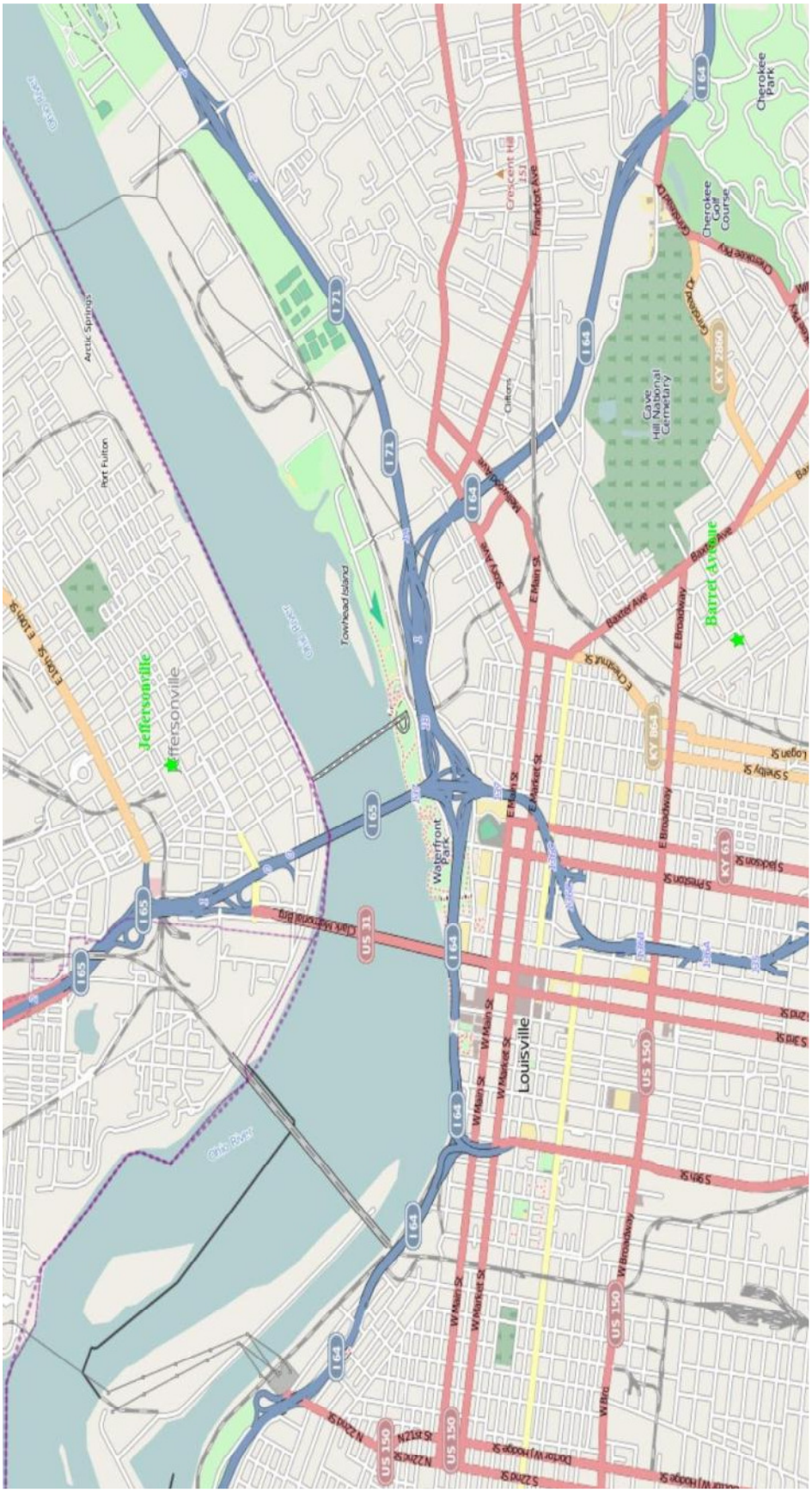


Exhibit 8 - More Detailed Map of the Barret Avenue and Jeffersonville PM2.5 Monitor Sites



Transportation and Traffic Conditions

Currently, mobility in the LMA is limited, in part, due to inadequate capacity to cross the Ohio River. Based on 2010 traffic counts, I-64 is carrying 82,000 vehicles per day; I-65 is carrying 122,300 vehicles per day; and US 31 is carrying 21,900 vehicles per day in the Downtown area. Therefore, the total current traffic volume in this area is 226,200 vehicles per day. The 2010 AADT for the LSIORB project area is depicted in Appendix A. Level of Service is poor. The 2010 LOS is depicted in Exhibit 3 previously seen in this report. With increased AADT and increased congestion, the LOS will continue to worsen. Based on current and future forecasted congested conditions, the existing and planned (excluding the LSIORB project) network will not carry the forecasted traffic without a severe increase in delay time resulting in an increase in travel time and a decrease in LOS on the interchanges (see Exhibit 3). The existing Downtown bridges will be forced to carry the additional cross-river traffic generated by the East End, increasing the travel and safety problems of the Downtown area.

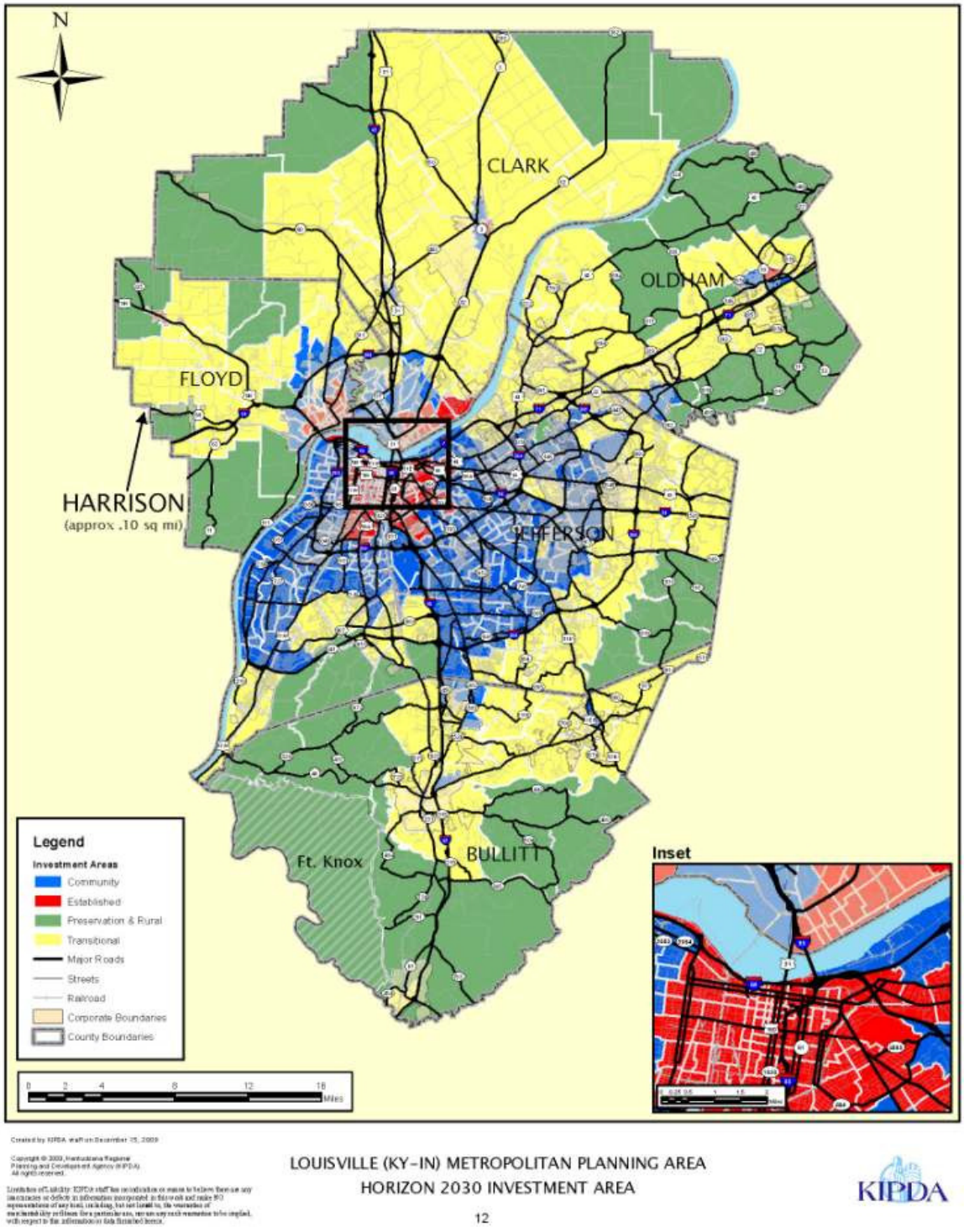
The Transit Authority of River City (TARC) provides public transportation within the LMA. TARC passenger and route information from the FEIS has been updated. Currently, TARC operates six bus routes across the Ohio River. Two routes use the Sherman Minton Bridge (I-64) and carry a total of approximately 350 passengers per weekday on 31 one-way trips. Four routes use the Clark Memorial Bridge (US 31), serving approximately 1,422 weekday passengers in aggregate on 117 one-way trips. Two of these routes use the Kennedy Bridge for peak-hour express trips. Pedestrian access is provided on two narrow walkways on the Clark Memorial Bridge (US 31). Bicycle travel is accommodated in the driving lanes on the Clark Memorial Bridge. Pedestrian and bicycle travel are prohibited on both the Kennedy (I-65) and Sherman Minton (I-64) bridges.

No other cross-river transportation access is provided in the LMA other than on the three existing roadway bridges and the two railroad bridges.

Built and Natural Environment

The LMA has developed effective planning and growth management systems. The existing land use throughout the LMA includes parks and open space, residential areas, commercial and industrial areas as well as agricultural areas. Exhibit 9 depicts the investment areas within the LMA from the ~~DSEIS~~SDEIS and depicts the developed, rural and transitional areas of the LMA. The Downtown area is currently the economic heart of the area; however, locally-approved land use plans call for additional commercial, industrial, and residential development, with attendant population and employment growth, in eastern Jefferson and southeastern Clark counties in the coming years.

Exhibit 9 - Investment Area Designations for the LMA

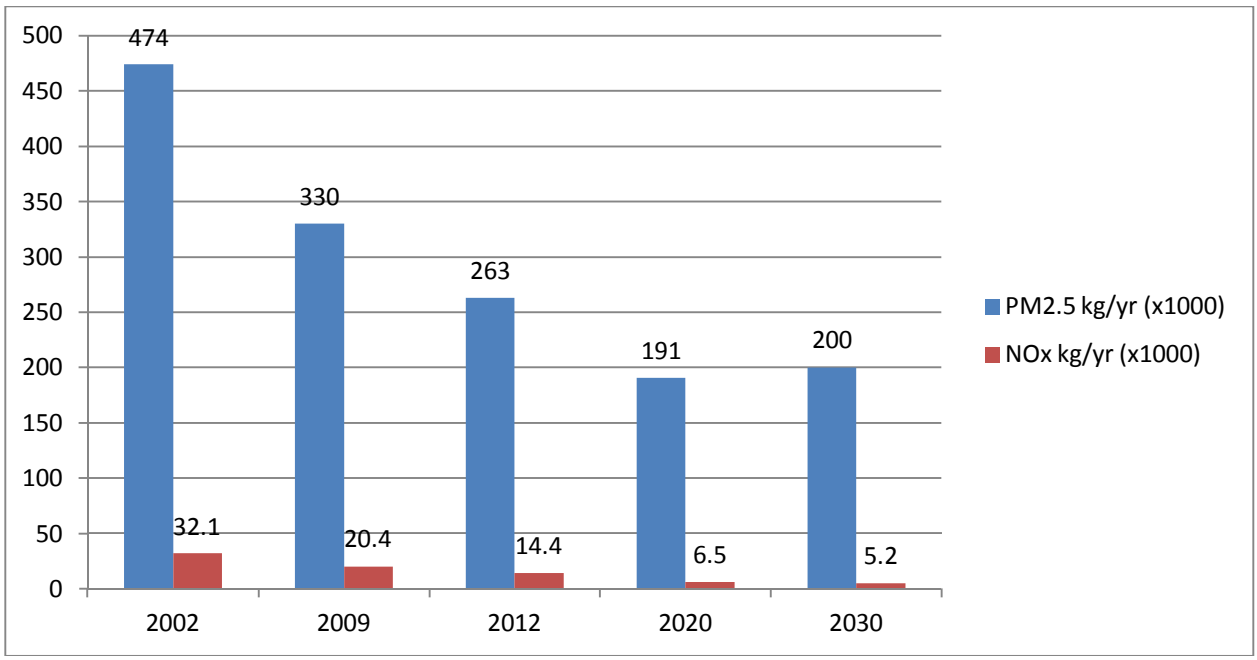


Source: Louisville MPO, *Horizon 2030 Metropolitan Transportation Plan* (adopted 2010)

Emissions Trends

EPA's December 2004 particle pollution trend report[11] findings indicate that $PM_{2.5}$ emissions have dropped nationwide by 10% from 1999-2003. During that time, in the Industrial Midwest states, including Kentucky, $PM_{2.5}$ emissions have dropped by 9%. Per the KIPDA October 2010, $PM_{2.5}$ preliminary conformity assessment using EPA's approved mobile source emissions estimation tool, MOBILE6.2, direct on-road mobile sources $PM_{2.5}$ annual mobile source emissions for the entire nonattainment area are expected to decrease by over 55 percent in 2016 (the anticipated open to traffic date for the East End bridge) from a 2002 baseline and by 61 percent in 2020 (the anticipated complete LSIORB project opening year), even though the vehicles miles traveled are expected to increase by 32 percent from 2002 to 2020 (see Exhibit 10.). Although the estimates of direct $PM_{2.5}$ from on-road mobile sources show a slight increase in 2030 from 2020, these estimates are still 58% less than the 2002 baseline and 39% less than 2009 emission estimates.

Exhibit 10 - $PM_{2.5}$ Mobile Source Emissions Trends Analysis for Louisville Nonattainment Area KIPDA October 2010 $PM_{2.5}$ Conformity Assessment [12]



According to EPA, beginning in 2007, highly effective control technologies for heavy-duty engines were introduced as a result of the 2007 Heavy-duty engine standards. Particulate matter emission levels are expected to be 90 percent lower on a per vehicle basis than 2000 standards levels due to the 2007 diesel engine and fuel program.[13]

[11] The Particle Pollution Report, EPA 454-R-04-002

[12] KIPDA 2010 Conformity Analysis

[13] Heavy-duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements - Final Rule ("2007 Heavy-Duty Highway Final Rule") (Signed December 21, 2000)

The LSIORB project is intended to provide additional roadway capacity in the study area to accommodate the future traffic growth and demand for through-traffic travel on both I-64 and I-65. The additional capacity in the region will help to reduce stop and go traffic, extended idling, and improve traffic flow in the area. Additionally, the new East End bridge will relieve traffic in the Downtown area by allowing cross-river travel between the high growth areas of eastern Jefferson County, Kentucky and southeastern Clark County, Indiana. Please refer to the FEIS, Alternatives for a complete presentation of the traffic data.

Analytical Considerations

A comparison approach was used for the $PM_{2.5}$ hot-spot consideration. A surrogate analysis was used. *A "surrogate" (or substitute) site is a site for which the current levels of 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 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.*

For purposes of the surrogate analysis, future "worst-case" conditions for PM2.5 emissions were identified for both the East End corridor and the Downtown corridor. For both corridors, the worst-case conditions are assumed to occur in the opening year, as further discussed below.

The East End build scenario open to traffic date of 2016 is considered the worst-case scenario for the East End. This worst-case scenario was compared to the example of "a project of air quality concern" from the preamble to the 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. Further, the East End 2016 worst-case scenario was compared to two "surrogate" sites.

The Downtown area build scenario 2020 worst-case (i.e., assuming completion and open to traffic of a new East End bridge and a new Downtown bridge, as well as completion of the Downtown Kennedy interchange reconstruction) was compared to the two chosen "surrogate" sites as well.

The KYTC reviewed the current traffic and monitoring data in Kentucky and neighboring states in search of a site that might possibly have similar traffic counts and truck percentages as the LSIORB project. Two surrogate sites were selected and are discussed below.

Worst-Case Scenarios

The USEPA's Qualitative Hot-Spot Guidance requires that project-level analyses consider the year (or years) of expected peak mobile source emissions from the project[14]. For $PM_{2.5}$, this is expected to be a near-term year, such as the first year of operation of the project, because emission rates from vehicles are predicted to decline with time due in part to improvements in

[14] See Qualitative Hot-Spot Guidance, p. 16 ("EPA believes that conformity requirements are met if areas demonstrate that no new or worsened violations occur in the year(s) of highest expected emissions – which includes the project's emissions in addition to background regional emissions. If such a demonstration occurs, then no adverse impacts would be expected to occur in any other years within the time frame of the transportation plan or regional emissions analysis.").

tailpipe emissions and national vehicle emissions control programs. As indicated in the KIPDA trend analysis shown in Exhibit 10, the regional $PM_{2.5}$ mobile source emissions are much lower in 2020 (the open to traffic year for the final phases of the LSIORB project) than in the 2002 baseline year. It should be noted that the KIPDA trend analysis predicts 2030 mobile source emissions slightly higher than for 2020; however, the 2030 predicted mobile source emissions are still 58 percent less than those for 2002 and 39 percent less than those predicted for 2009.

In addition, over the last few years, EPA has finalized a series of national vehicle control programs expected to reduce mobile source emissions substantially over the next several years. These programs include the Tier II vehicle and fuel sulfur standards for light-duty vehicles, the 2007 Highway Rule for heavy-duty diesel vehicles, and other related programs.[15]

Regional mobile source emissions are a good indicator of the overall emissions trends in the region, therefore it is expected that the open to traffic date would represent the year of peak emissions from the project and other emissions sources that affect the project area. As discussed below, the open to traffic date for the East End bridge is 2016 and the open to traffic date for the Downtown bridge and interchange reconstruction is 2020. Since these two areas are the only concentrations of traffic resulting from this project, it is logical to identify these two areas and their respective open to traffic dates as worst-case locations.

As a part of the LSIORB project, the East End bridge will be completed and open to traffic by 2016. At the time it is opened, the Downtown elements of the project (Kennedy Bridge and Kennedy Interchange) will not be completed. As explained above, the East End area build scenario in 2016 is assumed to be the worst-case emissions scenario for the East End corridor. Based on FEIS forecasted traffic for 2030, the 2016 AADT for the East End bridge can be estimated to be 39,000[16]. Based on 2030 forecasts from the travel demand model, the 2016 truck percentage for the East End bridge is assumed to be 11.6 percent; resulting in an estimated daily truck volume of 4,500 in 2016. This information is displayed in Appendix A.

The Downtown area 2020 traffic analysis, includes the impact of traffic on I-64 (after I-71 has merged with I-64), on I-65, and on the Clark Bridge (US 31). In 2020, the Downtown AADT has been estimated assuming completed construction of the new East End bridge and has been determined from forecasts detailed in the ~~DSEIS~~SDEIS[10]. Hence, since 2020 is the open to traffic date for the downtown construction, 2020 can be selected as a worst-case scenario for downtown. In 2020, with completion of both the new East End bridge and the new Downtown bridge, as well as the completion of the Kennedy interchange reconstruction and the reconfiguration of the existing I-65 bridge, I-64 is projected to carry 154,650 vehicles per day; I-65 is expected to carry 113,150 vehicles per day; and US 31 is projected to carry 28,450 vehicles per day in this vicinity. Therefore, the total overall 2020 traffic volume in the Downtown area for the LSIORB project is estimated to be 296,250 vehicles per day. I-64 is projected to have a truck percentage of 9.1 percent; I-65 to have a truck percentage of 19.3 percent; and US 31 to have a truck percentage of 1.6 percent. The weighted average truck percentage for these three roadways is approximately 12.3 percent or 36,400 trucks per day. The East End bridge 2020

[15] For more information on EPA's national vehicle control programs, please refer to EPA's Office of Transportation and Air Quality program information available at http://www.epa.gov/otaq.

[16] 2016 traffic was derived based 2010 and 2030 estimates from the ~~DSEIS~~SDEIS.

AADT has been estimated as 42,700. Based on projections from the travel demand forecasting model, the forecasted 2020 truck percentage for the East End bridge is forecasted to be 11.6 percent; resulting in an estimated daily truck volume of 5,000 in 2020. This information is displayed in Appendix A.

LSIORB Project Downtown Build 2020 (Worst-Case) vs. No-Action

As discussed above, the LSIORB project Downtown area open to traffic date of 2020 represents the Downtown area build worst-case scenario. As can be seen in Appendix A, the build 2020 worst-case forecasts are for considerably lower AADT and fewer trucks for the Downtown area than the forecasts for the 2020 no-action scenario. Further, based on the lower forecasted volumes and an improved interchange design, it can be assumed that the 2020 build scenario will lead to a better LOS for the Downtown area than that predicted by the no-action scenario. This is due to the relief in the Downtown AADT provided by the availability of the new East End bridge, with additional congestion relief and LOS improvement coming from the reconstruction of the Kennedy interchange and the additional cross-river lanes on the new Downtown bridge in the Downtown area. As compared to the no-action scenario, the 2020 build scenario will result in improved speeds, less delay, and reduced idling in the Downtown area; thus leading to reduced mobile source emissions.

Surrogate Site Search

A search was made in Kentucky and surrounding states for sites (surrogate sites) having similar, or greater, AADT and truck traffic as one or both the LSIORB worst-case locations as detailed in Appendix A. Two potential surrogate sites, current downtown Louisville I-64/I-65 Interchange and the Northern Kentucky I-75(I-71)/I-275 Interchange, were selected and are discussed below:

Surrogate Site 1 – Current[17] Downtown Louisville I-64/I-65 Interchange

Currently, in the Louisville Downtown area, near the I-64/I-65 Interchange, I-64 is carrying 161,600 vehicles per day; I-65 is carrying 122,300 vehicles per day; and US 31 is carrying 21,900 vehicles per day, resulting in a total current AADT in this area of 305,800 vehicles per day. Truck traffic makes up 11.4 percent or 34,700 trucks per day. The level of service (LOS) is poor. The Barret Avenue monitor (AIRS-ID number 211110048) and the Jeffersonville, Indiana monitor (180190006) are the only monitors in reasonably close proximity to the LSIORB project; both monitors are about 1.3 miles from the center of the Downtown project site. In the 2007 evaluation the Barret Avenue monitor annual design value was still slightly exceeding the annual standard with a 2003-2005 annual design value of 15.3 ug/m^3. The design values had dropped by 8 percent since 2002. The 2008 value was 13.4ug/m^3, a further reduction of 12% since 2002 and a value that is below the standard. In the 2007 analysis the Jeffersonville, Indiana monitor exceeded the annual standard with a 2003-2005 annual design value of 16.5 ug/m^3. The current 2008-2010 annual design value for the Jeffersonville monitor is 14.1 ug/m^3. This value is below the NAAQS annual standard. With the prevailing winds in the area from the southwest, the Jeffersonville monitor may be picking up river barge traffic emissions, industrial park emissions, and Downtown Louisville area mobile source emissions leading to the high design value. As stated earlier, none of the monitors in the area are exceeding the current 24-

[17] By definition, data for a surrogate site is current data; however, the redundant word "current" is used here to emphasize the distinction between the current (2010) Downtown conditions and the Downtown area build scenario 2020 "worst-case" conditions, i.e., locations are the same, years are different.

hour $PM_{2.5}$ standard of 35 ug/m^3. National, state, and local $PM_{2.5}$ emissions are expected to decrease dramatically over the next 15 years due to the implementation of various programs as explained above; the trend in $PM_{2.5}$ mobile source emissions for the LMA is demonstrated in the KIPDA trend analysis shown in Exhibit 10.

Downtown Area Build 2020 Worst-Case Comparison - The current Downtown Louisville AADT is more than the LSIORB Downtown area 2020 worst-case. The growth in truck percentage with time results in a Downtown area build 2020 worst-case truck percentage of 12.3 percent (or 36,400 trucks per day) versus the current Downtown truck percentage of 11.1 percent (or 34,700 trucks per day). The Barret Avenue monitor in the vicinity of the site was reading barely over the standard, and in 2008 was below the standard, and truck traffic is expected to increase only a small amount. Due to the downward trend in emissions in the area as discussed above, it is reasonable to conclude that the monitor readings in 2020 will not be increased, and, in fact, will be meeting the standard. Thus, the current Downtown Louisville area could act as a surrogate for the Downtown Louisville area 2020 build scenario. Hence, the LSIORB Downtown area build scenario 2020 worst-case emissions will not cause or add to an existing $PM_{2.5}$ violation.

East End Area 2016 Worst-Case Comparison - The current Downtown Louisville (surrogate site 1) AADT and number of trucks is more than triple the forecasted LSIORB East End area 2016 worst-case. Thus, this site (surrogate site 1) would adequately represent the LSIORB East End area build 2016 worst-case scenario. Further, as explained above, since the Barret Avenue monitor in the vicinity of the site was reading barely over the annual standard and is now below the standard, it is reasonable to conclude that the monitor readings in 2020 will not be increased, and, in fact, due to the area downward trend in emissions, will be below the annual standard. Further, as discussed above, the monitor readings are well below the 24-hour standard. Therefore, it is reasonable to conclude that the LSIORB East End area build scenario 2016 worst-case emissions will not cause or add to an existing $PM_{2.5}$ violation.

Surrogate Site 2 – Northern Kentucky I-75(I-71)/I-275 Interchange

Near the northern Kentucky I-75(I-71)/I-275 interchange area, I-75(I-71) is carrying 196,000 vehicles per day with 15.2 percent (29,800) trucks and I-275 is carrying 102,000 vehicles per day with 7.8 percent (8,000) trucks. Thus, the total current AADT in this area is 298,000 vehicles per day with an average percentage of 12.7 percent (37,700) trucks. The LOS is not available for this interchange, however, the volume to surface flow ratio (V/SF) values[18] are over or near 1.0, indicating that the LOS for at least some legs of the interchange are at a level E or worse. The 1401 Dixie Highway, Covington monitor AIRS-ID number 211170007 is the only monitor within reasonable proximity (about six miles away) of this interchange. The 2003-2005 annual design value for this monitor was below the annual standard with a value of 14.5 ug/m^3. Monitor readings for 2002-2005 were well below the 24-hour standard[5]. The 2008 to 2010 annual design value for this monitor was 11.7ug/m^3. This represents a reduction of 19% from values reported for the January 2007 $PM_{2.5}$ analysis. A map of this area, marking the monitor site, is shown in Appendix C.

[18] See FHWA's Highway Capacity Manual 2000 http://www.fhwa.dot.gov/ohim/hpmsmanl/appn.htm

Downtown Area Build 2020 Worst-Case Comparison - While the surrogate site 2 AADT is less than the LSIORB Downtown area 2020 worst-case, the truck percentage and number of trucks (22.7 percent trucks or 59,000 total trucks) are considerably higher than that of the LSIORB Downtown area 2020 worst-case forecasts (12.3 percent trucks or 36,400 total trucks). Thus, because of the excessive diesel traffic this site would likely generate more $PM_{2.5}$ than would the LSIORB Downtown area build 2020 worst-case scenario from a diesel emissions perspective. Therefore, since the monitor in the vicinity of this area has design values under the standards, it is reasonable to conclude that the Downtown area build 2020 area worst-case emissions will not cause or add to an existing $PM_{2.5}$ violation.

East End Area 2016 Worst-Case Comparison - The AADT and number of trucks is more than triple the LSIORB East End area 2016 worst-case. Thus, this site would adequately represent the LSIORB East End area 2016 worst-case scenario. Therefore, since the monitor in the vicinity of this area has design values under the standards, it is reasonable to conclude that the LSIORB East End area 2016 worst-case emissions will not cause or add to an existing $PM_{2.5}$ violation.

VII. Conclusion

In summary, based on the analysis, it is determined that the LSIORB 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 the timely attainment of the PM2.5 NAAQS for the following reasons:

- ***Downtown Area 2020 Worst-Case:*** The Downtown area build 2020 worst-case AADT has been estimated to be 296,250 vehicles per day with 12.3 percent trucks (36,400 trucks per day).
    - ***As compared against surrogate site 1(current Downtown Louisville)*** – Due to the building of the East End bridge, the Downtown area build 2020 worst-case AADT is less than the AADT for surrogate 1(current Downtown Louisville). Surrogate site 1 monitor design values were only slightly over the annual standard and 24-hour readings in 2007, are currently below the standard, and are well below the 24-hour standard. While the percent trucks and daily truck volume for the Downtown area build 2020 worst-case are slightly higher than those for surrogate 1, it is still reasonable to conclude that since the emissions from an individual truck will be much less due to technological improvements (implemented vehicle and fuel regulations) and the implementation of various non-road regulations as discussed under the section Emissions Trends, overall emissions for Downtown area build 2020 worst-case will be less than for surrogate 1.
    - ***As compared against surrogate site 2 (Northern Kentucky interstate interchange)*** - The Downtown area 2020 worst-case AADT is the slightly less than the AADT of surrogate site 2 (Northern Kentucky interstate interchange), and the percent and number of trucks are also slightly less than that of surrogate site 2. Surrogate site 2 monitor design value readings are meeting both the annual and 24-hour standards.
    - ***Build vs. No-build:*** $PM_{2.5}$ emissions are expected to be reduced in the project area, as demonstrated by projected reductions in the regional mobile source

emissions analysis, as well as by national projections by EPA reflecting the impacts of national emissions control programs, such as the 2007 Heavy-duty Diesel Rule. In addition, as can be seen in Appendix A, the LSIORB build scenario will result in less total traffic and truck volumes at the Downtown area location in 2020 as compared to the no-action scenario, resulting in lower roadway emissions and lower downwind $PM_{2.5}$ concentrations.

- Therefore, based on a comparison against surrogate site 1 and surrogate site 2, as well as the build vs. no-action, it is reasonable to conclude that the LSIORB Downtown area build 2020 worst-case will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, or increase the frequency or severity of a violation.

- ***East End 2016 Worst-Case:*** The East End build 2016 AADT has been estimated as 39,000. The truck percentage of 11.6 percent results in an estimated 4,500 trucks per day.
  - ***As compared March 10th Rule Example*** – The East End build 2016 worst-case scenario 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.
  - ***As compared against surrogate site 1(current Downtown Louisville)*** - AADT and number of trucks are considerably less than those of surrogate 1(current Downtown Louisville). Surrogate site 1 monitor design values were only slightly over the annual standard in the 2007 analysis and currently meet the annual standard. Further, surrogate site 1 monitor readings are well below the 24-hour standard.
  - ***As compared against surrogate site 2 (Northern Kentucky interstate interchange)*** - AADT and number of trucks are considerably less than those of surrogate 2 (Northern Kentucky interstate interchange). Surrogate site 2 monitor design value readings are meeting both the annual and 24-hour standards. Therefore, based on a comparison against the March 10th rule, surrogate 1 and surrogate 2, it is reasonable to conclude that the LSIORB East End area build 2016 worse-case will not cause or contribute to a new violation of the $PM_{2.5}$ NAAQS, or increase the frequency or severity of a violation.

- ***Attainment of the annual standard:*** As previously discussed, because of the overall downward trend in $PM_{2.5}$ emissions, and concentrations in the region, it is reasonably to conclude that this project will not delay timely attainment of the PM2.5 NAAQS.

Appendix A: AADT and Truck Percentages for Current (2010), 2016, and 2020

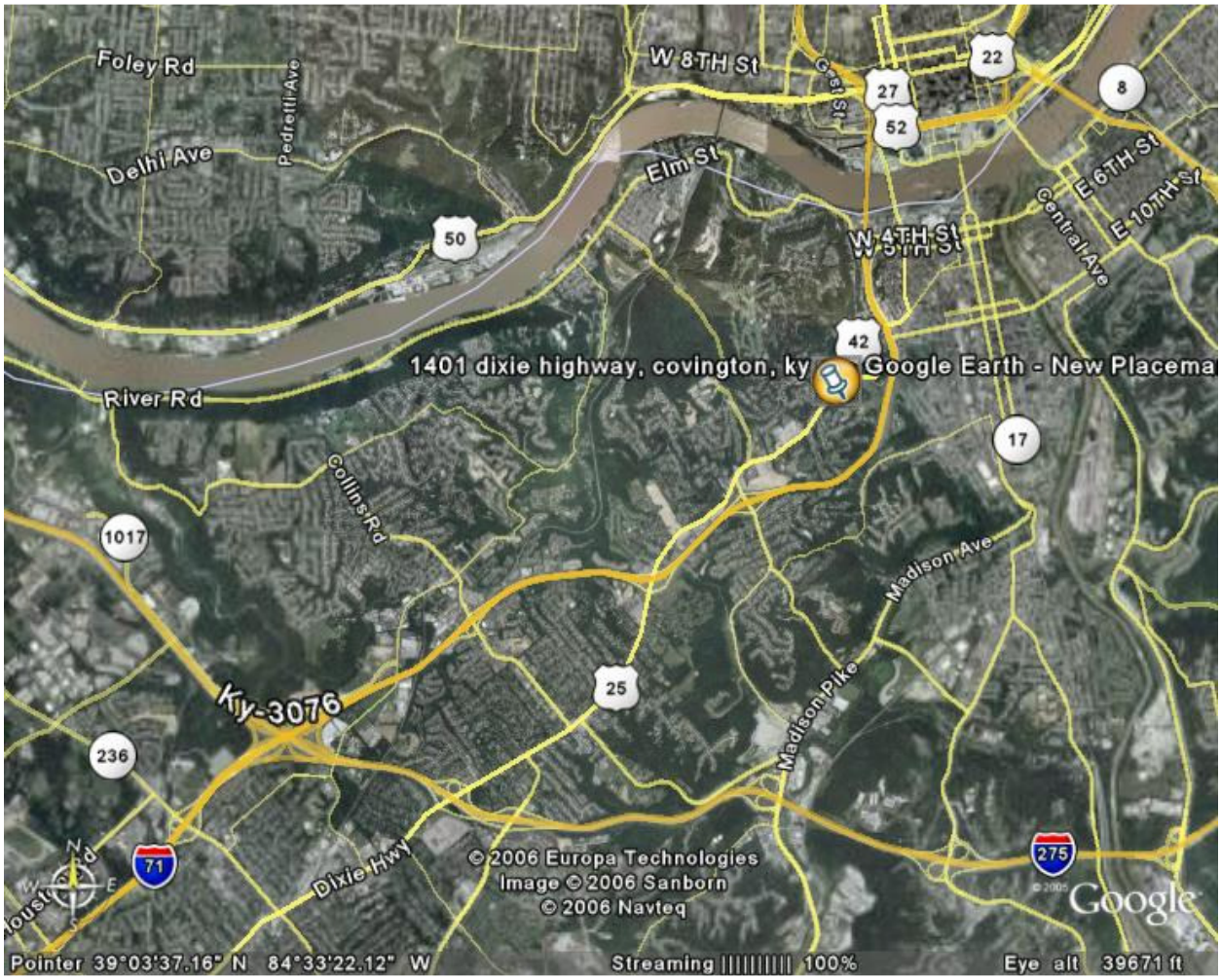
	Roadway	Annual Average Daily Traffic (AADT)	Percent Trucks	Total Annual Average Daily Traffic Impact (AADT)	Average Weighted Truck Percent	Total Average Daily Trucks
Downtown Current (2010)	I-65	122,300	9.40%	**305,800**	11.4%	34,700
	I-64	161,600	13.60%			
	US 31	21,900	5.80%			
East End Current (2010)	No East End River Crossing	0	0	0	0	0
Downtown No-Action (2020)	I-65	138,650	18.40%	340,300	12.6%	43,000
	I-64	178,200	9.60%			
	US 31	23,450	1.60%			
East End No-Action (2020)	No East End River Crossing	0	0	0	0	0
Downtown Build (2020) Worst-Case	I-65	113,150	19.30%	**296,250**	12.3%	36,400
	I-64	154,650	9.10%			
	US 31	28,450	1.60%			
East End Build (2020)	With East End River Crossing	42,700	11.6%	42,700	11.6%	5,000
East End Build (2016) Worst-Case	With East End River Crossing	39,000	11.6%	**39,000**	11.6%	4,500
Covington I-75/71/I-275 Current (2010)	I-75/71	196,000	15.2%	298,000	12.7%	37,700
	I-275	102,000	7.8%			

Appendix B: Louisville Area and Covington 2008-2010 $PM_{2.5}$ Monitor Data and Design Values

			98th Percentile of 24-hour average			3-Year Average of 98th percentile (Design Value)	Annual Mean			3-Year Average of Annual Mean (Design Value)
County	Monitor ID	Site	2008	2009	2010	2008-2010	2008	2009	2010	2008-2010
Bullitt	210290006	Shepherdsville, KY (Bullitt County) 2nd and Carpenter St	25.4	23.1	24.0	24	12.8	11.8	13.4	12.7
JEFFERSON - 37th	211110043	Southwick - Louisville, KY (Jefferson County) 37th and Southern Ave	28.7	24.3	27.5	27	13.2	12.2	13.5	13.0
JEFFERSON - Beecher	211110044	Wyandotte - Louisville, KY (Jefferson County) 1032 Beecher Ave	29.5	25.7	28.8	28	13.4	12.5	12.7	13.2
JEFFERSON - Barret	211110048	Barret (APCD) - Louisville, KY (Jefferson County) 850 Barret Ave	30.7	NA	NA	31	13.4	NA	NA	13.4
Jefferson - Watson	211110051	Watson - Louisville, KY (Jefferson County) 7201 Watson Lane	28.6	24.7	26.1	31	12.8	11.6	14.8	13.1
Jefferson - Cannons	211110051	Watson - Louisville, KY (Jefferson County) 7201 Watson Lane	NA	24.1	25.8	25	NA	11.7	13.3	12.5
Jeffersonville, IN	180190006	Jeffersonville, IN (Clark County) Pfau; 719 Walnut Street	33.1	26.1	29.2	29	14.5	13.0	14.7	14.1
New Albany, IN	180431004	New Albany, IN (Floyd County) Green Valley School	26.8	23.6	29.7	27	12.7	11.9	13.8	12.8
Covington, KY	211170007	1401 Dixie Highway	25.2	23.1	22.0	23	12.0	11.0	12.1	11.7

* The 3-year averages, or "design values", for the 24-hour average are rounded to the nearest whole number
* The 3-year averages, or "design values", for the annual average are rounded to the nearest tenth
* The 24-hour standard is attained when the 3-year average of the annual 98th percentile is less than or equal to 35 ug/m3.
* The annual standard is attained when the 3-year average of annual means is less than or equal to 15.0 ug/m3.
* The Jefferson County Barret Ave site was shut down in 2008
* Kentucky data was taken from the Kentucky Division for Air Quality 2005 Annual Ambient Air Quality Report
* Indiana data was provided by Indiana Department of Environmental Management

Appendix C: Map of the Northern Kentucky $PM_{2.5}$ Monitoring Site



Appendix D: Public Comments and KYTC Responses on the January 2007 Analysis

RIVER FIELDS

December 6, 2006

Mr. Kevin Dant
Environmental Coordinator
Kentucky Transportation Cabinet
District 5
977 Phillips Lane
P.O. Box 37090
Louisville, KY 40233-7090

RE: PM2.5 Project-Level Conformity Determination
Louisville-Southern Indiana Ohio River Bridges Project (LSIORB)

Dear Mr. Dant:

What follows are the comments of River Fields Inc. (River Fields) on the fine particulate matter conformity analysis (the qualitative "hot-spot analysis") for the Louisville Bridges Project.

In summary, under the regulations of the Council on Environmental Quality, it appears that the hot-spot analysis is required to be conducted through a supplement to the Environmental Impact Statement since the Louisville region's non attainment status under the new air quality standards for fine particulate matter represents a significant new circumstance bearing on the project's environmental concerns. The serious public health concerns associated with fine particulate matter emissions warrant an analysis that includes construction emissions given the lengthy time period proposed by the Kentucky Transportation Cabinet on December 1st. An almost 20-year period for construction of the downtown project is not "temporary." Finally, a valid conformity determination also requires a demonstration of compliance with the financial plan requirements for the regional long-range transportation plan. Because the financial plan does not include the LSIORB, federal requirements are not met and a valid conformity determination cannot be made.

Importance of Particulate Matter Analyses to the Health of Regional Residents

Fine particulate matter poses very serious human health risks. Emissions have been linked to premature mortality and respiratory problems, including aggravated asthma, chronic bronchitis, and decreased lung function. River Fields serves on Mayor Abramson's Task Force for Air Quality for implementation of the fine

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particulate matter standard in the Louisville region and also on the Louisville Strategic Toxic Air Reduction (STAR) work group for implementation of local air toxic control strategies for mobile and other non-stationary sources. Diesel particulates also pose serious air toxic risks to the public, particularly those living in proximity to our interstate system. Children and older citizens are particularly susceptible to these harmful health consequences. In the context of the hot-spot analysis for LSIORB for the new standard and future emission modeling for conformity purposes, emissions from diesel vehicles and construction dust are of primary concern to us.

A qualitative hot-spot analysis should not be viewed as simply a "paper" exercise. **The ability to predict, measure, and quantify fine particulate matter emissions associated with construction and operation of this almost $4 billion project, in whatever form it may take, presents a compelling public health consideration for residents of bi-state region.**

We note that as far back as January 20, 2001, the Jefferson County (now Metro) Air Pollution Control District (APCD) commented in writing to the Bridges consultants that:

> "Our first area of concern relates to air quality assessments and assumptions that underly the analyses:
>
> 1....We find no specific mention of...particulate matter (PM 2.5)...
>
> 2. What have the studies assumed regarding the Louisville area's attainment status for PM 2.5...
>
> 3. What effect on the project, if any, would come from being non-attainment for PM 2.5, and any need to reduce PM 2.5 emissions from mobile sources? ...
>
> This information would be very important to evaluate how any new bridge will impact the air quality for the community."

In its Feb. 18, 2002 comments on the Draft Environmental Impact Statement (DEIS) for LSIORB, the APCD noted:

> "The DEIS...did not address the issues of hazardous air pollutants...and the area's status relative to the....PM 2.5 standard.
>
> Emissions from the construction project(s) should have been estimated...

Neither the Draft or Final EIS addressed these issues and concerns.

The Conformity Analysis is Required to be Undertaken Through a Supplement to the LSIORB Final Environmental Impact Statement

The report states that the Louisville KY-IN area was designated by the U.S. Environmental Protection Agency (EPA) as non attainment for the fine particulate matter National Ambient Air Quality Standard on January 5, 2005, effective April 5, 2005 (p. 4). Transportation conformity for the fine particulate matter standards applied on April 5, 2006, requiring a "hot-spot analysis" for certain federally-supported projects. (*Id.*). The report further states that the hot-spot analysis for the Louisville Bridges Project could not be completed until after the EPA regulations became effective, which was after the Final Environmental Impact Statement and Record of Decision were issued in April 2003 and September 2003, respectively. "Therefore, public review and comment for this hot-spot analysis is being undertaken *separately from that of the ORB FEIS* (emphasis added)" (***Id.***).

River Fields disagrees that the analysis can be undertaken separately from the FEIS. Under 40 CFR §1502.9(c), an FEIS **shall be** supplemented if:

(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

Louisville's non attainment status under the fine particulate matter standards are "significant new circumstances or information relevant to environmental concerns and impacts" of the project and would appear to require a formal supplement to the FEIS for this initial transportation conformity analysis.

Additionally, both the Draft and Final EIS assumed a simultaneous 10-yr. build out of both the downtown project and eastern bridge for the purpose of assessing certain impacts (see, e.g., DEIS, construction impacts, pp. 5-29–5-32). As described below, the current construction schedule now substantially lengthens the downtown component to almost double the assumed schedule in the EIS, a substantial change in the proposed action and one relevant to environmental concerns from construction emissions of fine particulates. Additionally, construction emissions were not evaluated in the EIS, as the APCD requested, and cannot be defensibly characterized as "temporary" to avoid including them in the hot-spot (or future modeling) analysis.

All of these considerations warrant that this analysis be undertaken through a supplemental FEIS pursuant to rules implementing the National Environmental Policy Act.

Analysis Incorrectly Omits PM2.5 Emissions from LSIORB Construction

The conformity analysis did not include fine particulate matter emissions from construction of the LSIORB, stating that "Emissions resulting from construction of the project are not required to be considered in the hot-spot analysis if such emissions are considered temporary according to 40 CFR §93.123(c)(5)" (p. 13). The cited rule provides that temporary increases are defined as those which occur only during the construction phase and **last five years or less** at any individual site.

There are several problems with the hot-spot analysis regarding construction emissions. First, the construction schedule in Exhibit 6, p. 14, is incorrect and cannot serve as a basis for a valid conformity determination. On Dec. 1, the Transportation Cabinet submitted a required Long-Range Plan for the project that includes a construction schedule (included in these comments as Attachment 1). That schedule is lengthened from the hot-spot analysis schedule, substantially so for the Kennedy Interchange construction. The Cabinet's own document identifies an 18-yr. construction period for the Kennedy Interchange and a 6-yr. period for construction of the Indiana I-65 approach. In no stretch of the imagination can such activities be considered "temporary."

Second, the EPA rule provides that individual construction "sites" within a project can be analyzed to determine whether they are five years or less. The hot-spot analysis and Exhibit 6 do not define the "phases" of each project segment or the criteria for defining an "individual" construction site. As presented, Exhibit 6 appears to arbitrarily draw project segments in less than 5-yr. increments to avoid assessing construction emissions.

For these reasons, River Fields submits that it is indefensible under the applicable regulations and from a public health standpoint to omit an analysis of fine particulate matter from construction of this megaproject. Section 7.9 of our February 25, 2002 comments on the DEIS also specifically cited the failure to quantify construction emissions as a deficiency of the environmental study process.

A Valid PM2.5 Conformity Analysis Cannot be Made Because the Regional Long-Range Transportation Plan Excludes LSIORB from the Financial Analysis

River Fields has commented extensively on the lack of federally required fiscal constraint in the KIPDA Transportation Improvement Program. We have also commented extensively on the failure of the financial plan in KIDPA's Long-Range Transportation Plan to meet the criteria of 23 CFR §450.322(b)(11) because of the exclusion of LSIORB (see, *e.g.*, June 23, 2003 FEIS comments, Section 2). To our knowledge, a valid transportation conformity determination still requires fiscal constraint and compliance with the 23 CFR Part 450 requirements in transportation

plans. The hot-spot analysis fails to address these essential components of a valid conformity determination.

Closing

We look forward to a written response to these comments and concerns. Please ensure that these comments are included in the administrative record for the LSIORB project.

Sincerely,

Leslie E. Barras
Associate Director

c: Bart Bryant, KYTC
Paul Boone, INDOT
George Jones, FHWA
John Sacksteder, CTS

ATTACHMENT 1

Figure 4 (below) presents a visual overview of the LSIORB Project schedule showing the relative completion dates associated with the downtown and East End components of the project.

Design and Construction Schedule

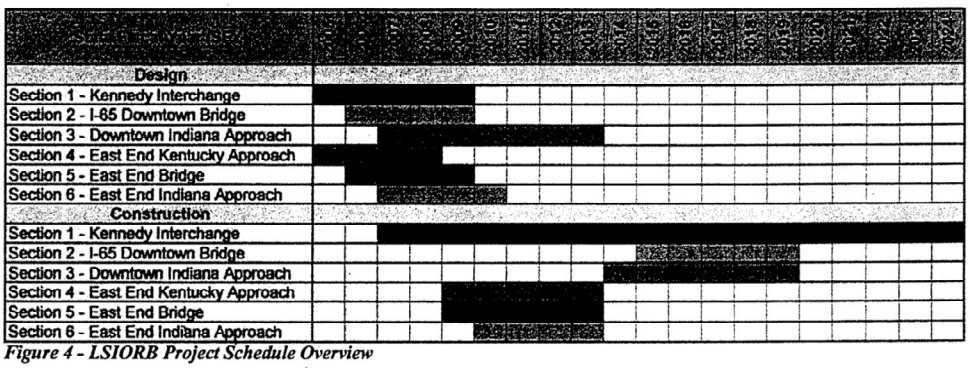

Figure 4 - LSIORB Project Schedule Overview

IV. Project Estimated Costs

This section provides a detailed description of the cost elements of the Louisville-Southern Indiana Ohio River Bridges (LSIORB) Project and provides current estimates of those costs. It also summarizes the costs incurred to date and provides detail on key cost-related assumptions.

The cost estimate to complete the LSIORB Project is broken down into six project sections plus an "Other" category to capture costs that are not section-specific, such as project-wide mitigation and enhancements. The sections and responsible sponsors are shown in Table 2 (below).

The current cost estimate is based primarily on the state fiscal year 2003 detailed cost estimate that was generated as part of the *Financing Options Plan* for the Project.[1] These costs were reviewed by both states and FHWA for validity of the base estimates and assumptions. The costs have subsequently been updated, adjusted, and inflated to reflect "year-of-expenditure" costs and the current project schedule.

Significant design activities have progressed on Section 1, and the cost estimate for this section has been updated based on current information. Adjustments also have been made to account for new cost information available on Section 4. Similar updates will be performed for other sections as additional section-specific activities proceed.

[1] Louisville-Southern Indiana Ohio River Bridges Project *Financing Options Plan*, April 2003.

KYTC Response to River Fields Comment on the January 2007 Analysis

River Fields' Comment 1.

"The serious public health concerns associated with fine particulate matter emissions warrant an analysis that included construction emissions given the length of time period proposed by the Kentucky Transportation Cabinet on December 1st."

Response:

The Transportation Conformity Rule does not require consideration of temporary emission increases from construction-related activities which occur only during the construction phase and last five years or less at any individual site. (40 CFR 93.123 (c) (5)).

Through interagency consultation, and consultation with the Federal Highway Administration's Headquarters (FHWA-HQ) and the Environmental Protection Agency's Headquarters (OTAQ), it was acknowledged that the Louisville Bridge project would be constructed in segments, as the whole bridges project could not be under construction at the same time. It is anticipated that the construction of these segments will be further divided into different individual construction sites. Localized construction emissions can be considered separately. Construction-related emissions at each individual construction site are anticipated to be less than 5 years. Per 40 CFR 93.123(c)(5), such temporary construction-related emissions are not required to be included in the hot-spot analysis.

The $PM_{2.5}$ Hot Spot Analysis was conducted using the best available information at the time.

The project Record of Decision acknowledges construction related dust and makes commitments to design and construct the project with state of the practice emission controls.

> 4.1.4 Air Pollution
> • Construction activities will be performed in a manner that controls emissions from burning (where allowed), drilling, blasting, production of materials, hauling, or any other necessary construction operations of any kind.
>
> • Air pollution associated with dust will be effectively controlled through the use of watering, the application of calcium chloride, or other techniques in accordance with the KYTC and the INDOT specifications. Watering work areas to increase moisture and reduce dust will control air pollutants generated by construction.
>
> • Contract specifications will dictate that all drilling, grinding, and sawing of rock, shale, concrete, and other similar dust-producing materials be performed with equipment provided with water sprays, fabric-filtered collection systems, or other suitable devices to prevent excessive dust from becoming airborne.

Appendix E: FHWA Project Level Conformity Determination for the January 2007 Analysis

U.S. Department
of Transportation
**Federal Highway
Administration**

Kentucky Division Office
Jose Sepulveda, Division Administrator

**330 West Broadway
Frankfort, KY 40601
PH. (502) 223-6720
FAX (502) 223-6735**

$PM_{2.5}$ PROJECT LEVEL CONFORMITY DETERMINATION FOR THE OHIO RIVER BRIDGES PROJECT

The Ohio River Bridges (ORB) project is located in Jefferson County, Kentucky and in Clark County, Indiana. Both counties are within the designated Louisville area $PM_{2.5}$ nonattainment area. As such, the project is required to meet Transportation Conformity Rule requirements found in 40 CFR Part 93.

The ORB Record of Decision (ROD) was issued on September 6, 2003. At that time, the United States Environmental Protection Agency (EPA) had not designated nonattainment areas for the $PM_{2.5}$ National Ambient Air Quality Standards. The Louisville area was not designated as a $PM_{2.5}$ nonattainment area until January 5, 2005, with an effective date of April 5, 2005. The "Transportation Conformity Guidance for Qualitative Hot-Spot Analysis in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas" states that if a project still requires a Federal Highway Administration (FHWA) approval or authorization, a project-level conformity determination is required prior to the first such action on or after April 5, 2006, even if the project has already completed the NEPA process.

In accordance with Section 176 (c) of the Clean Air Act (42 U.S.C. 7506 (c)), transportation projects in nonattainment and maintenance areas must be found to conform to the State Implementation Plan (SIP). Currently there is no applicable $PM_{2.5}$ State Implementation Plan, and therefore there are no $PM_{2.5}$ control measures with which to comply (40 CFR 93.117). We found that the ORB project demonstrated this by meeting the criteria of the Transportation Conformity Rule (40 CFR 93).

The Transportation Conformity Rule (40 CFR 93.114 and 93.115) requires that a currently conforming regional long-range transportation plan (LRTP) and a regional short-range transportation improvement program (TIP) must be in place at the time of project approval, and the project must come from the conforming LRTP and TIP.

On November 29, 2005 the Louisville area Metropolitan Planning Organization adopted its fiscally constrained 2006-2030 LRTP and 2006-2008 TIP, which included the Ohio River Bridges project. On March 3, 2006 the LRTP and the TIP were found to conform for all applicable pollutants by the Kentucky Division of the Federal Highway Administration and Region 4 of the Federal Transit Administration.

The Transportation Conformity Rule requires a hotspot analysis as part of the project level conformity in $PM_{2.5}$ nonattainment areas for certain projects (40 CFR 93.116 and 93.123). The November 2, 2006, report titled "Project-Level Conformity Determination for the Ohio River Bridges Project in Louisville,

Kentucky" addresses the new project-level transportation conformity requirements for the Ohio River Bridges project. The report was made available to the public for 15 days, starting on November 21, 2006 and ending on December 6, 2006.

One resource conservation group commented during the public comment period. Their comments focused on public health issues caused by $PM_{2.5}$, construction dust emissions, lack of $PM_{2.5}$ analysis in the EIS, fiscal constraint, and their desire for a supplement to the EIS.

The $PM_{2.5}$ Hot Spot Analysis determined that the Ohio River Bridges project:

- Did not require consideration of temporary emission increases from construction-related activities as the bridges project would be constructed in segments and divided into different individual construction sites. As such, localized construction emissions can be considered separately and temporary as construction-related emissions at each individual construction site is anticipated to be less than five years.

- Was included in the Louisville Area's Metropolitan Planning Organizations fiscally constrained Long Range Transportation Plan and Transportation Improvement Program which were found to conform on March 3, 2006.

- Did not result in any significant environmental impacts that were not already evaluated in the EIS, and that no violations of the $PM_{2.5}$ standard are likely to occur.

We find that the Ohio River Bridges project has met the requirements of 40 CFR 93 and is found to conform this 4th day of January, 2007. Further it was determined that the project will not have a significant impact on the PM2.5 air quality in the region and a supplement to the EIS was not required per 23 CFR 771.129 (b)

Jose Sepulveda
Division Administrator
Federal Highway Administration - KY

cc: Robert Tally, FHWA-IN
Harold Tull, Louisville Area MPO
William Nighbert, KYTC-Administration
Kay Prince, EPA-R4
John Lyons, KYDAQ
Art Williams, APCD