



**K I P D A**

Kentuckiana Regional Planning  
& Development Agency

## Amendment 1

# Fiscal Year 2023- 2026 Transportation Improvement Program (TIP)

TPC Approval Scheduled for

*\*May 25, 2023*

*\*pending federal approval of the Fiscal Year 2023-2026 Transportation  
Improvement Program*





Area Agency on Aging and Independent Living  
Area Development District  
Metropolitan Planning Organization



### FY 2023-2026 Transportation Improvement Program

The Kentuckiana Regional Planning and Development Agency (KIPDA) is the Metropolitan Planning Organization (MPO) for the five-county region covering Jefferson, Bullitt and Oldham Counties in Kentucky and Clark and Floyd Counties in Indiana. The MPO's responsibilities include producing a long-range transportation document, known as *Connecting Kentuckiana 2050* Metropolitan Transportation Plan (MTP) and a short-range planning document, the Fiscal Year (FY) 2023-2026 Transportation Improvement Program (TIP)

Changes have been proposed to the TIP. The TIP, with the proposed changes, remains fiscally constrained. This packet includes the following document:

- A listing of all projects being added, removed and/or modified
- Schedule for Amendment I
- Air Quality conformity documentation
- Meeting minutes from the Interagency Consultation (IAC) conference call

Providing comments for the proposed changes can be submitted by any of the following methods:

- Visiting <https://kipdatransportation.org/amendment-1/> and click on the *Amendment I Map* link
- Emailing [kipda.trans@kipda.org](mailto:kipda.trans@kipda.org)
- Mail to the following address

**TIP and MTP Amendment, KIPDA**

**11520 Commonwealth Drive, Louisville, KY 40299**

- Attend the virtual open house on May 9th from 12:00-1:00 pm via Zoom. Members of the public are encouraged to ask questions and leave comments. A link to the virtual public meeting can be found at: <https://kipdatransportation.org/amendment-1>

Please contact Community and Committee Engagement Specialist Greg Burress at 502-562-6144 ext. 123 or via email at [greg.burress@kipda.org](mailto:greg.burress@kipda.org) for additional questions or information.

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<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Indiana Department of Transportation (INDOT)	<b>KIPDA ID:</b>	3192	<b>State ID:</b>	2200833
<b>County</b>	Floyd	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-64 Hot-mix asphalt (HMA) Overlay	<b>Funding Source:</b>	National Highway Performance Program (NHPP)	<b>Open to Public Date:</b>	2027
<b>Total Estimated Project Cost:</b>	\$59,474,000		<b>Total Cost Programmed in TIP to Date:</b>	\$5,020,000	
<b>Description:</b>	Hot-mix asphalt (HMA) overlay minor structural on I-64 from 0.50 miles west of SR 135 to 1.01 miles west of SR 64				
<b>Justification:</b>	This project will improve the conditions of the pavement and extend its service life.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Preliminary Engineering phase with NHPP funds: \$4,500,000 (Federal) + \$500,000 (Other) = \$5,000,000 (Total)  FY 2024 Railroad phase with NHPP funds: \$9,000 (Federal) + \$1,000 (Other) = \$10,000 (Total)  FY 2025 Right of Way phase with NHPP funds: \$9,000 (Federal) + \$1,000 (Other) = \$10,000 (Total)				

<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Indiana Department of Transportation (INDOT)	<b>KIPDA ID:</b>	3193	<b>State ID:</b>	2101799
<b>County</b>	Clark	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-65 & Veterans Parkway	<b>Funding Source:</b>	National Highway Performance Program (NHPP)	<b>Open to Public Date:</b>	2029
<b>Total Estimated Project Cost:</b>	\$22,900,000		<b>Total Cost Programmed in TIP to Date:</b>	\$2,700,000	
<b>Description:</b>	Modify I-65 & Veterans Prkwy interchange by providing additional left turn capacity and adding pedestrian signal indications and push buttons at the signalized ramp terminal intersections.				
<b>Justification:</b>	The interchange is currently experiencing poor peak hour operating conditions that are expected to worsen. It is recommended that the interchange be modified to improve traffic operations, especially by providing additional left turn capacity.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Preliminary Engineering phase with NHPP funds: \$2,000,000 (Federal) + \$500,000 (Other) = \$2,500,000 (Total)  FY 2025 Right of Way phase with NHPP funds: \$180,000 (Federal) + \$20,000 (Other) = \$200,000 (Total)				

<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Indiana Department of Transportation (INDOT)	<b>KIPDA ID:</b>	3194	<b>State ID:</b>	2200050
<b>County</b>	Clark	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	SR 60 & Perry Crossing Road Intersection Improvement	<b>Funding Source:</b>	National Highway Performance Program (NHPP)	<b>Open to Public Date:</b>	2028
<b>Total Estimated Project Cost:</b>	\$3,207,022		<b>Total Cost Programmed in TIP to Date:</b>	\$600,000	
<b>Description:</b>	Intersection improvement at SR 60 and Perry Crossing Road.				
<b>Justification:</b>	This project will address safety concerns at the intersection of SR 60 and Perry Crossing Road.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Preliminary Engineering phase with NHPP funds: \$400,000 (Federal) + \$100,000 (Other) = \$500,000 (Total)  FY 2025 Right of Way phase with NHPP funds: \$80,000 (Federal) + \$20,000 (Other) = \$100,000 (Total)				

<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Kentucky Transportation Cabinet (KYTC)	<b>KIPDA ID:</b>	3195	<b>State ID:</b>	5-10064.00
<b>County</b>	Jefferson	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-65 Bridge at Hill, CSX RR & Burnett	<b>Funding Source:</b>	Bridge Replacement – On System (BRO)	<b>Open to Public Date:</b>	2025
<b>Total Estimated Project Cost:</b>	\$25,168,000		<b>Total Cost Programmed in TIP to Date:</b>	\$25,168,000	
<b>Description:</b>	Bridge project in Jefferson County on (056B00179N) I-65 at Hill, CSX RR & Burnett				
<b>Justification:</b>	Increase safety for all users. Maintain the existing transportation network in a state of good repair.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Design phase with BRO funds: \$1,830,400 (Federal) + \$457,600 (Other) = \$2,288,000 (Total)  FY 2023 Construction phase with BRO funds: \$18,304,000 (Federal) + \$4,576,000 (Other) = \$22,880,000 (Total)				

<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Kentucky Transportation Cabinet (KYTC)	<b>KIPDA ID:</b>	3196	<b>State ID:</b>	5-10066.00
<b>County</b>	Jefferson	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-65 Bridge at East Kentucky Street & South Brook Street	<b>Funding Source:</b>	Bridge Replacement – On System (BRO)	<b>Open to Public Date:</b>	2025
<b>Total Estimated Project Cost:</b>	\$31,647,000		<b>Total Cost Programmed in TIP to Date:</b>	\$31,647,000	
<b>Description:</b>	Bridge project in Jefferson County on (056B00183N) I-65 at East Kentucky & South Brook Street (Potential CMGC delivery project)				
<b>Justification:</b>	Increase safety for all users. Maintain the existing transportation network in a state of good repair.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Design phase with BRO funds: \$2,301,600 (Federal) + \$575,400 (Other) = \$2,877,000 (Total)  FY 2023 Construction phase with BRO funds: \$23,016,000 (Federal) + \$5,574,000 (Other) = \$28,590,000 (Total)				

<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Kentucky Transportation Cabinet (KYTC)	<b>KIPDA ID:</b>	3197	<b>State ID:</b>	5-10075.00
<b>County</b>	Jefferson	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-264 Bridge at P&L Railway	<b>Funding Source:</b>	Federal Bridge Program (FBP)	<b>Open to Public Date:</b>	2025
<b>Total Estimated Project Cost:</b>	\$30,679,000		<b>Total Cost Programmed in TIP to Date:</b>	\$30,679,000	
<b>Description:</b>	Bridge project in Jefferson County on (056B00250N) I-264 at P&L Railway				
<b>Justification:</b>	Increase safety for all users. Maintain the existing transportation network in a state of good repair.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Design phase with BRO funds: \$2,231,200 (Federal) + \$557,800 (Other) = \$2,789,000 (Total)  FY 2023 Construction phase with FBP funds: \$22,312,000 (Federal) + \$5,578,000 (Other) = \$27,890,000 (Total)				
<b>TIP Action:</b>	Add project				
<b>MTP Action:</b>	None				
<b>Exempt/Non-Exempt:</b>	Exempt	<b>Model Impact:</b>	No change to model impact.		
<b>Project Sponsor:</b>	Kentucky Transportation Cabinet (KYTC)	<b>KIPDA ID:</b>	3198	<b>State ID:</b>	5-22098.00
<b>County</b>	Oldham	<b>Parent ID:</b>	N/A	<b>Group ID:</b>	N/A
<b>Project Name:</b>	I-71	<b>Funding Source:</b>	National Highway System Funds for Pavement Management (NHPM)	<b>Open to Public Date:</b>	2025
<b>Total Estimated Project Cost:</b>	\$18,700,000		<b>Total Cost Programmed in TIP to Date:</b>	\$18,700,000	
<b>Description:</b>	Address condition of I-71 from milepoint 14.49 to milepoint 22.3 (2022CCR)				
<b>Justification:</b>	Maintenance of the existing transportation network in a state of good repair.				
<b>FY 23-26 TIP Funding:</b>	FY 2023 Design phase with NHPM funds: \$1,360,000 (Federal) + \$340,000 (Other) = \$1,700,000 (Total)  FY 2023 Construction phase with NHPM funds: \$13,600,000 (Federal) + \$3,400,000 (Other) = \$17,000,000 (Total)				





# AMENDMENT 1 SCHEDULE

## Fiscal Year (FY) 2023- 2026 Transportation Improvement Program (TIP)

### WHY ARE THERE AMENDMENTS TO THE MTP & TIP?

New projects that are not regionally significant and qualify as Group Projects, as well as many minor changes to existing projects, can be added through an administrative modification. Administrative modifications can be processed within 30 days.

New projects and project changes that do not fit the criteria above must be added to the MTP and/or TIP through an amendment. There are many reasons why a project must be amended. Adding a regionally significant project that does not fit KIPDA's Group Projects policy or changing the scope of a roadway project to add a travel lane are both examples of projects that must be amended. While every effort is made to expedite amendments, the process can take up to 6 months.

### KEY STEPS & TIMING

KIPDA staff completes project review	*December 15, 2022
Interagency Consultation Group (IAC) Coordination	*December 16 - 22, 2022
Public comment period	April 26, 2023- May 10, 2023
Transportation Technical Coordinating Committee (TTCC) Recommendation	May 10, 2023
Comments sent to the Transportation Policy Committee (TPC)	May 11, 2023
TPC Action	May 25, 2023

### ADDITIONAL INFORMATION

\* The project changes in Amendment 1 were previously reviewed as Amendment 9 for the Fiscal Year 2020 - 2025 Transportation Improvement Program and Connecting Kentuckiana 2040 Metropolitan Transportation Plan.

These updates are already included in Connecting Kentuckiana 2050 Metropolitan Transportation Plan. No Air Quality analysis is required.

KIPDA ID 2899 was removed after additional IAC consideration on May 17, 2023



## **AIR QUALITY CONFORMITY**

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The Louisville, KY-IN transportation planning study area consists of Clark and Floyd counties and 0.1 square miles of Harrison County in Indiana, and Bullitt, Jefferson, and Oldham counties and approximately 4 square miles of Shelby County in Kentucky. Much of this area coincides with the local ozone nonattainment area. In the past, a portion of the planning study area also coincided with a local PM 2.5 nonattainment area, but that standard was revoked in April 2015. The Louisville, KY-IN maintenance area for the 1997 8-hour ozone standard consisted of Clark and Floyd counties, IN, and Bullitt, Jefferson, and Oldham counties, KY. It was designated as a basic nonattainment area in June 2004 and redesignated as an attainment area with a maintenance status in July 2007. The 1997 8-hour ozone standard was revoked for the local area in April 2015, and at that time, it was not necessary for the local area to determine conformity. (However, the local area was still eligible to receive Congestion Mitigation/Air Quality funding).

In June 2018, the former Louisville, KY-IN 1997 ozone maintenance area was designated as a marginal nonattainment area for the 2015 8-hour ozone standard. Since that time, the monitoring data has indicated that the design value is sufficiently low that the local area can be redesignated as attainment of the 2015 8-hour ozone standard, and the air quality agencies with responsibility for the local area have undertaken steps to do so. The redesignation State Implementation Plan has been submitted to Regions 4 and 5 of US EPA, and the Motor Vehicle Emission Budgets (MVEBs) have been found adequate by Region 5. They are still under review by Region 4.

KIPDA is amending *Connecting Kentuckiana 2040*, the metropolitan transportation plan (MTP) and the FY 2021 – FY 2025 Transportation Improvement Program (TIP). This conformity analysis will support conformity determinations by the metropolitan planning organization and the U. S. Department of Transportation agencies for both documents. This analysis is intended to support determinations of conformity under the 2015 8-hour ozone standards.

### **CONFORMITY UNDER THE 2015 8-HOUR OZONE STANDARD**

When an area such as the Louisville area becomes nonattainment, the area must undertake a process known as conformity. This process provides a linkage between transportation planning and air quality planning. One of the key activities of conformity is to quantify the level of emissions of the air pollutant(s) and/or precursor(s) for certain analysis years and compare those levels to the motor vehicle emission budgets (MVEBs)—if they exist. The MVEBs limit the amount of a pollutant or precursor that can be emitted. If MVEBs do not exist, the area must rely on interim

tests, such as comparing the emissions to the level of emissions in a base year, to determine conformity. The baseyear would be set by US EPA when the standard is promulgated.

When the local area was designated as nonattainment of the 2015 8-hour ozone standard, the air quality agencies with responsibility for the local area were charged with the additional responsibility to develop a set of actions that could be taken to reduce pollutant/precursor emissions. These actions were to be included in air quality plans known as State Implementation Plans (SIPs). Since the Louisville nonattainment area is a bi-state area, these sets of the actions to reduce precursor emissions were to be incorporated into the Indiana and Kentucky SIPs. It was during this process that MVEBs were established. Subsequent to the local area being designated as a nonattainment area but before the SIPs were completed, the data from the air quality monitors in the area indicated that the 2015 8-hour ozone standard had been met. With this data in hand, the air quality agencies were able to submit a SIP known as a redesignation request. The establishment of the MVEBs was one of the components of the redesignation request. Since the SIPs were redesignation requests for ozone, the MVEBs were established for the precursors of ozone -- volatile organic compounds and oxides of Nitrogen.

#### CONSULTATION FOR *CONNECTING KENTUCKIANA 2040*

The first step in determining conformity of *Connecting Kentuckiana 2040* was to consult with the interagency consultation (IAC) group concerning matters not explicitly determined by the conformity rule. Conformity under the 2015 8-hour ozone standard had not been previously determined. Nevertheless, many of the issues normally arising in conformity had undergone consultation previously when the local area was a nonattainment or maintenance area under the 1997 8-hour ozone standard. This was of importance because the portion of the analysis involving the use of the travel demand model had been done in 2021. The results of this analysis did not have to be updated because no changes to the travel model were needed to reflect any changes due to the projects in this amendment. Therefore, the results of the travel model analysis from 2021 could be used without their being changed.

Consultation for this amendment took two forms. At first, there was a discussion conducted using e-mails in which each e-mail was sent to all of the other members of the IAC. The items sent to the IAC in the original e-mail included the following:

- (a) important dates in the schedule for the amendment;
  - December 9 -- Project applications due from sponsors
  - December 22 -- IAC consultation concludes
  - December 23 -- Public Review begins
  - January 9 -- Public Comments sent to Transportation Policy

- Committee
- January 11 -- Action by the Transportation Technical Coordinating Committee
  - January 26 -- Action by the Transportation Policy Committee
  - January 27 -- Documentation sent to review agencies for the federal conformity determination.

- (b) a draft list of projects—sent to the IAC with consultation notice—included in accompanying documentation.

The second portion of the consultation was a video conference held on December 20 to discuss issues relative to amendment 9 of the MTP and the conformity analysis for a future MTP update. The discussion specifically involving amendment 9 focused on the following issue:

- (c) the type of analysis to be used in determining conformity — Since none of the projects in the amendment required that a new analysis using the travel demand model, the possibility of determining conformity based on the previous regional emissions analysis was suggested. However, because there were new SIP budgets now available, it was concluded that a new regional emissions analysis would be necessary. Because the project changes in Amendment 9 could not be reflected in the travel demand model, the new analysis would use the travel data (vehicle-miles-traveled and speeds) from an analysis conducted in 2021 and a newer version of the MOVES emissions model. The emissions resulting from this analysis would be compared to the new SIP budgets to determine conformity or not.

Other Issues affecting Amendment 9

- (1) the proposed conformity test methodology/ies and analysis years—the set of analysis years and tests to be used are shown in table below.

<b>2015 8-hour Ozone Standard</b>	
<b>Analysis Year</b>	<b>Conformity Test(s)</b>
2025	Less than the 2019 SIP Base Year Emissions
2030	Less than the 2019 SIP Base Year Emissions
2035	Budget test using the 2035 MVEBs for the 2015 8-hour standard
2040	Budget test using the 2035 MVEBs for the 2015 8-hour standard

- (2) the pollutant(s)/precursor(s) of concern and the motor vehicle emissions budget(s), if applicable—see table 2 at the end of the report.

- (3) information concerning the inputs for the travel demand model and the approved emissions model—the main issue involving these models was that the version of MOVES now being used was MOVES 3.0.4 which should not provide significantly different values than MOVES 3.0.3, which was used in developing the SIP budgets; and
- (4) a listing of any transportation control measures (TCMs) in SIPs, if applicable—there are none.

## ESTABLISHED PRACTICE

In addition to the issues discussed during consultation, there were several issues which were not explicitly discussed or received little discussion during the consultation zoom meeting of March 4, but which had impacts on the analysis. Many of these issues had been discussed during previous consultations. These issues were handled in a manner consistent with the previous established practice. The more prominent issues are discussed below.

### Relationship of MTP and TIP for Conformity Purposes

The Transportation Improvement Program (TIP) is maintained as a subset of the Metropolitan Transportation Plan (MTP). Therefore, the conformity determination for the MTP will serve as the conformity determination for the TIP.

**Conclusion: The IAC members are informed of this from time to time in order to clarify the conformity determination for the MTP also serves as the conformity determination for the TIP.**

### Issues related to the KIPDA travel demand forecasting model

During recent changes to the MTP, there was a change of note to the KIPDA travel demand forecasting model.

During 2017 and 2018, KIPDA staff have updated and calibrated the travel demand forecasting model. This activity involved updating the inputs to the model and developing new values for the parameters of the model. The resulting model was considered calibrated when the model outputs matched observed data (e.g., HPMS VMT), within reason, for the baseyear. This update established 2015 as the baseyear (the year on which calibration was based) for the model.

**Conclusion: The IAC members have been informed that the KIPDA travel demand forecasting model has been updated and calibrated and that 2015 is now the baseyear for the model.**

### Vehicle Registration (Fleet Mix) Data

At various times in the past, new vehicle registration data has been provided for use in developing pollutant emissions. This vehicle registration data has been reviewed and accepted by the IAC. The data being used for the Indiana counties has been updated to 2017, and the data being used for the Kentucky counties is for 2018. These data represent the most recent information available for this issue.

**Conclusion: Based on a consensus of the IAC members, vehicle registration data for 2017 for the Indiana counties and for 2018 for the Kentucky counties is now being used in developing emission estimates.**

### CONFORMITY OF *CONNECTING KENTUCKIANA 2040*

The MTP, *Connecting Kentuckiana 2040*, was examined to determine if it met the requirements of the conformity rule under the 2015 8-hour ozone standards. In general, the process leading to a conformity determination has two major components:

- (1) a regional emissions (air quality) analysis to determine that air pollutant emissions do not exceed the budgets set in the SIPs, if applicable, or the emission levels for a given base year; and
- (2) a monitoring of the progress in implementation of the Transportation Control Measures (TCMs) contained in the SIPs.

In the past, consultation with the state and local air quality agencies and EPA had determined that there are no approved TCMs in the SIPs of Indiana and Kentucky. Therefore, it is possible to show conformity of *Connecting Kentuckiana 2040* simply by determining that the air pollutant emissions do not exceed the budgets in the SIPs or the base year emissions.

### ANALYSIS PROCESS

The process of calculating the regional emissions for *Connecting Kentuckiana 2040* involved three main procedures. The first procedure was a review of the projects to determine which projects needed to be included in the regional emissions analysis. The second procedure was to perform the calculations necessary to quantify the certain measures of travel behavior. The third procedure was to calculate the pollutant / precursor emissions. These activities are discussed below in greater detail.

## *Project Review*

The first procedure was to review the projects to determine which projects were exempt or non-exempt and which projects were “regionally significant.” The combination of these two considerations was the basis for determining which projects were recommended for inclusion in the regional emissions analysis. During the amendment of *Connecting Kentuckiana 2040*, a group of projects had been proposed for the plan. These projects were reviewed by KIPDA staff, who prepared a list of the projects with information about the projects and a staff recommendation concerning the project’s status relative to being exempt, non-exempt, etc. There is usually a straightforward explanation for why projects are included in or excluded from the analysis and why they are analyzed as they are. Most of the projects which were excluded were exempt projects as defined in the Code of Federal Regulations in 40 CFR 93.126 and 40 CFR 93.127.

During consultation, this list was reviewed and accepted by the IAC as described under the section entitled “CONSULTATION FOR *CONNECTING KENTUCKIANA 2040*.” (Please see above.) Those projects in *Connecting Kentuckiana 2040* which were not changed were analyzed as they had been previously. The projects which were newly added to the MTP or had been changed in *Connecting Kentuckiana 2040* were analyzed as indicated on the list provided to IAC. For amendment 9, all the projects were exempt except one. The non-exempt project was already in the MTP, and the only change to it was monetary meaning it did not change the results of the travel model analysis. Therefore, in the sections below which reference the calculation of travel-related information, the data provided relates to the analysis performed in 2021.

In the past, there were several projects which could not be analyzed using the travel model. In the past, most of these projects had been evaluated using spreadsheet methods factors. Since the MOVES emissions model was being used in the inventory mode, emission factors were not available for this analysis. However, experience had shown that the emission impacts for these projects were always small and positive (i.e., emission reducing). Therefore, it is reasonable to predict that the emission impacts of these projects—if they could be quantified—would decrease the emissions shown in the tables at the end of this document.

Also, there was one project affecting Bullitt County that could not be included in the travel model. Unlike the projects described in the paragraph above, this project could have the potential to increase emissions. Therefore, a special effort was made to include its impacts in the analysis of travel behavior impacts and, consequently, in the regional emissions analysis. This project is the relocated (southern) section of US 31E. This project, which had been discussed during consultation in the past, involves the relocation of a small (approximately 0.2 mile) section of US 31E from Nelson

County (outside of the nonattainment area) to Bullitt County (inside the ozone nonattainment area) during the reconstruction of that road. Estimates of the VMT for this project were developed using a spreadsheet approach. The VMT estimates were the product of the estimated traffic volumes for each of the analysis years and the length of the relocated section in Bullitt County. The VMT estimates for this project were then added to other Bullitt County VMT estimates of the same functional class. Consequently, the VMT estimates from this project were included with the other Bullitt County VMT, and the emissions in Bullitt County associated with this project were included in the overall emission estimates for Bullitt County.

### *Calculation of Travel-Related Information*

The analysis of the travel behavior impacts for the nonattainment area primarily involved using the KIPDA travel demand forecasting model to determine measures of travel such as vehicle-miles-traveled (VMT) and speed. The method for determining these measures was to input the appropriate roadway and transit information into the model and to run the model using the appropriate socioeconomic information for a given analysis year. This analysis is explained below in further detail in the sections concerning the KIPDA travel demand forecasting model and adjustment factors for travel model output.

### KIPDA Travel Demand Forecasting Model

The KIPDA travel demand forecasting model is a mathematical model which relates travel to the transportation system and basic socioeconomic information. The domain of the model is a study area which includes the Louisville (KY-IN) Metropolitan Planning Area. The Louisville (KY-IN) Metropolitan Planning Area consists of Clark and Floyd counties, and 0.1 square miles in Harrison County in Indiana, and Bullitt, Jefferson, and Oldham counties and approximately 4 square miles in Shelby County in Kentucky. This area is divided into 984 smaller units called traffic analysis zones.

As previously mentioned, the KIPDA regional travel demand forecasting model was updated and calibrated recently. This update established 2015 as the new base year for the model. The model update utilized the information incorporated into the travel model during previous updates. In particular, information from the 2000 KIPDA Household Travel Survey had been previously incorporated. Information from 2010 Census, the 2012-2016 American Community Survey, the 1990 and 1995 National Personal Transportation Surveys, and the 2001 and 2009 National Household Travel Surveys was incorporated to update the previous source data, particularly the 2000 KIPDA Household Travel Survey. During the update, the model parameters were adjusted such that the model output matched—within reason—three main calibration criteria based on measured data. These criteria were: (1) the total daily VMT for all highway facilities except local roads for the region; (2) the distribution of trip lengths



(duration in time) for each of the main trip purposes used in the model; and (3) highway traffic volumes crossing the Ohio River screenline. The result of the update was a travel model which generally replicated travel in the Louisville area for 2015. The updated travel model was used in the regional emissions analysis.

The KIPDA travel demand forecasting model uses the standard four steps of modeling: trip generation, trip distribution, mode choice, and trip assignment. In addition, it considers travel by vehicles entering, leaving, and crossing the study area. These types of trips are known as external-internal, internal-external, and external-external, respectively. The internal ends of these trips are determined by the methods described below for internal-internal travel. The external ends are determined from the volume of traffic crossing the study area boundary at any of the 46 external stations.

Trip generation is the process of determining the number of unlinked trip ends--called productions and attractions--and their spatial distribution based on socioeconomic variables such as households and employment. Trip rates used to define these relationships were derived from the travel data collection efforts described above. This information was supplemented by use of the *National Cooperative Highway Research Program Report #365* and the Institute of Transportation Engineers' *Trip Generation Report*. The KIPDA travel demand model uses three internal-internal trip purposes and utilizes different trip rates for each. Internal-internal trips are those which have both ends inside the modeling domain. The three purposes are home-based work, home-based other, and non-home based.

Trip distribution is the process of linking the trip ends thereby creating trips which traverse the area. The KIPDA travel model uses a gravity model to link all trips except the external-external ones. The gravity model is based on the principle that productions are linked to attractions as a direct function of the number of attractions of a zone and as an inverse function of the travel time between zones. This inverse function of travel time is used to generate parameters called friction factors which, in turn, direct the gravity model. The friction factors used in the gravity model were developed as part of the calibration effort performed during the model update. In addition, information from a study which investigated the behavior of travelers crossing the Ohio River and traffic count information from years near 2015 were utilized to develop additional parameters called K-factors. The K-factors are used by the model to ensure that it is predicting the correct volume of traffic crossing the Ohio River.

Mode choice is the process used to separate the trips which use transit from those which use automobiles. It is also used to separate the auto drive-alone trips from auto shared-ride trips. In some previous KIPDA travel demand models, mode choice was based primarily on information provided by the *TARC Travel Forecasting Study* from some time ago. In that model, the user's benefit or utility was calculated for

each mode based on zonal socioeconomic characteristics and the cost and time of the trip using the various modes. A nested logit model was used to determine the probability of the trip being made by each of the modes. This probability was then multiplied by the number of trips between zones to determine the number of trips by each mode.

As previously stated, the conformity analysis for *Connecting Kentuckiana 2040* utilizes transit information from the previous travel demand model. The results of the 2004 TARC on-board survey had been used to factor the data in the previous transit files. This was deemed acceptable for several reasons. The primary reason was that the transit network envisioned by *Connecting Kentuckiana 2040* is essentially the same as the existing one. In addition, the number of total trips from the two models was similar. Therefore, the use of the factored transit trip information from previous travel models did not significantly change the proportion of trips allocated to transit. Finally, the proportion of trips utilizing transit is less than 2% of the total trips. So small differences in the number of transit trips should provide a negligible effect on overall travel.

Trip assignment is the process used to determine which links of the network a trip will use. There are several assignment schemes which may be used. Two of the more common schemes are All-or-Nothing (AON)--in which all trips between two zones follow the shortest time path--and Stochastic--in which trips between two zones may be assigned to several paths based on their impedances or travel times. It is not uncommon for travel models to use several assignment schemes in sequence to converge to a better assignment. A sequence commonly used involves using several AONs with the traffic volumes reported at the end of each scheme being a weighted average of the volumes from the most recent scheme and the volumes from the previous schemes. A capacity restraint provision is used to adjust travel times between assignment schemes. This sequence is called an equilibrium assignment. The KIPDA travel model uses an equilibrium assignment which converges when the change in system-wide travel time over successive iterations is estimated to be within 0.0001 or less.

Tolls are being used as a means of providing for a portion of the cost of the Louisville Southern Indiana Ohio River Bridges project. To reflect the effect of the tolls in the KIPDA travel model, time penalties have been used in the model on the bridges where tolls are being collected. As mentioned above, the toll structure was recently changed. To reflect this in the MTP update, the time penalties used in the KIPDA travel model were likewise changed to reflect the effect of the new toll structure.

The output from the KIPDA travel model is in the form of a series of links with each link having certain associated data such as number of lanes, capacity, facility type, area type, functional class, and volume. This data allows for the calculation of other link information such as vehicle-miles-traveled (VMT). The VMT can be

calculated as the product of the volume of traffic using a link times the distance (length) of the link.

#### Adjustment Factors for Travel Model Output

The VMT and speeds from the travel demand model were adjusted before being used in the calculation of regional emissions. The purpose of these adjustments was to reconcile the model output with travel estimates from other sources, such as the Highway Performance Monitoring System (HPMS) estimates of VMT. To perform this adjustment, factors were developed for the baseyear of the model using HPMS or other estimates and applied to model output for other years.

The development of the VMT adjustment factors involved comparing the VMT outputs of the travel demand model to the HPMS VMT estimates for 2015. Factors were developed to adjust the model output to account for variation between the model and HPMS within each of the counties. To do this, the VMT from the 2015 model run was tabulated by county and functional classification. The VMT estimates derived from the model were then compared to the HPMS VMT estimates for 2015 to develop adjustment factors to be applied to the model output for subsequent years. The 8-hour ozone analysis is based on a level of traffic and the accompanying emissions expected on a typical summer weekday. For that analysis, the adjustment factors were increased by 2.9% to reflect the higher volume of traffic that can be expected on a typical summer weekday relative to the annual average daily traffic. The adjustment factors for VMT were developed on a functional classification basis for each county.

The development of the speed adjustment factors involved a similar process. The outputs of the travel demand model were compared to estimates of speed based on the equations of the Highway Economic Reporting System (HERS).

The HERS equations were used to estimate speeds on 6239 sections for five functional classifications of urban roadways and 2278 sections for five functional classifications of rural roadways. The speeds from these roadway sections were used to determine the average speed for each of five rural and urban functional classes. The speeds used in the travel model were also averaged for each of the five rural and urban functional classes for which HERS estimates had been developed. The speed adjustment factor for each of these functional classes was calculated as the ratio of the average speed using the HERS equations to the average speed using the travel model data.

There were not many HPMS minor collector and local roadway sections with data that allowed for the calculation of adjustment factors. Since the model contained the minor collector roadways in the area and these roadways were similar to the major collector roadways in the area, the adjustment factor for the rural major collectors

was used for the rural minor collector roadways, and the adjustment factor for the urban major collectors was used for the urban minor collector roadways.

The procedures described above produced speed adjustment factors for all functional classes except rural and urban local roads and ramps. (Ramps are not officially a separate functional class, but the speed behavior of traffic on ramps is not expected to be like that of any other functional class. Therefore, the ramps were treated as a separate "functional class". There was not sufficient data to estimate speeds for the roadways of these classes. For rural and urban local roads and ramps, the speeds in the travel model were used without adjustment (i.e., the speed adjustment factor for rural and urban local roads and for ramps = 1).

### *Calculation of Pollutant/Precursor Emissions*

The calculation of the pollutant/precursor emissions for the nonattainment area involved using the adjusted output data from the KIPDA travel demand forecasting model as input to the MOVES model. KIPDA staff provided adjusted travel model output data in the form of vehicle-miles-traveled (VMT), VMT by speed bin, and VMT fractions by speed bin by county and by MOBILE 6 facility type to the staff of the Louisville Metro Air Pollution Control District (LMAPCD). LMAPCD staff utilized this data along with other necessary inputs to run the MOVES model and develop emission estimates for volatile organic compounds (VOCs) and oxides of Nitrogen (NO<sub>x</sub>). They then provided these estimates to KIPDA staff. This analysis is explained below in further detail in the section below.

### MOVES Emissions Model

As previously mentioned, the Louisville region is a nonattainment area for the pollutant ozone and must therefore control the precursors of ozone, VOCs, and NO<sub>x</sub>. The emission estimates for VOCs and NO<sub>x</sub> were determined using the MOVES 3.0.3 and 3.0.4 emissions models. The staff of the Louisville Metro Air Pollution Control District (LMAPCD) produced the emissions for all of the counties in the nonattainment area. The methodology used in calculating these emission estimates is discussed below.

There are a number of factors affecting the emission estimates developed from the MOVES model. In the past, these factors included the presence of inspection/maintenance (I/M) programs in some of the counties. During that time period, the VMT generated in Clark, Floyd, and Jefferson (KY) counties came from some vehicles subject to an I/M program and from some vehicles not subject to an I/M program. The I/M program in Clark and Floyd counties was discontinued at the end of 2006. The I/M program in Jefferson County (KY) was discontinued in 2003. Therefore, these programs are no longer a factor in estimating emissions.

One of the other factors is the fuel used by the vehicles in the various counties. The fuels which are used in Clark, Floyd, and Jefferson counties include reduced Reid vapor pressure gasoline (RVP) and reformulated gasoline (RFG). While RFG is used in some portions of Bullitt and Oldham counties, unregulated gasoline is used in the other portions of those counties as well as the areas adjacent to the nonattainment area. Vehicles from these other areas can be expected to travel in the Clark, Floyd, and Jefferson (KY) counties also. In the past, the emission factors (from the MOBILE 6 model) for Clark, Floyd, and Jefferson (KY) counties used in the air quality analysis varied by county because they represent a VMT-weighted composite based on an estimate of travel in each county by vehicles from the various portions of the region. For this analysis, the MOVES model was used in what is known as the inventory mode. Using the inventory mode, it is possible to define the fuel characteristics and the presence of an I/M program for each county, but it is not possible to represent the effect of travel in a county by vehicles from other counties. Therefore, the use of composite emission factors was not possible. Other than that, the assumptions used in the analysis were consistent with those of the appropriate air quality agency for each of the counties. For Clark and Floyd counties, the assumptions of the Indiana Department of Environmental Management (IDEM) were used. Some assumptions of LMAPCD were also used for Clark and Floyd counties. For Jefferson County (KY), the assumptions of the LMAPCD were used. These assumptions had been previously reviewed and accepted by the IAC partners.

The assumptions used in developing the emissions for Clark, Floyd, and Jefferson (KY) counties were the same as those that were used in developing the ozone budget update (for VOCs and NO<sub>x</sub>) in 2003 with a few exceptions where newer data was incorporated. The changes which affected the VOC and NO<sub>x</sub> emissions included:

- (1) improved consistency and completeness of gasoline data provided with the new MOVES model,
- (2) the incorporation of newer vehicle registration data (for 2017) for Clark and Floyd counties (provided by INDOT),
- (3) the development and use of newer vehicle registration data (for 2018) for Jefferson County (KY), and
- (4) improvements in internal model calculations to account for emission controls, driving profiles and engine characteristics.

The emissions for Bullitt and Oldham counties were also developed by LMAPCD. Most of the inputs to the MOVES model were defaults and/or data used that was consistent with previous SIPs. As mentioned above, RFG is used in some portions (the "original" portions) of Bullitt and Oldham counties, and unregulated gasoline is used in the other portions (the "new" portions) of those counties as well as the areas adjacent to the nonattainment area. The "original" portions and "new" portions refer to whether a portion of these counties had originally designated as a nonattainment/maintenance status for the 1-hour ozone standard or had only been designated under the 8-hour ozone standard. Neither portion of either county had an I/M program. So

it was not necessary to have I/M input information for MOVES. However, it was possible that the gasoline formulation in the different portions of these counties could be different.

It was determined—based on data provided by US EPA for the MOVES model—that the gasoline formulation for Bullitt and Oldham counties is essentially the same as that for Jefferson County with respect to the use of RFG. Since the use of the MOVES model in the inventory mode does not allow for the characteristics of different blends of gasoline within the same county, the gasoline formulations of Bullitt and Oldham counties was modeled the same as for Jefferson County.

The assumptions used for Bullitt and Oldham counties were consistent with those for the 2003 ozone budget update with the following exceptions:

- (1) improved consistency and completeness of gasoline data provided with the new MOVES model,
- (2) the characterization of gasolines described in the previous paragraph
- (3) new 2018 vehicle registration data for Bullitt and Oldham counties, and
- (4) improvements in internal model calculations to account for emission controls, driving profiles and engine characteristics.

LMAPCD developed emission estimates of VOCs and NO<sub>x</sub> using the MOVES model. To review, the following steps were undertaken.

- (1) LMAPCD staff received (from KIPDA staff) the adjusted travel model output in the form of VMT, VMT by speed bin, and VMT fractions by speed bin, all by county and by MOBILE facility type by analysis year.
- (2) LMAPCD reformatted the data from KIPDA to prepare it as input to the MOVES model. Other necessary data was also prepared.
- (3) The MOVES model was run in inventory mode to determine emission estimates of each precursor for each county for each analysis year.
- (4) LMAPCD staff provided the emission estimates to KIPDA staff.

## RESULTS OF THE ANALYSIS

The transportation plan, *Connecting Kentuckiana 2040*, has been examined to determine if it is in conformity with the SIPs of Indiana and Kentucky and fulfills the criteria in the federal conformity rule (found in 40 CFR 93). The examination has been based on an air quality analysis to determine that air pollutant emissions of the appropriate areas did not exceed the VOC and NO<sub>x</sub> motor vehicle emission budgets.

As previously mentioned, the other criterion for determining conformity would have been the progress in implementation of the Transportation Control Measures (TCMs) contained in the SIPs. However, since previous consultation had determined that there were no approved TCMs, that criterion did not affect the determination of conformity. The results of the regional emissions analyses for ozone precursors are discussed below.

### 8-hour Ozone Analysis

The eight-hour ozone redesignation SIPs of Indiana and Kentucky contain emission budgets for the precursors of ozone, volatile organic compounds (VOCs) and oxides of Nitrogen (NO<sub>x</sub>). The regional emissions analysis was conducted to provide estimates of the levels of emissions of VOCs and NO<sub>x</sub> for the various analysis years. These emission levels were then compared to the budgets in the SIPs to determine if the conformity tests were passed.

The results of the regional emissions analysis are summarized in Tables 1 and 2. Table 1 shows the summer weekday vehicle-miles-traveled from the analysis. Table 2 shows that for 2025 and 2030, the summer weekday VOC and NO<sub>x</sub> emission levels for the 2015 8-hour nonattainment area are less than the 2019 base year emissions in the 2015 8-hour ozone redesignation SIP. Table 2 also shows that for 2035 and 2040, the summer weekday VOC and NO<sub>x</sub> emission levels for the 2015 8-hour nonattainment area are less than the emission budgets established in the 2015 8-hour ozone redesignation SIP.

### Conclusions – 8-hour Ozone

The regional emissions analysis of *Connecting Kentuckiana 2040* indicates that the Metropolitan Transportation Plan is consistent with the goals and emission budgets established in the State Implementation Plans of Indiana and Kentucky. The cumulative effect of the results shown in Table 2 indicates that *Connecting Kentuckiana 2040* has met the requirements of conformity under the 2015 8-hour ozone standards. In summary, it can be concluded that *Connecting Kentuckiana 2040* conforms to the SIPs and meets the requirements of the federal conformity rule.

**TABLE 1**

<b>SUMMER WEEKDAY VEHICLE-MILES-TRAVELED (VMT) ESTIMATED FOR THE 8-HOUR OZONE NONATTAINMENT AREA</b> (in 1000's of vmt/day)			
<b>YEAR</b>	<b>INDIANA</b>	<b>KENTUCKY</b>	<b>TOTAL</b>
<b>2025</b>	<b>7894</b>	<b>27297</b>	<b>35191</b>
<b>2030</b>	<b>8425</b>	<b>28719</b>	<b>37144</b>
<b>2035</b>	<b>8953</b>	<b>30053</b>	<b>39006</b>
<b>2040</b>	<b>9440</b>	<b>31183</b>	<b>40623</b>

**TABLE 2**

<b>SUMMER WEEKDAY EMISSIONS FOR THE 8-HOUR NONATTAINMENT AREA (kg/day)</b>				
<b>EMISSION LEVELS FOR VARIOUS YEARS</b>				
<b>YEAR</b>	<b>Area</b>	<b>VOCs</b>	<b>NOx</b>	<b>PASS</b>
<b>2025</b>	<b>Regional</b>	<b>7110</b>	<b>18828</b>	<b>YES</b>
<b>2030</b>		<b>5034</b>	<b>14658</b>	<b>YES</b>
<b>2035</b>		<b>4416</b>	<b>13669</b>	<b>YES</b>
<b>2040</b>		<b>4239</b>	<b>13904</b>	<b>YES</b>

NOTE: The criteria for conformity are as follows:

2025 and 2030 Regional emission levels for VOCs must be below the redesignation SIP base year emissions of 13.65 tons/day or 12,383 kg/day.

2025 and 2030 Regional emission levels for NOx must be below the redesignation SIP base year emissions of 33.03 tons/day or 29,964 kg/day.

2035 and 2040 Regional emission levels for VOCs must be below the redesignation SIP emission budget of 5.51 tons/day or 4,999 kg/day.

2035 and 2040 Regional emission levels for NOx must be below the redesignation SIP emission budget of 17.18 tons/day or 15,585 kg/day.





***Connecting Kentuckiana 2040* Metropolitan Transportation Plan and  
FY 2020-2025 Transportation Improvement Program Amendment 9  
Interagency Consultation Group Conference Call Meeting Minutes  
December 20, 2022  
11:00 AM EST**

**Participants:**

EPA – Sarah LaRocca & Anthony Maietta

FHWA – Erica Tait

FTA – Aviance Webb

INDOT – Jay Mitchell

KYDAQ – Lauren Hedge, Anna Bowman, & Kevin Davis

LMAPCD – Michelle King, Byron Gary, & Craig Butler

TARC – Burcum Keeton

KIPDA – Andy Rush, Alex Posorske, Chris Nicolas, Jeremeih Shaw, Randy Simon, & Spencer Williams

**Welcome/Roll Call:**

A total of 18 participants, representing eight local, state, regional, and federal agencies participated in the IAC video conference for KIPDA's *Connecting Kentuckiana 2050* Metropolitan Transportation Plan Update and Amendment 9 of KIPDA's *Connecting Kentuckiana 2040* Metropolitan Transportation Plan and the FY 2020-2025 Transportation Improvement Program. The meeting began shortly after 11:00 AM EST on December 20, 2022.

**Note: It should be noted that the video conference was for both the 2050 MTP update and Amendment 9 of the 2040 MTP and the FY 2020-2025 TIP. Only those points specifically applicable for Amendment 9 are included in these minutes.**