METHODOLOGY FOR DETERMINING IF CREATE PASSENGER RAIL PROJECTS ARE "PROJECTS OF AIR QUALITY CONCERN" IN $PM_{2.5}$ AND PM_{10} NONATTAINMENT AND MAINTENANCE AREAS"

The March 10, 2006 Particulate Matter Hot-Spot Analysis rule (71 FR 12491), provided examples of what would be considered "projects of air quality concern" in Particulate Matter ($PM_{2.5}$ and PM_{10}) Nonattainment and Maintenance Areas. One example of a highway project showed an increase of 10,000 trucks per day. While this increase in diesel trucks was not described as a threshold, it could be used as the foundation of determining if a project is one of air quality concern. The 10,000 diesel trucks per day data point could be utilized for establishing a train volume data point to assist in determining if a CREATE Passenger Rail Project (which is subject to Transportation Conformity) is a "project of air quality concern." FHWA and IDOT are proposing the following process be used to help make this determination:

TRUCK/TRAIN ANALYSIS

1. Determine if the project is located within the $PM_{2.5}$ Nonattainment Area only or if it is also located in the Lyons Township or the Lake Calumet PM_{10} Maintenance Areas.
2. IEPA will provide total PM emissions (grams/mile) for 10,000 trucks for 2010, 2015 and 2025 design years based on $PM_{2.5}$ and PM_{10} average emission factors for the two worse-case Heavy Duty Diesel Vehicle classes (HDDV 8a and HDDV 8b) obtained from the MOBILE 6.2 model used with the specific NE Illinois inputs.
3. Using #2 above, multiply total emissions for 10,000 trucks (grams/mile) by 1 mi to calculate the total emissions for 10,000 trucks in grams/day. (Note: this is a constant for a given design year.)
4. Obtain the PM emission factor for the fleet average (all locomotives) in grams/gallon (for the design year). Source: USEPA Publication *Emission Factors for Locomotive,* EPA420-F-97-051, December 1997, unless more recently developed information is available.
5. Determine the number of passenger rail locomotives associated with the design year no-build case and with the proposed design year build case. Subtract the no-build number from the build number to obtain the increase in passenger rail locomotive traffic associated with the project. (Note: this will vary from one project to another.)
6. Obtain fuel consumption rate of the passenger rail locomotives (miles/gallon). (Note: this will be provided by the RRs and is a constant.)
7. Using #3, #4, and #5 above, multiply delta number of trains (TRN/day) by inverted train fuel consumption rate (gallons/mile), the train emission factor (grams/gallon) and 1 mile to calculate the total emissions of the increase in train traffic (grams/day). (Note: this will vary from one project to another.)
8. Compare total emissions of the increase in train traffic, #6 above, to total emissions of 10,000 trucks calculated in #2 above. If emissions from the increase in train traffic closely approaches or exceeds that of 10,000 trucks, it is an indication that the project is of air quality concern.

Since the total truck emissions for 10,000 trucks is a constant, and since the train fuel consumption rate and emission factor will be constants, we can multiply the total truck emissions for 10,000 trucks by the train fuel consumption rate and then divide by the

train emissions factor to determine how many trains would be needed to be equivalent to 10,000 trucks. Once we have calculated this number, we would then compare the increase in train traffic number to this number. If the implementation of a CREATE passenger rail project approaches or exceeds this number, it is an indication the project is of air quality concern.

Since passenger rail projects are transit projects, it was determined that the CREATE passenger rail projects should also be looked at as transit type projects when applying the PM Hot-Spot rules. Because FTA is more familiar with transit type projects, FHWA sought and utilized their advice when developing this process of applying the PM Hot-Spot rules and determining if CREATE passenger rail projects should be considered "projects of air quality concern."

In § 93.123(b)(1) of the PM Hot-Spot regulations, transit projects that are considered "projects of air quality concern" are described as:

> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location
>
> (iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location

In addition, the March 10, 2006 PM Hot-Spot rules provide transit type examples of "projects of air quality concern" such as "An existing bus or intermodal terminal that has a **large vehicle fleet** where the number of diesel buses increases by 50% or more, as measured by bus arrivals." The final rule also give the example of what ***would not*** be considered a project of air quality concern as: "A 50% increase in daily arrivals at a **small terminal (e.g., a facility with 10 buses in the peak hour)."**

No "new" bus or rail terminals and transfer points are currently proposed under the CREATE program. As such, this analysis will focus on "expanded" bus and rail terminals and transfer points. Also, while the CREATE program does not involve any projects which will physically "expand" any existing bus or rail terminals and transfer points, it is possible that a CREATE project may cause an increased use of a facility, that is, implementation of a CREATE project may cause an existing rail terminal(s) to service additional passenger rail lines which they currently do not service. Although the PM Hot-Spot rules do not specifically mention this situation, based on advice from FTA, this does not preclude us from investigating the effects of this increase in train arrivals on the facility. FTA has indicated that, for transit projects in general, these types of projects would rarely increase use of a facility to a level that would approach or exceed the 50% increase indicated by the PM Hot-Spot rules. With this in mind, the following analysis was developed to assist in determining if a CREATE passenger rail project is one of air quality concern:

TRAIN ARRIVAL ANALYSIS

1) Determine if each terminal (station) along the involved line has a "**large vehicle fleet"** or is a **"small terminal (e.g., a facility with 10 buses in the peak hour)."** If

it is determined that all terminals (stations) along the involved line are small terminals, the project is not one of air quality concern. This determination will be included in the NEPA document for the project. If it is determined that one or more terminals (stations) along the involved line has a large vehicle fleet, proceed to #2.

2) Calculate the percent increase in daily passenger train arrivals at each terminal (station) that has a large vehicle fleet (percent difference between design year train arrivals and existing train arrivals at the facility). If this closely approaches or exceeds 50% for any terminal evaluated, it is an indication that the project is one of air quality concern.

The above analyses would be completed for each CREATE Passenger Rail Project to determine if it is a "project of air quality concern."

Documentation:

If it is determined that the CREATE Passenger Rail Project is not a "project of air quality concern", the following will be included in the NEPA document:

"This project does not meet the definition of a project of air quality concern as defined in 40 CFR 93.123(b)(1). Due to {state reason(s)}, it has been determined that the project will not cause or contribute to any new localized $PM_{2.5}$ or PM_{10} violations or increase the frequency or severity of any $PM_{2.5}$ or PM_{10} violations. EPA has determined that such projects meet the Clean Air Act's requirements without any further Hot-Spot analysis."

If a CREATE Passenger Rail Project is determined to be a project of air quality concern, a qualitative Hot-Spot analysis will be required to be completed for the project.

PARTICULATE MATTER EMISSION FACTORS USING MOVES REGIONAL SCALE OF ANALYSIS

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Table 1 shows the RunSpec generic parameters used for MOVES regional scale analysis

TABLE 1 MOVES RunSpec Parameters

Data Item	**Description**
Geographic location	Cook County, IL
Scenario Year	2029
Time Period	Two months representing summer and winter seasons
Pollutant	PM2.5
Emission Process	Running exhaust, crankcase running exhaust, break wear and tire wear
Vehicle- Fuel Combination	Diesel powered all MOVES vehicle types
Road Types	Both restricted and unrestricted road types
Scale of analysis	County
Time aggregation level which refers to level of pre-aggregation done to inputs	Based on regional conformity requirements, time aggregation level is set to hour.

Table 2 shows the local specific input data used for MOVES regional scale analysis.

TABLE 2 MOVES Local Specific Input Parameters

Data item	**Description**	**Source**
Vehicle Type VMT	Annual vehicle miles traveled by HPMS vehicle class for the year and geographic area being modeled	In this case, vehicle type VMT for Cook County was obtained from the travel statistics from Highway Performance Monitoring System (HPMS) for calendar year 2009. VMT distribution for calendar year 2029 was obtained using the growth factors from 2009 to 2029. The same percentage was applied to all vehicle types as individual growth factors by vehicle types were not available.
Source Type Population	The number of vehicles in the geographic area being modeled for each vehicle type such as passenger cars, passenger trucks etc	EPA converters to convert data from MOBILE format into MOVES compatible format were utilized for generating source type population based on vehicle type VMT.

Average Speed Distribution	The average speed data specific to vehicle type and road type and time of day/ type of data for geographic area being modeled	VMT distribution by speed bin for Freeways and Arterials by hour for the Chicago area for year 2007 was obtained from IL EPA for PM Hot-Spot Transportation Conformity Project. The same data was utilized for calendar year 2029 assuming there will a little significant change in future fractions. Due to lack of data, same speed-VMT fractions are used for urban and rural types. EPA converters were utilized to convert this data in MOBILE format into MOVES compatible format.
Road Type Distribution	The fraction of VMT by road type for the geographic area being modeled	EPA converters were utilized for generating road type distribution based on vehicle type VMT.
Source Type Age Distribution	Vehicle age distribution	Registration distribution for the Chicago area for year 2008 was obtained from IL EPA for PM Hot-Spot project. The same data was utilized for calendar year 2029 assuming there will a little significant change in future fractions. EPA converters were utilized to convert this data in MOBILE format into MOVES compatible format.

Meteorology	Temperature and humidity	Hourly temperature and relative humidity values were obtained from IL EPA in AERMET format and was extracted to be used for MOVES.
Fuel Supply	Fuel supply parameters and associated market share for each fuel	MOVES default fuel data was used with changes made to Reid Vapor Pressure, Sulfur content based on local data. Local data for Cook county was obtained from IL EPA.
I/M Program	Inspection-maintenance program parameters	MOVES default data.

Table 3 describes the files attached

TABLE 3 List of files attached

Input File Name	**Description**
Consolidated_inputs.xls	This file has all inputs used for MOVES regional scale.
Cook_CountyPM_Jan_detailedoutput.xls	MOVES output by road type, vehicle type and emission process.
Cook_CountyPM_July_detailedoutput.xls	MOVES output by road type, vehicle type and emission process.
Cook_CountyPM_Jan_consolidatedoutput.xls	MOVES output by road type, vehicle type.
Cook_CountyPM_July_consolidatedoutput.xls	MOVES output by road type, vehicle type.