

National Capital Region Transportation Planning Board

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M E M O R A N D U M

TO: TPB Technical Committee

FROM: Ronald F. Kirby
Director, Department of
Transportation Planning

SUBJECT: Updated Safety Margins for Mobile Emissions Budgets for the 2012 PM2.5
Redesignation Request and Maintenance Plan

DATE: September 7, 2012

At its March 21, 2012 meeting, the National Capital Regional Transportation Planning Board (TPB) approved a letter the Metropolitan Washington Air Quality Committee (MWAQC) recommending the incorporation of safety margins of 20 percent and 30 percent into out-year mobile emissions budgets for 2017 and 2025 respectively in a PM2.5 maintenance plan under development by MWAQC. On June 1, 2012, TPB staff provided additional information in support of this recommendation in the attached letter to MWAQC.

Over the past several months a Mobile Budget Task Force appointed by MWAQC Chair Phil Mendelson has been working on developing language to be incorporated into the PM2.5 maintenance plan to address the mobile budget issue. TPB staff provided comments and suggestions during some of the task force meetings based on the TPB's recommendation for safety margins in the mobile budgets. During a conference call held on July 31, I proposed that a safety margin of 20 percent would be sufficient and could be used for both 2017 and 2025, since the sensitivity analysis conducted by TPB staff and reported in the June 1, 2012 letter showed that the impact of an older fleet on PM2.5 emissions was actually lower in 2025 than in 2017. This proposal was accepted by the task force and has been reflected in all subsequent drafts of the mobile budget language.

In an article entitled "Make your car last 200,000 miles," the August 2012 issue of Consumer Reports states:

"The average age of all cars on the road is approaching 11 years, up from about eight years in 1995, according to Polk research," and "a decade ago - - - cars weren't as reliable and durable as they are today. But improvements in rust prevention, engine technology, and lubricants have been game changers, and now you can expect to keep any car rolling into six-figure territory with proper care."

It seems clear that the aging of the vehicle fleet is being driven in part by long-term increased durability factors, as well as by short-term economic conditions. This underscores the

importance of providing safety margins in the 2017 and 2025 mobile emissions budgets to allow for potential further aging of the vehicle fleet, along with other factors outside the control of the MPO process.

Currently the TPB plans to obtain updated fleet data as of July 1, 2014, July 1, 2017, and so on every three years. The TPB will be required to use the updated fleet data for any conformity determination after the data become available in late 2014, 2017 and so on, before the mobile budgets can be updated and found adequate by EPA in the PM2.5 maintenance plan. The safety margins will help ensure that conformity can still be demonstrated with the existing mobile budgets while the update process is underway.

I had the opportunity to discuss the use of safety margins in maintenance plans with EPA and FHWA officials and some other MPOs at the August 7-8, 2012 NTAQS meeting in Philadelphia. These discussions confirmed that the use of safety margins is common practice for maintenance plans for all of the same reasons as are being addressed in the Washington region.

Provisions of MAP-21 Affecting Air Quality Planning

During the most recent conference call of the MWAQC Mobile Budget Task Force on August 30, 2012, I suggested that the task force should include in its considerations new provisions in the MAP-21 legislation related to on-road mobile source emissions and PM2.5 emissions in particular. This new legislation was signed into law by President Obama on July 6, 2012, and the new provisions become effective on October 1, 2012.

MAP-21 introduced a new performance based approach to supporting seven national goals relating to safety, infrastructure condition, congestion reduction, system reliability, freight movement, environmental sustainability, and reduced project delivery delays. Performance measures will be established by the Secretary of Transportation for each of these goals, and states, public transportation providers and MPOs will establish targets for the measures in coordination with each other. Progress toward the targets will be referenced in plans and TIPs.

MAP-21 contains provisions in the Congestion Mitigation and Air Quality Improvement (CMAQ) Program that will ensure that CMAQ funds are used to achieve additional reductions in fine particulate matter. The following specific provisions relate to the use of CMAQ funds under section 104(b)(4):

“(k) PRIORITY FOR USE OF FUNDS IN PM2.5 AREAS. -

“(1) IN GENERAL. – For any State that has a nonattainment or maintenance area for fine particulate matter, an amount equal to 25 percent of the funds apportioned to each State under section 104(b)(4) for a nonattainment or maintenance area that are based all or in part on the weighted population of such area in fine particulate matter nonattainment shall be obligated to projects that reduce such fine particulate matter emissions in such area, including diesel retrofits.

“(2) CONSTRUCTION EQUIPMENT AND VEHICLES. – In order to meet the requirements of paragraph (1), a State or metropolitan planning organization may elect to obligate funds to install diesel emission control technology on nonroad diesel equipment

or on-road diesel equipment that is operated on a highway construction project within a PM2.5 nonattainment or maintenance area.

In addition, MPOs like the TPB are subject to new performance planning requirements, as follows:

“(1) PERFORMANCE PLAN. –

- (1) IN GENERAL. - Each metropolitan planning organization serving a transportation management area (as defined in section 134) with a population over 1,000,000 people representing a nonattainment or maintenance area shall develop a performance plan that –
 - (A) Includes an area baseline level for traffic congestion and on-road mobile source emissions for which the area is in nonattainment or maintenance;
 - (B) Describes progress made in achieving the performance targets described in section 150(d); and
 - (C) Includes a description of projects identified for funding under this section and how such projects will contribute to achieving emission and traffic congestion reduction targets.
- (2) UPDATED PLANS. – Performance plans shall be updated biennially and include a separate report that assesses the progress of the program of projects under the previous plan in achieving the air quality and traffic congestion targets of the previous plan.

These requirements should give assurance to stakeholder groups that the transportation sector will be making a continuing commitment to planning and implementing additional measures to reduce fine particulate matter in the Washington region.

The MPO planning requirements will provide an opportunity to analyze mobile source emissions using performance measures and targets in a manner that can supplement the EPA conformity process.

National Capital Region Transportation Planning Board

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June 1, 2012

Honorable Phil Mendelson
Chairman
Metropolitan Washington
Air Quality Committee (MWAQC)
777 North Capitol Street, NE, #300
Washington, DC 20002

Dear Chairman Mendelson:

At its March 21, 2012 meeting, the National Capital Region Transportation Planning Board (TPB) approved a letter to MWAQC recommending the incorporation of safety margins of 20 percent and 30 percent into out-year mobile emissions budgets for 2017 and 2025 respectively in a PM2.5 maintenance plan under development by MWAQC. In this letter, TPB staff is providing additional information in support of the TPB's March 21 recommendation.

If MWAQC proceeds with the development of a PM2.5 maintenance plan for the Washington region, mobile emissions budgets will need to be developed for the out-years of 2017 and 2025 for both precursor NO_x and primary PM2.5. EPA conformity regulations require that these budgets be based on current estimates of those emissions for 2017 and 2025 using the latest assumptions about future transportation and land use for the region, as well as the age and composition of the region's vehicle fleet and the parameters and procedures incorporated into the model currently mandated by EPA for estimating motor vehicle emissions. Once set, these budgets will be used, perhaps for many years, for determining the conformity of the TPB's plans and programs with the requirements of the Clean Air Act of 1990, as amended. The key issue of concern to the TPB is that future emissions estimates that the TPB will be required to develop to demonstrate conformity for these out-years could be impacted significantly by changes in the composition and age of the region's vehicle fleet, as well as by revisions to EPA's emissions estimation model (currently "MOVES 2010a"), both of which are external inputs to the planning process administered by the TPB.

The potential impact of changes in the vehicle fleet

TPB staff is providing as an attachment to this letter, and as a supplement to the TPB's March 21 letter, detailed results of a sensitivity test designed to assess the potential impact of changes in the mix and age of the vehicle fleet. As discussed later, these results form part of the rationale for the TPB's recommendation of safety margins of 20 percent and 30 percent for 2017 and 2025 respectively.

Honorable Phil Mendelson

June 1, 2012

2

The TPB has collected and analyzed Vehicle Identification Number (VIN) data for all vehicles registered in the Washington region for three distinct points in time in 2005, 2008, and 2011. Snapshots of the VIN data were taken on July 1 of each of these years, and it is anticipated that similar snapshots will be taken each July 1 at three year intervals into the future: 2014, 2017, 2020, and so on.

Since the TPB has VIN data for 2005, 2008, and 2011, it has been possible for TPB staff to estimate precursor NOx and primary PM2.5 fine particulate emissions for 2017 and 2025 for different vehicle fleet mix and age assumptions. Specifically, TPB staff calculated these emissions with the most recent 2011 VIN data (already programmed for use in the PM2.5 maintenance SIP), and also with the 2005 VIN data. As documented in the attached Power Point presentation, significant differences were found in the emissions levels using the two different years of VIN data. For 2017, precursor NOx and primary PM 2.5 emissions were found to be higher by 25 percent and 22 percent respectively with 2011 VIN data than with 2005 VIN data, due largely to aging of the fleet between 2005 and 2011. For 2025, the differences were found to be 8 percent and 11 percent respectively. Breakdowns by vehicle type found that these differences were due predominately to light commercial trucks, buses and heavy duty trucks. For precursor NOx only 41 percent of the difference in 2017 and 21 percent in 2025 was due to passenger vehicles. The corresponding percentages for primary PM2.5 were 19 percent and 40 percent respectively.

The levels of emissions reductions that will actually be achieved in 2017 and 2025 will be highly dependent on continued steady turnover of not only passenger vehicles, but also light commercial trucks, buses and heavy duty trucks. If the turnover rates are slower than currently projected, the anticipated reductions will not be achieved. Such slower turnover rates could result in revised precursor NOx and primary PM2.5 projections that exceed the TPB staff projections currently being considered by MWAQC for use in setting mobile emissions budgets for 2017 and 2025. It is to allow for the possibility of such slower turnover rates, as well as possible changes in EPA's mandated emissions model, that the TPB has recommended the incorporation of safety margins in mobile emissions budgets for 2017 and 2025.

Summary

The specific safety margins recommended by the TPB in its March 21 letter to MWAQC, 20 percent for 2017 and 30 percent for 2025, are based in part on the VIN data assessment reported above, and in part on previous experience with changes in EPA's mandated emissions estimating procedures, which have typically resulted in significantly higher emissions estimates from the same set of local inputs. While there is no basis at this time for predicting the impact of future changes in EPA's emissions estimating procedures, the likelihood of such changes occurring increases as time goes on; hence the significantly higher safety margins recommended for 2025 than for 2017.

Three charts that were provided in the attachment to the TPB's March 21 letter are provided again in the PowerPoint attached to this letter. First, page 10 shows that primary PM2.5 emissions currently projected for 2040 are 2.1 percent higher than projected for 2025, so that conformity could not currently be demonstrated for 2040 if the 2025 mobile emissions budget were set at the 2025 projected level. Second, pages 11 and 12 show that even with the safety margins recommended by the TPB, total emissions from all sources are significantly below the levels required for a PM2.5 maintenance plan.

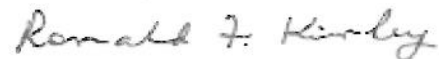
Honorable Phil Mendelson

June 1, 2012

3

TPB staff is transmitting with this letter a set of detailed results of the VIN data assessment reported above. The letter and the supporting data tables are being provided to help inform ongoing MWAQC deliberations about the development of a PM2.5 maintenance plan, and the implications of such a plan for the TPB's ability to meet air quality conformity requirements for future updates to the region's transportation plans and programs.

Sincerely,

A handwritten signature in cursive script that reads "Ronald F. Kirby".

Ronald F. Kirby
Director, Department of
Transportation Planning