

## National Capital Region Transportation Planning Board

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### M E M O R A N D U M

**TO:** MWAQC Technical Advisory 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 11, 2012

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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.

## **National Capital Region Transportation Planning Board**

777 North Capitol Street, N.E., Suite 300, Washington, D.C. 20002-4290 (202) 962-3310 Fax: (202) 962-3202

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<sub>x</sub> 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.

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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 NO<sub>x</sub> and primary PM<sub>2.5</sub> 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 PM<sub>2.5</sub> 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 NO<sub>x</sub> 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 NO<sub>x</sub> only 41 percent of the difference in 2017 and 21 percent in 2025 was due to passenger vehicles. The corresponding percentages for primary PM<sub>2.5</sub> 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 NO<sub>x</sub> and primary PM<sub>2.5</sub> 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 PM<sub>2.5</sub> 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 PM<sub>2.5</sub> maintenance plan.

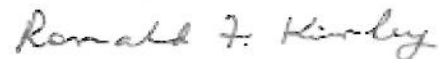
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TPB staff is transmitting with this letter a set of detailed results of the VIN data assessment reported above. The letter and the supporting data tables are being provided to help inform ongoing MWAQC deliberations about the development of a PM2.5 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