

July 29, 2005

Ms. Carol Hammel-Smith
Fuel Economy Division
National Highway Traffic Safety Administration
Room 5320
400 7th Street
Washington, DC 20590

Re: Peer Review of CAFE Compliance and Effects Modeling System

Dear Ms. Hammel-Smith,

This letter serves to highlight some of the areas of consensus that were identified among Gary Rogers, Jonathan Rubin and Michael Wang from discussion of their individual comments on the CAFE modeling system. Each of the reviewers possesses different professional strengths and qualifications and was charged by NHTSA with different focus areas. Hence, each individual report should be considered separately for specific observations and recommendations. By referring to areas of consensus, we are not suggesting that there are major areas of disagreement. Rather, as a result of varying areas of professional experience, not all reviewers feel qualified to address all of the observations and recommendations identified in the individual reviewer reports.

Some of the major areas of consensus are outlined below:

- 1) Based upon the explanation provided by Gary Rogers related to the intent and limitations of the fuel consumption improvement estimations associated with various technologies outlined in the NAS report, the reviewers agree that the use of the NAS data on the individual vehicle models of a manufacturer, as presented in the current version of the CAFE modeling system, will likely produce results that predict fuel economy performance that will differ from actual performance at the level of individual vehicles. This is because the performance estimates were developed for the NAS study as "class-averaged estimates" that assume a distribution across a large number of vehicles produced by many different manufacturers.
- 2) The incremental cost increases associated with specific technology introductions were likewise estimated across a broad range of vehicle manufacturers and Tier 1 suppliers. Published data and engineering judgment by the NAS committee members were used in making these estimations. Use of the NAS cost results across a class of vehicles with many manufacturers and suppliers is appropriate. However, the accuracy of the cost estimation from that effort for application to a particular vehicle model for a unique OEM or Tier 1 supplier, as in the case of fuel economy performance discussed above, will likely differ from actual costs for any given vehicle.
- 3) The reviewers believe that class-averaged estimates of potential technology introductions can be made using the NHTSA code, but as noted in the above two

paragraphs, their use at the level of individual vehicles is likely to entail prediction error whose size is not quantified. However, due to the nature of the NAS estimation method, as the number of sequential technology estimates increases, the potential for error between predicted and actual technologies increases. This is especially important when technology potentials and cost estimates from other studies are to be incorporated by NHTSA and other users.

Although not part of the current model, the documentation does anticipate that NHTSA may consider the effect of allowing trading of CAFE credits among manufacturers as suggested by the NAS. The overall merits of such a system, including, but not limited to, the impacts on individual manufacturers' economic competitiveness, cost savings and compliance, have not been evaluated. In regards to the accuracy of the current model to predict accurately changes fuel economy performance and cost, however, we would expect CAFE credit trading to improve the accuracy class-average estimates of potential technology introductions because trading would allow manufacturers to equate costs and technologies across manufacturers.

- 4) To accurately estimate changes in criteria pollutant emissions, NHTSA should evaluate potential Bin approaches under the EPA Tier 2 emission regulations and estimate vehicle model mixes while complying with both CAFE and Tier 2 requirements.
- 5) Consideration for alternative-fueled vehicles, the associated fuel economy credits, and potential displacement of petroleum fuel should likely be incorporated into the model.
- 6) The peer review did not include a "quality control" evaluation of the implementation code behind the algorithms and mathematical logic of the model. The reviewers recommend that such an independent quality review be conducted as part of the final model release.

Many additional observations, technical questions and recommendations concerning the interpretation and use of the model data, solution algorithms, and quality control can be found in the individual reviewer reports that are attached.

The members of the Peer Review Committee wish to express their thanks to the NHTSA staff for the timeliness and completeness in all professional dealings during the review period.

Sincerely,

Gary W. Rogers

Jonathan Rubin

Michael Quanlu Wang