

aware of such risks and notes that these risks are also accompanied by opportunities. Just as there is a risk that consumers may demand less fuel-efficient vehicles, changes in market conditions could also stimulate a greater demand for more efficient vehicles. Additionally, a number of potential technologies, including clean diesel and hybrid vehicles, and the shift to more fuel efficient cross-over utility vehicles, may offer opportunities for greater fuel savings and may serve to offset some of the risk anticipated by DaimlerChrysler.

The agency is certainly aware that vehicle manufacturers must have sufficient lead time to incorporate changes and new features into their vehicles. Similarly, NHTSA also recognizes that vehicle manufacturers follow design cycles when introducing or significantly modifying a product. This is why the agency has always been respectful of industry needs in this regard. At the same time, we also observe that competition has forced manufacturers to become considerably more agile in modifying and changing products to meet demand. This is evidenced by Ford's and General Motors' submitting revised product plans between May 2002 and February 2003. Generally speaking, we believe that manufacturers have the same ability to meet market driven demands for design changes as those required by regulation. NHTSA believes that the requirements of this final rule do not impose technical demands beyond those that DaimlerChrysler or other manufacturers can meet in the allotted time.

B. Economic Practicability and Other Economic Issues

The agency has estimated not only the anticipated costs that would be borne by General Motors, Ford and DaimlerChrysler to comply with the standards, but also the significance of the societal benefits anticipated to be achieved through direct and indirect fuel savings. In regard to manufacturer costs, the NPRM relied on the Volpe analysis to determine a probable range of costs. In preparing this final rule, we have prepared cost estimates using updated versions of both the Volpe analysis and the Stage analysis. We have concluded that these standards need not result in reductions in employment or competition, and that—while challenging—they are achievable within the framework described above, and that they will benefit society considerably. For the sake of this analysis, we have translated the societal benefits into dollar values and compared those

values to our estimated costs to the manufacturers for this final rule.

1. Costs

After review of the comments submitted in response to the NPRM and performing further analysis, NHTSA estimates the average incremental cost per vehicle needed to meet the standards to be \$22 for MY 2005, \$67 for MY 2006, and \$106 for MY 2007. The total incremental cost (the cost necessary to bring the corporate average fuel economy for light trucks from 20.7 mpg to the standards) is now estimated to be \$170 million for MY 2005, \$537 million for MY 2006, and \$862 million for MY 2007.

The level of additional expenditure necessary beyond already planned investment varies for each individual manufacturer. These individual expenditures are discussed in more detail in the FEA. In order to estimate them, the agency developed cost estimates for the various technologies that are available to and technologically feasible for vehicle manufacturers within the time frame covered by this final rule. These cost estimates were developed through use of a refined "Volpe" analysis that incorporates a number of changes made in response to concerns pointed out by commenters.

The differences between the costs projected in the NPRM and the costs now estimated for this final rule are significant and reflect changes in the agency's methodology, calculations and underlying assumptions. We note first that our analysis of which technologies are most likely to be used by manufacturers to improve fuel economy has changed markedly as a result of the comments and updated product plans submitted in response to the NPRM. The remainder of the difference between the two cost estimates stems from changes to our "Volpe" analysis. Although this methodology is more completely described in both the FEA accompanying the NPRM and the FEA accompanying this final rule, the final rule "Volpe" analysis relies on several inputs and uses an algorithm to calculate overall costs for fuel economy improvements.

Manufacturer comments indicated dissatisfaction with the NPRM "Volpe" analysis. The companies, General Motors in particular, argued that our analysis underestimated the costs for certain of those technologies, contained clerical and mathematical errors, and applied technologies with little or no regard for leadtime and proper allocation of capital investment. General Motors also noted that the Volpe analysis and the Stage analysis applied

different technologies. While the Volpe analysis estimated costs using one set of technologies, the agency's Stage analysis supported the proposed new standards by relying on another. General Motors also indicated that many of the technologies employed in the "Volpe" analysis were either not ready, did not deliver the fuel savings described and were, in many instances, not practicable for General Motors.

As indicated above, the agency reexamined and improved the Volpe analysis in response to the comments. As discussed in more detail in the FEA, we recalculated our assessment of the costs after remedying the clerical errors noted by General Motors. In contrast to the earlier "Volpe" analysis used to calculate the costs set forth in the NPRM, cost estimates in the final rule Volpe analysis first assumed that manufacturers would apply technologies in a fashion more consistent with our "Stage" analysis. As explained below, this differed from our methodology used for the NPRM. Our NPRM "Volpe" analysis applied the cheapest technologies first and added new technologies largely in order of increasing cost.

While our new analysis did not abandon the idea that less costly technologies would be used before those that are more costly (ranked on a cost per mpg investment basis), we considered both the order in which technologies are most likely to be used based on availability as well as cost. We also changed the methodology to recognize that capital costs require employment of technologies for several years, rather than a single year. Finally, we updated the Volpe analysis to include more accurate cost estimates for some technologies and increased benefits from others. In our view, this makes the Volpe analysis more consistent with the Stage analysis and better reflects actual conditions in the automotive industry.

General Motors argued that restricting availability of large engines would impact on sales and result in job losses. Referring to its experience with one of its models that was simultaneously redesigned and given a new 6.0L engine, General Motors stated that a large increase in sales of this vehicle resulted when the 6.0L engine replaced a smaller predecessor. The company then stated that replacing the 6.0L with a newly designed smaller engine would result in lost sales. General Motors' argument implies that replacing the 6.0L engine in this model with a smaller engine would reduce sales to a level equivalent to its sales before the redesign.