

in the daily range would undoubtedly come closer to Hunt's two percent. The NASTC driver, however, would have to work more days in the week. The NPRM may also cause lost opportunities. NASTC predicted the productivity loss could go as high as 25 to 33 percent because of the requirement in the proposal to log waiting time as on-duty time. This was not an absolute under the proposal. A driver could log up to two hours waiting time as break time, provided it qualified as off-duty time. If it did not, it must be logged as duty time even under the existing rules.

The NPTC offered no explanation for its position that anything less than a 15-hour workday for private carriers could not survive a cost-benefit analysis. It did not appear to relate to the lack of flexibility in the proposal, but rather to an assumption of inflexibility in private carrier operations. Drivers for private carriers could not sustain a 15-hour day schedule for very long under the present rules without coming afoul of the seven- or eight-day limitations. This issue would require additional attention to learn the particulars of their position.

Although the NERA study made some valid points about errors in the agency's analysis, its own analysis of the costs of the proposal was not based on any independent findings regarding industry practices. Rather, its conclusions appeared to be based on assumptions provided by its industry sponsor. It also cited the results of the ATA survey as the basis for its estimate of the degree to which the FMCSA had understated the costs for additional drivers and equipment. Similarly, the review performed by the RSP, which appeared to misunderstand part of the proposal, did not rely on independent examination of industry practices. Neither the ATA nor any of the other associations proposing alternative rules made any attempt to quantify their related costs or benefits.

On the benefit side, industry severely criticized the agency's reliance on "fatigue relevant crashes" to increase the pool of fatalities from which it could draw an estimated benefit (fatalities avoided) from the proposed rules. The NTSB uses the phrase "fatigue-related" in its reports and recommendations involving human fatigue. The IIHS and the safety advocates, although not supporting the agency's methodology, stated the FMCSA arrived at an accurate number of deaths caused by fatigue related crashes, and would have done so had it used the methodology discussed earlier in this document, namely "population percent attributable risk calculations" taking the increased risk of crashes from driving longer hours and

placing it into a formula together with the rate of drivers driving longer hours. Industry, however, also noted that the agency should have at least reduced the number of those fatalities by applying a percentage equal to the ratio of collisions determined to be the fault of the truck driver, about 30 percent. The agency notes there is a big difference between the "at fault" crashes the industry uses and the "contributed to," "fatigue relevant," and "fatigue-related" crashes the agency, safety advocates, and NTSB use.

Industry was also critical of the agency's overreach in stating benefits from the use of EOBRs by reducing the level of non-compliance, an estimated level that industry stated was far too high. The public interest commenters observed that the evidence of non-compliance was very strong, and even drivers and owner-operators agreed that daily logs are routinely abused.

In conducting the RIA for this final rule, the FMCSA used a more conservative approach to estimating fatigue-related crashes and how benefits would be reduced if the number of fatigue-related crashes were smaller. See the RIA's Section 8.2 for a discussion of the estimates of the number of crashes involving trucks, by severity of crash. In addition, it discusses methods for estimating the percentage of crashes attributable to fatigue, and the results of applying those methods.

In determining the effects of the HOS rules on the mode split between truck and rail (which was not done for the NPRM), we used the Logistics Cost Model (LCM) developed by Paul Roberts. The LCM is a computer model that determines the total logistics cost of transporting a product from a vendor to a receiver. It is an updated variant of models developed by Mr. Roberts for the Association of American Railroads (AAR) and the FHWA. The model determines the lowest cost for ordering, loading, transporting, storing, and holding a product. The model assumes the shipper selects the alternative that minimizes total logistics costs. Total logistics cost in this case may include the costs occasioned by service frequency, transit time, reliability, loss and damage, spoilage and other service-related factors occurring during ordering, transport or storage. By converting all of these factors into their quantitative impacts on total logistics cost, the analysis can address the tradeoffs among service quality, inventory carrying and transportation charges.

The mode shift analysis was limited to movements of 250 miles or more. The RIA did this because the probability of

switching traffic from truck to rail is effectively zero for moves under 250 miles. Most authorities would assert, in fact, that this probability is quite low for shipments under 500 miles. Two hundred fifty miles was chosen for the RIA as a minimum, however, to ensure a thorough analysis.

The RIA exercised the mode shift model over a range of changes in trucking rates from a 2.0 percent decrease to a 2.0 percent increase. From this analysis, the RIA was able to estimate a price elasticity of (1.4). This means that, for a 1.0 percent change in trucking rates, there is 1.4 percent change in truck shipments, truck shipments increasing with a rate decrease and diminishing with a rate increase. This measure of elasticity was used, in turn, to estimate impacts on truck and rail traffic for each of the HOS rule alternatives. Details of the computational method and data used are presented in the RIA's Appendix D.

In addition to calculating the social costs, benefits, and net benefits of the alternatives, the RIA also considered the impacts on the carriers, and on the economy as a whole. The changes in labor productivity, costs for labor and other inputs, and changes in the mode split between truck and rail were disaggregated to six regions and fed into the REMI Policy Insight regional economic model (developed by Regional Economic Models Incorporated). The model's outputs give an approximate picture of the relative effects of the alternatives on economic growth and employment across the country.

The RIA found that the PATT alternative would be more expensive to comply with than current rules, especially for short-haul operations, while the ATA alternative would be less expensive. The FMCSA staff alternative would be more expensive for short-haul operations, though it would be less expensive overall due to its savings for long-haul operations.

The basis of the benefits analysis is the estimation of the total number of crashes involving vehicles subject to the rule, the damages imposed by those crashes, and the assessment of the percentage of those crashes and damages attributable to fatigue. The FMCSA found an estimated 8.15 percent of the total crashes and damages result from fatigue. Thus, the total damages from fatigue-related crashes have a value of about 8 percent of \$32 billion, or about \$2.5 billion per year. Excluding a fraction of crashes that occur in operations that would be little affected by the changes in the HOS rules, the fatigue-related crashes subject to the