Some simple structural modifications have been demonstrated to be effective in reducing aerodynamic drag on vehicles that have empty open cargo bays. The modifications were originally intended to be made in railroad coal cars because the amounts of coal and the distances over which they are transported by railroad in the United States are so large that the resulting reduction in drag could, potentially, result in an annual saving of millions of gallons of diesel fuel.

The basic idea is to break up the airflow in a large open cargo bay by inserting panels to divide the bay into a series of smaller bays. In the case of a coal car, this involves inserting a small number (typically between two and four) of vertical full-depth or partial-depth panels. For example, as shown in Figure 1, two triangular partial-depth vertical panels can be conveniently attached to triangular braces that are already integral parts of a typical coal car.

In an experiment, measurements of aerodynamic drag on models of coal cars were made in a wind tunnel. The results of the measurements, summarized in Figure 2, clearly show the drag-reducing effects of the dividers; they also show that the braces also contribute small reductions of drag.

This work was done by James C. Ross of Ames Research Center, Bruce L. Storms of Aerospace Computing, Inc., and Dan Dzoan of Ohlone College.

Inquiries concerning rights for the commercial use of this invention should be addressed to the Ames Technology Partnerships Division at (650) 604-2954. Refer to ARC-15422-1.