RESEARCH PAYS OFF

Improved Utilization of Multilevel Autorack Railcars

Problem For many years, multilevel railcars that carry finished automobiles have been assigned to specific automobile assembly plants. When loaded, these assigned cars hauled automobiles from the manufacturing plants to the unloading ramps, from which the vehicles were delivered by highway to dealerships. After each railcar was unloaded, it traveled empty back to the same plant to be loaded for another trip. This practice resulted in unproductive, empty railcar mileage and reduced the time the equipment was available for loaded movement.

Solution A Multilevel Car Project was established by the Association of American Railroads (AAR) as a part of a larger project to improve utilization of freight cars. The project team examined the procedures used to manage multilevel cars and quickly concluded that major improvements could be made. Cooperation of the Southern Railway was enlisted. A linear computer program already being used by the Southern Railway was used to examine different possible car flow patterns and to analyze costs and benefits. The primary benefit was a reduction in empty-car miles or days. On the basis of the favorable results of the analyses, the project team then developed reports of car status and location for use in making decisions on the routing of empty cars.

Application A project management group was established in Detroit to distribute specific empty multilevel cars that moved from seven General Motors assembly plants to 16 unloading ramps during the 1980 automobile-model year. The group was composed of a director, two car distributors, and a secretary. Inputs to the model were supplied weekly in the form of a detailed plan of expected shipments by each assembly plant and a forecast of expected receipts by each unloading ramp. The data were cross-checked to increase the forecast accuracy.

The model output was used by the project management team to plan the daily distribution of empty cars. Cars were moved from the unloading ramps to the closest appropriate plant in a manner to reduce empty handling costs without jeopardizing a dependable rail car supply for any plant. During the first year, two more plants were added to the project. Subsequently the program continued to expand, with additional multilevel car types, plants, and ramps. A second project team was established to distribute the multilevel railcars in service to Ford Motor Company.

Benefits In the first year, empty-car handling was reduced by 20 to 30 percent. The average distributed empty car moved 335 fewer miles to its next loading plant, took 36 hours less to get there, and had 0.42 fewer railroad-to-railroad interchanges than it would have had before the start of the project. The savings were estimated to be $150 per car distributed, or a total of $2.7 million. By the 1983 model year, it was estimated that the Multilevel Car Projects resulted in an annual savings of 96 million empty miles, or $34 million. In addition, substantial reductions in the fleet size required to handle a given level of traffic were made possible. The AAR subsequently developed an information system that can provide input to the computer independently of the automobile manufacturers and has improved the accuracy of the forecasts. A second improvement has been development by the AAR of a dynamic network optimization model, which is producing improved car routings and larger reductions in empty-car miles.

Although development of the computer programs has been important in realizing large savings, the major research achievement was definition of the problem and bringing it to the attention of railroad management.

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