

**15th Annual Arnoff Lecture on the Practice of
Management Science**

“The Dance of the 30 Ton Trucks”

Karla L. Hoffman, Professor

Department of Systems Engineering and Operations Research
The Volgenau School of Information Technology and Engineering
George Mason University

7:30 P.M., Thursday, May 25, 2006

112 Carl H. Lindner Hall, College of Business, UC

Dispatching & scheduling is never easy, but the scheduling of concrete deliveries is particularly difficult for several reasons: 1) concrete is an extremely perishable product – it can solidify in the truck if offloading is delayed by a few hours; 2) customer orders are extremely unpredictable & volatile – orders are often canceled or drastically changed at the last minute; 3) to compensate for this unpredictability, the concrete company overbooks by as much as 20%; 4) many orders require synchronized deliveries by multiple trucks; 5) when a truck arrives at a customer site, the customer may not be ready for the delivery or a storm may negate the ability to use the concrete; & 6) most of the travel takes place in highly congested urban areas making travel times highly variable. In order to assist the dispatchers, schedulers, & order takers at this company, we designed & implemented a decision support tool consisting of both planning & execution tools. The modules determine whether new orders should be accepted, when drivers should arrive for work, the real-time assignment of drivers to delivery loads, the dispatching of these drivers to customers and back to plants, & the scheduling of the truck loading at the plants.

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*Fifteenth Annual E. Leonard Arnoff Memorial Lecture
on the Practice of Management Science*

“The Dance of the 30 Ton Trucks”

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The Volgenau School of Information Technology and Engineering
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*112 Lindner Hall, College of Business, University of Cincinnati
7:30 P.M., Thursday, May 25, 2006. Reception at 8:30 P.M.*

Abstract

This talk describes the application of operations research techniques to a very complex scheduling and dispatching problem. Dispatching and scheduling is never easy, but the scheduling of concrete deliveries is particularly difficult for several reasons: 1) concrete is an extremely perishable product – it can solidify in the truck if offloading is delayed by a few hours; 2) customer orders are extremely unpredictable and volatile – orders are often canceled or drastically changed at the last minute; 3) to compensate for this unpredictability, the concrete company overbooks by as much as 20%; 4) many orders require synchronized deliveries by multiple trucks; 5) when a truck arrives at a customer site, the customer may not be ready for the delivery or a storm may negate the ability to use the concrete; and 6) most of the travel takes place in highly congested urban areas making travel times highly variable.

In order to assist the dispatchers, schedulers, and order takers at this company, we designed and implemented a decision support tool consisting of both planning and execution tools. The modules determine whether new orders should be accepted, when drivers should arrive for work, the real-time assignment of drivers to delivery loads, the dispatching of these drivers to customers and back to plants, and the scheduling of the truck loading at the plants.

Karla L. Hoffman

After earning an MBA and a D.Sc. in Operations Research from George Washington University, Karla Hoffman worked from 1975 to 1984 as a Mathematician in the Applied Mathematics Division of the National Bureau of Standards. In 1984, she was the first mathematician to receive the Bureau of Standards' Applied Research Award. That same year, she received the U.S. Department of Commerce Silver Medal for Meritorious Service, for her work in advancing the use of combinatorial optimization techniques by government agencies. In 1985, Dr. Hoffman joined the Operations Research and Operations Engineering Department at George Mason University, where she was Department Chair from 1996 to 2001. In 1989, she received the George Mason University Distinguished Professor Award.

Dr. Hoffman is internationally recognized for her work in the optimization field. She has published extensively in professional journals, edited two books on operations research related subjects, and served on a variety of editorial boards. Dr. Hoffman has always advocated working on practical problems, and her consulting activities have included crew and fleet scheduling algorithms for the airline industry, real-time scheduling algorithms for truck and bus transportation systems, and capital budgeting tools for a major telecommunications company. Her interest in combinatorial auctions has led to consulting arrangements with the Federal Communications Commission on auction design for spectrum auctions, and with the Federal Aviation Administration, where she is studying the use of auctions for slot allocation at congested airports.

Dr. Hoffman has been actively involved in INFORMS activities for over 25 years. She served on the ORSA Board during the formation of INFORMS, and was actively involved in the ORSA-TIMS merger that created the organization. She was President of INFORMS in 1998, and served on INFORMS' Executive Committee from 1995-1999. She has also been active in the Mathematical Programming Society, where she served on its Board for three years. She continues to be heavily involved with INFORMS, presently serving as Chair of the Puerto Rico (2007) meeting. She is a Fellow of INFORMS.