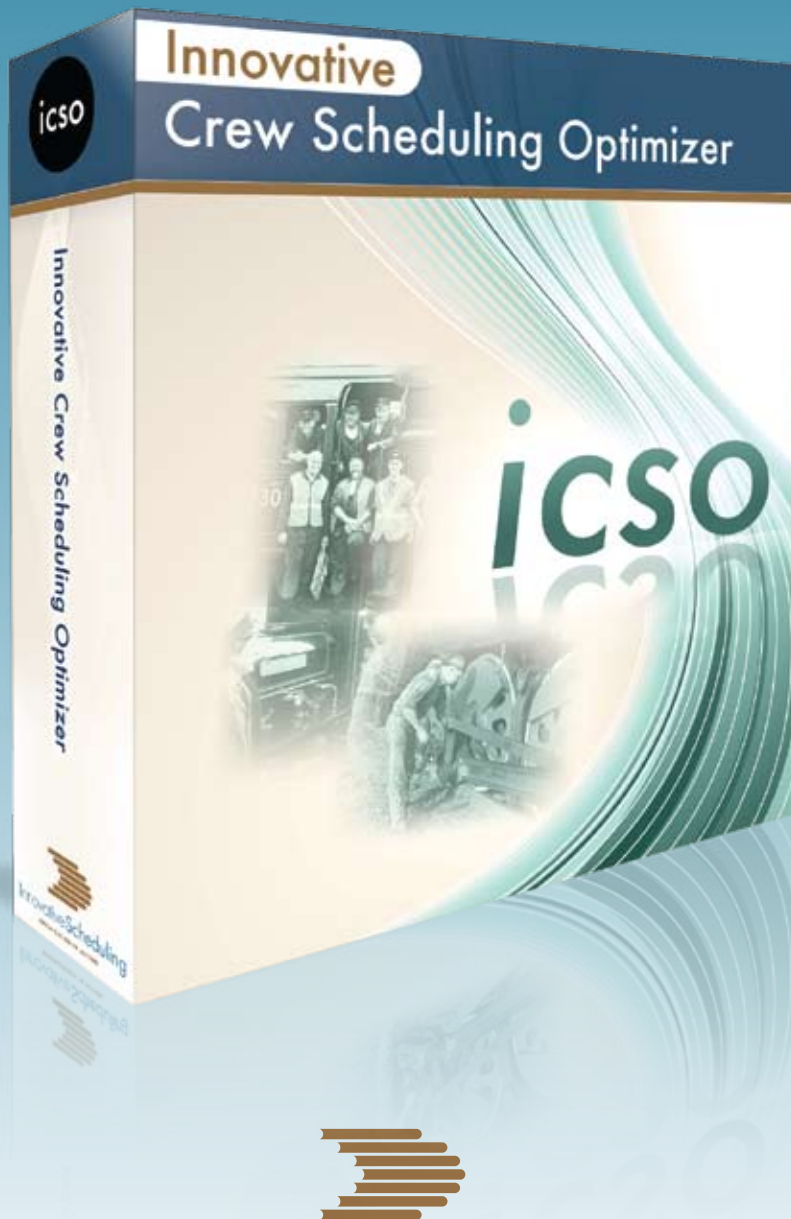


# MINIMIZE CREW COSTS AND DEADHEAD MOVES



Innovative Scheduling

OPTIMIZATION IN ACTION

Innovative Crew Scheduling Optimizer (ICS0) is an interactive, web-based decision support system that determines crew assignments for a given train schedule.

- ➔ Optimize existing rule-based crew assignment systems
- ➔ Determine crew requirements for different districts
- ➔ Assess impact of service design changes on crew costs
- ➔ Forecast crew requirements and assist in hiring/training
- ➔ Use in various what-if analyses (effect of pool size on crew cost, changes in home/away locations, restructuring of crew districts)
- ➔ Assist management and unions identify mutual beneficial agreements

# INNOVATIVE CREW SCHEDULING OPTIMIZER



## INNOVATIVE CREW SCHEDULING OPTIMIZER RECOMMENDS THE FOLLOWING:

- Assignment of crews to scheduled trains
- Detailed itineraries for each crew
- When crews should stay in hotels and when they should deadhead
- Optimal manpower-staffing levels

In the US, a freight railroad's territory is divided into hundreds of crew districts, a geographic segment of a rail corridor that can be traversed within one crew's work shift. Each crew has a home location, an away location, rests in a hotel, and then operates a train in the reverse direction to return home. Sometimes, instead of traveling between home and away locations on trains, the crew deadheads by a taxi or train. The crew scheduling challenge is to assign crews to scheduled trains, optimize deadhead moves, and minimize total costs over a time horizon (generally a week).

The crew schedule must honor a variety of constraints including minimum rest requirements at home and away locations, and first-in-first-out constraints of assignment of crew to trains.

**MAJOR CONTRIBUTIONS:** ICSO constructs a network model to represent the flow of crews over crew districts. It then formulates crew scheduling as an integer multi-commodity flow problem over the network, where different types of crews define different types of commodities. Various crew constraints are captured, solving any crew scheduling problem in a matter of minutes.

**FEATURES OF THE DECISION SUPPORT SYSTEM:** ICSO is a web-based decision support system that allows proposed crew plans to be published on the web and viewed by the entire organization. User-friendly forms enable the user to view data, edit and calibrate parameters, run the model, store optimal solutions, and drill down into any solution for an in-depth analysis. Canned reports enable additional analysis of any solution. The user can create several scenarios, analyze any scenario, and compare any two scenarios.



Contact us to learn more about this or other Innovative Scheduling products:

[info@InnovativeScheduling.com](mailto:info@InnovativeScheduling.com)

352.334.7283, ext. 301

[www.InnovativeScheduling.com](http://www.InnovativeScheduling.com)