

# **An efficient algorithm for work shift scheduling in the operation of massive transit systems**

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## **Abstract**

This study is focused in the construction of work shifts for the drivers of the massive transit system in the city of Pereira, Colombia. Starting with the multiple tables of services designed by the public transportation tactical agency (Megabús), the problem consists on finding out the minimum and feasible set of work shifts that must be attended by the drivers. Arises the need of an adequate division of each one of the time tables, so that each partition meets the constraints of continuous work, and also the maximum work time allowed for a driver in the same day. The methodology consists on a two-phase heuristic algorithm to solve the Crew Scheduling Problem. The algorithm is tested in the massive transit system of the West-center Metropolitan Area (AMCO), operated by Integra S.A., which attends around 5000 services during weekdays. The proposed methodology reduces the number of work shifts for operating the massive transit system of the AMCO. The algorithm has a good performance in terms of computing time, it reaches good quality solutions in limited times by the operation, and it is an adequate solution for reprogramming the attention of the services during contingencies in the system.

## **Keywords**

Scheduling, Operations Planning, Heuristics, Matheuristics, Transportation, Group Scheduling.

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