

A Routing Problem from the Fédération des producteurs de lait du Québec

Company

Fédération des producteurs de lait du Québec

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Team common language

French

Reference

P. Toth and D. Vigo, *The Vehicle Routing Problem*, SIAM Monographs on Discrete Mathematics and Applications, Philadelphia, 2002.

Abstract

One of the mandates of the Fédération des producteurs de lait du Québec (FPLQ) is to organize and regulate the pick-up of milk produced by dairy farmers, the transportation of milk to the processing plants, and the delivery of the milk products to the merchants. To give an idea of the scope of these tasks, it suffices to mention that in 2006, there were 7390 dairy farms in Québec and the total fleet available to the FPLQ through leasing consisted of 274 vehicles of several types, which were assigned to 592 tours. At the moment, the scheduling of vehicles is carried out by a partially automated procedure.

The problem constraints and the formula giving the transportation costs (established by the FPLQ and the transportation companies) are especially complex. This formula results from an attempt to estimate correctly the operating costs of the transportation companies, including the amortization costs, the cost of fuel and that of manpower (representing about 40% of the formula). The complete description of these costs is contained in a twenty page long document. In this project, however, we will only consider the manpower cost and the cost of fuel.

The problem objective is to find an “optimal” collection of routes, i.e., a collection of routes assigned to the available vehicles and respecting the constraints of the problem, such that the milk produced by the farmers is delivered to the processing plants at minimum cost! We will be looking for strategies yielding solutions that are as close as possible to the optimum.