

Internship in logistics and transportation: design of a shared distribution network

Small or medium companies initiatives to form partnerships in order to jointly distribute common customers have shown the potential interest of such an approach in several aspects: From the companies point of view, gathering demands increases the average number of pallets shipped per truck, which results in better carrier rates and finally reduces the overall transportation cost. This flow increase also results in a higher frequency in customer deliveries, combined with a reduction in the number of truck accesses to customers platforms. In addition, the overall customer demand is delivered by a lower number of trucks, with smaller unoccupied spaces. The total driven distance is reduced and savings in terms of CO2 emissions are straightforward.

Beyond political and strategic issues which make such a collaborative project hard to finalize, estimating the potential benefits of distribution sharing, as well as the number and the locations of the collaborative facilities, is a hard task which falls under the scope of combinatorial optimization. Assessing collaboration implies to be able to compare several collaborative modes based on historical data. For this comparison to be accurate enough, the distribution should be optimized on each evaluated scenario. As a result, our goal is to develop optimization tools that can simulate various collaborative scenarios and evaluate the benefit of sharing.

The internship is devoted to the design of optimization algorithms for location and routing problems that occur in shared distribution networks. The student should be familiar with facility location and vehicle routing problems as well as mixed integer linear programming and meta-heuristics.

The internship is funded by PREDIT through the FUSION-CO2 project and has a duration of 6 months starting on January or February 2012. It is located at Ecole des Mines de Nantes in the Logistics and Production System team of the IRCCyN Laboratory (<http://www.irccyn.ec-nantes.fr/spip.php?rubrique94>).

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