
VRPTW with European Union regulations

Naima Belakbir^{*†1}, Ahcène Bounceur¹, Stéphane Croguennec², Reinhardt Euler¹, Marc Le Pouliquen¹, Marc Sevaux³, and Jean François Trevien²

¹Université de Bretagne Occidentale - Lab-STICC (UBO/Lab-STICC) – Université de Bretagne Occidentale (UBO), CNRS : UMR6285 – 3 rue des Archives - CS 93837 - F29238 Brest cedex 3, France

²SYSTRANS – SYSTRANS – Rue Didier Daurat, 29600 Saint-Martin-des-Champs, France

³Université de Bretagne Sud - Lab-STICC (UBS/Lab-STICC) – Université de Bretagne Sud [UBS], CNRS : UMR6285 – BP 92116 - 56321 Lorient cedex, France

Abstract

In the European Union, truck drivers must comply with a Regulation (EC) No 561/2006, which provides a set of basic rules on daily or weekly driving time and break or rest periods after specific driving times. The resulting problem is a Vehicle routing problem with time windows (VRPTW) combined with a truck driver scheduling problem. It aims to find a set of routes

for a fleet of vehicles, such that each customer is visited within its given time window, the accumulated load to be delivered (or collected) does not exceed the capacity of the vehicle, each truck driver can comply with applicable hours of service regulations, and the total transportation costs are minimized. This project is conducted in collaboration with SYSTRANS, a society specialized in solving large scale real-world VRPTWs. So far, our problem has attracted little attention in the vehicle routing literature. Heuristic approaches have been introduced by Goel (2009), Kok et al.(2010), Prescott-Gagnon et al. (2010) and Goel and Vidal (2014). For our case, the metaheuristic introduced by Goel and Vidal (2014) appears to be quite appropriate, due to its important contribution in terms of solution quality and computational efficiency. We intend to implement this algorithm, to test it on instances arising from SYSTRANS real-world applications, and to finally integrate European regulations.

*Speaker

†Corresponding author: n.belakbir@systrans.fr