
Branch-and-Cut for a 2-Commodity Flow Relocation Model with Time Constraints

José-L Figueroa^{*†}, Mourad Baiou¹, Alain Quilliot¹, Hélène Toussaint¹, and Annegret Wagler¹

¹Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes – Université Clermont Auvergne : UMR6158, Université Clermont Auvergne, Laboratoire d'Informatique, de Modélisation et d'Optimisation des Systèmes – France

Abstract

We deal here with a general 2-commodity flow model for shared mobility systems on a given transit network. It involves two integral flows (for carriers and transported objects), and may be viewed as the projection on the transit network of a flow model on a time expanded network. To make this projected model compatible with the time expanded network model, we introduce specific constraints whose handling involves a separation process. We prove that this separation can be performed in polynomial time, discuss the experimental behaviour of the related Branch-and-Cut algorithm and briefly address the lift issue to turn an optimal solution of our projected model into a solution of the original problem.

^{*}Speaker

[†]Corresponding author: jfg77-sigma@hotmail.com