

Accepted Manuscript

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Cristián E. Cortés, Michel Gendreau, Louis Martin Rousseau, Sebastián Souyris, Andrés Weintraub

PII: S0377-2217(14)00220-3
DOI: <http://dx.doi.org/10.1016/j.ejor.2014.03.006>
Reference: EOR 12208

To appear in: *European Journal of Operational Research*

Received Date: 13 April 2013

Accepted Date: 1 March 2014

Please cite this article as: Cortés, C.E., Gendreau, M., Rousseau, L.M., Souyris, S., Weintraub, A., Branch-and-Price and Constraint Programming for solving a Real-Life Technician Dispatching Problem, *European Journal of Operational Research* (2014), doi: <http://dx.doi.org/10.1016/j.ejor.2014.03.006>

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Branch-and-Price and Constraint Programming for solving a Real-Life Technician Dispatching Problem

Cristián E. Cortés*

*Civil Engineering Department, Universidad de Chile
Blanco Encalada 2002, 5th floor, Santiago, Chile*

Michel Gendreau, Louis Martin Rousseau

*CIRRELT and MAGI, Ecole Polytechnique de Montréal
C.P.6079, Succ. Centre-ville, Montreal (Quebec), Canada H3C 3A7*

Sebastián Souyris

*McCombs School of Business, University of Texas at Austin
2110 Speedway Stop B6500, Austin, TX 78712, USA*

Andrés Weintraub

*Industrial Engineering Department, Universidad de Chile
Republica 701, Santiago, Chile*

Abstract

We consider a real problem faced by a large company providing repair services of office machines in Santiago, Chile. In a typical day about twenty technicians visit seventy customers in a predefined service area in Santiago. We design optimal routes for technicians by considering travel times, soft time windows for technician arrival times at client locations, and fixed repair times. A branch-and-price algorithm was developed, using a constraint branching strategy proposed by Ryan and Foster along with constraint programming in the column generation phase. The column generation takes advantage of the fact that each technician can satisfy no more than five to six service requests per day. Different instances of the problem were solved to optimality in a reasonable computational time, and the results obtained compare favorably with the current practice.

Keywords: Branch-and-price, Constraint programming, Routing, Technician dispatch problem

*Corresponding Author, phone: 562 29784380, fax: 562 26894206

Email addresses: ccortes@ing.uchile.cl (Cristián E. Cortés), michel.gendreau@cirrelt.ca (Michel Gendreau), louis-martin.rousseau@polymtl.ca (Louis Martin Rousseau), sebastian.souyris@utexas.edu (Sebastián Souyris), aweintra@dii.uchile.cl (Andrés Weintraub)

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