Multi-product Multi-vehicle inventory-routing problem considering weight and volume in a wholesale grocery chain.

Salutino Flores Monroy[*1] and Osvaldo González[1]

[1]Facultad de Ingeniería, UNAM (Facultad de Ingeniería, UNAM) – Av. Universidad 3000, Ciudad Universitaria, Coyoacán, México D. F. CP 04510, México, Mexico

Abstract

The Multiproduct multivehicle inventory routing problem (MMIRP) is a logistical problem that arises in the great majority of organizations, especially those in which more than one product is marketed, in many cases the packaging does not have the same volume and weight. The distributor decides what delivery strategy should be made given the demand and the inventory of the customers in a finite and discrete time horizon. The delivery strategy includes the time and the size of the deliveries to minimize the total cost of delivery. In the literature, we generally study a single homogeneous product with a deterministic but variable time demand that is delivered in a finite time horizon. This work focuses on the weight and volume restrictions that have to be charged to the vehicles in order to be taken from the distribution center to the customer in a mexican wholesale chain. This type of study is important because even though the weight restriction has been applied, many times by volume the transport vehicle can not take all the merchandise and leave something at the distribution center or vice versa. We formally define and shape the problem, and we solve it exactly. Demand was predicted with Holt - Winters models. Previously the combinations of the points of sale were made to solve previously the best routes between them so that given the necessary vehicles with the correct merchandise covering the restrictions of weight and volume, to cover the demand the itinerary is chosen.

---

[*]Speaker