Generic Formulation of Location-routing Problem with Dynamic Demand

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Abstract: The vehicle-routing problem with a time window (VRPTW) is a class of vehicle-routing problem in which customers' demands have a specific function of time. This has been extensively investigated by researchers. According to this function, a vehicle must reach a customer within a time window specified by the customer; otherwise, the customer demand expires. Although the VRPTW has been addressed by researchers, other forms of demand function varying by time have not been investigated. Hence, this paper attempts to formulate the problem when customers' demands change after the initiation as a function of time. This problem in conjunction with the location-allocation problem (LAP) is called the location-routing problem with time-dependent demand (LRPTD). The objective here is to minimize the total network cost by finding the best network configuration. This includes finding the best strategy with respect to location, allocation, and routing plan. The problem formulation eliminates waiting times and can also handle problems with time windows. An example is presented for to illustrate the model presented.

Keywords: Location-Routing Problem, Vehicle-Routing Problems with Time illustrate Windows, Dynamic Demand