

Optimization of Ambulance Routes

Natalia Shamray, Marina Veretekhina

Institute of Automation and Control Processes,
5, Radio street, 690041, Vladivostok, Russia,

Far Eastern Federal University,
8, Sukhanova street, 6900091, Vladivostok, Russia,

`shamray@dvo.ru, vfhmzif-96@mail.ru`

We study a problem of optimal assignment of ambulance teams on calls maximizing the number of served calls on a given time horizon. At the beginning of period are known: 1) the number of working ambulance teams, their location in the nodes of transportation network and the time until the end of service; 2) the number of calls for the further service, their location in the nodes of network and duration of service. For the planning period are known: 1) loading of the network with traffic flows; 2) the intensity of new calls, their distribution among the different zones of network and estimation of service duration. The calls are classified by the nosological forms and by the priority of service. Each ambulance team is specialized on the certain amount of nosological forms. It is required to assign the teams on calls waiting for service and to identify the route of their movement to maximize the amount of served calls on a given time horizon. This problem is formalized as the integer programming model. In the report we will show an experience of modeling the problem on working ambulance stations of Vladivostok.