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### **Logistic Analysis of Enterprise Interaction Based on a Network Model**

One of the most important tasks of long-term planning is a rational arrangement of transport companies in relation to the existing network of consumption, production companies and warehousing systems.

There is a widely known fact that a large proportion of goods of both industrial and food produce, which is to be transported from the place of their production to the points of their sale must first be delivered to some industrial base (that will be called warehouses) for their sorting and packaging, pre-processing etc. These conventional warehouses may be sorting bases, ports, warehouses for storage etc. In this connection, the problem of optimal interaction of suppliers, consumers and pre-processing and storage stations is raised.

One of the main problems is the analysis of the situation: from which enterprise to which warehouse and from which warehouse to which seller to carry products, so that the overall cost of delivery and storage of goods were minimal.

These optimization problems are often solved by the so-called network methods, as they relate to a particular network of transport routes (roads, rails, water routes etc.).

The important thing is that the total capacity of the warehouse is more than a number of transported products.

Linking the traffic volume with each edge network on this edge, we can get a number of values, that we call a traffic plan. These numbers of values are imposed by limitations associated with the capacity of railways, conditions of complete withdrawal of goods from production and delivery of the required quantity of goods to the selling point, as well as conditions associated with a capacity of warehouses.

The plan that satisfies these conditions will be called admissible, and the objective of the work is to find among the variety of feasible plans that one when the total cost of transporting products and storing them in warehouses will be minimal.

This transportation plan will be called optimal. The admissible plan for optimality is validated by using the so-called method of potentials.