

# **Methodology to Determine the Optimum Logistics Cost Cluster Size of Multiple Facility and Server System**

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Majority of suppliers of material required for construction are concentrated in to a particular area to handle their facilities due to the location of existing customers, existing supplying capacity and the locations of their key requirements such as raw material suppliers or sites. The market demand for a particular facility can be exceeded due to the existing demand and due to the growth of facility consumers. So the competition of the market can also be increased. This will encourage the forming of new facilities or plants and also increasing the supplying capacity of existing facilities or plants. With time facility providers can be scattered over a large area with continuous growth of the facility consumers and there is a need to determine the optimum location for new facilities.

This type of problems is usually handled by using clustering method to improve the convenience and the efficiency of operation. The usual practice is to consider the geographic basis or arbitrarily based on suppliers and consumers. When there are interactions among the clustered facilities and/or between the facilities and a central server, the cost of transport & logistics operations would be a significant component that affects the efficiency of the system. The problem of locating regional facilities and allocating customers to optimize the cost of transportation covers the core topics of optimums logistic cost cluster model.

This paper describes a mathematical model that can be used to determine the optimum location and cluster size for a given facility. This model can be applied in to transportation requirements which based on direct shipment network type such as construction sites of contractor, distribution network of retail stores and serves etc. Transportation problem theories and center of gravity methods were used to develop the model. The cost of transportation was assumed to be proportionate to the distances between the origin and destination. This was later relaxed by using an individual time factor which user can define according to the average speed of the particular road. Operation requirements also introduced to enhance the model accuracy and efficiency such as the concrete delivery time of concrete transportation etc.

**Key Words:** Facility location, Cluster size, Transport network, Optimization