

# Location-Allocation-Inventory-Routing Model

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This research presents an efficient method to model and design a simple distribution system such that the total relevant cost of the system is minimized.

The general characteristics of our model are as follows:

- single commodity
- capacitated plants
- capacitated distribution centers
- stochastic customer demands
- capacitated transportation modes
- zero or one echelon network
- static model for one period

Assumptions of our model are as follows :

- Operating cost at DC : piece-wise linear
- Service level for customer demands at each DC : predetermined
- Shipping from plants to DCs : by vehicle unit or SPU
- A delivery vehicle : can visit several customers in one route
- Customer : served by many DCs

Our solution technique provides the following information.

- 1) Which candidate DCs to open.
- 2) How much to ship per period from each plant to each DC
- 3) How much to ship per period from each DC to each customer
- 4) Which transportation modes to use
- 5) How much safety stock to maintain at each DC
- 6) Economic order quantity at each DC
- 7) Economic size (small, medium, large) of each open DC

Here we formulated a mathematical model in the aspect of snapshot