

The Principle of Median Location

The principle explains location decisions of firms that have multiple markets

Principle of Median Location - the optimal location for a firm with multiple markets is the median transportation location which is the location that splits the total monetary weight of the firm into 2 equal halves

Assumptions of the Model

1. Ubiquitous Inputs - all inputs are available at the same price at all locations so input transport costs are zero.
2. Consumers - they are located along a road and each consumer buys one unit of the good per day.
3. Output price - is the same at all locations.
4. Delivery Costs - firm delivers the product at no charge and makes one trip per customer per day.

Suppose we have a pizza firm that sells one pizza per customer per day and the delivery cost is \$2 per pizza per mile. Suppose the firm faces the following situation.

Locations	W	X	Y	S	Z
Miles from W	0	1	2	3	9
Number of Consumers	2	8	1		10
Monetary Weight	\$4	\$16	\$2		\$20

Monetary weight at each location is sales volume multiplied by the delivery cost per pizza per mile or twice the number of customers at each location.

Point Y is the median location since it splits the total monetary weight of the firm into 2 equal halves; \$20 to the left and right of Y.

The median location is the transport minimizing location because any move away from it will increase delivery costs for the majority of the consumers so total transport cost increases.

The principle of median location explains why large cities get larger

Location	S ₁	S ₂	S ₃	S ₄	L
Demand	4	4	4	4	17

The median location is L since any move to the left of L will increase delivery costs for the majority of the customers causing total transport costs to increase. Thus the concentration of demand in large cities causes them to grow as more firms select the median location.