

AN INVENTORY CONTROL EXAMPLE

Laura Tanner is the owner of Computers of Tomorrow (COT), a retail computer store on Austin, Texas. Competition in retail computer sales is fierce-both in terms of price and service. Laura is concerned about the number of stockouts occurring on a popular type of computer monitor. This monitor is priced competitively and generates a marginal profit of \$45 per unit sold. Stockouts are very costly to the business because when customers cannot buy this item at COT, they simply buy it from a competing store and COT loses the sale (there are no back-orders). Laura measures the effects of stockouts on her business in terms of service level, or the percentage of total demand that can be satisfied from inventory.

Laura has been following the policy of ordering 50 monitors whenever her daily ending inventory position (defined as ending inventory on hand plus out-standing orders) falls below her reorder point of 28 units. Laura places the order at the beginning of the next day. Orders are delivered at the beginning of the day and, therefore, can be used to satisfy demand on that day. For example, if the ending inventory position on day 2 is less than 28, Laura places the order at the beginning of day 3. If the actual time between order and delivery, or lead time, turns out to be four days, then the order arrives at the start of day 7. The current level of on-hand inventory is 50 units and no orders are pending.

COT sells an average of six monitors per day. However, the actual number sold on any given day can vary. By reviewing her sales records for the past several months, Laura determined that the daily demand for this monitor is a random variable that can be described by the following distribution.

Units Demanded:	0	1	2	3	4	5	6	7	8	9	10
Probability:	0.01	0.02	0.04	0.06	0.09	0.14	0.18	0.22	0.16	0.06	0.02

The manufacturer of this computer monitor is located in California. Although it takes an average of four days for COT to receive an order from this company, Laura has determined that the lead time of a shipment of monitors is also a random variable that can be described by the following probability distribution:

Lead Time (days):	3	4	5
Probability:	0.2	0.6	0.2

One way to guard against stockouts and improve the service level is to increase the reorder point for the item so that more inventory is on hand to meet the demand occurring during the lead time. Laura wants to determine the reorder point that results in an average service level of 99%.