



## Schwartz Advisors

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# SA White Paper Series

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## Optimizing Your Service Level Goals

Balancing revenue, gross margin, customer satisfaction  
and the cost of safety stock inventory

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Pete Kornafel started his automotive industry career as a light truck product planner at Ford Motor Company. In 1970 he joined Hatch Grinding Company, his family's auto parts warehousing firm, which he eventually owned and ran as President for nearly 26 years. Pete became President of CARQUEST and a Director in General Parts International Corporation in 1996. In 2001 he became Vice Chairman of CARQUEST. Today, Pete is a Managing Partner at Schwartz Advisors, an M&A Support and Consulting firm supporting the automotive aftermarket.

Pete's passion for the people of the automotive aftermarket is shown in his Chairmanship of the Global Auto Aftermarket Scholarship Committee, which, since its founding in 1998, has given over 2500 scholarships to young people seeking to enter the auto aftermarket industry.

When people say that Pete Kornafel "wrote the book on inventory planning" they mean it literally. Pete's book entitled INVENTORY MANAGEMENT AND PURCHASING: TALES AND TECHNIQUES FROM THE AUTOMOTIVE AFTERMARKET is the definitive primer on auto parts inventory optimization. You can read more on Pete's inventory guidelines at [www.inventorychamp.com](http://www.inventorychamp.com).

# Optimizing Service Level Goals

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Most supply chain software packages forecast demand and measure demand variability. Some track and forecast lead time and lead time variability. Those, along with replenishment cycle information are used to convert service level goals into safety stock amounts. But, very few software packages provide any assistance in establishing optimum service level goals at the item/location level.

The service level goal should strike a balance between desirable revenue, gross margin, customer satisfaction and the cost of carrying safety stock inventory.

## **Inventory Carrying Cost:**

It is straightforward to use an “inventory carrying cost rate” to convert safety stock investment into an annualized cost. The inventory carrying cost rate should include the physical costs of storing and caring for the inventory and the opportunity cost (what you could earn with the funds if they weren’t invested in this inventory). It should also include costs for insurance, obsolescence risk, and shrinkage. As your inventory performance improves, you should raise the carrying cost. This reflects an increased opportunity to add new inventory in additional categories or locations. In our auto parts company we eventually used 40% of the investment as the annual carrying cost. That’s higher than most inventory text books recommend, but we had high inventory performance, too.

## **“Lost sale” cost:**

It is not so straightforward to assign a financial value to achieving a specific service level goal. Here are two extreme examples. A custom furniture company has no safety stock requirement, as its customers will wait for products manufactured to their specifications. A hospital operating room has an extremely high safety stock requirement, as any possible drug or other item must be immediately available.

Auto parts companies (and most hard goods distribution businesses) are in between those extremes. Failure to have a needed item in inventory is likely to result in a lost sale and, in repeated cases, loss of customers.

In our auto parts distribution company, we normally assumed that we lost the entire gross margin if we could not fill an order from inventory. We incurred the operating expenses of taking the order and verifying there was no inventory. Our delivery trucks ran their routes with or without that item. Even if we retained the sale through a special order or backorder, the additional expense of achieving that sale likely resulted in no net contribution to margin.

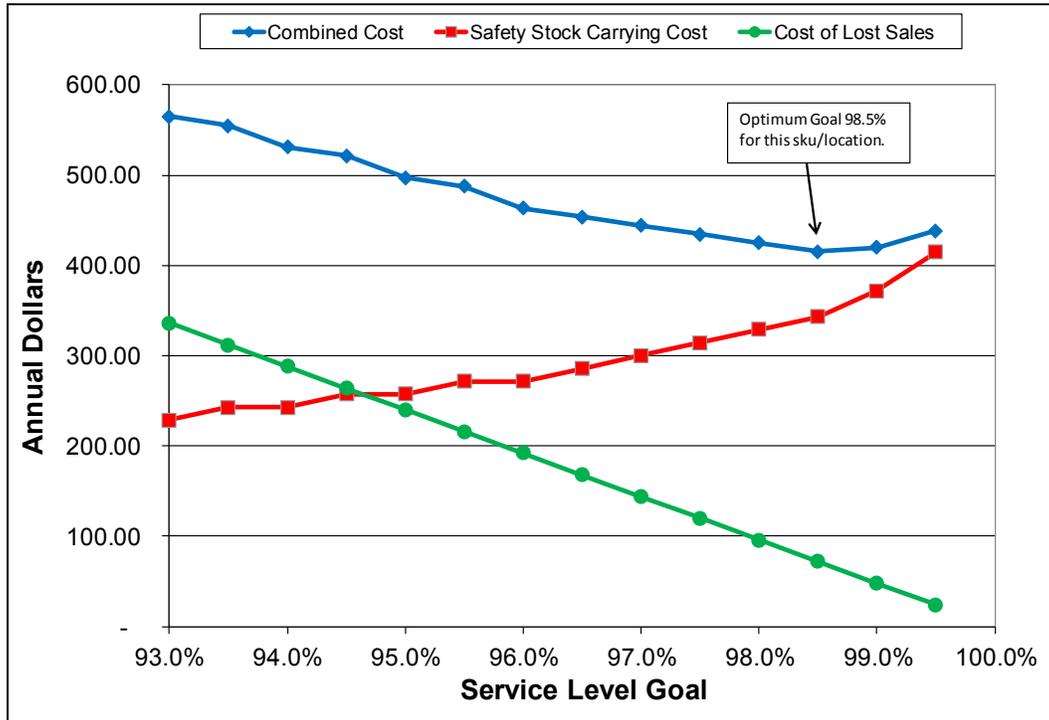
## **Item/Location Level Goals:**

Ideally, service level goals should be set at the item/location level. Fast moving items with small variability in demand and lead time are ideal for an inventory manager. They require very little safety stock to achieve very high service levels. The profit increment from that very high service level (and very low lost sales) justifies a service goal like 99.5%. At the other extreme, expensive, slower moving items with high variability of demand and probably higher variability of lead time require much more safety stock inventory to reach each increment of service level goals. The potential cost from lost sales is lower, too, on these slower moving items. The service level goals to balance these costs should be much lower. In our auto parts inventory, we routinely set service goals of about 90% for these items.

We computed the lost gross margin and the safety stock carrying cost for item/location combinations at various possible service level goals. The lowest total combined cost gave the optimum service level goal for that item/location combination.

**An Example:**

Item Selling Price: \$20	Gross Margin: 20%	Demand: 100 units/month	Demand Variability: 30%
Lead Time: 10 days	Lead Time Variability: 35%	EOQ: 40 units	Normal Order: Weekly
Safety Stock Carrying Cost: 35% of safety stock investment		Cost of Lost Sales: 100% of lost gross margin	



In our auto parts distribution business we updated the service goals monthly and used this for almost 20 years.

We never told our customers we were doing this – we said we were trying to give the best service we could on everything. But, this method gave us both an overall reduction in inventory and a gain in service level.

This process also gave us a large scale “gas pedal” and “brake pedal” to help manage the inventory for mild short term changes. Our business usually had a mild dip in the winter months, and peaked in the spring and summer months. So, in the early fall, for a month or two, we would temporarily lower the “cost of lost sales” to about 75-80% of the forecast gross margin. That lower cost moved the service level goals down roughly 1%. It doesn’t sound like much, but it was enough to trim purchase orders a bit going into the slower months. We set it back to normal once we had entered the seasonal period. And, we raised the lost sale cost above normal to 115-120% of margin for a couple of months in February-March, and that added a bit of extra inventory going into the spring and summer peak.

For many items, the investment in safety stock is larger than the investment in cycle stock, so a tool to optimize that investment is very valuable.

Schwartz Advisors can help you assess your present supply chain systems and inventory performance, and can assist implementing a variety of improvements, including this one to help optimize the investment in safety stocks.