RETAIL GUIDE

Defining Demand Curves and Replenishment Curves

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Retail Guides

Defining Demand Curves and Replenishment Curves

Whatever you call them — curves, shapes, forecasts — they all represent predicted future requirements. However, the point when a sale occurs (when a customer buys) is not the same as the time you need the stock in-store or in the warehouse. Understanding that difference is the core purpose of converting a demand curve into a replenishment curve.

What is a Demand Curve?

A demand curve (or demand shape) shows predicted customer demand over time — usually presented as weekly sales volumes. It reflects when customers will buy and is built from historical sales, trends, events and seasonality.

Key characteristics:

- Based on the week sales actually occur.
- Shows peaks, troughs and trend behaviour.
- Used to forecast future sales so you can estimate required stock.

What is a Replenishment Curve?

A replenishment curve shows when stock must be available to satisfy the demand curve. It factors in lead time, order cadence, minimum order quantities, safety stock and allocation logic. In short — it's the demand curve shifted and shaped to match operational realities so stock arrives in time to meet customer purchases.

Key characteristics:

- Shifted earlier to reflect supplier lead time or internal transit time.
- Smoothed or chunked to match order frequency or minimum order quantities.
- Includes safety stock to protect service levels.

Why Weekly Sales Aren't the Same as When You Need Stock

A sale in week X means the product had to be available on the shelf at the start of week X — or even earlier. In other words, stock must arrive ahead of demand.

Several factors influence the timing gap between when stock is needed and when sales occur:

- **Supplier lead time:** The number of days or weeks between placing an order and receiving stock.
- **Replenishment frequency**: How often you order or deliver stock (daily, weekly, fortnightly, etc.).
- **Minimum order quantities (MOQ) and pack sizes**: These can force rounding up or down, affecting when and how much stock arrives.
- **Allocation rules:** How central stock is distributed across stores or channels.
- **Safety stock:** The buffer you hold to cover unexpected fluctuations in demand.
- **Events and promotions**: Short-term activity that can cause sudden peaks in sales.

Because of these factors, replenishment planning naturally reshapes the demand curve, shifting it earlier to ensure stock is available when customers are ready to buy.

How to Turn a Demand Curve into a Replenishment Curve – A Simple Example

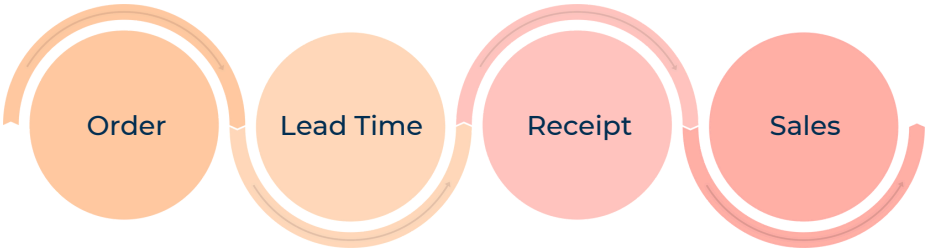
Let's imagine you sell garden furniture.
Your sales forecast shows that customers will start buying more in April, reach a peak in June, and then slow down again towards September. That's your demand curve — it shows when people are likely to buy.

However, to make those sales, you need the stock before customers start shopping. If it takes two weeks for your supplier to deliver, your replenishment curve needs to start earlier.

Here's what you might do:

1. **Start with your sales forecast.** You can see when demand rises and falls.
2. **Work backwards from delivery times.** If you need products on sale in early April, you'll place your orders in March to allow time for delivery.
3. **Add a small buffer**. Keep a little extra stock in case demand is higher than expected or a delivery is delayed.
4. **Think about order size and timing.** You might prefer to order once a month in larger quantities rather than weekly in smaller ones — whichever fits your space and supplier agreements.
5. **Create your plan.** Map out when orders should be placed and when stock will arrive. This becomes your replenishment curve — it mirrors demand but starts slightly earlier so you're ready for it.

In short, the demand curve tells you when customers will buy, and the replenishment curve shows when you need to act to have the stock ready.



Practical tips & best practice

- Use statistical safety-stock if you have enough historical data: Safety stock = demand during lead time. If not, use a conservative percentage based on variability.
- Keep demand curves at the right level — product, category or department — depending on how much an individual SKU skews the group curve.
- Document events (promotions, stock-outs, weather) so you can exclude or annotate anomalies.
- Align planning horizons — short lead times allow tighter, more reactive replenishment; long lead times require more smoothing and higher stock.
- Review forecasts regularly and re-run replenishment curves when assumptions change (supplier lead time, product lifecycle, upcoming promotions).
- Use visual checks — overlay demand and replenishment curves to spot gaps or excess inventory visually.

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