

# Designing supply chain networks that matter

Uncomplicating and transforming complexity into an operating advantage through supply network design.

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In today's increasingly volatile geopolitical business environment—characterized by fluctuating freight rates, persistent labor shortages, evolving customer expectations, sourcing and tariff uncertainty, and compressed product lifecycles—organizations are recognizing that supply chain network design is no longer a luxury but a strategic necessity. Rather than simply reacting to disruption, leading companies are leveraging network design to proactively shape resilient, cost-effective, and service-oriented supply chains. Companies must align the right problems with the appropriate project types and methodologies to deliver meaningful, measurable, and lasting impact.

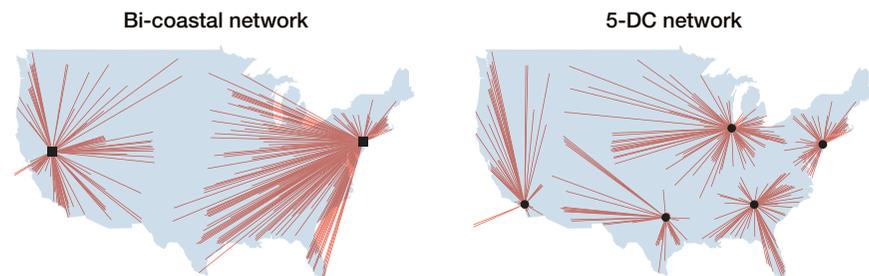
## What is supply chain network design?

Supply chain network design, at its core, aims to optimize the entire end-to-end supply chain ecosystem—from suppliers and manufacturers through warehouses and distribution centers, all the way to retailers and end customers. Often referred to as “network modeling,” this process involves building a mathematical model that

represents the supply chain's structure and operations. The goal is to identify the optimal number and locations of facilities, as well as the most efficient product flows between them (see Figure 1). By testing various scenarios and constraints, network design enables companies to make data-driven decisions that balance cost, service, and flexibility across the entire supply chain network.

FIGURE 1

### Supply chain network configurations



Source: Author

## The hidden cost of suboptimal networks

Across hundreds of projects conducted by our supply chain consultancy, we consistently identify between 5% and 15% in annual cost avoidance through supply chain network design. Supporting this, Gartner has identified through their research that approximately 80% of a supply chain’s total costs are effectively locked in by the location of its facilities—a figure that mirrors the well-known principle that 80% of a product’s cost is determined during the design phase (Figure 2).

This insight has major implications: companies aiming to improve inventory turns, increase transportation utilization, or shift transportation modes may only realize limited gains if their facility network is fundamentally misaligned. In other words, operational improvements can only go so far when the structural foundation of the supply ecosystem—the network itself—is suboptimal.

Recognizing this, many organizations are turning to supply network design not only to reduce costs but to build more resilient, scalable, and responsive supply chains. A well-executed network design study offers a range of strategic and operational benefits that go far beyond cost savings.

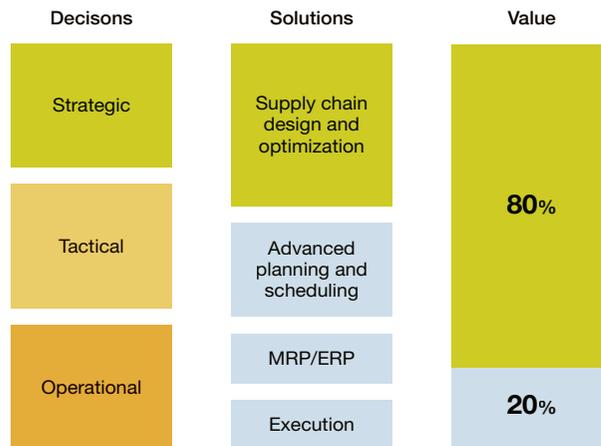
## Unlocking value through supply network design

Beyond mitigating hidden costs, supply network design offers a multitude of strategic and operational benefits that unlock significant value across the supply network. Among the most compelling reasons to undertake such a study is its ability to “uncomplicate” network options, tradeoffs, and complexity.

Supply chain networks are inherently complex and intricate, with vast amounts of data describing flows, constraints, options, and costs. Network optimization tools can evaluate thousands of potential facility

FIGURE 2

## How strategic decisions within a supply chain network design study



Source: Author

configurations in a fraction of the time it would take using spreadsheets or manual analysis. These tools leverage modern computing power and algorithms to deliver faster, more accurate ecosystem supply network recommendations.

Another key benefit is the ability to perform sensitivity analysis. Once a supply chain is modeled and calibrated to reflect actual business flows and costs, companies can test multiple variables like growth rates, geopolitical uncertainty, fuel prices, operating costs, inventory turns, and simulated disruptions to see how the optimal network might respond and pivot. This helps organizations anticipate tipping points and plan proactively.

Network design also supports strategic sourcing and manufacturing decisions, especially in an environment of tariff and geopolitical uncertainty. Whether adding a new production line or evaluating plant closures, a network model can quantify the impact on cost, service, and inventory. It’s equally valuable during major events such as mergers, divestitures, or disruptions like natural disasters or pandemics. A working model enables rapid scenario planning—identifying which products to reroute or

which customers to serve from alternate locations.

Ultimately, the most successful businesses use network design to define the optimal number, location, and role of facilities, as well as the flow of products between them. These decisions are critical to achieving both cost efficiency and service excellence. More and more companies are realizing that network optimization isn't just a tool—it's a competitive advantage.

### **Project types: Matching design to business need**

When undertaking a supply chain network optimization project, companies often seek answers to a wide range of strategic questions. Network optimization leverages data and modeling to support informed decision-making across many scenarios. Following are several common project types where network design delivers significant value.

**1. Merger/acquisition.** Before or after a merger or acquisition, companies use network optimization to understand the optimal distribution network of the combined companies. Network optimization helps understand questions like: are there redundant facilities in the network? Should the distribution centers be in a different location based on the combined customer demand?

**2. Cross divisional synergies.** Companies with separate divisions or business units often ask if there are synergies by combining the divisions in the same warehouse(s). For example, could products from multiple divisions be shipped together or could smaller warehouses be combined into a single location? Utilizing network optimization can help companies understand if opportunities exist and the potential benefits.

**3. Capacity challenges.** Many companies have

capacity challenges either in distribution or manufacturing. Network optimization can be utilized to address how to best alleviate those challenges. For example, for distribution capacity issues, network optimization can help with the choices of expanding existing locations vs. locating to a new geography vs. keeping the current facility and adding an additional distribution node to the network. In manufacturing, network optimization can help determine where to add a new plant or a new line within a network of plants. Conversely, when there is too much capacity in a supply chain, network optimization can help determine which facility, plant or line to remove or close.

**4. Customer experience.** To meet customer expectations or experience, companies use network optimization to determine the appropriate supply chain network to meet those requirements. For example, the number of distribution centers increases as service levels (transit time) increase. Many other “what if” analyses/scenarios can be performed to understand the appropriate supply chain network based on varying current or potential future customer expectations.

**5. Labor shortages.** Labor has been more difficult to find over the last few years than ever before. Network optimization can quantify the cost differences in various network configurations. For example, a company might want to add additional DCs to limit the number of workers required at a certain DC. Also, if the minimum cost network puts DCs in locations where labor is more challenging to find, network optimization can quantify the cost differences of moving distribution from one location to another.

**6. Sourcing/manufacturing changes.** Companies either considering or changing manufacturing

or sourcing from one location to another usually understand the cost differences. Network optimization can help companies understand the total landed cost (product, facility, and transportation). Network optimization can also help determine if there is capacity available in the short and long term to manage changes in sourcing.

**7. Carbon footprint.** Companies may want to or may be required by regulations to reduce their carbon footprint or environmental impact. Network optimization can be used not only to minimize cost but also to lower emissions and environmental impact based on the number of distribution locations and/or transportation modes.

Once a digital “twin” model is built, these questions can be answered quickly and tested under various assumptions over time—making network optimization a powerful tool for both strategic planning and operational agility.

### **Successful projects: What sets them apart**

Executing a supply chain network optimization initiative is a significant undertaking—one that requires a thoughtful and disciplined project approach. Leveraging many years of experience and “lessons learned,” we’ve identified several key factors that consistently contribute to successful outcomes. While not exhaustive, the following elements have proven to be critical in delivering tangible results.

- **Clearly defined scope and objectives.** A well-scoped project provides direction, maintains momentum, and keeps the team aligned. Clearly articulated objectives help prevent scope creep and ensure that the team remains focused on solving the right problems. Upfront alignment of goals also increases the likelihood of staying on schedule and within budget.

- **Executive sponsorship and support.** Strong leadership backing signals that the project is a priority. Executive sponsors can help remove roadblocks, secure resources, and reinforce the importance of the initiative across the organization. Projects with visible leadership support are also more likely to see their recommendations implemented.

- **Structured milestones and checkpoints.** Establishing defined milestones creates natural checkpoints for progress and decision-making. These stages allow the team—and often key stakeholders—to validate assumptions, review findings, and align on next steps. Milestones also help maintain accountability and momentum throughout the project lifecycle.

- **Appropriate level of analytical detail.** The analysis must be detailed enough to ensure credibility, but not so granular that it becomes unwieldy or distracts from strategic goals. Network design projects typically begin with extensive data collection—some of it clean, some not. Experienced modelers know when and where assumptions can be made without compromising the integrity of the results.

- **Engaged and responsive project team.** While much of the heavy lifting is done by the consulting team after data collection, client-side engagement remains essential. Timely responses to clarification requests, validation of assumptions, and participation in key decisions are critical to keeping the project on track and ensuring that the final recommendations are both accurate and actionable.

### **When the rubber meets the road**

By understanding *why* supply network design is crucial, recognizing the different *types* of projects it entails, and diligently applying the *keys* to successful project execution, organizations can build more resilient, efficient, and customer-centric supply chain network ecosystems. •