WHITEPAPER

Redesigning the Manufacturing Warehouse Network for What Comes Next

Why so few manufacturing warehouse footprints were planned, and what it takes to build one deliberately.



WSI®

Executive summary



According to WSI's recent survey, **three-quarters** of U.S. manufacturers say their warehouse network evolved organically over time rather than being designed strategically. Nearly the same share says their current model was built for a different operating environment. Now, **88%** expect their U.S. warehouse and distribution footprint to change within the next 18 months.

That does not mean those networks were poorly designed from the start. Many were never designed as networks at all. Warehouses were placed near plants, capacity was added when production grew, and new locations came through acquisitions, customer requirements, or local availability. Each decision could make sense independently while gradually creating a footprint that no one would build the same way today.

The conditions behind those decisions have changed:

- Production and sourcing are shifting.
- Manufacturers are carrying additional inventory against disruption.
- Industrial real estate costs and facility requirements have moved.
- Compliance varies by product and jurisdiction.
- Customers expect faster service, while leaders need better visibility across multiple sites and logistics providers.

The result is an important distinction between **network optimization** and **strategic network redesign**. Optimization improves the network a manufacturer already has. Redesign asks whether that network still fits the business.

For manufacturers dealing with persistent cost, capacity, service, or risk problems, that second question is becoming harder to avoid.

About the research

In April 2026, WSI commissioned independent research firm TrendCandy to survey 306 supply chain, operations, and logistics leaders at U.S. manufacturing companies with annual revenue of at least $50 million. Respondents represented electronics, metals, food and beverage, chemicals, building materials, and other industrial sectors. The survey has a margin of error of +/-4% at the 95% confidence level.



The network is now a strategic operating decision



Warehousing has traditionally been viewed through a fairly narrow operating lens: *Where is there space? What does it cost? How close is it to production?*

Those questions still matter but they are no longer sufficient.

A manufacturing warehouse network affects how much inventory a company carries, how far materials travel before they reach production, how quickly finished goods reach customers, and how much exposure exists when a facility or transportation lane goes offline. It can also determine whether a manufacturer has the right permits, containment, rail access, labor pool, or building infrastructure for the products moving through the operation.

The market around that footprint is moving as well. Cushman & Wakefield reported[1] that U.S. industrial net absorption reached **62.1** million square feet in the second quarter of 2026, up **21%** from the previous quarter. National vacancy fell to **6.9%**, while average asking rents were **47%** higher than five years earlier. Manufacturers and 3PL providers together accounted for more than **55%** of leasing activity through midyear.

At the same time, trade and input-cost uncertainty continue to affect manufacturing decisions. In the National Association of Manufacturers' Q2 2026 outlook survey,[2] **71.8%** of respondents cited trade uncertainty as a business challenge, while **83.1%** cited rising raw material costs.

A warehouse footprint shaped by yesterday's transportation costs, sourcing patterns, and service requirements cannot be assumed to remain the right footprint simply because the buildings are already there.

How manufacturing warehouse networks were built



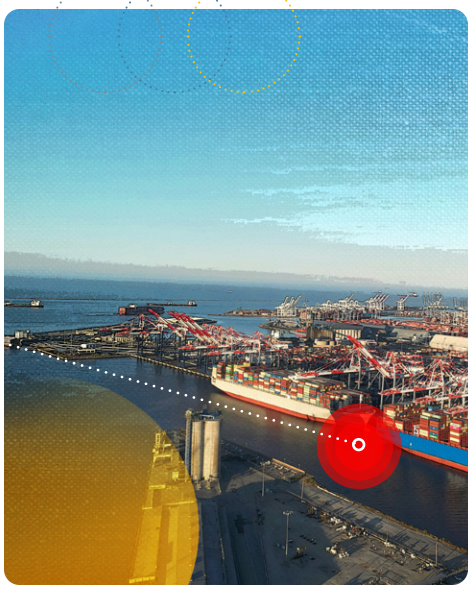
For much of modern manufacturing, the logic behind warehouse location was straightforward. The plant was the center of the network.

Inventory needed to remain close to production and finished goods moved from the plant to a warehouse or regional distribution center before continuing to a customer. Keeping storage close reduced transfer distances and gave operations teams direct control over materials supporting production.

WSI's research shows how strongly that model persists; **83%** of manufacturers describe their warehouse networks as highly or somewhat centralized. **Fifty-nine percent** say physical proximity between a warehouse and manufacturing plant is very important, yet only **35%** actually have their primary warehouse within 10 miles of production.

Jesse Jones, VP Operations at WSI, has seen the same production-centered logic over the course of his career. "There are a lot of situations where warehouses were built in close proximity to a manufacturing site. And based on transportation and real estate costs at the time, that made the most sense."

Customer conversations reflect the same pattern. For one manufacturer interviewed, the warehouse network evolved through practical decisions made over time. They added space when capacity tightened, used different locations for different product needs, and adapted the footprint as the business changed. Each move addressed a real need, but together they created a network that required more coordination, visibility, and control than the original decisions were designed to support.



Globalization adds another layer. Materials that once moved relatively short distances began arriving from suppliers around the world. Longer inbound lead times increased exposure to disruption and, in some cases, created a need to hold more raw material close to production. Jones noted that manufacturers with limited plant storage may need nearby warehouse capacity precisely because globally sourced materials have longer lead times and greater supply risk.

Today, **75%** of WSI survey respondents say their network grew organically rather than through strategic design. Another **73%** say the model they have was designed for a different operating environment.

The network did not necessarily start wrong. The business around it changed.

Why legacy networks are falling behind

The clearest signal is coming from the problems manufacturers are already trying to solve. Warehouse operating costs were the top operational challenge in WSI's study, cited by **48%** of respondents. Storage capacity and inventory accuracy and visibility each followed at **35%**, while **33%** cited transportation costs.

Individually, those can look like warehouse problems. Collectively, they can indicate a network problem.

Production and supplier geography are moving

Reshoring and supply chain regionalization are changing where inventory enters the network and where it needs to sit. Thirty-five percent of manufacturers in WSI's survey are adding U.S. warehouse capacity to support reshored production, while 34% are repositioning facilities closer to new manufacturing locations.

The Reshoring Initiative reported in April 2026 that annual reshoring job announcements had risen from approximately 11,000 in 2010 to 244,000 in 2025.[3] Whether a company is bringing production home, adding domestic suppliers, or simply diversifying its sourcing base, those moves can change transportation lanes and warehouse requirements.



Resilience requires physical capacity



Manufacturers have spent the last several years adding protection against supply disruption. WSI found that **63%** increased safety stock or inventory buffers during the previous 24 months. **Half** added excess storage capacity, and **46%** added a warehouse in another region as a backup.

Those measures create resilience, but they also create cost. More inventory requires space. Another node creates another inventory position to manage. Backup capacity can sit underutilized during normal periods.

Rail and chemical storage are clear examples. A manufacturer cannot optimize its way into rail access if the facility has no rail connection. Likewise, changing chemical regulations or product requirements can make a building unsuitable if its containment capabilities no longer meet the need. At that point, the constraint is structural.

The question is no longer whether resilience has value. It is where that resilience belongs in the network and how much the manufacturer is willing to pay for it.

The building itself matters more

The industrial real estate market illustrates another structural shift. Cushman & Wakefield found that demand in 2026 was concentrated in newer facilities and large-format buildings.[1] Warehouses built since 2020 recorded 137 million square feet of net absorption through midyear, with occupiers favoring higher clear heights and greater power capacity to support automation and advanced systems.

That matters for manufacturers evaluating a legacy facility. A building can be well located and fully depreciated while lacking the power, clear height, containment, dock configuration, or transportation access required by the future operation.





Optimization has a limit



Optimization remains essential. A well-positioned warehouse can still benefit from better slotting, labor planning, routing, automation, storage density, or inventory policies.

The distinction lies in the boundary of the problem.

Jones says, "You need to take a step back and look at the structure itself. Optimizing a particular facility or a group of facilities individually isn't going to address inefficiencies that are baked in."

For example:

- A facility may achieve excellent labor productivity while remaining hundreds of miles from where demand has shifted.
- Automation can lower handling cost without addressing excessive freight.
- Higher storage density may delay a capacity problem while continuing to place inventory in the wrong region.

The same problem arises when resilience is layered onto the existing network without reconsidering its design. Adding safety stock helps only if that inventory is positioned where it can protect production or service. Adding another location creates optionality, but it can also fragment inventory and require additional transfers.

Past capital investments make the decision harder. Nearly **74%** of WSI survey respondents said previous facility investments had delayed or prevented warehouse changes to some degree.

Those investments belong in the transition analysis. They should not automatically define the future network.

Network optimization	Strategic network redesign
Improves performance within the existing footprint	Tests whether the footprint itself is still appropriate
Treats major locations as largely fixed	Reconsiders locations, facility roles, and operating models
Addresses labor, layout, routing, and throughput	Addresses structural cost, capacity, service, and risk
Works from current flows	Models alternative future flows
Best when the basic network remains sound	Necessary when the underlying assumptions have changed

The first task, then, is diagnosing the source of the problem.

Jones recommends, "approaching warehouse cost, capacity, and service issues through root-cause analysis rather than assuming every symptom points to network redesign."

A labor shortage may be a site problem; persistent freight cost or lead-time issues may be structural. The right response depends on the cause.

Designing for today's manufacturing supply chain

A strategic redesign begins by defining what the network has to accomplish.

Start with operating requirements

Production continuity, inventory policy, service commitments, regulatory requirements, and acceptable risk should be established before individual buildings are treated as permanent pieces of the design.

Product characteristics matter as well; raw materials supporting production may need a different network than finished goods serving national customers. Hazardous materials can require specialized buildings. High-volume products may justify regional inventory, while slow-moving SKUs can often remain centralized.

A future-state design may therefore combine company-operated plant warehouses, dedicated facilities, shared 3PL capacity, rail-served storage, or specialist locations. The right model can vary by node.

The combination approach is consistent with WSI's survey as manufacturers are moving in different directions rather than converging around a single operating model. Some are outsourcing, some are bringing operations back in-house, and others are consolidating. What works depends heavily on the product and operational requirements.

Measure the full cost of the flow

Facility cost alone is a poor proxy for network cost. Jones says, "It's really understanding the total end-to-end cost and other implications."

That calculation can begin with inbound raw materials and continue through the manufacturing facility, downstream warehouse, and final customer. Transportation and storage belong in the model, along with additional handling, damage exposure, inventory carrying cost, and lead time.

A lower warehouse rent does little good if the location requires repeated shuttles or extends transportation lanes enough to erase the savings.

The same principle applies to capacity. Space may be a hard constraint, while labor can sometimes be added. Automation equipment can create another ceiling. Looking at those limitations across the complete network shows where capacity actually exists rather than where an individual facility appears full.



Design against several futures

No current forecast deserves enough confidence to become the sole basis for a long-lived network.



Deloitte's 2026 Manufacturing Industry Outlook recommends preparing for multiple economic scenarios rather than assuming one trajectory.[4] Its manufacturing research also points to trade volatility and ongoing supply chain complexity as reasons manufacturers are using technology for route analysis, risk identification, cost modeling, and scenario planning.

NIST research similarly supports scenario-based thinking. Its work on agent-based supply chain models examines how disruptions can propagate downstream and how patterns emerge across an interconnected network. NIST's 2026 Strategic Supply Chain Network workshop[5] focused on moving from siloed operations toward coordinated, data-informed responses with system-wide visibility.

A manufacturer might test what happens after a new plant opening, a large customer win, a demand decline, a supplier disruption, or a material change in tariff exposure. Regulatory and permitting changes can also alter the suitability of a location.

Jones specifically calls out demand shifts because a major customer gain or loss can change the network as materially as a production move.

Put a number on resilience

Resilience cannot remain an abstract goal.

WSI's survey shows how divided manufacturers are on the tradeoff. Twenty-nine percent prioritize efficiency when designing the network, 34% prioritize resilience, and 35% give them equal weight.

29% prioritize efficiency when designing the network

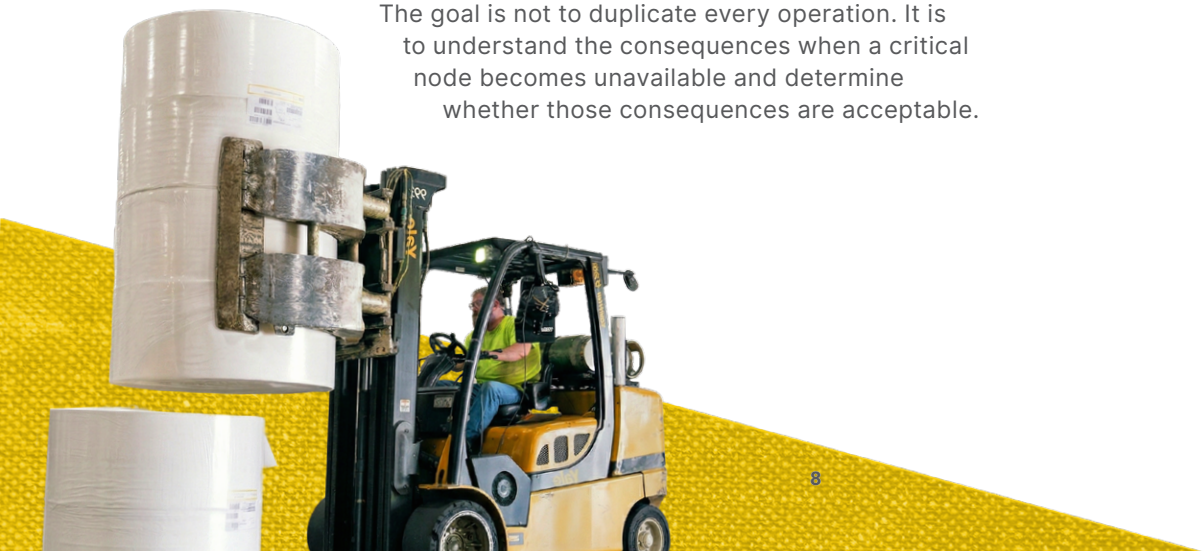
34% prioritize resilience when designing the network

35% give them equal weight when designing the network

That balance should be made explicit. Leaders can establish how much volume needs to be redirected if a site goes down, how much inventory is required to protect production, or how long alternate capacity can take to activate.

Extreme disruptions belong in the analysis even when they are unlikely. Jones cited warehouse losses from tornadoes and fires as examples of why manufacturers have to decide how much risk they are prepared to concentrate in one node.

> The goal is not to duplicate every operation. It is to understand the consequences when a critical node becomes unavailable and determine whether those consequences are acceptable.



Build system-level visibility

A network cannot be managed strategically if each warehouse is viewed separately. Jones says, “System-level visibility is absolutely critical. Otherwise, you’re making decisions one site at a time.”

The National Association of Manufacturers identifies resilient, transparent supply networks as a core 2026 manufacturing trend.[6] Its research points to real-time data, predictive modeling, digital traceability, and forecasting models that incorporate external disruption indicators.

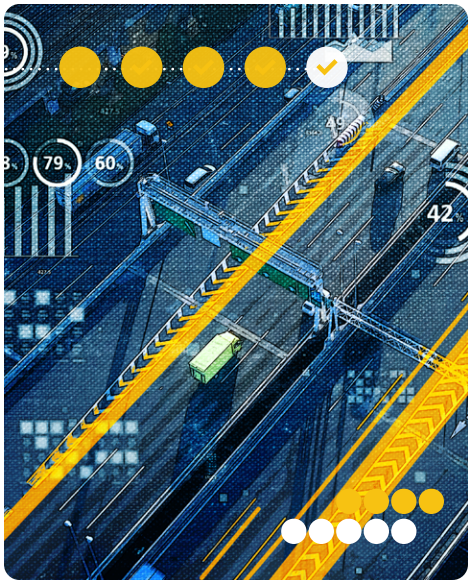
NIST reaches a similar conclusion.[7] Better visibility supports earlier identification of supply risk, inventory decisions, and contingency planning, while traceability frameworks are being developed to connect data across increasingly complex manufacturing supply chains.

That requires common definitions across the network. Total delivered cost, capacity utilization, inventory, lead time, service, and risk must be measured consistently enough to compare one node with another.

Multiple logistics partners can complicate that work. In WSI’s survey, **75%** agreed that managing several 3PL relationships creates more complexity than value, while **60%** had ruled out a provider because it lacked experience with their industry or product type.

Customer conversations reinforce how quickly network complexity can become an operating issue. One manufacturer using multiple warehouse locations described the real value comes from maintaining continuity across sites: consistent product handling, reliable communication, visibility into where inventory sits, and confidence that the broader network is being managed as one system rather than as a collection of disconnected buildings.

Technology can help normalize data from separate systems, but governance still matters. If AI or other analytical tools are used in network analysis, sensitive operational and customer data also needs appropriate security controls. Jones cautioned that manufacturers need to understand how the tools they use protect the information being fed into them.



> **System-level visibility is absolutely critical**. Otherwise, you’re making decisions one site at a time.”



Jesse Jones
VP Operations at WSI





A practical path from inherited network to deliberate design



Strategic redesign does not mean rebuilding the entire warehouse footprint at once. The work can be staged.

1. Establish the current-state baseline.

Start with 12 to 24 months of actual facility, inventory, order, transportation, labor, and cost data. Document the role of every location, its true capacity, major inbound and outbound flows, lease or ownership commitments, compliance capabilities, and known constraints.

2. Identify the source of the gap.

Separate problems that can be addressed within a facility from those created by the network itself. Root-cause analysis should precede a solution. If the issue is picking productivity, redesigning the national footprint is unnecessary. If excess freight is built into where inventory sits, another labor initiative will not solve it.

3. Develop several future-state scenarios.

One option may retain the current footprint with targeted improvements. Another may consolidate sites. A third may add regional capacity or move specialized products into a different facility model. The purpose is to compare viable choices rather than force the data toward a predetermined answer.

4. Stress-test the scenarios.

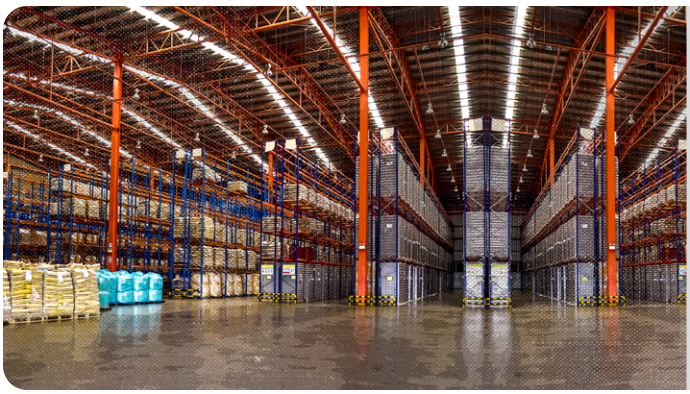
Evaluate normal operating cost but also test each model against changes in demand and supply. Examine what happens when production moves, a critical site loses capacity, transportation costs change materially, or permitting requirements alter the use of a facility. NIST's supply chain work reinforces the value of looking across the system rather than treating disruptions as isolated events.[8]

5. Build a transition roadmap.

Network redesign is an operating change, not a map exercise. Inventory has to move without interrupting production. Customer service must continue. Systems need to connect, employees need to be trained, and permits may have to be secured before a new location can handle product. Lease expirations and capital cycles can help determine the order of implementation.

6. Set the conditions for the next review.

A strategically designed network should still change when its assumptions do. A new manufacturing site, acquisition, major customer shift, sustained overflow, supplier relocation, regulatory change, or significant transportation-market movement should trigger a fresh review.



NIST's Manufacturing Extension Partnership[9] makes a similar case for continuous supply chain assessment, emphasizing visibility into demand, inventory, capacity, cost, and customer experience alongside scenario evaluation and contingency planning.

The objective is not to create a perfect network and freeze it. It is to establish a process that keeps the physical network aligned with the business.

Intentionality is the advantage

Only **12%** of manufacturers in WSI's survey expect their warehouse footprint to remain unchanged over the next 18 months. The rest anticipate expansion, consolidation, a change in operating model, or active evaluation of their options.

There is no single configuration toward which they are all moving. That is the point.

A manufacturer does not automatically need more warehouses, fewer warehouses, or more outsourcing. It needs a clear reason for every node it operates. Each facility should have a defined role in supporting production, inventory, service, compliance, and an acceptable level of risk.

Strategic network redesign creates that discipline. It challenges inherited assumptions before another lease is signed, another buffer is added, or another site receives capital simply because it is already part of the network.

The strongest networks over the next decade will not be the ones built around a perfect forecast. They will be the ones able to perform when the forecast changes.

For manufacturers that determine a different physical footprint is needed, formal network modeling may be handled internally or with a specialized design or engineering partner.

The analysis identifies where the network needs to go. The operating model determines whether the redesign works once it gets there.



Resources:

1 **Cushman & Wakefield, Q2 2026 U.S. Industrial MarketBeat.** Q2 2026 U.S. Industrial MarketBeat

2 **National Association of Manufacturers, Q2 2026 Manufacturers' Outlook Survey.** NAM Q2 2026 outlook survey

3 **Reshoring Initiative, 2025 reshoring update and 2026 industry survey announcement.** Reshoring Initiative 2026 update

4 **Deloitte, 2026 Manufacturing Industry Outlook.** Deloitte 2026 Manufacturing Industry Outlook

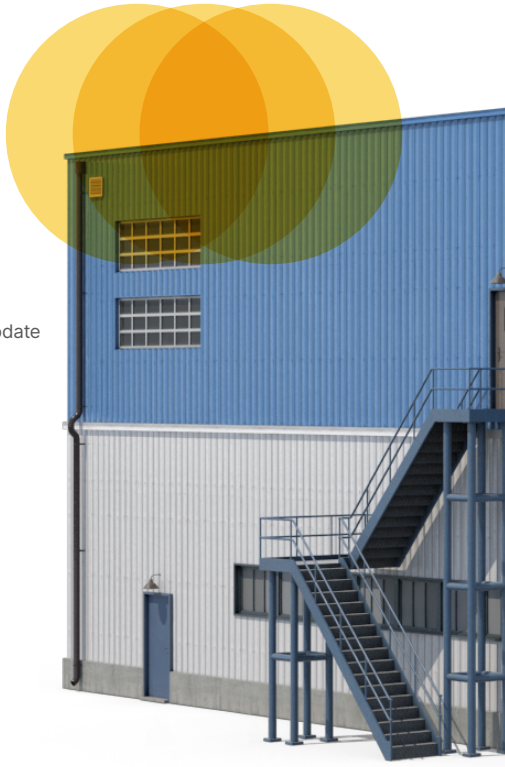
5 **NIST, Building the Strategic Supply Chain Network.** NIST strategic supply chain network

6 **National Association of Manufacturers, Manufacturing Trends 2026.** NAM Manufacturing Trends 2026

7 **NIST, Supply Chain Traceability Manufacturing Meta-Framework.** NIST supply chain traceability framework

8 **NIST, Supply Chain Disruption and Agent-Based Modeling.** NIST supply chain disruption modeling research

9 **NIST Manufacturing Extension Partnership, Building Resilient Supply Chains and Supply Chain Optimization resources.** NIST resilient supply chains



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Warehouse Specialists, LLC (WSI) is one of the largest privately held logistics companies in the United States, providing customized warehousing, transportation, fulfillment, and contract logistics services for manufacturers and retailers nationwide. Since 1966, WSI has helped companies improve supply chain performance through flexible solutions and specialized expertise. Along with a nationwide network of strategically located warehouses, the company's fulfillment division, Kase, supports direct-to-consumer, B2B, wholesale, and omnichannel operations for brands across North America. WSI also provides Freight Brokerage services via its subsidiary, WSI Freight Solutions.

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