



# **Certified in Logistics, Transportation and Distribution**

**Designing or Redesigning a  
Logistics Network**





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# **Designing or Redesigning a Logistics Network**

## **1. Strategic Role of the Logistics Network**

Designing a logistics network starts with understanding its strategic role in supporting business goals such as market expansion, cost reduction, or customer service improvement. Logistics network design aligns facility locations, inventory placement, transportation flows, and service policies with long-term competitive strategy. Companies may prioritize speed, flexibility, or cost leadership depending on customer expectations. A strong strategic foundation ensures that decisions about distribution centers (DCs), cross-docks, warehouses, or transportation modes support overall company objectives while maximizing value and minimizing risk.

## **2. Customer Service Requirements**

Customer service expectations—such as order lead time, delivery frequency, fill rate, customization needs, and responsiveness—drive logistics network design. Understanding customer segments and service priorities helps determine the number, type, and location of facilities. High service requirements may require more decentralized networks, while cost-focused customers may accept longer lead times. Customer service also influences transportation modes, stocking strategies, and safety stock levels. Mastering this concept ensures that the network delivers value while meeting or exceeding customer expectations.

## **3. Demand Forecasting and Market Analysis**

Accurate demand forecasting informs network capacity, warehouse sizing, transportation planning, and inventory

placement decisions. Market analysis evaluates demand patterns, seasonal variations, geographic distribution, growth trends, and customer clusters. Understanding demand helps avoid overbuilding capacity or creating bottlenecks that reduce service performance. Network redesign initiatives often begin with updated demand projections to ensure facilities are sized appropriately and located near growth markets. This concept is crucial for balancing cost efficiency with service reliability.

#### **4. Facility Location Analysis**

Facility location analysis determines optimal geographical placement of warehouses, distribution centers, or cross-docks. Methods include center-of-gravity, load-distance analysis, network modeling, and optimization algorithms. Factors such as transportation costs, labor availability, infrastructure quality, supplier and customer proximity, government incentives, taxes, and risk profiles all influence location decisions. A well-designed facility location strategy reduces transportation time and cost while improving service performance. Understanding how to evaluate trade-offs in location decisions is a core CLTD competency.

#### **5. Transportation Network Design**

Transportation network design defines how goods move through the supply chain—from suppliers to manufacturing, DCs, retailers, and customers. It includes mode selection, routing, fleet strategy, carrier partnerships, and consolidation opportunities. Transportation costs often represent the largest portion of logistics expenses, making network design decisions critical. The goal is to create efficient, flexible, and cost-effective transportation flows

that align with service expectations. Mastery of this concept ensures the logistics network supports high reliability and responsiveness.

## **6. Warehouse and Distribution Center Design**

Warehouse design involves determining the layout, material handling systems, automation level, storage methods, and operational processes needed to support efficient flow. Factors include throughput requirements, SKU characteristics, picking methods, labor availability, and safety considerations. Well-designed distribution centers reduce handling cost, minimize travel time, and support accurate, fast order fulfillment. Redesigning a logistics network often requires evaluating whether existing facilities can support future demand or require expansion or reconfiguration. This concept forms a key performance driver in logistics networks.

## **7. Inventory Positioning and Allocation**

Inventory positioning decides where to hold stock in the network and at what quantities. Centralized inventory reduces safety stock and holding costs but may increase transport time to customers. Decentralized inventory improves responsiveness but raises carrying costs. Inventory decisions must align with customer service requirements, product characteristics, and demand variability. Proper allocation reduces stockouts, excess inventory, and obsolescence. This concept ensures that inventory supports both service levels and cost efficiency throughout the logistics network.

## **8. Network Modeling and Optimization Tools**

Advanced modeling tools—such as linear programming, mixed-integer optimization, simulation, and heuristics—help evaluate logistics network configurations and identify the optimal structure. These tools assess trade-offs among facility location, transportation routes, inventory levels, and cost. Software solutions allow scenario testing to reflect market changes, demand shifts, or risk factors. Mastering modeling concepts equips logistics professionals with analytical skills required to build resilient and cost-effective networks.

## **9. Cost-to-Serve Analysis**

Cost-to-Serve analysis measures the true cost of serving different customer segments or SKUs by evaluating activities across storage, picking, transport, order processing, and returns. This approach reveals profit leakage, high-cost customers, and inefficient logistics flows. Understanding Cost-to-Serve helps determine where network redesign can reduce unnecessary complexity or realign resources. It is vital for selecting appropriate service levels, optimizing allocation, and identifying improvement areas in the logistics network.

## **10. Total Landed Cost (TLC)**

Total Landed Cost accounts for all expenses associated with sourcing, transporting, storing, and delivering products. It includes freight, duties, taxes, handling, insurance, administrative costs, and risk-related expenses. TLC helps compare supplier options, location strategies, and distribution models. Understanding TLC is crucial when designing global logistics networks where costs can be

dispersed across multiple stages. Evaluating TLC enables better decisions that balance service performance with holistic cost efficiency.

### **11. Global Logistics Considerations**

Global logistics network design must consider customs regulations, trade agreements, lead times, political stability, currency fluctuations, and global transportation reliability. Regional differences in infrastructure, labor availability, and cultural practices influence network configuration. Understanding free trade zones, bonded warehouses, and global sourcing strategies is essential. A strong global logistics design minimizes risk while ensuring efficient cross-border flows. Mastering this concept is critical for companies with international supply chains.

### **12. Risk Management and Resilience**

Effective logistics networks must withstand disruptions such as natural disasters, geopolitical conflicts, supplier failures, transportation breakdowns, or capacity shortages. Risk management involves identifying vulnerabilities, assessing probability and impact, and developing mitigation strategies. Resilient designs include multi-sourcing, redundant capacity, buffer stocks, diversified transportation modes, and contingency routes. Understanding resilience ensures that the logistics network maintains service continuity despite uncertainties.

### **13. Sustainability and Green Logistics**

Sustainability considerations include reducing carbon footprint, optimizing energy usage, adopting renewable materials, and minimizing waste. Green logistics evaluates

transportation emissions, packaging efficiency, load consolidation, and warehouse energy performance. Designing sustainable networks is increasingly important due to regulations, customer expectations, and corporate responsibility goals. Understanding sustainable design ensures logistics networks balance economic performance with environmental stewardship.

#### **14. Technology Integration in Network Design**

Technologies such as WMS, TMS, YMS, RFID, automation, robotics, IoT sensors, digital twins, and route optimization systems play crucial roles in network performance.

Integrating technology ensures accurate data, faster decision-making, and improved process efficiency.

Technology also influences facility design, labor requirements, and inventory accuracy. Understanding the role of technology helps logistics professionals design future-ready, intelligent networks.

#### **15. Scenario Planning and Sensitivity Analysis**

Scenario planning evaluates how changes in demand, fuel prices, labor costs, regulations, or service expectations impact the network. Sensitivity analysis determines which variables most significantly influence cost or performance. This tool supports decisions under uncertainty and helps organizations test network robustness. Mastering scenario planning ensures readiness for future disruptions and strategic shifts.

#### **16. Make-or-Buy and Outsourcing Decisions**

Network design often requires deciding whether to operate facilities internally or outsource to third-party logistics (3PL)



or fourth-party logistics (4PL) providers. Outsourcing can reduce capital investment, increase flexibility, and provide access to specialized expertise. However, it may reduce control and introduce service risks. Understanding outsourcing criteria ensures that network design supports strategic goals while optimizing cost and service.

### **17. Reverse Logistics and Returns Management**

An effective logistics network must account for reverse flows such as product returns, repairs, recycling, refurbishing, and disposal. Reverse logistics affects warehouse space, transport costs, and inventory accuracy. Efficient returns networks improve customer satisfaction while reducing waste and recovering value. Understanding this concept is essential for modern e-commerce and after-sales service operations.

### **18. Capacity Planning**

Capacity planning ensures that logistics facilities, transportation assets, and systems can support future demand without excessive cost or constraints. It involves analyzing throughput, labor productivity, equipment capacity, and peak season requirements. Proper capacity planning prevents bottlenecks, delays, and inefficiencies. It is an essential element of designing scalable logistics networks able to handle growth or variability.

### **19. Cross-Docking and Flow-Through Strategies**

Cross-docking enables products to flow directly from receiving to shipping with minimal storage time. Flow-through strategies improve speed, reduce inventory, and minimize handling. These methods are especially effective

for fast-moving, high-volume products. Understanding cross-docking helps determine when to use centralized vs. decentralized DCs and how to design networks that optimize product velocity.

## **20. Implementation Planning and Change Management**

Even the best logistics network design fails without effective implementation. Change management ensures stakeholder alignment, workforce readiness, and smooth transition to new processes or facilities. Implementation planning includes timeline development, communication plans, pilot testing, facility ramp-up, and risk mitigation. Mastery of this concept ensures that the redesigned network delivers intended benefits successfully and sustainably.

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# Micro-Learning Programs in Supply Chain Management



1. Fundamentals of Supply Chain Management
2. Supply Chain Planning and Optimization
3. Demand Forecasting Techniques
4. Inventory Control and Management
5. Distribution and Logistics Strategy
6. Warehouse Layout and Operations Efficiency
7. Supply Chain Risk Management
8. Supply Chain Performance Metrics (KPIs)
9. Lean Supply Chain Practices
10. Agile and Responsive Supply Chains
11. Sales and Operations Planning (S&OP)
12. Supply Chain Network Design
13. Supply Chain Digital Transformation
14. AI and Data Analytics in Supply Chain
15. Supply Chain Sustainability and Green Logistics
16. Reverse Logistics and Returns Management
17. Supply Chain Collaboration and Integration
18. Supplier Relationship Management in SCM
19. Global Supply Chain Strategy
20. Transportation Management Systems (TMS)
21. Inventory Optimization Models
22. Demand-Driven MRP (DDMRP) Concepts
23. Blockchain Applications in Supply Chain
24. Supply Chain Cost Reduction Techniques
25. SCOR Model and Process Improvement



# Micro-Learning Programs in Supply Chain Management ...



26. Capacity Planning and Resource Allocation
27. Managing Supply Chain Disruptions
28. End-to-End Supply Chain Visibility
29. Cold Chain Logistics Management
30. Supply Chain Compliance and Ethics
31. Import–Export Procedures and Documentation
32. Managing Third-Party Logistics (3PL) Providers
33. Supply Chain Collaboration Technologies
34. Production Planning and Scheduling
35. Strategic Supply Chain Design Using Case Studies
36. Circular Economy in Supply Chain
37. Vendor-Managed Inventory (VMI)
38. Transportation Optimization Techniques
39. E-Commerce Supply Chain Models
40. Omni-Channel Fulfillment Strategies
41. Warehouse Automation and Robotics
42. SCOR DS Roadmap for Supply Chain Excellence
43. Customer-Centric Supply Chain Strategies
44. Supply Chain Finance and Working Capital Management
45. Supply Chain Data Visualization Using Power BI
46. Strategic Sourcing in Supply Chain Context
47. Supply Chain Benchmarking and Best Practices
48. Integrated Business Planning (IBP)
49. Supply Chain in Crisis Management and Recovery
50. Future Trends and Technologies in Supply Chain

# Micro-Learning Programs in Procurement



1. Fundamentals of Procurement Management
2. Strategic Sourcing and Category Management
3. Supplier Selection and Evaluation
4. Contract Management Essentials
5. Cost and Price Analysis in Procurement
6. Negotiation Strategies for Procurement Professionals
7. E-Procurement and Digital Tools
8. Procurement Planning and Budgeting
9. Risk Management in Procurement
10. Supplier Relationship and Performance Management
11. Sustainable and Ethical Procurement
12. Total Cost of Ownership (TCO) Analysis
13. Make-or-Buy Decision Frameworks
14. Procurement Policies and Governance
15. Procurement in Public vs. Private Sectors
16. Procurement Audit and Compliance
17. Procurement Data Analytics and Reporting
18. Procurement Scorecards and KPIs
19. Strategic Supplier Partnerships
20. Category Strategy Development
21. Managing Global and Offshore Procurement
22. Negotiation Simulation Workshop
23. Contract Law for Procurement Managers
24. Cost Reduction Strategies in Procurement
25. Supplier Risk Assessment Models

# Micro-Learning Programs in Procurement ...



26. Procurement Process Mapping and Improvement
27. Procurement Automation and AI Applications
28. Managing Procurement Teams Effectively
29. Procurement Ethics and Transparency
30. Procurement in the Digital Supply Chain
31. Vendor Consolidation Strategies
32. Spend Analysis and Optimization
33. Demand Forecasting for Procurement
34. E-Auction and Reverse Bidding Techniques
35. Inventory and Procurement Alignment
36. Procurement in Project-Based Organizations
37. Supplier Onboarding and Development
38. Procurement Market Intelligence
39. Measuring Supplier Innovation
40. Procurement in Times of Supply Disruption
41. Cross-Functional Collaboration in Procurement
42. Writing Effective RFPs, RFQs, and RFIs
43. Contract Negotiation Best Practices
44. Green Procurement and Circular Economy
45. Legal Aspects of Procurement Contracts
46. Performance-Based Contracting
47. Procurement Leadership and Strategic Influence
48. Cost Avoidance and Value Creation in Procurement
49. Managing Procurement with Power BI Dashboards
50. Future Skills and Trends in Procurement



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