

Introduction to Logistics Operations

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Key concepts, components, and best-practice principles

1. What Is Logistics?

The planning, implementation, and control of the efficient, effective flow and storage of goods, services, and related information from point of origin to point of consumption.	
Goal	Satisfy customer demand while minimizing total cost.
Scope	Includes transportation, warehousing, inventory management, order fulfillment, material handling, and information flow.

2. Core Elements of Logistics Operations

Element	Main Functions	Typical Metrics
Transportation	Mode selection, routing, carrier management, freight consolidation	Delivery lead time, cost per ton-mile, on-time delivery (OTD)
Warehousing & Distribution Centers	Receiving, put-away, storage, picking, packing, cross-docking	Space utilization, order pick accuracy, dwell time
Inventory Management	Forecasting, safety stock, replenishment, cycle counting	Inventory turnover, days of inventory on hand (DOH), stock-out rate
Material Handling	Equipment selection, layout design, automation (conveyors, robots)	Labor productivity, handling cost per unit
Information & Control Systems	ERP, WMS, TMS, RFID/barcode tracking, analytics	Data accuracy, system uptime, order cycle time
Reverse Logistics	Returns processing, refurbishment, recycling, disposal	Return rate, cost per return, recovery value

3. Logistics Process Flow (Typical Order Cycle)

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1. **Order Receipt** – Customer order entered into ERP/WMS.
2. **Demand Planning** – Forecast vs. actual demand; trigger replenishment.
3. **Procurement & Supplier Coordination** – Purchase order issuance, inbound scheduling.
4. **Inbound Transportation** – Freight booking, carrier selection, arrival notification.
5. **Receiving & Put-away** – Inspection, labeling, storage location assignment.
6. **Inventory Control** – Update stock levels, cycle count if needed.
7. **Order Picking** – Wave, batch, or zone picking; use of pick-to-light or voice picking.
8. **Packing & Consolidation** – Packaging optimization, labeling, documentation.
9. **Outbound Transportation** – Load planning, carrier dispatch, shipment tracking.
10. **Delivery & Proof of Delivery (POD)** – Final hand-over, customer confirmation.
11. **After-sales Service / Reverse Logistics** – Returns handling, warranty processing.

(Flow can be visualized as a linear diagram with feedback loops for inventory replenishment and returns.)

4. Key Performance Indicators (KPIs)

Category	KPI	Target Example
Cost	Total logistics cost (% of sales)	? 12?%
	Transportation cost per unit	\$0.45/unit
Service	On-time delivery (OTD)	? 98?%
	Order fill rate	? 99?%
Efficiency	Warehouse labor cost per order	\$2.50/order
	Dock-to-stock time	? 2?h
Quality	Order accuracy	? 99.9?%
	Damage rate	? 0.2?%
Responsiveness	Lead time (order to delivery)	? 5?days
	Cycle-time for returns	? 7?days

5. Transportation Modes & Selection Criteria

| Mode | Typical Use | Advantages | Disadvantages | |-----|-----|