

# CSCP

CERTIFIED SUPPLY CHAIN  
PROFESSIONAL

## MODULE 5: FORWARD AND REVERSE LOGISTICS

### SECTION A: LOGISTICS AND DISTRIBUTION

## Section A Introduction

### Section A Key Processes:

- Define and manage the distribution network.
  - Develop and execute logistics planning and information systems.
  - Develop and execute the warehouse strategy.
  - Develop and execute the transportation strategy.

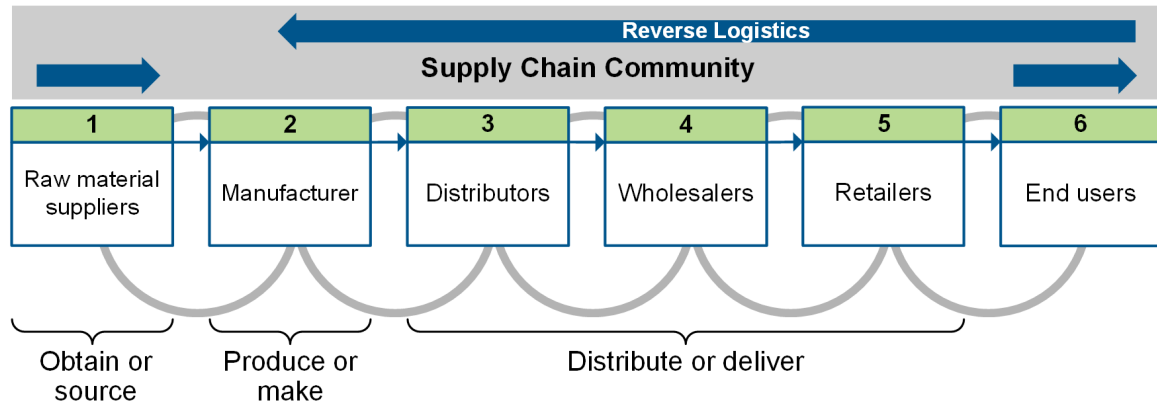
### Section A Topics:

- Logistics
- Warehousing and Materials-Handling Strategy
- Transportation Strategy

## The Role of Logistics in Supply Chain Management

All tasks necessary to get the right product in the right quantity and right condition at the right place at the right time for the right customer at the right price

- Warehousing
- Transportation
- Import/export
- Packaging/materials handling
- Inventory management
- Logistics IS management



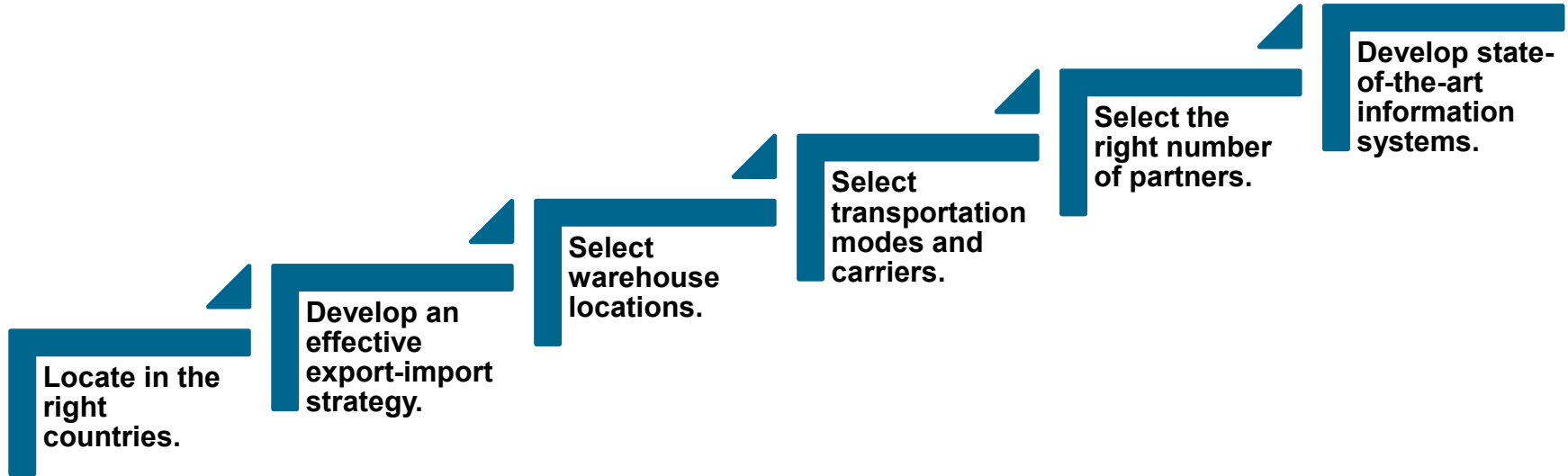
## Logistics Trends

- “State of Logistics Report,” 2019, U.S. firms (billions):
  - Total logistics: US\$1,630
  - Transportation costs:
    - Truck: US\$680.4
    - Rail: US\$83.9
    - Parcel: US\$114.4
    - Water: US\$47.9
    - Air: US\$75.2
    - Pipeline: US\$57.4
- 65% of logistics costs: transportation
- Carrying costs: +6.6% over prior year
- Trade wars; pandemic:
  - Resilience: diversification, backup capacity
  - Avoid going too far with a single-sourcing, JIT focus.

## Logistics Objectives and Tactics

Logistics Objectives	Logistics Tactics
<ul style="list-style-type: none"><li>• Rapid response capability</li><li>• Minimum variance</li><li>• Minimum inventory expense</li><li>• Consolidated shipments</li><li>• High quality</li><li>• Product life cycle support</li></ul>	<ul style="list-style-type: none"><li>• Coordinating functions</li><li>• Integrating the supply chain</li><li>• Substituting information for inventory</li><li>• Reducing number of partners</li><li>• Pooling risks</li></ul>

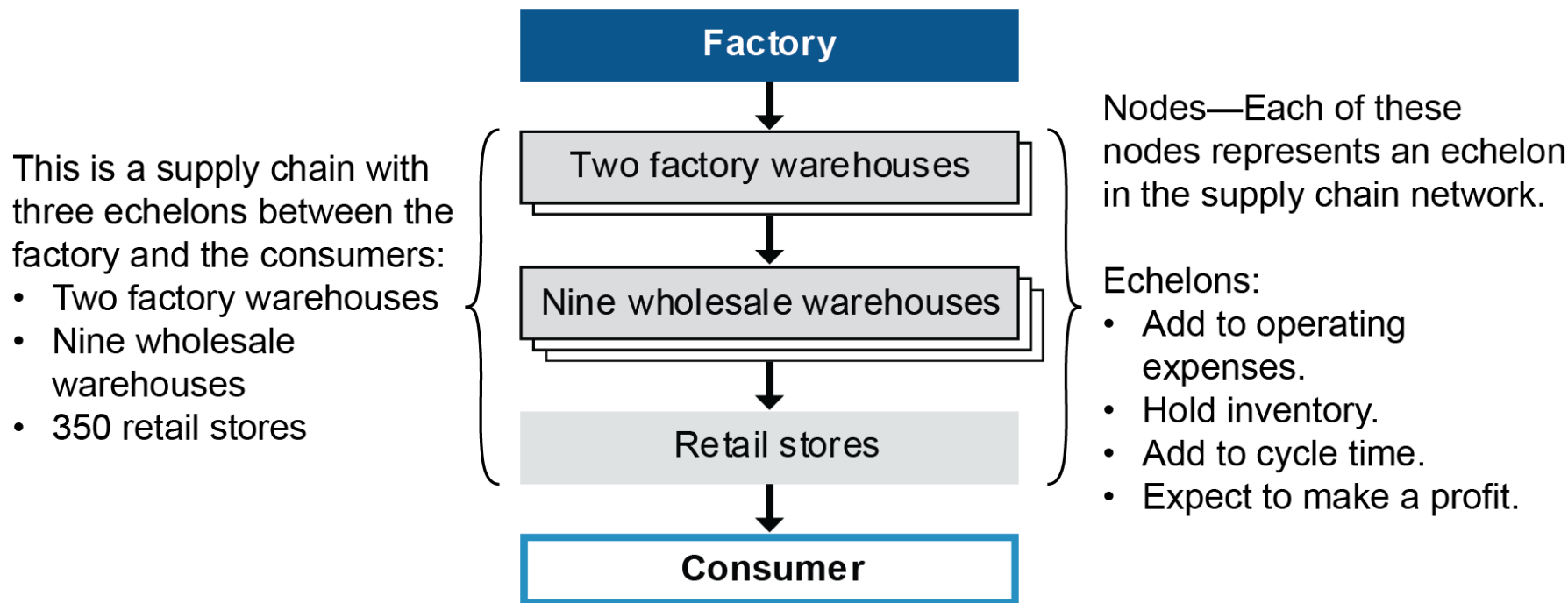
## Integrating the Supply Chain



## Information in Place of Inventory

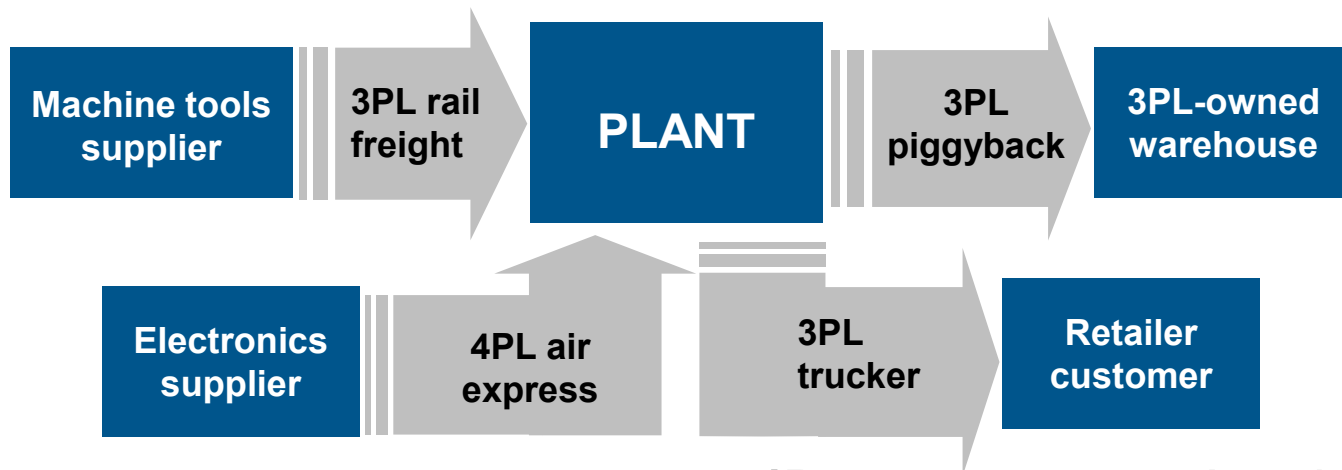
- Improve communications.
- Collaborate with suppliers.
- Track inventory precisely.
- Keep inventory in transit.
- Use postponement centers.
- Mix shipments to match customer needs.
- Speed up customs.
- Make more on demand.

## Reducing SC Partners to an Effective Number





## How 3PLs and 4PLs Are Related



- **3PL** arrangement: The third party takes over some or all logistics functions and performs them itself.
- **4PL** arrangement: A logistics specialist takes over the entire logistics operation and subcontracts some or all specific functions.

## 3PL and 4PL Tradeoffs

	Potential Benefits	Risks
3PL	<ul style="list-style-type: none"><li>• More focus on areas of competence</li><li>• More current technology; more technological flexibility</li><li>• More efficient warehousing (economies of scale)</li><li>• Improved customer service</li><li>• More workforce flexibility</li></ul>	<ul style="list-style-type: none"><li>• Less control over some aspects of logistics, including overall strategy</li><li>• Potential for inefficiency</li></ul>
4PL	<ul style="list-style-type: none"><li>• Improved focus on areas of competence</li><li>• Higher-quality logistics, reduced costs, or both</li><li>• Greater business flexibility</li></ul>	<ul style="list-style-type: none"><li>• Less control over all aspects of logistics, including strategy</li><li>• Potential loss of effectiveness or higher cost if 4PL deals with favored providers</li></ul>

## Outsourcing Considerations

### Current Costs?

- How much will it save?
- Is it worth the risks?
- Are the benefits worth paying more?

### Customer Skills?

- Evaluate the bidders' customer skills.
- Are the bidders reliable?
- Are their references credible?

### Special Strengths?

- How did the company (especially if a 4PL) get started?
- What does it do best?
- Is there a match between its strengths and your needs?

### Subcontracting Ability?

- Will the contractor subcontract effectively and honestly to get competent service?
- Are they biased toward their own divisions or toward certain firms that lack competence or over-charge?

## Outsourcing and Contract Considerations

### Contract Considerations

- Mutually beneficial
- Specify what each part will do to ensure success
- Commitment of time and energy
- Shared risks and rewards
- Carefully select performance metrics that address performance and customer service

### Specific Rules and Clauses

- Confidentiality
- Subcontractor
- Remedies (correcting variances from performance targets)
- Use of arbitration
- Escape

# Warehousing and Materials-Handling Strategy

## Warehousing Objectives

Objective	Warehousing Contribution
Rapid response	Strategic placement, optimal numbers facilitate response to markets and order changes.
Minimize variances	Technology and automation aid efficient handling to promote predictable service.
Minimize inventory	Determine most efficient number of warehouses to reduce inventory, prevent stockouts.
Consolidation of movement	Warehouse placement, transportation interface, efficient materials handling all required for effective consolidation of shipments.
High quality	Subject all aspects of warehousing to continuous improvement.
Life cycle support	Place warehouses for returns, repairs, etc., as well as to support product movement during growth, development, and maturity.

# Warehousing and Materials-Handling Strategy

## Owned versus Leased Warehouses

### Private warehouses owned by firm

- Control and flexibility to suit to products/SC
- No markup
- Market presence
- Fixed cost, depreciates

### Public warehouses available for hire

- Flexibility to scale
- Potential cost savings from economies of scale (multiple clients)

### Contract warehouses

- Potential cost savings with equal or better service
- Tailored services
- Flexibility
- Expanded geographic market

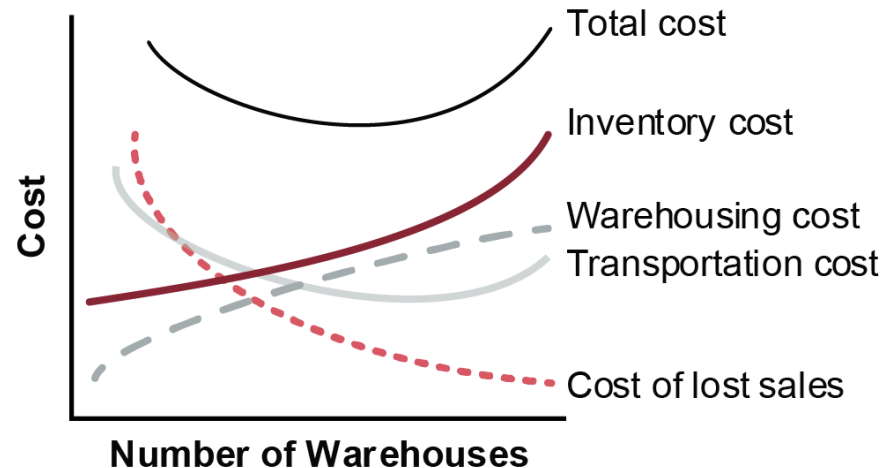
# Warehousing and Materials-Handling Strategy

## Effects of Adding Warehouses

- Customer service improves.
- Transportation costs decline with shorter distances to travel.
- Rapid delivery may improve competitive position.
- Decentralized system allows better service to small customers.

But note that:

- Inventory costs rise with redundant functions, safety stock.
- Setup and overhead costs go up.



# Warehousing and Materials-Handling Strategy

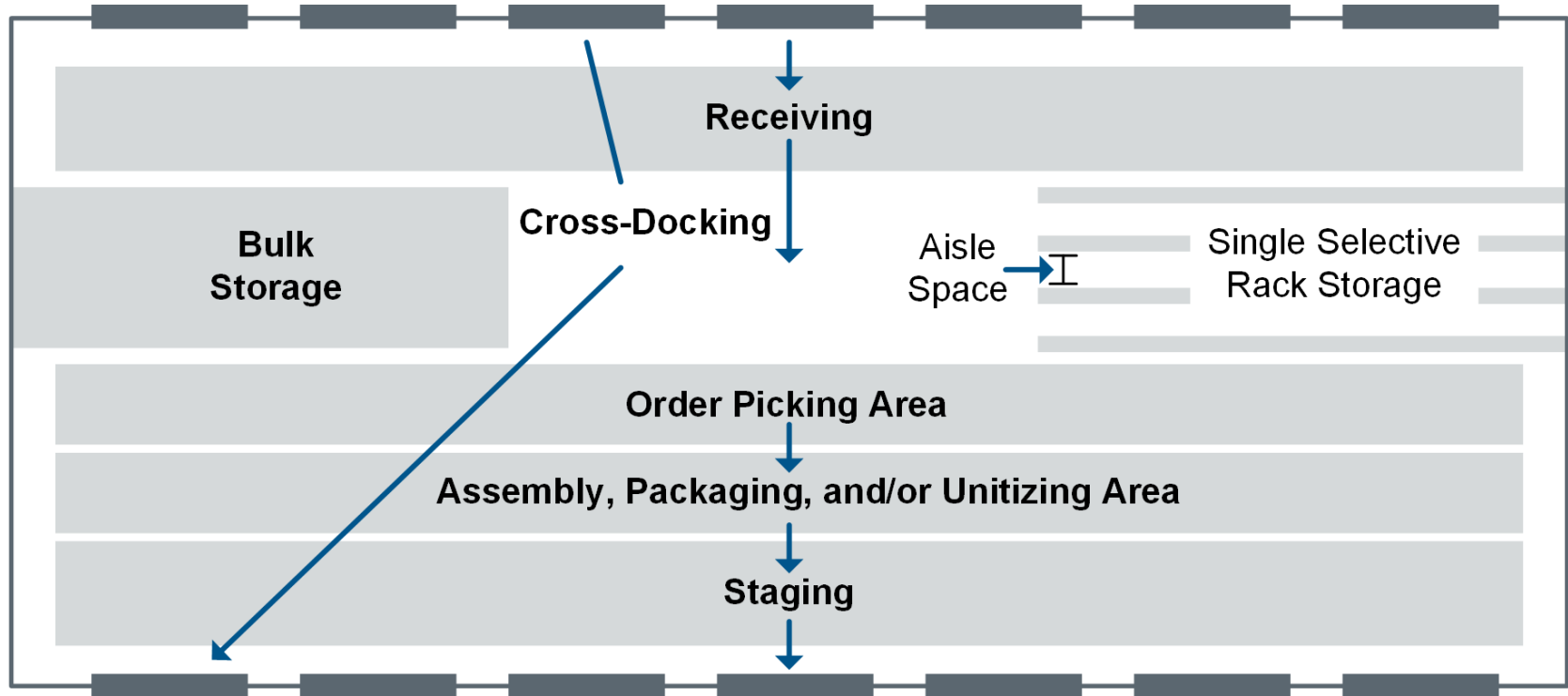
## Where Should Warehouses Be Located?

<b>Services</b>	Availability of services is most important factor.
<b>Neighborhood</b>	Consider available space, soil support, nearness to market; not restricted to warehouse districts.
<b>Costs</b>	Services, location (urban costs more), taxes, insurance, transportation (tradeoff with cheaper land).
<b>Community inducements</b>	Tax incentives, infrastructure support, trained and available workforce.
<b>Regulations</b>	Environmental impact statements can slow construction, inflate costs.



# Warehousing and Materials-Handling Strategy

## Organization of Storage Locations



# Warehousing and Materials-Handling Strategy

## Stock Location

<b>Random location</b>	Maximizes cube utilization but need locator file
<b>Fixed location</b>	Need more space, but learn fixed locations
<b>ABC</b>	Good for secure/fast-moving requirements
<b>By function</b>	Good for modular units, assists assembly
<b>By velocity</b>	Fast-moving items placed near docks
<b>By physical similarity</b>	Frozen or refrigerated items, bulky items
<b>Separate reserve stock</b>	Bulk storage items (or defective/obsolete) out of way, replenishes working stock

# Warehousing and Materials-Handling Strategy

## Warehouse Capacity Forecasting and Planning

Factor adjustments:

- Partial pallets
- Space around inventory, for movement, assembly, etc.
- Levels of vertical storage
- Target utilization of warehouse
- Bulk storage calculated separately

Individual averages  
(mean)

Average aggregate  
inventory

Number of pallet bays

Factor adjustments

Warehouse size

# Warehousing and Materials-Handling Strategy

## Materials-Handling Options

### Goals of warehousing

- Cost-effective
- Efficient use of:
  - Warehouse space
  - Human labor
  - Equipment
  - Software, automation, IT

### Limitations of equipment and automation

- May add cost without increasing value
- Must blend with space, labor skills, layout, etc.
- May require expert advice and software to select

# Warehousing and Materials-Handling Strategy

## Mechanized Systems



Forklifts



Conveyors



Bridge/ wagon  
cranes



Towlines

### Other mechanized systems

- Carousels
- Pick-to-light
- Tow tractors with trailers

# Warehousing and Materials-Handling Strategy

## Automated Systems

Type	Features and Uses
<b>AGVS</b>	<ul style="list-style-type: none"><li>• Riderless; moves along floor on tape or wire with preset stops.</li><li>• Similar in use to forklift and tow tractors.</li><li>• Available with tines or platforms.</li></ul>
<b>Sorting systems</b>	<ul style="list-style-type: none"><li>• Generally used with conveyors.</li><li>• Automate direction of items into shipments.</li><li>• Programmable for different speeds to fit shipment requirements.</li></ul>
<b>Robotics</b>	<ul style="list-style-type: none"><li>• Used to build and break down unit loads.</li><li>• Recognizes product stacking patterns.</li><li>• Transfers to/from conveyor belt.</li></ul>
<b>Live racks</b>	<ul style="list-style-type: none"><li>• Gravity roller conveyors.</li><li>• When item is taken from front, rest move down.</li></ul>
<b>AS/RS</b>	<ul style="list-style-type: none"><li>• Automate both storage and retrieval.</li><li>• Machine moves both horizontally and vertically and can have high racks.</li><li>• Pickup and dropoff programmed at end-of-aisle stations.</li></ul>

## Transportation Objectives

### **Movement of Materials Through Network**

- Time issues
- Cost issues
- Environmental issues

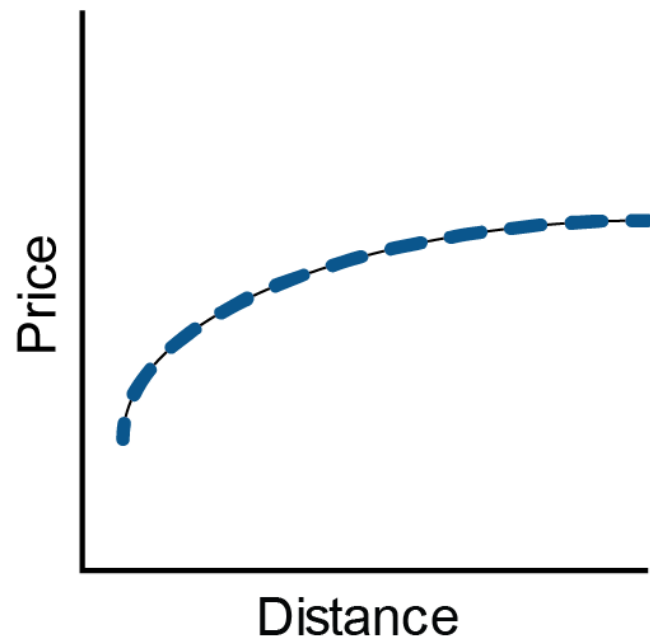
### **Temporary Storage**

- Park without unloading for short-term storage.
- Take early, slow route from crowded facility (if same cost).
- Divert in mid-course due to order or demand changes or warehouse capacity.

## Capacity Constraints: Distance

- More distance means higher cost but not uniformly.
- Longer trips allow:
  - Fewer starts and stops
  - More cruising
  - Nonurban miles (trucking).

**General relationship  
of distance to cost**

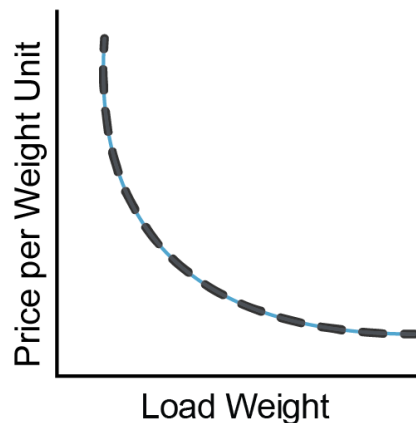




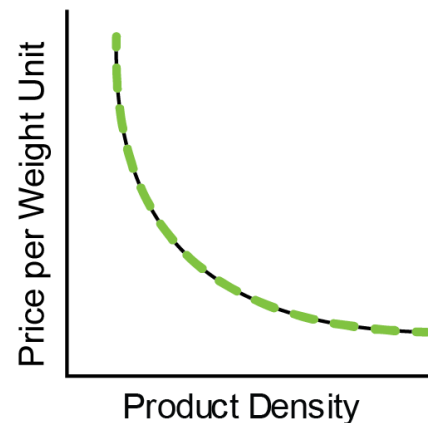
## Capacity Constraints: Volume and Density

- Volume adds to cost, but full loads earn discounts.
- Higher volume may qualify for full-load pricing; spreads cost over more weight units.
- Denser loads may cost more in total but less per weight unit.
- Higher density packing spreads cost over more units—good unless weight limit precludes full load.

General relationship of volume to unit cost



General relationship of cargo density to unit cost



## Capacity Constraints: Stowability, Handling, and Liability

### Stowability and Handling

- Shape storage efficiency?
- Difficult loading and unloading?
- Specialized handling equipment?
- Packaging and grouping for handling?

### Economics of Liability

- Susceptibility to damage
- Perishability
- Susceptibility to theft
- Value per pound

## Capacity Constraints: Conflicts of Interest

Optimize tradeoffs.		
Manufacturers: Large lot sizes for lower unit setup costs	↔	Logistics: Reduction in inventories and improved system responsiveness
Per-item transportation costs reduced by full truckload (TL)	↔	Inventory holding costs reduced by less-than-truckload (LTL)
Lead time reduced if goods are transported as they are made	↔	Transportation costs reduced if orders wait until ship via TL
High product variety	↔	High transportation and storage cost

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## SECTION B: DISTRIBUTION SERVICES AND TRANSPORTATION CHOICES

## Section B Introduction

### Section B Key Processes:

- Provide distribution services.
  - Receive, put away, and store product.
  - Pick, pack, and ship product.
  - Provide value-added services.
  - Select mode and transport providers.

### Section B Topics:

- Distribution Services and Delivery Patterns
- Transportation Mode and Carrier Selection

## Warehouse Capabilities

### Warehousing activities

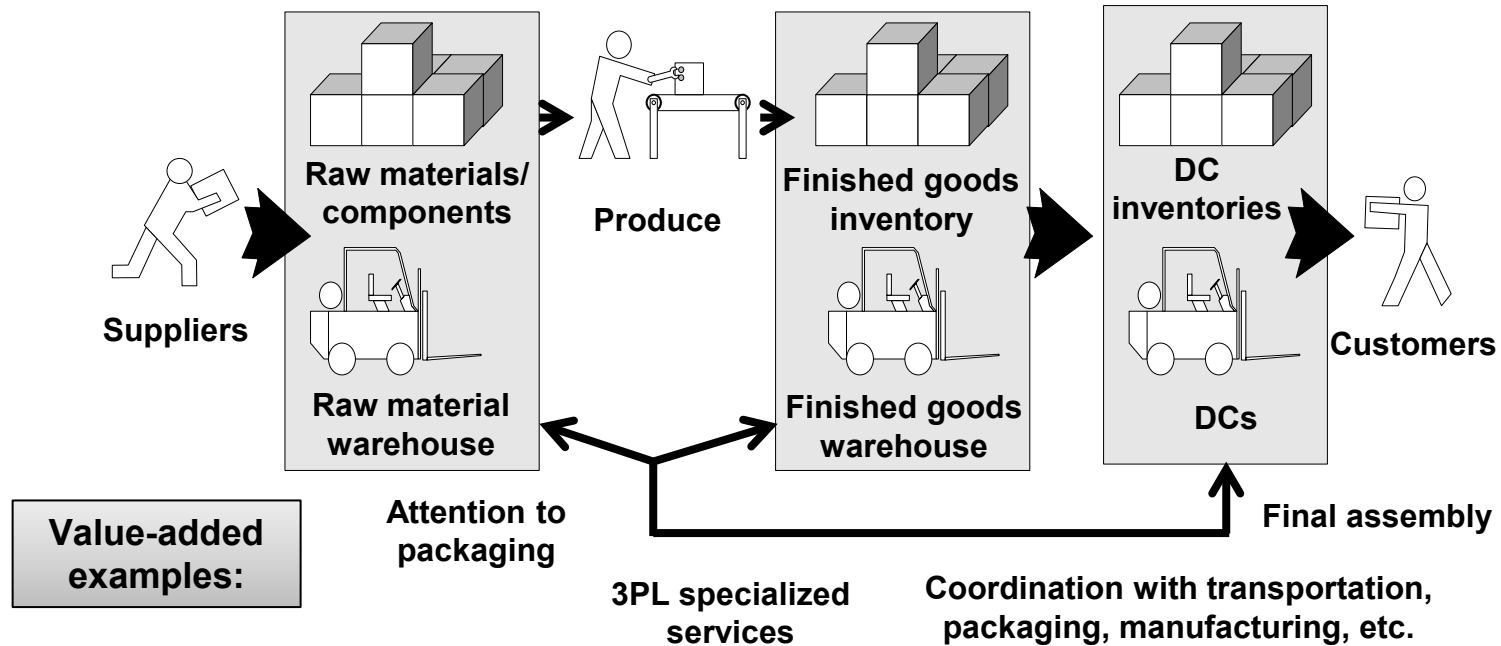
- Consolidation
- Break-bulk and cross-dock
- Postponement and processing
- Stockpiling seasonal inventory
- Spot stocking advance shipments
- Assortment
- Mixing

### Warehouse functions

- Receiving
- Prepackaging
- Put-away
- Storing
- Order picking
- Moving
- Shipping
- Packaging
- Packing and marking
- Cycle counting

# Distribution Services and Delivery Patterns

## Value-Added Warehousing

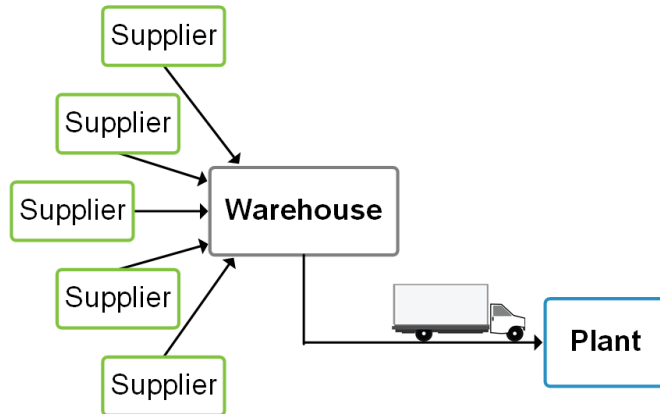


# Distribution Services and Delivery Patterns

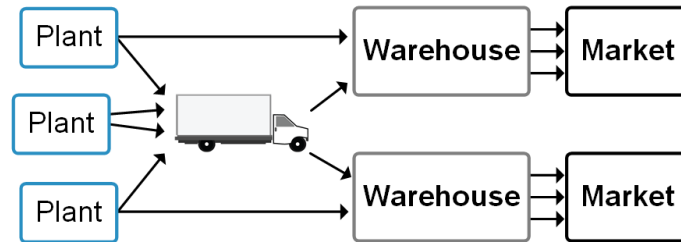
## Consolidation

- Combining inbound or outbound shipments for economies of scale to reduce logistics costs
- Reduced congestion at receiving dock

(a) Consolidation of inbound materials or components



(b) Consolidation of outbound finished goods



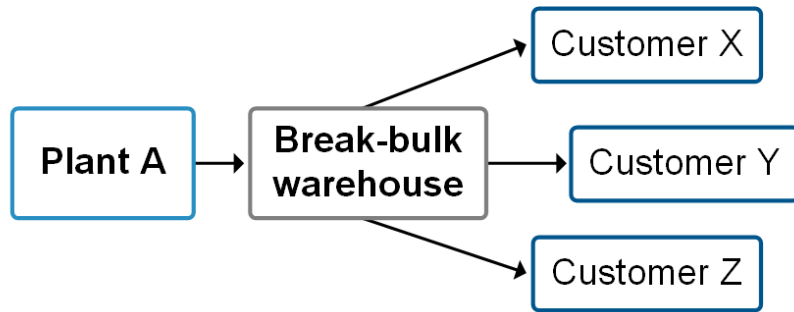


# Distribution Services and Delivery Patterns

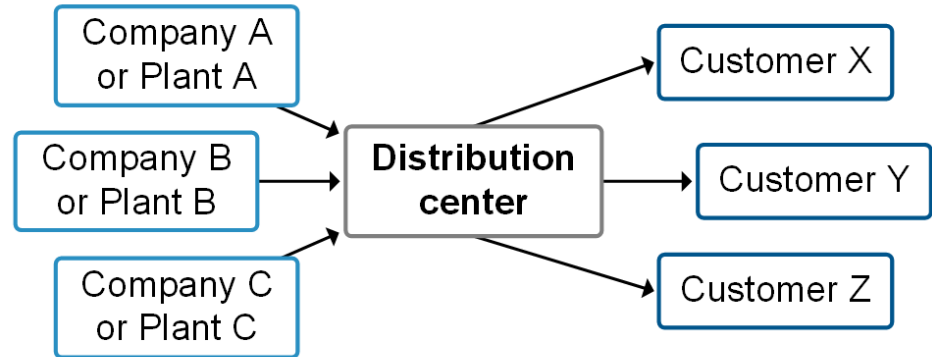
## Break-Bulk and Cross-Dock

- Combining inbound or outbound shipments for economies of scale to reduce logistics costs
- Reduced handling costs (no storage)

### Break-bulk

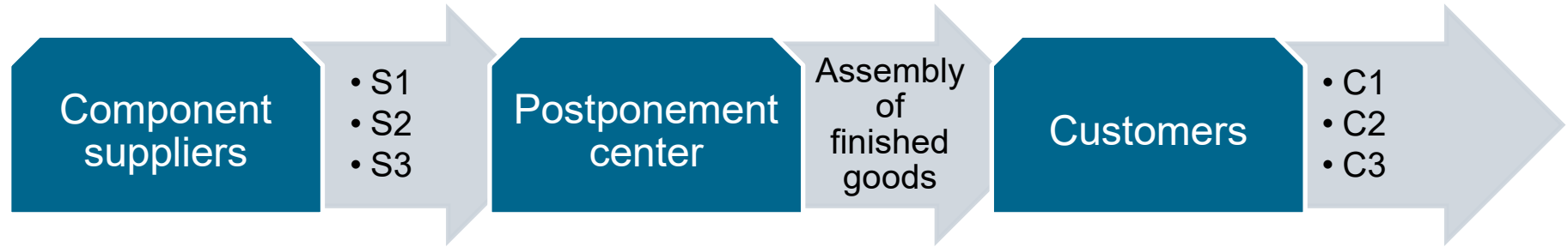


### Cross-dock



# Distribution Services and Delivery Patterns

## Postponement



### Benefits:

- More efficient storage
- More accurate forecasting
- Less safety stock required
- Mass customization

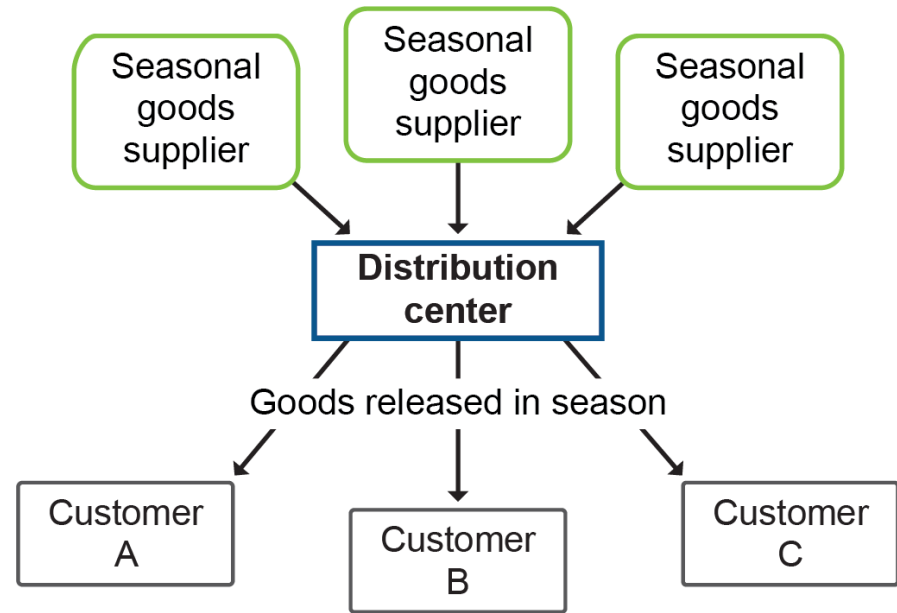
### Drawback:

- Increased costs for hiring, training, and (possibly) finishing

# Distribution Services and Delivery Patterns

## Anticipation (Stockpiling)

- Benefits:
- Efficient use of production by eliminating seasonal increase and decrease in capacity
- Reduced chance of seasonal stockouts
- Drawback:
- More warehouse capacity than required for JIT delivery

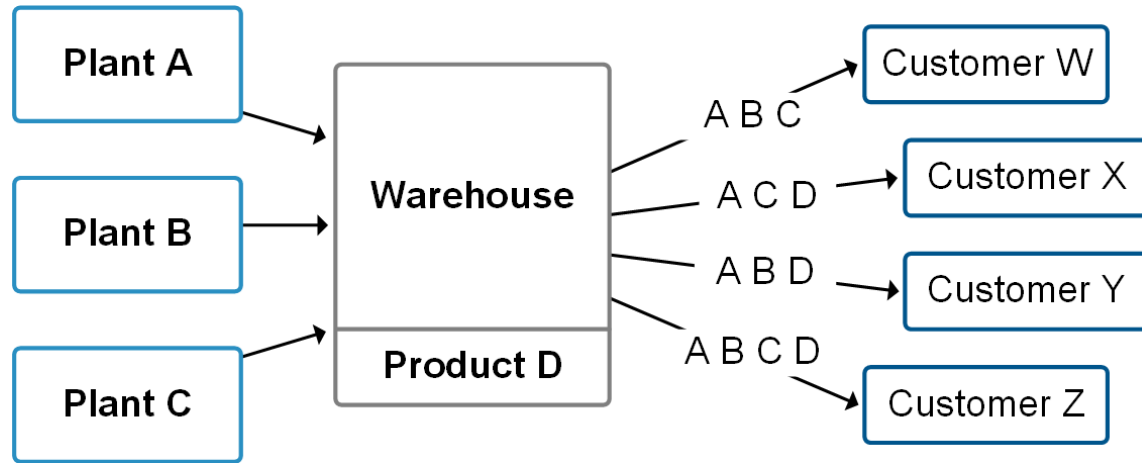


# Distribution Services and Delivery Patterns

## Mixing

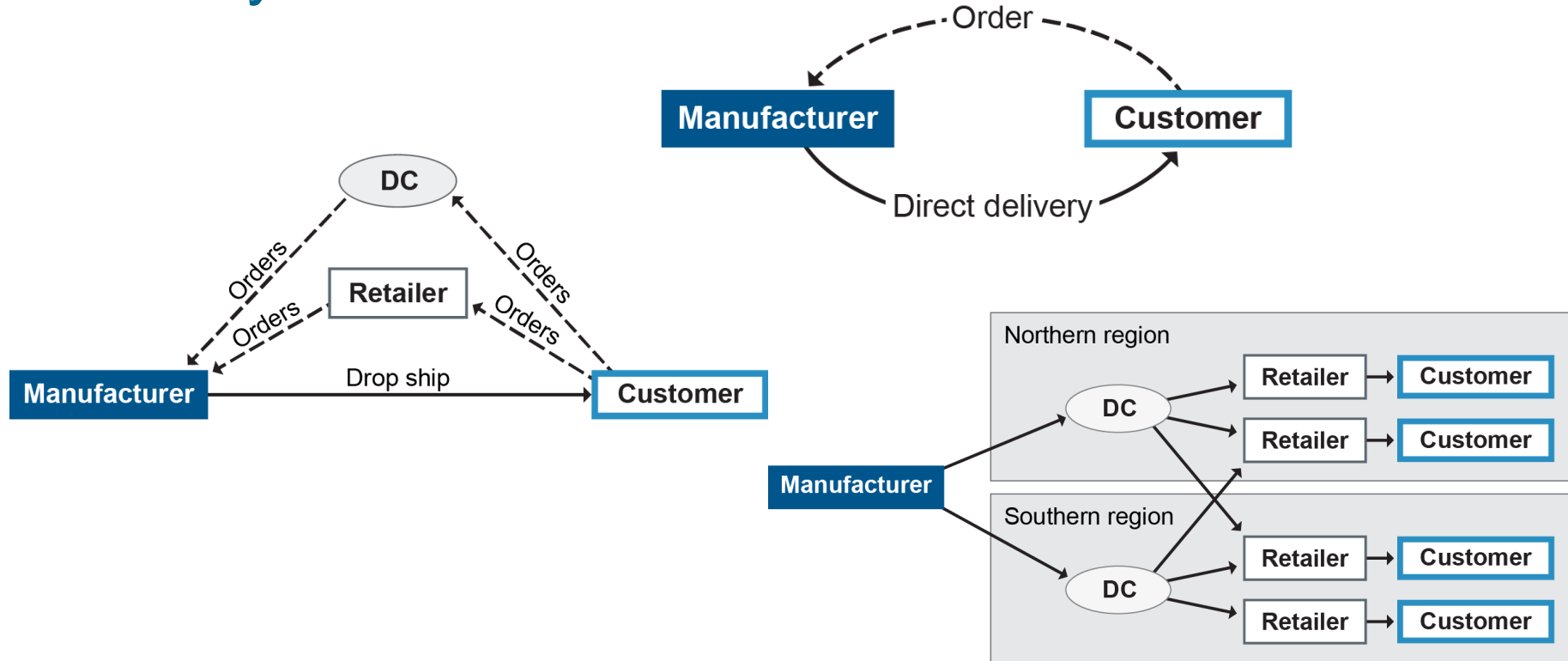
### Benefits:

- Serves customers by reducing their costs for handling, storage, etc.
- Increases efficient use of warehouse space



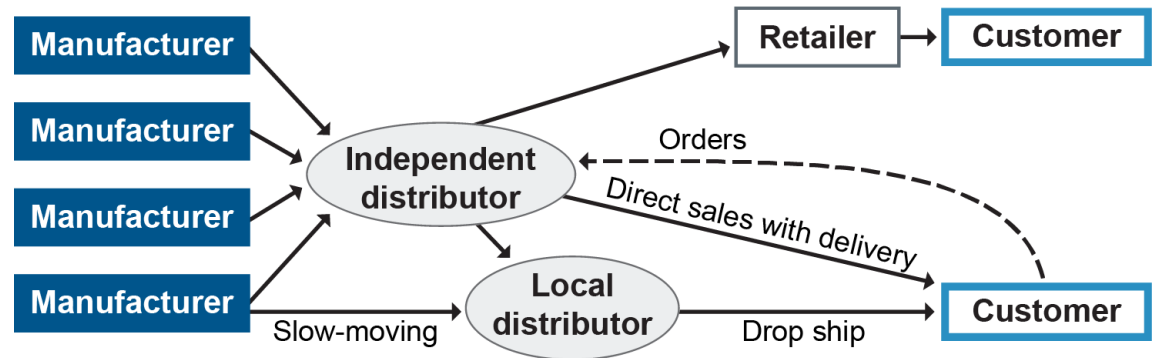
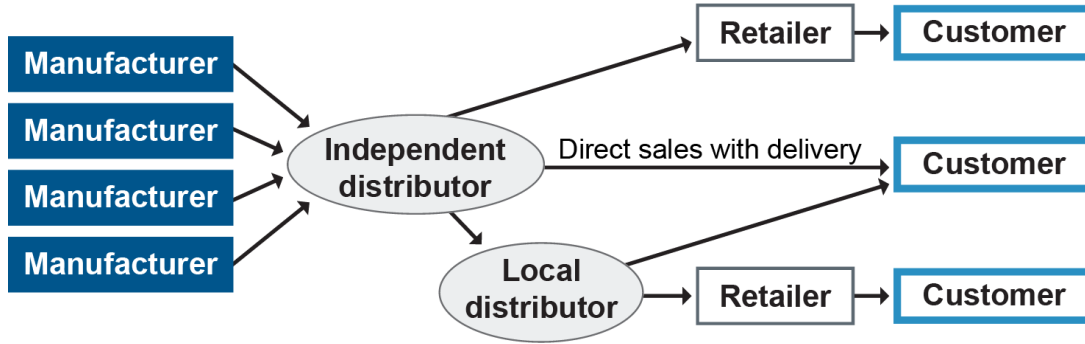
# Distribution Services and Delivery Patterns

## Delivery Patterns



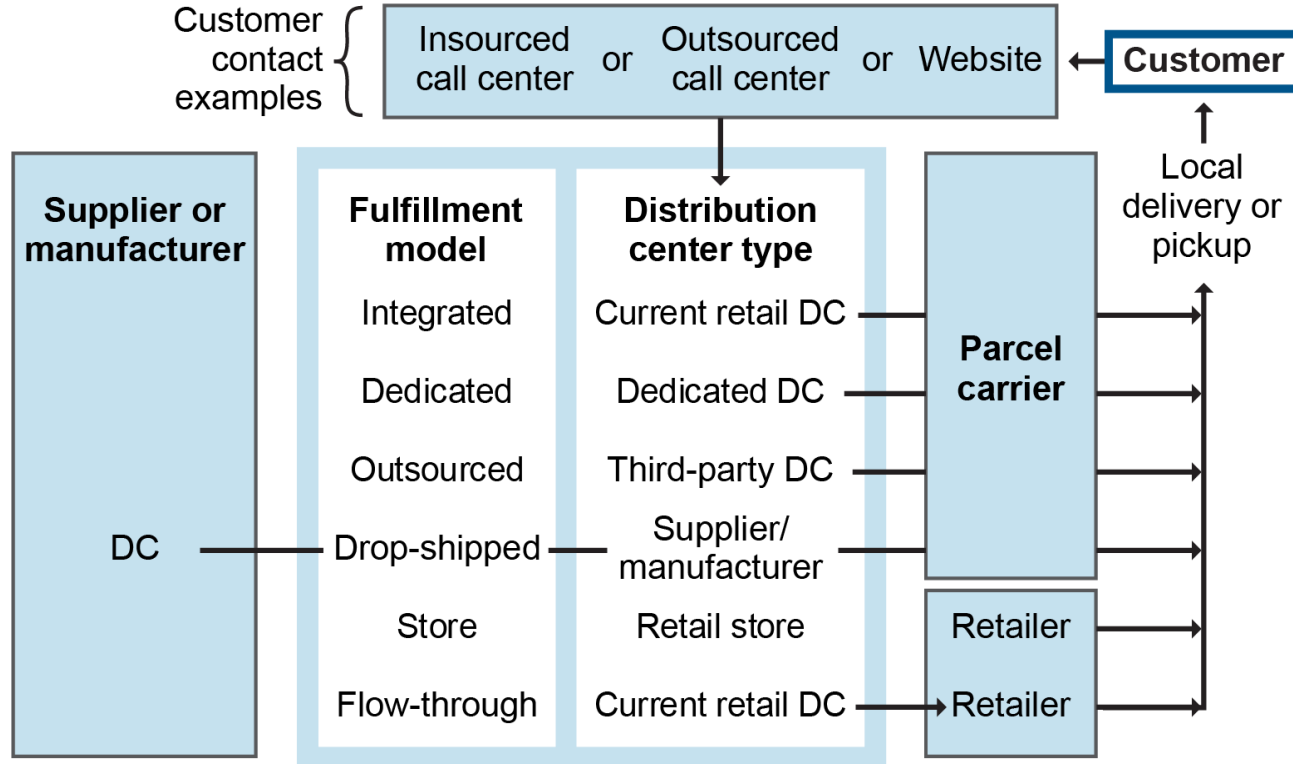
# Distribution Services and Delivery Patterns

## Delivery Patterns (continued)



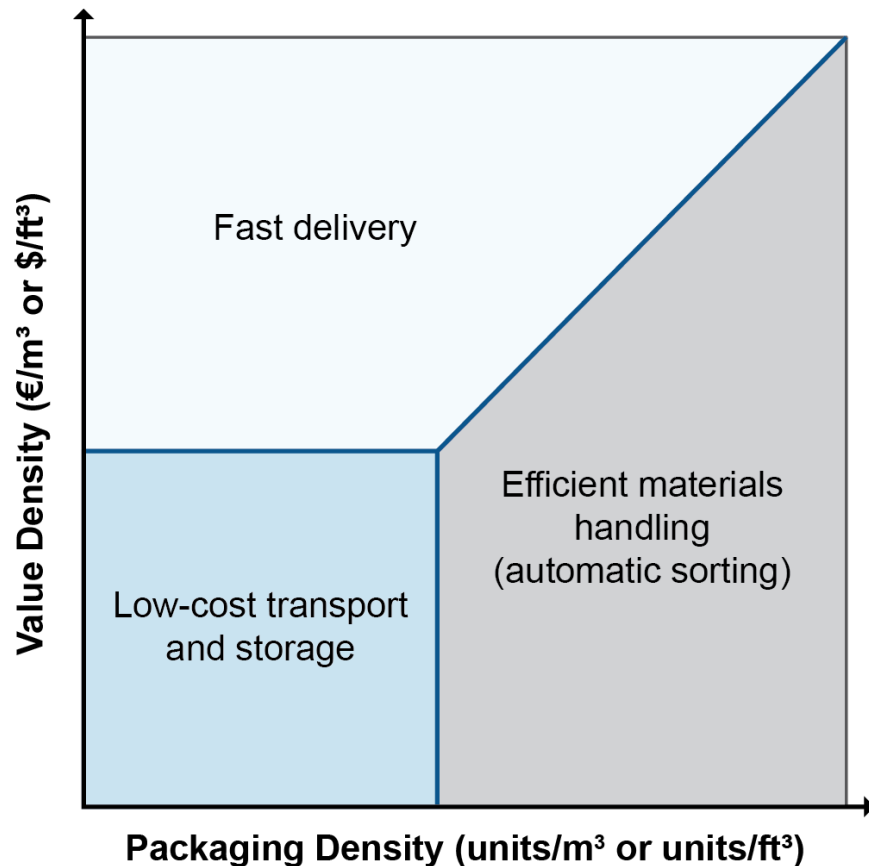
# Distribution Services and Delivery Patterns

## Direct-to-Consumer Model



# Transportation Mode and Carrier Selection

## Value Density vs. Packaging Density





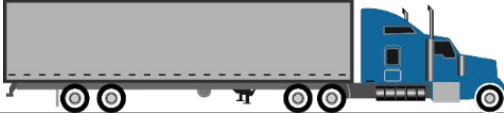
# Transportation Mode and Carrier Selection

## Modes of Transportation: Rail

Capabilities	Market	Limitations
<ul style="list-style-type: none"><li>Fuel-efficient</li><li>Heavy loads (equal to water)</li><li>Any load (with bulk restrictions)</li><li>Low-value cargo</li><li>Relatively low rates</li><li>Low variable costs</li></ul>	<ul style="list-style-type: none"><li>Low variable costs, high fixed costs</li><li>Few carriers (U.S.), mostly consolidated</li><li>Growth in China still possible, little elsewhere</li><li>Intermodal options growing</li></ul> 	<ul style="list-style-type: none"><li>Restricted destinations, little chance to expand</li><li>Slow if stops, gauge or crew switches</li><li>Rough ride</li></ul>

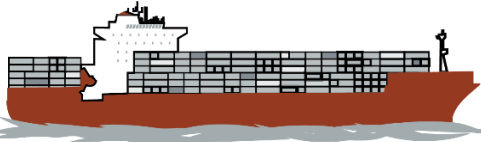
# Transportation Mode and Carrier Selection

## Modes of Transportation: Motor Carriers

Capabilities	Market	Tradeoffs
<p>Small shipments; high-value items; short to medium hauls</p> <p>Greatest accessibility for pickup and direct delivery</p> <p>Speedy delivery</p>	<p>Low fixed costs with tax-funded infrastructure</p> <p>High variable costs: wages, equipment, etc.</p> <p>Easy entry, many carriers available; TL, LTL, specialty</p> <p>Some regulatory limits on type of cargo</p> 	<p>Labor-intensive with rising rates</p> <p>Intense competition with resulting bankruptcies</p> <p>Less hazardous than rail or water for high-value goods</p>

# Transportation Mode and Carrier Selection

## Modes of Transportation: Water Transport

Capabilities	Market	Tradeoffs
<p>Huge, heavy loads hauled for distances</p> <p>Low-value, high-density cargo such as coal, crude oil, or grain</p> <p>Very low per-mile cost and fuel-efficient</p>	<p>Used in U.S. Great Lakes, rivers; EU rivers; China and SE Asia and elsewhere</p> <p>Waterways maintained by taxpayers</p> <p>Low fixed costs for ease of entry, private fleets</p>  A stylized illustration of a large cargo ship, likely a bulk carrier, with a red hull and a white superstructure. The ship is shown from a side profile, sailing on a greyish-blue sea. It has multiple decks and a prominent funnel.	<p>Limited accessibility, other transport required to/from port</p> <p>Slow travel (trains faster but higher cost)</p> <p>Harmful to environment</p>

# Transportation Mode and Carrier Selection

## Modes of Transportation: Pipeline Transport

Capabilities	Challenges
<p>Special adaptation for crude oil, petroleum products</p> <p>No packaging required</p> <p>Storage and transport combined</p> <p>Usable 24/365 in all weather</p> <p>Fixed costs similar to rail; low operating cost (no driver required)</p> <p>New types of cargo being developed in slurry form</p>	<p>Cargo limited to liquids, slurry</p> <p>Costly construction</p> <p>Monopolies (most are common carriers)</p> <p>Limited access</p> <p>Political barriers at borders</p> <p>Vulnerable to terrorism</p>



# Transportation Mode and Carrier Selection

## Modes of Transportation: Air Transport

Capabilities	Market	Tradeoffs
<p>Speed—may eliminate safety stock</p> <p>Smooth ride for valuable and perish-able cargoes—or any cargo</p> <p>Lower packaging expense</p>	<p>Low fixed cost, high variable cost</p> <p>Tends to be run by government or heavily regulated</p> <p>Competes for transoceanic carriage</p> <p>Tiny percentage of overall cargo market</p>	<p>Cargo secondary to passenger service (except FedEx, etc.)</p> <p>Very high delivery costs per ton/mile</p> <p>Limited access (some help from intermodal)</p> <p>Reliability problems</p>



# Transportation Mode and Carrier Selection

## Hybrids: Package Delivery Services

Capabilities	Market	Limitation
<p>Speed—up to same-day service</p> <p>Accessibility and flexible hours for pickup, delivery</p> <p>Perfect for perishable and high-value goods, e.g., food and drugs</p>	<p>Compatible with JIT and lean</p> <p>Large employer and logistics provider globally</p> 	<p>High price—traditionally limited to small, high-value items (package delivery)</p>

# Transportation Mode and Carrier Selection

## Hybrids: Intermodal Transport

<b>Piggyback service</b>	Trailer or container on rail flatcar
<b>Trainship or containership service</b>	Truck trailer, railcar (trainship), or container (containership) on ship or barge; land bridge
<b>Truck-plane services</b>	Air transport plus surface transit to/from terminal
<b>Freight truck on railroad car</b>	Truck loaded on flatbed railcar in EU so driver can sleep

### Benefits

- Flexibility
- Efficiency
- Lower cost



# Transportation Mode and Carrier Selection

## Types of Carriers

Type of Carrier	Description	Benefits	Drawbacks
<b>Common (public)</b>	Perform bulk of shipping; required to serve commercial shippers.	<ul style="list-style-type: none"><li>• Availability, rates supported by regulations</li><li>• Carrier assumes risk</li></ul>	<ul style="list-style-type: none"><li>• Most economic regulations to consider</li><li>• Must publish reasonable rates</li></ul>
<b>Private</b>	Shipper's own fleet of vehicles for carrying own goods (and possibly some other goods).	<ul style="list-style-type: none"><li>• Control of vehicles</li><li>• Possible cross-licensing since deregulation for backhaul loads</li></ul>	<ul style="list-style-type: none"><li>• Maintenance cost</li><li>• Problems when business slows</li><li>• Core competence?</li><li>• Empty backhauls</li></ul>



# Transportation Mode and Carrier Selection

## Types of Carriers (continued)

Type of Carrier	Description	Benefits	Drawbacks
<b>Contract</b>	Work on contract with specific clients; not required to serve all shippers; negotiable (not regulated) rates.	<ul style="list-style-type: none"><li>• Low rates</li><li>• Custom services</li></ul>	<ul style="list-style-type: none"><li>• Not required to provide service</li></ul>
<b>Exempt</b>	Free from most federal regulation (state-licensed in U.S.); restricted to specific markets—mostly agriculture.	<ul style="list-style-type: none"><li>• Low rates (no regulation)</li><li>• Adapted to special niches</li></ul>	<ul style="list-style-type: none"><li>• Limited availability for most products</li><li>• Limited range of operation</li></ul>

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## SECTION C: TRADE CONSIDERATIONS

## Section C Introduction

### Section C Key Processes:

- Evaluate trade considerations.
- Comply with import/export regulations.
  - Use Incoterms® trade terms.
  - Provide appropriate documentation.
  - Understand foreign/free trade zones/trading blocs

### Section C Topics:

- Legal, Security, and Regulatory Requirements
- Import/Export Regulations and Documentation
- Trade Zones and Blocs

## Security and Regulatory Concerns

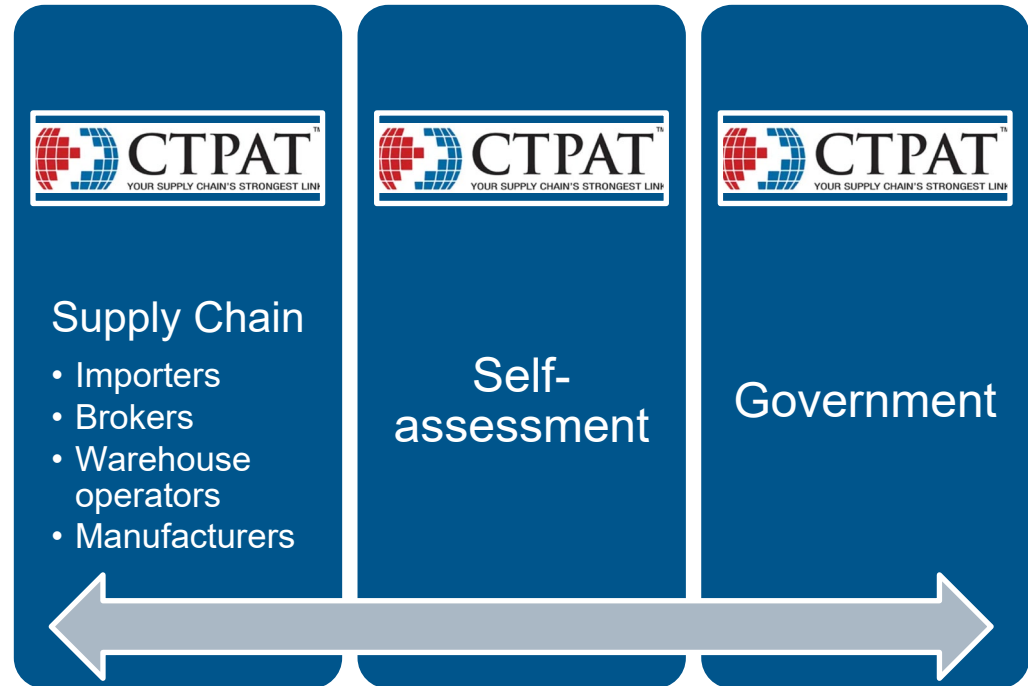
- Physical security of transportation and storage
- Meeting increased identification requirements
- Systems to deny access
- Keeping SC IS secure from hacking
- Voluntarily comply with global antiterrorism initiatives (e.g., CTPAT or AEO)?
- Internal operational and financial controls

# Legal, Security, and Regulatory Requirements

## CTPAT (Customs Trade Partnership Against Terrorism)

### Benefits:

- Fewer inspections, reduced border time (neither guaranteed)
- Account manager
- Access to membership list
- Special account processes
- Self-policing
- Positive risk-assessment factor
- Good community partner
- Mutual recognition



## Complying with Import and Export Requirements

- International requirements and trade agreements (e.g., harmonized system)
- Exceptions expertise
- Electronic messaging to preclear shipments
- Prohibited goods
  - Check prohibited lists.
- Labeling and documentation
  - Labeling requirements
  - Language of each country goods pass through?
  - Documentation complete and correct?
  - Electronic messaging used?

# Legal, Security, and Regulatory Requirements

## International Labor Considerations

Your Organization's...	Compared Against...
Entry-level wage	Minimum wage and gender disparity
Average wages	Market rates and gender disparity
Senior position	Local staffing
Infrastructure	Local job base investments
New hires	Diversity and retention by subgroups
Full-time benefits	Part-time
Parental leave	Support and postpartum retention
Layoffs/plant closings	How communicated, unions, and support services
Health and safety	Worker committee representation, union/nonunion
Injuries	Region and gender
Training	Gender or role
Grievances	Existence and efficacy

# Import/Export Regulations and Documentation

## Import/Export Road Map

- Import licensing/government
  - World Trade Organization (WTO)
- To clear customs, even large organizations rely on experienced customs house brokers.
  - Regulations change.
  - Must be certified to clear shipments.
- Customs regulations serve two purposes:
  - Provide revenue.
  - Protect domestic industries.
- Customs intentions:
  - Confirm stated cargo value.
  - Verify correct markings.
  - Find forbidden/illegal items.
  - Enforce quotas.
  - Ensure invoice is correct.
  - Discourage trade dumping.



# Import/Export Regulations and Documentation

## Incoterms®

### What are Incoterms®?

- International Commercial Terms define the obligations of exporters and importers.

### Are they legally binding?

- No. But buyers and sellers may use them in POs. Contracts must specify the Incoterm® year.

***Example:***

**FOB Med Shipping Terminal, Port of  
Baltimore, Incoterms® 2020**

# Import/Export Regulations and Documentation

## Incoterms® 2020 Definitions

Terms for Any Mode or Modes of Transport	
<b>EXW</b>	Ex Works (buyer takes over goods at seller's location; loads vehicle)
<b>FCA</b>	Free Carrier (if named place is seller's premises, seller loads on buyer's means of transport (e.g., truck))
<b>CPT</b>	Carriage Paid To (seller selects and pays for main carriage)
<b>CIP</b>	Carriage and Insurance Paid To (seller pays main carriage and insurance)
<b>DAP</b>	Delivered at Place (seller delivers goods and buyer receives and unloads)
<b>DPU</b>	Delivered at Place Unloaded (seller delivers goods to a location and unloads)
<b>DDP</b>	Delivered Duty Paid (seller incurs all costs, including import duty)
Terms for Sea and Inland Waterway Transport	
<b>FOB</b>	Free on Board (seller puts goods on ocean vessel)
<b>FAS</b>	Free Alongside Ship (buyer lifts cargo onboard)
<b>CFR</b>	Cost and Freight (seller selects/pays for main carriage)
<b>CIF</b>	Cost, Insurance, and Freight (seller pays main carriage and insurance)

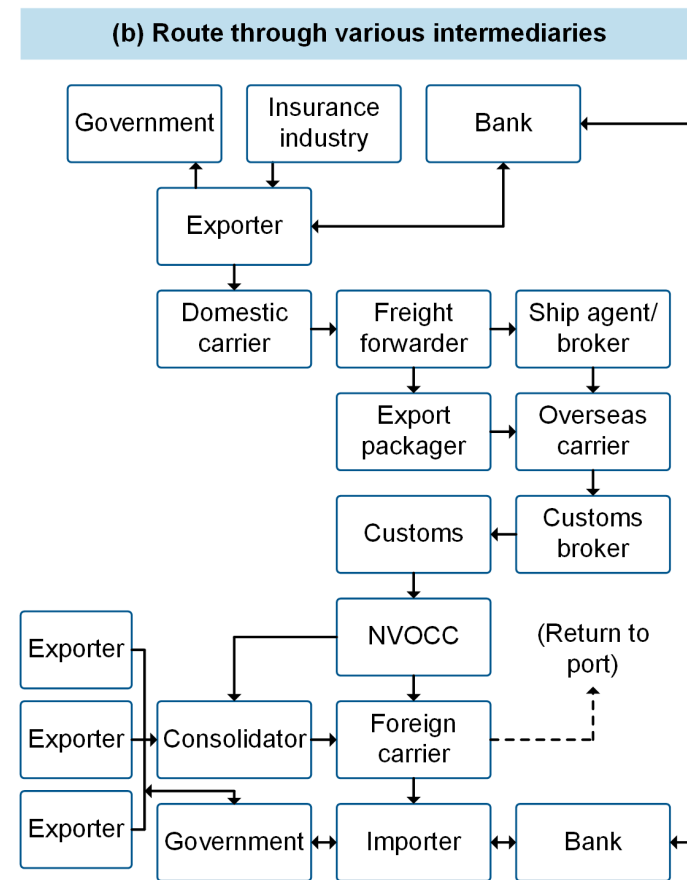
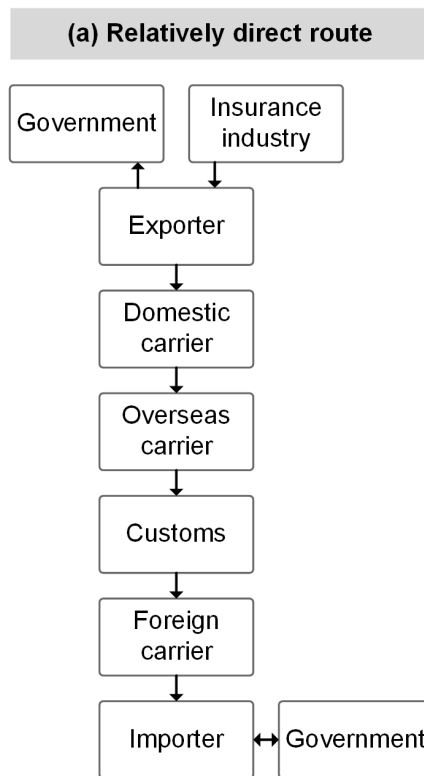
## Export-Import Participants

- Exporter
- Importer
- Domestic carrier
- Overseas carrier
- Freight forwarder
- NVOCC
- Consolidator
- Custom house broker
- EMC
- ETC
- Shipping association
- Ship broker
- Ship agent
- Export packing company

# Import/Export Regulations and Documentation

## Export-Import Flowchart

- Determine which intermediaries make sense



## Export Documentation

- Export declaration
- Export license
- Commercial invoice
- ATA carnet
- Certificate of origin
- Bills of lading
- Air waybills
- Dock receipt
- Certificate of insurance
- TIR Convention and TIR Carnet
- CMR convention and CMR waybill

# Import/Export Regulations and Documentation

## Import Documentation

- Harmonized system classification codes
- Declared value/duty drawbacks
- Calculating import costs
  - Import duties
  - Value-added taxes (VAT)

### *Live*

- 0301.99-290 Fish (excluding ornamental fish, fry for culture and 0301.99-210), live (import)
- 0301.99-900 Other live fish (export)

### *Fresh or chilled*

- 0302.11-000 “Masu” (*Salmo trutta*, *Oncorhynchus mykiss*, *O. clarki*, *O. aguabonita*, *O. gilae*, *O. apache* and *O. chrysogaster*) (import and export)
- 0302.12-000 Pacific, Atlantic or Danube *sake* (export only)
- 0302.12-011 “Benzake”, red salmon *O. nerka* (import only)
- 0302.12-012 “Ginzake”, silver salmon *O. kitsutch* (import only)
- 0302.12-019 Pacific salmon excluding *O. nerka* and *O. kitsutch* (import only)
- 0302.12-020 Atlantic or Danube Salmon (import only)
- 0302.70-000 Livers, eggs and soft roe of fishes (export only)
- 0302.70-090 Livers, eggs and soft roe of fishes (not *Clupea*, *Gadus* or *Merluccius* spp.) Fish livers and roes nes) (import only)

### *Frozen*

- 0303.10-000 Pacific *sake* (prior to 2002) (export only)
- 0303.11-000 “Benzake” Sockeye salmon or red salmon *O. nerka* 2002 onward (imports and exports) — prior to 2002, code 0303.10-010 was used for imports and 0303.10-000 was used for exports)
- 030.19.000 Other Pacific “sake” 2002 onward (export only)
- 030.19-010 “Ginzake” silver salmon *O. kisutch* 2002 onward — previously 0303.10-020 (prior to 2002) (import only)

## Free Trade Zones (FTZs)

- **Benefits:**

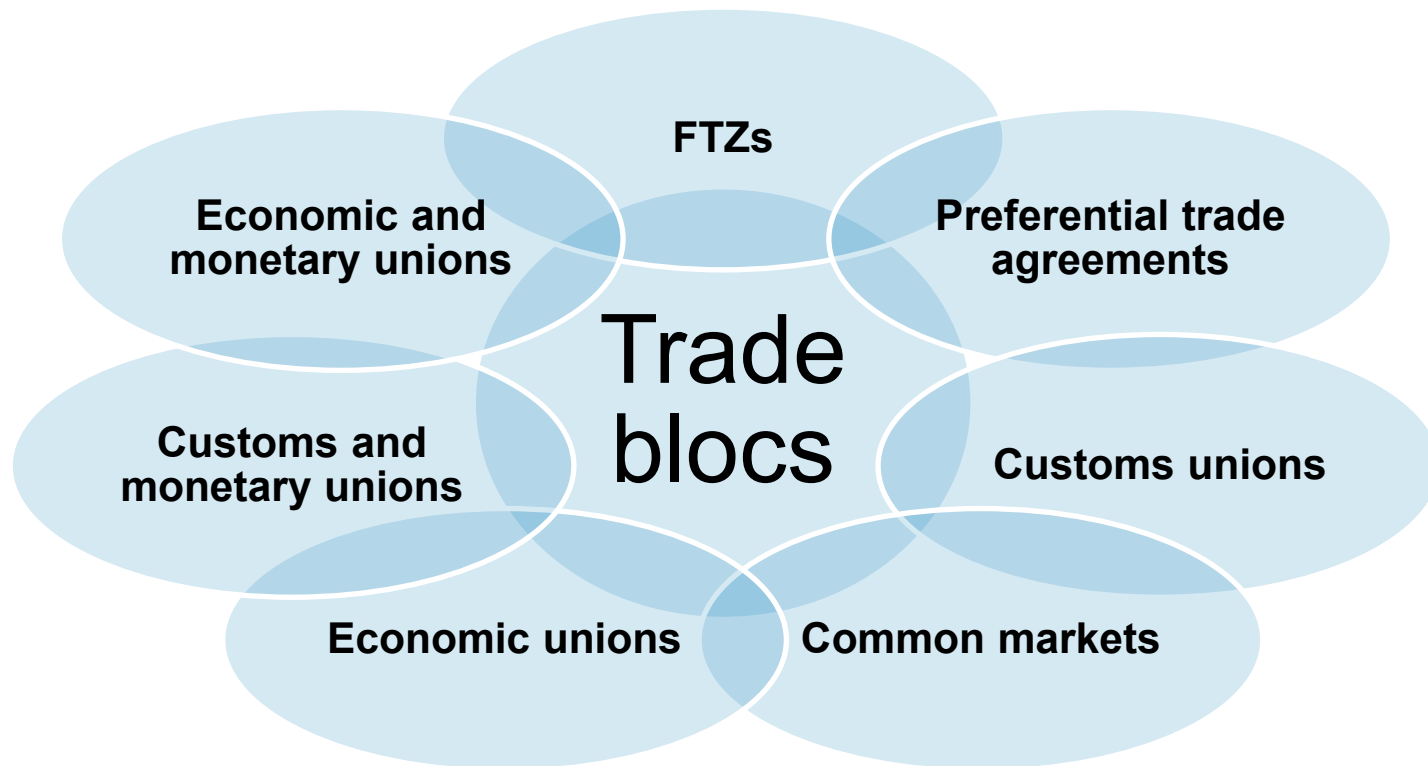
- Deferral of all duties and excise taxes until goods leave the FTZ for customs—a chance to repack, reprocess, etc., for compliance
- Reduced import duties on some cargoes
- Chance to inspect (and reject) cargo before paying duties
- Avoidance of quotas
- Indefinite cost-effective storage
- Manufacture and assembly without “inverted duties”

- **There will be NO:**

- Customs formalities, duties, or quotas
- Duties or quotas on reexports
- Fines
- Retail trade.

# Trade Zones and Blocs

## Trade Blocs





## United States-Mexico-Canada Agreement (USMCA)

- Went into effect on July 1, 2020
- Replaces the North American Free Trade Agreement (NAFTA); generally consistent with it
- Changes to rules of origin
- Certificate of origin eliminated
- De minimis levels to streamline trade and support small/medium-size enterprises
- Reviewed every six years; expiry July 1, 2036



## SECTION D: REVERSE FLOW

## Section D Introduction

### Section D Key Processes:

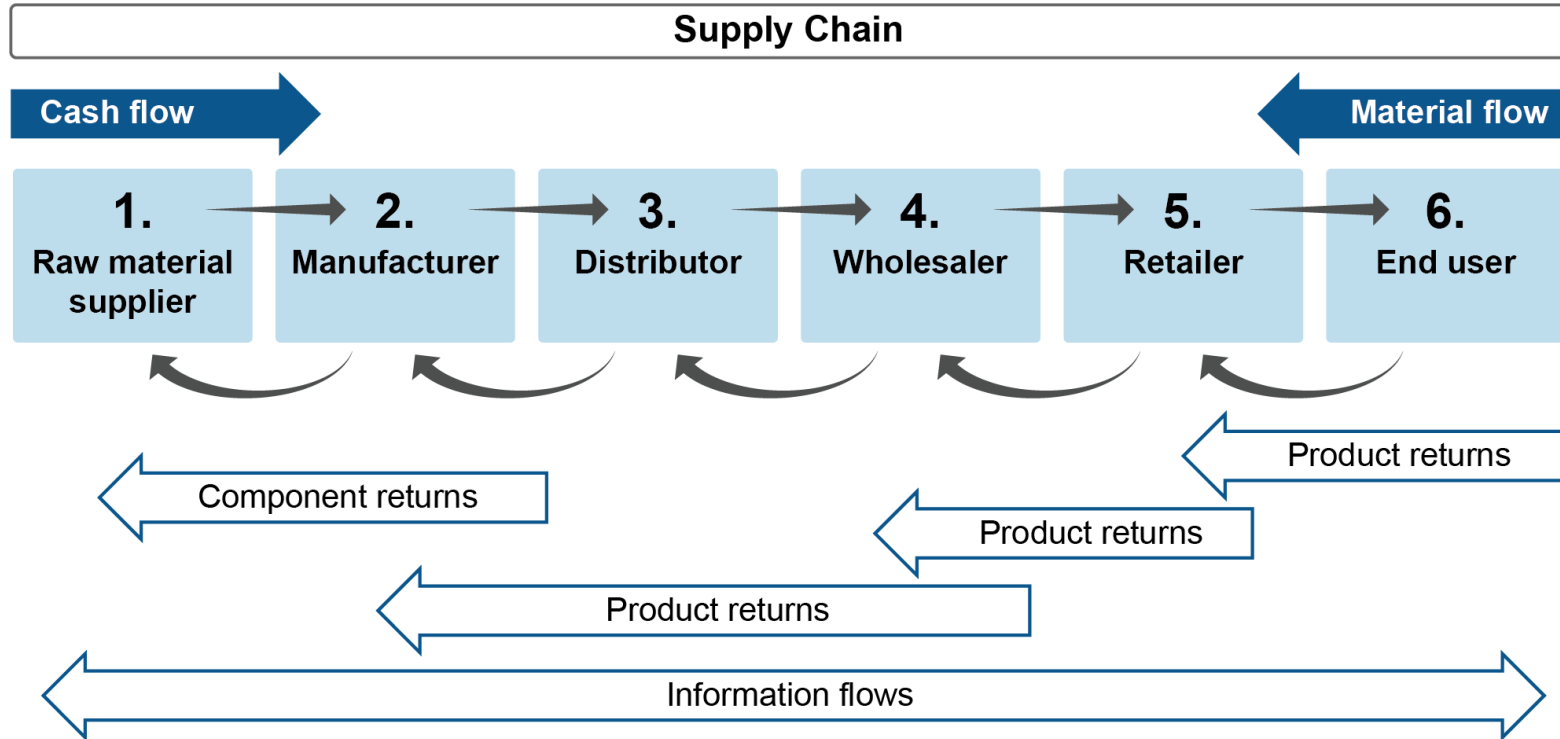
- Design and manage reverse flow.
  - Determine reverse logistics activities.
  - Determine use of warranties and disposition.
  - Analyze costs and benefits.
  - Incorporate reduce, reuse, recycle, and recover waste hierarchy.

### Section D Topics:

- Reverse Logistics
- Waste

# Reverse Logistics

## Reverse Logistics



## Benefits

- Lucrative service contracts
- Mitigation of unprofitable effects of returns
- Enhanced customer loyalty and reputation
- Valuable raw materials in product returns
- More efficient products and logistical tactics
- Profits from resale of refurbished products/ parts
- New types of jobs
- More sustainable use of energy and resources
- Reduction of harmful emissions and pollutants
- Reduced need for landfills and incinerators

## Total Cost of Reverse Logistics

- + Returned product liquidation revenue
- + Recycling revenue
- + Repair revenue
- + Restocking charges and warranty/service program fees
- + Increase in sales from warranties, remanufacture programs, environmental reputation, etc.
- + Capture of tax savings or incentive program benefits
- Returned product cost of goods sold
- Processing and handling costs
- Transportation costs
- Repair and spare parts costs
- Warranty expenses and returns credits

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**Total cost of reverse logistics**

## Requirements for Reverse Logistics

### **Cost avoidance**

Keep more revenue by investing in reverse logistics strategy and management.

### **Aftermarket savings**

Sell metals, etc., from returns, containers.

### **Competitive edge**

Win customers with service excellence.

### **Pressure**

Comply with “green” pressure from stakeholders.

### **Growing market**

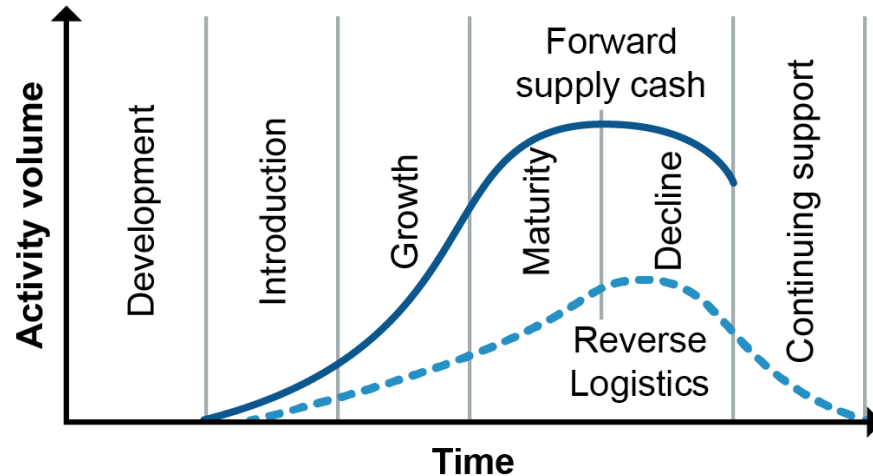
Market “organic,” chemical free products.

### **Environmental concern**

Do the right thing.

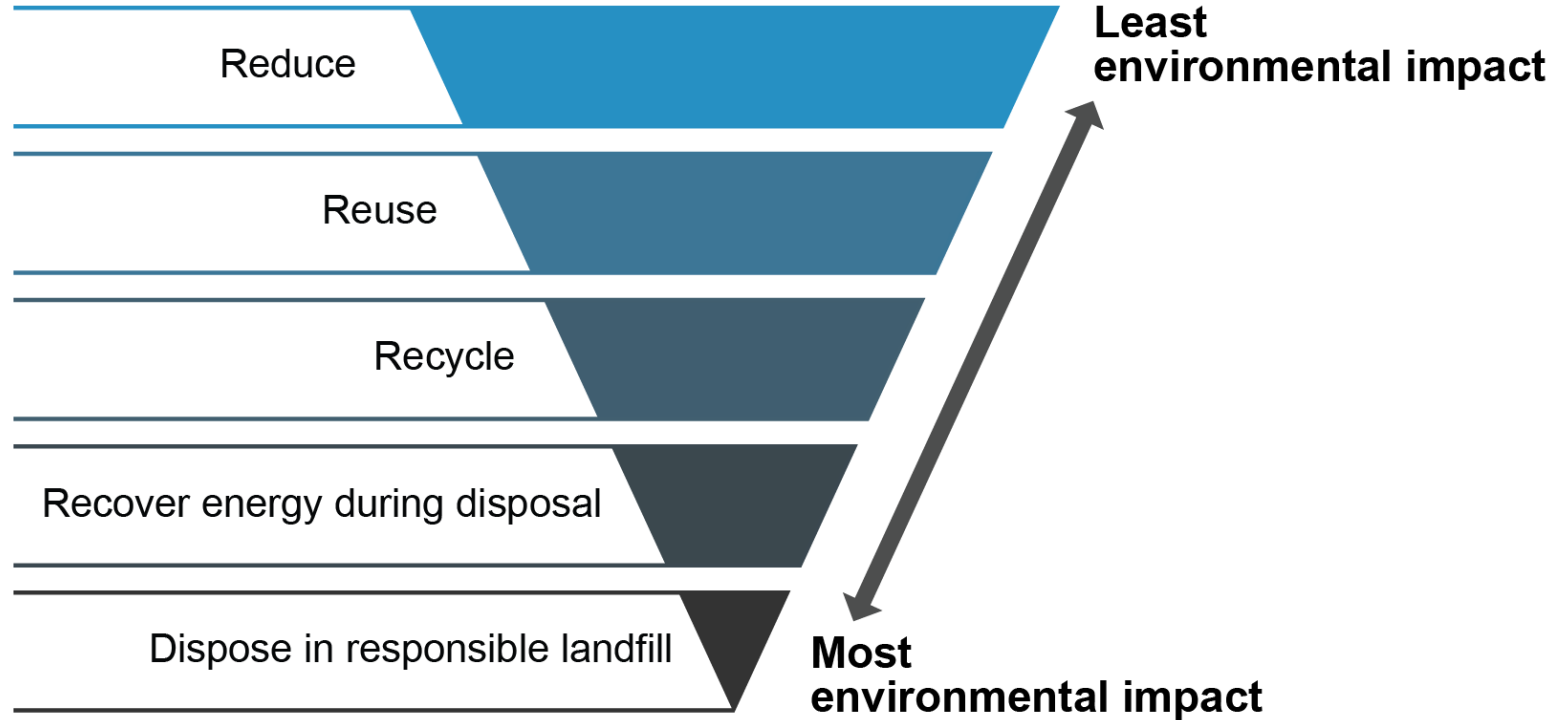
## Reverse Logistics Design

- Reverse flows require their own systems.
- Design warranties and RMAs.
- Life cycle design considers reduce, reuse, recycle, and recover energy (4 Rs) in all phases.





## Waste Hierarchy



## Waste Regulations and Compliance

<b>WEEE</b>	<ul style="list-style-type: none"><li>• Burden of disposing computers, monitors, televisions, printers, etc., on manufacturers.</li><li>• Manufacturers cannot charge a fee to take.</li><li>• Known as “E-waste” in a many U.S. states</li></ul>
<b>RoHS</b>	<ul style="list-style-type: none"><li>• Aimed at reducing waste.</li><li>• Impacts the PDLC.</li><li>• Limits what new electrical and electric equipment can contain to be sold in EU from any source:<ul style="list-style-type: none"><li>— Lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl, polybrominated diphenyl ether</li></ul></li></ul>