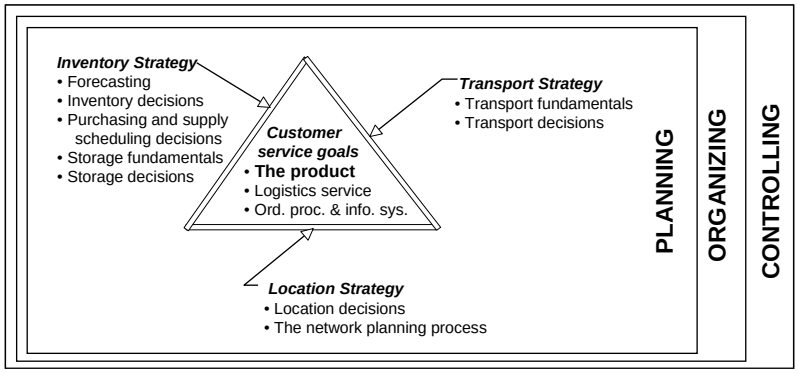
The Logistics/Supply Chain Product

"Logistics/Supply Chain managers are 'owners' of the product-flow *process* from raw material sources to final consumers, not activity administrators."

3-1

Product in the Planning Triangle



3-2

Nature of the Product

- **Product classification**
  - Convenience goods
  - Shopping goods
  - Specialty goods
  - Industrial goods

- **The Product life cycle and Pareto's law**
  - An empirical relationship for the 80-20 curve is

$$Y=\frac{(1+A)X}{A+X}$$

where

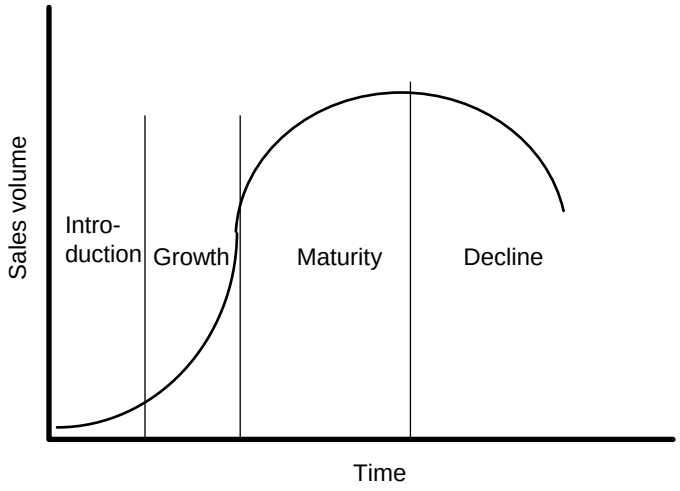
Y = cumulative fraction of sales
X = cumulative fraction of items
A = constant to be determined

The constant is found by

$$A=\frac{X(1-Y)}{Y-X}$$

CR (2004) Prentice Hall, Inc.

Product Life-Cycle Curve



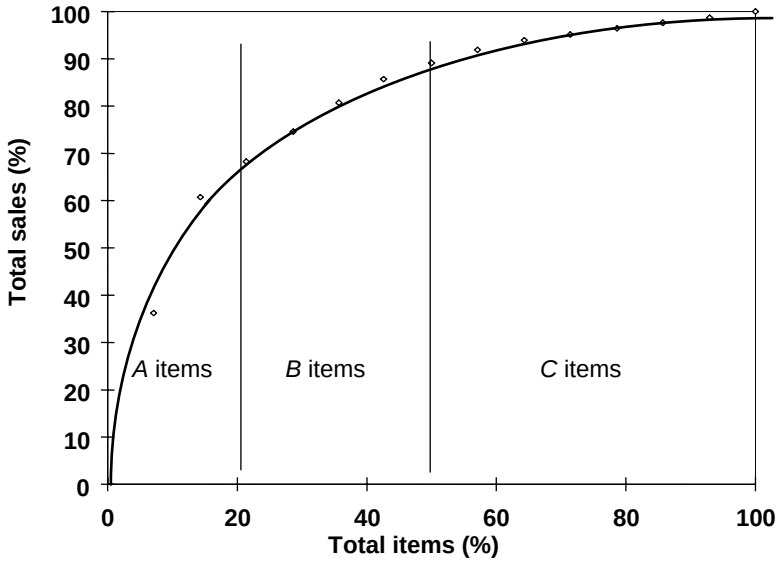
ABC Classification for 14 Products

Product Number	*Product Rank by Sales*[a]	*Monthly Sales (000s)*	*Cumulative Percent of Total Sales*[b]	*Cumulative Percent of Total Items*[c]	*An ABC Classification*
D-204	1	$5,056	36.2%	7.1%	
D-212	2	3,424	60.7	14.3	***A***
D-185-0	3	1,052	68.3	21.4	
D-191	4	893	74.6	28.6	***B***
D-192	5	843	80.7	35.7	
D-193	6	727	85.7	42.9	
D-179-0	7	451	89.1	50.0	
D-195	8	412	91.9	57.1	
D-196	9	214	93.6	64.3	
D-186-0	10	205	95.1	71.4	***C***
D-198-0	11	188	96.4	78.6	
D-199	12	172	97.6	85.7	
D-200	13	170	98.7	92.9	
D-205	14	159	100.0	100.0	
		$13,966			

CR (2004) Prentice Hall, Inc.

3-5

Cumulative 80-20 Curve



3-6

Nature of the Product (Cont'd)

Example Suppose that in an inventory of 10 items, 15% of the items account for 80% of the sales volume. The total sales of all 10 items is $90,000 per year. How much inventory can be expected if turnover for *A* items = 8, *B* items = 5, and *C* items = 2?

First, find *A*.

$$A = \frac{.15(1-.80)}{.80-.15} = 0.0462$$

Then, using *A* = 0.0462 and the first item (1/10), we project the sales volume to be:

$$Y = \frac{(1+.0462).10}{.0462+.10} = 0.7156, \text{ or } 71.6\% \text{ of the sales}$$

Turnover

Total sales

The inventory for this item is expected to be 0.716(90,000)/8 = $8,055.

Continue for the remaining items and generate the following table.

3-7

Example (Cont'd)

Item (X) no.	*Cumulative item fraction*	*Projected cumulative sales fraction*	*Projected cumulative sales (Y)*	*Projected item sales*	*Turnover ratio*	*Average inventory*	
1	.10	.716	$64,440	$64,440	8:1	$8,055	**A**
2	.20	.850	76,500	12,060	8:1	1,508	
3	.30	.907	81,630	6,630	5:1	1,326	**B**
4	.40	.938	84,420	2,790	5:1	558	
5	.50	.958	86,220	1,800	5:1	360	
6	.60	.971	87,390	1,170	2:1	585	**C**
7	.70	.981	88,290	900	2:1	450	
8	.80	.989	89,010	720	2:1	360	
9	.90	.995	89,550	540	2:1	270	
10	1.00	1.000	90,000	450	2:1	225	
				$90,000		$13,697	

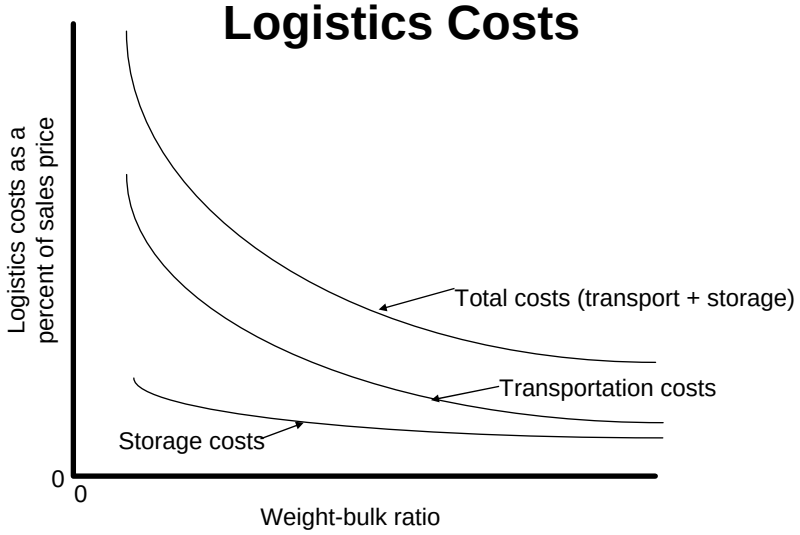
3-8

Nature of the Product (Cont'd)

- ***Product characteristics***
  - Weight-bulk ratio
  - Value-weight ratio
  - Substitutability
  - Risk
- ***Product packaging***
- ***Product pricing***
  - F.o.b. origin
  - F.o.b. destination
  - Zone pricing
  - Single and uniform pricing
  - Quantity discounts
  - Deals

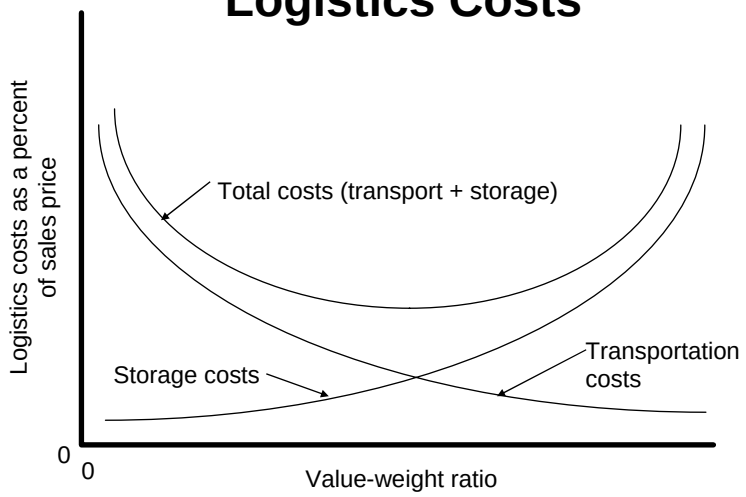
3-9

Effect of Weight-Bulk Ratio on Logistics Costs



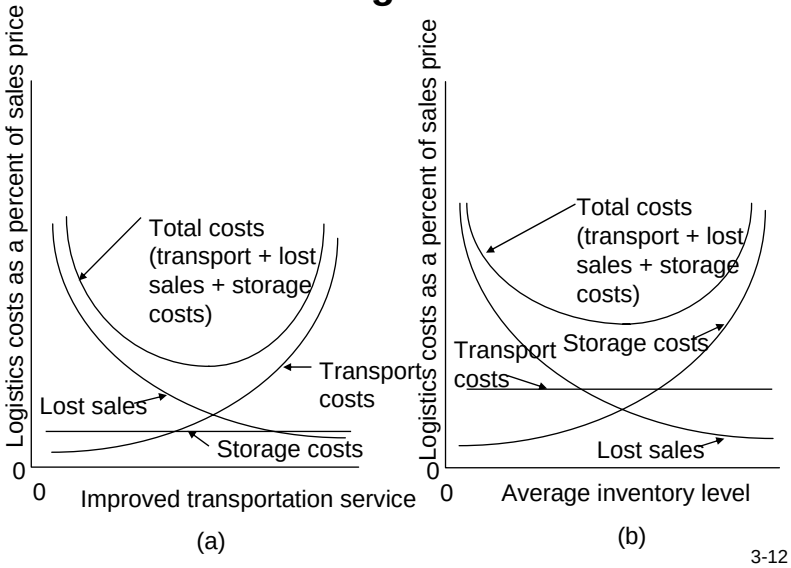
3-10

Effect of Value-Weight Ratio on Logistics Costs



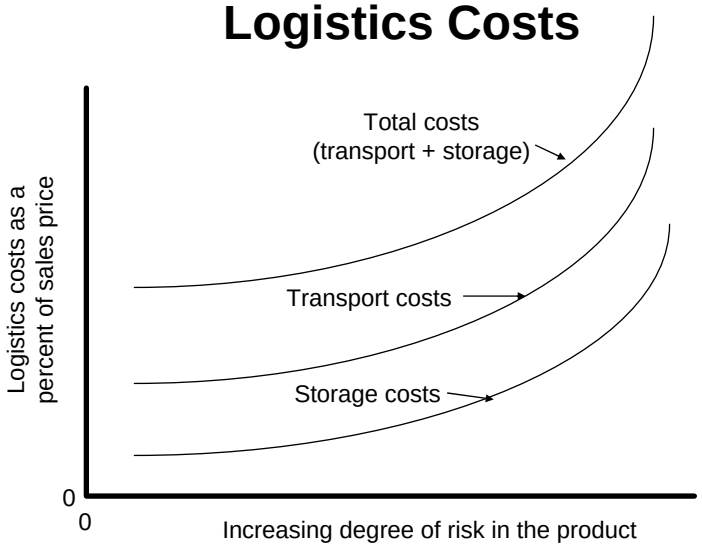
3-11

Effect of Transport Service and Inventory Level on Logistics Costs



3-12

Effect of Product Risk on Logistics Costs



3-13

Reasons for Product Packaging

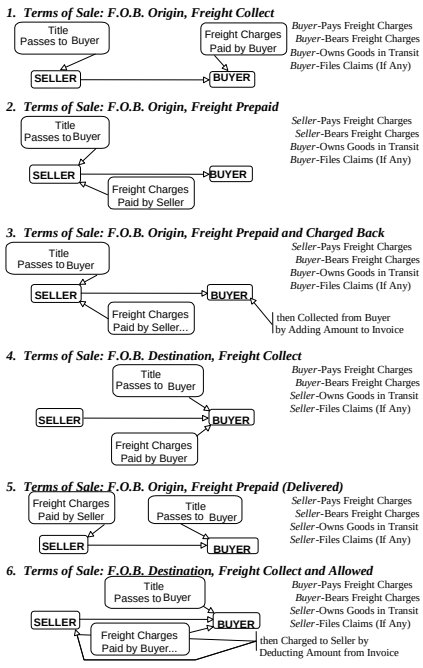
- Facilitate storage and handling
- Promote better utilization of transport equipment
- Provide product protection
- Promote the sale of the product
- Change the product density
- Facilitate product use
- Provide reuse value for the customer

3-14

Product Pricing

- Geographic pricing methods
  - F.o.b. pricing
  - Zone pricing
  - Single, or uniform, pricing
  - Freight equalization
  - Basing point pricing
- Incentive pricing
  - Quantity discounts

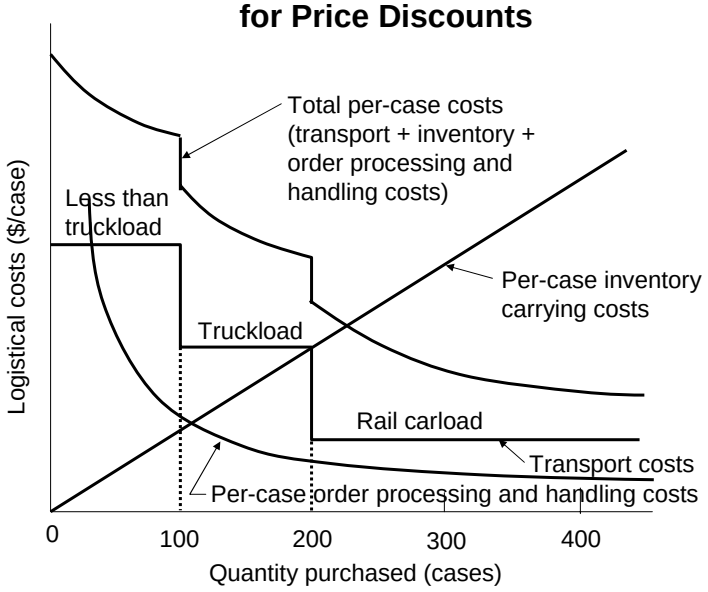
3-15



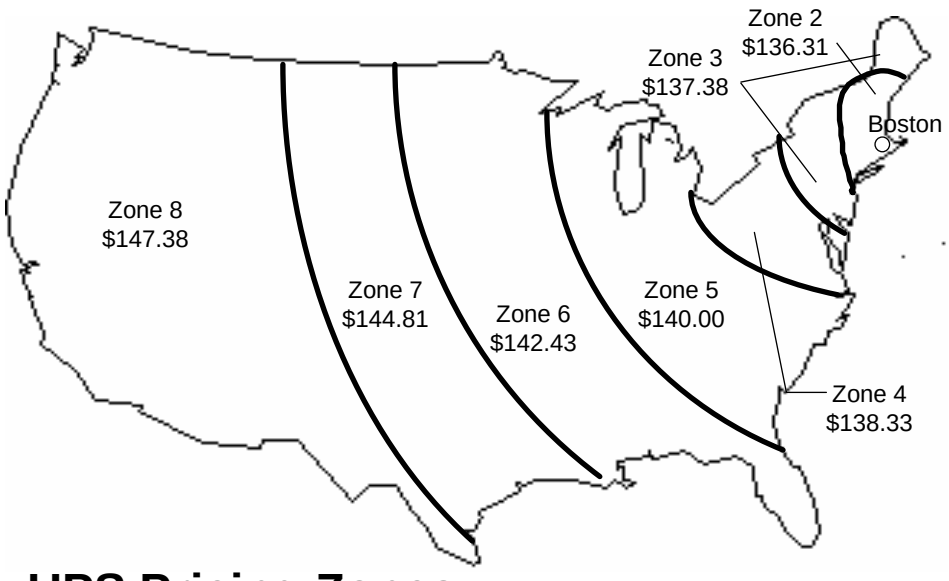
A Variety of Pricing Arrangements

3-16

Per-Case Logistics Costs as a Justification for Price Discounts



3-17



UPS Pricing Zones

3-18