

Chapter 6

Fleet and Revenue Management

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Fleet Management – Defined

- Fleet Management is a reduction of materials handling costs resulting in increased efficiency.
 - This requires a planned replacement program which optimizes the economic life of the fleet.
- The overall goal is universal: to reduce costs.
- However, each customer's definition of, and expectation from, fleet management is unique.

Fleet Facts – Understanding Costs

- 20% of the total cost of materials handling is associated with the acquisition cost of the fleet.



20%

- *80% of total cost is related to operator and maintenance expense.*



80%

Fleet Facts – Lifecycle

- The average vehicle is over 12 years old.
- The average vehicle has an estimated economic life of **10,000-14,000** hours.
- As a fleet ages, the cost of operation increases:
 - Repair expenses increase
 - Downtime increases
 - Productivity decreases

Fleet Facts – Utilization

- On average, companies have 10% to 20% more units in operation than are required to do the job.
- Short term rental units are often used to address shortages created by excessive downtime.
- vehicles are often sourced through multiple vendors, limiting flexibility related to fleet rotation and re-location.

Fleet Facts – Maintenance

- Many companies do not have scheduled or preventative maintenance programs for their vehicle fleets.
- vehicle fleets typically consist of a diverse mixture of brands, requiring an extensive inventory of parts to support them.
- Record keeping regarding vehicle maintenance is generally poor or non-existent.

fleet: the focus of TPM

- The Six big Losses
- fleet Effectiveness
- Calculating fleet Effectiveness
- fleet Management

Factors Affecting fleet Effectiveness

- fleet failure (breakdown)
- Setup and adjustment downtime
- Idling and minor stoppages
- Reduced speed
- Process defects
- Reduced yield

Cycle Time and Set-Up Reduction

Shorter runs produce customer orders with less lead time

- However, fleet breakdowns, idling and minor stoppages will make it very difficult to reduce cycle times
- Hence, cycle time reductions result in shorter and more frequent production runs.
- Suddenly, set-ups and adjustments become crucial in reducing cycle times
- Past OEE studies show that set-up and adjustments can consume up to 50% of total production time
- In such situation the six big losses become more of an issue to solve

The Six Big Losses

➔ Down Time.

1. **Breakdowns** due to fleet failure.
2. **Setup and adjustment** (e.g. exchange of dies in injection molding machines, etc.)

➔ Speed Losses.

3. **Idling and minor stoppages** (abnormal operation of sensor, etc.).
4. **Reduced speed** (discrepancies between designed and actual speed of fleet)

➔ Defects.

5. **Defects** in process and rework (scrap and quality defects requiring repair)
6. **Reduced yield** between machine startup and stable production.

The fleet Losses (you can and must measure)

fleet Availability	• Setup and Adjustments – Including changeovers. – Programming. – Test runs. • fleet Failures – Sporadic breakdowns. – Chronic breakdowns.
fleet Efficiency	• Idling and Minor Stoppages – Jams and other short stoppages. – No parts, no operator. – “Blocked”. • Reduced Speed – fleet worn out. – Lack of accuracy.

Contd.

Quality	• Process Defects – Scrap. – Rework
Others	– fleet warm up etc. – No parts, no operator.

Availability

- **Loading time** = Total available time per day (or month) – Planned downtime
- **Planned downtime**: amount of downtime officially scheduled in the production plan

$$\text{Availability} = \frac{\text{Loading Time} - \text{Down Time}}{\text{Loading Time}} \times 100$$

Example

- Loading time per day = 460 min.
- Downtime: breakdowns = 20 min.
- Setup 20 min = 20 min.
- Adjustments = 20 min.
- Availability = ?

$$\text{Availability} = \frac{\text{Loading Time} - \text{Down Time}}{\text{Loading Time}} \times 100$$

Solution

- Loading time per day = 460 min.
- Downtime: breakdowns = 20 min.
- Setup 20 min = 20 min.
- Adjustments = 20 min.
- Availability = ?

$$\text{Availability} = \frac{\text{Loading Time} - \text{Down Time}}{\text{Loading Time}} \times 100$$

$$\text{Availability} = \frac{460 - 60}{460} \times 100 = 87\%$$

Performance Efficiency Contd.

- Alternative formula in case ideal cycle time is not known or products with different cycle times are run on the same machine.

$$PE = \frac{\text{Operation time} - \text{Lost time}}{\text{Operation time}}$$

- Lost time due to
 - Idling and minor stoppages,
 - Speed losses,

Rate of Quality

$$\text{Rate of Quality} = \frac{\text{Processed amount} - \text{rejects}}{\text{Processed amount}} \times 100$$

$$\text{Rate of Quality} = \frac{\text{Usable operating time} - \text{Defect time loss}}{\text{Usable operating time}} \times 100$$

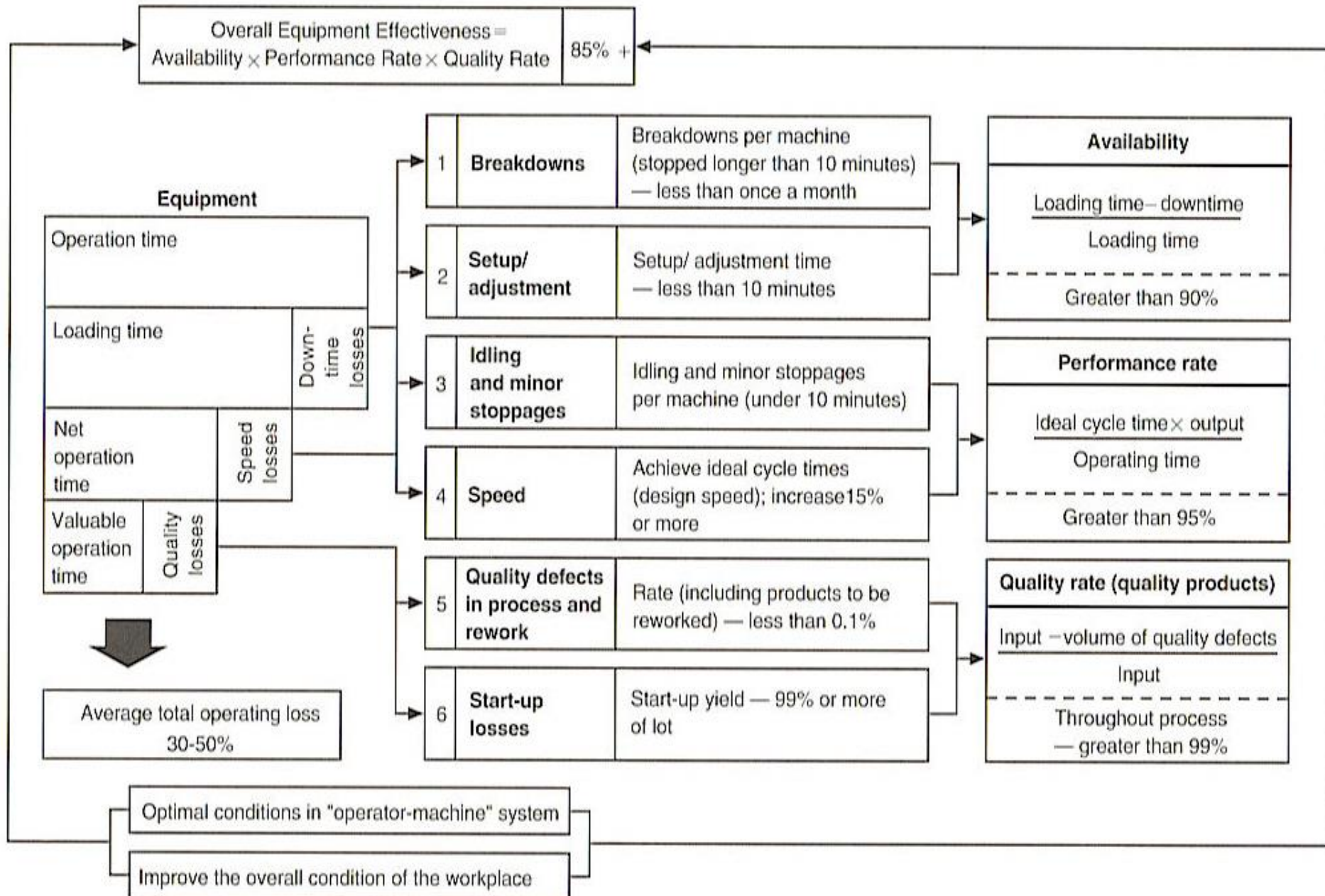
Example

Processed amount = 200

Rejects = 4

$$\text{Rate of Quality} = \frac{200 - 4}{200} = 98\%$$

Improvement Goals for the Six Big Losses



Measures of Effectiveness in Graph

Total Operating time						
Availability	A	Net time	Operating			*No scheduled production
	B	Running time				* Failures * Setup
Performance	C	Target	Output			
	D	Actual Output				* Minor Stoppages * Reduced Stoppages
Quality	E	Actual Output	Lost effectiveness			
	F	Good Output	* Scrap/ rework * Startup losses			
OEE = B/A X D/C X F/E						
Availability rate Performance rate Quality rate						

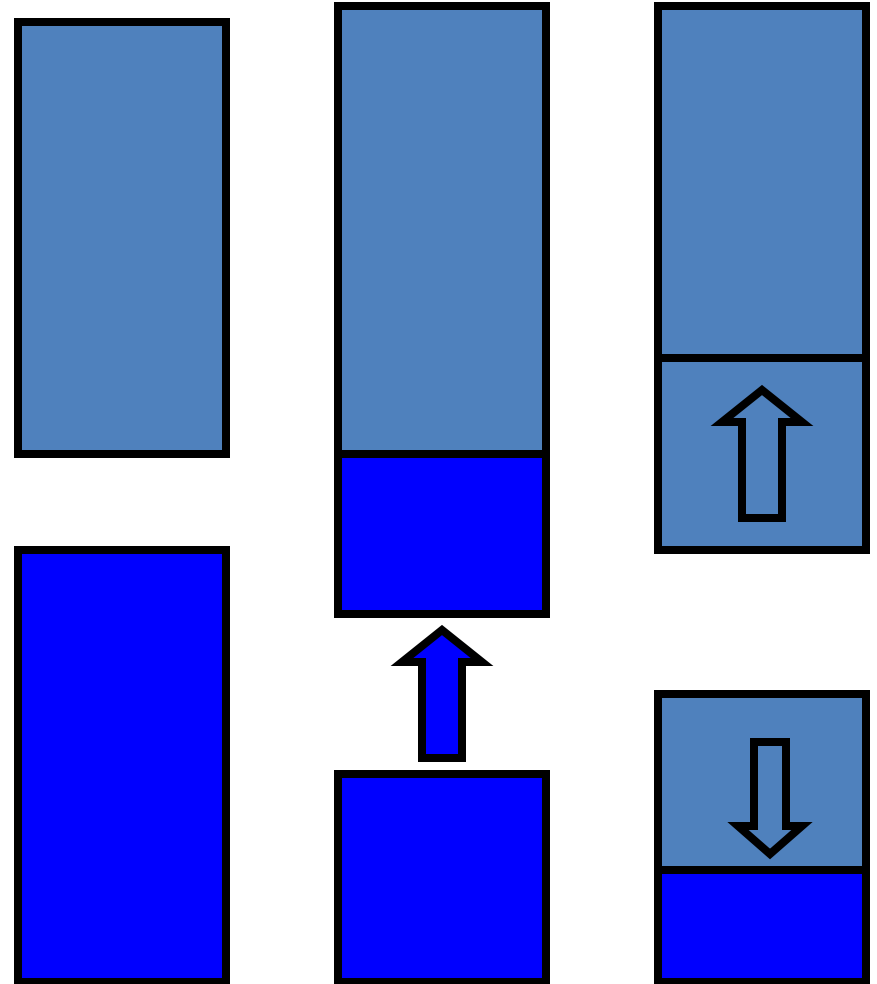
Single-Minute Exchange of Die (SMED)

SMED was originally designed to improve die press setups but its principles apply to changeovers in all types of processes. Set-ups can be either:

- **Internal Setup:** Operations that are performed while a machine is stopped
- **External Setup:** Operations that are performed while a machine is running

3 Phases of SMED

- Separating Internal and External Setup
- Converting Internal Setup to External Setup
- Streamlining all Aspect of the Setup Operation



Overall fleet Effectiveness (OEE)

In an ideal factory, fleet would operate 100 percent of the time at 100 percent capacity, with an output of 100 percent good quality.

In real life, however, this situation is rare.

The difference between the ideal and the actual situation is due to losses.

Calculating the **overall fleet effectiveness (OEE) rate** is a crucial element of any serious commitment to reduce fleet- and process-related wastes through total productive maintenance (**TPM**) and other lean manufacturing methods like Operational Excellence, Six Sigma or World Class Manufacturing.

Overall fleet Effectiveness (OEE) contd.

- When we buy a piece of fleet, we do so to carry out a specific function.
- So, let's imagine that we have bought our new tool and installed it to the manufacturer's standard.
- Everyone has been trained and we all know how to use it, how to set it up for production, and we have also started making our first product.

The question is how do we know when the tool has failed?

- We, as the users, need to consider all the different ways it can fail or how many ways it can fail to fulfill the description.

Overall fleet Effectiveness (OEE) contd.

Possibly there are three ways that failure may occur.

1. *The fleet can stop working completely known as a total failure (Availability),*

$$\text{Availability (\%)} = \frac{\text{total time available} - \text{downtime}}{\text{total time available}} * 100\%$$

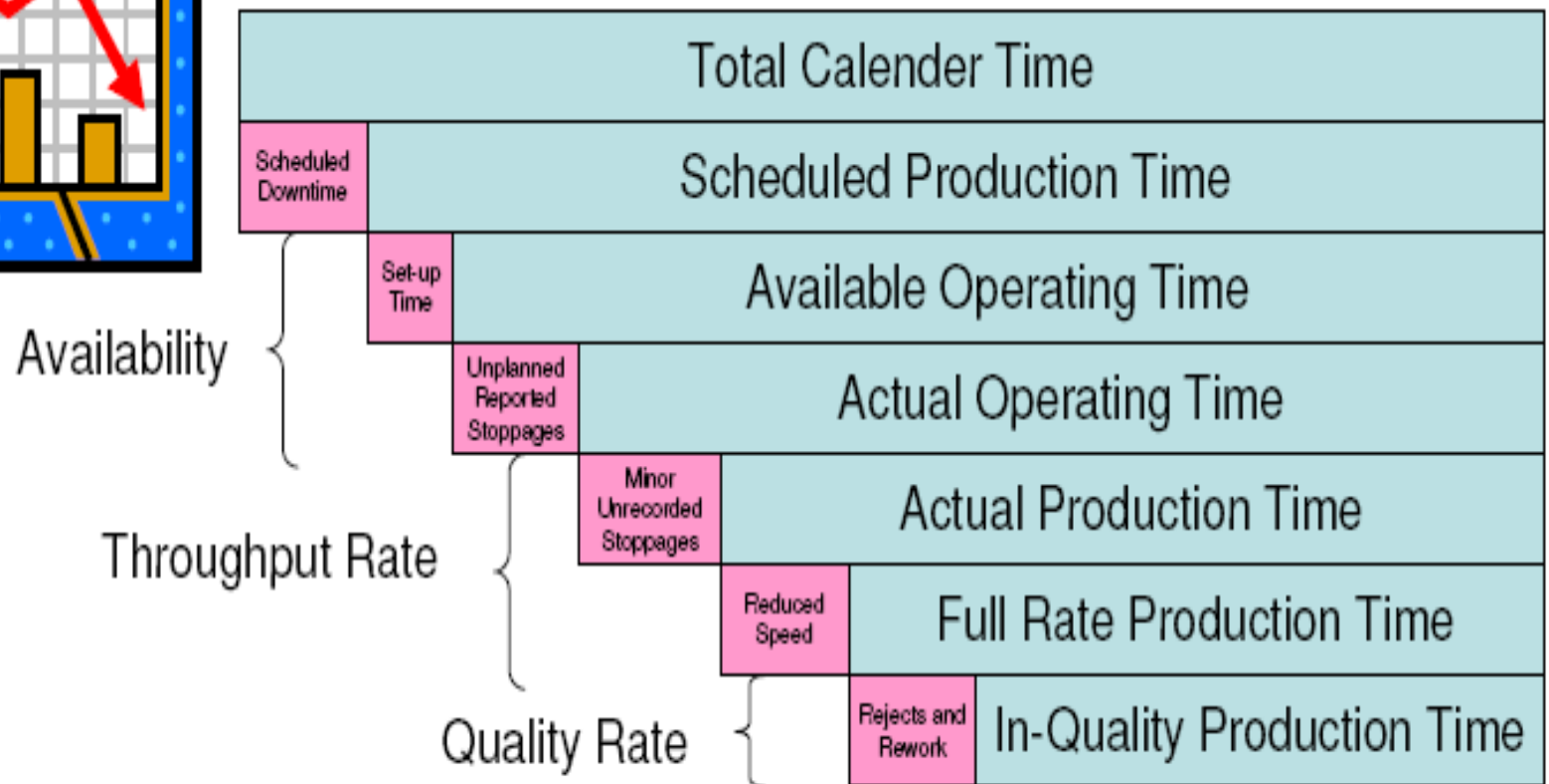
2. *The fleet can work slower than it is capable of known as the partial failure (throughput rate/Performance), and*

$$\text{Performance (\%)} = \frac{\text{number of units manufactured}}{\text{possible number of manufacturable units}} * 100\%$$

3. *The fleet or product can lose quality known as quality failure (Quality).*

$$\text{Quality (\%)} = \frac{\text{number of units produced} - \text{number of defects}}{\text{number of units produced}} * 100\%$$

Overall fleet Effectiveness contd.

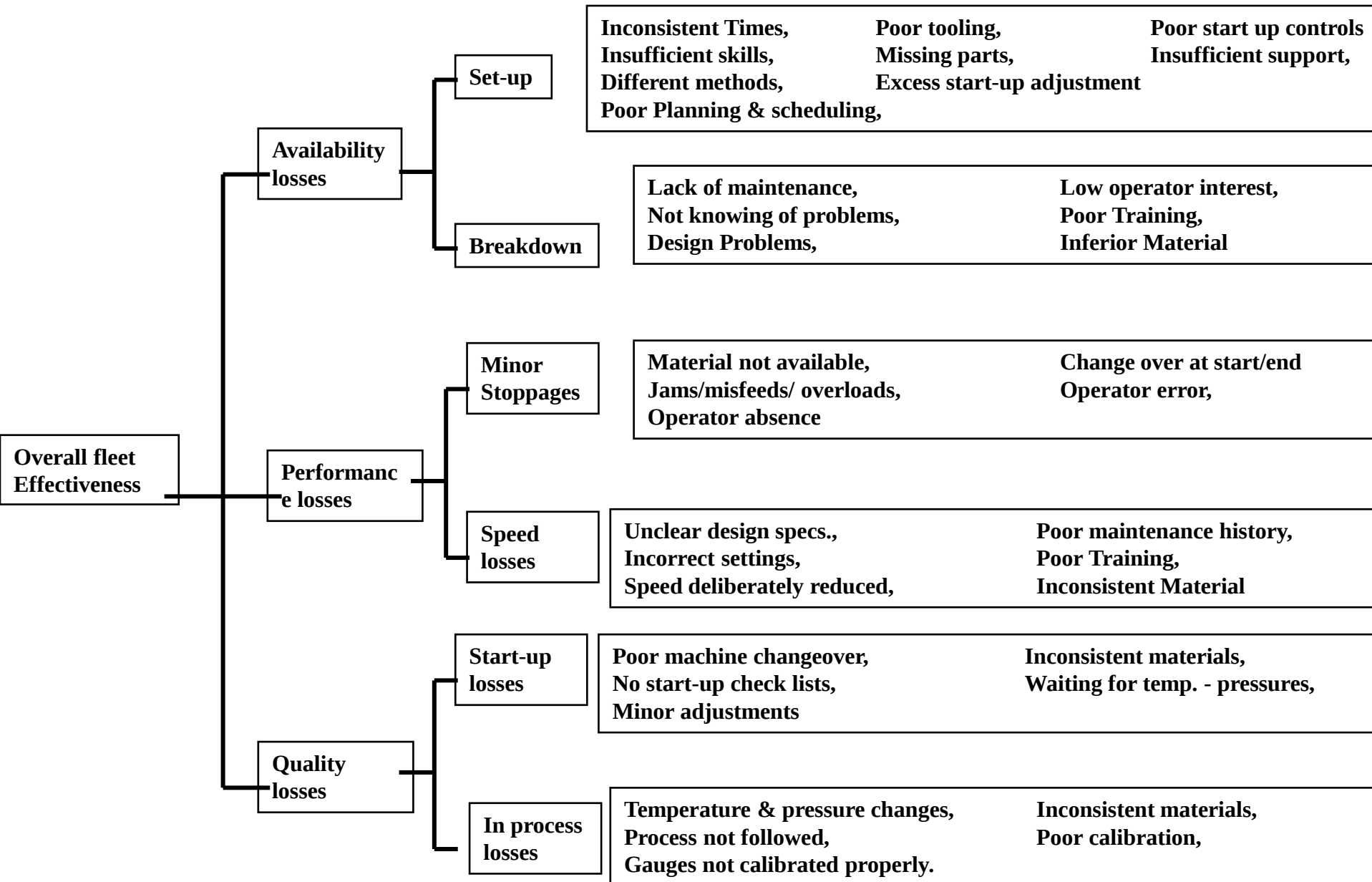


$$\text{OEE} = \text{Availability} \times \text{Throughput Rate} \times \text{Quality Rate}$$

The six big losses contd.

Loss Categories	The Six Big Losses
Downtime (lost availability)	fleet failures, Setup and adjustments
Speed losses (lost performance)	Idling and minor stoppages, Reduced speed operation
Defect losses (lost quality)	Scrap and rework Start-up losses

OEE (The six big losses) contd.



World Class OEE

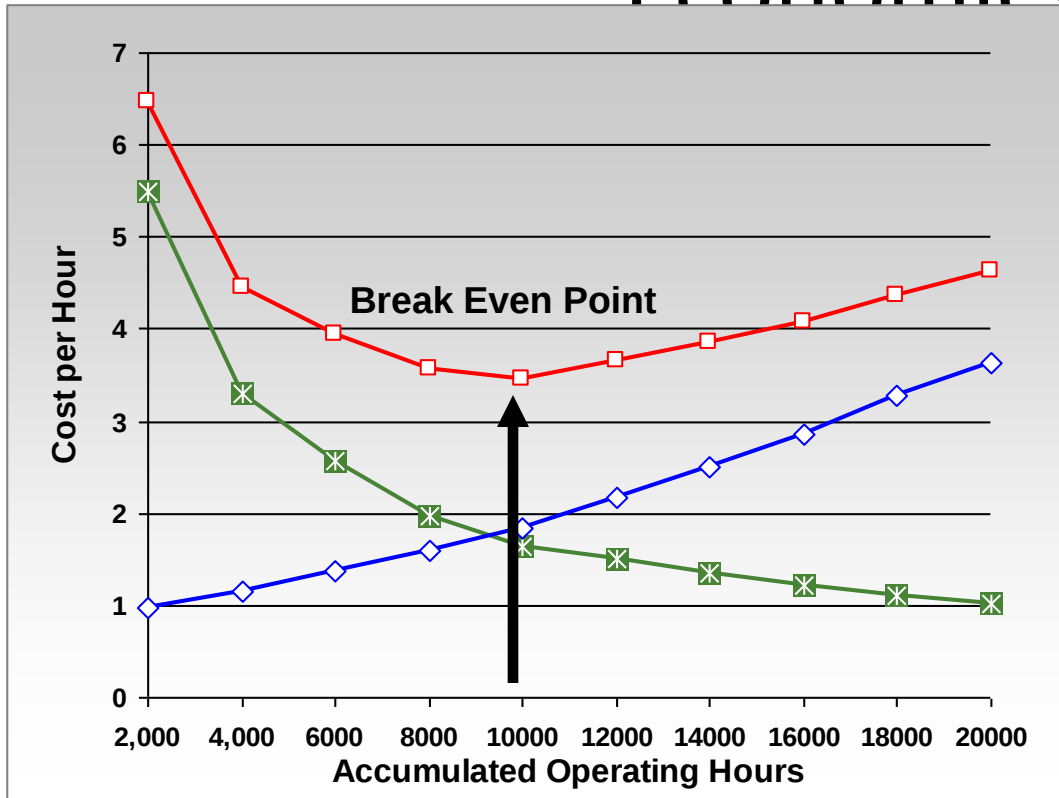
OEE Factor	World Class
Availability	90.0%
Performance	95.0%
Quality	99.9 %
OEE	85.0%

Fleet Management – Optimum Life Economics

- Understanding the point at which **acquiring** a new vehicle for your fleet is **more cost-effective than** continuing to **repair** your current fleet is critical to the deployment of an effective fleet management program.
- The graph on the following slide demonstrates the concept of **Optimum Life Economics** to determine a vehicle's “Break Even” point.

Fleet Management – Optimum Life

Economics



Ownership costs
+ **Maintenance costs**
= **Total costs**
(ownership + maintenance)

“Break even” occurs
when cumulative costs
per operating hour
reach their lowest point
on the *total cost*** curve.**

Fleet Savings Calculator

- Use our interactive calculator to understand the dynamics of maintenance expenses associated with typical vehicle fleets.
- Based on your input, see possible savings that can be realized with a fleet management program.



Fleet Savings Analysis

This analysis tool demonstrates the dynamics of maintenance expenses associated with a lift truck fleet in a typical application and the possible savings that can be realized through a fleet management program. Based on criteria selected in steps #1 - 5, a profile of your fleet, including estimated current costs and potential savings, will be displayed below. The data used in this program is based on national averages and your actual fleet profile will vary based on your specific operating hours, application, and fleet composition. Your local Hyster dealer or Hyster Fleet Services Representative can provide a no-cost consultation on your specific operation.

Select the items, by clicking on the button options to the right, that best describe the typical unit in your current fleet. When you have made your selections, your profile will display below. Print this page for future reference. To return to the presentation, close this spreadsheet.

1. Select Equipment Type	IC/Pneumatic	IC/Cushion	Electric/Sit Down
2. Select Capacity (in pounds)	5,000	8,000	12,000
3. Select Average Age (Years) of Current Fleet	5	10	15
4. Select Average Hours Operated per Year	1,500	2,000	2,500
5. Select Approximate Number of Lift Trucks in your Current Fleet	25		

Your Fleet Of: 25, 5000 Lbs IC/Pneumatic's With an Avg Age of 5 Yrs at 1500 Hrs Per Yr

Estimated Average Annual Maintenance Cost per Current Unit	\$6,117
Estimated Average Annual Maintenance Cost for Current Fleet	\$152,929

[Click here to go to the calculator](#)

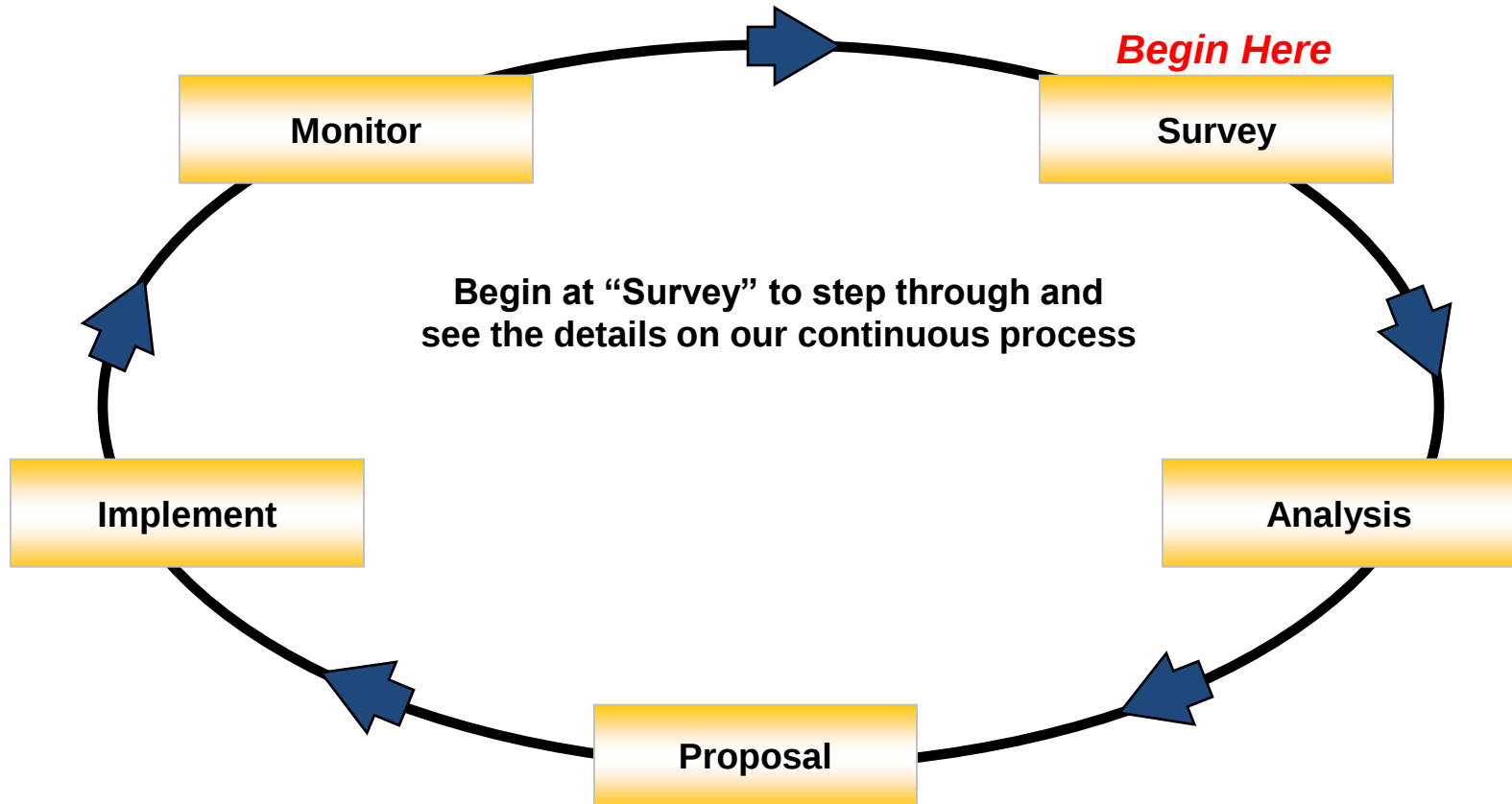
NOTE: The Fleet Savings Calculator requires Microsoft® Excel and uses macros to support interactivity. Click **Yes** to **Enable Macros** when the on-screen message displays*. **No** will **Disable Macros**, and the interactive options will not work. You will, however, see a sample analysis based on a default profile. When you are done using the calculator, close the spreadsheet to return to this screen.

** If you don't see any message, your copy of Excel is using "High" security and has automatically disabled the macros. Change this in Excel by going to Tools, Macro, Security and selecting "Medium."*

Hyster Fleet Services

- A well designed fleet management program can:
 - ✓ *Lower operating costs*
 - ✓ *Reduce fleet size*
 - ✓ *Increase utilization*
 - ✓ *Train operators/technicians*
 - ✓ *Evaluate contract maintenance*
 - ✓ *Determine financing alternatives*
 - ✓ *Improve or eliminate parts inventory*
 - ✓ *Redirect head count*
 - ✓ *Monitor costs*
 - ✓ *Reduce supplier base*
 - ✓ *Maximize efficiency*

Fleet Management Process



Fleet Management Process – Step 1: Survey

- Gather Information on the Existing Fleet

- Make/Model
- Age/Serial Number
- Current/Anticipated Operating
- Utilization/Required Availability
- Specifications/Special
- Application/Operating
- Maintenance History

Require

Co



[Return to Process Flow](#)

Fleet Management Process – Step 2: Analysis

- Compare Existing Fleet to Replacement

- Maintenance History Interpretation
- Utilization Studies
- Projected Maintenance
- Potential Savings
- ROI Analysis



[Return to Process Flow](#)

Fleet Management Process – Step 3: Proposal

- fleet Recommendations

- Replacement Units and Configurations

- Maintenance Options

- Contract Maintenance or Inventory

- Training

Recommendations

- Operator and Mechanic

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Fleet Management Process – Step 4:

Implement

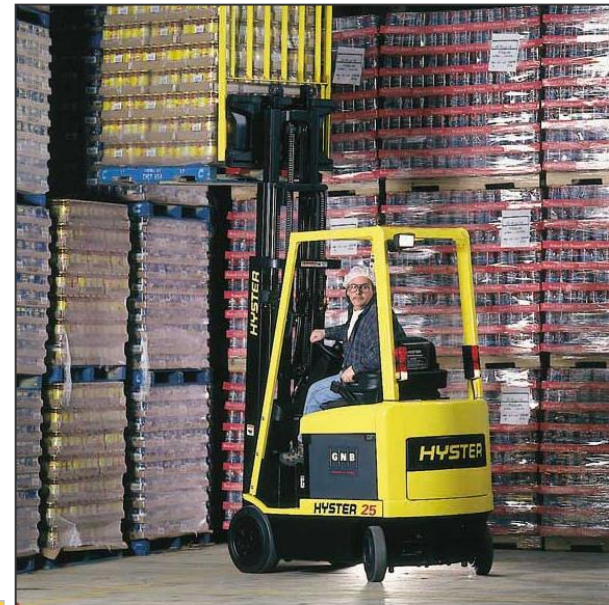
- Finalize Action Plan
 - Standardize Proposed Recommendations
 - Product Supply Plan
 - fleet Disposal Plan
 - Establish Training Schedule
 - Maintenance Arrangements
 - Customer Commitment



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Fleet Management Process – Step 5: Monitor

- Regular Review of Plan
 - Condition of fleet
 - Hours
 - Utilization
 - Maintenance Cost
 - Fleet Size and Replenishment
 - Management Reporting



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*Step 5 completes the process.
Click forward arrow to continue.*

International Air Regulation

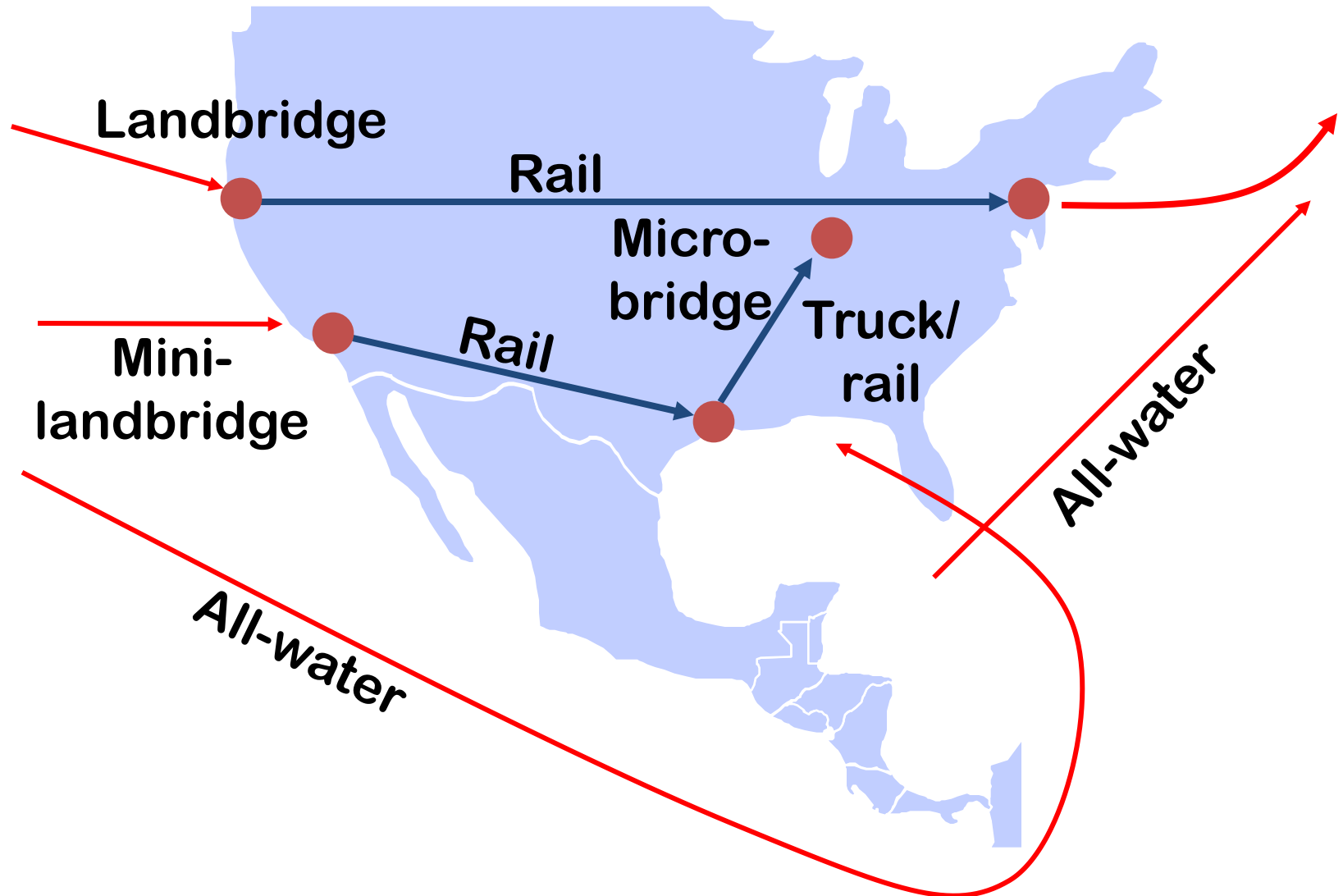
- US policy has opened direct flights into many cities other than coastal gateways
- Price reductions not yet realized
- Foreign carriers may be reluctant -- requires opening of several European cities
- IATA provides collective rate making for international carriers

Modal Selection & Carrier Management

Cargo Characteristics

- **Size:** Dimensions & Volume
- **Weight:** Absolute weight of cargo
- **Hazardous Cargo:** Special handling and service requirements
- **Density:** the weight-to-volume ratio
- **Stowability:** degree to which a product can fill the available space in a transportation vehicle
- **Handling:** ease or difficulty of handling the product
- **Liability:** Likelihood (& cost) of threat of theft or pilferage

Distribution/Transportation Options



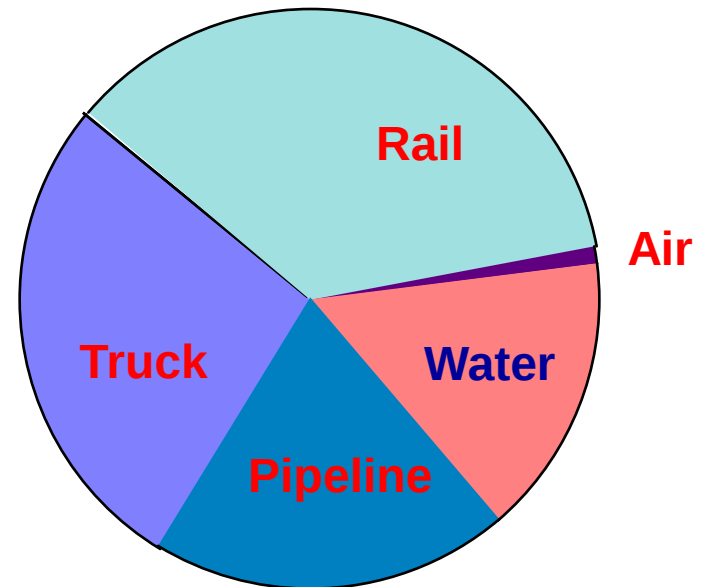
Land, Mini-, and Micro-bridges

- Consists of containers traveling over a sea leg and a land leg
- Reduces ship fuel and capital costs
- Reduces transit time
- Frees expensive ship for additional travel



Pipeline

- Initially used to feed other modes (rail)
- Common carrier
- Move more than 20% of intercity freight
- Growth peaked in 1988
- Primarily oil (60%) and natural gas
- Efficient (specific commodities),
- Low damage risk
- Low cost
- Limited geographic coverage, one-way



Road



- Most flexible and widely used
- Considerable competition within the industry
- Air and rail are chief competitors (particularly intermodal rail)
- Suitable for higher value, lower volume products (than rail)

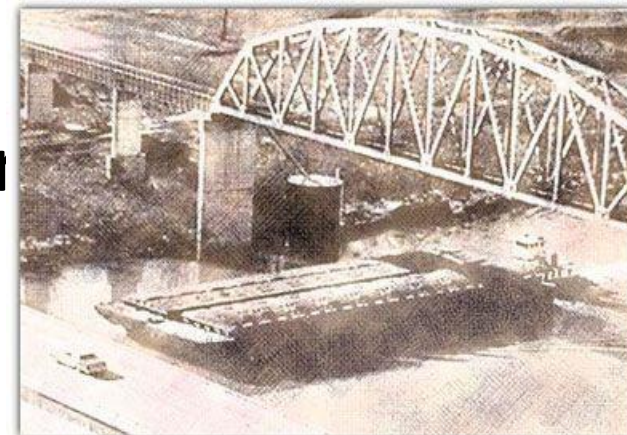
Rail



- Cost-effective but influenced by government ownership and driving limits
- Energy-efficient and competitive with road over 500 miles
- Suitable for low value, high volume products

Water

- Heavy, dense freight
- Speed not an issue
- Inexpensive and suitable for low value, high volume products
- Domestic (*inland*) vs. ocean carrier

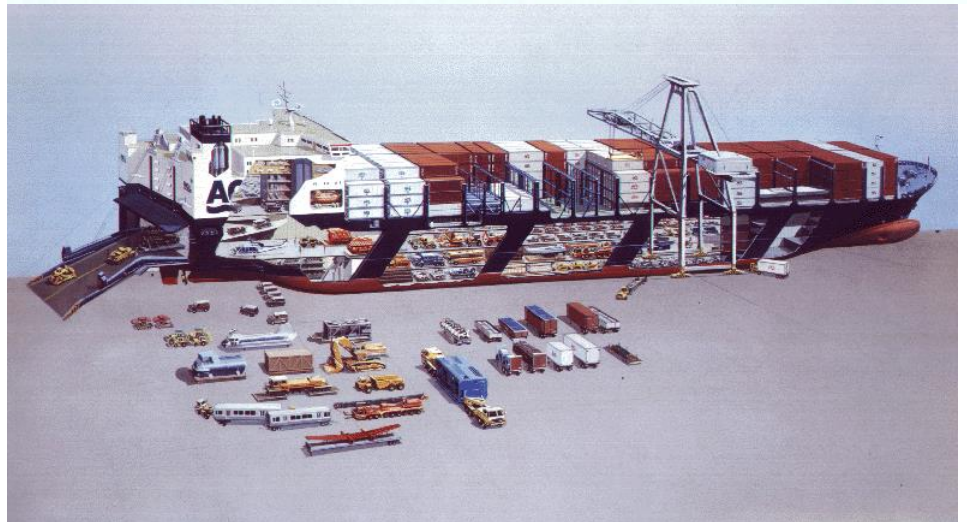


Types of Vessels

- Breakbulk Freighters
- Container Ships
- RORO
- Bulk Freighters
- Tankers
- Seagoing Barges



Jacksonville, Florida (Ro/Ro Terminal)



US Port Volumes

U.S. PORT RANKING BY CARGO VOLUME 1999								
TOTAL TRADE			FOREIGN TRADE			DOMESTIC TRADE		
RANK	PORT	SHORT TONS	RANK	PORT	SHORT TONS	RANK	PORT	SHORT TONS
1	South Louisiana (LA)	214,196,912	1	Houston (TX)	102,092,448	1	South Louisiana (LA)	119,453,922
2	Houston (TX)	158,828,203	2	South Louisiana (LA)	94,742,990	2	New York/New Jersey	70,231,084
3	New York/New Jersey	133,715,223	3	New York/New Jersey	63,484,139	3	Houston (TX)	56,735,755
4	New Orleans (LA)	87,511,476	4	Corpus Christi (TX)	55,691,987	4	Pittsburgh (PA)	52,931,007
5	Corpus Christi (TX)	77,986,587	5	Beaumont (TX)	53,855,574	5	Valdez (AK)	49,393,923
6	Beaumont (TX)	69,406,951	6	New Orleans (LA)	48,908,681	6	Baton Rouge (LA)	43,324,207
7	Baton Rouge (LA)	63,728,759	7	Long Beach (CA)	42,208,155	7	Plaquemines (LA)	40,611,729
8	Plaquemines (LA)	62,461,023	8	Hampton Roads (VA)	39,421,930	8	New Orleans (LA)	38,602,795
9	Long Beach (CA)	60,882,795	9	Los Angeles (CA)	36,658,028	9	St. Louis (MO/IL)	32,650,783
10	Hampton Roads (VA)	55,123,339	10	Texas City (TX)	31,239,512	10	Tampa (FL)	32,512,833
11	Valdez (AK)	53,391,575	11	Lake Charles (LA)	30,752,162	11	Duluth-Superior (MN/WI)	29,427,323
12	Pittsburgh (PA)	52,931,007	12	Philadelphia (PA)	25,266,737	12	Huntington (WV)	22,313,997
13	Tampa (FL)	51,518,312	13	Mobile (AL)	24,063,403	13	Corpus Christi (TX)	22,294,600
14	Lake Charles (LA)	50,741,854	14	Baltimore (MD)	23,072,072	14	Mobile (AL)	21,375,982
15	Texas City (TX)	49,502,557	15	Freeport (TX)	22,517,138	15	Chicago (IL)	20,688,838
16	Mobile (AL)	45,439,385	16	Plaquemines (LA)	21,849,294	16	Lake Charles (LA)	19,989,692
17	Duluth-Superior (MN/WI)	42,296,553	17	Baton Rouge (LA)	20,404,552	17	Long Beach (CA)	18,674,640
18	Los Angeles (CA)	42,267,055	18	Tampa (FL)	19,005,479	18	Texas City (TX)	18,263,045
19	Philadelphia (PA)	39,270,741	19	Portland (ME)	18,461,957	19	Memphis (TN)	16,611,022
20	Baltimore (MD)	37,287,472	20	Paulsboro (NJ)	17,850,509	20	Hampton Roads (VA)	15,701,409
21	St. Louis (MO/IL)	32,650,783	21	Pascagoula (MS)	17,761,595	21	Beaumont (TX)	15,550,377
22	Portland (OR)	29,339,074	22	Portland (OR)	16,438,705	22	Indiana Harbor (IN)	15,127,407
23	Pascagoula (MS)	28,095,079	23	Seattle (WA)	16,388,650	23	Cincinnati (OH)	14,293,775
24	Freeport (TX)	28,076,004	24	Savannah (OH)	15,402,604	24	Baltimore (MD)	14,215,400
25	Paulsboro (NJ)	26,845,472	25	Charleston (SC)	14,886,470	25	Philadelphia (PA)	14,004,004
26	Chicago (IL)	26,602,449	26	Tacoma (WA)	13,322,509	26	Portland (OR)	12,900,369
27	Seattle (WA)	25,442,979	27	Duluth-Superior (MN/WI)	12,869,230	27	Lorain (OH)	12,693,921
28	Richmond (CA)	22,355,552	28	Boston (MA)	12,840,521	28	Port Everglades	12,554,477
29	Huntington (WV)	22,313,997	29	Port Arthur (WA)	11,414,266	29	Anacortes (WA)	12,469,852
30	Boston (MA)	22,170,862	30	Richmond (CA)	11,263,112	30	Cleveland (OH)	12,436,957
31	Port Everglades	22,053,829	31	Marcus Hook (PA)	9,861,012	31	Detroit (MI)	12,332,561
32	Tacoma (WA)	21,103,313	32	Port Everglades	9,499,352	32	Two Harbors (MN)	11,571,507
33	Portland (ME)	20,370,505	33	Jacksonville (F)	9,190,627	33	Richmond (CA)	11,092,440
34	Charleston (SC)	19,916,241	34	Oakland (CA)	9,158,361	34	Honolulu (HI)	10,509,556
35	Marcus Hook (PA)	19,260,811	35	San Juan (PR)	7,590,982	35	Pascagoula (MS)	10,333,484

Port Authority



- Government organization that owns, operates, or provides wharf, dock, and other terminal investments
- Functions:
 - Rent waterside access
 - Develop waterways and pier terminals
 - Capital financing such as container-loading facilities
 - Promote overall trade (Portland and Seattle even have www sites advertising their capabilities)

Future Directions

- Expansion due to growth in global trade
- Many firms entering markets -- growing need for value-added services
- Nationalism may constrain growth to protect domestic interests
- International transportation is different and will increase size of transportation firms
- FAST Ship technology



FASTSHIPS, such as the one rendered above, may well ferry cargo between the U.S. and Europe soon. Thanks to an innovative hull design and high-powered propulsion system, FastShips can sail twice as fast as traditional freighters. As a result, valuable cargo should be able to cross the Atlantic Ocean in days rather than weeks.



Liner Rate Making

- Costs fairly fixed in nature, low variable costs
- Ships designed for a specific trade route
- Price according to value of service to maximize profitability
- Charges based on a “weight or measure” (W/M) basis
- Different commodities would have different W/M charges

Conference Rate Making

- ***Conferences*** represent several firms which have banded together for collective rate making -- a steamship conference
- Composed only of member firms
- Contract or discounted rates (10 - 15%) charged to shippers signing “exclusive patronage” agreements



Problems with Conference System

- Oversupply of space has resulted in some liner firms withdrawing and offering lower rates
- Price cutting by ships owned by the former Soviet Union (under variable costs) in order to obtain hard currency
- Overall, they provide a somewhat stable rate structure which foster uniformity of rates and procedures

Air



- Expensive
- Fast
- Move highly perishable, high value and low volume items
- Mostly Intermodal



Rate Making: Air Cargo

- Value of service or cost of service
- Value of service applied to sensitive cargo and high demand routes
- Cost of service used in pricing cargo
- Utilization of space and product density drive
- Use standard density of 10.4 lbs/cf

Rate Making: Air Cargo

- Suppose a carrier charges \$90 per cf
- Product has weight of 480 lbs with dimensions of 6'x5'x3' or 90 cubic feet. $480/90 = 5.33$ lbs/cf
- Carrier charges based on standard density since this is a low density item
- $90\text{cuft} \times 10.4 \text{ lbs} = 936 \text{ lbs}$ is basis for charge
- Items with high density ($> 10.4 \text{ lbs/cf}$) charged on actual weight



Other Air Cargo Rates

- **General Cargo**: Available for many commodities
- **Class Rate**: Used to attract freight and allow shippers to penetrate markets (generate demand)
- **Container Rates**: Cost based, often discounted based on number of containers on a route

Other Rate Considerations

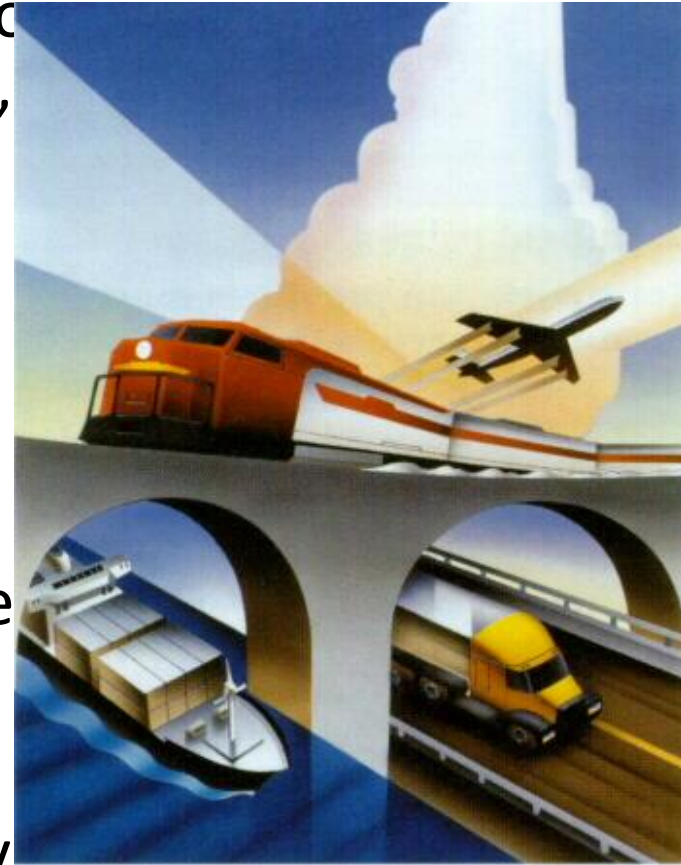
- **Time/volume Rates**: Rate reduction for a guaranteed amount of tonnage or containers over a specific time period
- **Currency Adjustment**: Covers currency fluctuations
- **Ports**: Less competitive ports have had higher rail rates

Mode Characteristics

	Air	Motor	Pipeline	Rail	Water
Cost per ton-mile	\$0.425	\$0.219	\$0.011	\$0.027	\$0.0074
Operating Ratio	high 80s	93 - 95%	mid 50s	low 70s	92 - 95%
Volume Carried	0.1%	40.5%	16.3%	26.3%	16.8%
Speed	400 mph	40 mph	5 mph	20 mph	5 mph
Competitors	Motor	Air or I/M Rail	Water	Water, Pipeline, or Motor	Rail or Pipeline
Type of Freight	High Value	Varies widely	Petrol or Slurry	Low value, Bulk	Low value, Bulk

What is Intermodal Transportation?

- The use of two or modes of transportation in moving a shipment from origin to destination
- Mostly associated with “piggyback” or container shipments
- Combines advantages (and disadvantages) of each mode used
- Reduces risk of theft and loss
- Shortens customer order cycle time and effectively reduces costs
- Promotes “seamless” product movement: Eliminates unnecessary handling



Growth of Intermodal Transportation

- Deregulation
 - Removed barriers to modes working together
- Global business
 - Off-shore sourcing of goods
- Changes in business environment
 - Higher operating costs
 - Driver shortages
 - Increased competitive pressures



Containerization

- Significant growth during Vietnam War
- Improves efficiency, protects materiel, reduces handling & pilferage
- Sizes: 20 ft (TEU) or 40 ft (FEU)
- Shorter to permit multiple units on railcars



Other Forms of Carriers



I. Third Party Providers

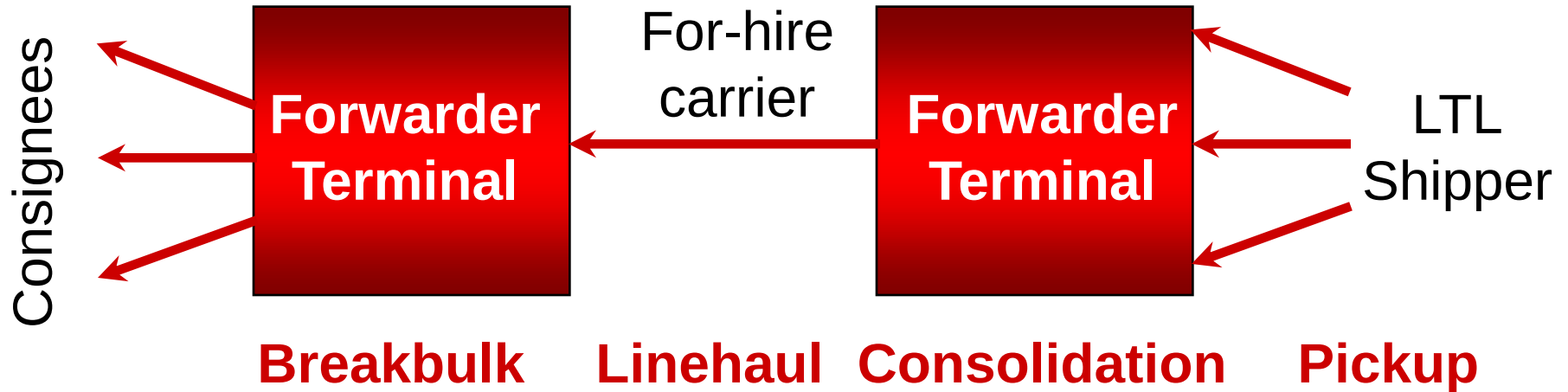
- **The offering of nearly any form of transportation to a shipper or receiver as part of a total package of logistics services**
- **Shipper or user avoids capital outlays and investment**
- **Focus on core competency--let experts do logistics**

II. Freight Forwarders

- Formerly common carriers
 - non-asset owning
- Earn difference between what they charge (LTL, LCL) and what they pay (CL, TL)
- Issue bill of lading



Forwarder Operations



III. Owner-Operator

- Own or lease a truck and trailer and make services available to for-hire carriers
- Contract out their services to non-union carriers
- Provide overflow capacity and flexibility
- Reduce financial risk to carriers

IV. Freight Brokers

- Intermediaries who bring shippers and carriers together for a fee
- Find customers for carriers or carriers for shippers
- Reduce burden for carriers & shippers
- Find best means/rate for shippers
- Help maximize capacity for carrier
- Information Systems expanding opportunities



V. Express & Courier

- UPS, FEDEX, DHL
- Fast, door-to-door service
- Operate large network of terminals, pick up and delivery vehicles, and line haul
- Typically under 200 lbs
- Compete with Postal Service
- Future good due to expansion and innovative practices

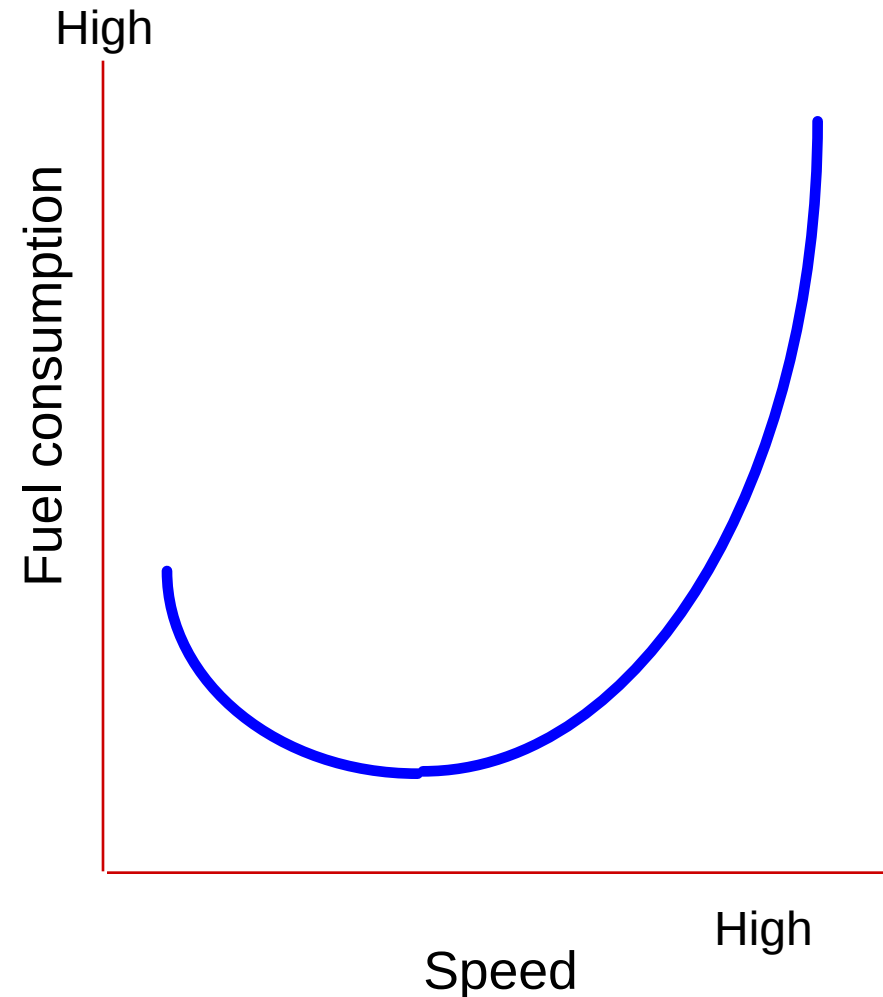
Key Principles of Transportation Management

I. Improving Efficiency

- **Rule of efficiency:** Straight line, minimize stopping--avoid damage and cost (delay)
- **Minimize handling:** Avoid “handshakes” and attempt to make process “seamless”
- **Full capacity:** Reduce cost per unit
- **Break bulk & consolidation** on long haul
- **Avoid empty backhauls**
- **Effective Scheduling:** “Optimize” labor and fleet (5%-10%)
- Transportation rates are **distance related**, not distance proportional

II. Efficient Use of Technology & fleet

- High utilization of expensive assets
- Larger the vehicle, the lower the cost per unit
- Speed does not equal economical operations
- Minimize vehicle gross weight
- Standardized vehicles and fleet
- Balance specialization with adaptability
- Examine trade-offs between IT and traditional logistics functions



III. Coordinate Operations

- Coordinate operations with requirements to ensure trade-offs and appropriate level of service
- Cost accountability as part of performance measurement
- Reliability is sometimes better than speed
- Look for opportunities to innovate, but recognize proven principles



Costing & Pricing



Rate versus Price

- **Rate:**
 - the amount that is lawfully charged and is based on cost plus market supply and demand
- **Price:**
 - implies value based on prevailing market forces. Charged under deregulation--carriers much more concerned with price.

Factors Influencing Transportation Costs

- **Market-related factors**
 - » **Degree of competition**
 - » **Location of markets**
 - » **Government regulation**
 - » **Freight traffic into and out of a market**
 - » **Domestic versus international movement**

Factors Influencing Transportation Costs



Product-Related Factors

- **Density:** the weight-to-volume ratio
- **Stowability:** degree to which a product can fill the available space in a transportation vehicle
- **Handling:** ease or difficulty of handling the product
- **Liability:** threat of theft or pilferage

Factors Influencing Transport Pricing

- Market Structure Models
- Pure Competition (Road)
- Monopoly (Rail/Air)
- Oligopoly (Ocean/Air)
- Monopolistic Competition

Cost Concepts Used in Transportation

- Accounting cost: Cash outlays of firm.
Allocation a problem
- Economic cost
 - Opportunity cost
 - Sunk cost
- Social cost --what are costs to society

Cost Structures

- Separable (traceable or directly assignable)
- Common
- Fixed, do not vary with volume
- Variable, vary with volume
- Marginal or incremental cost
- Out-of-pocket, immediately payable



Pricing of Transportation

- Transportation firms claim to know their costs but do not know how to price
- Relied on regulation and tariffs to set rates
- Must recognize impact of market forces, government regulation, other channel members, and competitors in establishing prices

Comparison of US Domestic Transportation Modes

- **Economic characteristics**
 - » **Cost**
 - » **Market coverage**
 - » **Degree of competition**
 - » **Predominant traffic**
 - » **Average length of haul**
 - » **fleet capacity**

Comparison of US Domestic Transportation Modes

- **Service characteristics**
 - » **Speed (time-in-transit)**
 - » **Availability**
 - » **Consistency (delivery time variability)**
 - » **Loss and damage**
 - » **Flexibility (adjustment to shipper's needs)**

Carrier Pricing

- Free-on-board (FOB)
- Cost-of-service pricing
- Value-of-service pricing
- Delivered pricing
- Quantity discounts
- Allowances

Mode/Carrier Selection

- **Problem recognition**
- **Search process**
- **Choice process**
- **Postchoice evaluation**

FOB Terms

- FOB = Free (freight) on board
- Comprise of two key elements of freight ownership and freight payment.
- Identifies your legal responsibilities during a transaction and perhaps hidden costs.

7. The Maritime Shipping Industry

- Introduction
 - Ships and Shipping fleet
 - Shipping Company Operations
 - Maritime Economics
 - Shipping Regulation
 - Managing Ocean Carriers
 - Case Study: ?

9. Port and Facility Operations

- Introduction
 - Port and Facility Functions
 - Ocean Ports
 - Air Ports
 - Other Ports
 - Warehousing
 - Free Trade Zones
 - Case Study: Fedex Midnight Turnaround

8. Air Transportation

- Introduction

A Brief History of Aviation

Airline Economics

Airline Regulation

Airplanes and Aviation fleet

Managing Air Carriers

Case Study: Holland's Fresh Cut Flowers



Revenue Management

- Revenue management, also known as yield management, is an essential instrument for matching supply and demand by dividing customers into different segments based on their purchase intentions and allocating capacity to the different segments in a way that maximizes a particular firm's revenues (El Haddad, Roper & Jones, 2008).

- Basically, yield management is the process of allocating the right type of capacity to the right kind of customer at the right price so as to maximize revenue or yield.
- It is profitably applied by airlines, hotels, restaurants, golf courses, shopping malls, telephone operators, conference centres and other companies.

- The airline industry is considered the birthplace of yield management. After deregulation in the late 1970s, airline competition increased, and the airlines tried to operate their planes as efficiently as possible.

- Yield management was one of the methods developed as a way of increasing competitive advantage and increasing revenue. In airlines, yield management is concerned with selling the right seat to the right customer at the right price so as to maximize yield.
- Yield management is also applied mostly in a hotel industry.

- In a hotel context, yield management is concerned with market sensitive pricing of fixed room capacity relative to specific market characteristics. The 'goal' of YM is the formulation and profitable alignment of price, product and buyer.

Generally, Yield Management system will significantly alter the traditional approach to accommodation management specifically within the following key areas:

- Management focus
- Data collection
- Optimum guest mix
- Capacity levels
- Technological input

- Pricing
- Customer hotel interface
- Human resource implications
- Incentive schemes
- Training