TOTAL CARGO MARKET

GIANT MARKET CONSISTING OF:

• TRUCKING
• RAIL
• SEABORNE
• AIR CARGO

AS THE “WORLD GETS SMALLER”, THE GROSS VOLUME OF FREIGHT HAS INCREASED DRAMATICALLY!
COMMERCIAL CARGO OPERATIONS

- SEA
- LAND
- AIR
- RIVER, LAKES, OCEAN
TYPES OF FREIGHT

• SMALL PACKAGE DELIVERY
• “LESS-TAN TRUCKLOAD” FREIGHT
• AIRLINE “BELLY FREIGHT”, e.g. AA, DL, JAL
• PALLETIZED FREIGHT
• CONTAINERIZED FREIGHT
• BULK CARGO
INTERMODAL TRANSPORTATION

ALTHOUGH THERE ARE NUMEROUS TYPES OF EQUIPMENT FOR FREIGHT, SOME STANDARDIZATION HAS BEEN ACHIEVED IN:

CONTAINERS
PALLETS
AIR FREIGHT CONTAINERS
8’ X 8’X 20’ CONTAINERS
8’X 8’ X 40’ CONTAINERS
CONTAINERSHIPS

CAPACITY:
UP TO 9000 CONTAINERS

SIZE: 950’ LENGTH
UP TO 100,000 TONS G.W.
EVERGREEN CONTAINERSHIP-TAIWAN
MODERN CONTAINER SHIPS

• BEAM GREATER THAN 110 ft.
• CAN’T TRANSIT PANAMA CANAL (TOO WIDE !!)
• CREW OF ONLY 13 (U.S. Destroyer is 360’, 3200 tons, crew of 360 !!!)
• DIESEL POWERED, 22-23 KNOTS
• AUTOMATED SYSTEMS –low labor costs
• OPTIMIZED FOR EFFICIENCY (reduced ton-mile costs!!)
PORT FACILITIES

- HUGE LOGISTICAL INVESTMENT !!

AUTOMATION IS KEY; SPEED IN UNLOADING / MINIMIZATION OF LABOR TO REDUCE COSTS
ONE-MAN CONTAINER HANDLING
HONG KONG-PEARL RIVER DELTA- CONTAINERPORT

MILLIONS OF 20 ft. CONTAINERS PASSING THROUGH IN 2002*

- HONG KONG  25.2*
- LONG BEACH  10.6
- NEW YORK    3.3
- OAKLAND     1.6

( PRC’S EXPORTS GREW 22% IN 2002 !)

SOURCE: NY TIMES 1/26/03
EXPLOSIVE GROWTH IN CONTAINER THROUGHPUT

LONG BEACH, CA

Port Container Growth
in millions of twenty-foot container units

- 188% since 1990

- 1990: 1.6
- 1992: 1.0
- 1994: 2.5
- 1996: 3.0
- 1997: 3.5
- 1998: 4.0
- 1999: 4.4
- 2000: 4.6
NUMBER & SIZE OF THE U.S. FLAG MERCHANT FLEET

WORLD FLEET  28,318 SHIPS
U.S. FLEET    454  (2%)
CONTAINERSHIPS  90
ROLL-ON / ROLL-OFF SHIPS  60
GENERAL CARGO SHIPS  136

MAERSK SHIPPING LINE
INTERMODAL CONTAINER

INTERMODAL CONTAINERS ON TRANS-CONTINENTAL RAIL SYSTEM
CARGO COMPETITION IS INTENSE!

K-LINE

EVERGREEN

TPL LINE

MAERSK SHIPPING
DOUBLE-STACKED CONTAINERS ON RAIL
(TRAINS MOVE DAY AND NIGHT !!)
8’X8’X20’ CONTAINERS AT FURNITURE FACTORY
DEMURRAGE

• AFTER A CONTAINER HAS BEEN DELIVERED TO ITS DESTINATION, THE RECIPIENT HAS 24 HOURS TO UNLOAD

• "DEMURRAGE" CHARGES START TO ACCUMULATE AFTER 1 DAY

• CONTAINER SHIPPING COMPANIES TRACK THOUSANDS OF CONTAINERS ALL OVER THE WORLD!
BARGES-OCEAN, LAKES & RIVER
BULK CARGO: COAL, SAND, GRAVEL, ORE, OIL, ETC.
AIR FREIGHT
TYPES OF CARGO AIRCRAFT

- **FREIGHTERS** (e.g. 747 F, MD-11F, new A-380)
- **COMBI AIRCRAFT** (e.g. ALITALIA MD-11 COMBI CARRIES 200+ PAX AND MAIN DECK CARGO AFT)
- **CONVERTIBLE FREIGHTERS** (e.g. MD-11CF)

FREIGHTERS ARE MANUFACTURED NEW (747-400 ERF) OR ARE MODS OF OLDER PAX AIRCRAFT (MD-10)
GENERALLY GOOD CORRELATION BETWEEN AIR CARGO AND GDP
757 CARGO HANDLING SYSTEM
(SIDE-LOADING PALLETS)
747 FREIGHTER-NOSE LOADING
747-400 FREIGHTER

NEW 747-400ER FREIGHTER: 910,000 lbs. MTOGW ; APPROX. 8000 n.m. RANGE
757 & 767 FREIGHTERS
UPS: 767F
DHL: 757F
A-300 CARGO HANDLING SYSTEM

- TIE-DOWN ATTACHMENTS
- POWER-DRIVE UNITS
- REINFORCED STRUCTURE
- LARGE SIDE ACCESS DOOR (LOADING / UNLOADING)
- CARGO RESTRAINT SYSTEM
EVA MD-11 CARGO FREIGHTER

630,000 lbs. MTOGW, 192,000 lbs. CARGO, 7200nm. Range
MD-11 CONVERTIBLE FREIGHTER & COMBI

CONVERTIBLE FREIGHTER
24hrs. PAX to Freighter
48 hrs. Freighter to Pax

MartinAir-HOLLAND COMBI
Alitalia Combi
Main Deck Cargo +
219 Passengers
MD-11 COCKPIT
6 ACROSS MULTIFUNCTION FLAT PANEL DISPLAYS

THIS COCKPIT WAS INSTALLED IN THE DC-10 MOD TO MD-10 FREIGHTER FOR FEDEX
DC-8F CARGOLINER
PAX AIRCRAFT CONVERTED TO CARGO; RE-ENGINEED WITH TURBO-FANS
(UPS FLEET)
THE BUSINESS OF AIR CARGO!

- **ECONOMICS JUSTIFY HIGH PRIORITY TIME CRITICAL PAYLOADS**
  (ELECTRONICS, FLOWERS, BERRIES)
- **URGENT PACKAGES, DATA, PARTS**
- **AIR CARGO MARKET AIDED BY PRESSURE TO REDUCE INVENTORIES & CYCLE TIME**
- **SHORTER TIME TO MARKET**
AIR CARGO CARRIERS

• POLAR AIR CARGO
• ATLAS AIR
• EVERGREEN INTERNATIONAL
• MARTINAIR
• GEMINI AIR CARGO
• AMERIJET INTERNATIONAL
• EMORY AIR FREIGHT
• DHL
• AIRBORNE EXPRESS
• LUFTTHANSA CARGO
• UPS
• FEDEX
NUMEROUS FREIGHT FORWARDERS!