JW Marriott Hotel Pennsylvania Avenue, March 21, 2007, Washington DC

Future Trends and Challenges of the MTS

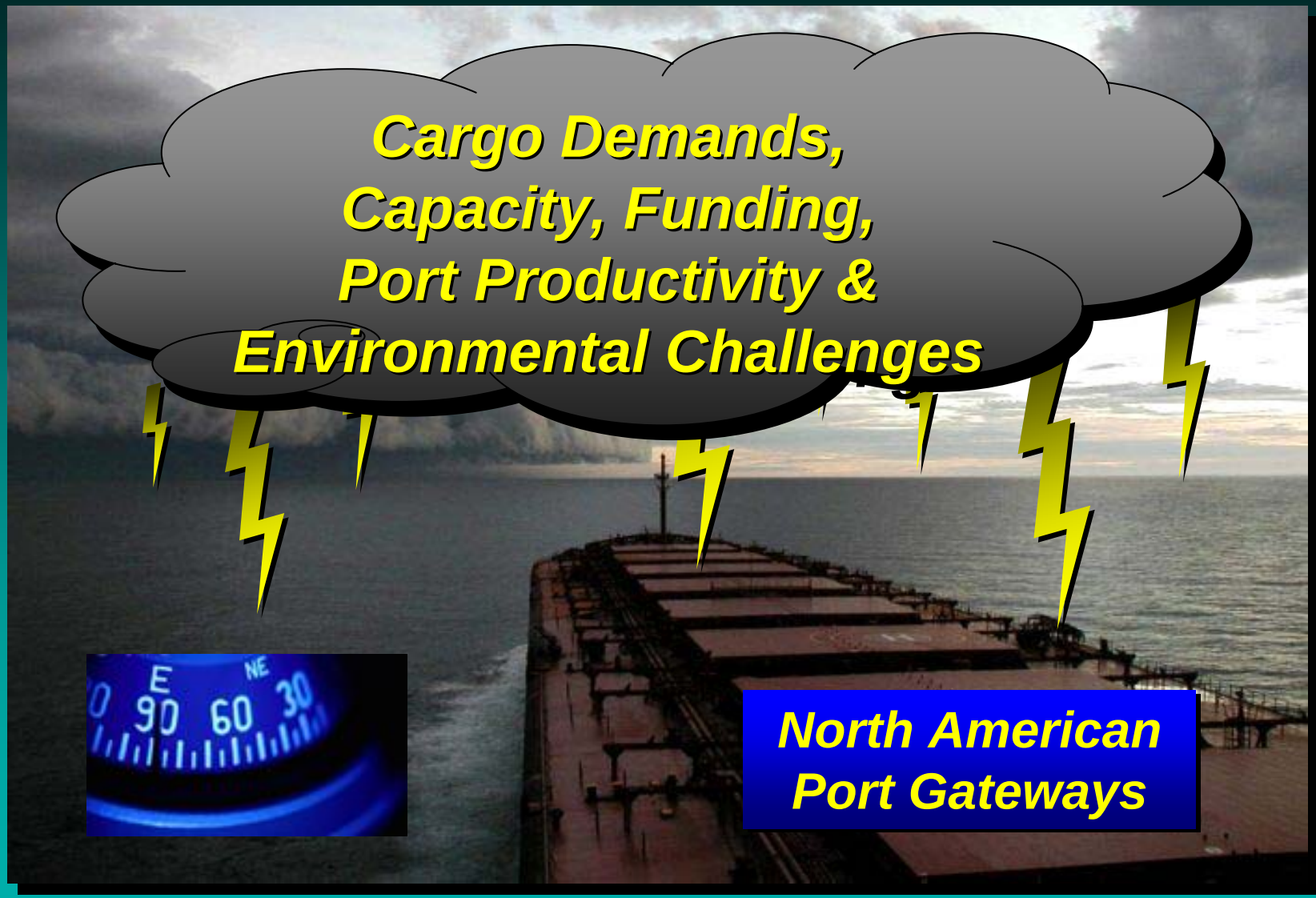
John Vickerman — TranSystems — *Norfolk, Virginia*

Today's Agenda

- External Industry Pressures
- International Cargo Demand Trends
- The Asian Import Trade Challenge
- North America Forecasted Cargo Volumes
- North American Port & Intermodal Capacity
- International Port Productivity Comparisons
- Vessel Technology Trends
- Environmental Concerns for Vessel Emissions

Port & Intermodal External Industry Pressures

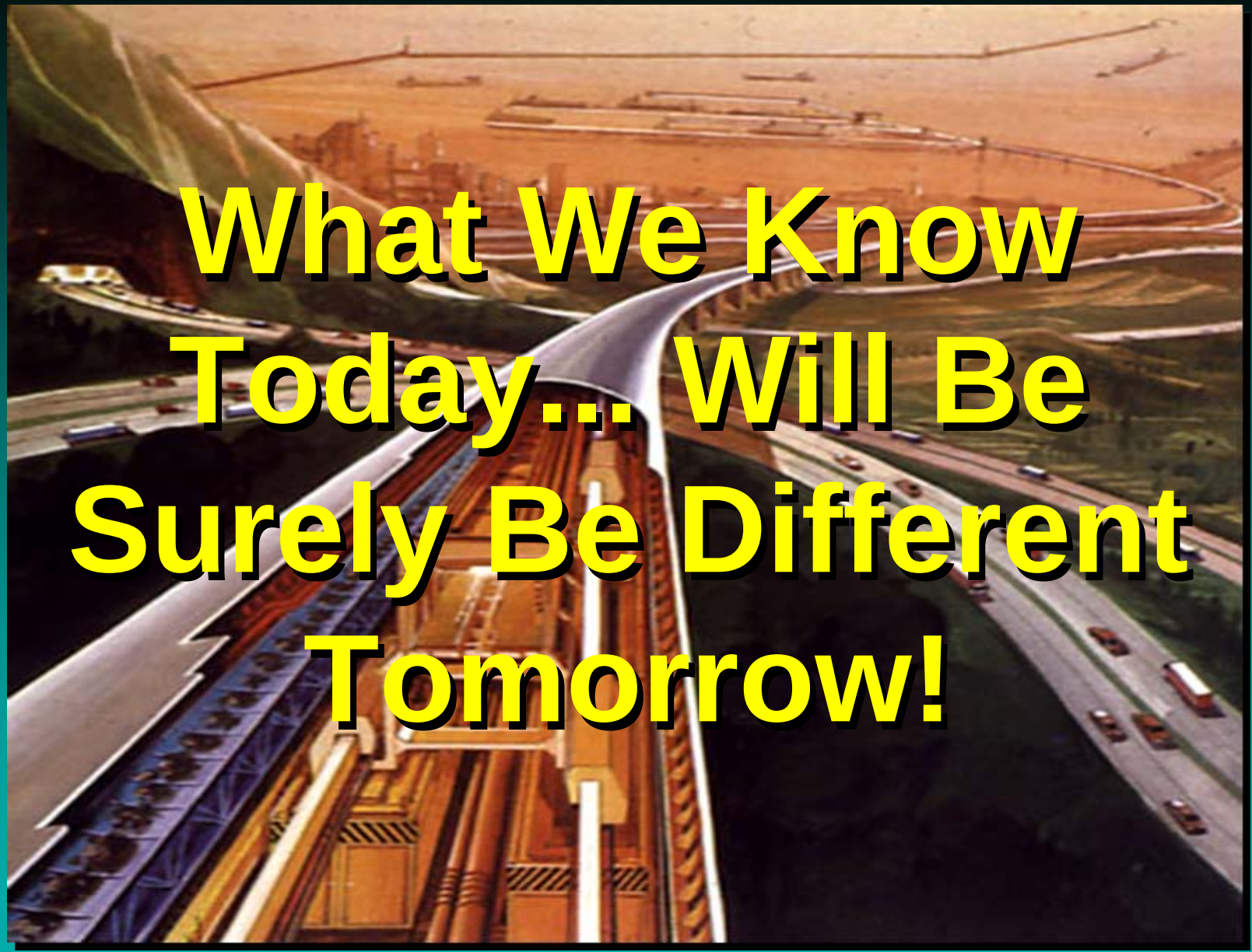
Global Trade: Current Course & Direction?



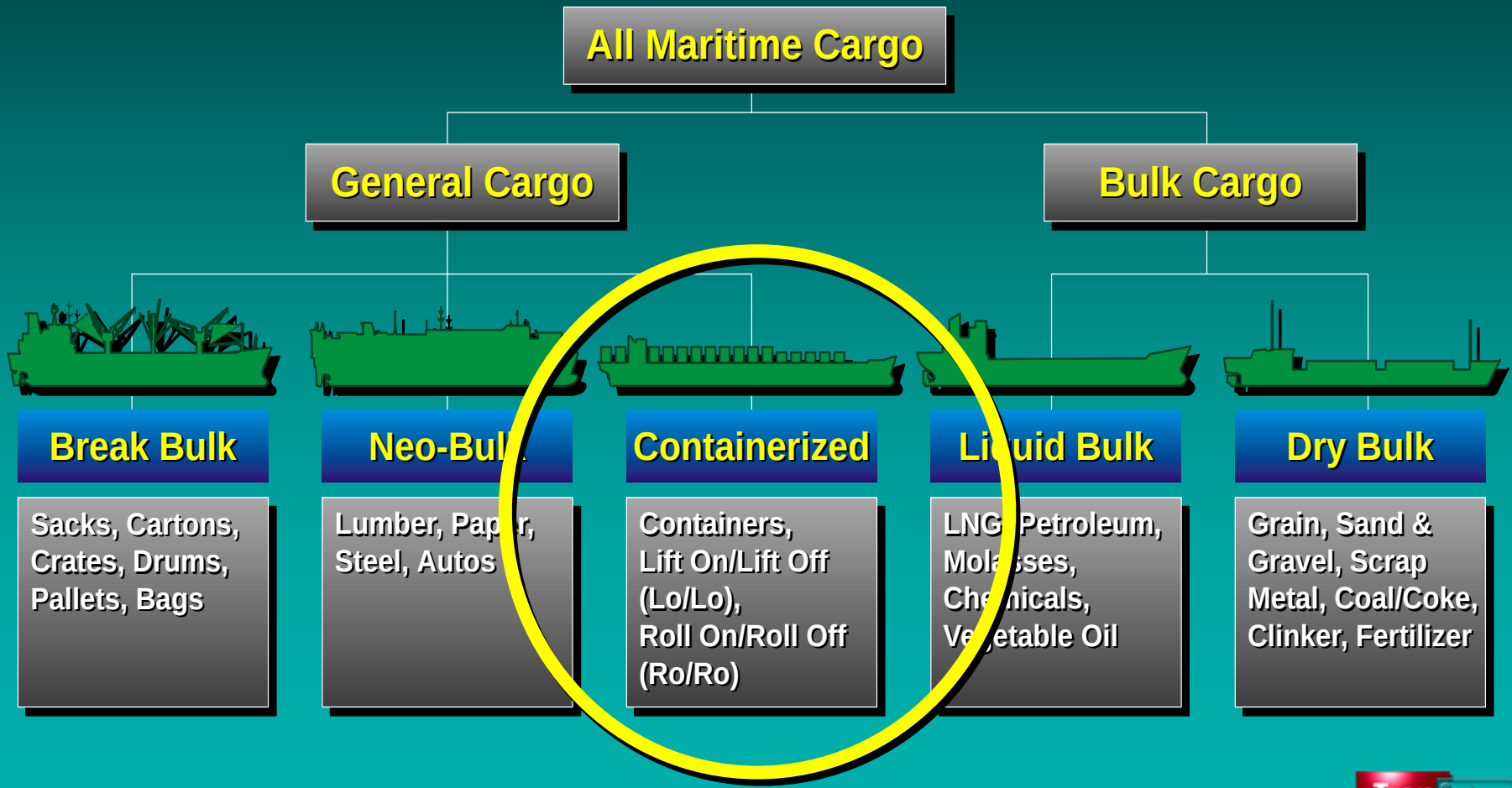
Vessel Cargo Handling Circa 1950

Cargo Handling Circa 2005

US Navy Fast Frigate Circa 2035

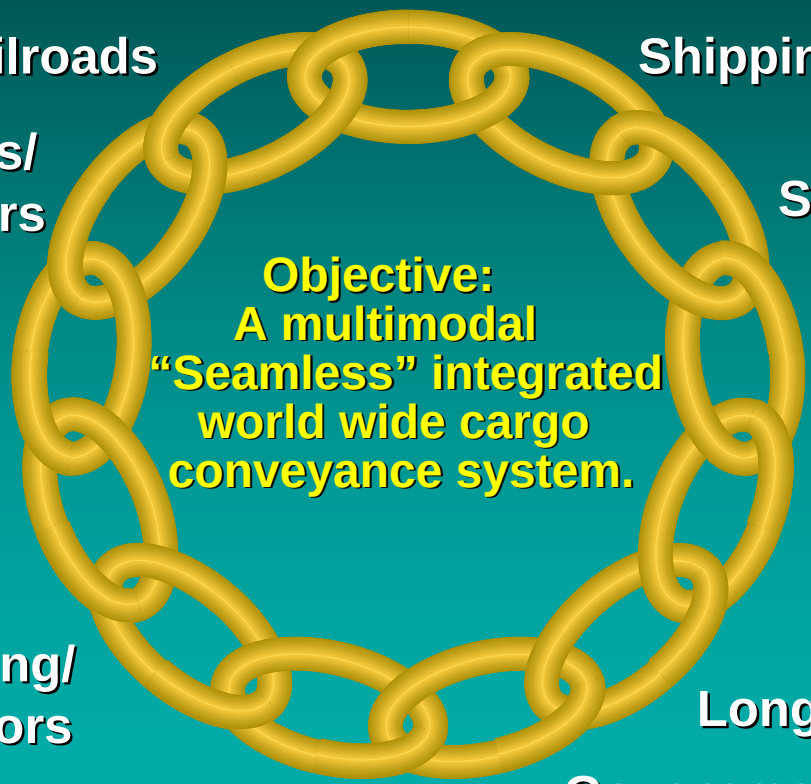


Functional Classification of Global Maritime Cargoes

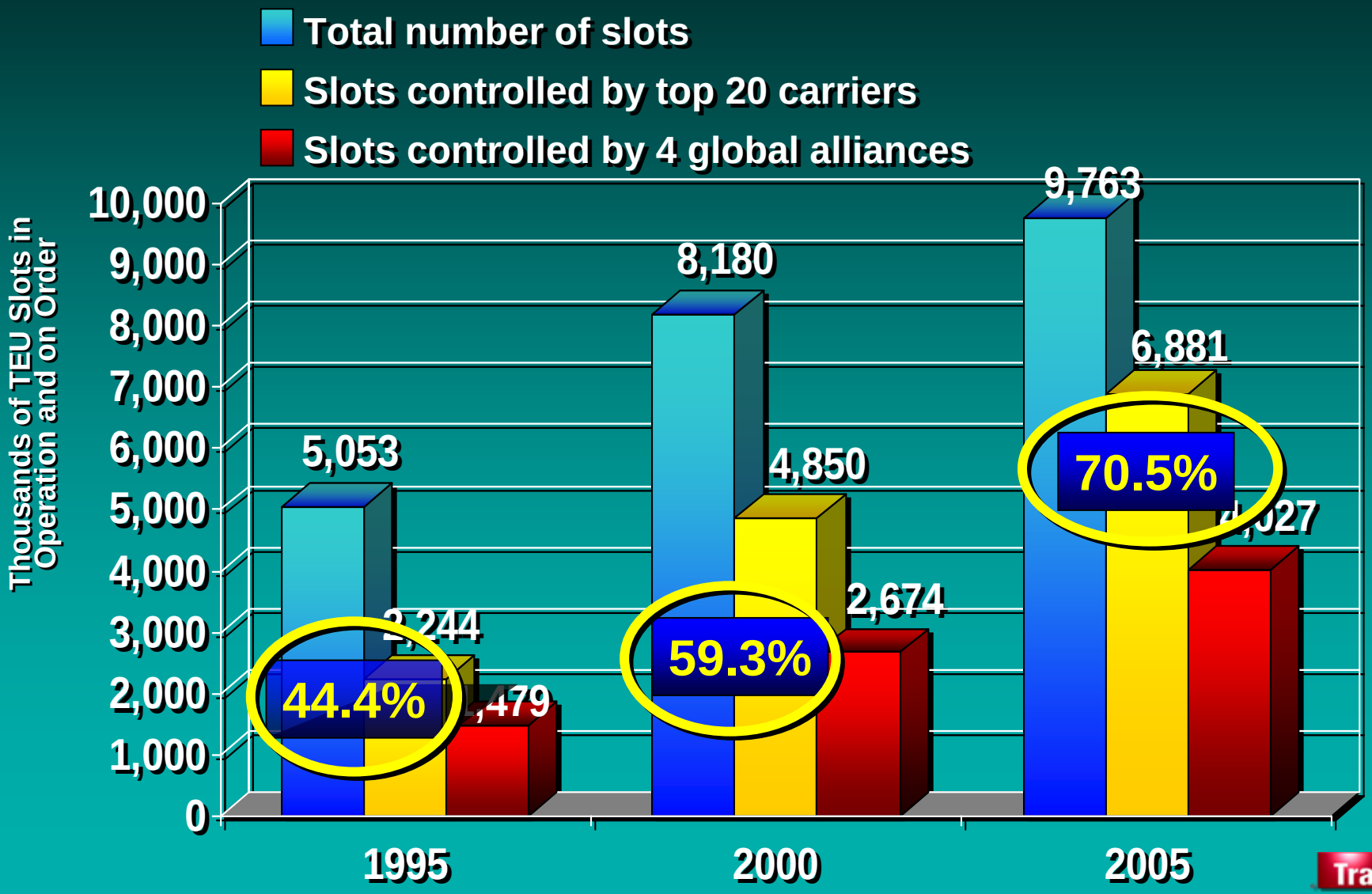


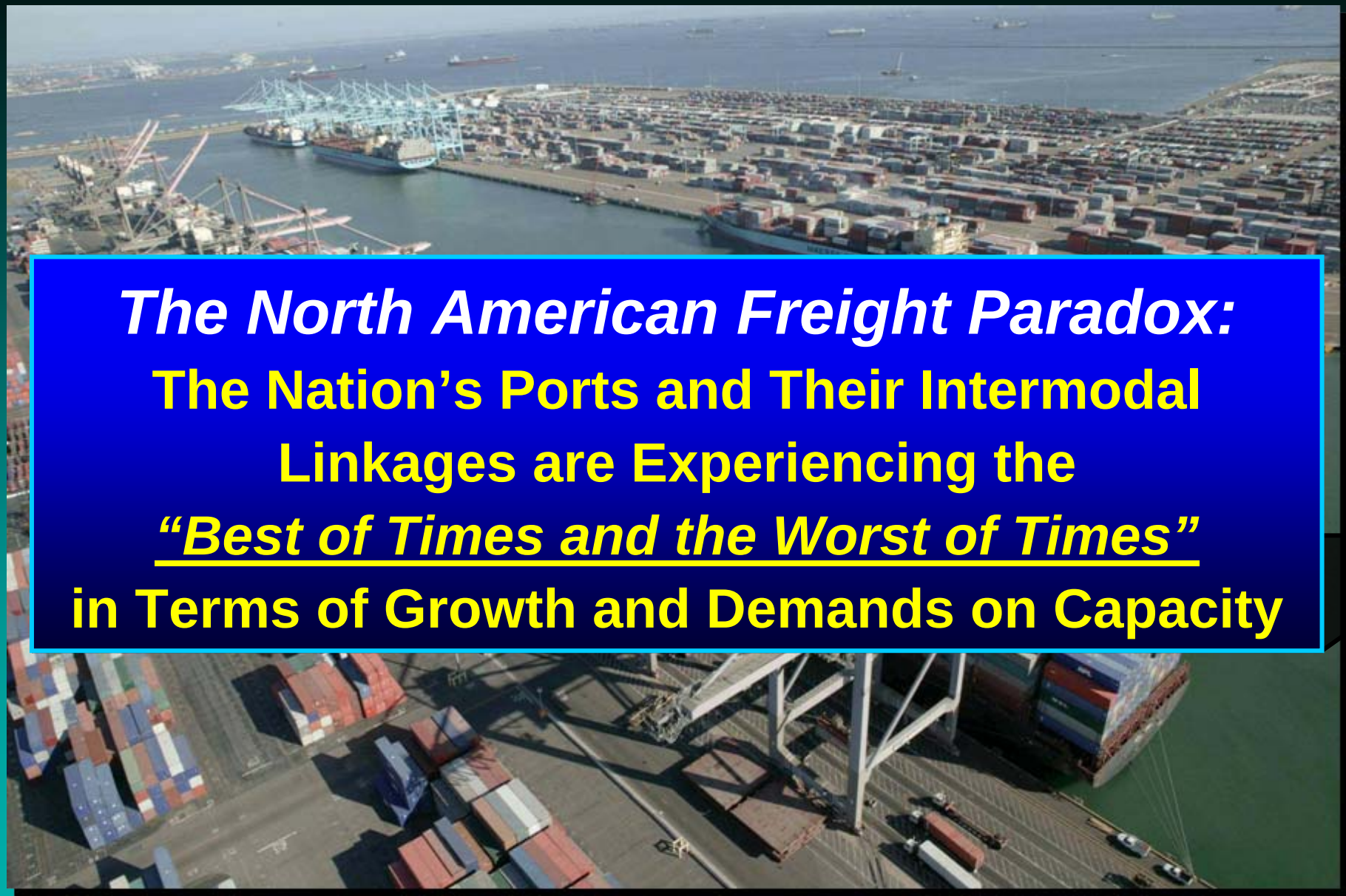
The "Port"

One of the Many Diverse Constituencies in the Cargo Transportation Logistics Chain



The Global Container Industry Continues to Consolidate…



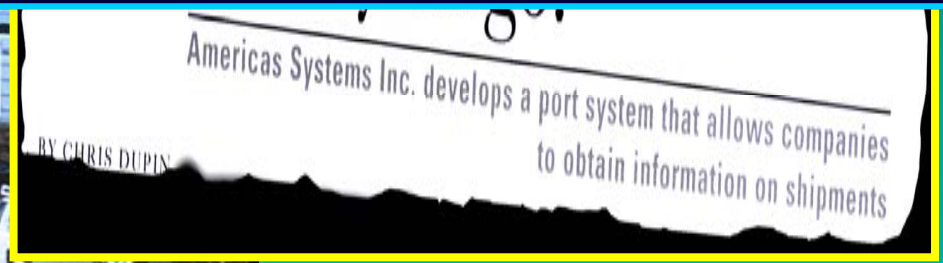


The North American Freight Paradox:

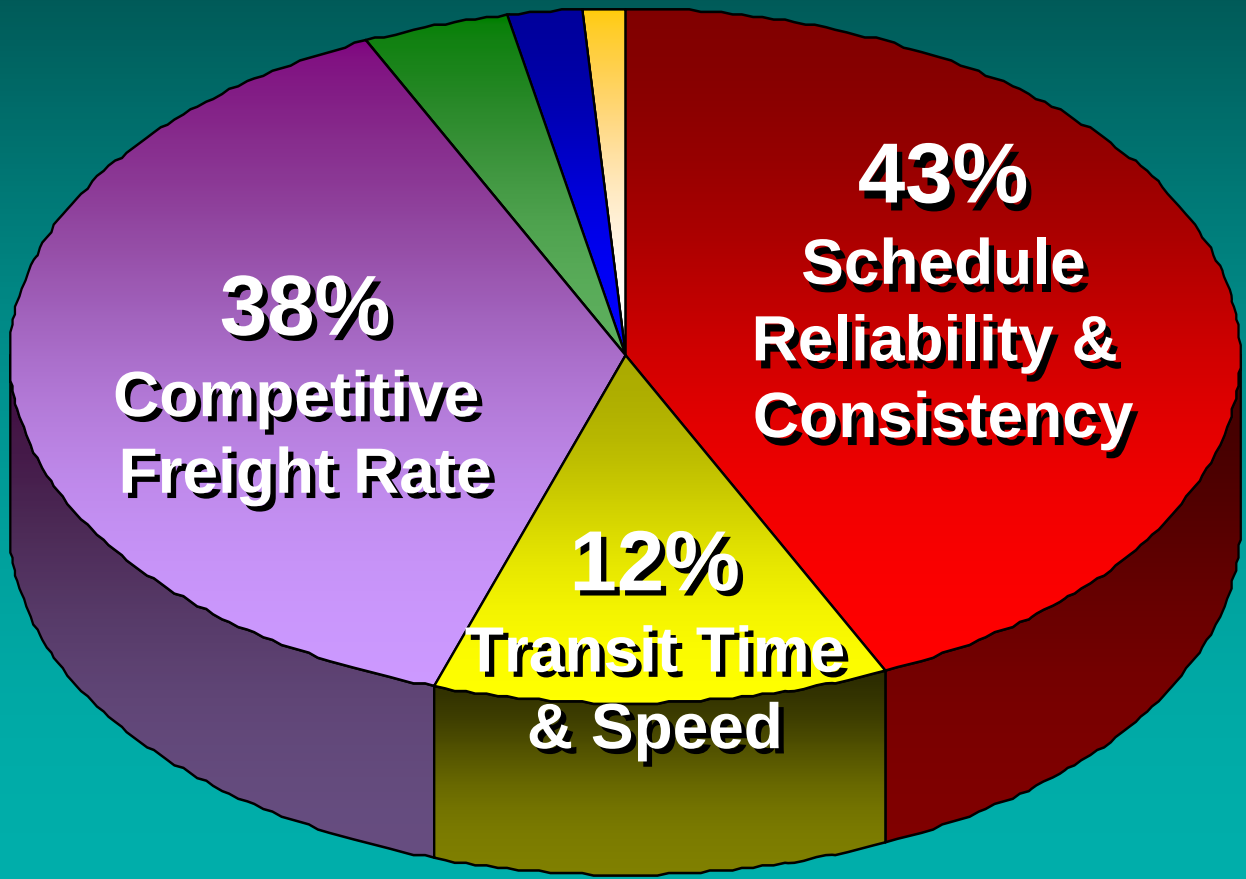
The Nation's Ports and Their Intermodal Linkages are Experiencing the *"Best of Times and the Worst of Times"* in Terms of Growth and Demands on Capacity

At <u>Current Productivity</u> and <u>Growth Levels</u> by 2020 North American Ports & Their Associated Intermodal Systems Will Be Severely Congested.

In Today's Supply Chain Congestion Can't be an Excuse…



Poll of the Top 1000 "Blue Chip" Multinational Shipper Priorities

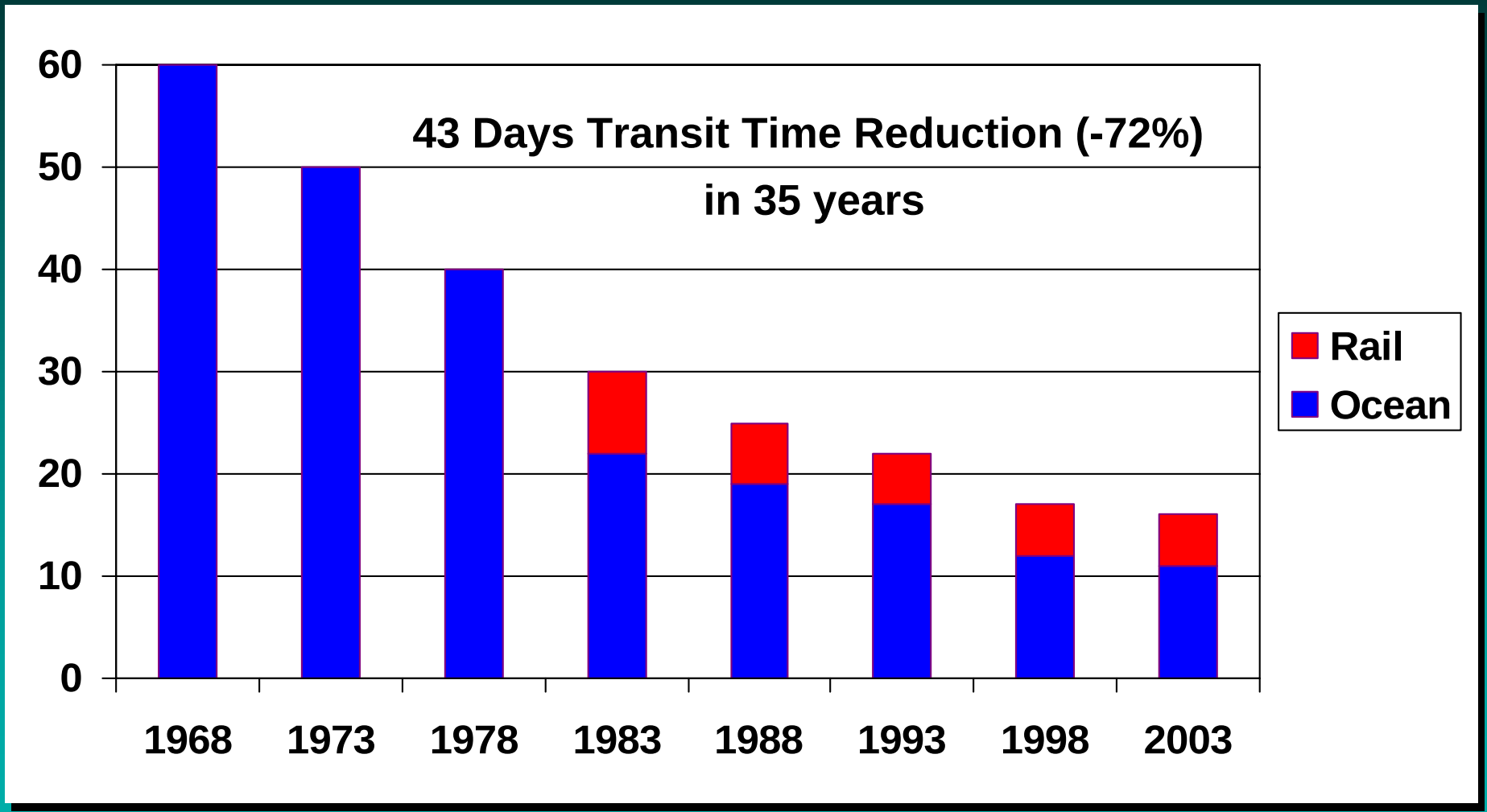


Today's Logistics Truth:

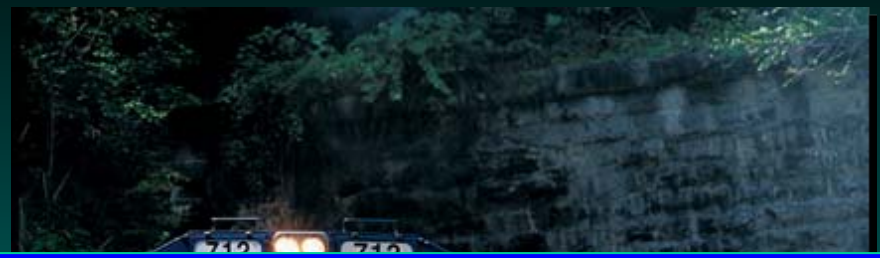
"The customer wants more and is willing to pay less for it."

Today: Global Trade is an Intermodal System

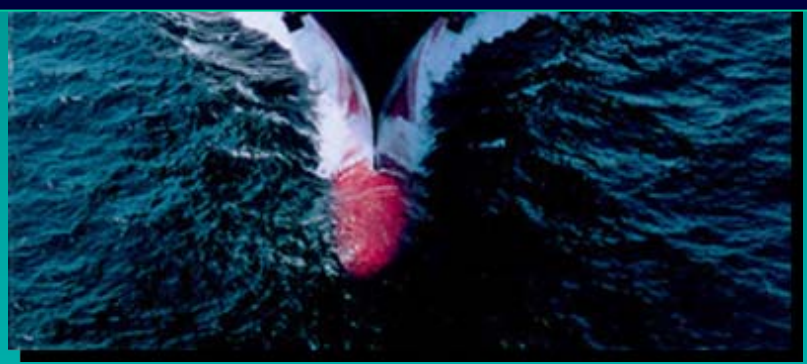
Typical Transit Days: Hong Kong to New York



Source: Kansas City Southern Railroad



We do not have an "intermodal system" as such. Rather we have an aggregation of multiple, private and public modes, each of which are "stove-piped" within their own individual areas of interest with little or no true cross communication and collaboration.



Ports are Experiencing Dramatic Surges in Seaport Security Costs

Port of Miami's Security Costs Today are 600% Higher Than that of 2001

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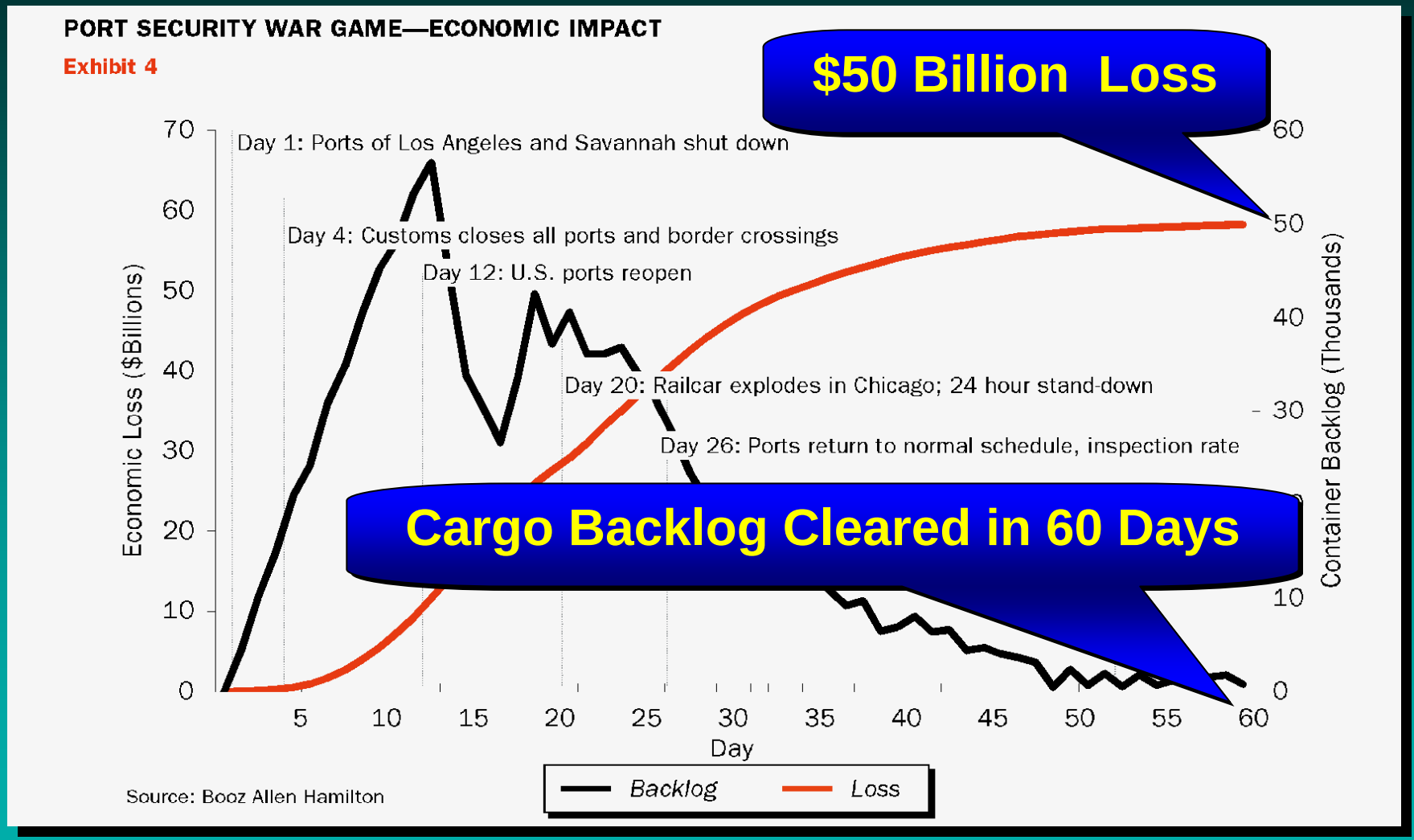
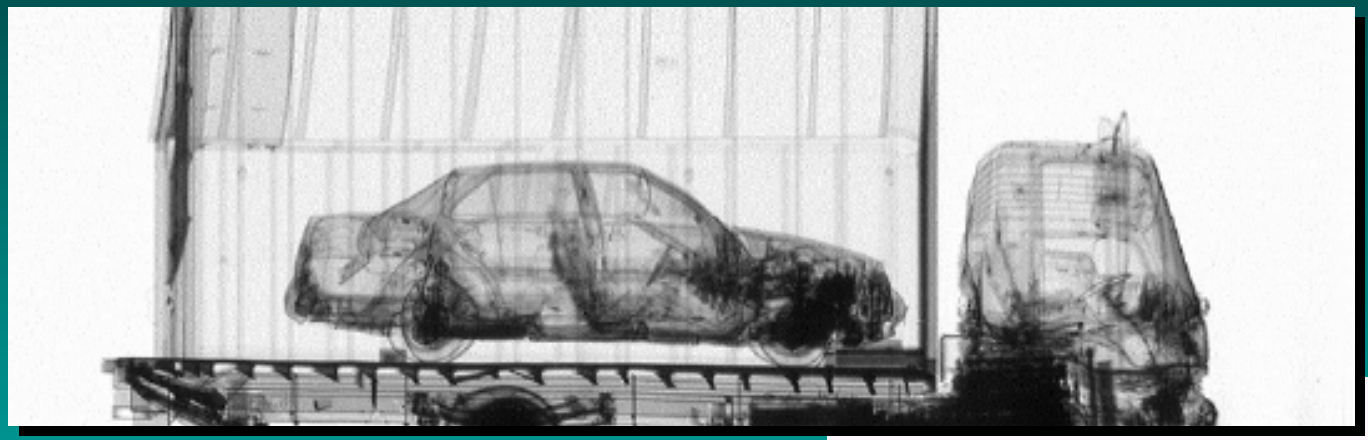
US Port Security Breach:
Supply Chain Disruption



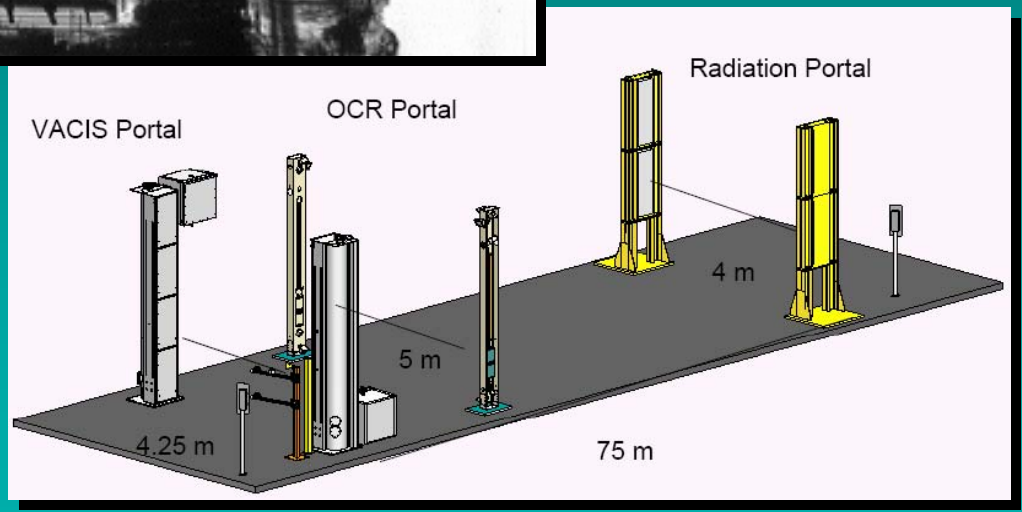
Equipment and Technologies

Security Container Inspection

100% Radiological Inspection Regime



Gamma-Ray Scan

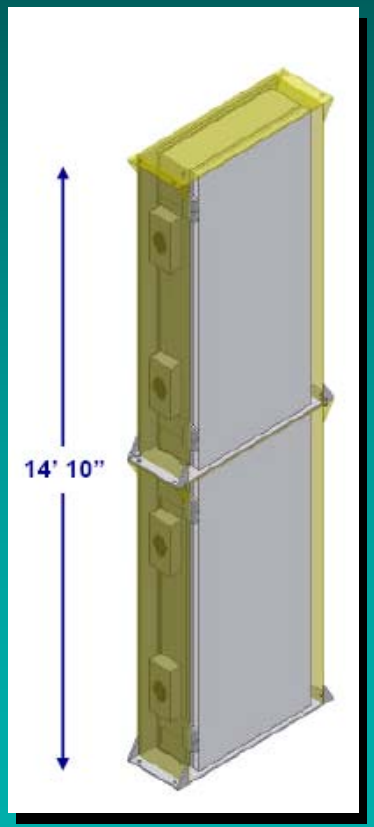


SAIC Configuration

Source: TranSystems

What is a Radiation Portal Monitor (RPM)?

1st Generation: **Plastic Scintillators (RPM)**
2nd Generation: **Spectroscopic (SPM)**
(SPM Isotope Identifying Software)



AREVA

A radiation portal monitor is a detection device that provides Customs and Border Protection (CBP) with a passive, non-intrusive means to screen containers and trucks as well as other conveyances for the presence of nuclear and radiological materials.

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Plastic Scintillators Versus Spectral SPMs

First generation Radiation Portal Monitors (RPM), have been referred to as… Kitty Litter Detectors because they couldn't differentiate between dangerous and non-dangerous sources, spectral devices referred to as Spectroscopic (SPM), can identify isotopes.

Spectroscopic (Spectral) SPM Array

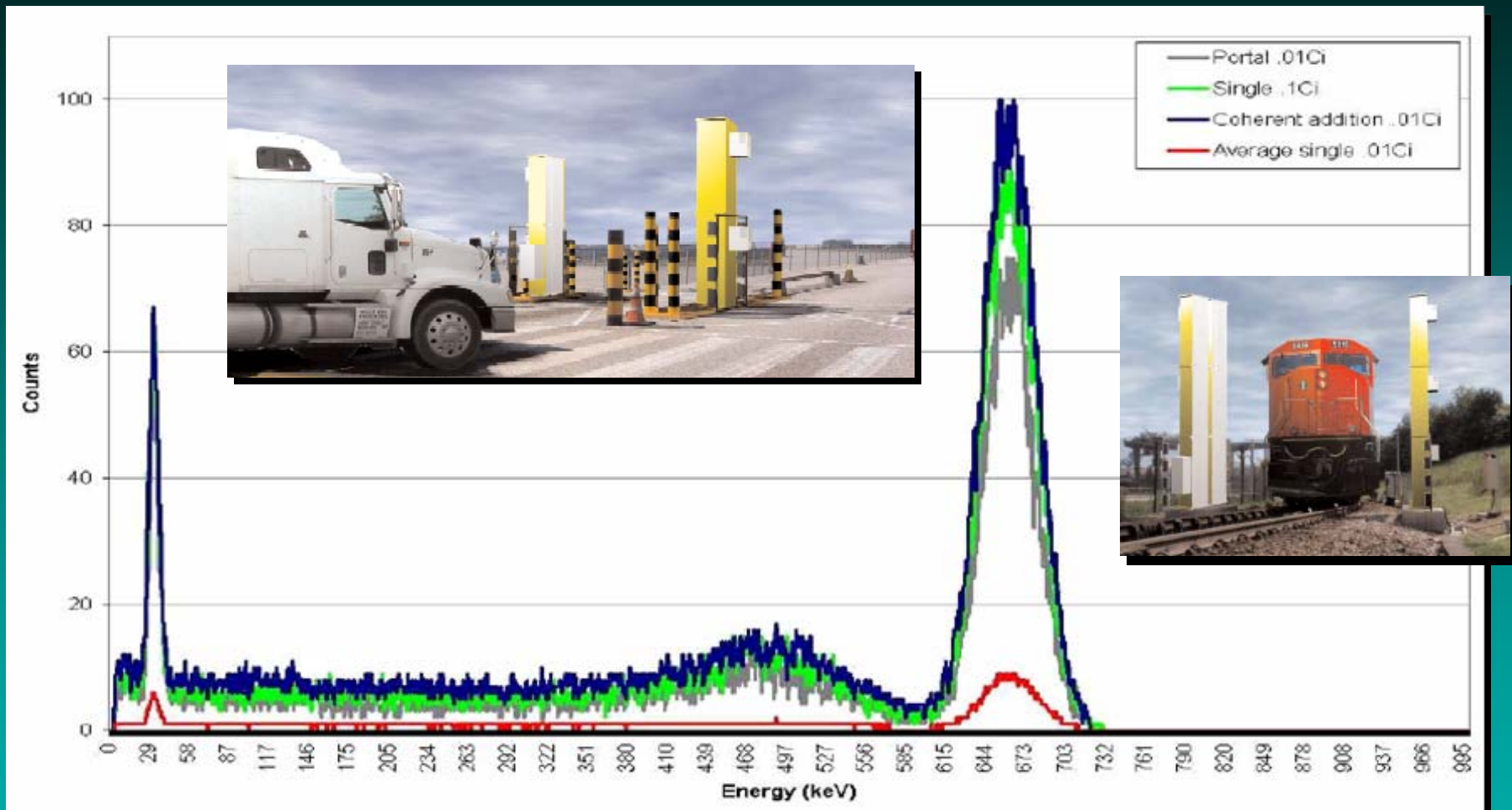

Fig. 2. Detected spectra for coherent addition of eleven 75mm NaI DSN detectors with a 0.01Ci source, a typical portal monitor detection of the same source, and detection of a 0.1Ci source using only one DSN detector, as well as an average single DSN detector sensing a 0.01 Ci source.

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Safe Port Act of 2006 (HR 4954 - The Security and Accountability For Every Port Act)

- 100% scanning using visual imaging and radiation detection
- Deployment radiation detection equipment in the 22 largest US seaports by the end of 2007 with screening of all ports handling inbound containers by end of 2008.
- Transportation Worker Identification Credential (TWIC) card required in top 40 US ports in specified security zones by January 1, 2008
- Codification of ATS, CSI and C-TPAT "Greenlane".

NNSA Second Line of Defense

Radiological Portal Monitor (RPM) Systems Deployment

Seamless Shared Information Between Our First and Second Line of Defense Would Serve the Intermodal Industry Well. Port Security and Port Productivity are Two Sides of the Same Coin!

I Global

ac

Wi

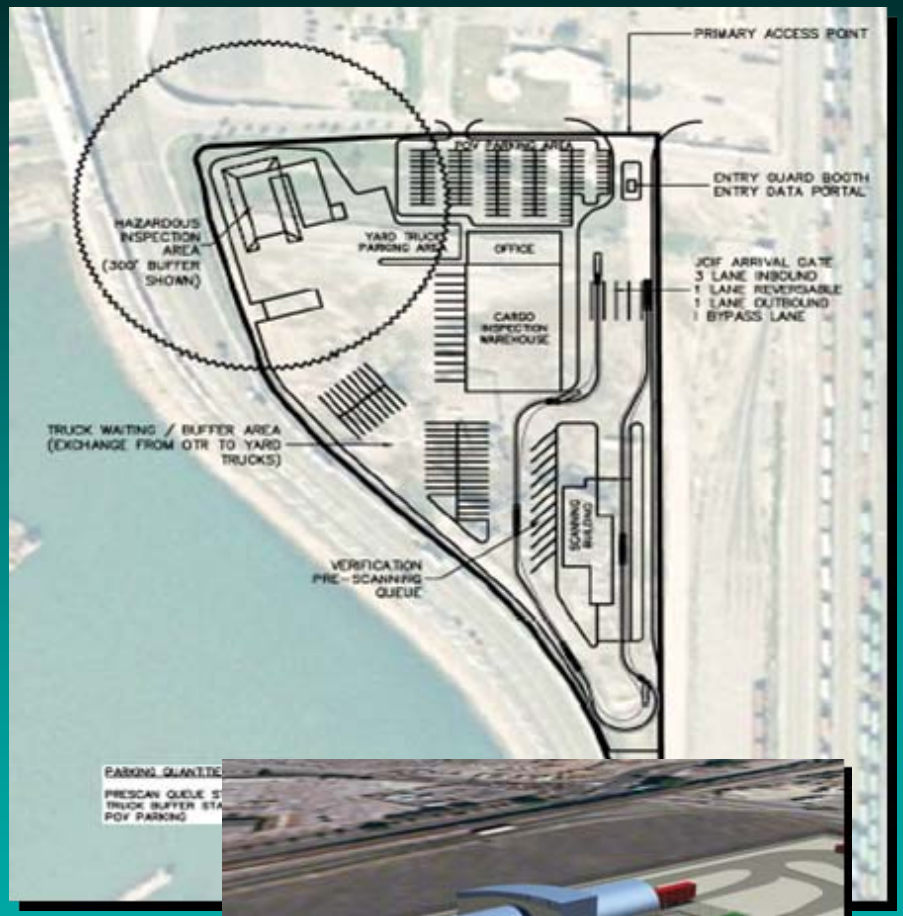
II L

And ***and install sustainable***

Sen ***communication systems throughout the world with the capability to detect and deter illicit trafficking of nuclear materials across international borders - $700 M over 7 years***

Once We Find a "Dirty Nuclear Threat"… What Do We Do With It?, How Do We Contain It?

Port of Los Angeles/Port of Long Beach Joint Container Inspection Facility (JCIF)



$65 M High Tech Model Facility to be Replicated at all US Container Gateway Ports Under a TSA/DHS Grant

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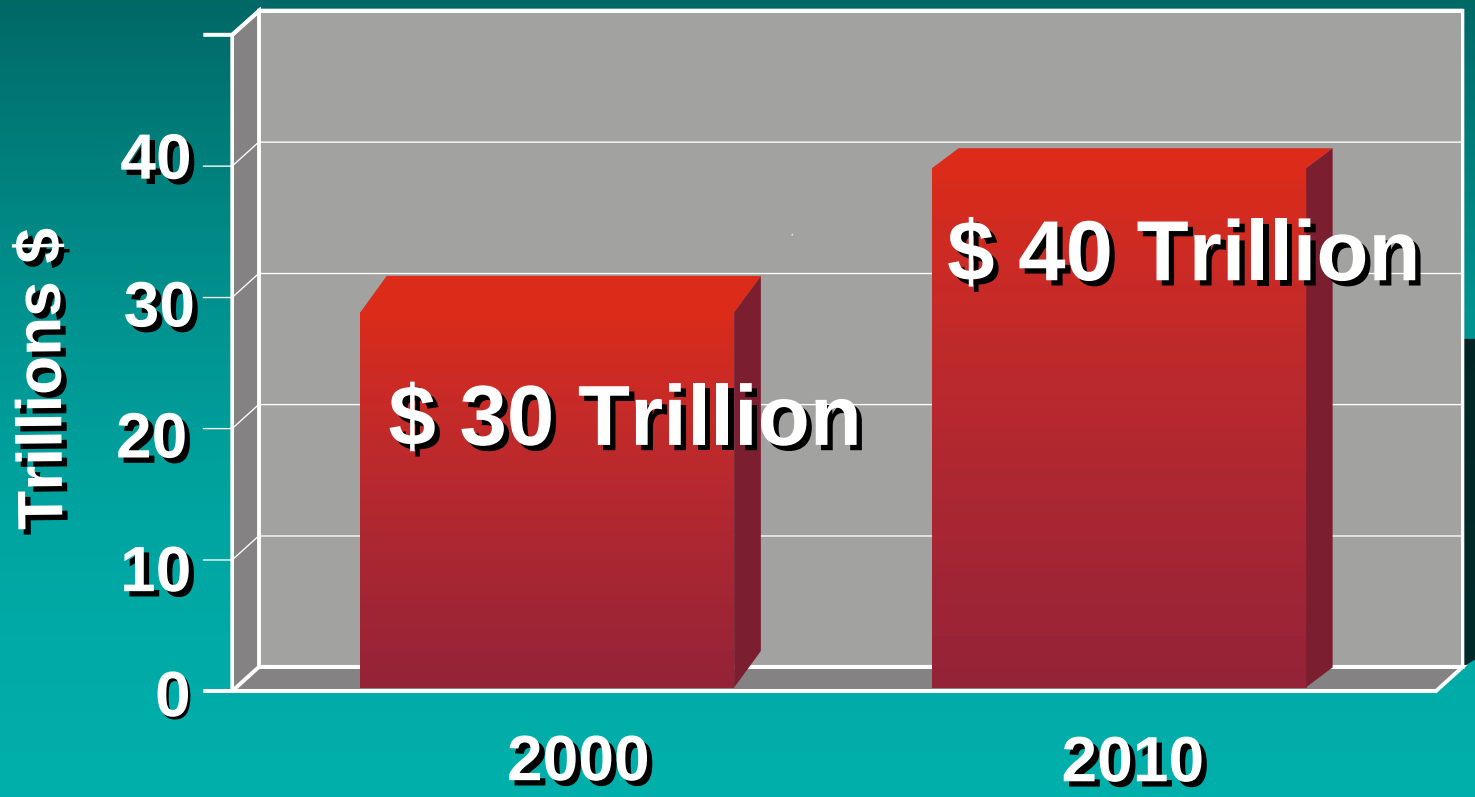
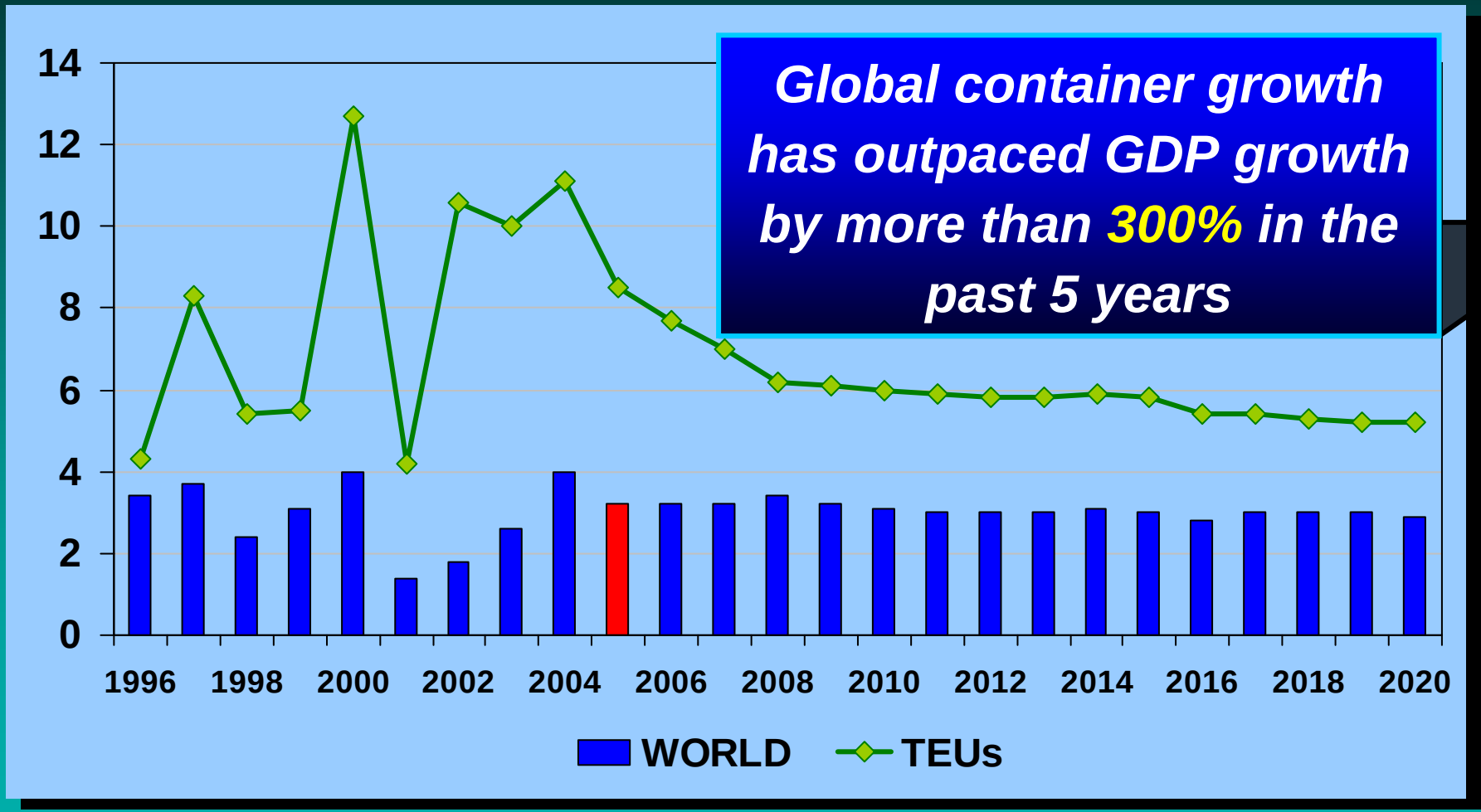
International Maritime Cargo Demand Trends

World Bank's 2010 "Global Economic Prospects"

World Output will Increase 33% in 10 years



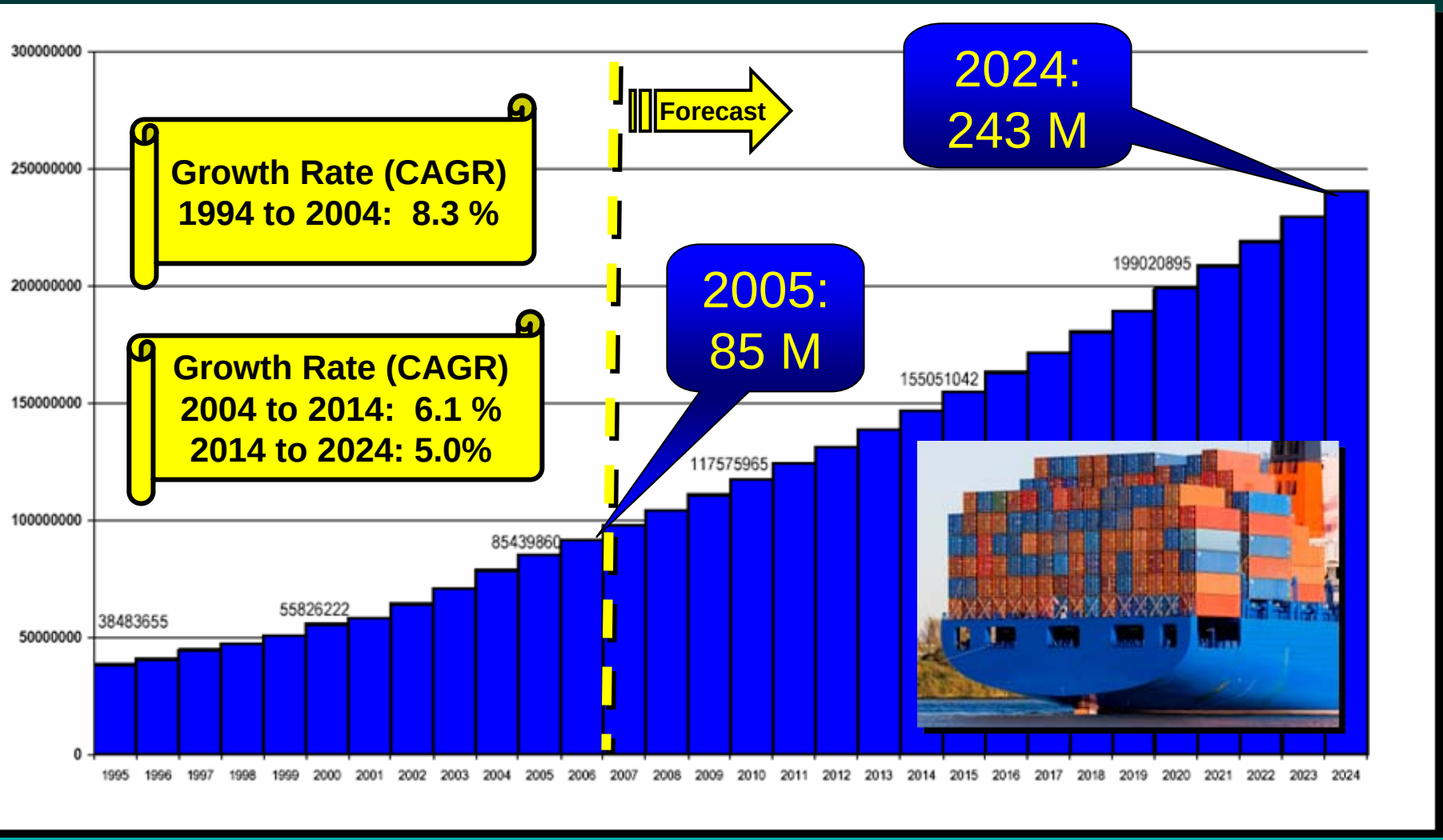
Ocean Container Trade Volume Will Continue to Grow Faster than the World Economy



Source: Global Insight World Service and World Trade Service

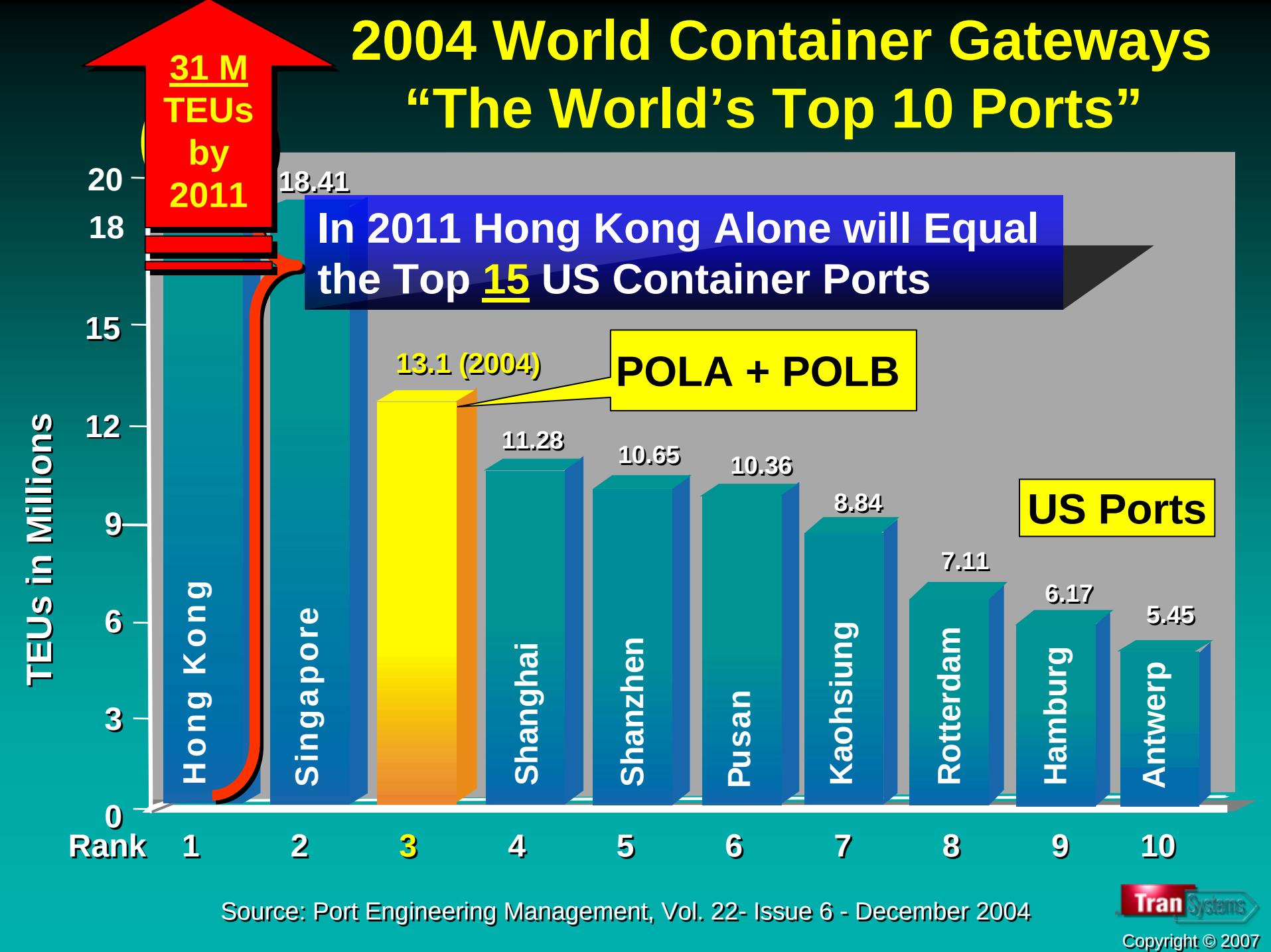
World Container Forecast to 2024 in TEUs

(186% Increase in Next 20 Years)



Source: Global Insight, 2004

2004 World Container Gateways
"The World's Top 10 Ports"



Source: Port Engineering Management, Vol. 22- Issue 6 - December 2004

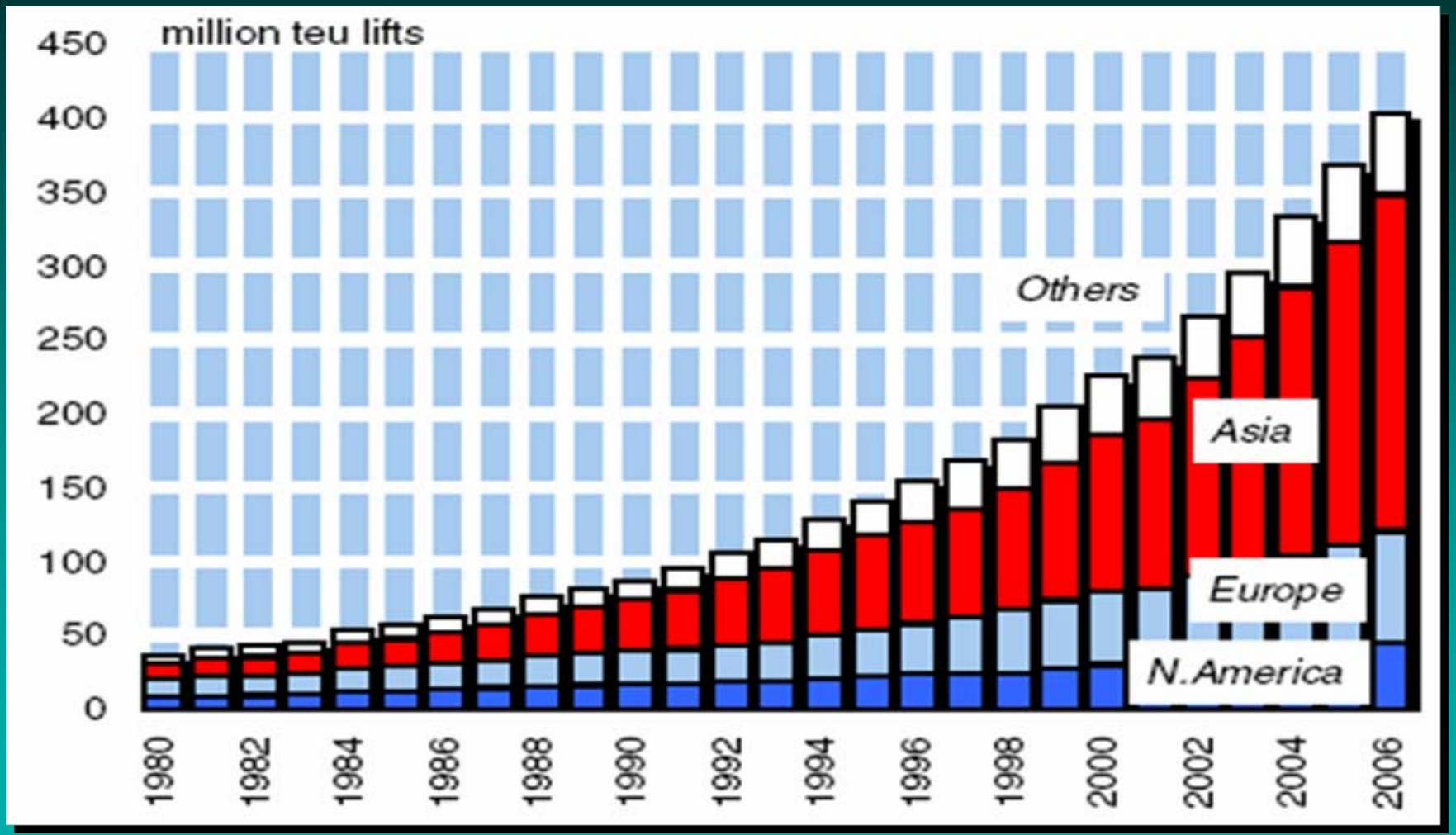
Global Market Economic Shifts (Country GDP Rank)

	2000	2010	2020	2030	2040	2050	
#1	USA	USA	USA	USA	USA	CHINA	#1
	Japan	Japan	CHINA	CHINA	CHINA	USA	#2
	Germany	Germany	Japan	Japan	INDIA	INDIA	#3
	UK	UK	Germany	INDIA	Japan	Japan	
	France	CHINA	UK	Russia	Russia	Brazil	#5
	Italy	France	INDIA	UK	Brazil	Russia	
#7	CHINA	Italy	France	Germany	UK	UK	
#8	Brazil	INDIA	Russia	France	Germany	Germany	
#9	INDIA	Russia	Italy	Brazil	France	France	
	Russia	Brazil	Brazil	Italy	Italy	Italy	

Source: Global Insight, 2005

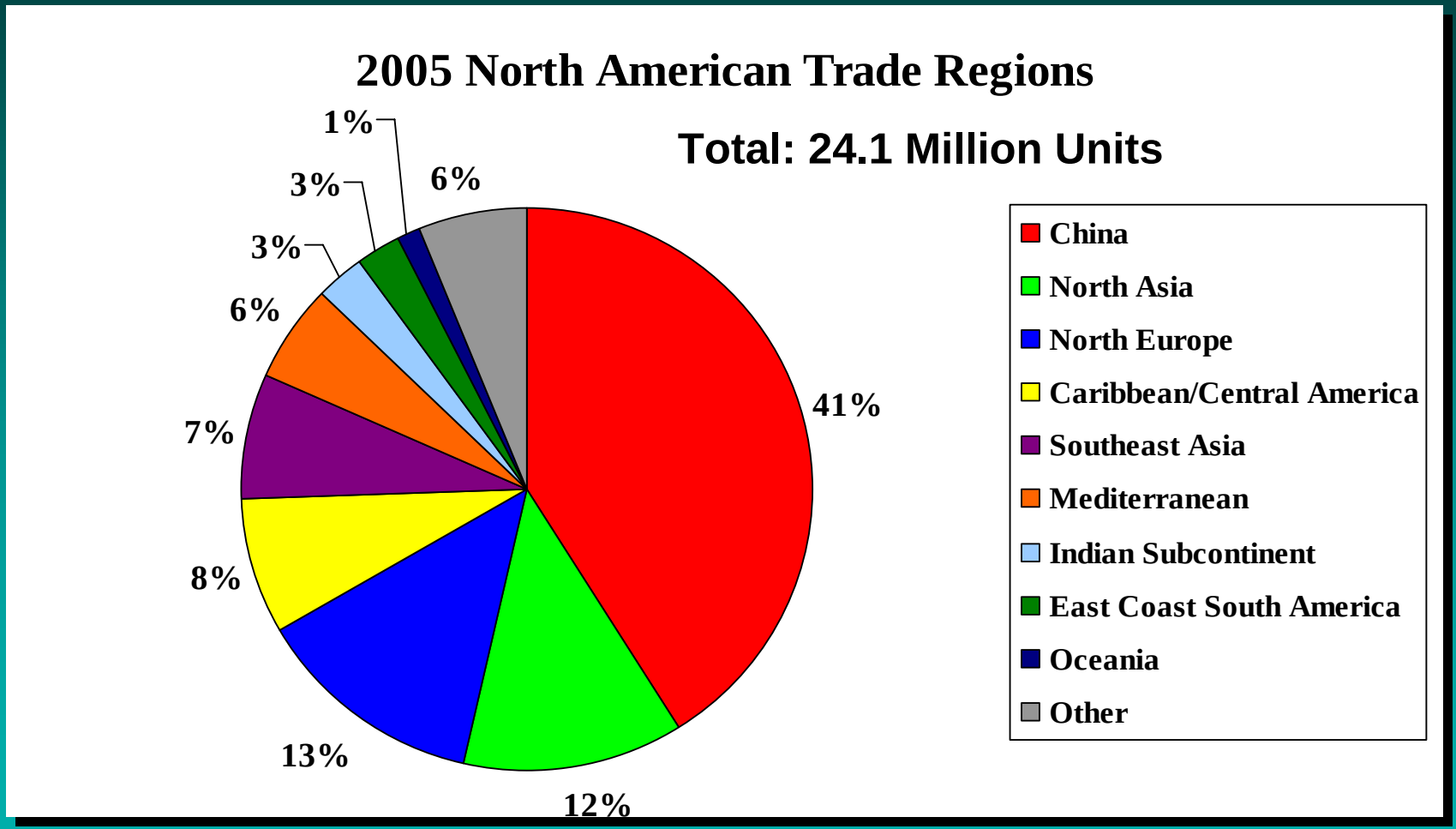
The Growing Asian Import Trade Challenge

Global Interdependent Economics Have Resulted in a Major Product Sourcing Shift to Asia



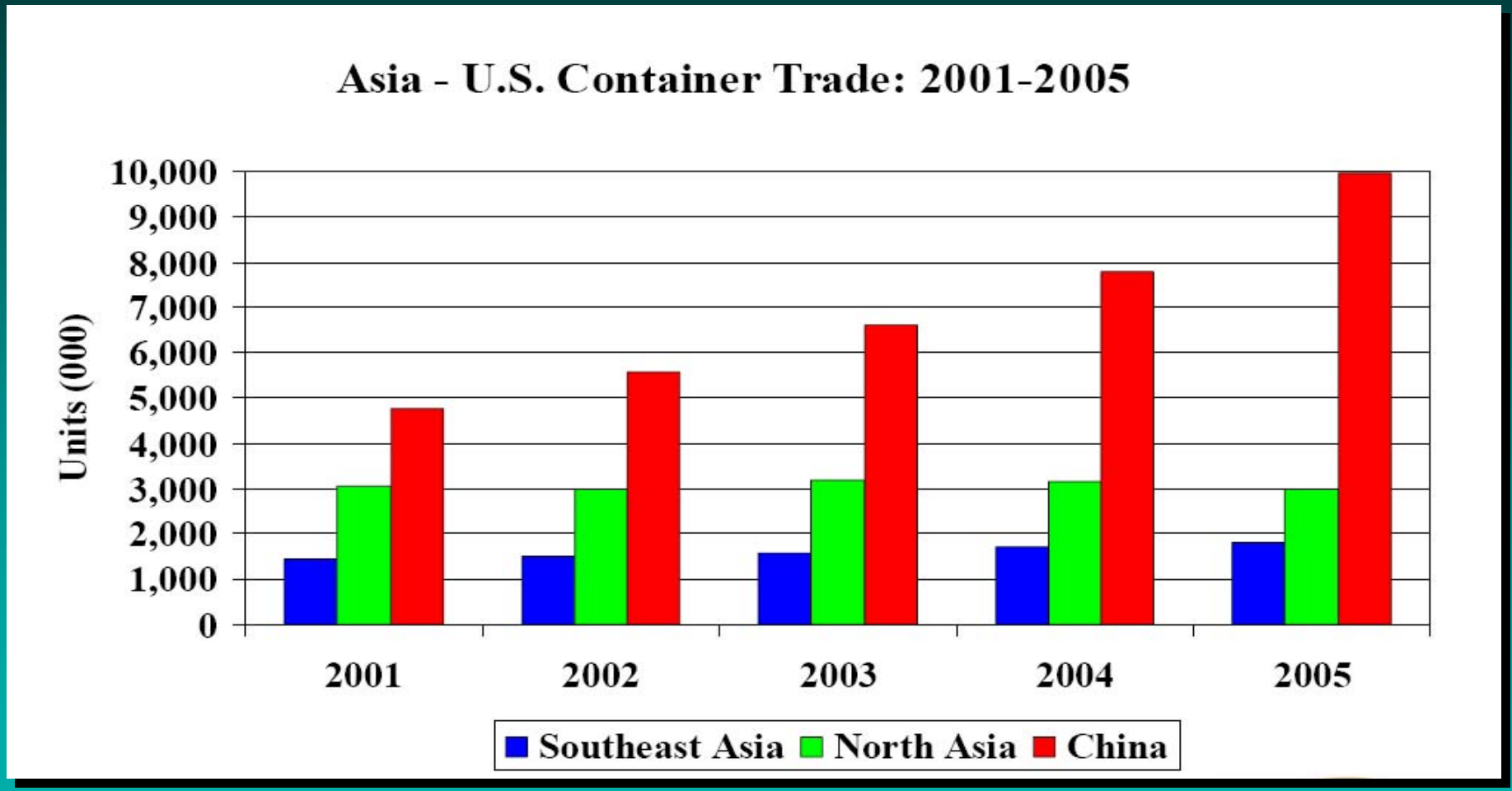
Source: Clarkson Research Studies

Today, more than 60% of all North American container trade is with Asia. European container flows have held steady (19% market share).



Source: PIERS; Port Reported Throughput; Norbridge Analysis

Last 5 Years Asia- US Container Trade Increased 12% CAGR and China Accounted for 95% of the Increase



Source: PIERS, Port Reported Throughput, Norbridge

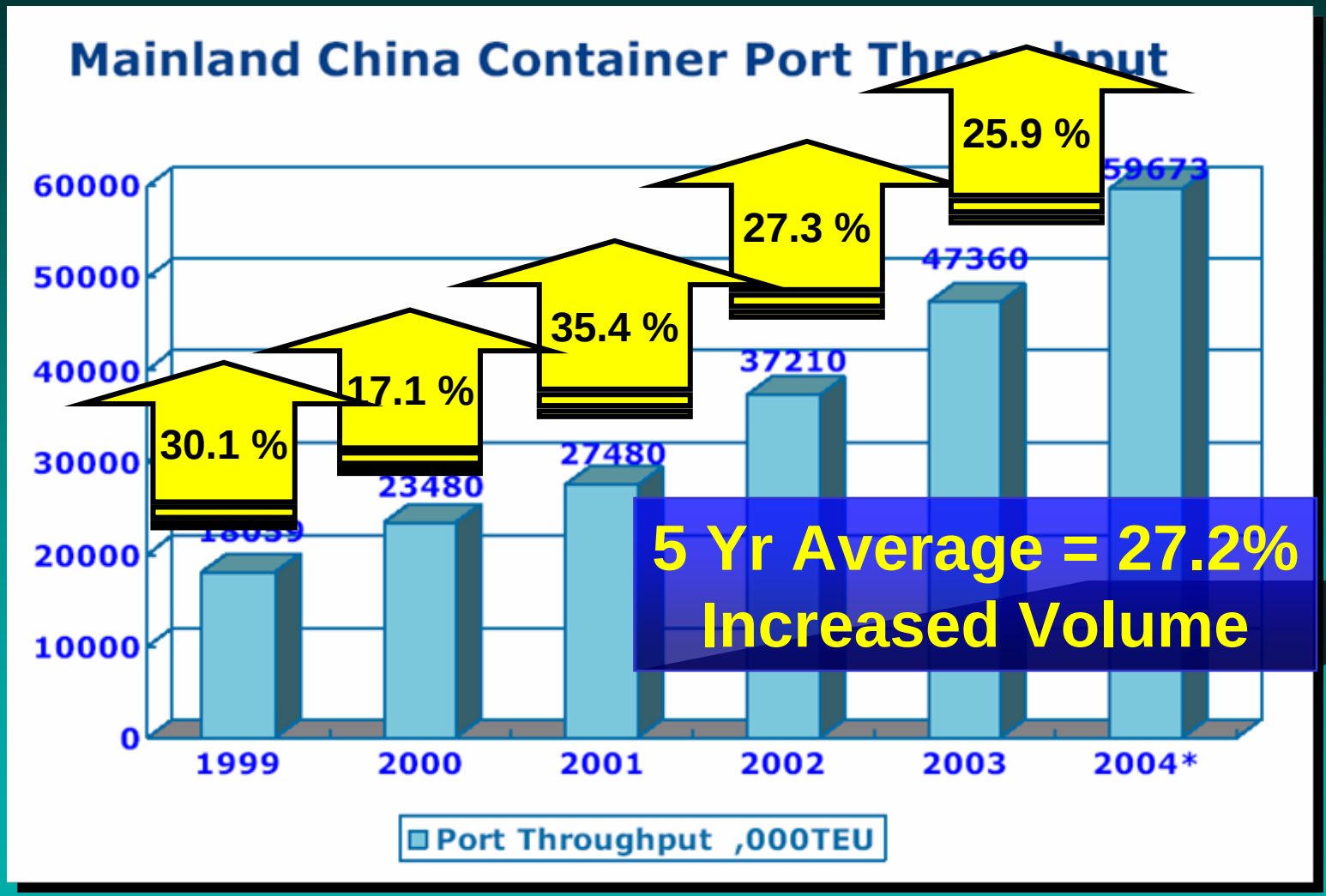
China-US: Twin Engines of the World

Population:
US: 298 million
China: 1,307 million
(1/5 World)

The number of Chinese children in elementary school is equivalent to the total US population.

Mainland China Container Port Growth

(Compound Annual Growth Rates)



China's Ministry of Railways Signed a 5 year Cooperation Agreement with the US BNSF Railroad for Intermodal Rail Development

- Develop China's high volume efficient intermodal network
- $242 billion program to 2020
- On-dock & near-dock intermodal transfer yards at ports
- Ministry to build 18 mega-terminals with 7 at seaports, 40 smaller Intermodal terminals

铁路

BNSF Burlington Northern Santa Fe Railway

Shanghai International Shipping Center

Yangshan Deep Port & Logistics Park

Emerging New Mexican Intermodal Gateways & Corridors – Nearly 4 Million TEUs

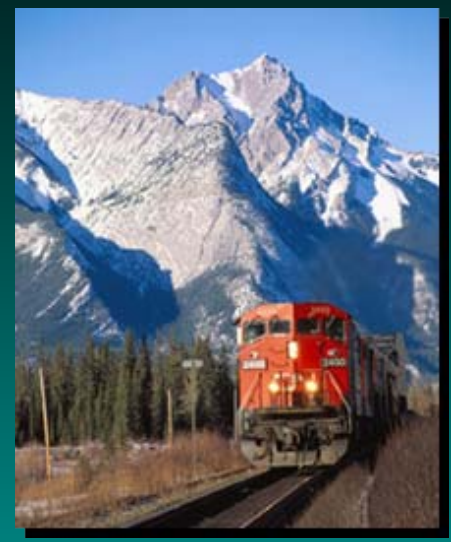
Guaymus
1.0 mil TEU

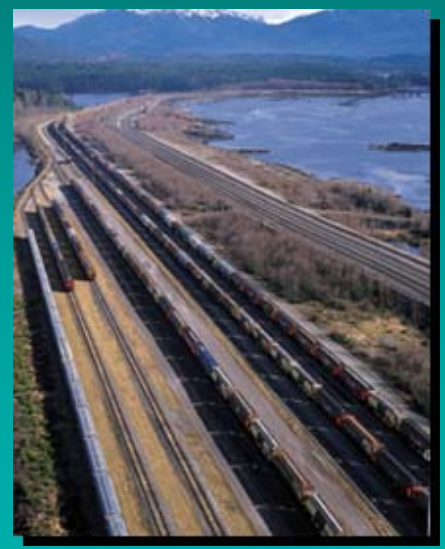
Punta Colonet
1 mil TEU Throughput

HPH

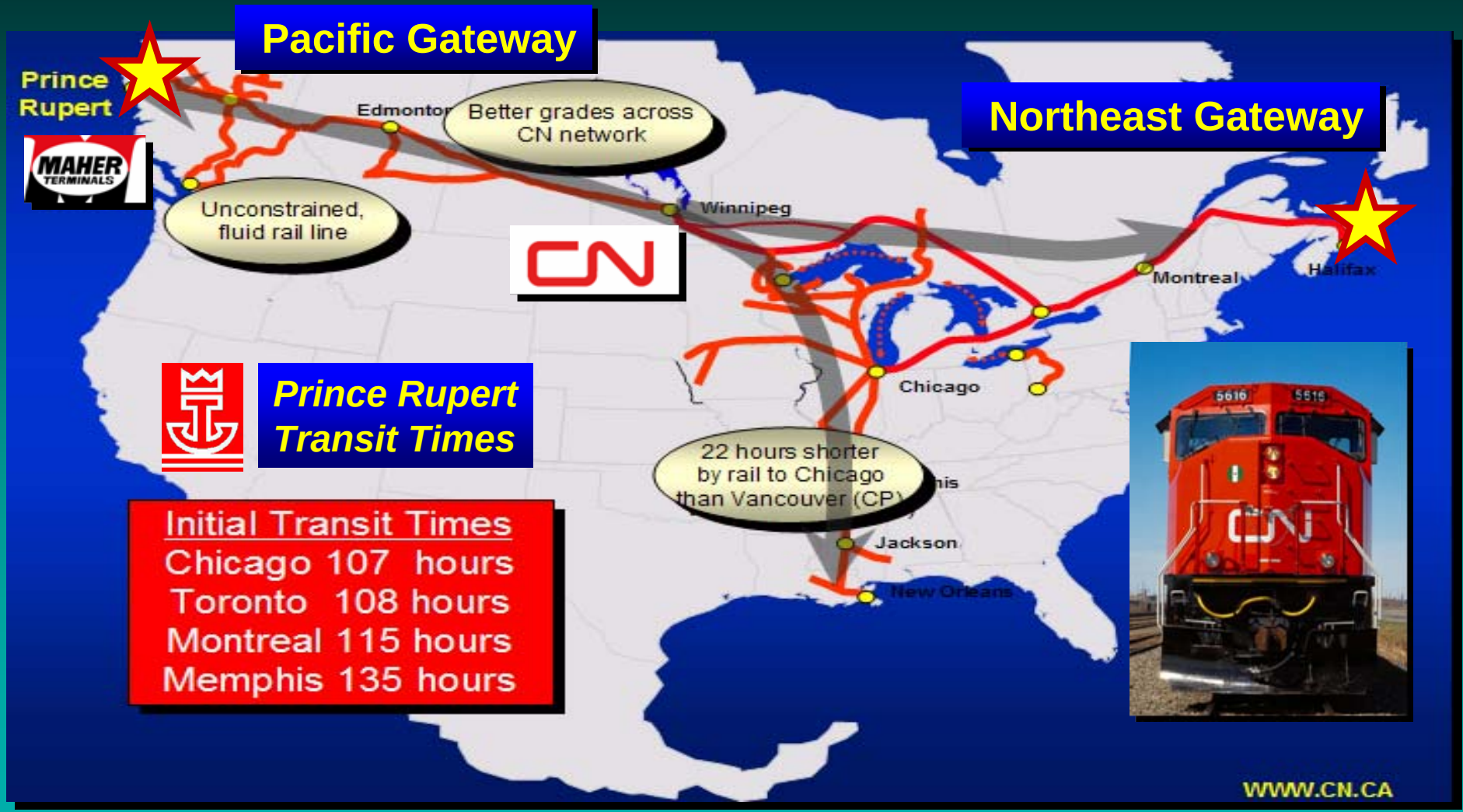
Lazaro Cardenas
Phase I - 700K TEU
Fut. Phase - 2.0 mil TEU

New North American Container Gateway





The Emerging CN Transcontinental Land Bridge



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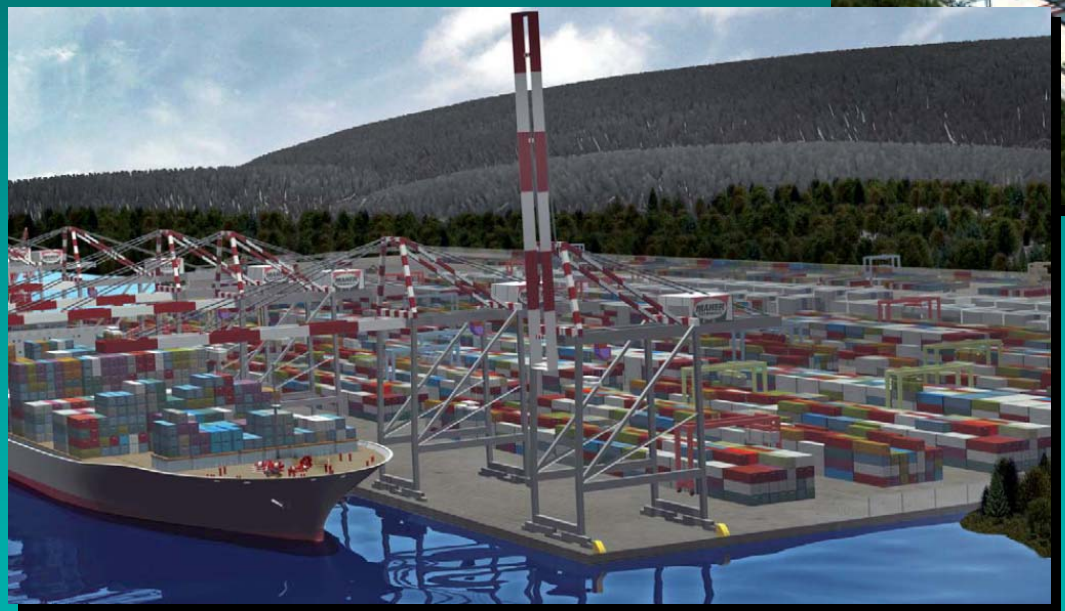
Melford International Terminal
Strait of Canso – Northeast Gateway

Melford
INTERNATIONAL TERMINAL INC



A Project Developed By Trident Holdings Inc.

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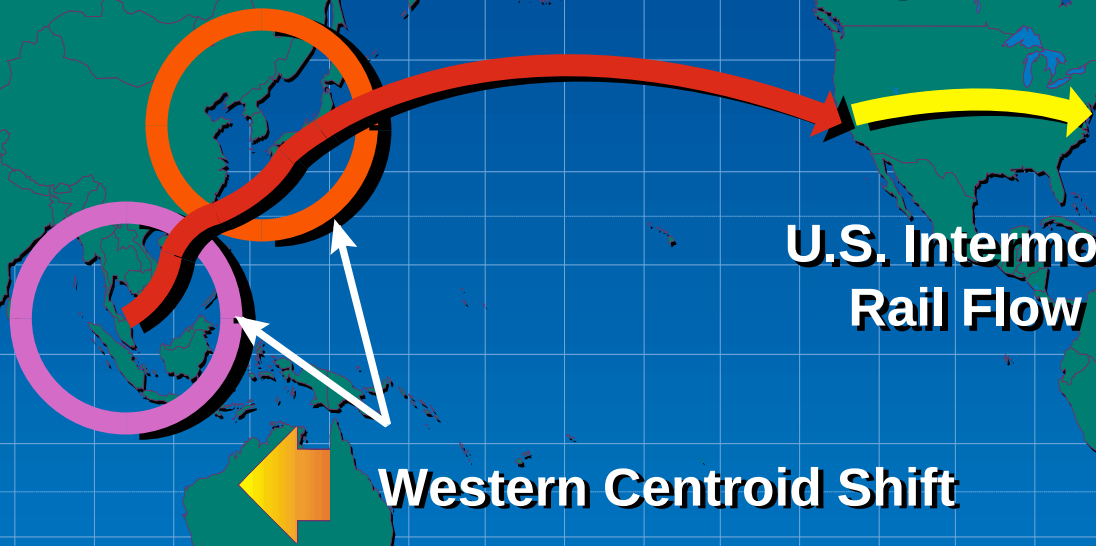
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow



Eastbound: All Water Flow
Eastbound: US Intermodal Rail Flow

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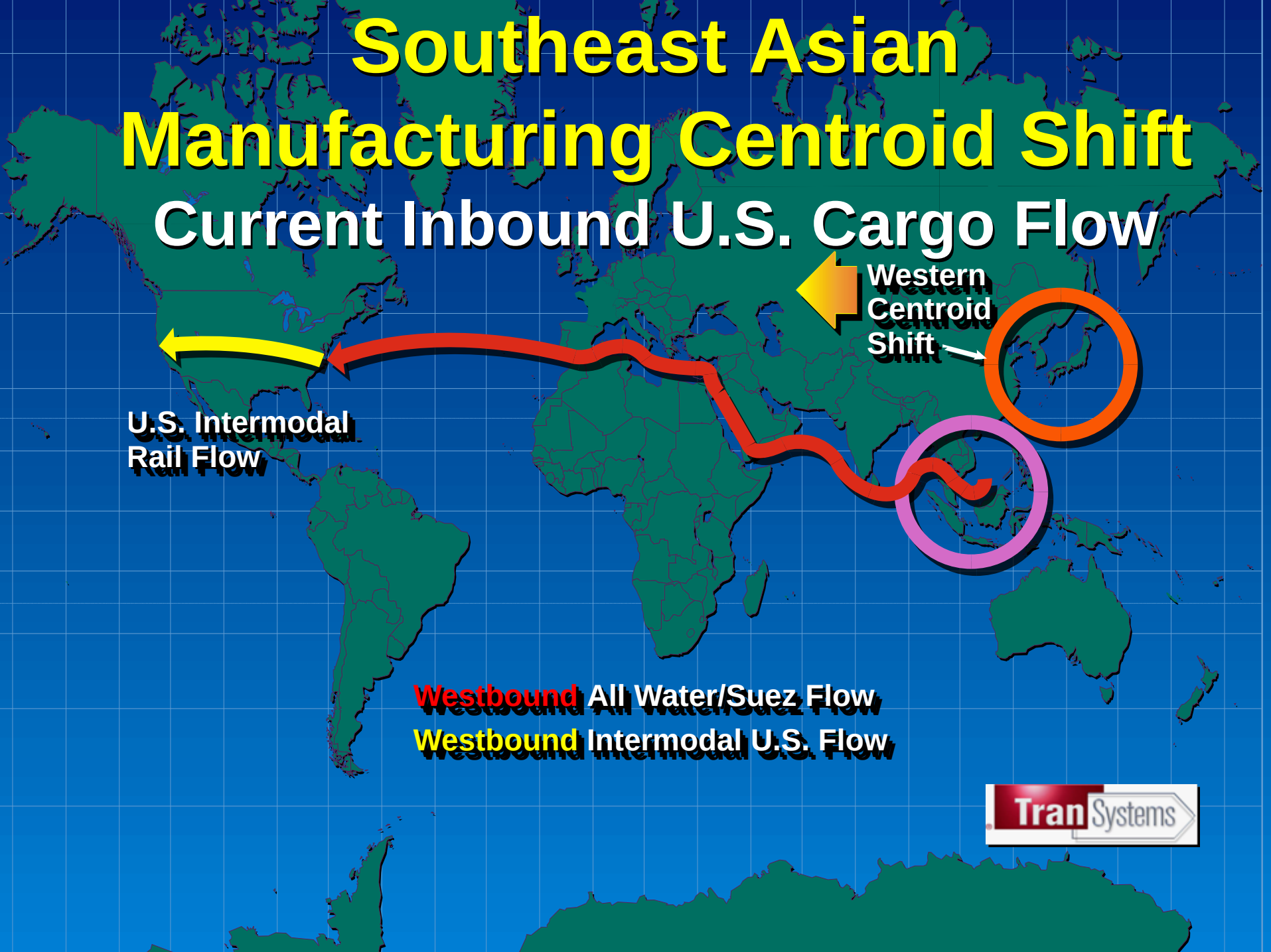
Southeast Asian Manufacturing Centroid Shift

Current Inbound U.S. Cargo Flow



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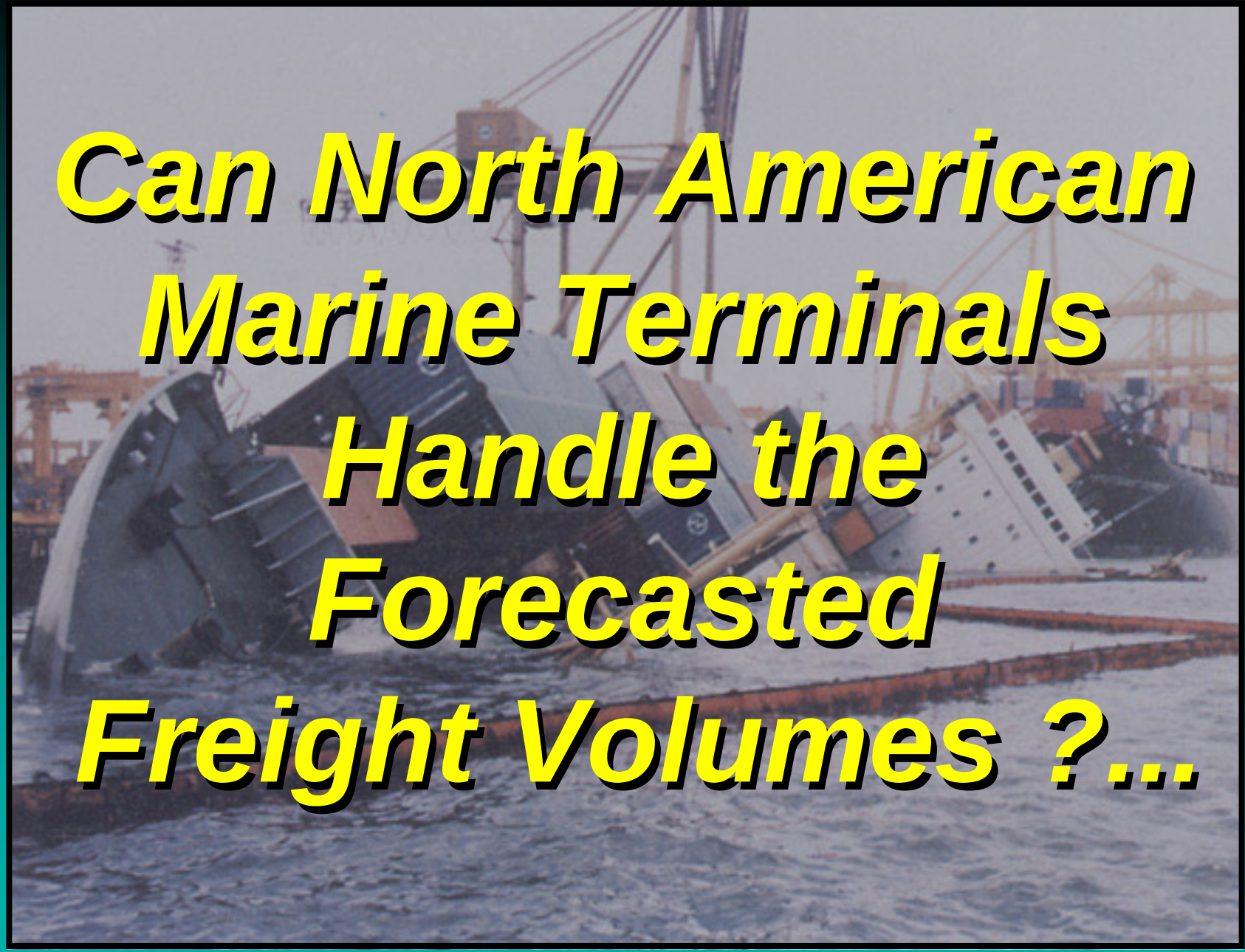
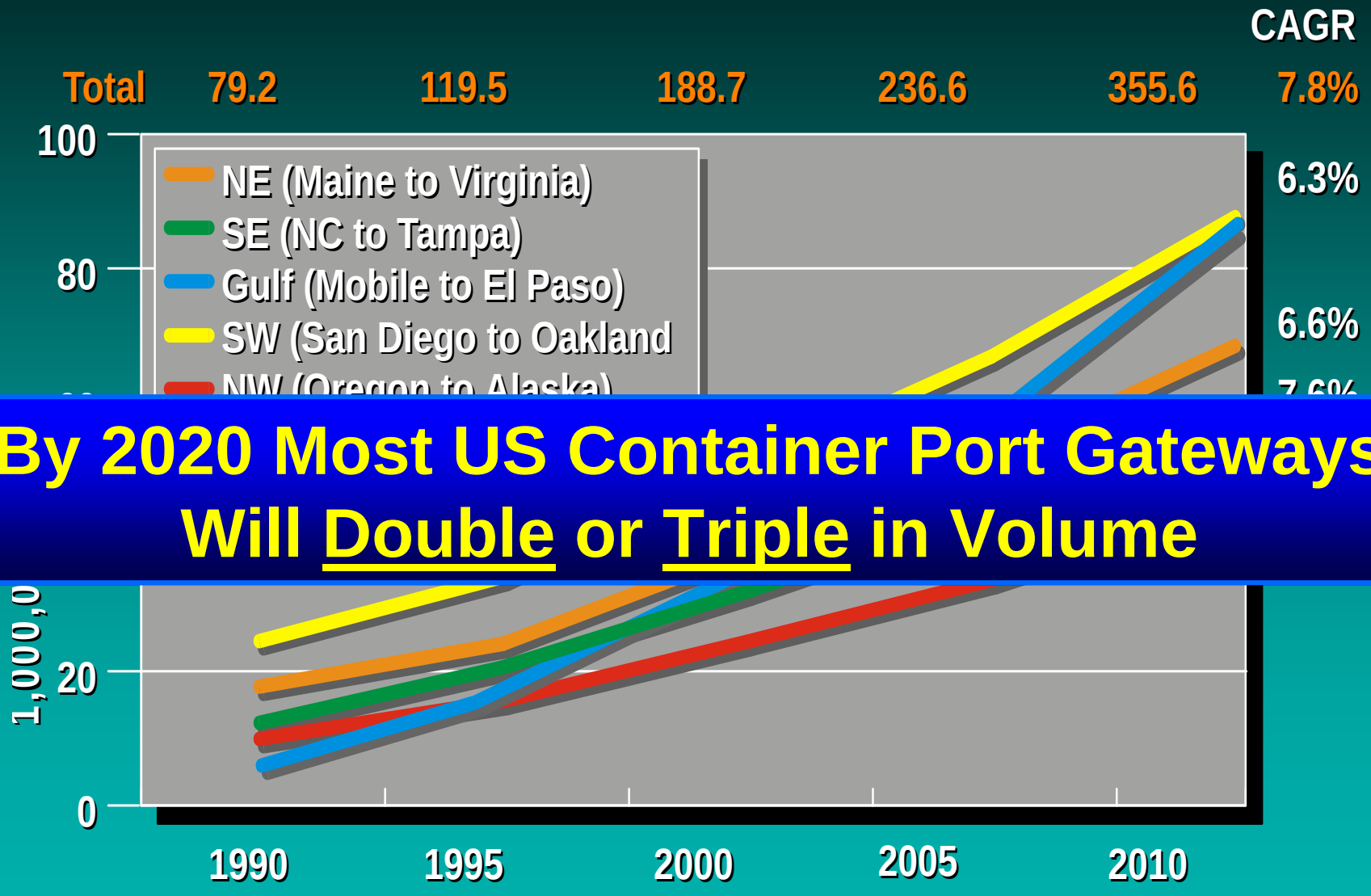


U.S. Containerized Tonnage Forecast

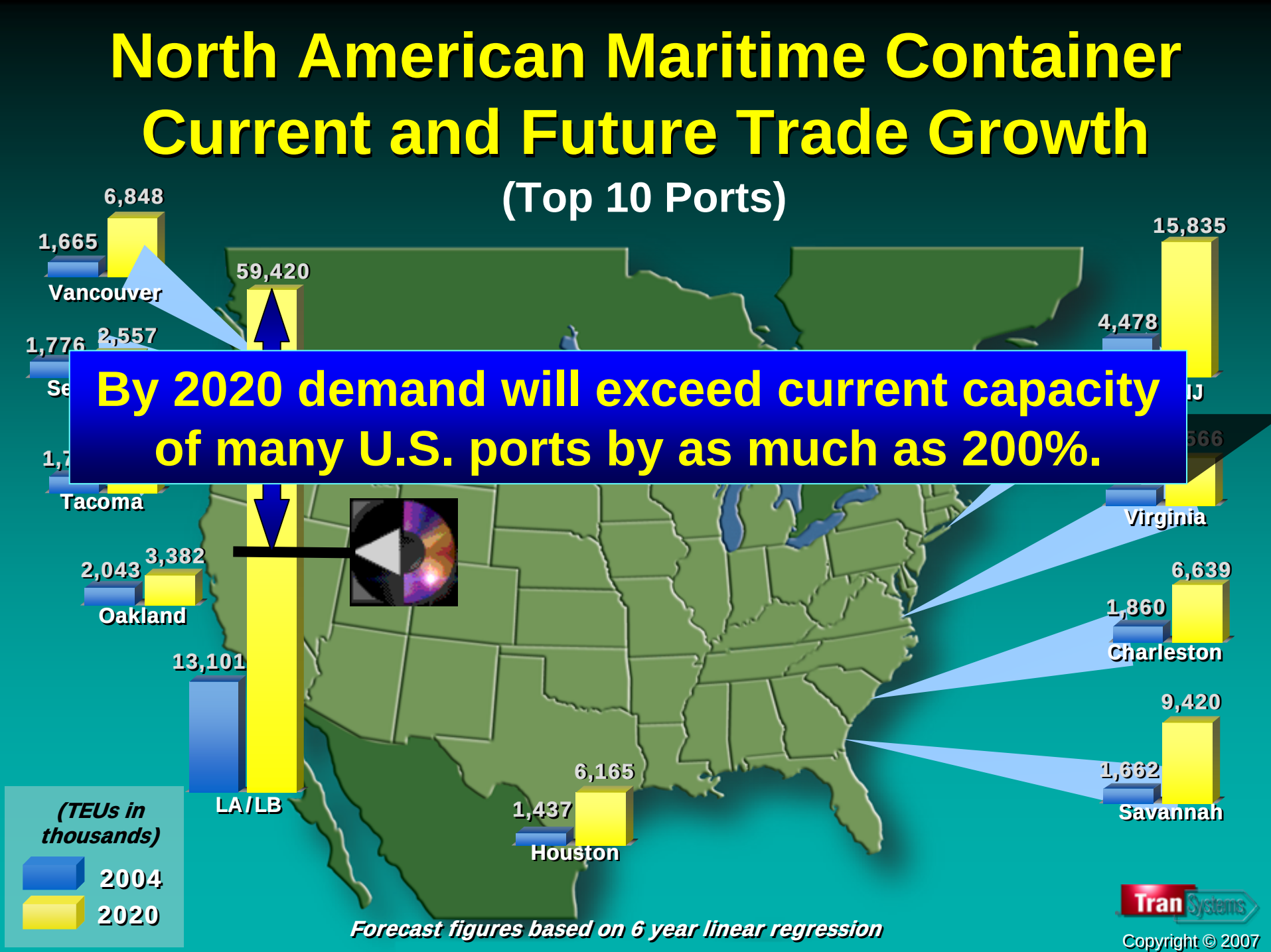


By 2020 Most US Container Port Gateways Will Double or Triple in Volume

Source: DRI/McGraw Hill

North American Maritime Container Current and Future Trade Growth

(Top 10 Ports)



By 2020 demand will exceed current capacity of many U.S. ports by as much as 200%.

Forecast figures based on 6 year linear regression

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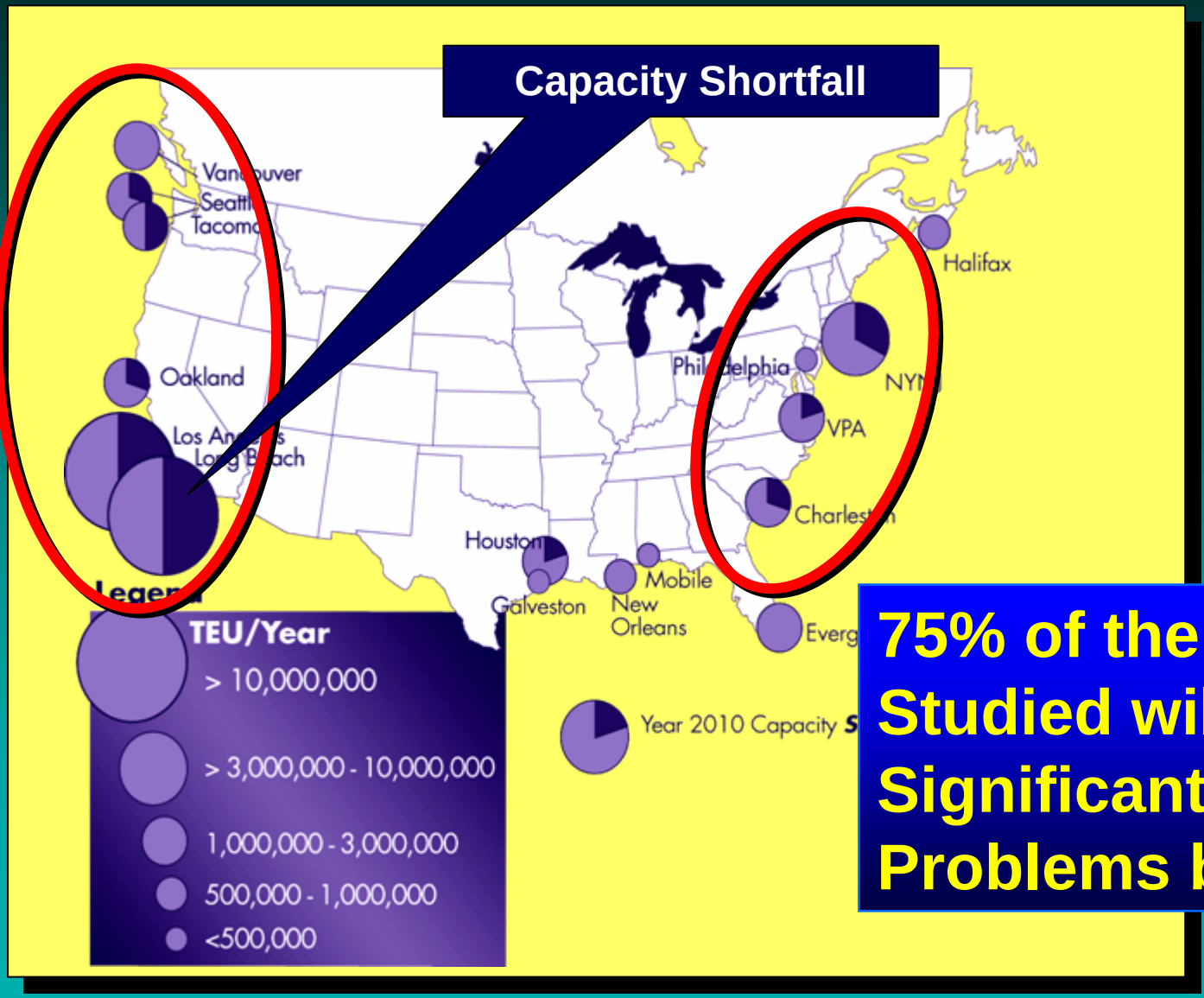
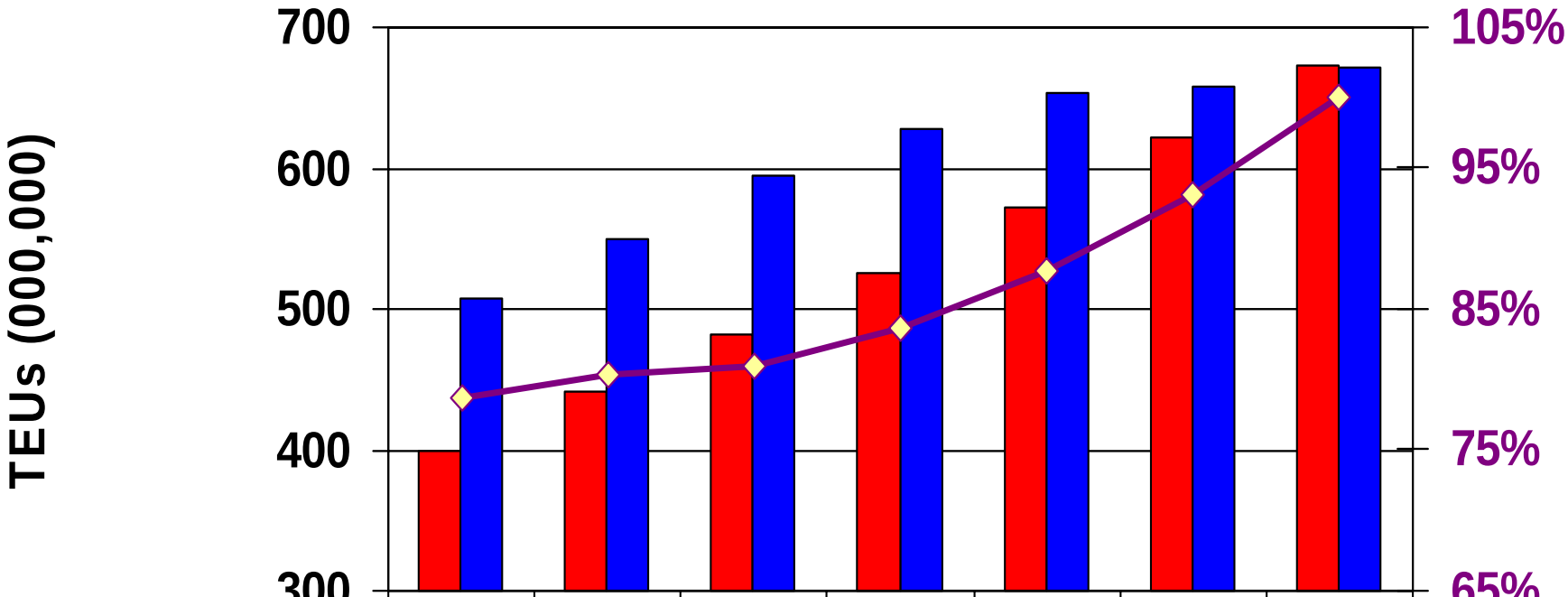
North American Port & Intermodal Capacity Trends

2010 Projected Public Port Capacity Shortfall



75% of the 16 Ports Studied will have Significant Capacity Problems by 2010

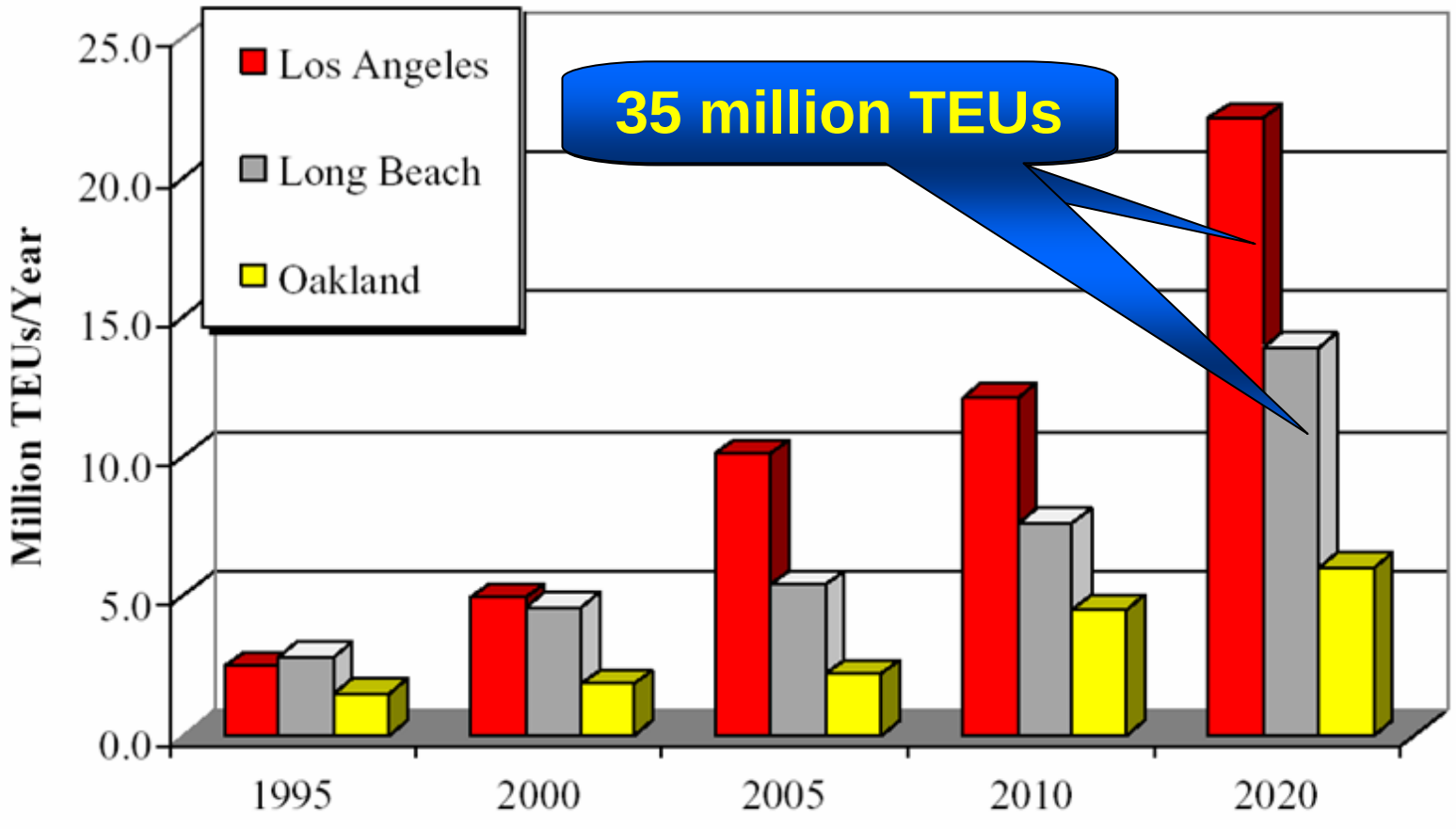
North American Marine Terminal Capacity



	2005	2006	2007	2008	2009	2010	2011
Demand	399.2	441.8	481.4	525.7	572.8	622	672.9
Supply	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	658.1	672.1
Utilization	78.7%	80.3%	80.9%	83.7%	87.7%	93.1%	100.1

Source: Drewry Shipping Consultants

Explosive Southern California Port Container Growth Forecasted



Source: California Goods Movement Action Plan – Jan 2005 Draft

Capacity vs. Demand Bottom Line:

Balancing Capacity and Demand is Both a Public and Private Issue

North America's future economic and environmental health is at risk as a result of declining transportation efficiency and reliability.

International Port Productivity Comparisons

Global Port Terminal Productivity

North American Ports Are Not As Productive As The Most Productive International Ports

By a Factor Of More Than 4 To 1

Global Marine Terminal Productivity

(Circa 1999 to 2004)

(Throughput measured in TEUs/Acre/Year)

	1999	2004	5YR CAGR
Asian Ports	9,272	16,595	15.3%
European Ports	4,284	6,396	15.4%
United States Ports	2,894	4,028	7.7%
US West Coast Ports	3,543	4,944	7.5%
US Gulf Coast Ports	3,149	4,635	9.4%
US East Coast Ports	2,021	2,661	6.8%

Source: 1999 - 2004 CI Database, Seaports of the Americas, Port Data

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Maritime Vessel Technology Trends


April 26, 1956
58 Modified 35-foot Truck Containers
The deck of the *Ideal X* at Port Newark preparing for the historical sailing of the world's first containership
April 2006:
50 Year Anniversary of the Container
In 1955 Malcolm McLean, sold McLean Trucking, and secured a bank loan of US$42 million to build the world's first container ship.
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World Container Ship Evolution

1st Generation (Pre-1960 - 1970)

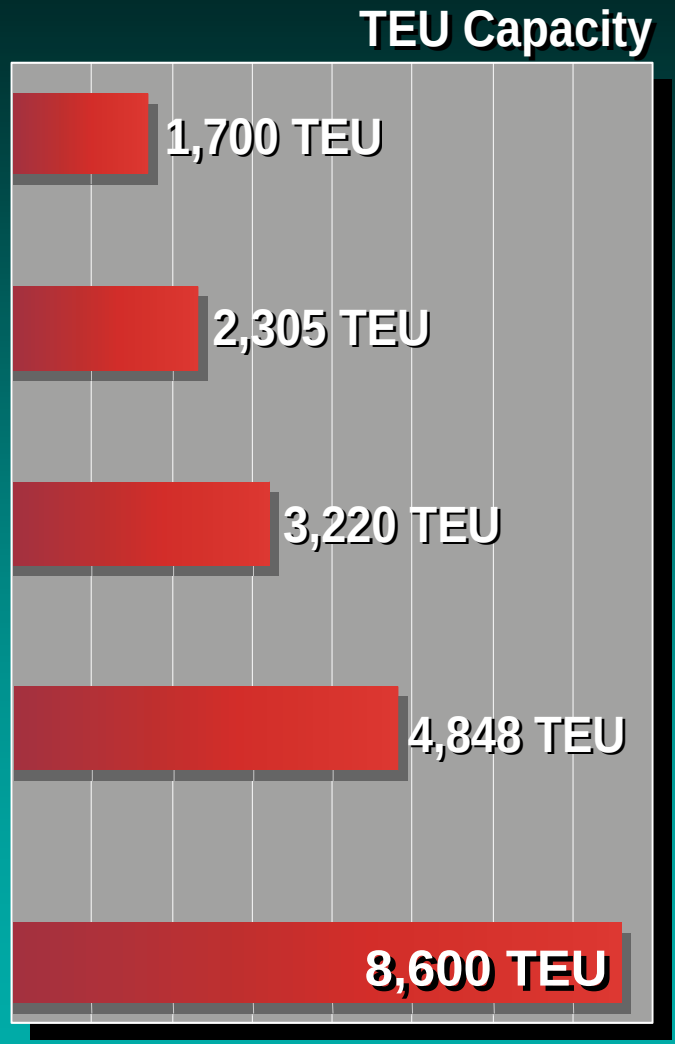
2nd Generation (1970 - 1980)

3rd Generation (1985)

4th Generation (1986 - 2000)

5th Generation (2000 - 2005)

6th Generation ???



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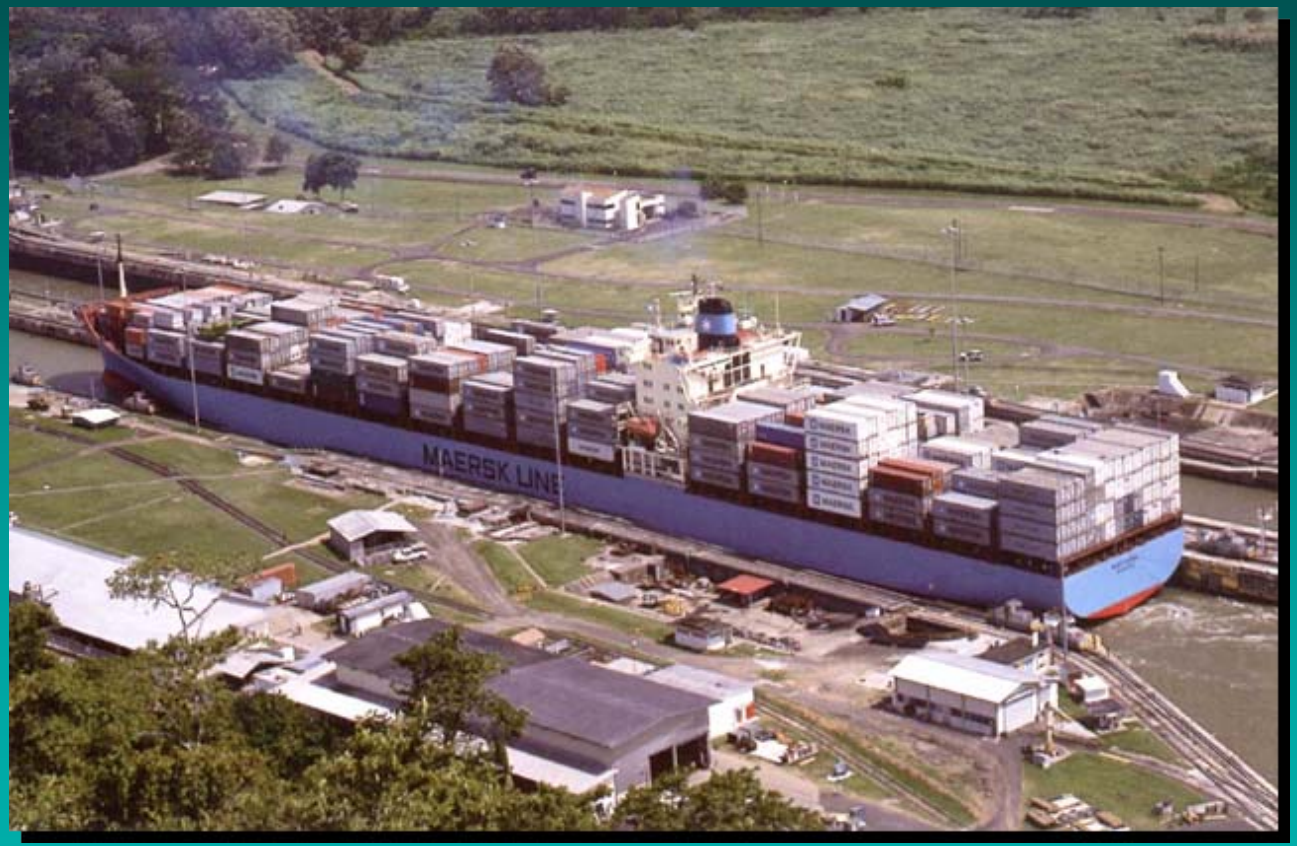
Madison Maersk (3,928 TEUs) in the Panama Canal

(Current Max Panamax = 5000 TEUs)



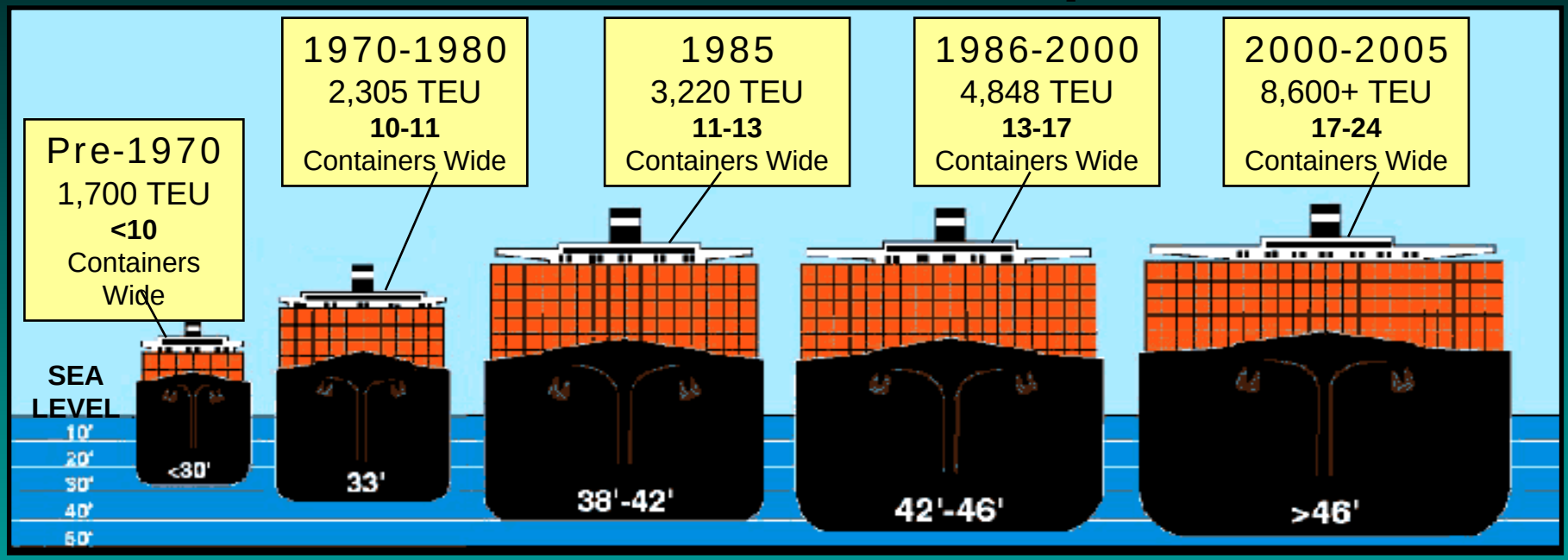
Today's Mega Ships - Measuring Up

Eiffel Tower – 990 feet

Regina Maersk – 1043 Ft, 140 Ft wide, 6000+ TEUs

Today's Mega Ships - Measuring Up

How Wide, How Deep?



7000+ TEU Containerships Slot Capacity in the Fleet and on Order

SUMMARY OF WORLD CONTAINERSHIP FLEET IN SERVICE AND ON ORDER (OCTOBER 2005)				
Ship Type	5000-5999	6000-6999	7000+	Total
Slots on Order	371,509	435,032	1,561,394	4,323,417
Ships on Order	68	67	183	1,113

Current Vessel Capacity = 2,304,286 Slots

Order Book Vessel Capacity = 2,367,935 Slots

A 103 % Increase in Fleet Slot Capacity on Order

Source: *Containerisation International Yearbook 2005*

10,000 TEU Container Ships Currently on Order

Zim orders four 10,000 TEU container ships from Hyundai Shipyards in Korea; will double its carriage capacity
Zim will take delivery of the ships, second half of 2009

Cosco orders four 10,000 TEU containerships from Hyundai Heavy Industries to be delivered in 2008
$505 M Deal

Source: North Sea Terminal Bremerhaven GmbH & Co

2005 COSCO Orders Four 10,000 TEU Vessels

LENGTH OVERALL	349 M (1145 FT.)
BREADTH	45.6 M (149.6 FT.)
MAX. DRAFT	14.5 M (47.6 FT.)
OPERATING SPEED	25.8 KNOTS (29.7 miles/hr)

Source: Lloyd's Register, February 2005

A.P. Moller-Maersk September 2006 Service Announcement for 14,000 TEU Vessel

The new-build known as "M/S Emma Maersk", was christened at the Odense-Lindo Shipyard in Denmark in August 2006.

The nominal capacity of the new vessel could be as high as 14,000 TEUs based on its reported LOA of 397 m, Beam of 56 m, Draft of 15.5 m, Gross Tonnage 170,974 gt, Speed 25.5 knots

Source: Journal of Commerce August 2006, Marine Log December 2006

A.P. Moller-Maersk L Class M/S Emma Maersk

(14,000 TEU Vessel - 22 Containers Wide)

Length: 1,302 ft, Width: 207 ft, Net Cargo: 123,200 tons

Key Cranes: 10, Engine: 14 in-line cylinders diesel engine (110,000 BHP)

Cruise Speed: 31 mi/h, Full Crew: 13, Construction cost - US $145 M+

Source: Maritime World Logistics Inc. January 2007

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The Hatch-Less Container Vessel

Per P&O Nedlloyd:

- 15% Faster Port Productivity
- 84% Less Re-Stows
- Less Damaged Boxes

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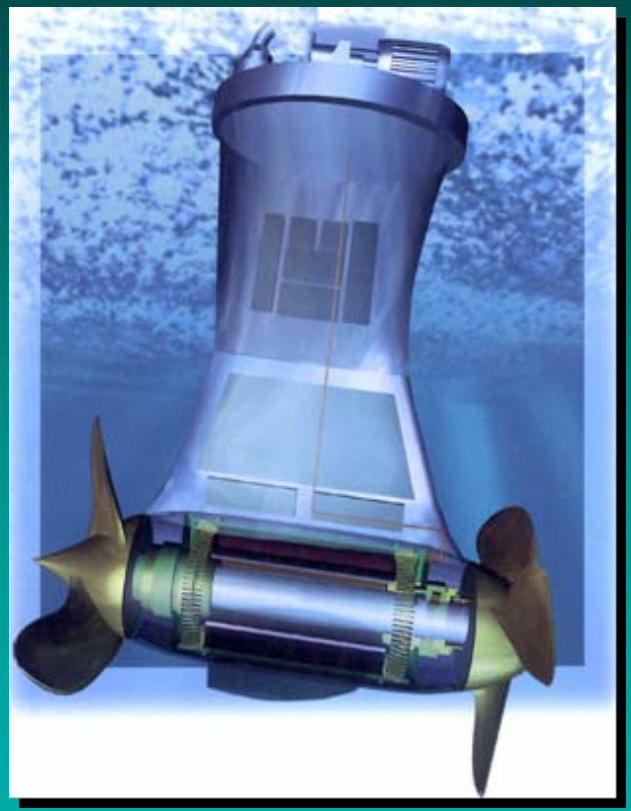
Containerships & Recent Cruise Vessel Technological Advances…What's Next?



SSP Propulsion
Schottel / Siemens

Azipod
Eagle Class Cruise Vessel

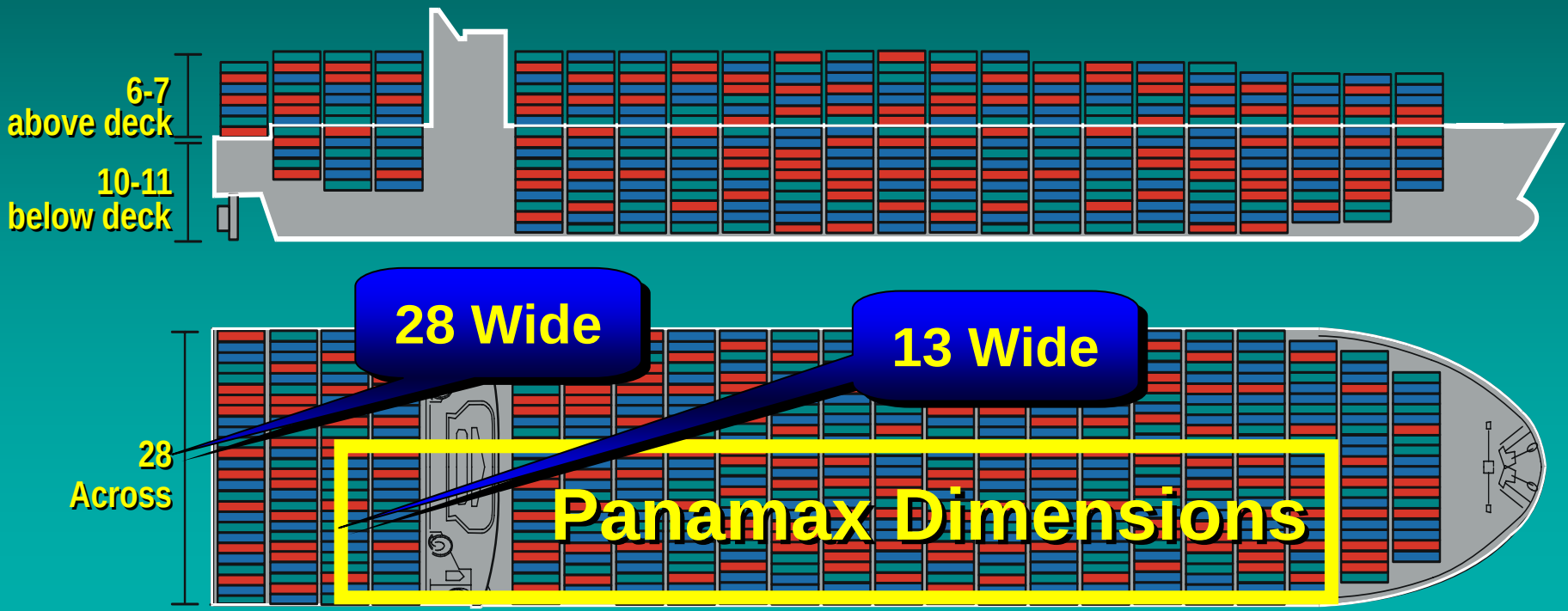
The 15,000 TEU Containership

"…the ship is a flight of fancy… but such a ship is within the current state of the shipbuilder's art…"

R. G. McLellan, P&O Containers

The 15,000 TEU Containership

LOA. = 400 m (1,312 ft.)
Draft = 14 m (46 ft.)
BEAM = 69 m (226 ft.)



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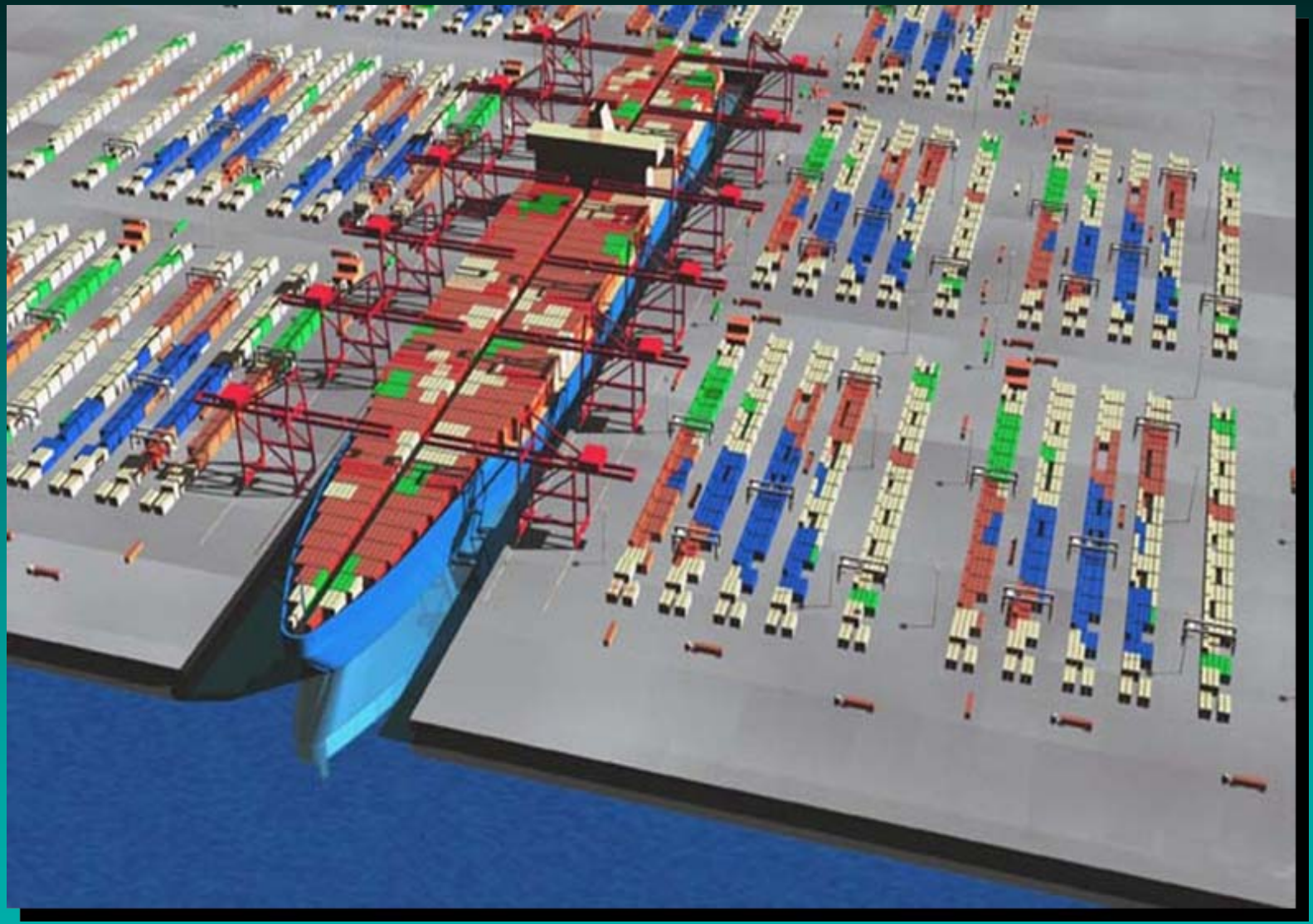
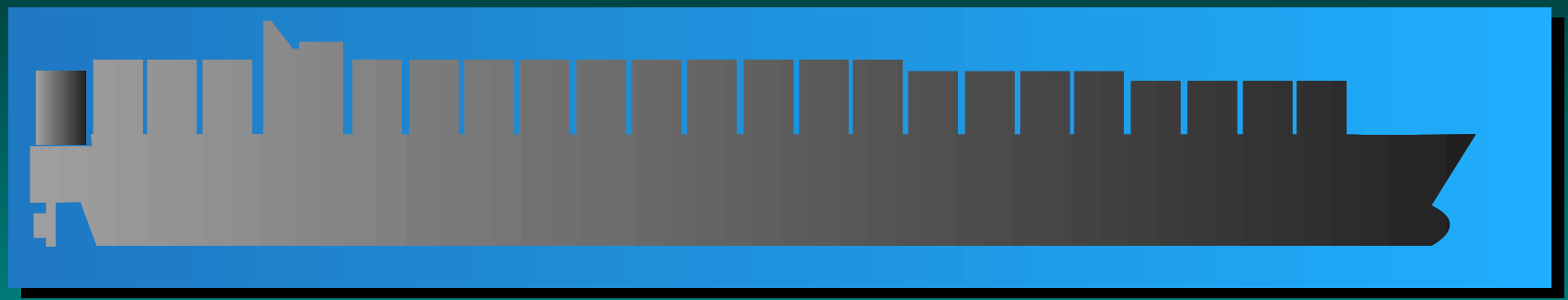
Container Ship-in-a-Slip Concept



The 18,000 TEU Malaccamax Reported Predictions/Benefits



- By 2010 on Asia-Europe Trade Route
- **30% Cheaper** than 4800 TEU Panamax Vessel, primarily due to "Economies of Scale"
- US$40/TEU Savings

Source: Dynamar Consultancy, Rotterdam

Emergence of North American Fast Feeder Short-Sea Coastal Vessels

The New Frontier:
Transshipment and Short Sea

2,000 - 3,000 TEU
Feeder Ship

10,000 to 15,000 TEU Mega Ship

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Short Sea Shipping
COOPERATIVE

Short Sea Shipping
Coastwise Maritime Trade

Taking Freight off of Congested Roads

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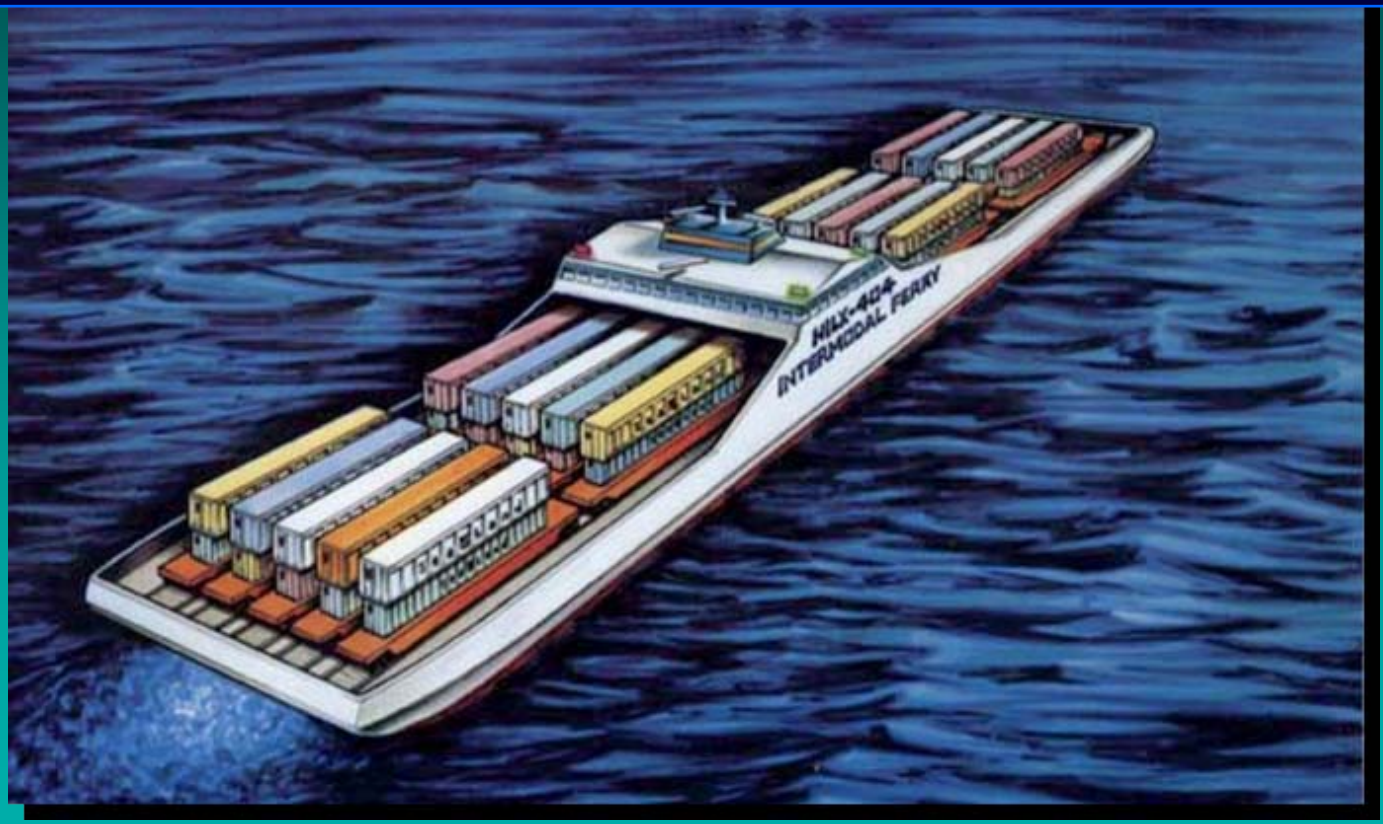
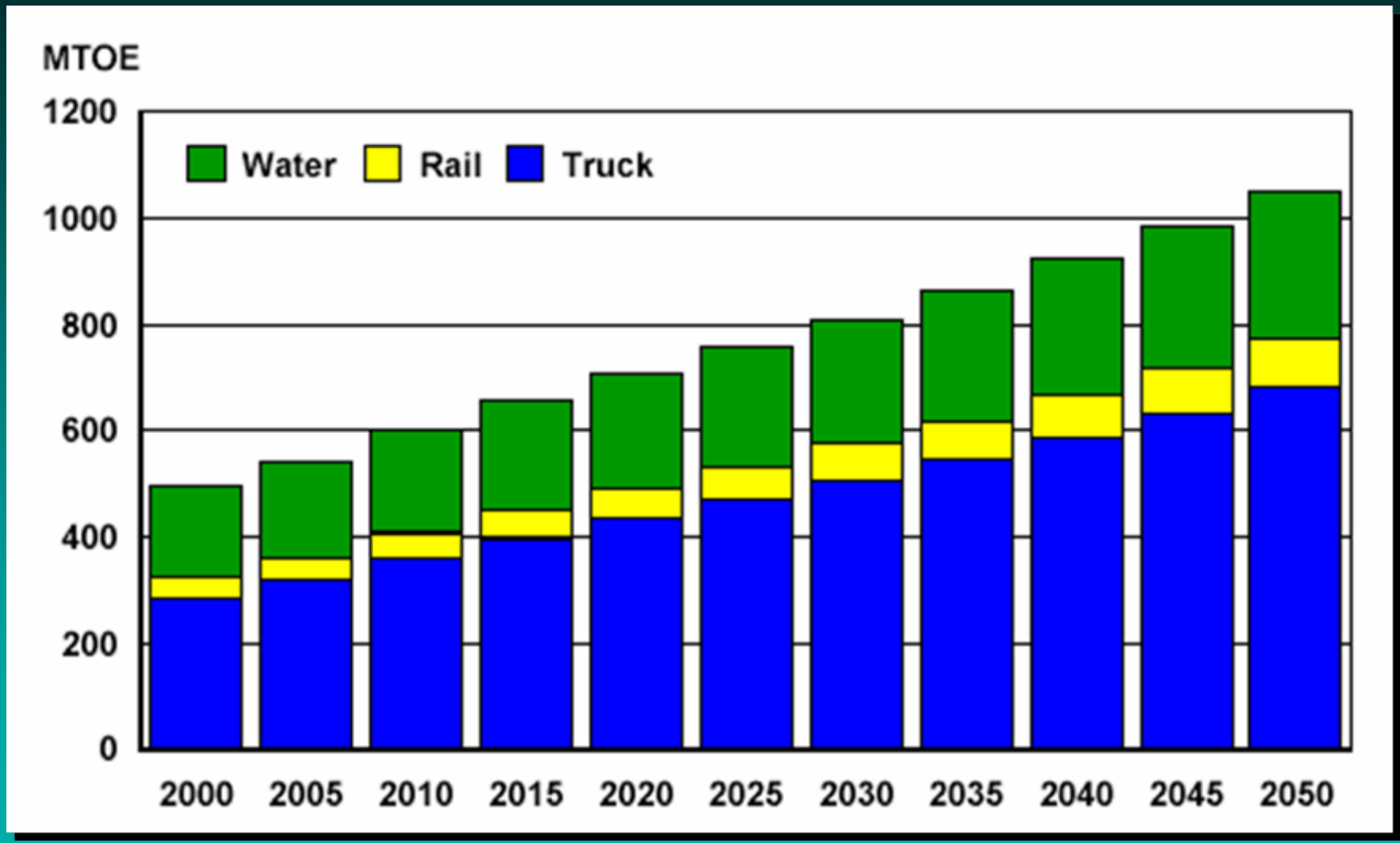
Emerging Viable Container On Barge Coastal Shipping Concepts & Inland Intermodal Port Potential

High-Speed, Low Wake, Intermodal Float Technology



Growing Environmental Concerns for Marine Vessel Emissions

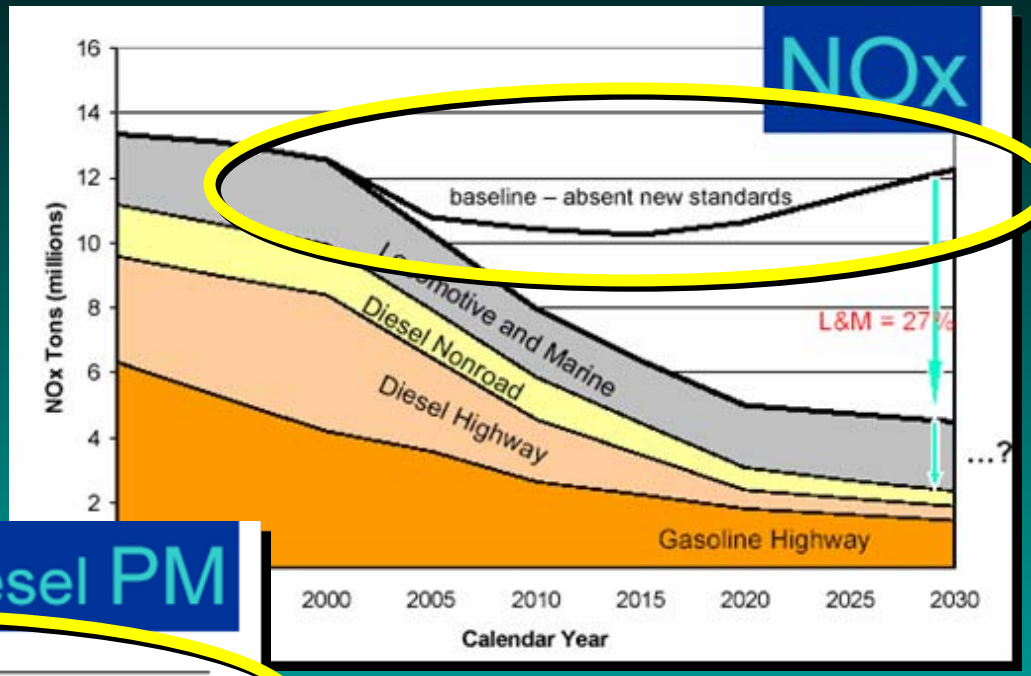
Global Freight Energy Use is on the Rise

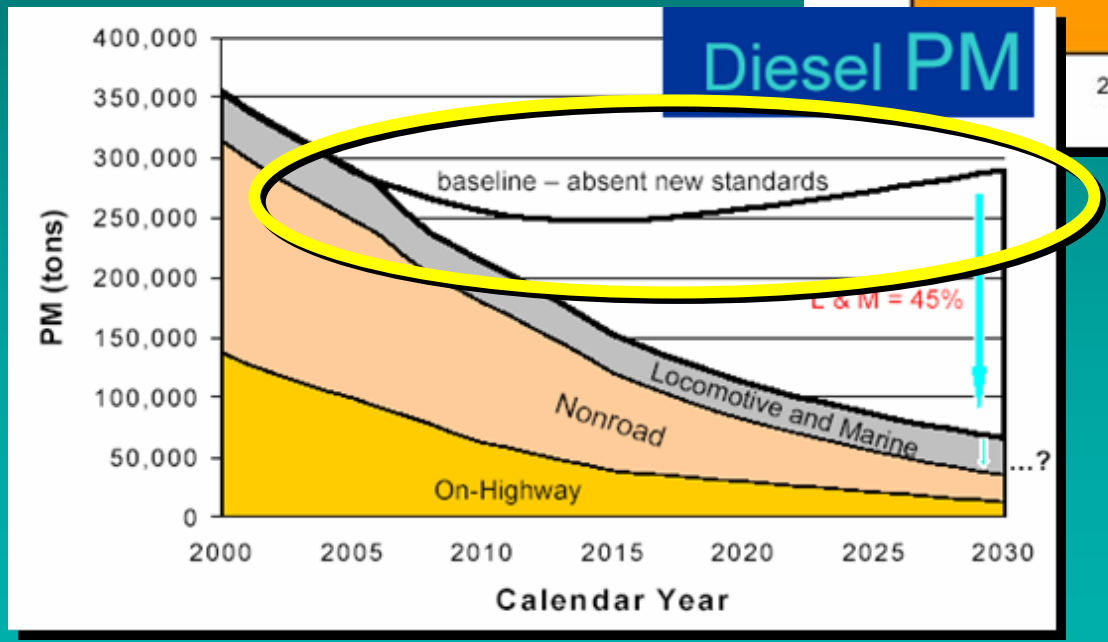


Source: 2005 Haagen Smit Worldwide Emissions Overview & NRDC " Harboring Pollution"

Global Diesel PM & NOx Baseline Projections

Land Based Pollutants Have Declined with Regulation, but the Unregulated Marine Based Pollutants are Increasing

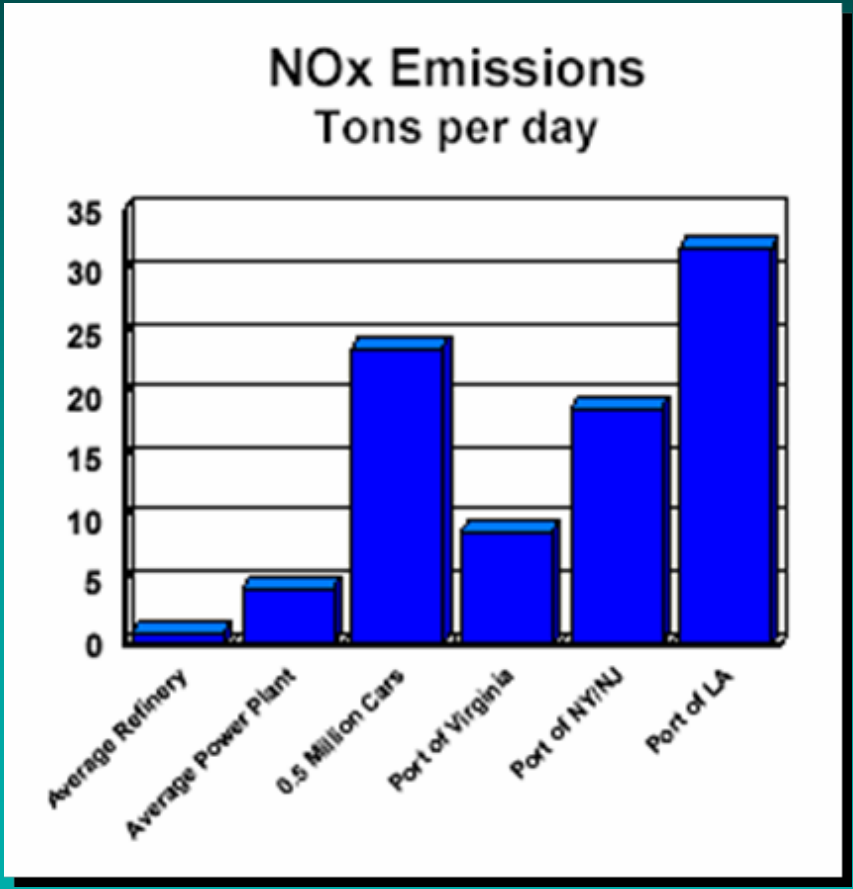


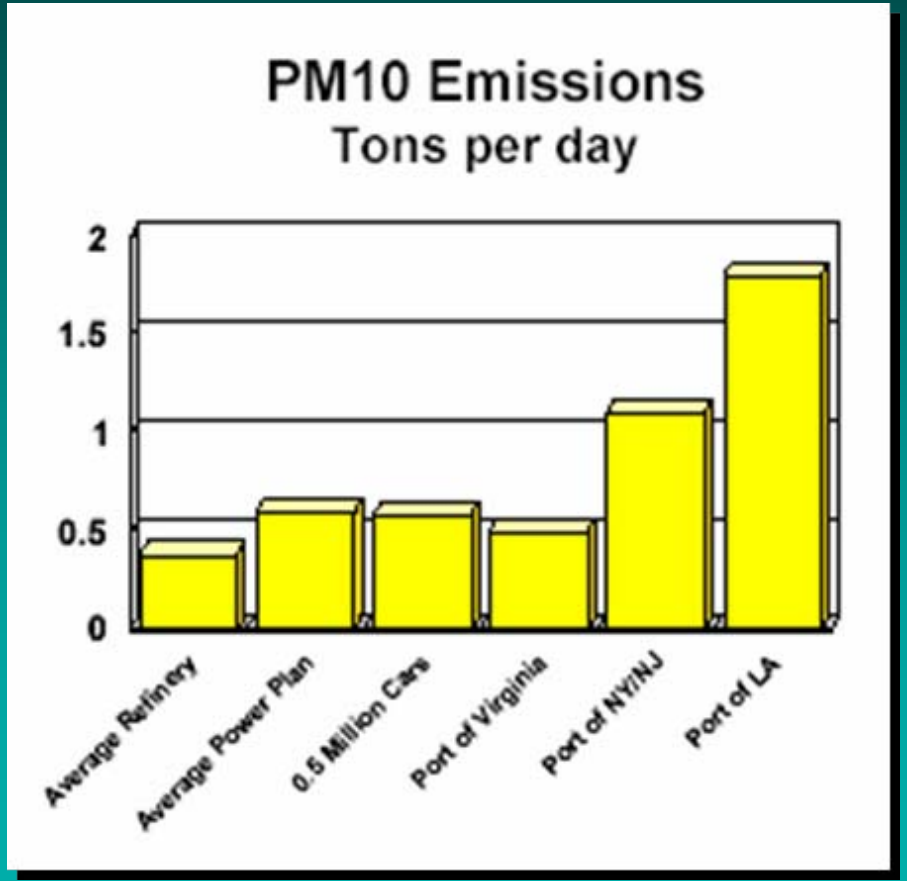


Absent New Standards and Regulations the Pollutant Baselines Are Forecast to Rise

Source: 2005 Haagen Smit Worldwide Emissions Overview

Pollution Sources
US Ports vs Other Industries…
We Need To Do Better





Source: 2005 Haagen Smit Worldwide Emissions Overview & NRDC " Harboring Pollution"

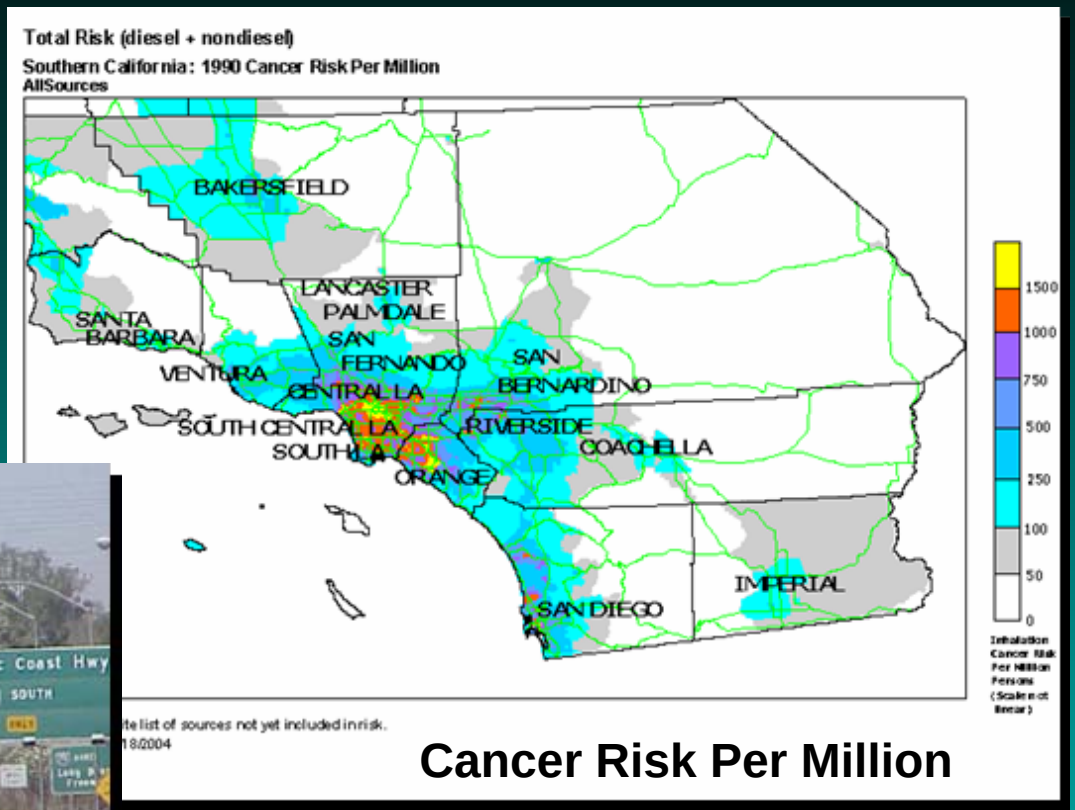
Transportation Diesel Pollutants are Putting Our Health in Jeopardy

Progress has stalled and diesel emissions from ships, locomotives and port complex are projected to increase.

Source: SCAQMD, Multiple Air Toxics Exposure Study II, March 2000

South California Environmental Challenges

The "Diesel PM Death Zone"



Cancer Risk Per Million

I-710 Typical Day from POLA/POLB

- **Environmental Constraints are Growing**
- **POLA/POLB Have had 40 major Projects Held up for Years**
- **State Looking Into User Fees**

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Cost-Effective Air Quality Emission Reduction Improvement Measures

Modernize truck fleet: Scrap dirty old trucks Retrofit all other pre-2007 trucks

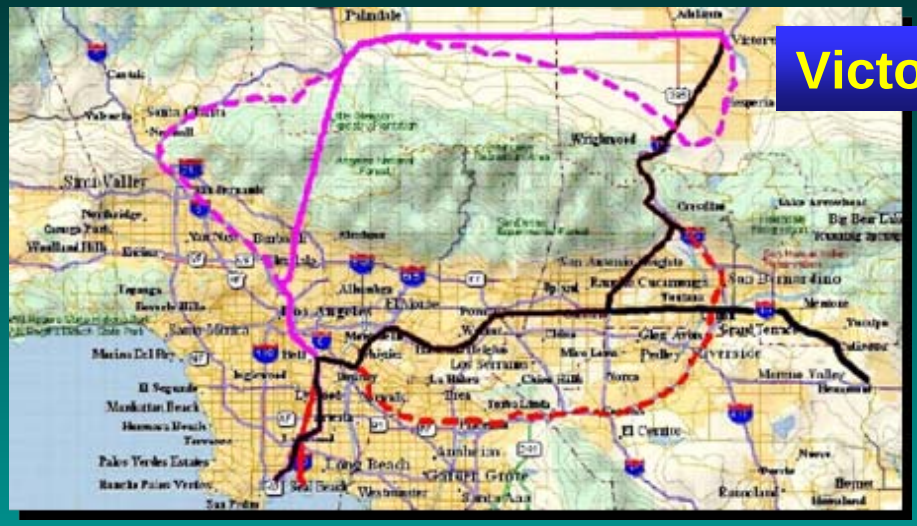
Upgrade all cargo handling equipment with electric equipment or clean fuels

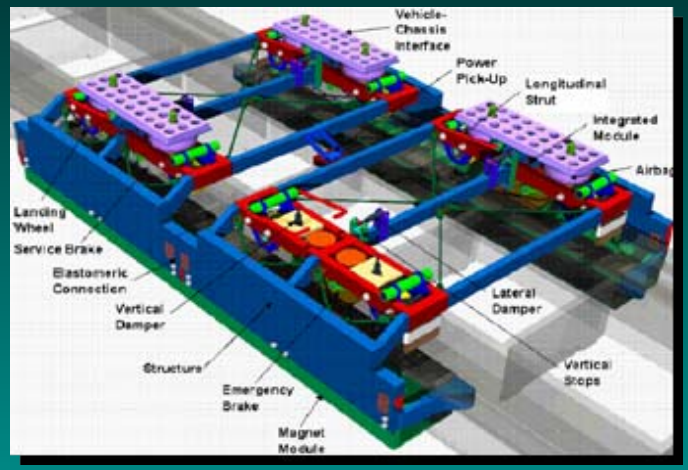
Use clean marine fuels Provide onshore electric power for ships at berth (Cold Iron)

Replace locomotives with cleaner technologies, fuels, and explore rail electrification

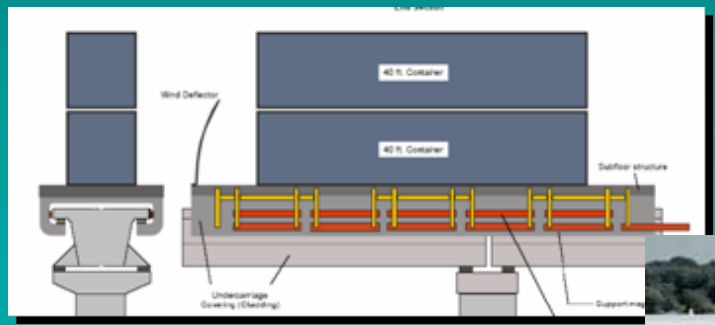
Source: Southern California Association of Governments

MAGLEV Cargo Conveyor Demonstration Project





GENERAL ATOMICS



Transrapid Freight Vehicle Concept

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Port & Intermodal Terminal Competitive Mandates

- Ports & intermodal linkages must change the current **cost** versus **value** relationship in the logistics chain. **Become Value Added Multipliers...**
- Successful ports & intermodal terminals in the next decade must **invest in and leverage technology** to improve terminal productivity, cost, effectiveness and reliability for all modes of transportation…**securely as environmental stewards.**

JW Marriott Hotel Pennsylvania Avenue, March 21, 2007, Washington DC

Thank You

John Vickerman

TranSystems

Norfolk, Virginia