Intermodal Industry Overview

- History of Containers and Intermodal Industry
- Intermodal Operations
- Chassis and Chassis Pools

TRAC Intermodal Investor Relations

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What is Intermodal?

- **Intermodal freight transportation** involves the movement of goods using multiple modes of transportation - rail, ship, and truck. Freight is loaded in an intermodal container which enables movement across the various modes, reduces cargo handling, improves security and reduces freight damage and loss.

Overview

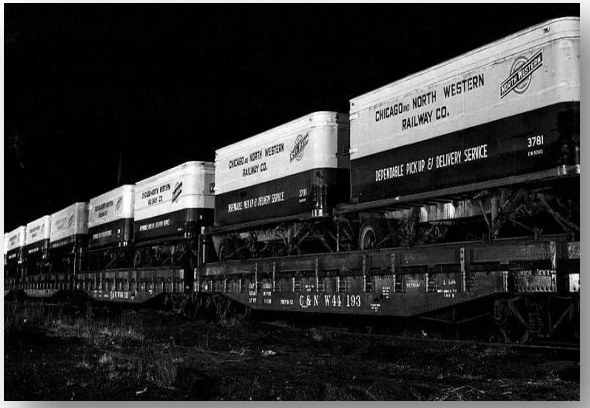
HISTORY OF CONTAINERS AND INTERMODAL INDUSTRY

Containerization Changed the Intermodal Industry

- Intermodal Timeline:
  - By Hand - beginning of time
  - Pallets
    - started in 1940's during the war to move cargo more quickly with less handlers required
  - Containerization: **Marine**
    - First container ship built in 1955, 58 containers plus regular cargo
    - Marine containers became standard in U.S. in 1960s (Malcom McLean 1956 – Sea Land, SS Ideal X, 800 TEUs)
    - Different sizes in use, McLean used 35'
    - 20/40/45 standardized sizes for Marine

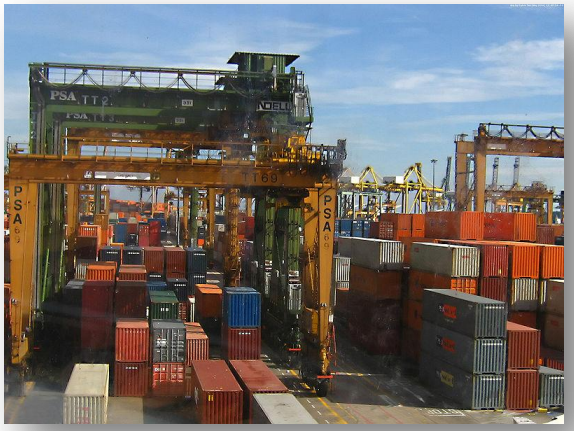
Containerization Changed the Intermodal Industry

- Intermodal Timeline:
  - Containerization: **Domestic Railroads**
    - Earliest containers were for bulk – coal, sand, grains, etc. – 1800's
    - Piggy backing was introduced in the early 1950's where regular trailers were placed directly on train flat cars.
    - Southern Pacific Railroad introduced the first double-stack intermodal cars in 1977
    - Railroads double-stacking fully introduced by 1984
    - 48/53 for US Domestic, Introduced in 1989 - 60% more capacity than standard 40'
    - Double-stack rail transport is approximately 70% of the United States' intermodal shipments, it transports more than one million containers per year



Containerization Changed the Intermodal Industry

- Intermodal Timeline:
  - Containerization
    - 17 million intermodal containers in the world of varying types according to the World Shipping Council at 2010
    - 90% of non-bulk cargo worldwide is transported by container
    - Typical container has doors fitted at one end, and is constructed of corrugated weathering steel
    - Built to be stacked up to seven units high
    - Average life of 10 to 14 years depending on use
    - Cost $3k to $5k

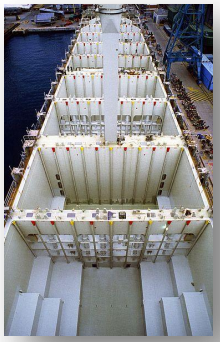


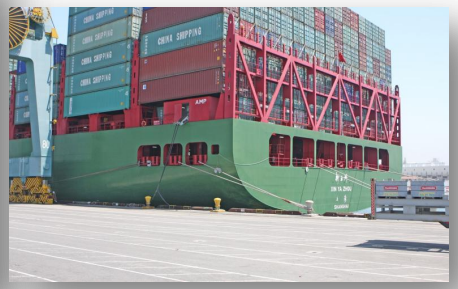
Standardization / Variations of Containers

- Containers vary but the pin systems remain constant on ships and trains
  - Marine Standard 20’/40’/45’
  - Domestic Standard 53’
  - Other Types:
    - Tanker
    - Refrigerated
    - Bulk for minerals, heavy machinery

Container Locking / Securing System

- A **twist-lock** and **corner casting** together form a standardized rotating connector for securing to:
  - Container Ships
  - Chassis
  - Railcars
  - Container cranes



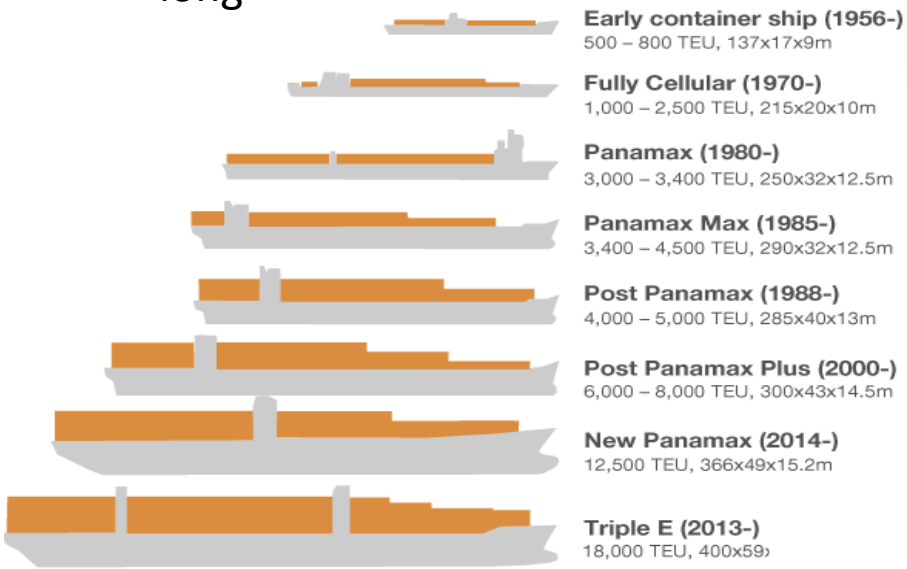


Rail

- Double-stack rail transport is approximately 70% of the United States' intermodal domestic shipments

Container Ships Have Grown

- First container ships were converted WWII surplus tankers – 1951 / 58 containers
- Modern container ships can carry up to 16,020 twenty-foot equivalent units (TEU)
- Maersk Triple E class "Economy of scale, Energy efficient and Environmentally improved", ¼ mile long



Container Ship Size has Limits

- Most U.S. ports have bridge or depth limitations
- Panama canal has a TEU limit of approximately 5,000 TEUs[1]

[1] The $5.3B Panama Canal expansion program will be done in 2015, allowing ship TEU limits to rise to 13,000.

Overview

INTERMODAL OPERATIONS

Intermodal Transportation

Re-Order

Factory

Store

Ship

Distr Ctr

Train

Truck

TRAC INTERMODAL

Example of Freight Route – Asia to Eastern U.S.

Ship

Rail

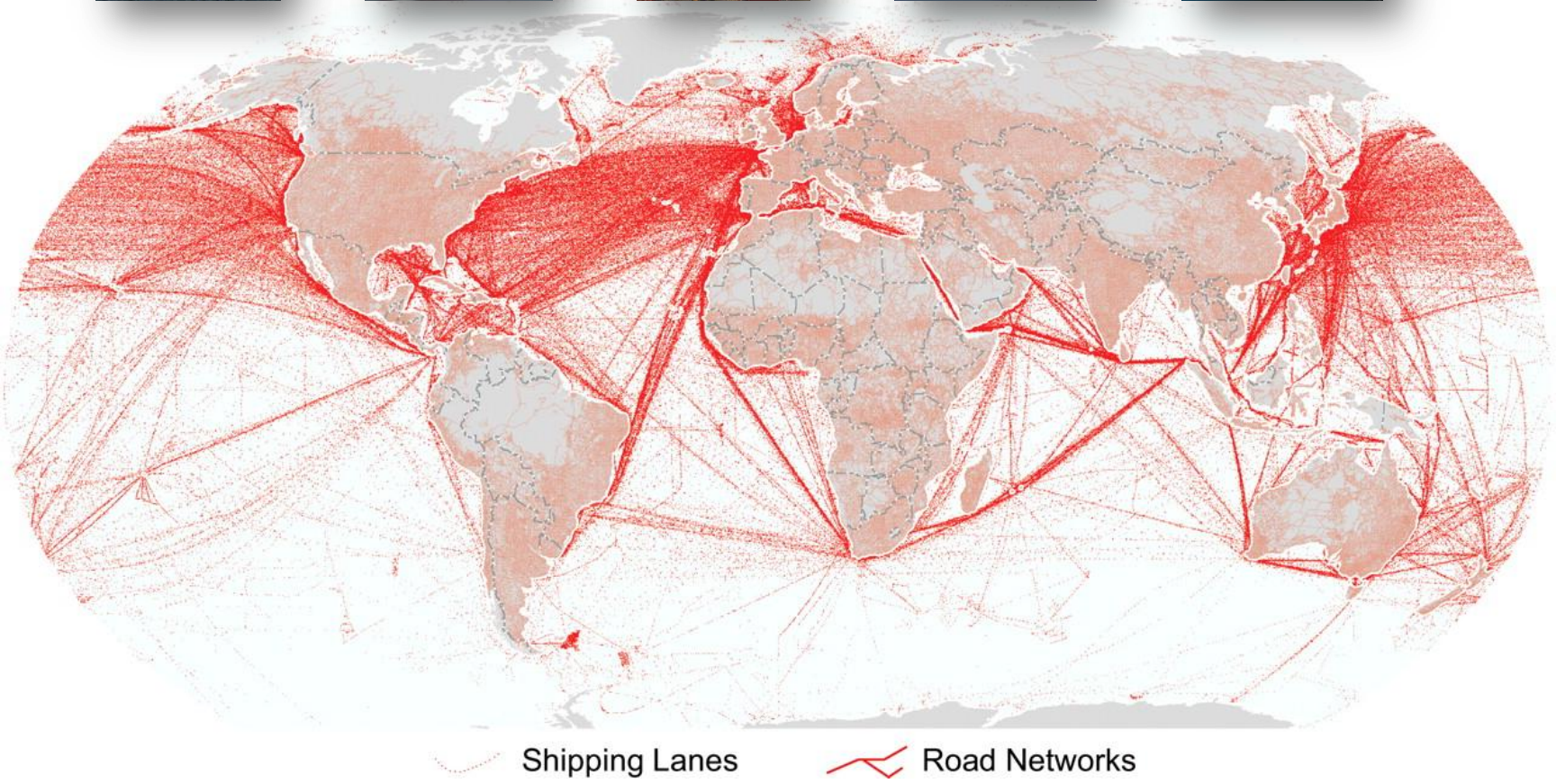
Truck

Steamship Lines Operate Regularly Scheduled Routes

- Top US ports – LA/LB, Newark, Gulf, S. Atlantic, Pacific / No. Cal

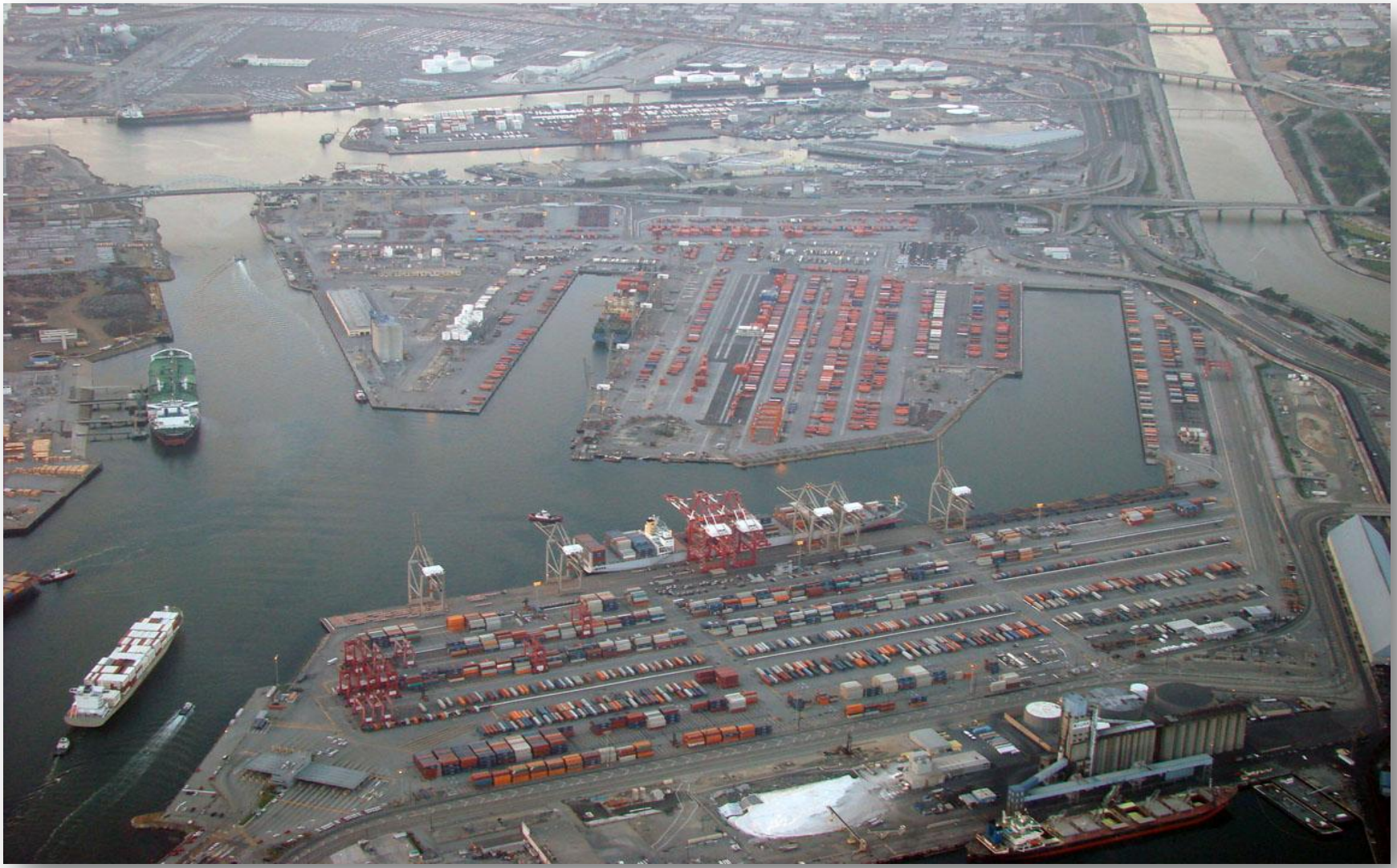






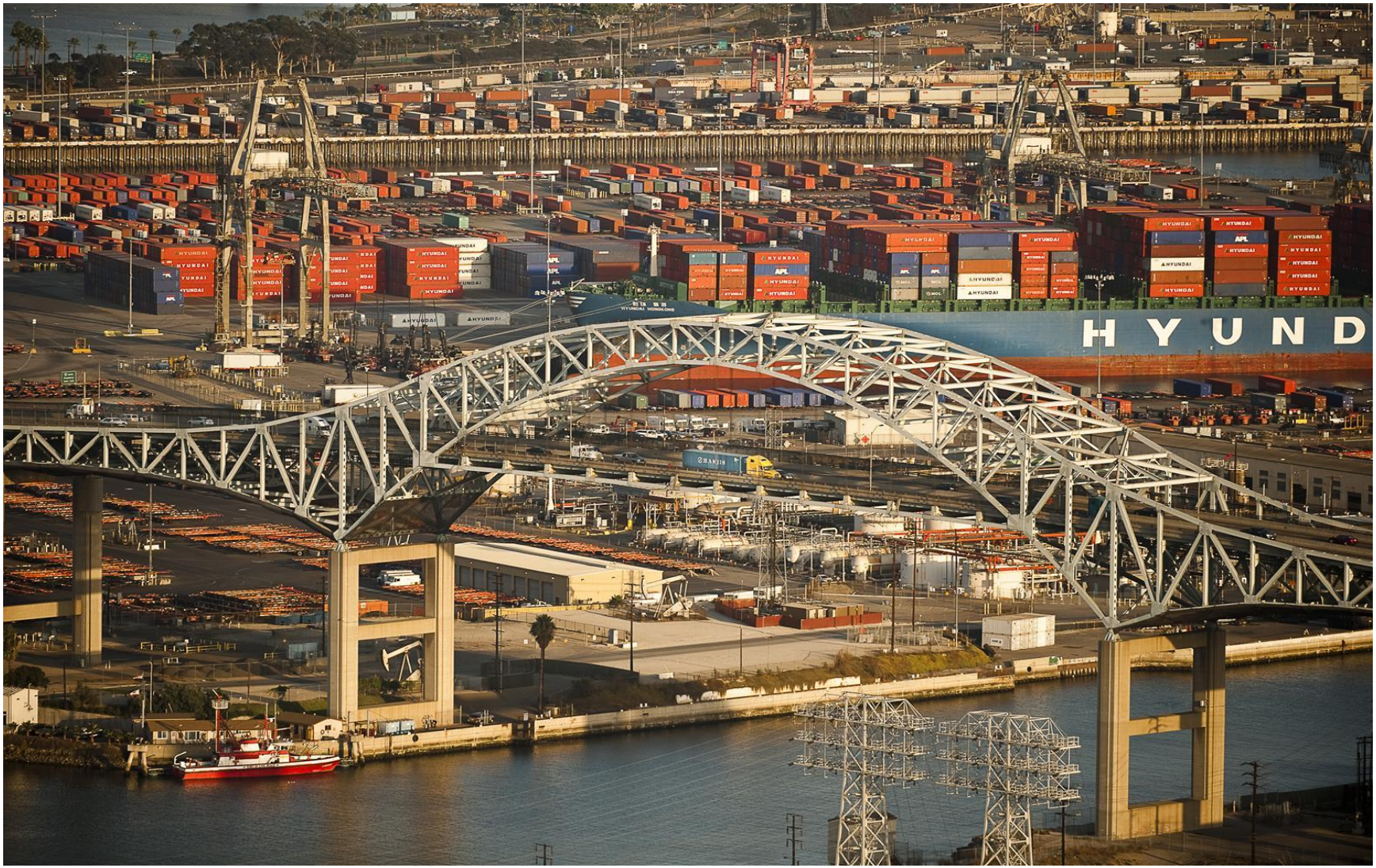
Deliver Containers to Dock Side

Ports – Multiple Births – Some Specific to a SSL



OOCL Ship at Port Long Beach

Port – Some congested with limited space



Hanjin Ship at Port LA

Gantry Cranes Load / Unload Containers

Gantry Crane Loading Containers into Ship

Loading Container on ‘Port Chassis’

Stacking Containers

Ports – Stacked Containers (Grounded Operating Model)

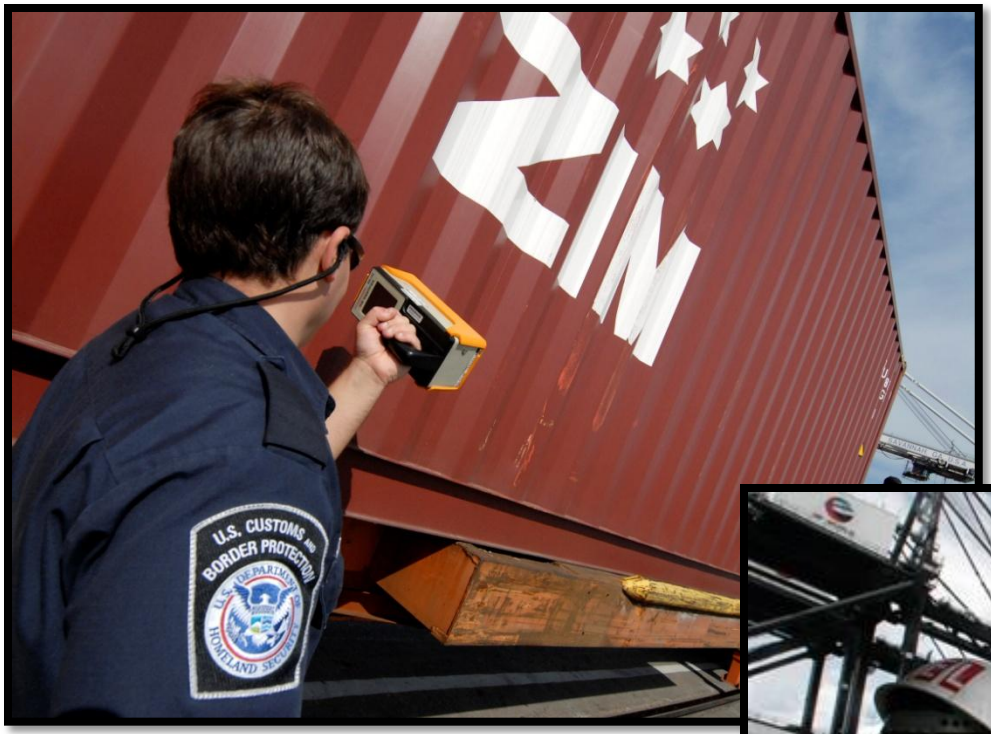
Ports – Wheeled Containers (Wheeled Operating Model)

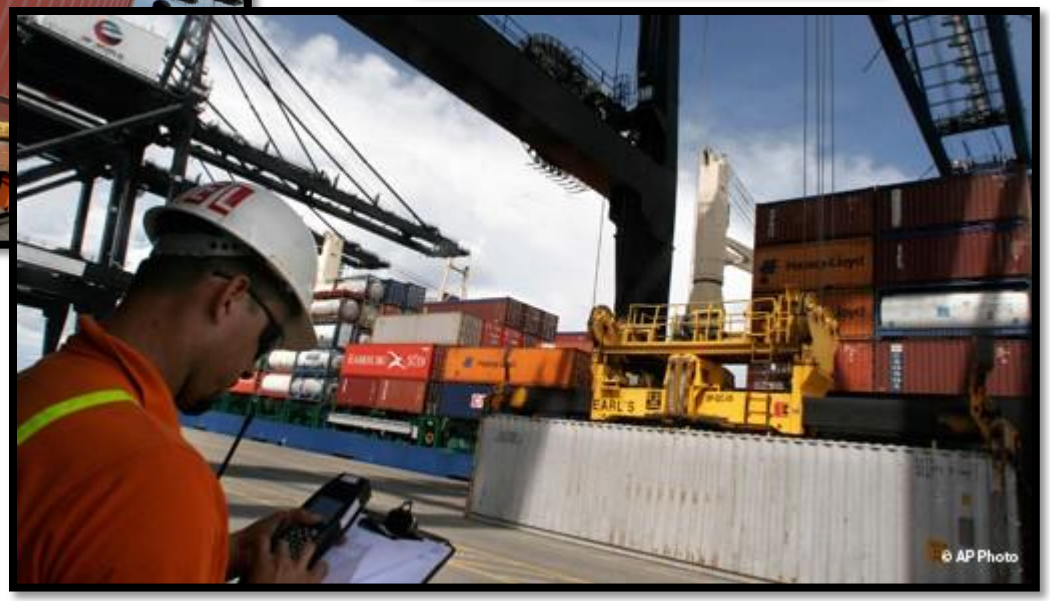
Truckers Check-In to Port

Truckers Exiting Port Terminals

Long Beach Gate Operations

Ports and Rails are Secure Facilities / Customs

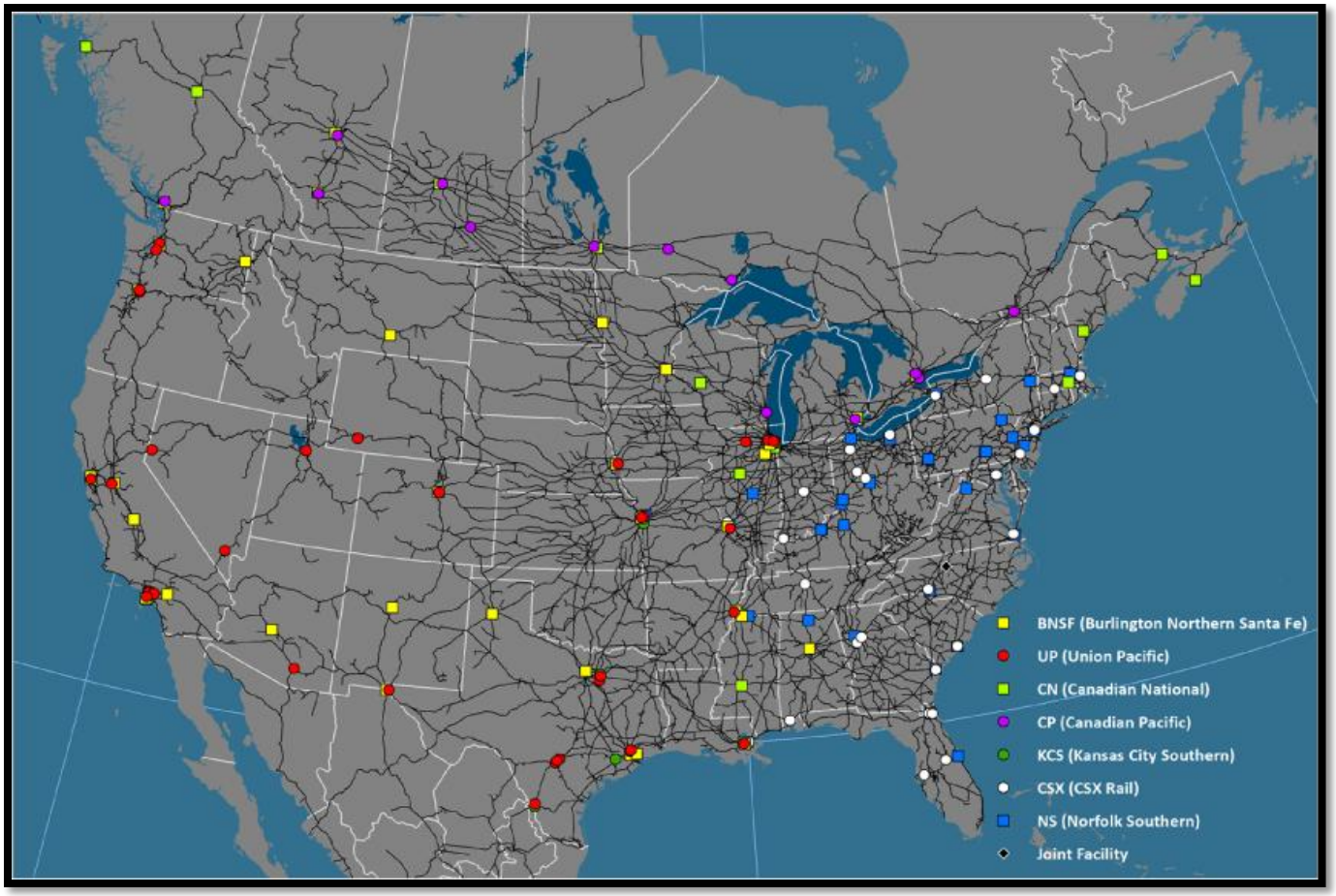




Rail Heads at Marine Ports

Rail Terminals

- Over 2000 rail terminal, 10% handle 90% of intermodal freight
- Most intermodal terminals are clustered around major ports



Rail Terminal Inland

Rail Modes – Piggyback, Trailer on Flat Car (TOFC) and Double Stack in Background

Transloading – Marine or Bulk to Rail

- Transloading is the process of transferring a shipment from one mode of transportation to another
- 3 x 40’ Marine = 2 x 53’ Domestic Containers
- Shippers increase / decreasing Transloading depending on shipping costs on rails and truck travel distances.
- 46% Domestic Containers in Southern California Leaving by Rail were Transloaded[1], up from 33% a decade ago.

[1] Alameda Corridor Transportation Authority, April 2013

Container Delivered to Customer

Overview

CHASSIS AND CHASSIS POOLS

Chassis in North America

- The North American chassis market is unique versus the rest of the world. Chassis have historically been provided by steamship lines.
  - Origins of this difference: Sea-Land started the container business and needed to compete with truckers who provided a trailer as part of their service.
  - Container and chassis became a package in competing with trucker's trailer.
  - Chassis have an investment, storage, repair and logistic element that steamship lines no longer wanted to manage.
  - All steamship lines are expected to exit the chassis provisioning business by 2016.

Chassis in North America

- **Key Drivers of Chassis Usage**
  - Import / export volumes
  - Type of Port: wheeled containers or stacked containers
  - Type of Rail Ops: mostly wheeled
  - Warehouse operations: shippers use ‘drop & pick’ or a ‘live’ upload model
  - Wait time and ‘turn times’ for chassis are approximately 6 to 7 days
  - Average time on the ‘street’ / on-hire is five days

- **Owners of Chassis**
  - Steamship lines exiting ownership
  - Pool and leasing companies – TRAC, Flexi, DCLI, banks
  - Railroads and Truckers – prefer not to own chassis

- **Operators of Chassis**
  - Truckers, Railroads, Ports, Shippers
  - Pool Managers – TRAC, Flexi, CCM

Chassis Types for Containers

- 20' x Chassis
- 40' x Gooseneck Chassis
- 40'- 45'- 48' x Adjustable Chassis
- 45’- 53’ Adjustable Chassis
- 53' x Domestic Chassis
- Tri-Axle Chassis

Chassis at Ports – location depends on port

Chassis Pools – On Terminal or Off

Chassis Service Depots

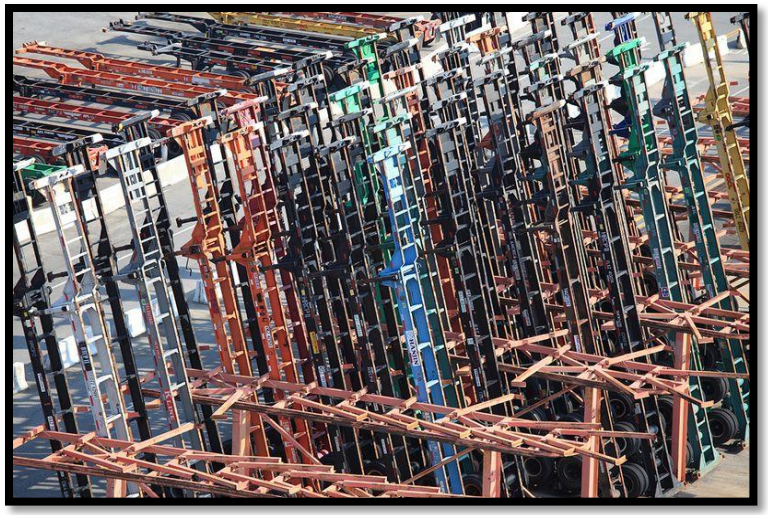
- Chassis Inspections
  - Truckers before checking out a chassis
  - Pool operators / staff
- Chassis Repairs
  - At depots which are usually offsite but near a port or rail terminal
  - $600-$800 annual chassis repair in the industry for inland operations
  - Higher costs at port locations
  - Largest repair costs
    - Tires
    - Lights
    - Brakes


Inspection


Repair

Chassis Pools

- Efficient and effective
  - Higher asset utilization
  - Centralize repairs
  - Ease of pick-up & return
- Provide chassis to truckers on a per diem basis.
  - Check out – then load container
  - Check in – remove container and return chassis
  - Billing is usually pool gate to gate



Port Newark – Chassis Pool on terminal

Stacking Chassis for Storage

Chassis Manufactured

- Chassis Manufactured
  - Limited new chassis being manufactured
    - No Marine, over supply, steamship lines trading
    - Some Domestic, domestic intermodal is growing
  - Chassis manufacturers are mostly in U.S., Mexico and China

Chassis are Remanufactured

- Chassis Re-Manufactured
  - At end of useful life
  - Use existing axles

Remanufactured – Marine Chassis

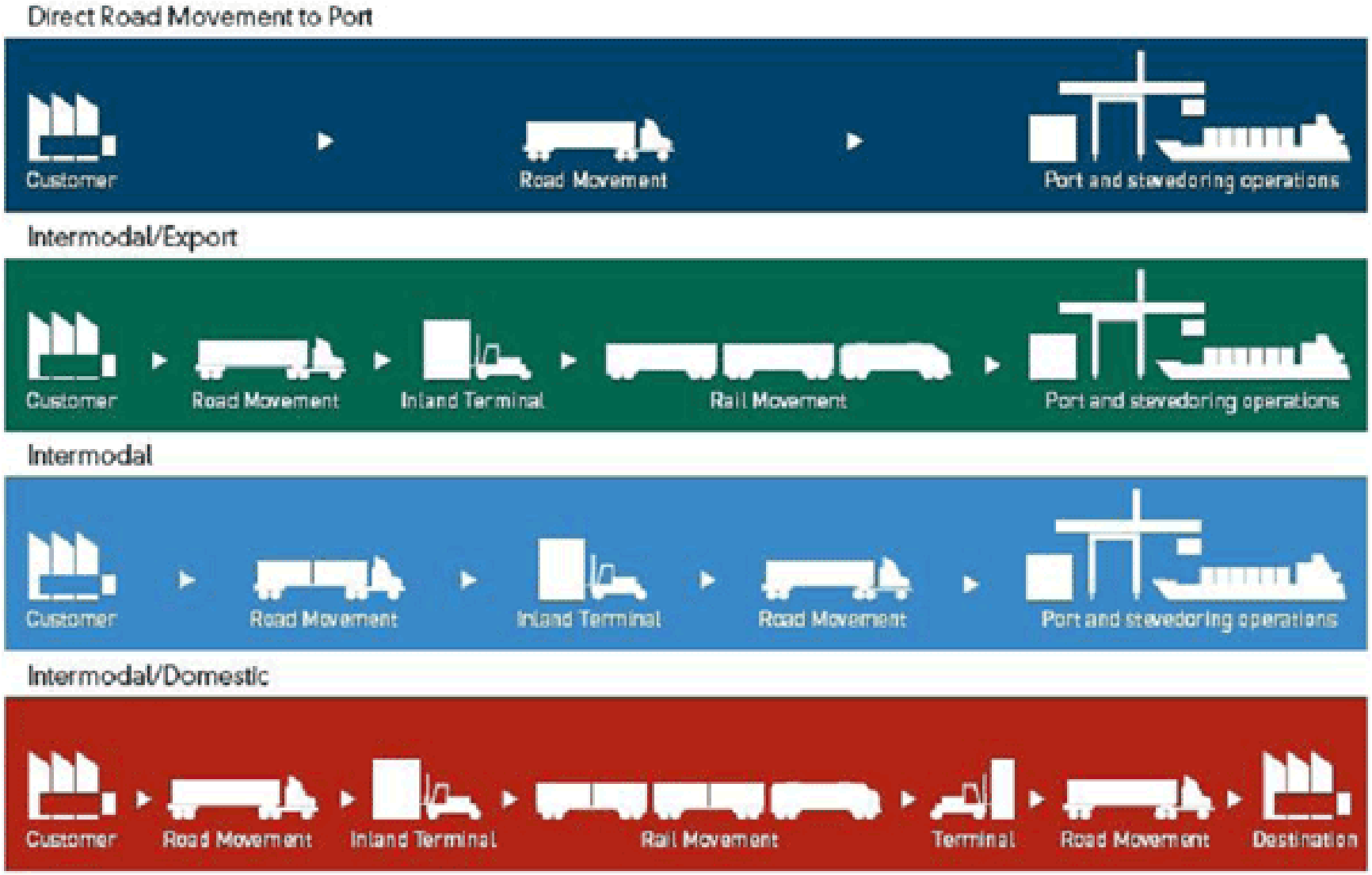
Remanufactured – Domestic Chassis

APPENDIX

Biggest Shipping Companies

Top 20 container shipping companies in order of TEU capacity, 15 May 2012		
Company	TEU capacity[17]	Number of ships[17]
A.P. Moller-Maersk Group	2,632,681	668
Mediterranean Shipping Company	2,221,631	488
CMA CGM	1,319,722	390
COSCO	699,905	154
Hapag-Lloyd	650,249	149
Evergreen Marine Corporation	645,693	172
American President Lines	616,456	139
CSCL	563,091	150
Hanjin Shipping	541,378	107
MOL	473,446	108
Orient Overseas Container Line	419,593	90
NYK Line	416,321	104
Hamburg Süd	412,709	104
K Line	358,978	80
Yang Ming Marine Transport Corporation	347,456	82
Hyundai Merchant Marine	328,716	64
Zim Integrated Shipping Services	321,213	88
UASC	291,282	50
Pacific International Lines	288,079	143
CSAV	279,549	64

Intermodal Types



Marine Container - Standards

- 40’ Shipping Container
  - External Dimensions

Container Length (feet)	Container Width (feet)	Container Height (feet)	Inside Capacity (cubic feet)	Floor Area (sq feet)	Container Weight (tons)	Door Width (feet)	Door Height (feet)
40′	8’0″	8’6″	2,360	305	4	7’6″	7’5″

  - Internal Dimensions

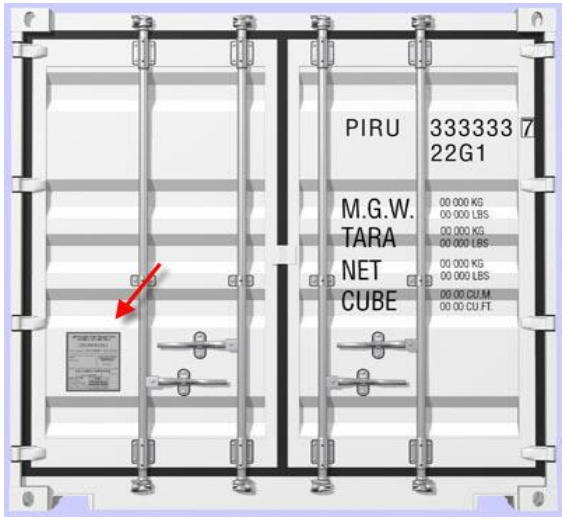
Container Length (feet)	Container Width (feet)	Container Height (feet)	Inside Capacity (cubic feet)	Floor Area (sq feet)	Container Weight (tons)	Door Width (feet)	Door Height (feet)
39’4″	7’7″	7’9″	2,360	305	4	7’6″	7’5″

First Container Ship

- 1955
- Clifford J Rodgers

Standardization of Containers

- The International Convention for Safe Containers is a 1972 regulation by the Inter-governmental Maritime Consultative Organization on the safe handling and transport of containers. It decrees that every container travelling internationally is supplied with a "CSC-Plate".



- Container identification system is an ISO standard (ISO 6346), used to manage the movement and tracking of shipping containers.

Owner Code (3 letters): TGH
Product Group Code (1 letter): U
Registration Number (6 digits): 759933
Check Digit (1 digit): 0
Size & Type Code (4 digits/letters): 45G1

Operational Characteristics
Maximum weight: 30,480 kg
Container weight: 3,870 kg
Payload weight: 26,610 kg
Cubic capacity: 2,700 cubic feet

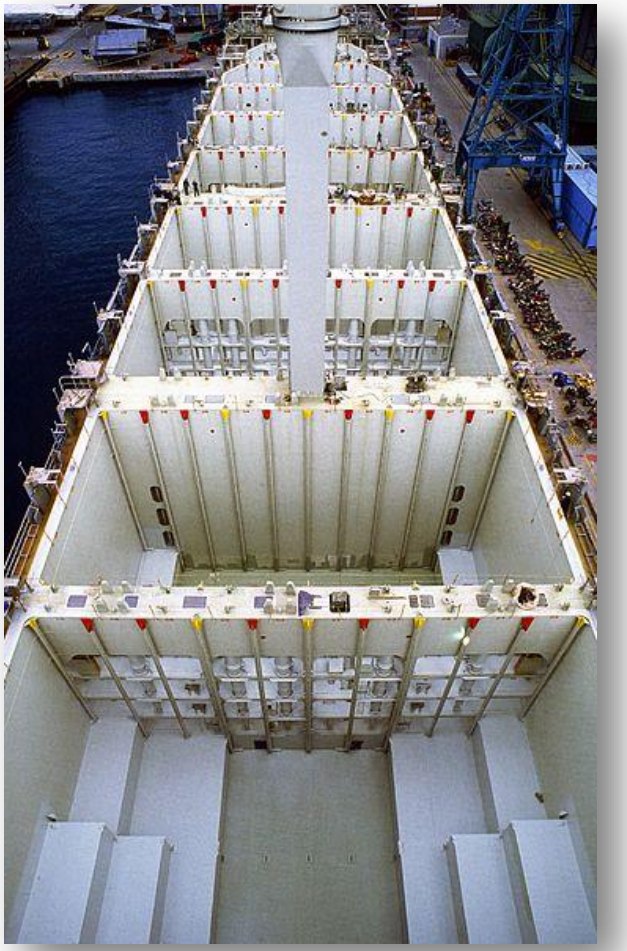
Container / Chassis Regulations

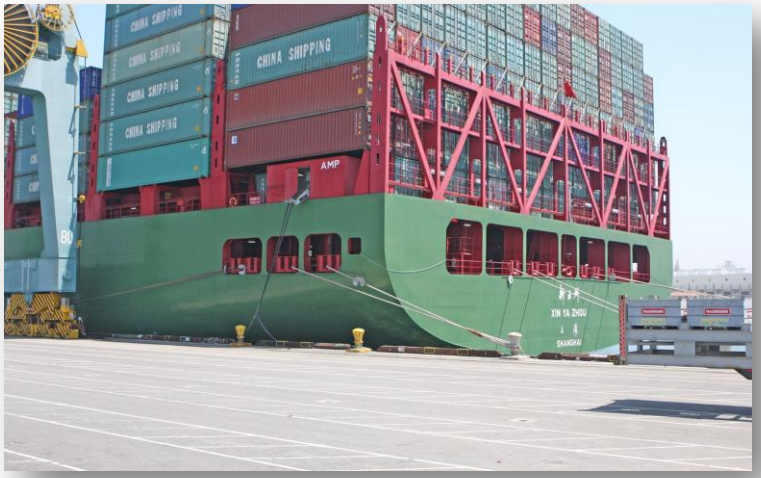
Container and chassis are covered by laws, regulations, conventions and standards on both an international and national basis. Many of the international conventions have been established under the umbrella of the United Nations and its sponsored organizations. National laws and regulations have been developed to apply the international conventions and national requirements.

- **Customs Convention on Containers, 1972**
  - Entered into Force: December 6, 1975
    Oversight: World Customs Organization (WCO)
    Synopsis: Recognizes containers as Instruments of International Traffic (IIT) and establishes framework for containers to be used in international transportation.
- **TIR Convention, 1975**
  - Oversight: UNECE
    Synopsis: Establishes framework for International transport by road
- **ISO Standards**
  - The International Organization for Standardization's (ISO) International Standards for freight containers and chassis have allowed "the box" to become the backbone of global supply chains. To date, over 30 International Standards exist in this domain. They cover a wide variety of aspects of different types of freight containers that include air/surface/(intermodal) containers, containers on board vessels, tank containers, platform and platform-based containers.
- **Roadability Regulations, effective 2009**
  - Oversight: US Federal Motor Carrier Safety Administration
    Synopsis: Establishes regulatory requirements for safe operation, inspection, repair and maintenance of intermodal chassis in the United States
- **U.S. Safe Port Act of 2006**
  - Oversight: US Department of Homeland Security
    Synopsis: Establishes certain regulatory security requirements for the operation of intermodal containers in the United States

Container Locking / Securing System

- Locking systems on Ships
  - Cell guides / racks
  - Container guides, locating cones, and anti-rack spacers to lock the containers together
  - Container Locking / Securing System

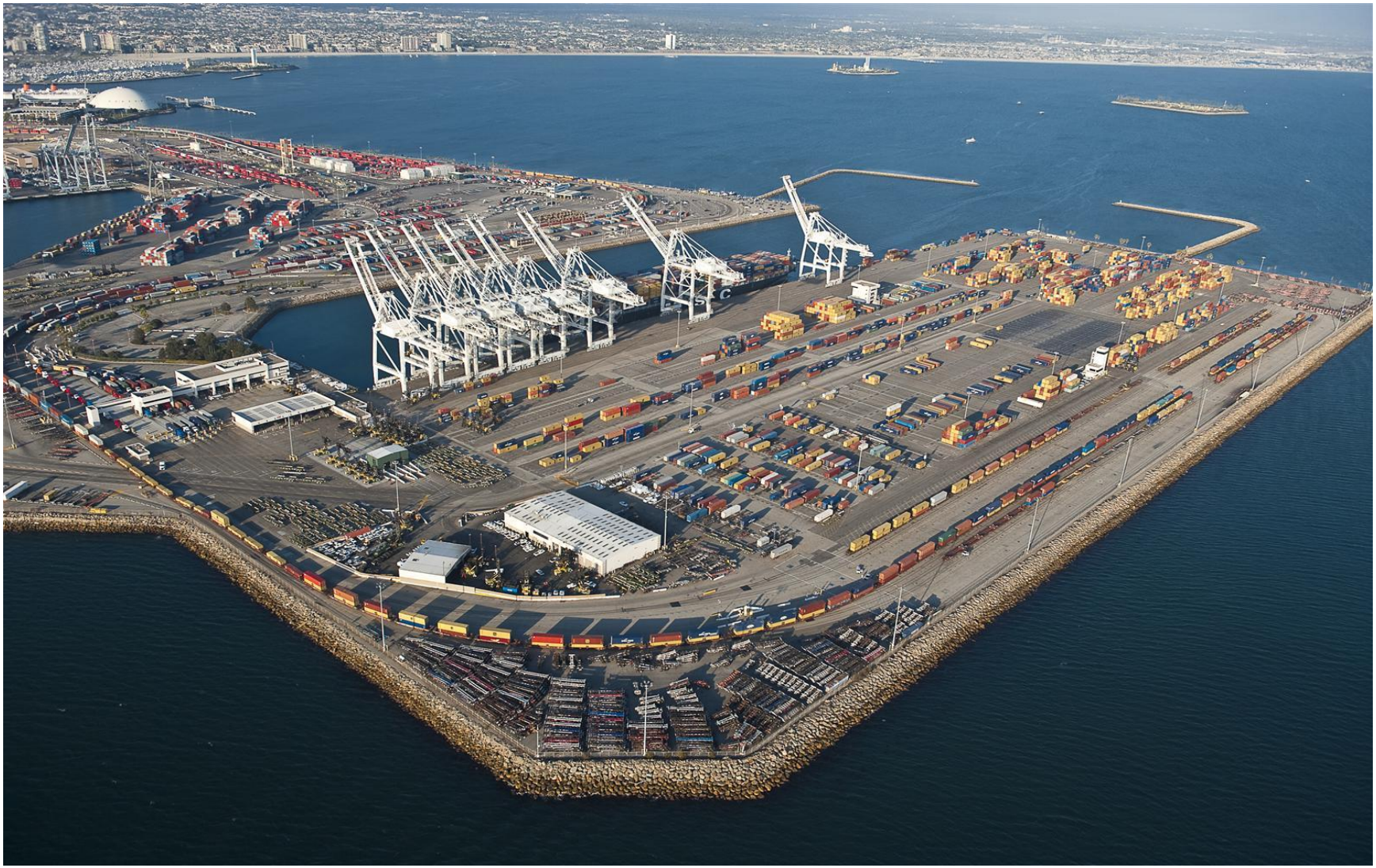




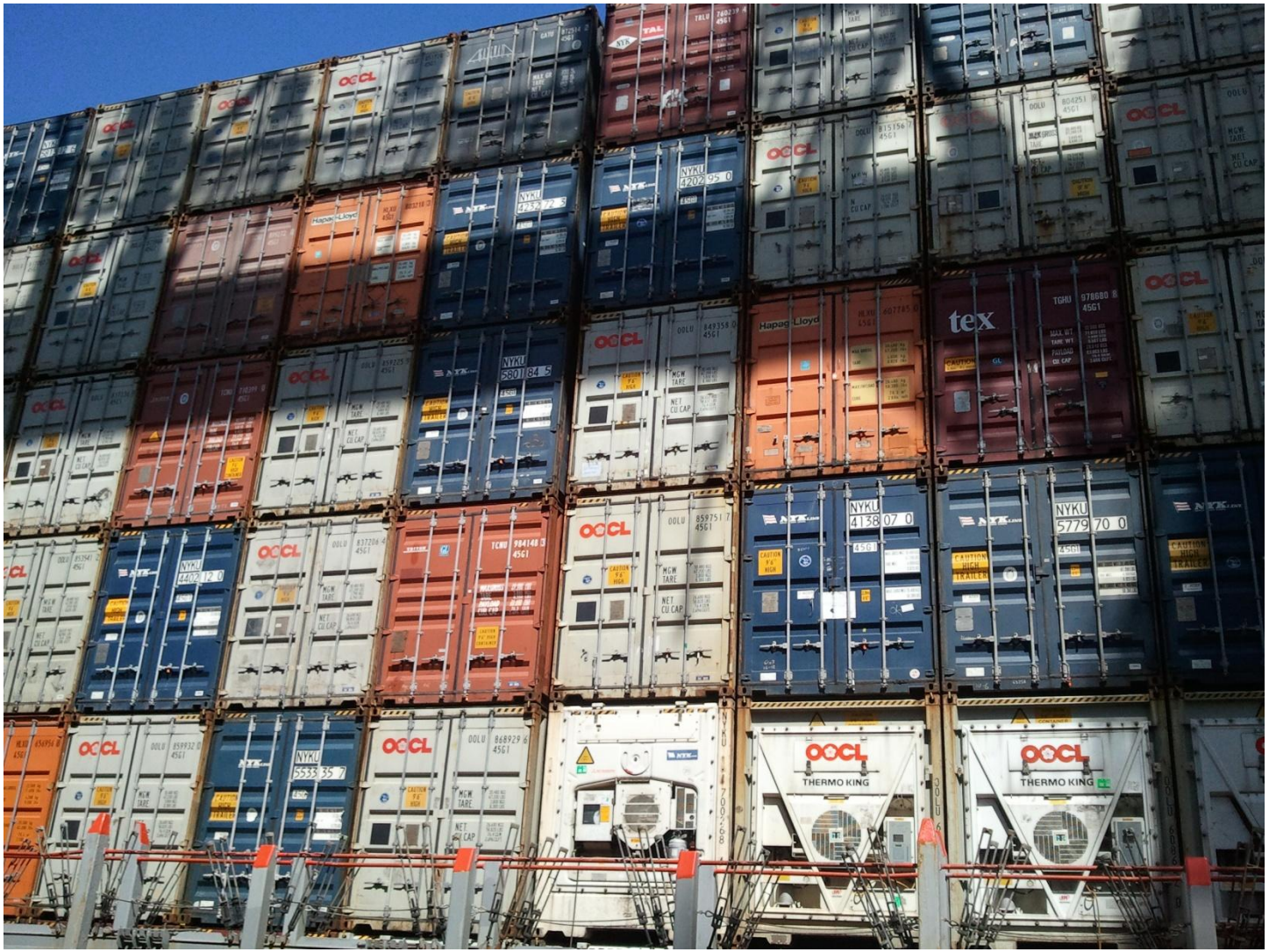
Types of Container Lift Systems

- Reach Stackers
  - used for handling intermodal cargo containers in small terminals or a medium-sized ports
- Forklifts
  - Multi purposed, versatile
- Gantry Cranes
  - Marine port terminals

Port – Some Newly Built with Ample Space



Containers Stacked on Ship / Secured



Container End Of Life

- Storage
- Offices
- Homes
- Scrap