The International Commission for Environmental Cooperation

The State of U.S. Seaborne Trade

And Port Efforts to Green the Supply Chain

December 12, 2016

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THE PORT OF LOS ANGELES

Presentation Overview

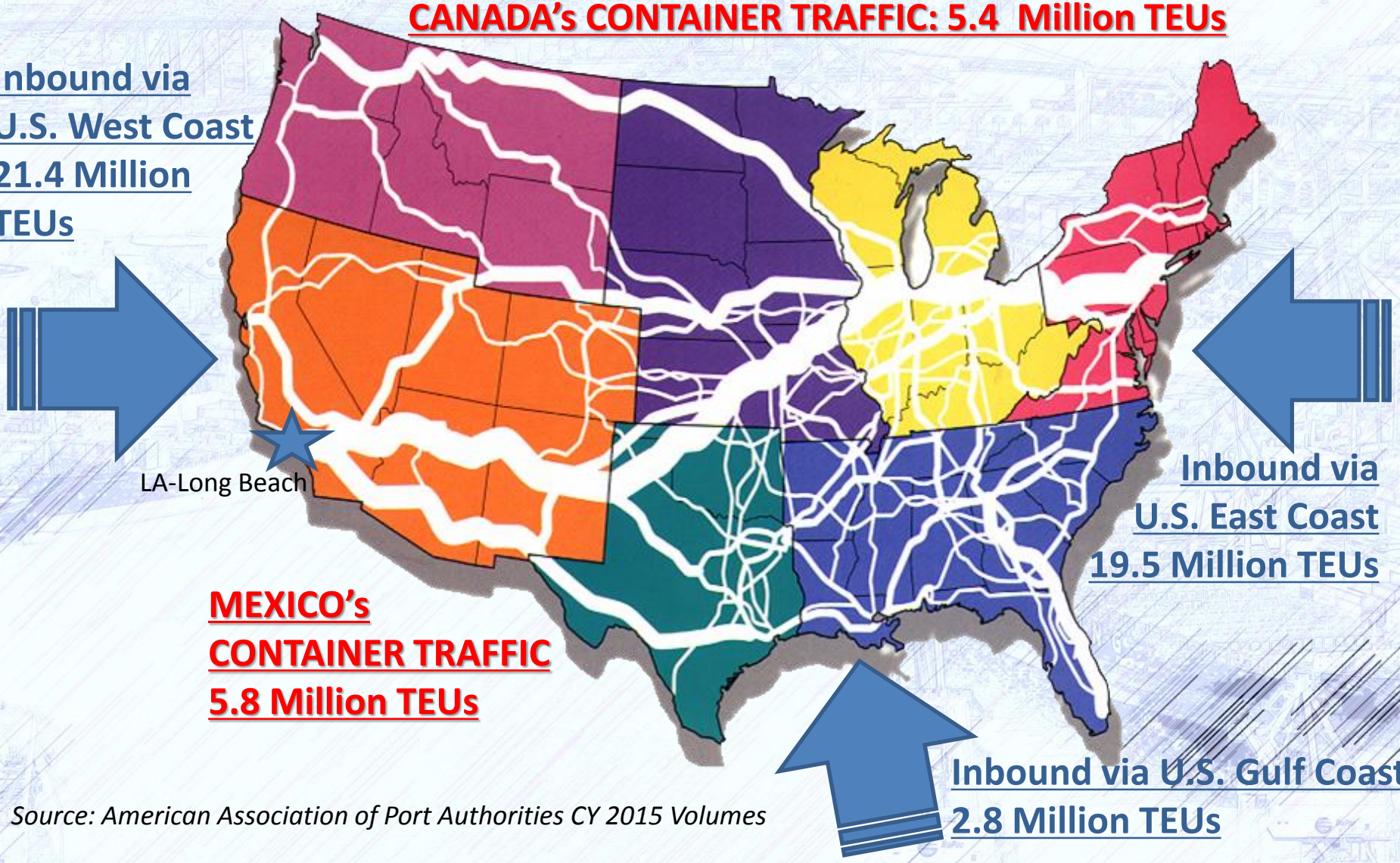
- North American Containerized Trade
  - Los Angeles Trade Gateway At A Glance
- State of the Shipping Industry
- The Need for Focusing on Supply Chain Efficiency
- Advancing Environmental Initiatives

North American Container Traffic

UNITED STATES' CONTAINER TRAFFIC: 43.7 Million TEUs

CANADA's CONTAINER TRAFFIC: 5.4 Million TEUs

Inbound via U.S. West Coast 21.4 Million TEUs



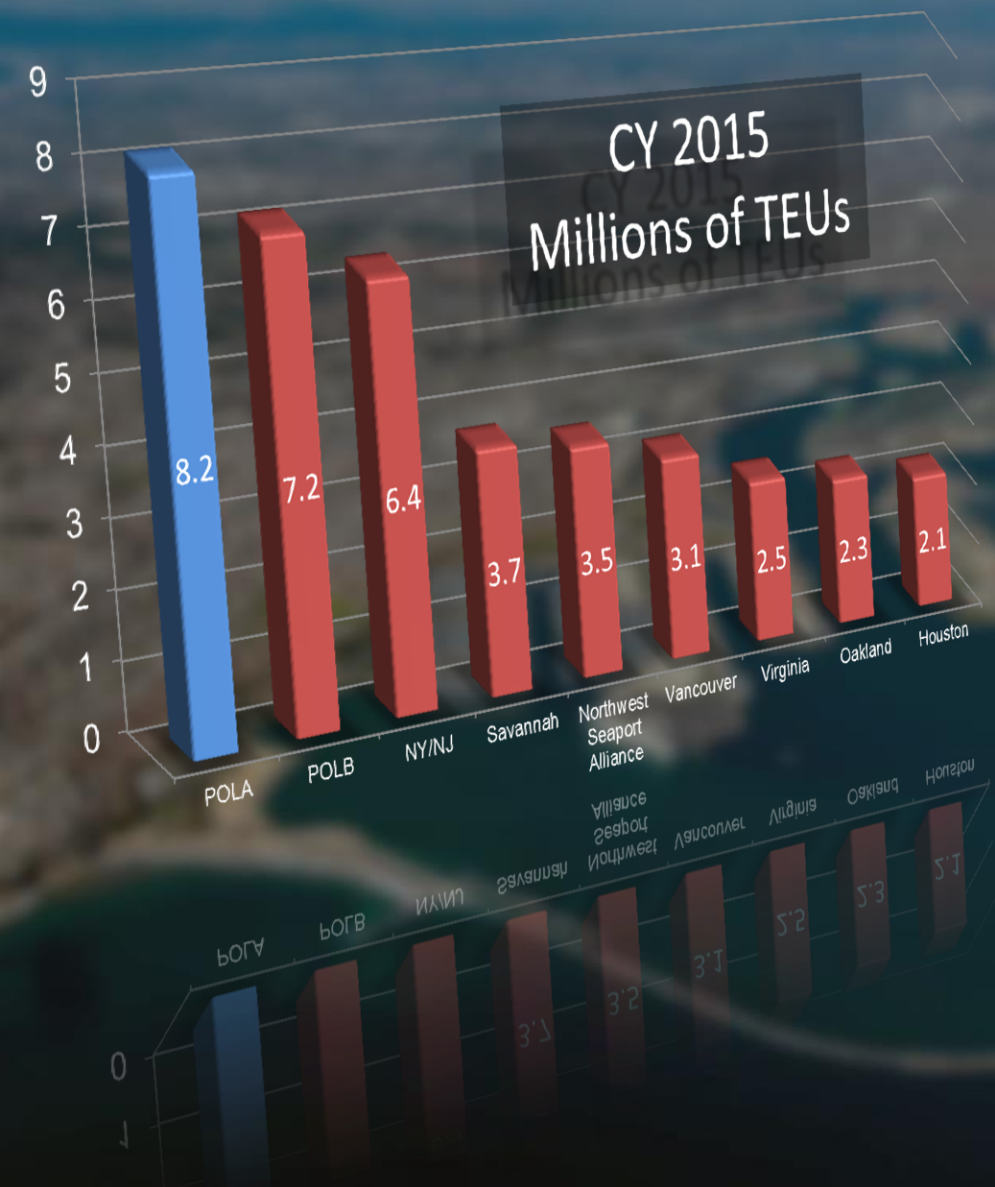
Inbound via U.S. East Coast 19.5 Million TEUs

MEXICO's CONTAINER TRAFFIC 5.8 Million TEUs

Inbound via U.S. Gulf Coast 2.8 Million TEUs

Source: American Association of Port Authorities CY 2015 Volumes

Port of Los Angeles At-A-Glance



- #1 U.S. Container Port
- Primary Gateway for Pacific Rim Trade
- Connectivity to Every Congressional District in the U.S. (lower 48)
- Economic Engine
- A Full Service Port

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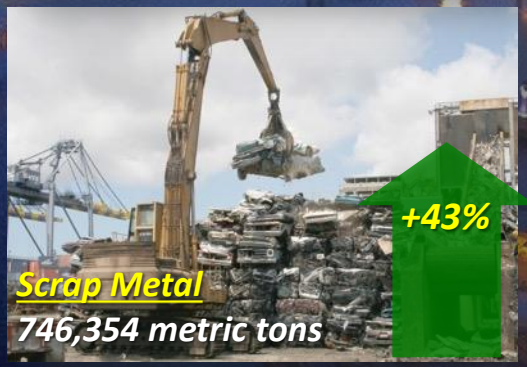
Our Lines of Business



A "Full Service" Port

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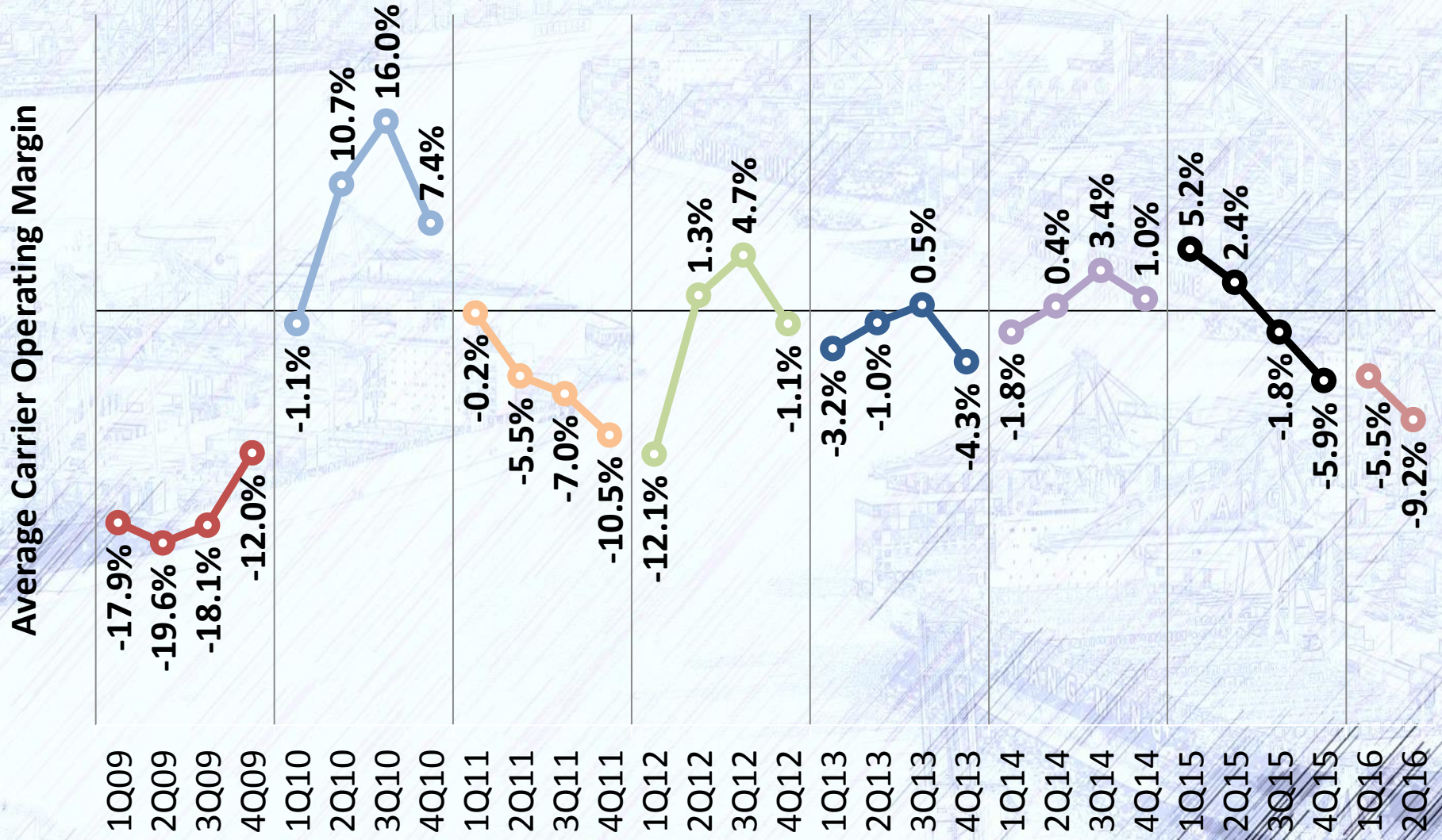
Container Shipping Lines Continue to Struggle



Source: Alphaliner. Average of APL, CMA CGM (fr 2010), CSCL, EMC, Hanjin, Hapag-Lloyd,HMM, KL, Maersk, MOL, NYK, WHL, YML, Zim.

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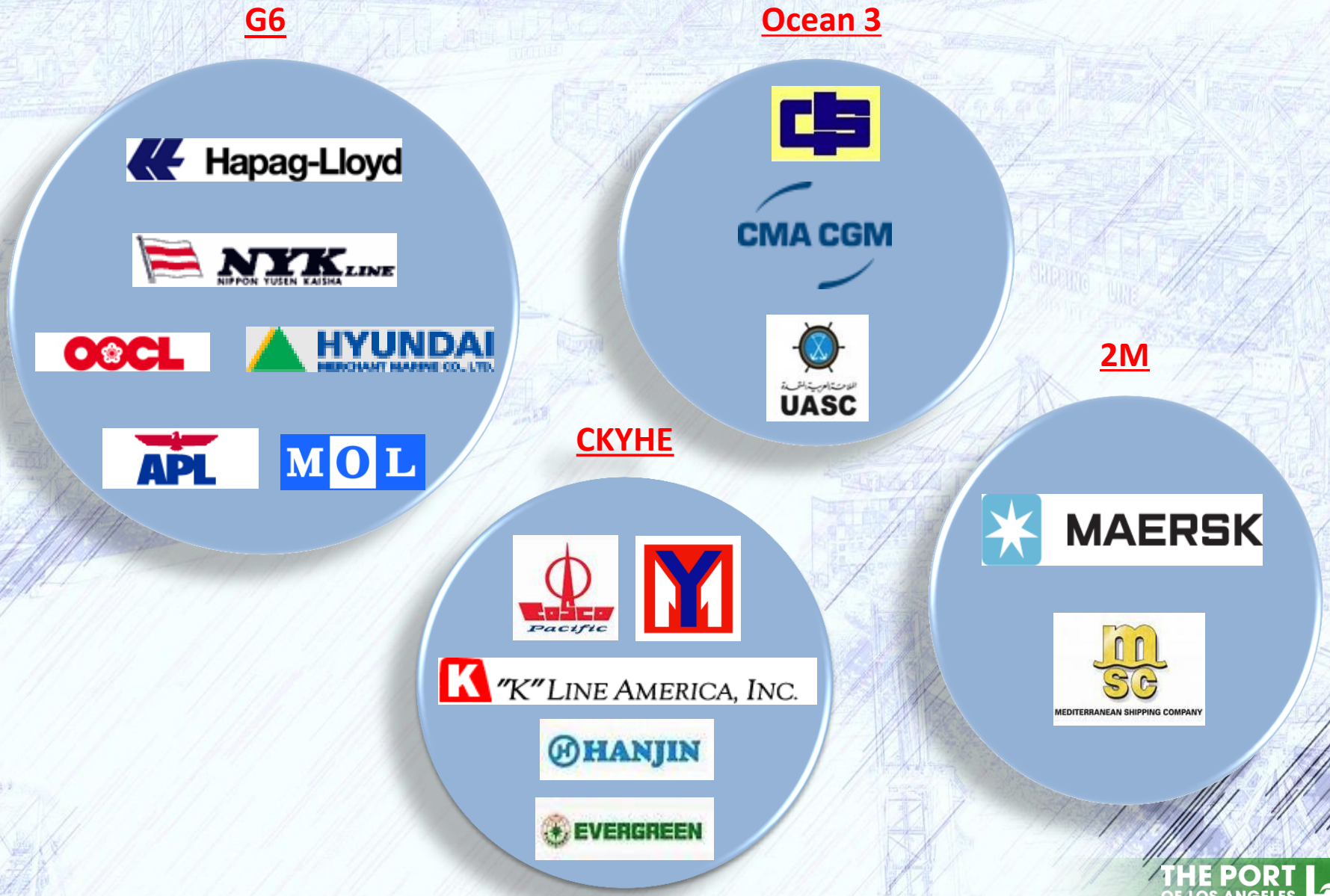
Mega Shipping Alliances 2015-2016



Shipping Alliance Outlook by Q2 2017

* *Lines that have recently merged, announced plans to merge, or combined through acquisition*

As of October 2016

Big Ships Reduce Ocean Transit Costs

WHY LARGER SHIPS?

A 14,000 TEU vessel costs as much 60% less per slot than a 4,800 TEU vessel

Photo: The 2 largest ships to ever call at a U.S. Port
Maersk Edmonton (15,000 TEUs)
CMA CGM Benjamin Franklin (18,000 TEUS)
December 26, 2015

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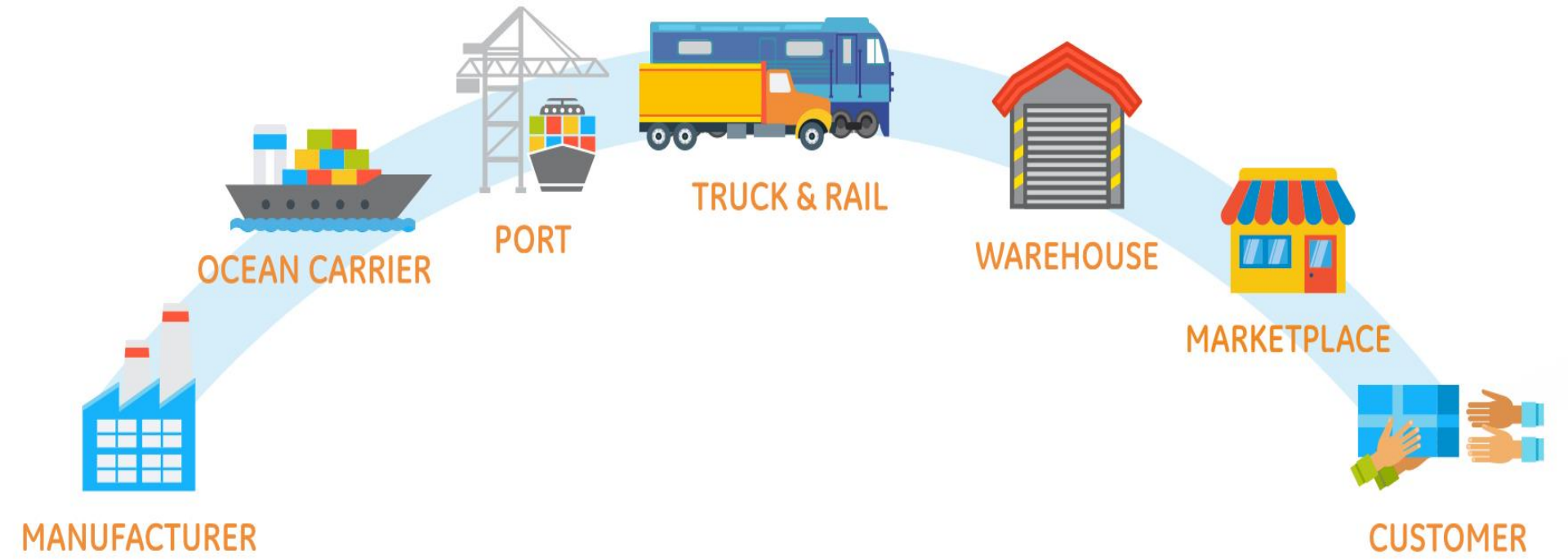
Cargo Surge Management Focus Points

- **Strategic Land Use**
  - Re-Purposing Land to Support Short- and Mid-Term Cargo Needs
- **Process Management**
  - Supply Chain Optimization Initiative w/ 100+ Stakeholders
  - Active Engagement with State & Federal Policymakers
- **Technology**
  - Bay-Wide Truck Reservation System
  - Digital Port Information Portal Pilot Project Q2 2017

Cargo Data Information Portal Pilot Project



GE Transportation

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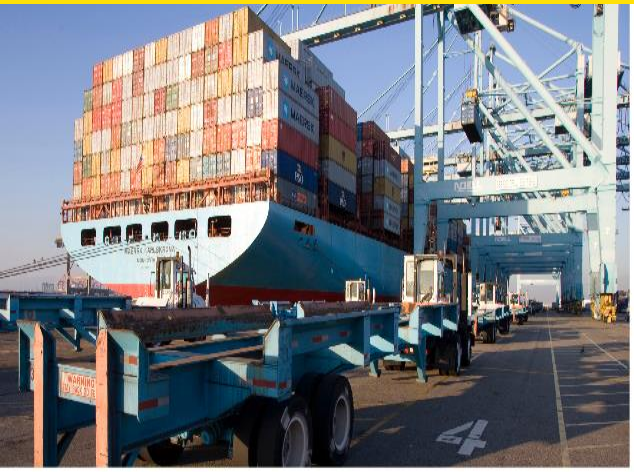
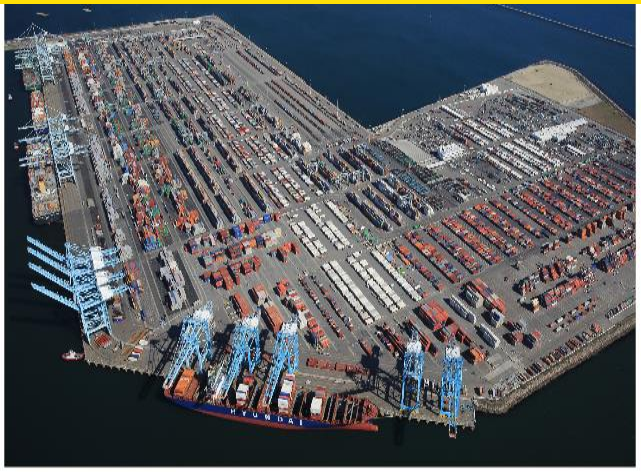
Improved Data-flow Will Give Port & Terminal Operators Extended Line Of Site To Better…





- Improve predictability and reliability
- Plan for vessel arrivals
- Stage labor and equipment
- Effectively sort the cargo
- Minimize terminal congestion
- Keep the supply chain moving
- Unlock the power of big data and generate insights to build a smarter, more efficient supply chain moving forward.

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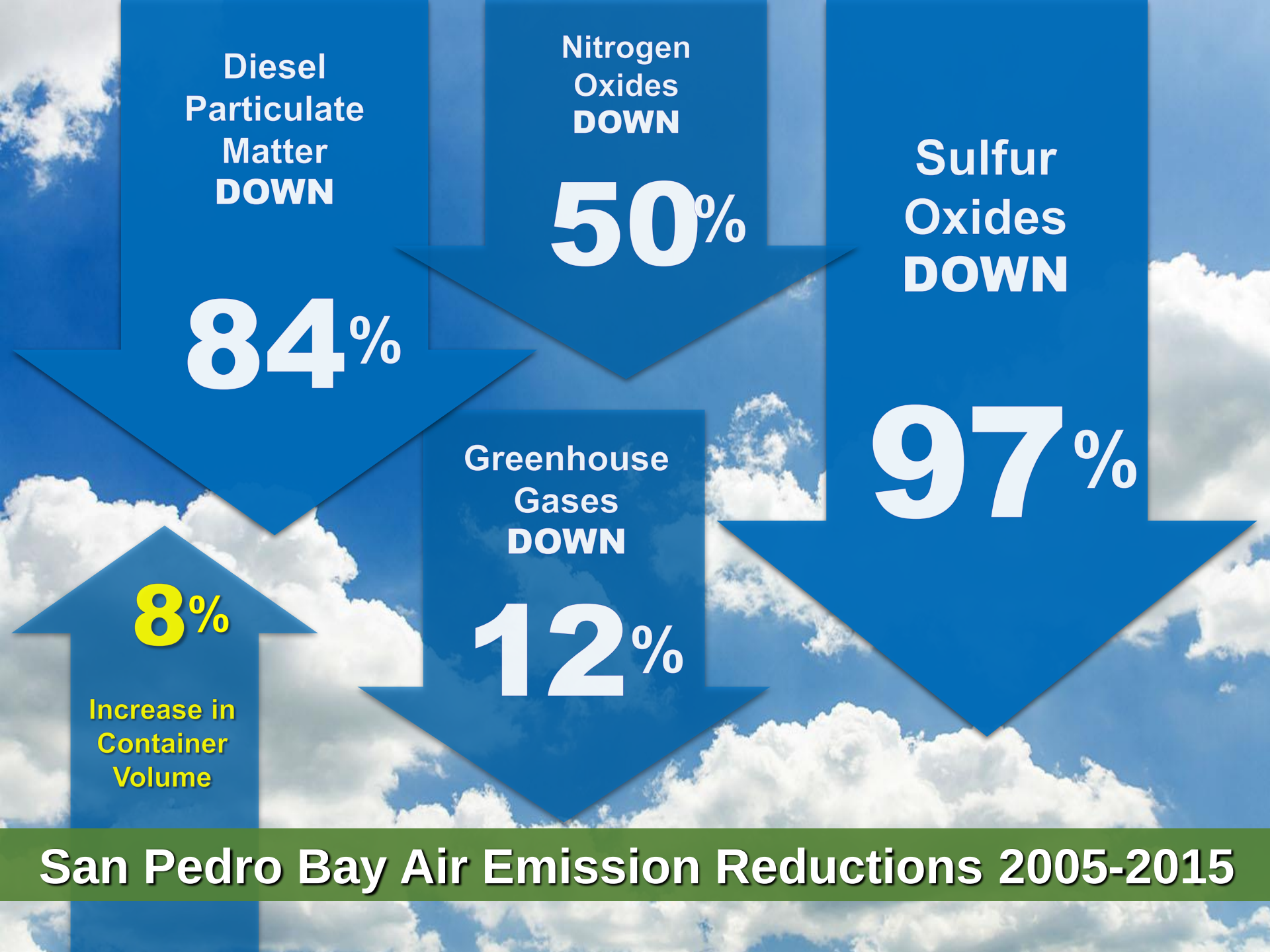

Diesel Particulate Matter DOWN
84%
Nitrogen Oxides DOWN
50%
Sulfur Oxides DOWN
97%
Greenhouse Gases DOWN
12%
8%
Increase in Container Volume
San Pedro Bay Air Emission Reductions 2005-2015

2017 Clean Air Action Plan

- Supports the State's Sustainable Freight Action Plan
- Establishes New Long-Term Greenhouse Gas Reduction Goals
- Proposed Strategies:
  - Freight Efficiency Strategies
  - Clean Vehicles, Equipment Technology and Fuels
  - Freight Infrastructure Investment and Planning
  - Energy Resource Planning

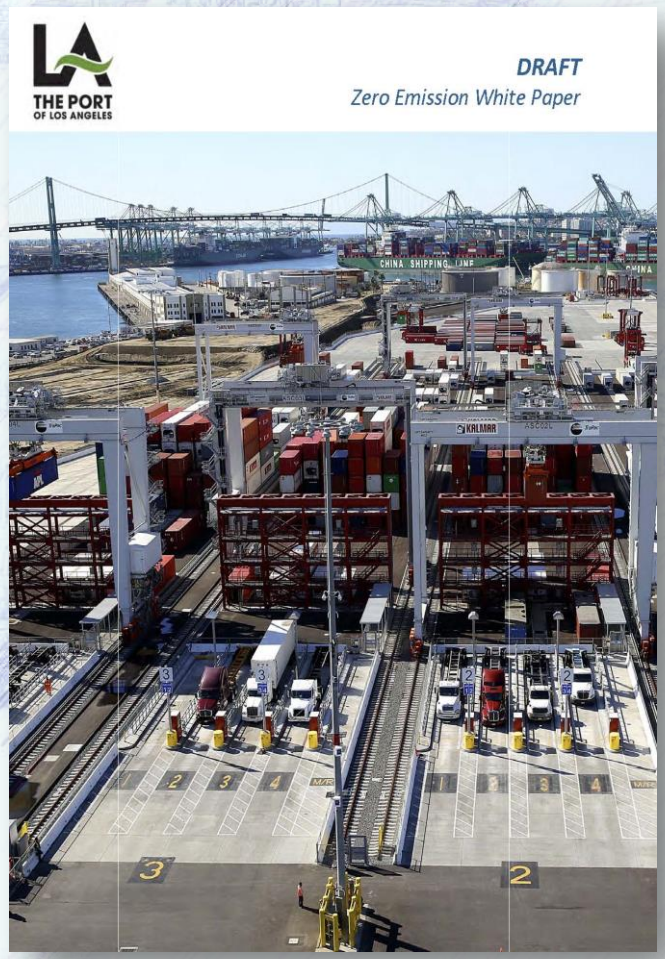
Environmental Investments

- $380.5 Million Spent by the Port of Los Angeles since FY 2006

- Bulk of Investment, $346.2M, spent on Three Air Quality Programs:

✓ *AMP/Shore-Side Power - $200M*
✓ *Clean Truck Program - $113M*
✓ *Clean Air Action Plan - $33.2M*

Current Air Quality Initiatives



- ***Clean Air Action Plan (3rd update)***
  - ✓ Clean Truck Program
  - ✓ Vessel Speed Reduction Program
  - ✓ Technology Advancement Program
- ***Annual Air Quality Emissions Inventory***
  - ✓ Including Operation of Real-Time Air Monitoring Stations
- ***Grant Programs***
  - ✓ Pasha Green Omni Terminal – ($14.5M)
  - ✓ Everport ZE/Near ZE Demo – ($5.8M)
- ***Environmental Ship Index Program (IAPH)***
  - ✓ International Program with 80 Participating Ports to Incentivize Cleanest Ships to Operate Between these Locations

POLA's July 2016 ***Draft Zero Emission White Paper*** *outlines near-term plan for expanded testing and development of ZE technology*

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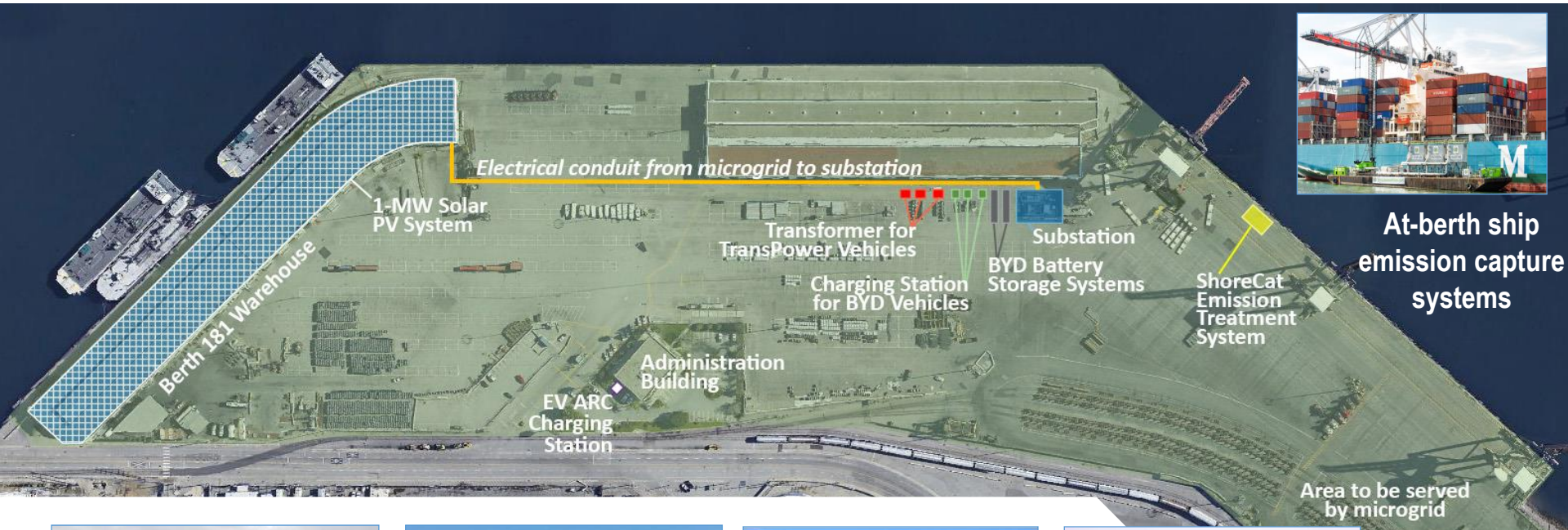
3PL Opportunities -- Pasha Green Omni Terminal

$26.6M Demonstration Project



At-berth ship emission capture systems

Strong EV Integration

Electric-powered rubber-tired gantry (RTG) cranes, yard tractors, forklifts (8- &15 tons) and bus (for worker transport). Standardized bi-directional charging systems

Renewable Power

Integrated 1 MW solar photovoltaic and on-site battery storage system

Solar-powered LED lights

Zero Emissions Five Year Plan

- Complete Multi-Party Testing and Demonstration Protocol (completed Spring 2016)
- Test and Deploy up to 40 Vehicles/Year
  - ✓ Up to $20 Million Annually from Grant Programs (this will require port investment for grant fund matching)
- Develop Infrastructure Plan (commenced Summer 2016)
- Assign Harbor Port Staff, Budget and Resource Requirements
- Produce an Annual Report on Technical, Operational and Cost Feasibility Issues for Ongoing Zero Emission Demonstrations, including Implementation Planning, as Appropriate

POLA Zero Emissions Program

- In the Near-Term, Short-Haul Drayage and On-Terminal Container Handling Equipment are Two of the Most Viable Areas for Zero- and Near-Zero Technology Applications & Testing
- Our Role
  - ✓ Facilitate Testing and Deployment Opportunities
  - ✓ Establish Clear Test Guidelines & Procedures
  - ✓ Plan & Develop Port Infrastructure (Battery Testing Standardization)
  - ✓ Collaborate with Regional Stakeholders on Testing and Development
- Demonstrate Broad Commercial Availability and Cost
  - ✓ Help the Major Truck Manufacturers See the Opportunity and Develop Commercially Available Units
  - ✓ Increased Production Volume will Reduce Product Costs
- Demonstrate Operational Reliability
  - ✓ Show that the Trucks and Yard Equipment meet Duty Cycles and have Long-Term Reliability

Challenges for Ports & Terminals

Being Green in an Evolving Maritime Industry Presents Certain Challenges:

- Regulatory Requirements are Increasingly Stringent and Challenging to Meet
- Cargo Volume Growth is Slowing (reducing revenues)
- Shipping Alliances are Extremely Cost-Focused
- Increased Environmental Controls can Impact Port Competitiveness
- Community Investment -- and Support from Community -- Remain Critical to Greening and Growing Cargo Operations

Technical Challenges

- Ports are Expected to Continue Reducing Criteria Pollutants as Cargo Volumes Grow Over Time
- Climate Change Requires more Innovation
  - ✓ The Main Reason Why We Must Reduce Dependence on Combustion-Based Engine Technologies
  - ✓ A Driver for 21st Century Energy Planning and Related Infrastructure Investments
- Supply Chain Efficiency
  - ✓ A more Fluid and Efficient Supply Chain will Reduce our Carbon Footprint
  - ✓ Supply Chain Optimization Requires Extensive Stakeholder Engagement, Collaboration and Consensus

Environmental Partners & Affiliates

Global Port Collaboration is Essential

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Thank You
APL