The State of U.S. Seaborne Trade
And Port Efforts to Green the Supply Chain
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Gene Seroka
Executive Director
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

LA-Long Beach

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
Our Lines of Business

Containers: 8,160,457 TEUs (-2.1%)

Autos (WWL): 164,231 units (+33%)

Liquid Bulk (Petroleum): 93,660,059 barrels (+46%)

Steel (PASHA): 2,690,097 metric tons (-13%)

Scrap Metal: 746,354 metric tons (+43%)

Fruit (SSA): 90,323 metric tons (+29%)

Cruise: 123 calls in 2015 (up by 1 call)

Visitors to LA Waterfront: 1.6 million in 2015 (+43%)

A “Full Service” Port
Container Shipping Lines Continue to Struggle

Average Carrier Operating Margin

Mega Shipping Alliances 2015-2016

G6
- Hapag-Lloyd
- NYK Line
- OOCL
- HYUNDAI
- APL
- MOL

Ocean 3
- CMA CGM
- UASC
- MOL

CKYHE
- "K" Line America, Inc.
- HANJIN
- EVERGREEN

2M
- MAERSK
- MSC
Shipping Alliance Outlook by Q2 2017

Ocean Alliance
- CMA CGM
- APL
- OOCL
- China COSCO Holdings Company Limited

THE Alliance
- MOL
- NYK Line
- "K" Line America, Inc.
- Hapag-Lloyd
- UASC

H2M
- HMM
- MAERSK
- MSC

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
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

OCEAN CARRIER → PORT → TRUCK & RAIL → WAREHOUSE → MARKETPLACE → CUSTOMER

MANUFACTURER

GE Transportation

THE PORT OF LOS ANGELES
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.

- Diesel Particulate Matter: DOWN 84%
- Nitrogen Oxides: DOWN 50%
- Sulfur Oxides: DOWN 97%
- Greenhouse Gases: DOWN 12%
- Increase in Container Volume: 8%
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
$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
3PL Opportunities -- Pasha Green Omni Terminal
$26.6M Demonstration Project

- **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**

- **At-berth ship emission capture systems**

- **Electrical conduit from microgrid to substation**

- **EV ARC Charging Station**
- **Transformer for TransPower Vehicles**
- **Charging Station for BYD Vehicles**
- **Substation BYD Battery Storage Systems**
- **ShoreCat Emission Treatment System**

- **Area to be served by microgrid**
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
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
Global Port Collaboration is Essential
Thank You