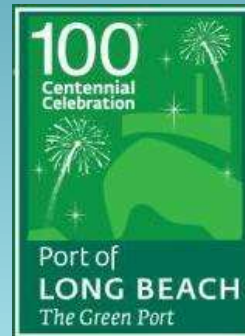


# Roadmap for Zero Emissions



AAPA Management Training  
October 18, 2011

# What is the Roadmap?

- Steps and schedule to get started – local and regional
- Evaluation framework
- No “silver bullets” or “one-size-fits-all”
- Flexibility for future innovations
- Success requires collaboration

Roadmap for Moving Forward with  
Zero Emission Technologies  
at the Ports of Long Beach and Los Angeles



Technical Report

Updated August 2011

FINAL

# Zero Emission Technologies

- What are zero emission technologies?
- Why do we need zero emission technologies?
- What is the ports role?
- What is the role of the regional stakeholders?



# Progress to Date

- Technology Advancement Program
- Zero Emission Container Movement System efforts
- I-710 Major Corridor Study



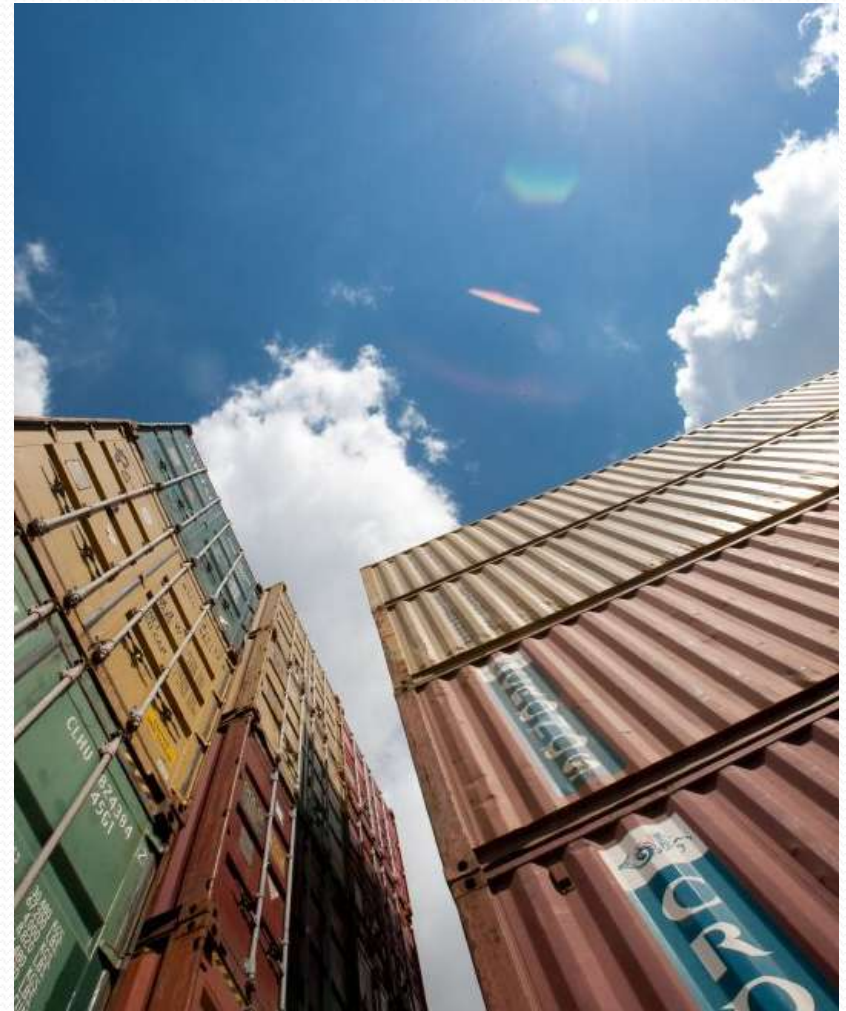
# Principles

- Target where technically and economically feasible
- Integration of technologies into operations
- Flexibility for future innovations
- Regional scalability to maximize benefits
- Take immediate action
- Stakeholder collaboration essential



# Evaluation Criteria

- Emissions and Health Risk Reduction
- Constructability
- Technical Readiness
- Operations Compatibility
- Regional Scalability
- Cost and Economic Sustainability
- Timeline for Implementation



# Target Sources

- Focus on technologically feasible and economically viable options:
  - Drayage
  - Terminal Equipment
  - Locomotives
- What about ships and harbor craft?

# Drayage

- Local and regional needs
- Operational needs
- Widespread distribution network





# Truck Destinations

33% within the rest of the region

50-60% of all truck trips: off-dock rail yards, Gateway Cities area

12% of trips in nearby area

13 container terminals between the two ports



# Drayage

- Infrastructure
- Significant recent investment
- Current TAP demonstrations
- Regional partnership





# Drayage

- On-road zero emission trucks rank high
- Actions:
  - Conduct TAP demonstrations
  - Continue to seek improved technologies
  - Establish a regional partnership
  - Collaborate with stakeholders
  - Seek grant funding

# Terminal Equipment

- Cooperative approach
- Significant recent investment
- Operations
- Technology readiness



# Terminal Equipment

- Zero emission terminal equipment rank well against criteria
- Actions:
  - Conduct TAP demonstrations
  - Continue to seek improved technologies
  - Collaborate with stakeholders
  - Facilitate electrification of eRTGs and use of RMGs
  - Develop performance specifications
  - Seek grant funding

# Locomotives

- Stakeholder partnership
- Local and regional needs
- Operations - national fleet
- Significant cost for infrastructure
- Potential technology options





# Locomotives

- Linear Synchronous Motor technology most “demonstration ready”
- Actions:
  - Participate in Phase 1 “Proof of Concept” Demonstration
  - Continue to seek other zero emission technologies
  - Collaborate with stakeholders

# Moving Forward

- Act now
- Target trucks, terminal equipment and locomotives
- Fund technology demonstrations
  - Zero emission trucks
  - Zero emission cargo-handling equipment
  - LSM for rail
- Collaborate with regional partners
- Stay engaged