Sustainability in Port Engineering
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Introduction

- Overview of the Port of Long Beach
- Review of Sustainability Initiatives and Programs
- Challenges Adapting Sustainability to Engineering
- Using an EMS to integrate Sustainability
POLB Overview

- 3230 Acres
- 7 Container Terminals
- 80 berths
- 76-foot-deep main channel
- 72 post-panamax cranes
- 2007 Cargo
  - 7.3M TEUs
  - $140B value
World’s Top Container Seaports

2007

- 1. Singapore
- 2. Shanghai
- 3. Hong Kong
- 4. Shenzhen, China
- 5. Long Beach/LA.
- 16. Long Beach

*Twenty-foot-equivalent units (TEUs)*
The recession hits the shipping industry

Anxious consumers are not buying furniture, clothing, toys, cars...
As a result...

6.5 million TEUs in 2008
Down 11.3% compared to 2007
Worst yearly decline in more than 20 years
Every month in 2008 was worse than the same month in 2007
25.3% drop in December 2008 was the second worst monthly decline in more than 20 years.
Rising unemployment...

Less work for longshoremen, truckers, warehouse workers...
TEU Forecast Comparison

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<th>Year</th>
<th>2009 Forecast TEU</th>
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Port’s Response to Growth Trends

- **Efficiency Improvements**
  - Technology
  - Densification and Consolidation of Smaller Terminals
  - More On-Dock rail

- **Capital Improvements**
  - Terminal Expansions
  - Infrastructure and Navigation Projects
  - Rail Enhancement Program

- **Revised EIR Processes and Mitigations**
  - Clean Air Action Plan (CAAP)
  - Throughput Limitations
  - Shore Side Power

- **Green Port Policy**
Green Port Policy

GREEN PORT POLICY

• Protect the community from harmful side effects of Port operations
• Distinguish Port as leader in environmental stewardship and compliance
• Promote sustainability
• Employ best available technology to minimize environmental impacts
• Engage and educate the community

SIX KEY STRATEGIES

AIR

WATER

WILDLIFE

SOIL/SEDIMENT

SUSTAINABILITY

COMMUNITY ENGAGEMENT

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Clean Air Action Plan

Strategies

• Clean Trucks Program
• Clean Vessels Program
  – Vessel Speed Reduction (Reaching 94% Compliance)
• Shore-side power for ships
• Clean Locomotives Programs
• Clean Cargo Handling Equipment
• Clean Harbor Craft
• Alternative technology Program

The Goal is Reduce pollution by 45% within five years
Other Sustainability Programs

- Green Port Integrating Committee
- Green Leases
- Solid waste recycling programs
- Green Port Fest
- Educational Partnerships
- “Let’s Talk Port” Community Outreach
- Urban Reforestation Program
- Sustainable Landscaping Palettes
Transporting Sustainability from Environmental to Engineering

• General perception was:
  – Sustainability is primarily an environmental program
• Implementation centers on environmental issues first
• Sustainable environmental initiatives evolve into sustainable operations
• Sustainable operations requires sustainable engineering practices
• Sustainable development focuses on the building industry
  – Commercial and residential accounts for 40% of total US energy consumption
• What about Sustainable Infrastructure?
• How do we apply sustainability to the engineering environment?
Port Engineering Applications

- LEED “Green Building” Program
- Materials Recycling/Reuse/Reduction
- Railroad Sustainability Standards
- “Green” Construction Methodologies
- Engineering Bureau Purchasing and Procurement Environmental Management System

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LEED “Green Building” Program

- City of Long Beach Green Building Ordinance
- Security Command and Control Center
- New Port Administration Building/Maintenance Facility Complex
  - Gold certified
- Pier G Silver LEED Terminal
  - All buildings Silver LEED Certified
- Targeted Effect:
  - Energy Efficiency reduction in greenhouse gases
  - Green energy
  - Water conservation
  - Stormwater Management
  - Resource conservation

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The Pier G (ITS) Terminal Will Include Over 270 Acres
All Terminal Buildings Will Be Silver LEED Certified
All Concrete, Asphalt, and Base are recycled on site or within the Port District resulting in major savings
Savings for Base Recycling Alone to Date: $15 million
First Shore Side Container Berth in Long Beach (2008)
$25 Million Electrical Infrastructure to power ships on all berths for Piers G and J Terminals
Planning for Total Terminal Automation
Materials
Recycling/Reuse/Reduction

- Operational recycling programs
  - Office paper, cardboard, magazines, food/beverage containers
- Construction Waste Recycling Program
  - COLB ordinance (60% diversion from landfill)
  - LEED points (90%+ achievable)
  - Specs require recycling of concrete, asphalt & rock rubble
  - Soil import/export guidelines
- Locally purchased materials
- Recycled building products
- Reused materials
- Targeted Effect:
  - Materials conservation
  - Energy efficiency reduction in greenhouse gases
  - Reduced resource consumption
Railroad Sustainability Standards

- $2B Rail Enhancement Program
- More on-dock and near-dock rail
- Truck trip reduction strategy relies on more rail
- Hybrid and alternative fuel locomotives
- Developing Sustainable Design Standards
  - Modeled after LEED Standards
  - Defining broad categories rather than individual points
  - Incorporate into design development process
- Targeted Effect:
  - Materials conservation
  - Hazard materials reduction
  - Air quality improvements
  - Energy use
Green Construction Methodologies

- Ultra Low Sulfur Diesel
- USEPA Tier 3 non-road standards equipment
- Fugitive dust controls
  - Soil stabilizers
  - Wheel washouts
  - Wind fencing
- Truck idling reduction measures
- Storm water management
  - SWPPP
  - BMP’s
Storm Water Management Elements

• Construction SWPPP SOP
  – Increased inspections
  – Improved record keeping
  – Periodic auditing

• Design Phase SWM SOP
  – Design checklists for construction and operational BMP’s
  – Integrated into the design process

• Orphaned Areas/Inactive Construction Sites SOP
  – SWPPP Capital Project for Orphaned Areas
  – Annual inventory of orphaned areas & inactive construction sites
Thank You!

Port of
LONG BEACH
The Green Port