SAN PEDRO BAY PORTS

CLEAN AIR ACTION PLAN

OVERVIEW, NEAR-TERM PRIORITIES & NEXT STEPS

Lisa Wunder
Marine Environmental Manager
Port of Los Angeles

Morgan Caswell
Environmental Specialist Associate
Port of Long Beach

San Pedro Bay Complex

Clean Air Action Plan
Initial Development

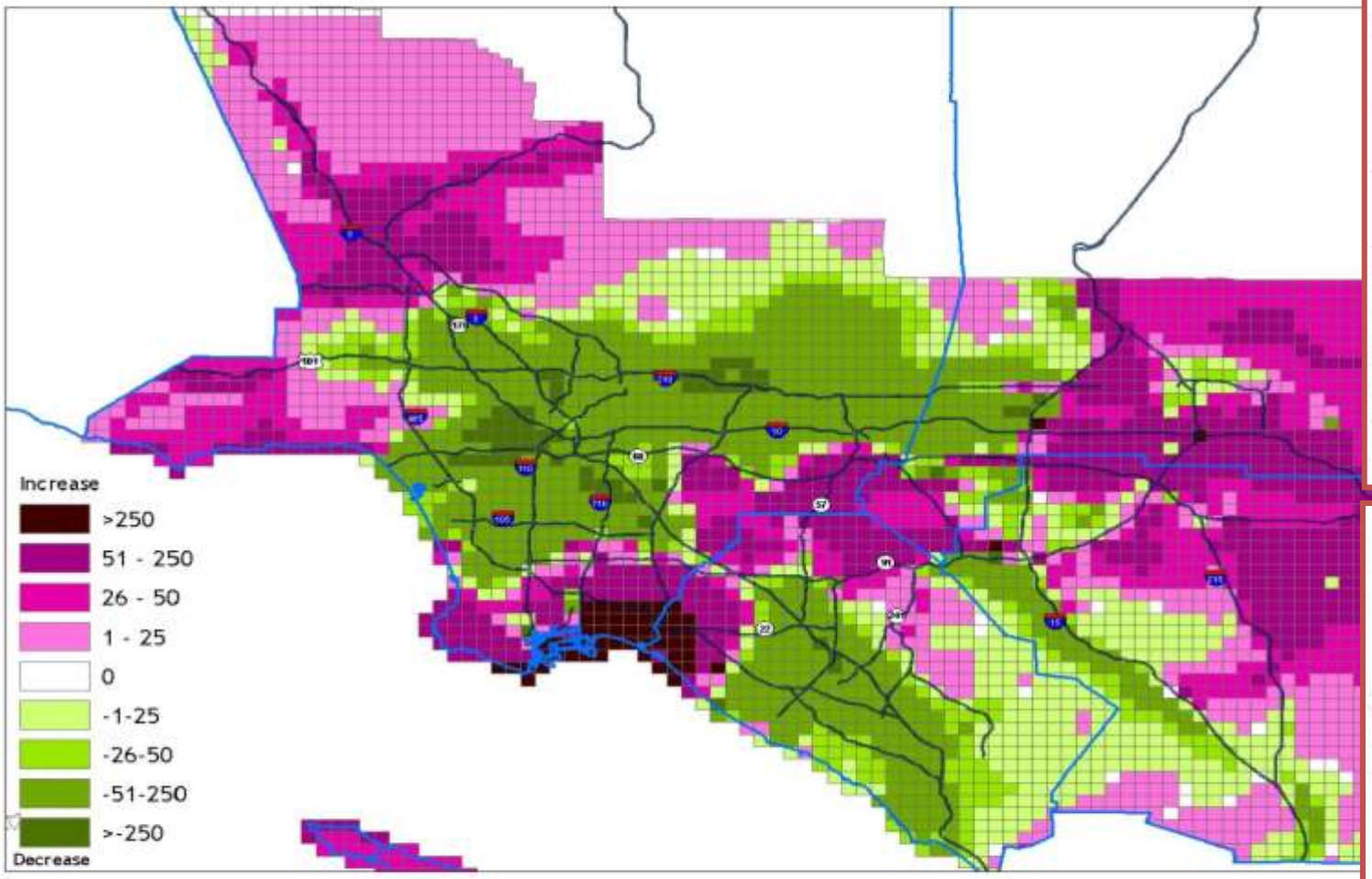


Figure 4-8
Change in CAMx RTRAC Simulated Air Toxics Risk (per million) from the 1998-99 to 2005 (using back-cast 1998 emissions and 1998-99 MM5 generated meteorological data fields)

Pollution, traffic are linked to illness

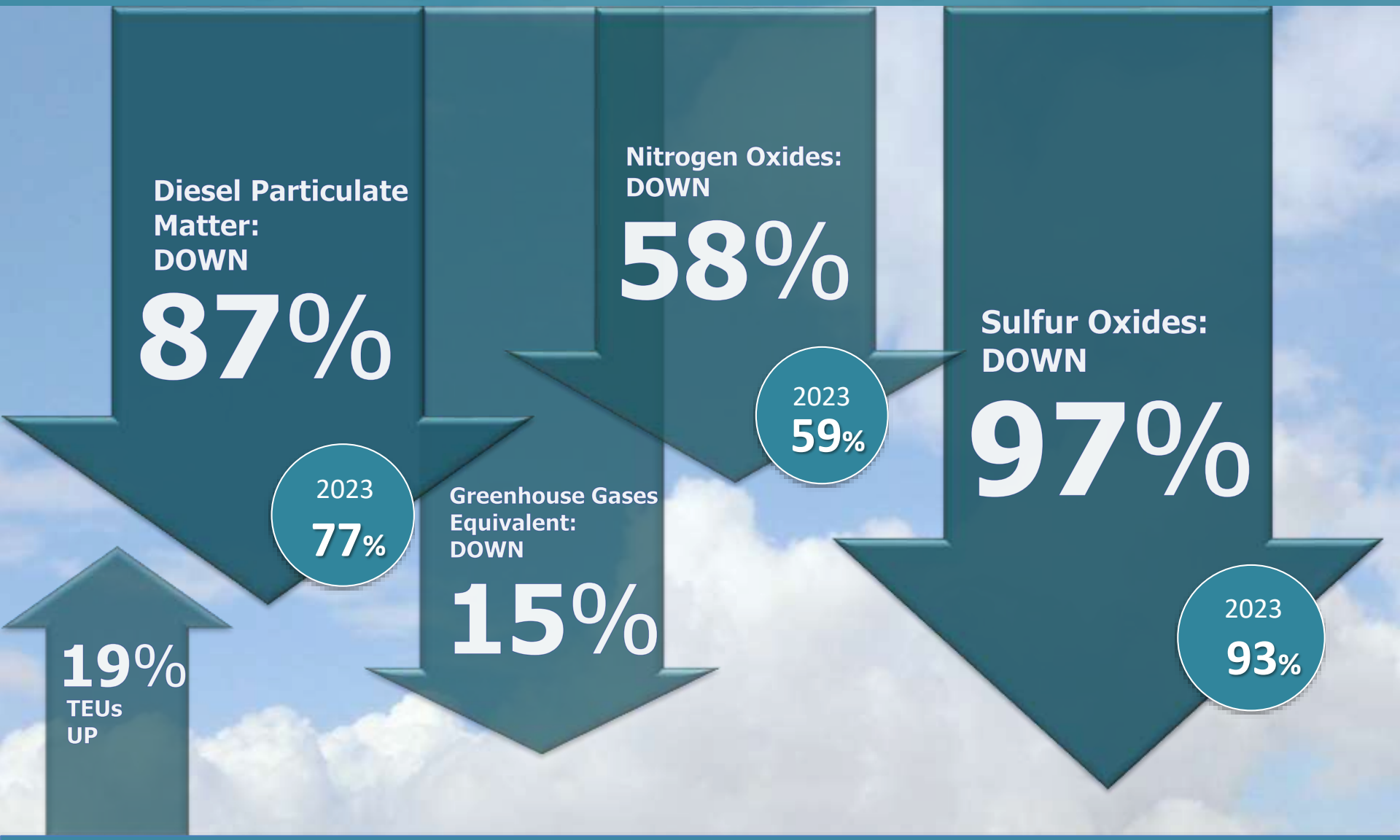
ENVIRONMENT: German study finds heart attacks are three times more likely in congestion. Bad air is blamed.

Latino areas are hit hard by environmental health threats

REPORT: Group suffers more from pollution than the rest of the population, study finds.

Clean Air Action Plan
Source Categories

San Pedro Bay Ports
Air Quality Improvements (2005-2017)



Overview

OCEAN-GOING VESSELS

HARBOR CRAFT

ON-ROAD TRUCKS

TERMINAL EQUIPMENT

EFFICIENCY IMPROVEMENTS

2017 CAAP Update Strategies

Ocean-Going Vessels

- **Increase vessel speed reduction compliance within 40 nautical miles**
- **Use at-berth emission reduction technologies**
- **Incentivize energy efficiency upgrades and clean technologies**
- **Develop a Clean Ship Program to transition the oldest, most polluting ships out of the fleet**

Heavy-Duty Trucks

- **Advance the Clean Trucks Program and transition to zero-emission trucks by 2035**
- **Adopt a reservation system at terminals to improve trucks turn times**

Terminal Equipment

- **Transition to zero emissions terminal equipment by 2030**
- **Limit idling**

Additional 2017 CAAP Update Highlights

- **Expand use of on-dock rail**
- **Accelerate deployment of cleaner harbor craft engines**
- **Encourage improvements in freight efficiencies**
- **Develop Green Terminal Recognition Program**
- **Ensure energy infrastructure is available to support use of cleaner technologies**

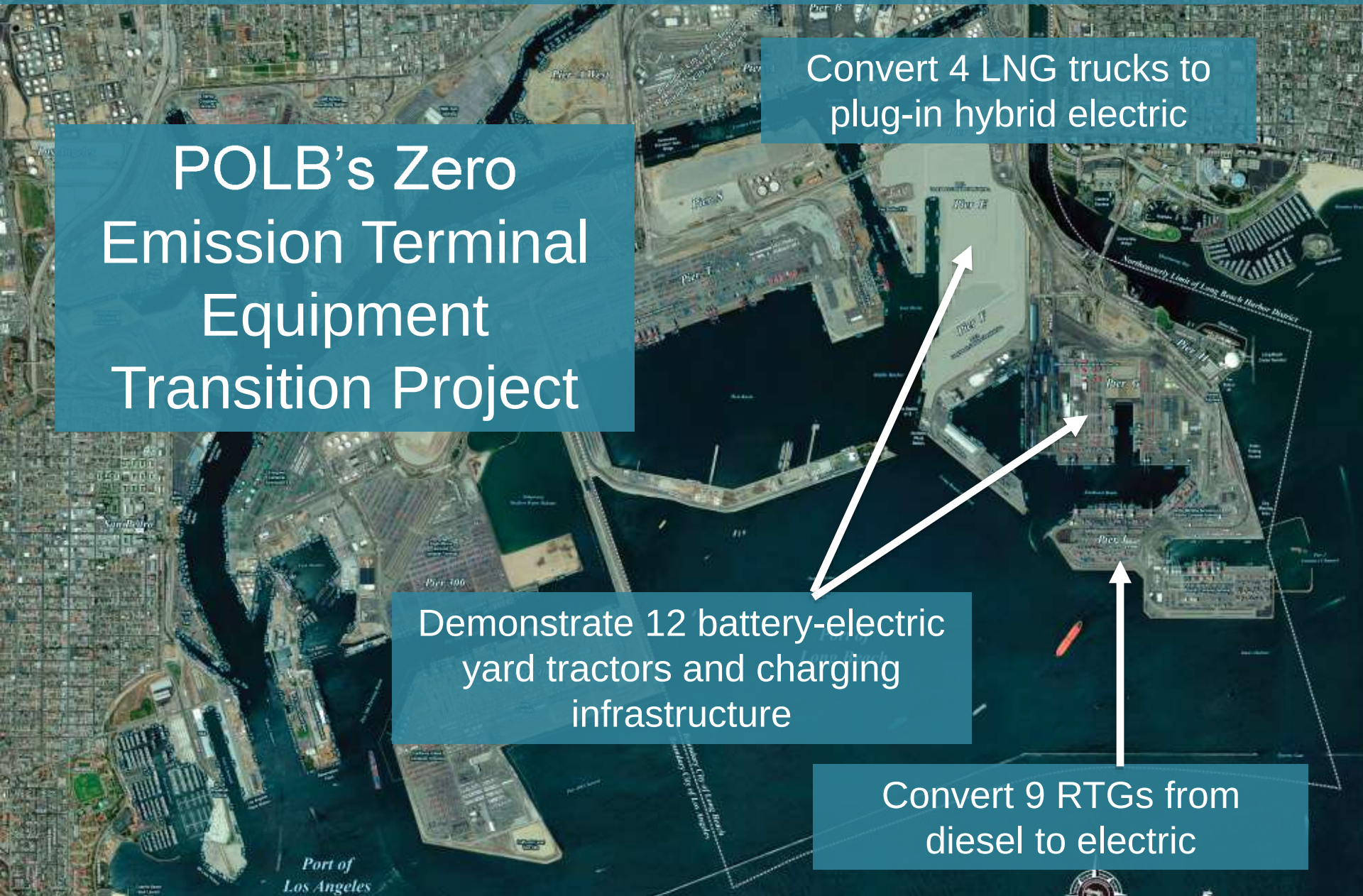
Incremental Cost Estimates

	Low End	High End
Trucks		
Near-Zero Emissions	$1,002,000,000	$1,026,000,000
Zero-Emissions	$2,927,000,000	$8,289,000,000
Cargo-Handling Equipment		
Equipment	$914,000,000	$2,105,000,000
Infrastructure	$2,166,000,000	
At-Berth Emission Reduction Technologies	$138,000,000	
Incentive Programs for Ships	$137,000,000	
Technology Demonstration & Development	$22,000,000	
TOTAL	**$7,306,000,000**	**$13,888,000,000**

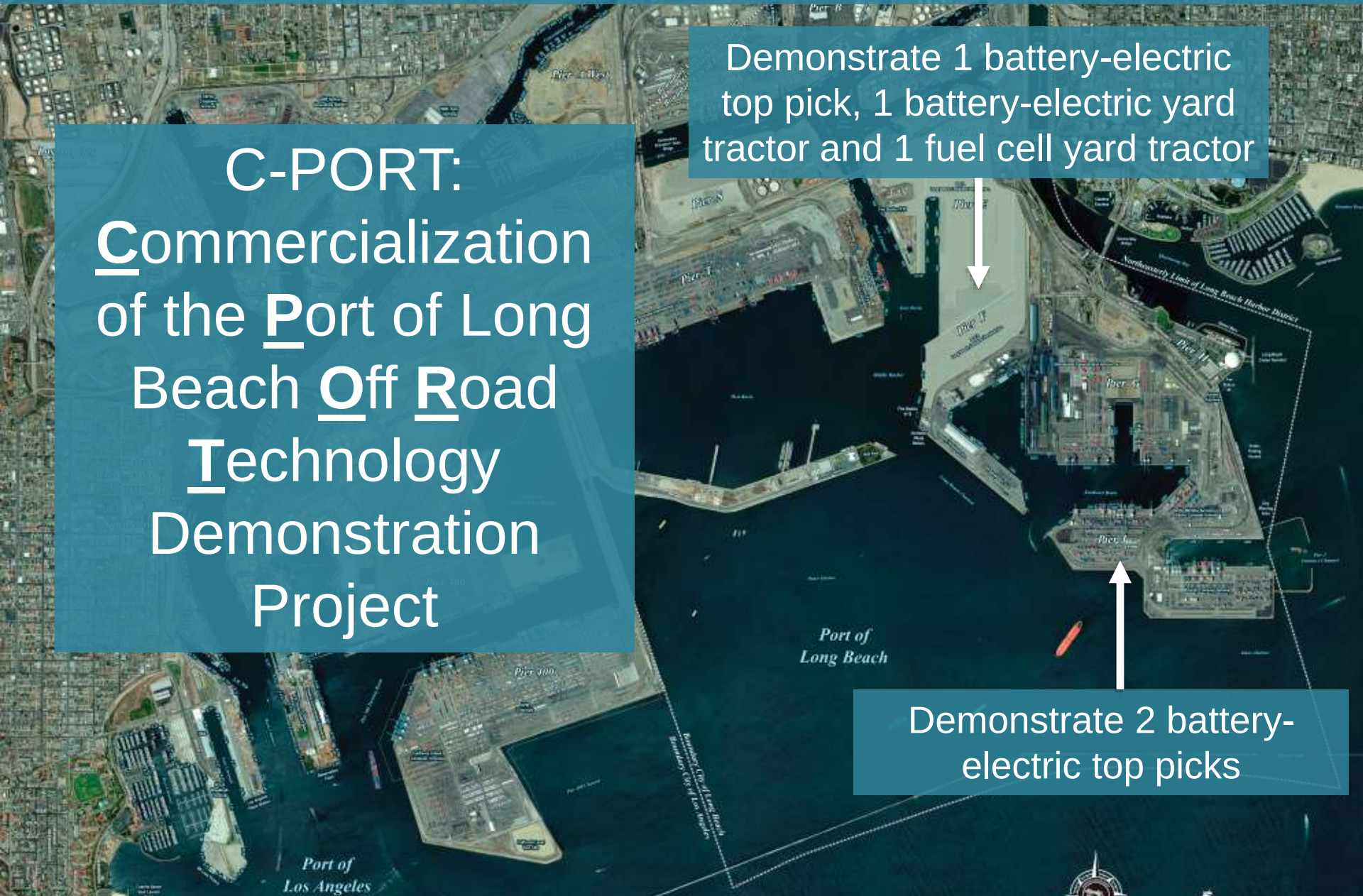
Technology Development

- Demonstrations of Zero Emission On-Road Trucks and Development of 50-100 Truck Pilot Deployment
- Demonstration of Harbor Craft Technologies
- Near-Zero Switcher Locomotive Demonstration
- Vessel Energy Efficiency Improvements Evaluation and Demonstration of At-Berth Emission Reduction Technologies
- Demonstrations of Zero Emission Terminal Equipment

Technology Development



Technology Development



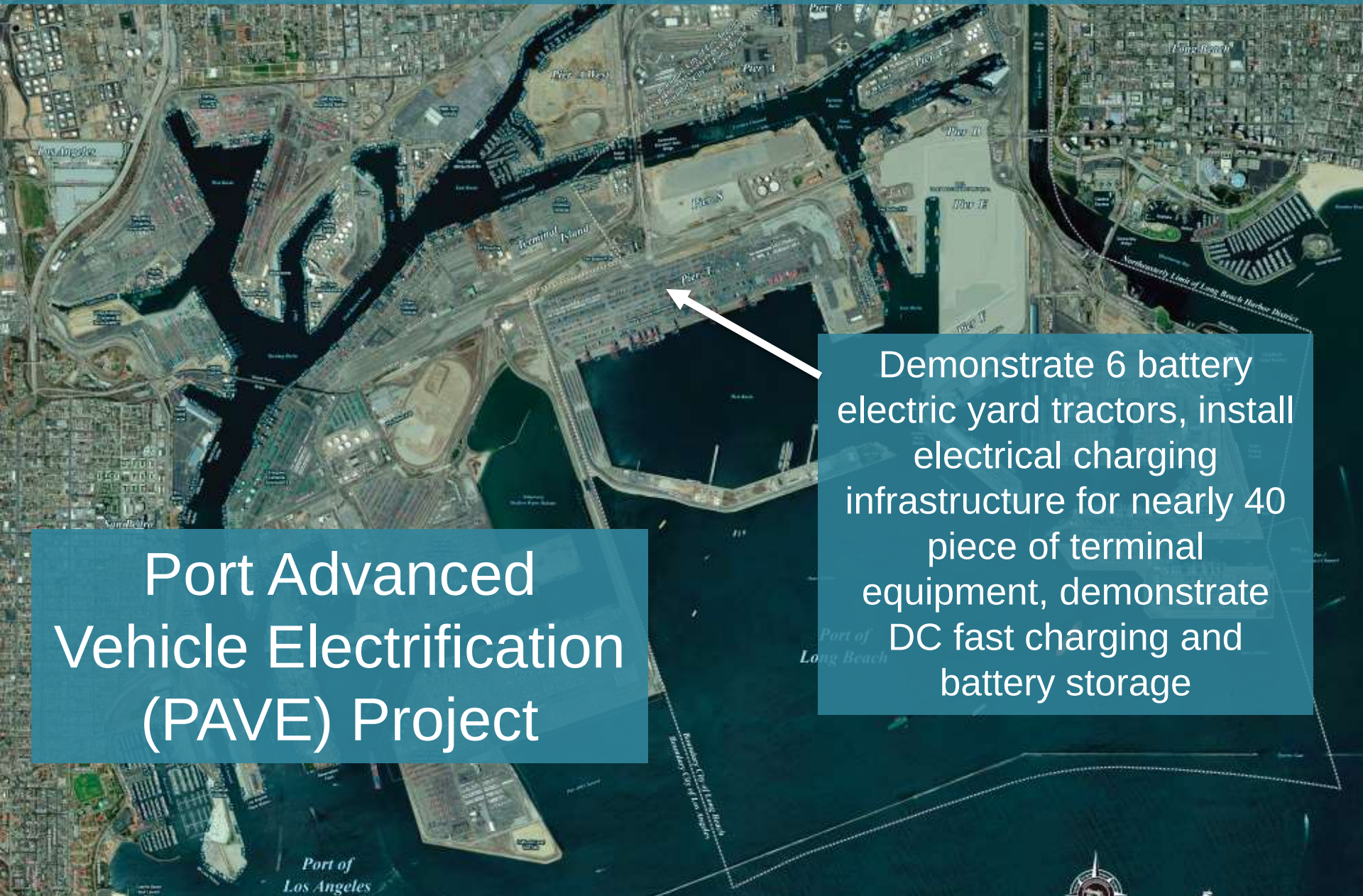
C-PORT: **C**ommercialization of the **P**ort of Long Beach **O**ff **R**oad **T**echnology Demonstration Project

Demonstrate 1 battery-electric top pick, 1 battery-electric yard tractor and 1 fuel cell yard tractor

Demonstrate 2 battery-electric top picks

Technology Development

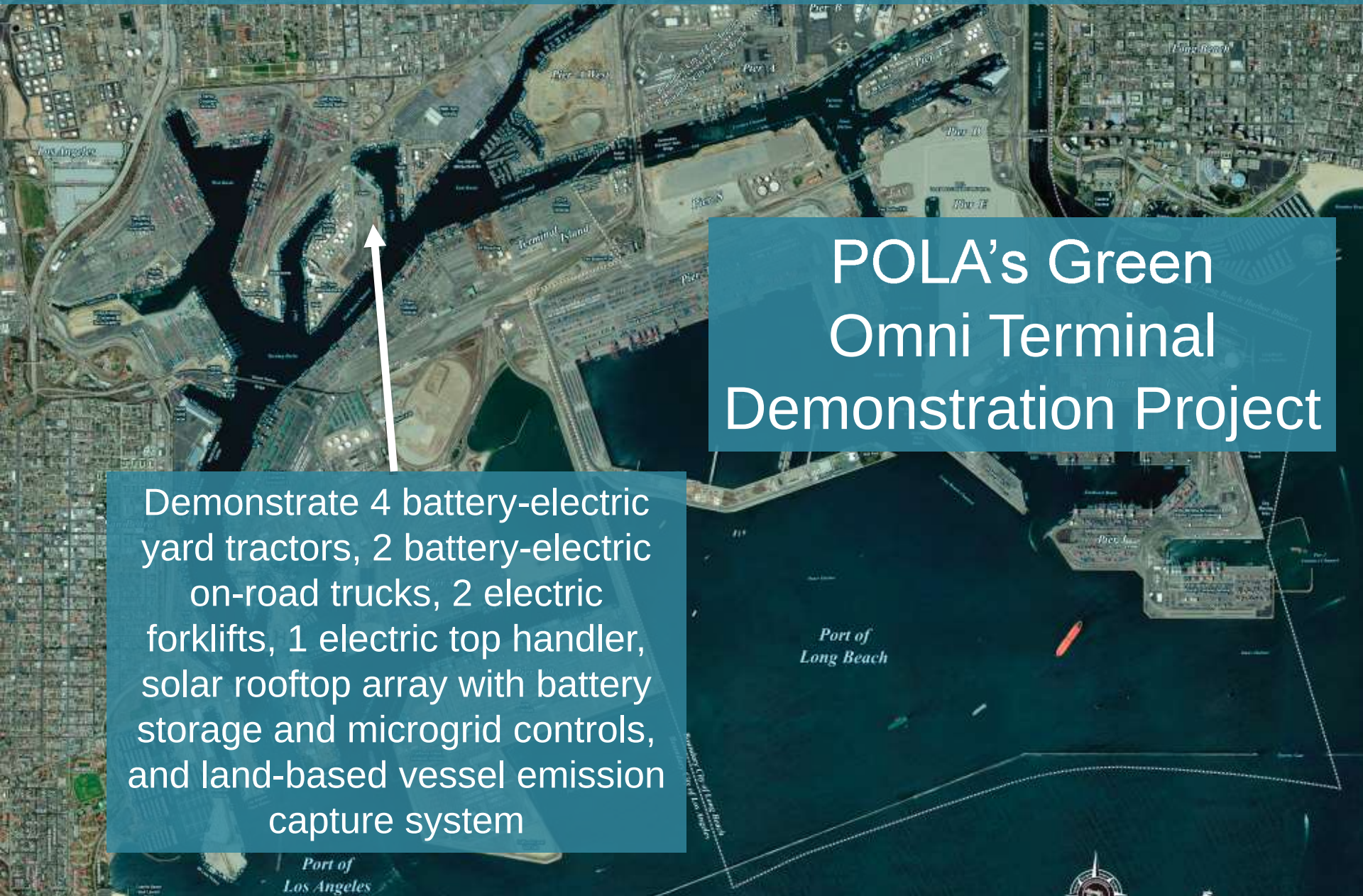
Technology Development



Port Advanced Vehicle Electrification (PAVE) Project

Demonstrate 6 battery electric yard tractors, install electrical charging infrastructure for nearly 40 piece of terminal equipment, demonstrate DC fast charging and battery storage

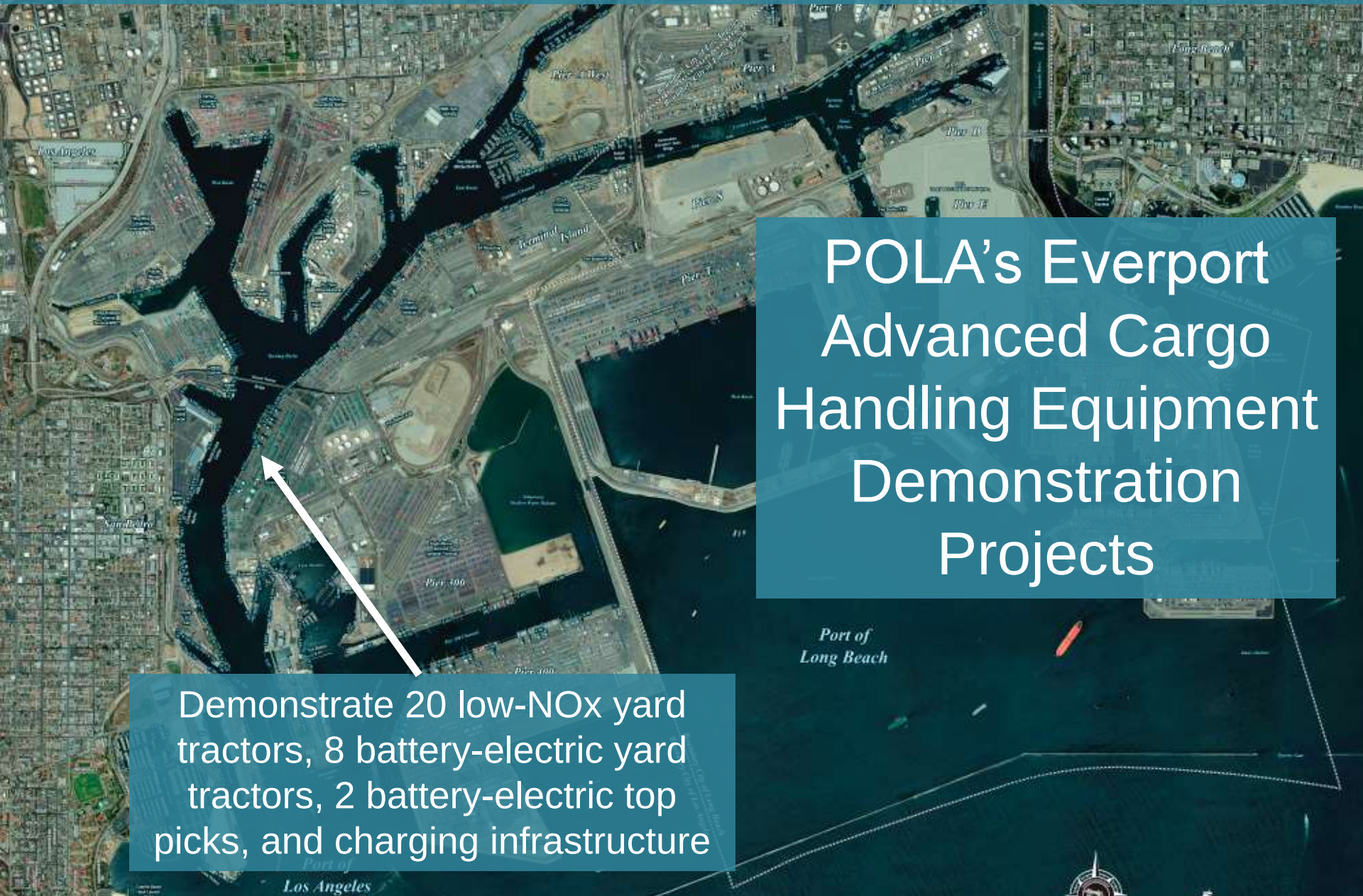
Technology Development



POLA's Green Omni Terminal Demonstration Project

Demonstrate 4 battery-electric yard tractors, 2 battery-electric on-road trucks, 2 electric forklifts, 1 electric top handler, solar rooftop array with battery storage and microgrid controls, and land-based vessel emission capture system

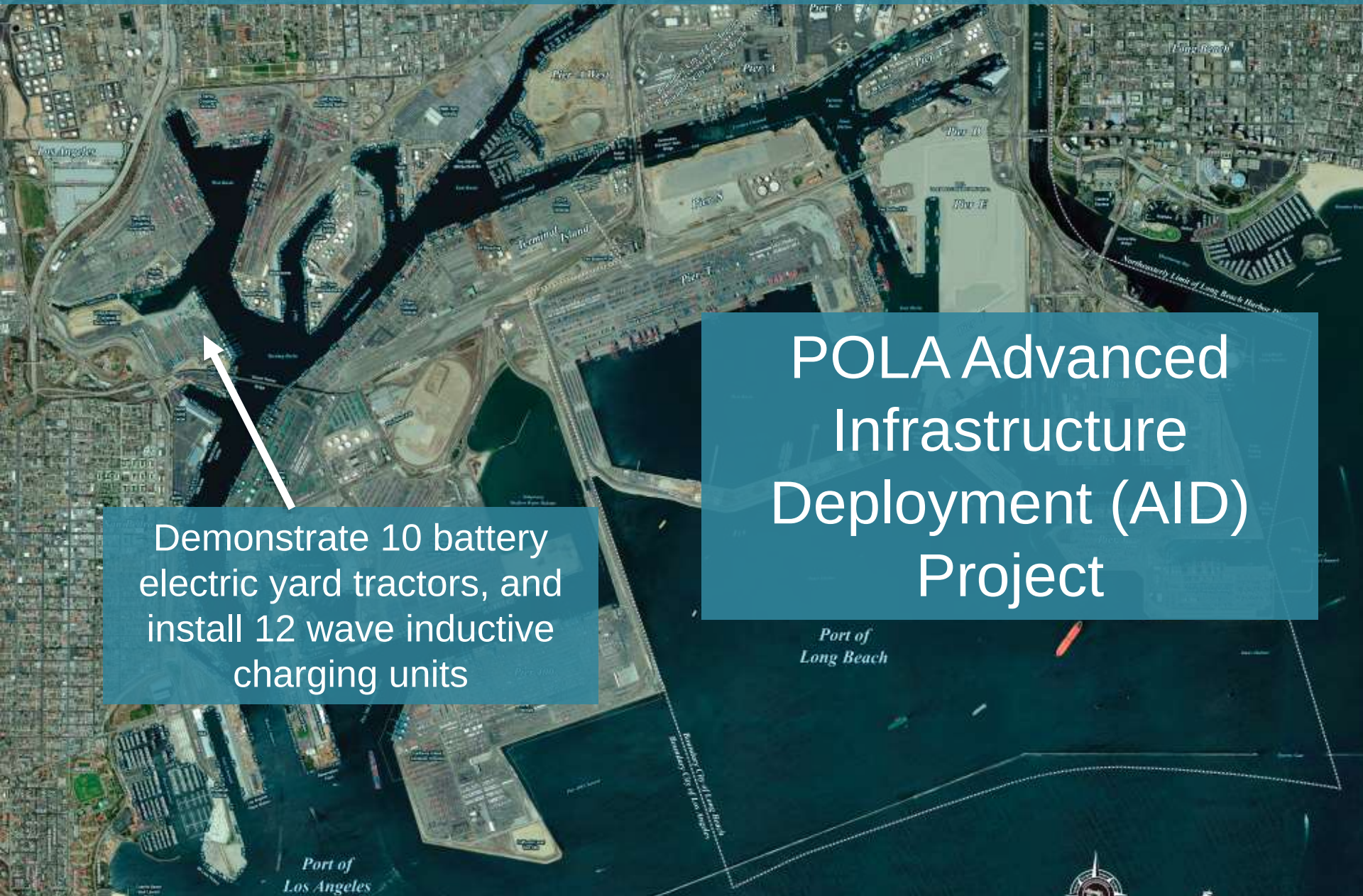
Technology Development



POLA's Everport Advanced Cargo Handling Equipment Demonstration Projects

Demonstrate 20 low-NOx yard tractors, 8 battery-electric yard tractors, 2 battery-electric top picks, and charging infrastructure

Technology Development



Demonstrate 10 battery electric yard tractors, and install 12 wave inductive charging units

POLA Advanced Infrastructure Deployment (AID) Project