



SOUTH COAST **AQMD**

ZERO & NEAR-ZERO EMISSION **TRUCKS**

H2



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South Coast Air Quality Management District

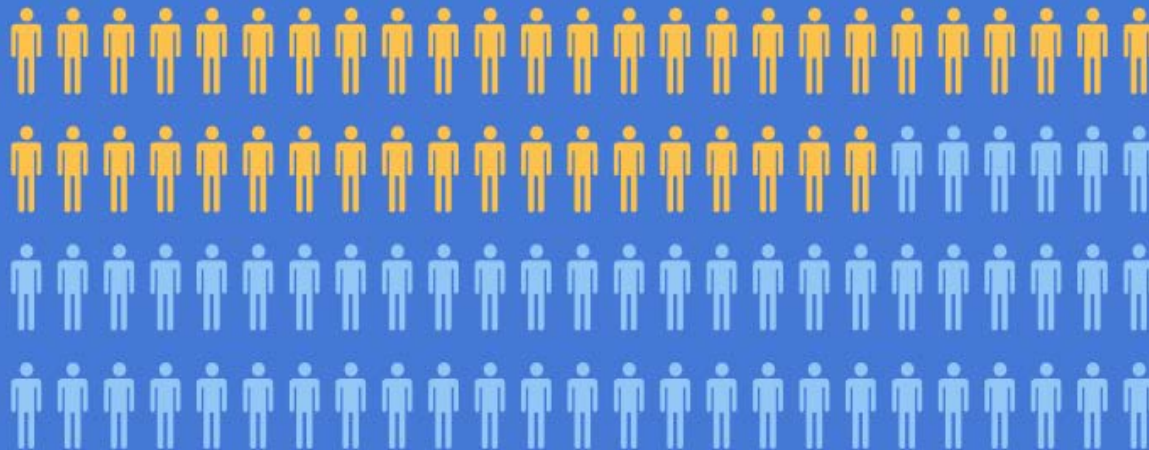
4 Counties of

- Los Angeles
- Orange
- San Bernardino
- Riverside



44%

State's population in
South Coast



■ AQMD (44%) ■ CA (56%)

South Coast Air Quality Management District

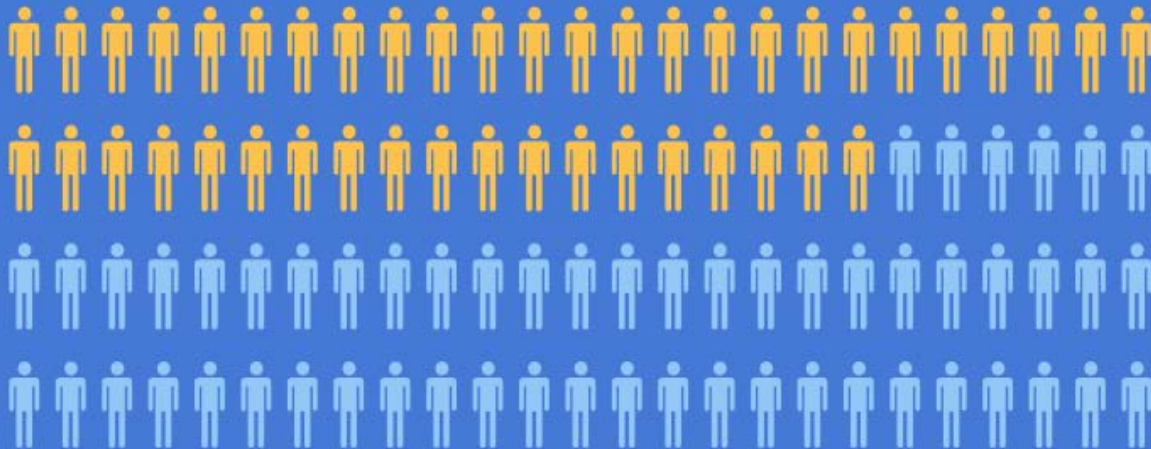
40%

Containerized goods
to nation



44%

State's population in
South Coast



■ AQMD (44%) ■ CA (56%)

SCAQMD Population



27,500,000



22,600,000



20,300,000



19,800,000



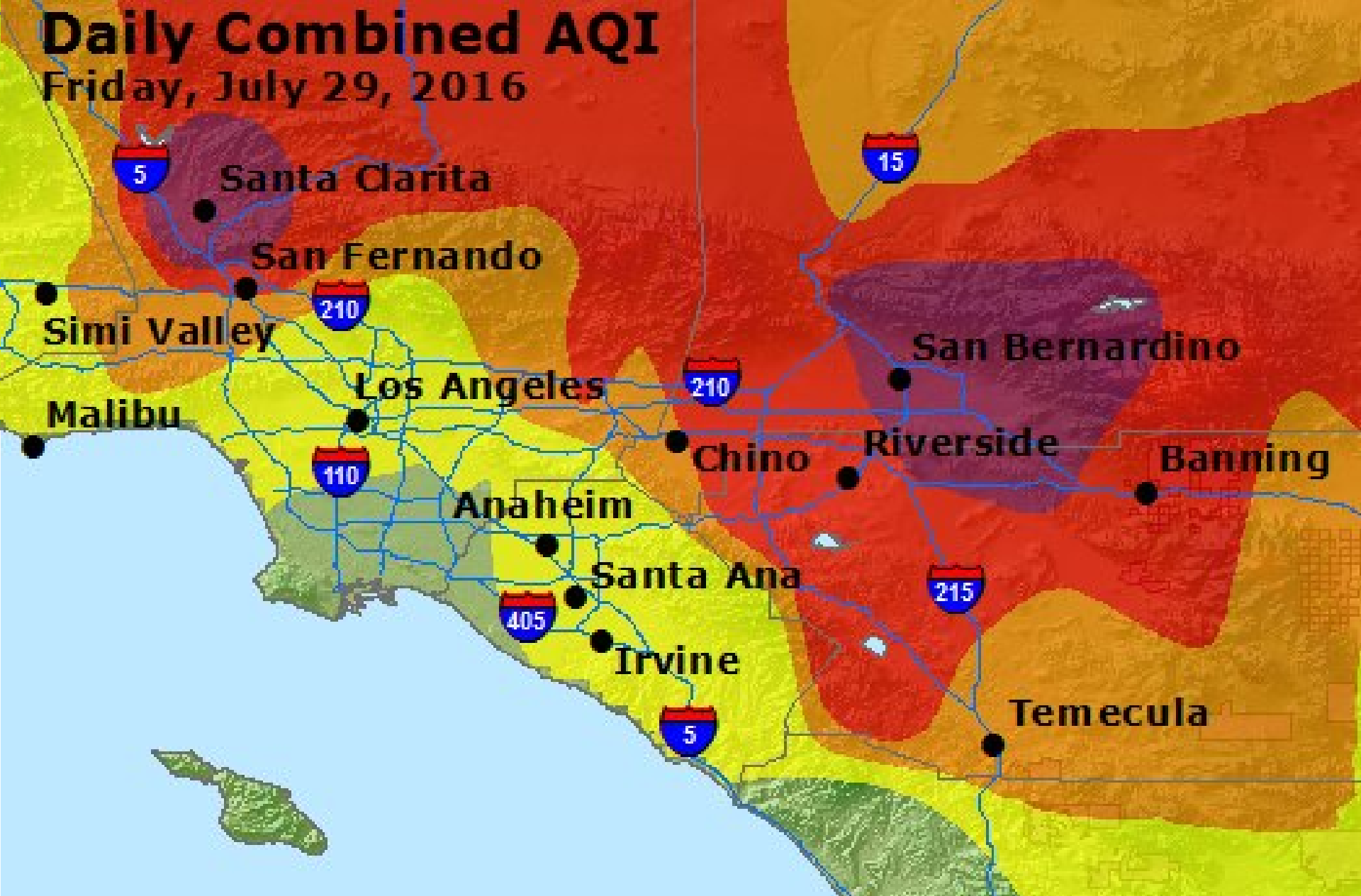
16,500,000



12,900,000

Daily Combined AQI

Friday, July 29, 2016



Good

Moderate

USG

Unhealthy

Very
Unhealthy

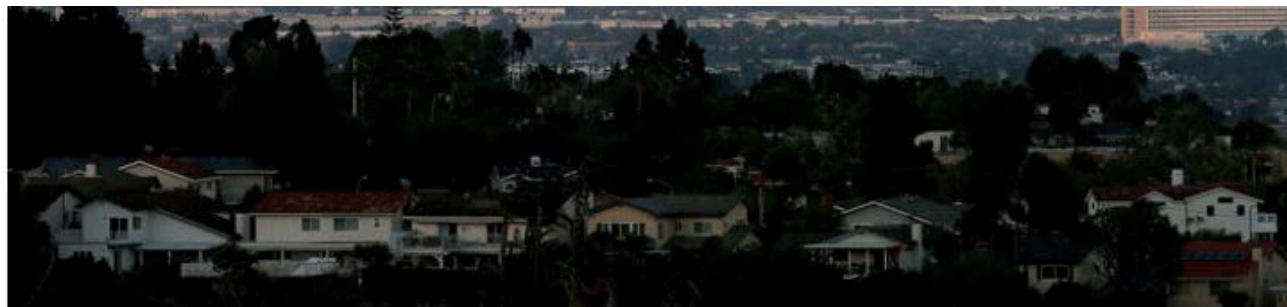
Hazardous



Thousands of lives could be saved in California by stricter air pollution limits, study finds



SoCal hit with worst smog in years as hot, stagnant weather brings surge in hospital visits

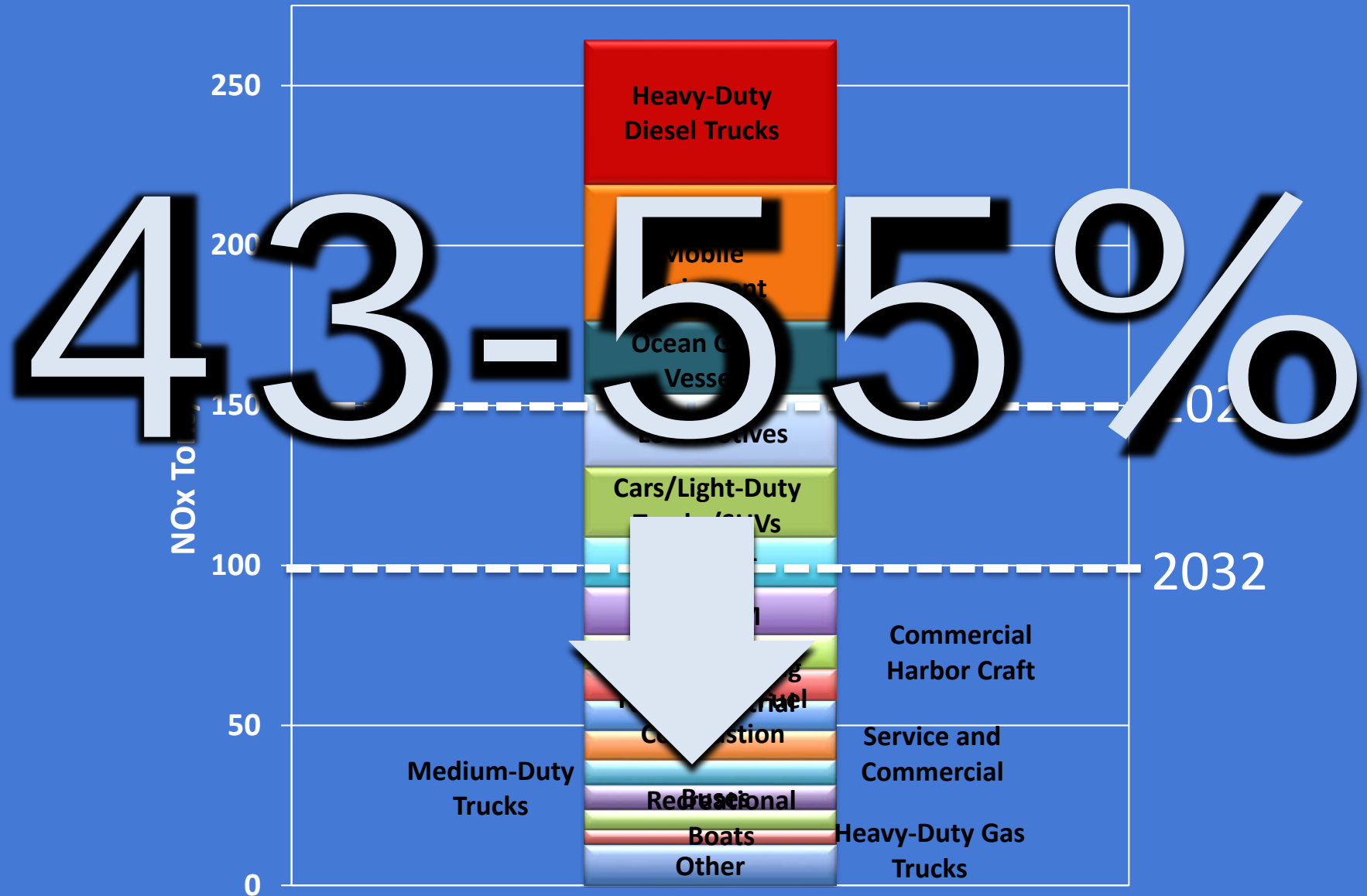


Smog descends on downtown Los Angeles during a November afternoon in 2015. (Los Angeles Times)

By **Tony Barboza**

AUGUST 11, 2016, 9:00 AM

Top NOx Sources 2023







Ryder signs exclusive deal with L.A. electric-truck maker Chanje



The Chanje all-electric delivery truck will be leased out by Ryder. (Chanje)



Near-Zero Emission NG Engines

Ultra-Low Emission Heavy-Duty Natural Gas Engine Tests Better Than 99.8 Percent Clean



SOURCE: UNIVERSITY OF CALIFORNIA RIVERSIDE'S CE-CERT AUG 15, 2017



2016



12L



2018



Southern
California
Gas Company





Zero Emissions Cargo Transport 1 & 2



Battery



NG Rex



The Port of
LONG BEACH



BAE SYSTEMS



Fuel Cell



Zero Emissions Drayage Trucks



\$24 Million



California Environmental Protection Agency
AIR RESOURCES BOARD



KENWORTH

Battery



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT



NG Rex



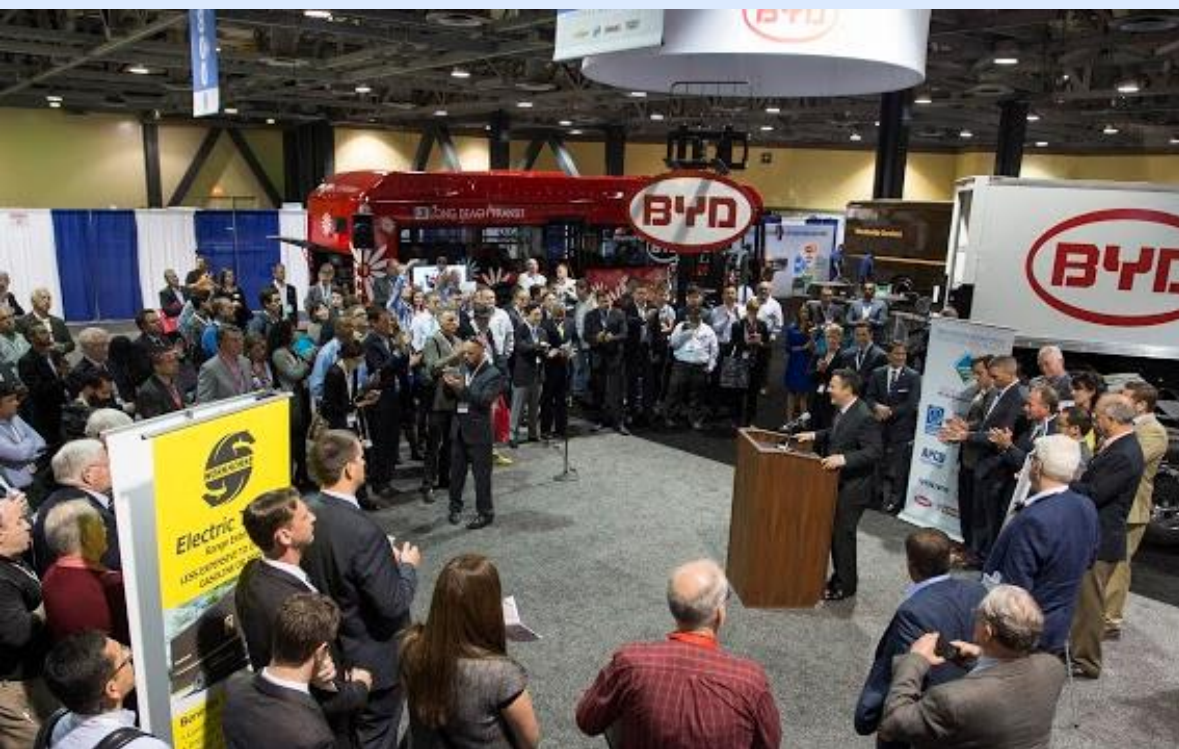
APCD
AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO



VOLVO TRUCKS

Diesel PHEV





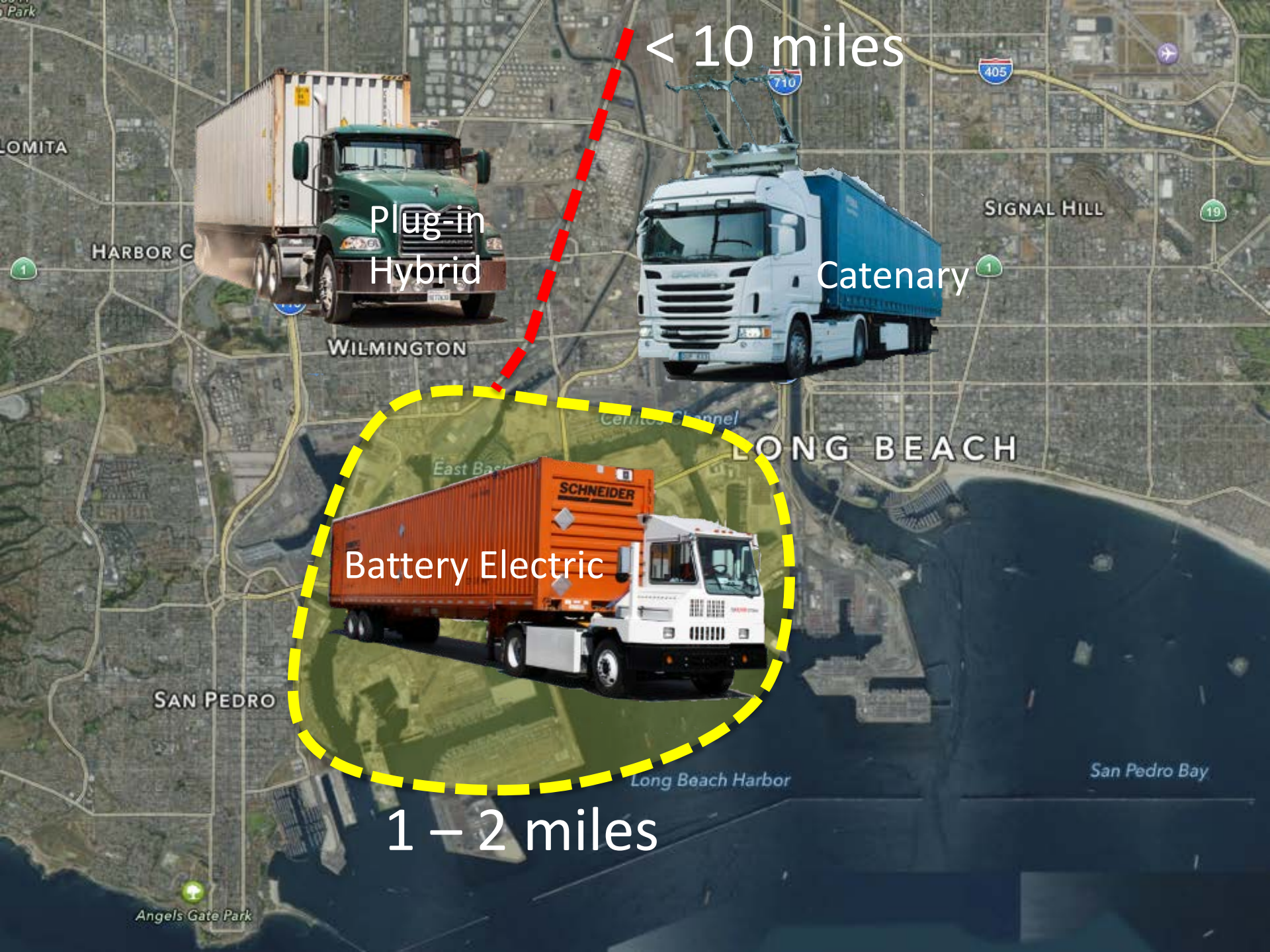
< 10 miles

Plug-in
Hybrid

Catenary

Battery Electric

1 – 2 miles



Near-Zero
Natural Gas

20

A green Chevrolet truck pulling a white container, with the text "Plug-in Hybrid" overlaid.A blue and white Kenworth truck is shown from a front-three-quarter view. The text "Fuel Cell" is overlaid in large white letters across the front of the truck. The truck is parked on a paved surface with yellow lines. In the background, there is a green field and some trees. The text "wn" and "arde" are visible on the left side of the image, and "Pa" is visible on the right side.

LONG

Zero & Near-Zero Demo Fleet



■ BEV (63%) ■ NG PHEV (23%) ■ Fuel Cell (7%) ■ Diesel PHEV (4%) ■ Near Zero NG (3%)

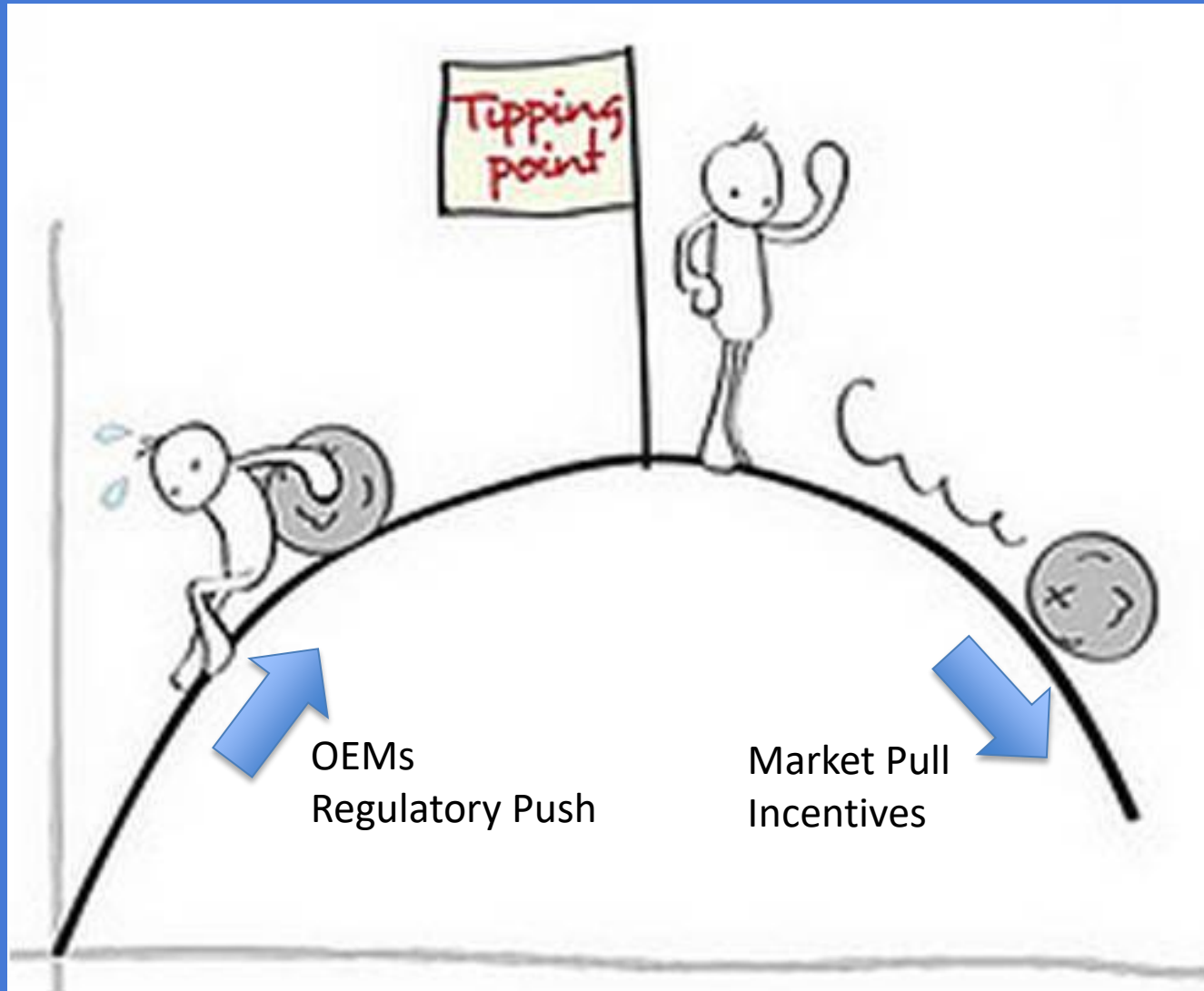
Zero & Near-Zero Fleet Needed per Year until 2023

x15



How to get to Tipping Point?

Initiating Market for Zero and Near-Zero Trucks



Medium & Heavy-Duty

- * SCAQMD helped co
- * Initiated regulator
- generation heavy

Petition to EPA for Rulemaking to Adopt Ultra-Low NOx Exhaust Emission Standards for On-Road Heavy-Duty Trucks and Engines

Submitted by:

South Coast Air Quality Management District
Pima County Dept. of Environmental Quality (Arizona)
Bay Area Air Quality Management District (California)
Connecticut Dept. of Energy and Environmental Protection
Delaware Dept. of Natural Resources and Environmental
Control, Division of Air Quality
Washoe Co. Health District, Air Quality Management Services
New Hampshire Dept. of Environmental Protection (New York)
New York City Dept. of Environmental Protection (Ohio)
Akron Regional Air Quality Management District (Ohio)
Washington State Dept. of Ecology
Puget Sound Clean Air Agency (Washington)

Standard



Optional

Low NOx

Future Reg



2014

standard

AUG. 21, 2017, 7:00 A.M.

California Senate leader eyes cap-and-trade funding for cleaner tractors, trucks and cars

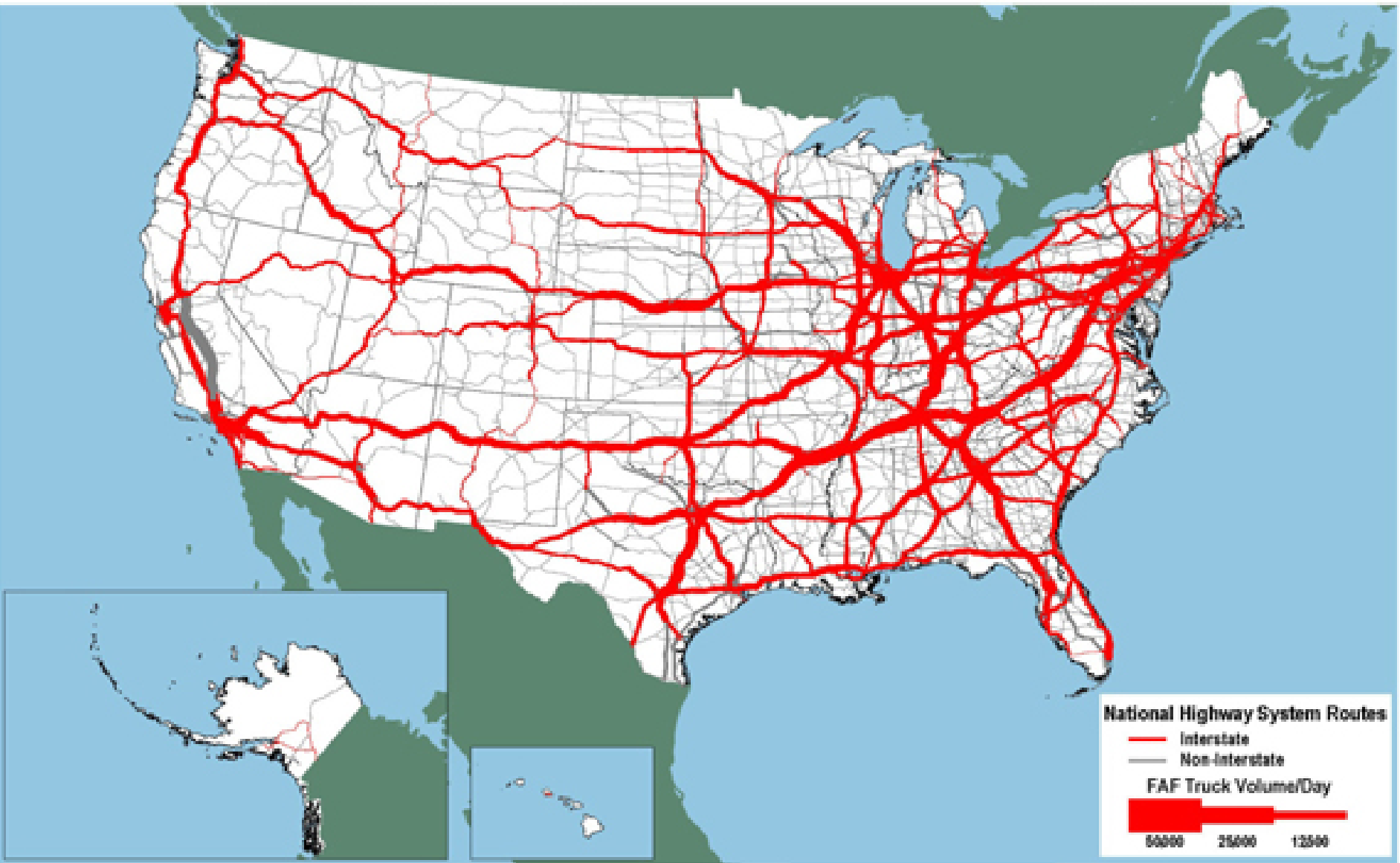


Chris Megerian



(Rich Pedroncelli / Associated Press)

Exhibit 1-23 Average Daily Long-Haul Freight Truck Traffic on the National Highway System, 2007



Note: Long-haul trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 3.1, 2010.

Exhibit 1-25 Average Daily Long-Haul Freight Truck Traffic on the National Highway System, 2040



Note: Long-haul trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, Version 3.1, 2010.

Takeaways

- Emission reductions needed in truck sector
- Technologies will be available soon
- Continue support through early deployment
- Large amount of incentives will be necessary
- National markets needed to accelerate turnover
- CA issues will challenge rest of US

