

Zero and Near-Zero Emission Trucks: Their Role in the South Coast Basin



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South Coast Air Basin

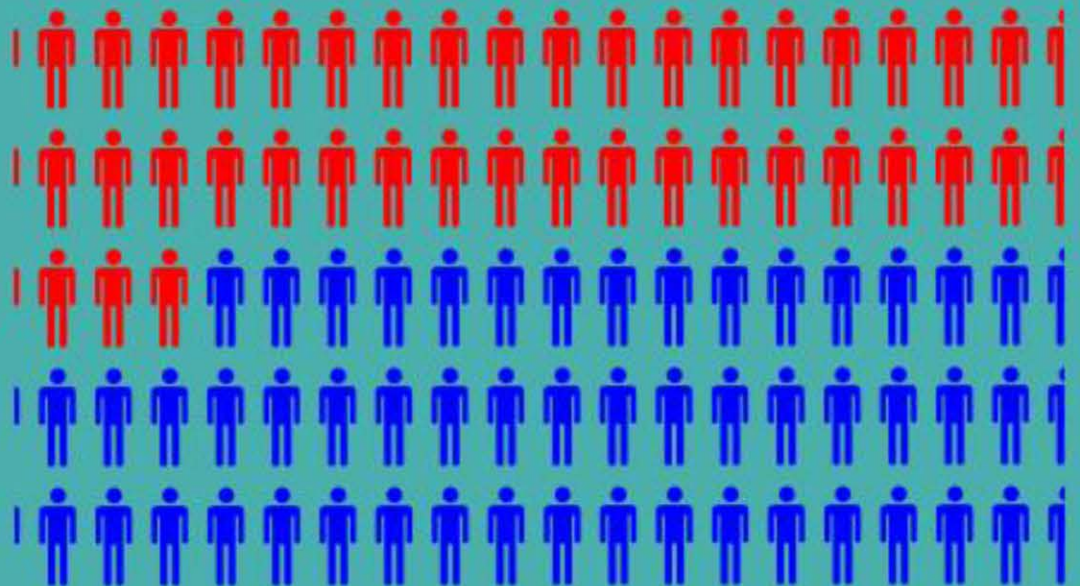
4

- Counties of
- * Los Angeles
 - * Orange
 - * Riverside
 - * San Bernardino



44%

State's population in
South Coast



South Coast Air Basin

4

Counties of
* Los Angeles
* Orange
* Riverside
* San Bernardino

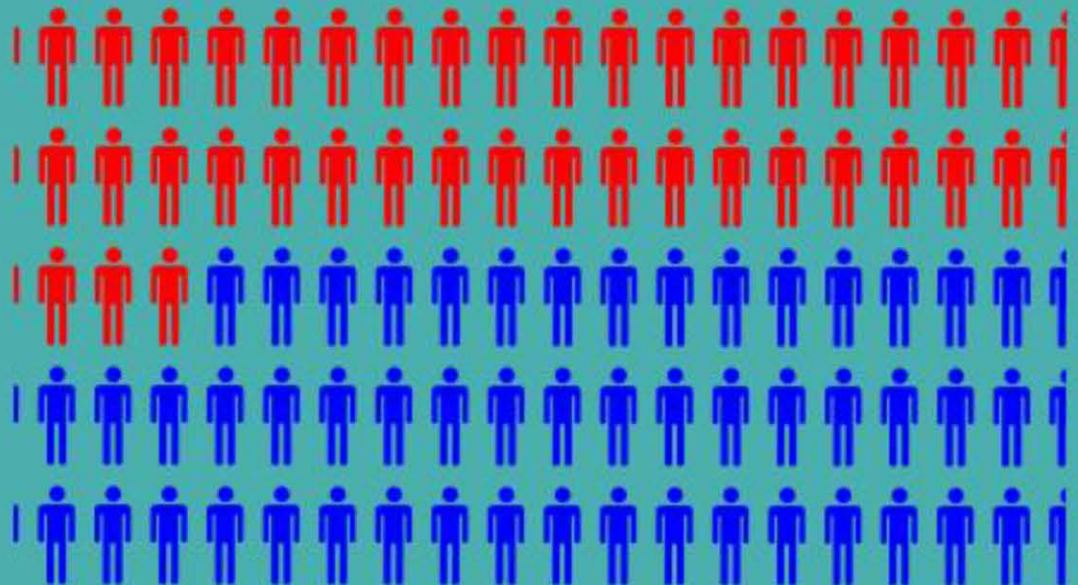
40%

Containerized Goods
to Nation



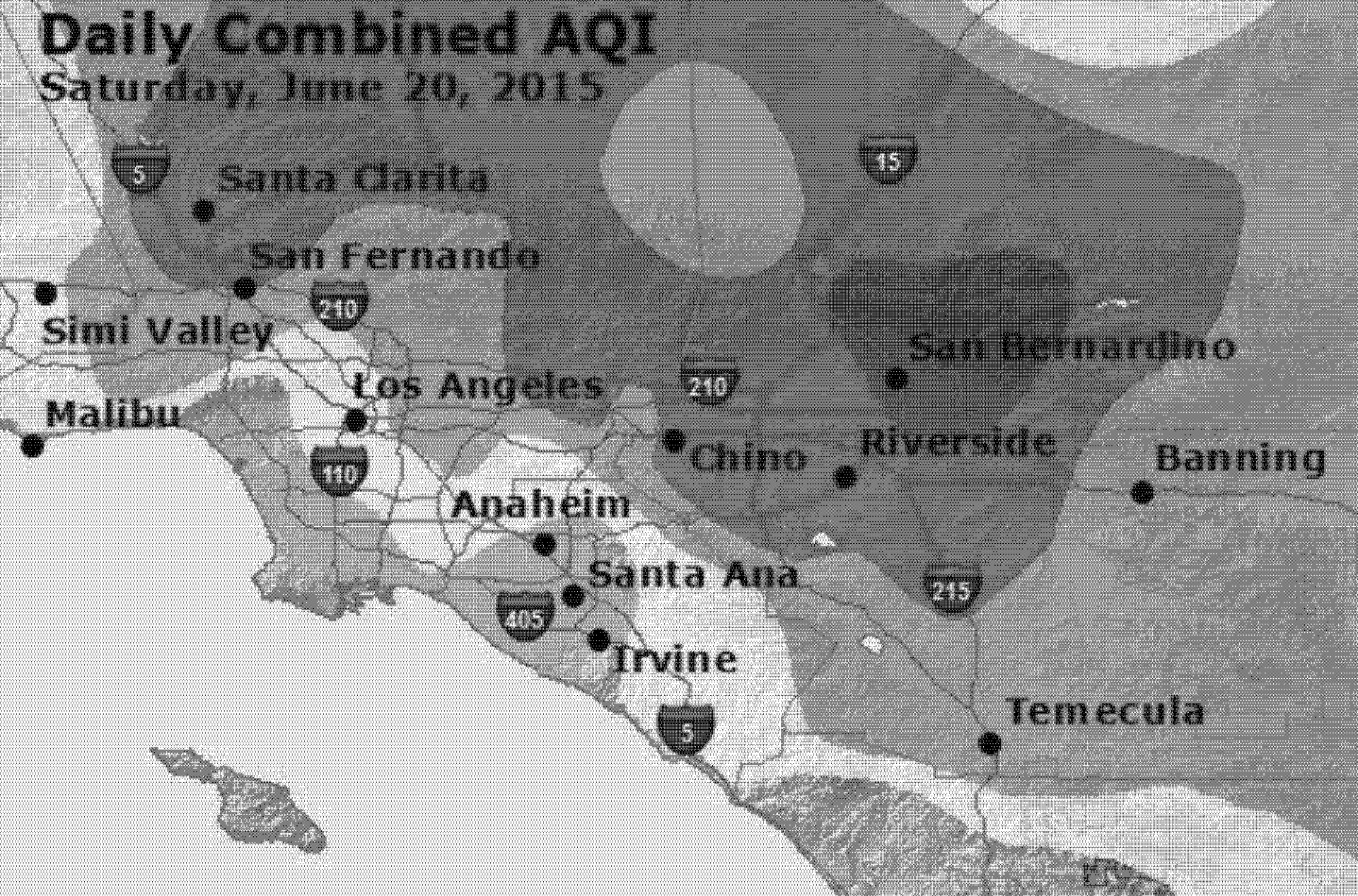
44%

State's population in
South Coast



Daily Combined AQI

Saturday, June 20, 2015



Good

Moderate

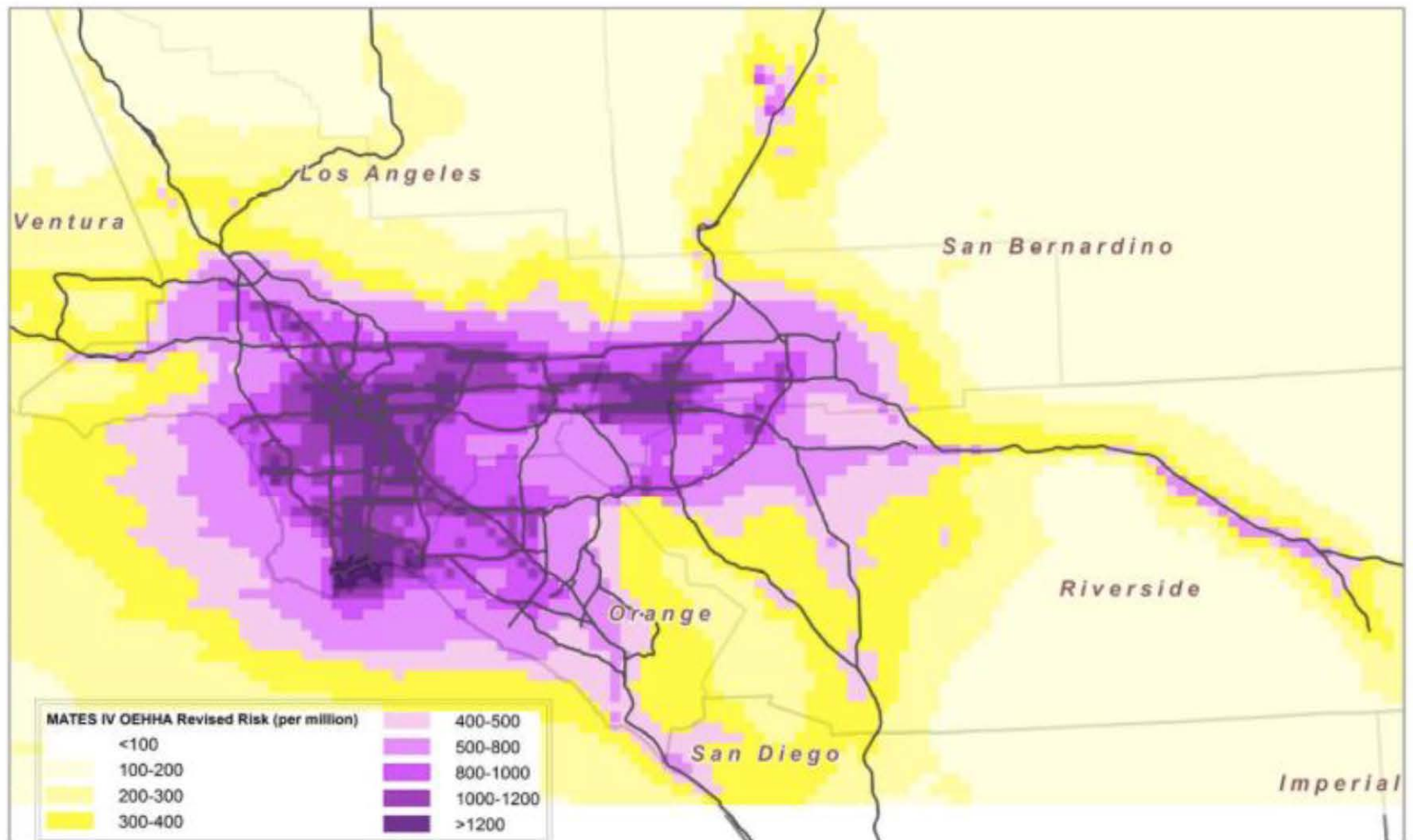
USG

Unhealthy

Very Unhealthy

Hazardous

Risk with New OEHHA Methodology





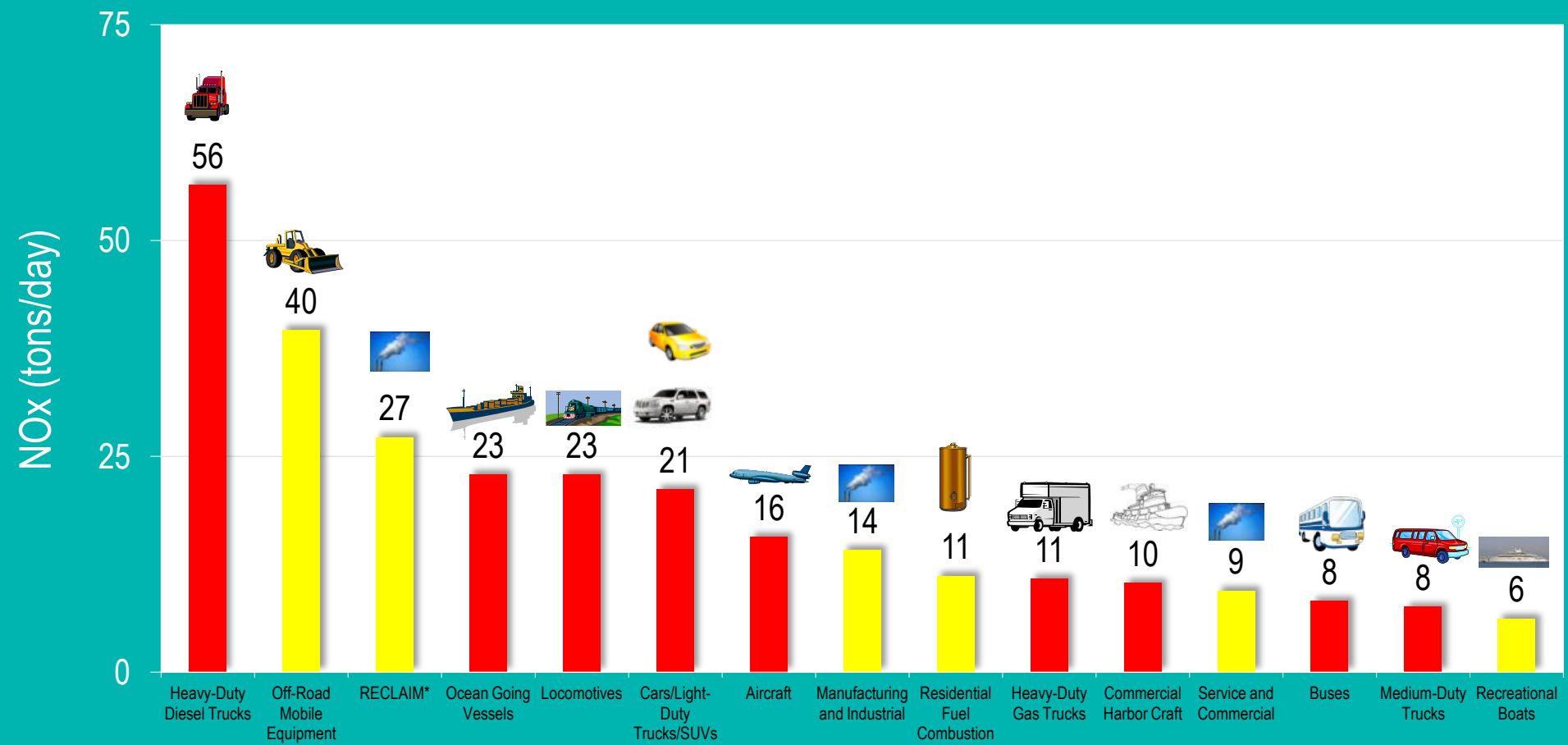
+4,100 deaths
year

Additional costs include

- Hospitalizations
- Cases respiratory illness
- School absences
- Lost workdays

\$ BILLIONS

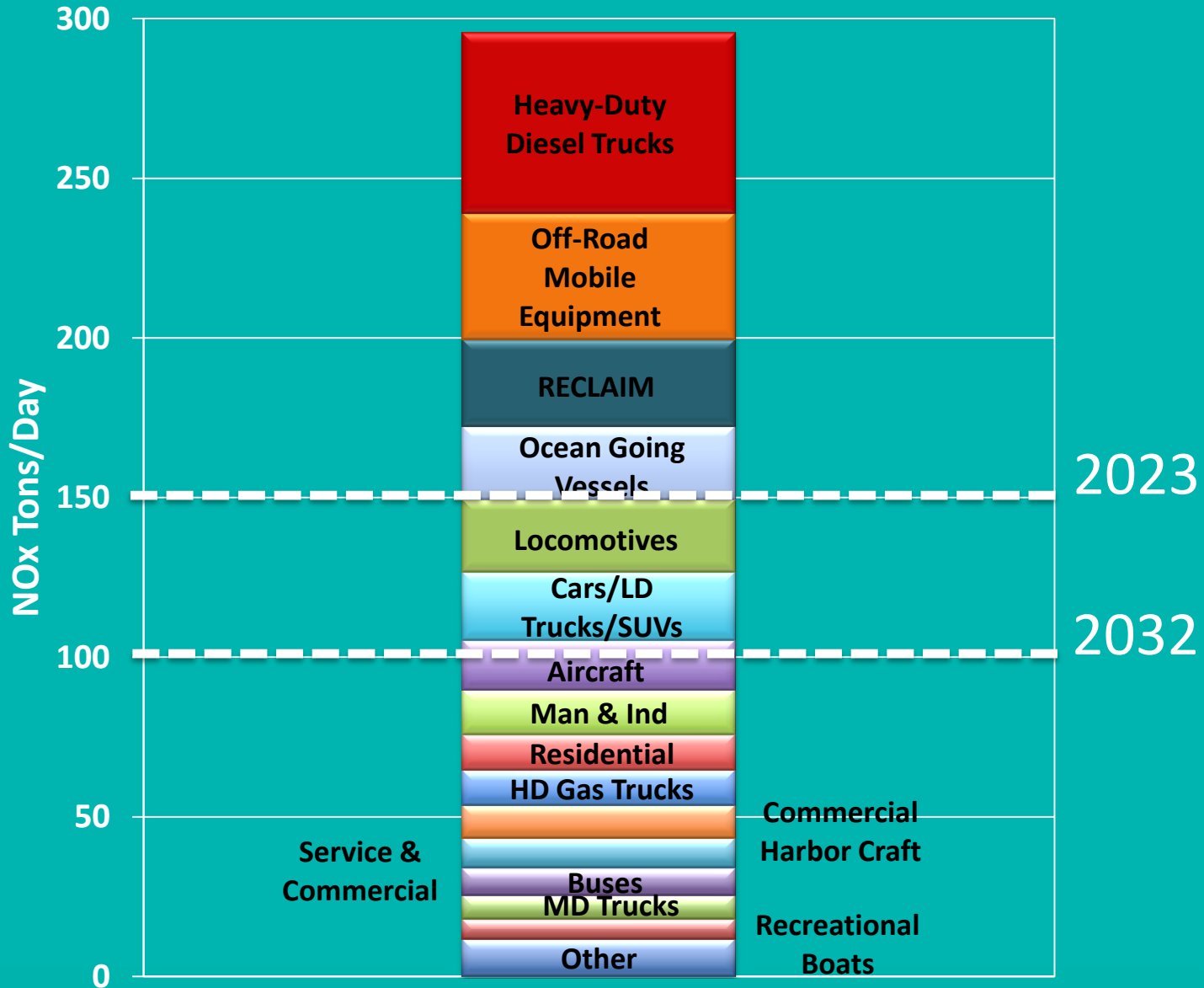
Top NOx Sources in 2023



*RECLAIM: 320 largest stationary sources, including all refineries and power plants

Source: Draft 2016 AQMP Emissions Inventory – June 2015

Top NOx Sources in 2023



Zero Emission Mile Vehicles

MY 2015



Chevy Volt



Nissan Leaf



Ford Focus Electric



Ford Fusion Energi



Ford CMax Energi



Toyota Prius Plug-in



Fiat 500e



BMW i3



Chevy Spark EV



Kia Soul EV



Hyundai Tucson Fuel Cell



Tesla Model S



Mercedes B Class



VW eGolf



HD NG Engines



Partners



Westport

8.9L



12L



Total Cost

\$ 1 3.6 million



Application



Schedule





Battery Electrics



US Hybrid



Partners



Part of
LONG BEACH

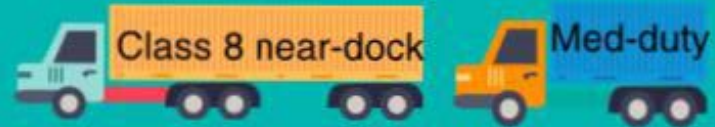


Total Cost

\$11.0 million



Application



Schedule





HD Plug-in Hybrids



VOLVO TRUCKS



IOR



SIEMENS

gti.

BAE SYSTEMS



Partners



Total Cost



Application



Schedule

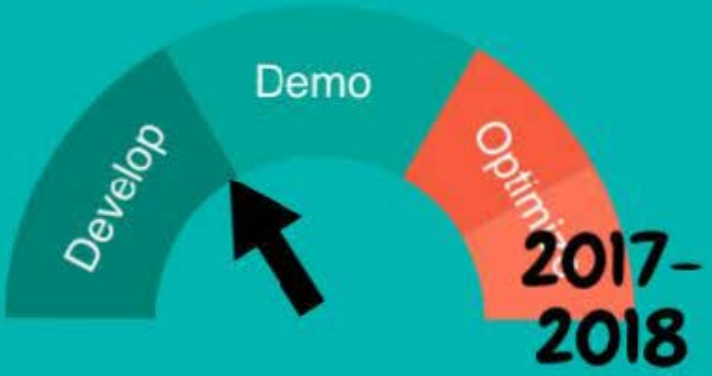
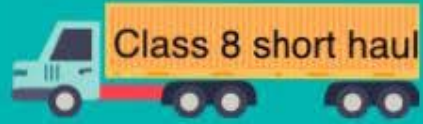


Southern California Gas Company



\$21.0

million



eHighway

- Three different architectures
 - Diesel hybrid
 - CNG hybrid
 - Battery
- Trucks can be used on or off catenary
- Investigate local and regional applicability





H₂ Fuel Cell



BAE SYSTEMS

 **US Hybrid**



Partners



Total Cost



Application

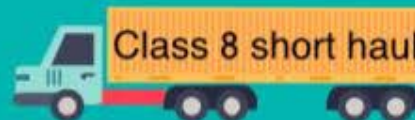


Schedule



Port of
LONG BEACH

\$20.0 million



Class 8 short haul



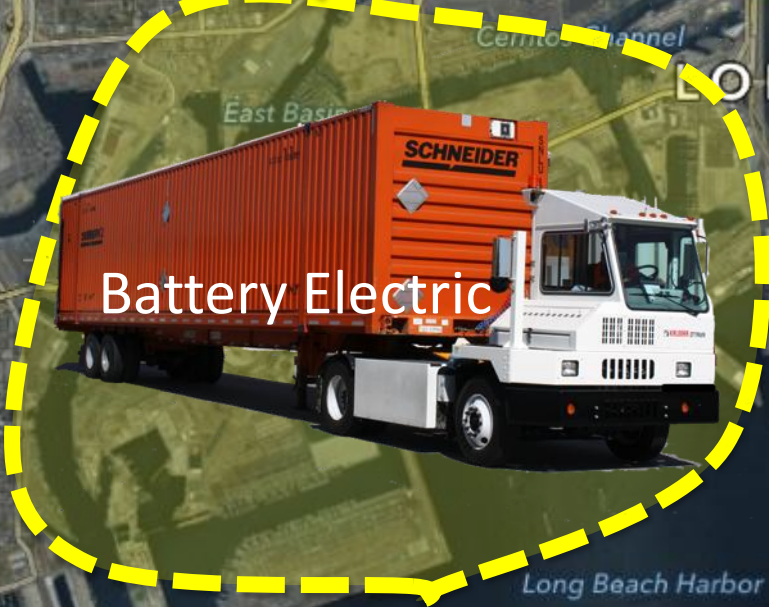
< 10 miles



Plug-in Hybrid

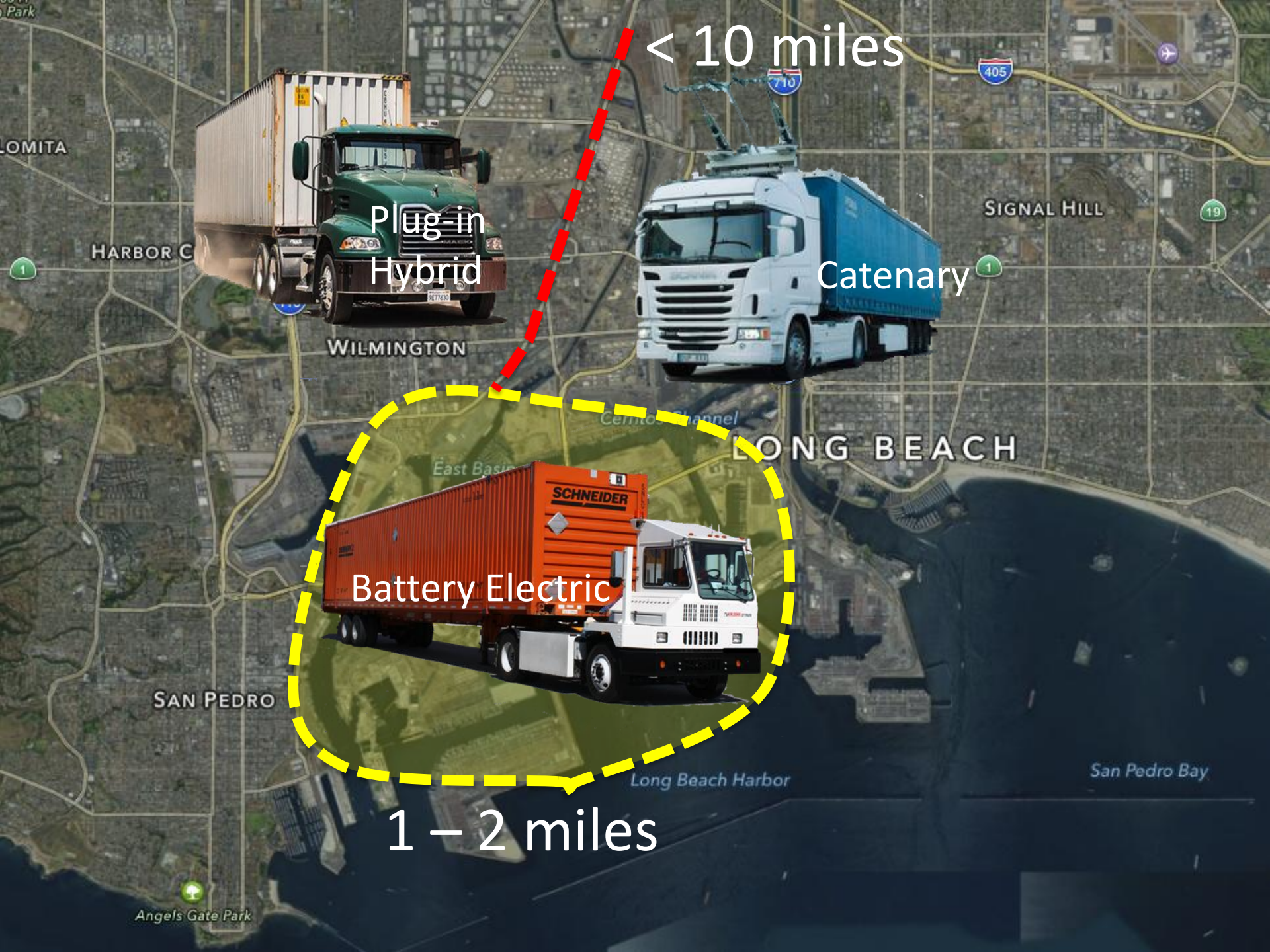


Catenary



Battery Electric

1 – 2 miles





Near-Zero
Natural Gas

> 20 miles



Plug-in
Hybrid



Fuel Cell



Catenary



Takeaways

- Criteria pollutant/toxics reductions needed now
- Technology advancements occurring
- Portfolio of architectures must be examined
- Same technologies mitigate climate change
- Will need political will and \$\$\$

