

Harboring Pollution

The Dirty Truth about U.S. Ports and Strategies for Clean Up



Faster Freight – Cleaner Air Conference 2006
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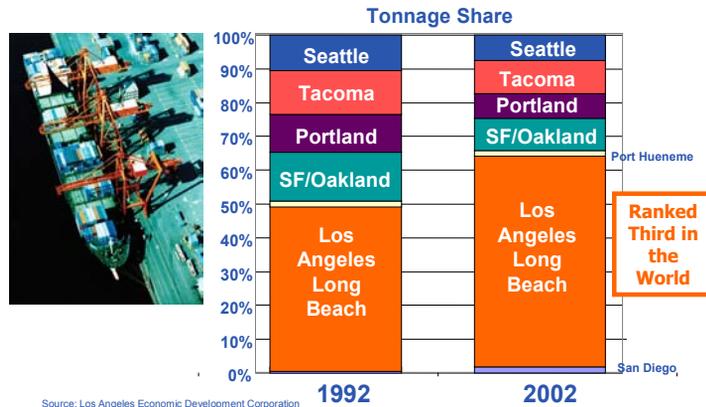


Background Information

- POLA is the largest port in the nation
- POLA and POLB combined qualify as the 3rd largest port in the world
 - Gateway to ~40% of the nation's goods
 - Container throughput has increased 175% since 1990 and continues to grow



Cargo at Major West Coast Ports



California continues to subsidize the country's trade



Ports in Southern California *Grim Outlook*

- **#1 fixed source of air pollution**
- **> 40,000 trucks frequenting Ports of LA and LB daily**
- **Trucks trips to *triple*; container throughput to *quadruple* by 2025**

Ports of LA/LB
Daily
Equivalent:

**-3,000,000 cars
OR**

**-80 refineries
OR**

**-13 power plants
OR**

**-16,000 trucks
idling 24hrs/day**



Health Effects of NOx and Diesel PM



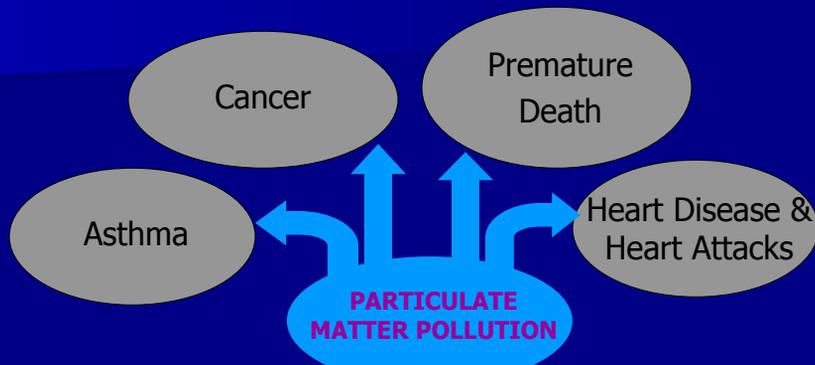
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Why Are Port Operations Harmful to Human Health?

- The ships, trains, trucks & equipment that service ports are powered by diesel fuel.
- Diesel emissions contain a number of pollutants harmful to human health, including Particulate Matter (PM) and Nitrogen Oxides (NOx).
 - PM is made of fine particles of smoke, dust and soot. Smaller particles easily lodge themselves in lung cells.
 - NOx is a precursor to smog or ground level ozone.

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HEALTH EFFECTS OF DIESEL PARTICULATE MATTER



Source: NRDC, 2004



Startling Health Impact Statistics

- Diesel particulate is responsible for over 70% of the cancer risk from air pollution
- This year, the number of diesel-related premature deaths will exceed the number of homicides in California
 - ~3,000 premature deaths
 - ~2,700 cases of chronic bronchitis
 - ~4,400 hospital emissions for cardiovascular and respiratory illnesses

Cost of health impacts = \$21.5 billion per year

Source: NRDC, 2004



Health Effects of NOx

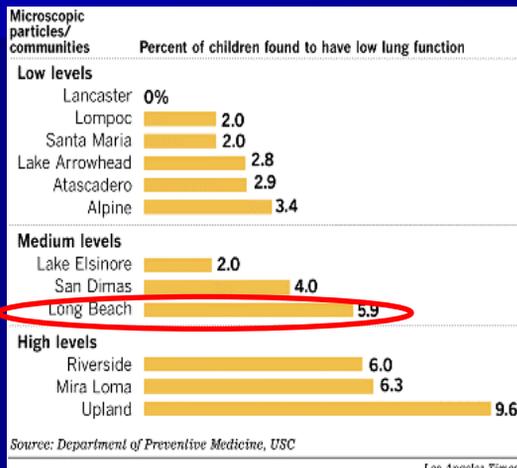
- NOx causes a wide variety of health & environmental impacts
- NOx is a precursor to smog
- NOx causes respiratory problems:
 - exposure can lead to significant decreases in lung function growth among children
 - NOx has been linked to increased risk of lung cancer
- It may also cause birth defects



Source: NRDC, 2004



Low Lung Function due to Air Pollution *USC, Keck School of Medicine*



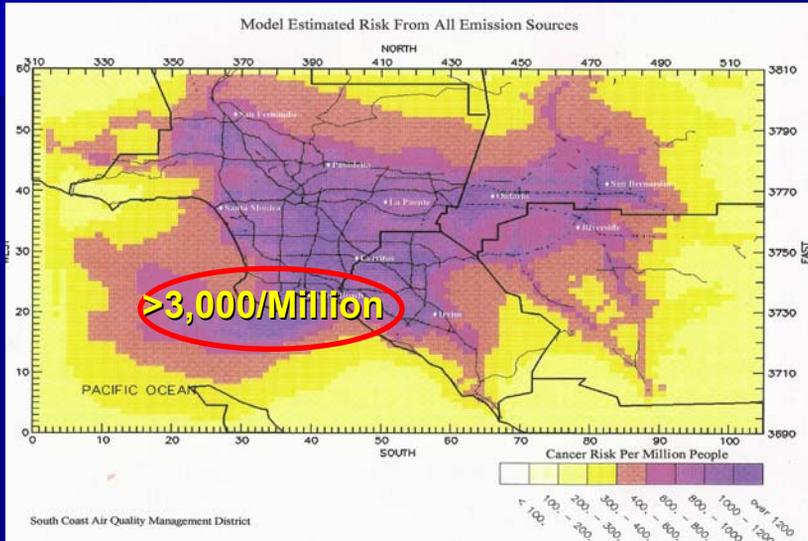
- Examined 1,800 So Cal children in 12 communities over 10 yrs
- Significant lung function loss due to slowed lung growth and high asthmatic rates
- Study links both PM and NO₂ emissions to port communities



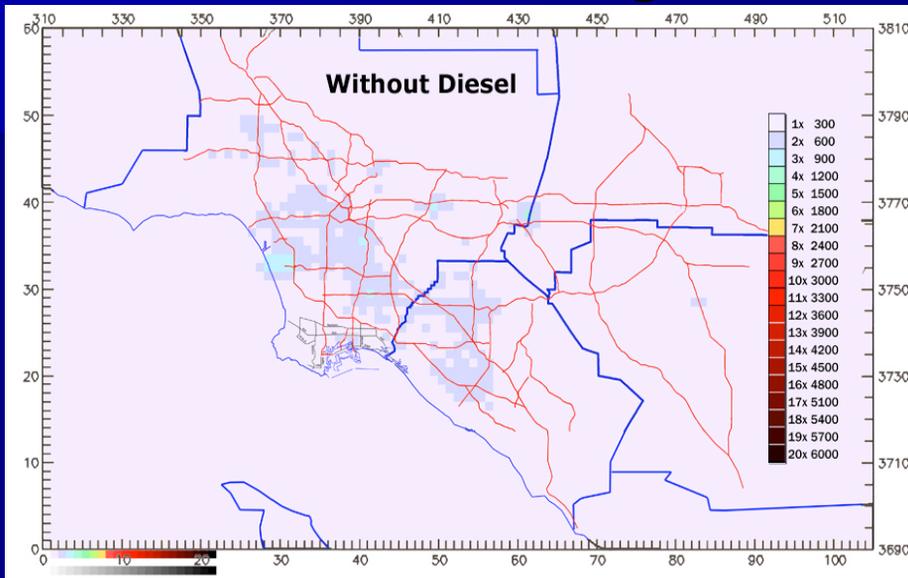
**Long Beach
among worst**



SCAQMD Cancer Risk Study



Cancer Risk Excluding Diesel



Source: NRDC, 2004



Primary Community Concerns

- Major public health impact
- Poor relationship with Port officials
- Minimal buffer between residents and port
- Lack of adequate mitigation for all projects



Harboring Pollution Reports



1st Report revealed the health impacts of port pollution and evaluated 10 largest ports based on:

- Air Quality
- Water Quality
- Land Use
- Community Relations

2nd Report assessed feasibility and cost-effectiveness of stringent measures that are available today & provided policy and technical recommendations



Port Pollution Can Be Reduced



Principal Sources of Diesel Exhaust Pollution at Ports

- Marine Vessels
- Harbor Craft
- Yard Equipment
- Trucks
- Locomotives



Ports of LA and LB create nearly one-quarter of the PM and NOx for the entire region!



Marine Vessels - *Mitigation*

- **COLD IRONING:** Require electrification of existing wharves and at least 70-80% of ships calling on the terminal to plug in to electric power while at berth.

Cold-ironing eliminates a ton of pollution per day for each ship that plugs in.

- **CLEANER FUELS:** Require cleaner diesel fuels that contain a sulfur content level no higher than 1,000 or 2,000 ppm while at berth (if not using electric power) and while maneuvering.

CARB recently adopted rules that require vessel auxiliary engines to reduce emissions. One method to achieve reductions is to use cleaner fuels. But use of the "cleanest fuels" (1-2%) is not required.

- **EMISSIONS CONTROLS:** Use of selective catalytic reduction (SCR) can reduce NOx emissions by more than 80%



Yard Equipment - *Mitigation*

- **ALTERNATIVE FUEL NEW YARD TRACTORS:** Require all new yard tractors to use alternative fuels

Switching from diesel to natural gas can reduce NOx by more than 60% and PM by 30%

- **RETROFIT & CLEANER FUELS:** Retrofit all existing equipment w/the best available control devices and require a switch to low-sulfur fuel

- **RETIRE OLD EQUIPMENT:** Retire all yard equipment that is 10 or more years old and replace with the cleanest equipment and fuel choices

CARB recently adopted rules that will accelerate the turn-over of yard equipment, BUT there is no preference for alt fuel equipment



Heavy Duty Trucks - *Mitigation*

- **TRUCK REPLACEMENT PROGRAM:** Fund programs that provide incentives to replace and retrofit older trucks
 - **"Gateway Cities" has replaced more than 200 pre-1984 trucks, removing more than 160 tpy of NOx and 40 tpy of PM**
- **LIMIT IDLING:** A 10 min. idling restriction can result in significant fuel savings and reductions in PM and NOx
- **CLEANER FUEL:** Require diesel emulsions or Low Sulfur Diesel with after treatment devices



Locomotives - *Mitigation*

- **ALTERNATIVE FUELS:** Replace diesel switcher locomotives (which operate for long periods at terminal and tend to be very old) w/alt fuel switchers or w/diesel hybrid switchers
 - Switching from diesel to electric-hybrid or natural gas switching engines reduces smog-forming NOx emissions by 50-85%
- **LIMIT IDLING:** Implement idling restrictions on locomotives and require installation of automatic engine shut-off equipment to limit idling



Technological Recommendations

Short Term  Longer Term



Emission Reduction Goals

If current technology is applied to reduce emissions from from ships, trucks, yard equipment and locomotives, significant emissions reductions can be achieved from each source:

- At least a 33% reduction in NO_x
- Almost a 66% reduction in PM

But, given that the Ports plan to triple trade, even this won't be enough. More is needed, and expansion projects must be even cleaner to insure a reduction in emissions over time as ports expand.



Policy Recommendations

- **Container Fees**
 - Funds for air quality mitigation fees
 - Graduated Harbor Fees incentivizing cleaner equipment
- **Reduce total emissions to a baseline year then beyond**
- **Using new leases and renegotiations to require mitigations**



CONCLUSION

- **Trade must be conducted in an environmentally sound sound manner.**
- **Feasible emission reduction technologies exist and must must be applied to existing and new sources.**
- **Ports, cities and regulators have the ability and responsibility to require that these technologies be implemented. Such requirements must be mandated by mandated by regulations or required as part of the terminal lease. Voluntary measures have proven insufficient.**
- **Industry, cities, states, and the federal government can can and should put aside money to pay for and incentivize a switch to clean practices.**





Photo credit: Gilbert Estrada (above)
& Kristin Hayes (below).



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