



## Community Health: Impacts of Goods Movement

Long Beach Alliance for Children with Asthma  
(LBACA)

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### The Long Beach Alliance for Children With Asthma (LBACA)



- **Vision:** LBACA is broad based community partnership to improve the lives of children with asthma in Long Beach, San Pedro, Carson & Wilmington.
- **Recognition:**
  - One of 7 grantees of the RWJ Foundation's *Allies Against Asthma* program
  - One of 12 grantees of CA Endowment's *Community Action to Fight Asthma* (CAFA) program

# Community Health



A perspective on public health that assumes community to be an essential determinant of health and the indispensable ingredient for public health practice. It take into account the tangible and intangible characteristics of the community.

# Goods Movement Background Information



- California is called the “doorstep to the nation” – over 40% of the nation’s imported goods come through our ports.
- The flow of containers has increased 175% since 1990 and is expected to triple by 2020.
- The Ports of Los Angeles and Long Beach combined qualify as the 3<sup>rd</sup> largest port complex in the world.
- The reach of pollution from goods movement impacts communities throughout the state.

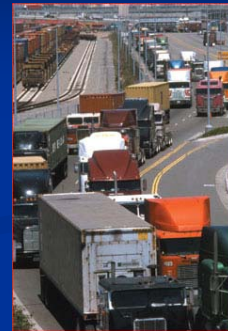
# Sources of Pollution from Goods Movement



High polluting diesel engines used in:

- Cargo Ships
  - Harbor Craft (ex. Tugboats)
  - Cargo Handling Equipment used to move cargo around facilities
  - Trains
  - Trucks
- Also, jet engine exhaust generated by airport operations.

## Powered by Diesel

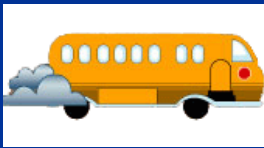


# Air Pollutants Regulated by Government Agencies

- Ozone ( $O_3$ )
- Particulate Matter (PM)
- Carbon Monoxide (CO)
- Nitrogen Dioxide ( $NO_2$ )
- Sulfur Dioxide ( $SO_2$ )
- Lead (Pb)



## Ozone ( $O_3$ ) (Smog)



Emissions  
(Containing VOCs or  
 $NO_x$ )

+



Sunlight

=

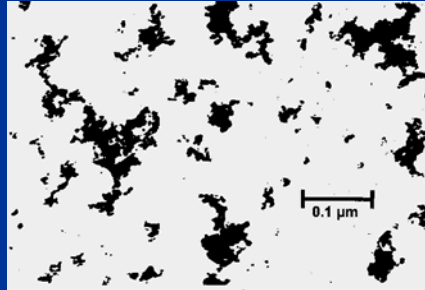


Ozone (smog)

(Photochemical reaction)

## Particulate Matter (PM)

- Particles floating in the air
- By-products of fuel combustion in cars, power plants, and refineries, combined with dust or pollen



### PM<sub>10</sub>

- Particles that are 10 micrometers in diameter
- Sometimes called “coarse” particles
- Can travel in the air up to 30 miles

### PM<sub>2.5</sub>

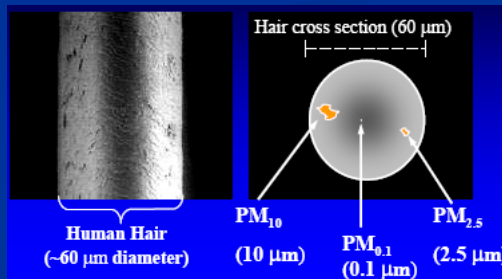
- Particles that are 2.5 micrometers in diameter
- Sometimes called “fine” particles
- Can travel in the air up to 500 miles

Ultra-fine  
Particles

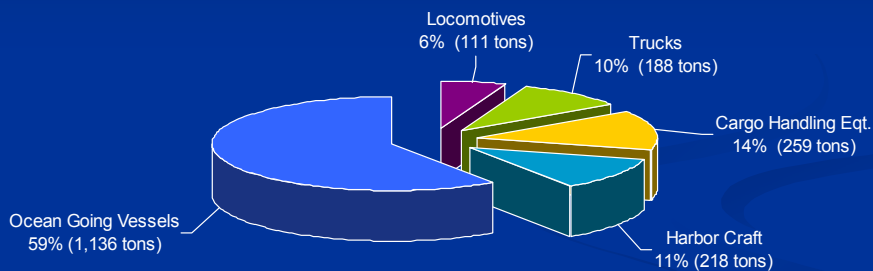
extremely tiny, smaller  
than 2.5 micrometers

# What is diesel exhaust?

- Since 1990, diesel exhaust has been listed as a known **carcinogen** under California's Prop 65. In 1998, the California Air Resources Board formally listed diesel particulate as a **toxic air contaminant**.
- A cocktail of thousands of gases and fine particles (referred to as **soot**) that contains more than 40 toxic air contaminants.
- 94% of diesel emissions are estimated to be ultrafine particles which can bypass respiratory systems and lodge deep in the lungs.
- Contains **Nitrogen Oxides (NOx)** a major component of smog.

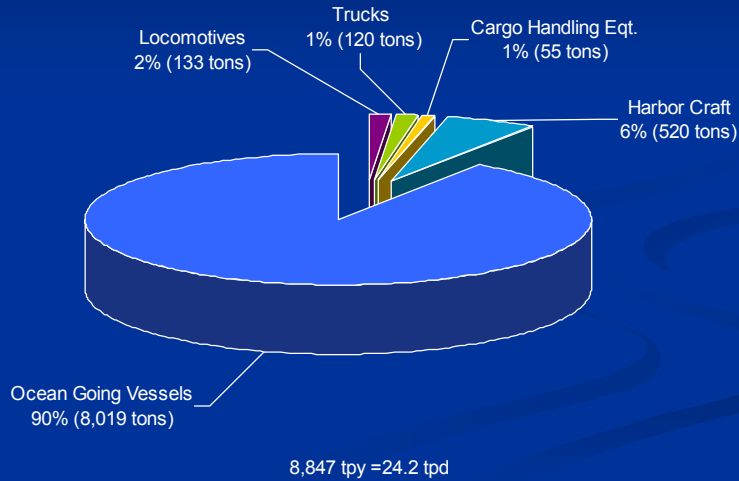


## International Goods Movement Diesel Particulate Matter Emissions



1,912 tpy = 5.2 tpd

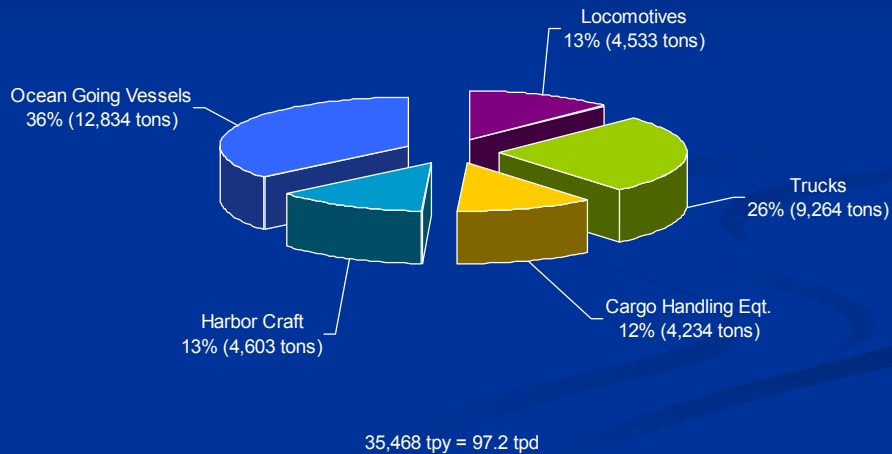
## International Goods Movement SO<sub>x</sub> Emissions



## SO<sub>x</sub>

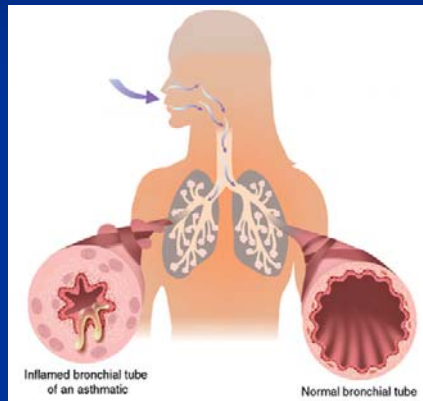
- SO<sub>x</sub> gases are formed when fuel containing sulfur, such as coal and oil, is burned.
- Marine Vessels are the largest single source of Sulfur Oxides in the region—44% of these emissions in 2005.
- Sulfur Oxides are a major contributor to particles in the air.

## International Goods Movement NO<sub>x</sub> Emissions



## Particles in the Body

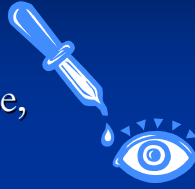
- Primary route of entry into the body: inhalation
- The larger a particle is, the more likely it is to get stuck in the body's first defenses, the lungs, causing illness or disease.
- Ultrafine particles (the tiniest) can get into the bloodstream and move to other organs throughout the body





## Immediate Health Effects of Diesel Exposure

- Irritation of eyes, nose, throat, and lungs.
- Coughing, headaches, light-headedness, nausea.



## Long Term Health Effects of Diesel Exposure

- Increased respiratory illnesses
  - Decreased lung function growth in children
  - Asthma exacerbations
  - Increased doctors' visits and school absences
- Exposure linked to increased risk of developing lung and other types of cancer.
- Premature Birth
- Cardiovascular Disease

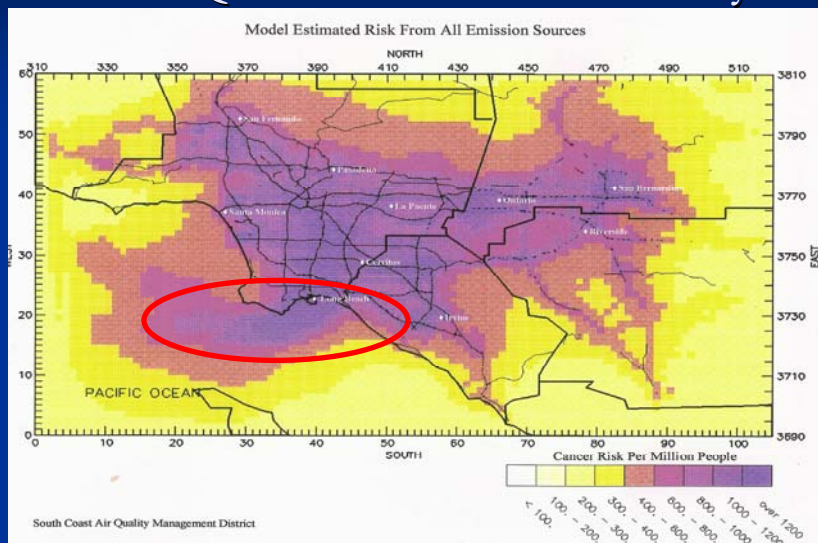


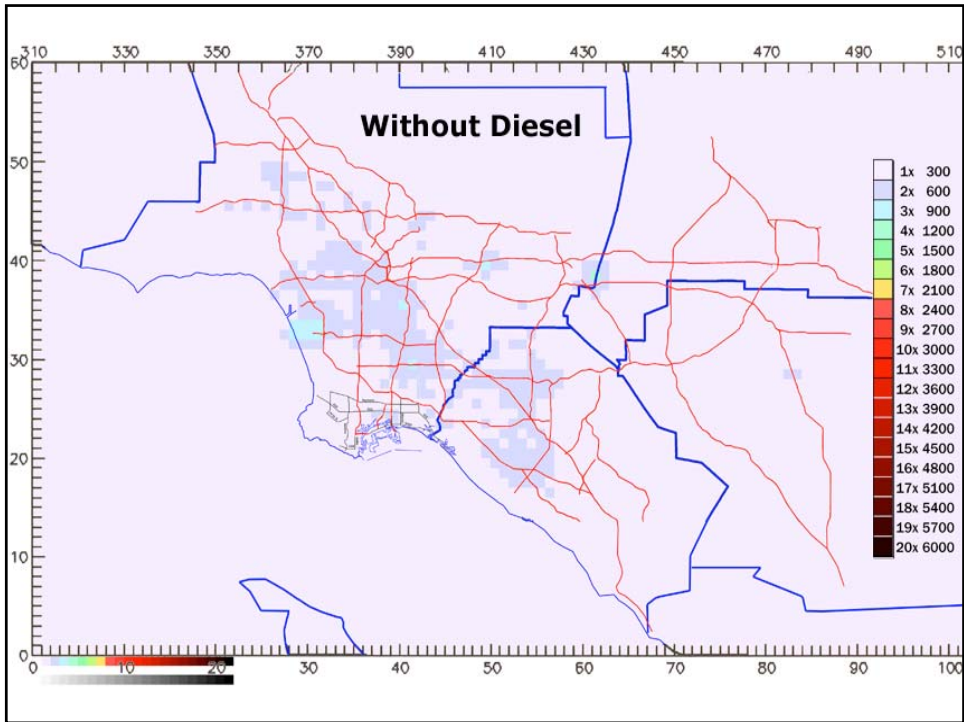
# Health Effects of Diesel Exhaust Exposure (cont.)



- The California Air Resources Board (CARB)'s Emission Reduction Plan attributed the following health impacts to Ports and Goods Movement in California:
  - 2400 premature deaths annually, mostly from particulate pollution,
  - 2000 hospital admissions (respiratory causes),
  - 830 hospital admissions (cardiovascular causes),
  - 62,000 Asthma and Other Respiratory Symptoms,
  - 360,000 Lost Work Days, and
  - 1,100,000 School Absence Days.
- Estimated economic value of the health impacts of PM and Ozone pollution from Ports and Goods Movement (w/measures adopted Oct 2005): **\$19 Billion Dollars annually**
- For every \$1 invested in reducing emissions, an estimated \$3-\$8 benefit in health impacts would result.

## SCAQMD Cancer Risk Study





## USC Children's Health Study

- Most comprehensive study on air pollution and health effects on children
- Studied 1800 children from schools in 12 southern California communities and measured lung function annually for eight years



Findings from the 10-year  
USC Children's Health Study (CHS)

■ **In the more polluted communities,  
children have:**

- More school absences
- Asthma exacerbation
- New cases of asthma
  - related to **high ozone levels** in active children
- Reduced lung function

Findings from the 10-year  
USC Children's Health Study (CHS)

- **Children living closest to freeways have a  
two fold risk of asthma**
- **18 year olds growing up in polluted  
communities in Southern California have a  
5-fold risk of having abnormal lungs –  
related to a package of traffic-related  
pollutants (e.g., PM, NO<sub>2</sub>, elemental  
carbon)**

Gauderman et al., [USC Children's Health Study] *Epidemiology*,  
2005

Gauderman et al. USC Children's Health Study,  
*NEJM*, 2004

## Findings from the 10-year USC Children's Health Study (CHS)

- **Children living within 500m of a freeway had twice as much decreased lung function as compared to children living within 1500m.**

Gauderman et al., [USC Children's Health Study] *Lancet*, 2007

## Health Effects of Living Near Traffic

- **Children and adults who suffer from asthma and live near heavy vehicular traffic are nearly three times more likely to visit the ER or be hospitalized for asthma than those who live near low traffic density.**

Meng et. al., UCLA Health Policy Research Brief, August 2006

## Asthma Prevalence in Children - LA County

- 2X higher rate among African Americans
  - African Americans: 16%
  - White: 9%
  - Latino: 6%

*Los Angeles County Department of Health Services LA HEALTH report, October 2004  
Los Angeles County Healthy Survey, Office of Health Assessment & Epidemiology 2002-03  
Los Angeles County Health Survey, 2005*

## Asthma Hospitalizations – L.A. County

**10%** of residents are African American

**22%** of asthma hospitalizations are African American

*Los Angeles County Department of Health Services Patient Discharge Data, 2004*

## Environmental Justice

- There is evidence that urban communities, where many minority and lower-income residents live, experience:
  - higher air pollution exposure levels, and
  - higher risks for disease than non-urban communities

## LBACA's Policy & Advocacy Work



- **Local, Regional and Statewide Groups recognize community input.**
  - LBACA presents “community voice” at hearings for the Air Quality Management District (Regional Agency), The California Air Resources Board (Statewide Agency), and locally at the Port of Los Angeles (POLA) /Port of Long Beach (POLB) and City Council meetings
  - LBACA Moms honored/celebrated for their community involvement, which brings more community members to the table
    - AQMD Clean Air Awards for Community Engagement/Education
    - LBACA called upon locally, regionally and nationally to bring community representation

## LBACA's Policy & Advocacy Work



- Local, Regional and Statewide Groups recognize community input (cont.)
  - Continue to advocate for cleaner technology as ports expand to follow both Mayors of LA/LB “Grow Green” ideology.
    - Changed the original design of the 710 freeway
    - Commitment from POLA to invest \$1 million in a demonstration project for alternatives to a 710 freeway expansion
    - Clean Air Action Plan (CAAP) from POLA/POLB attributed to community advocacy for cleaner air (LBACA cited during Press Conference)

## LBACA's Policy & Advocacy Work



- Local, Regional and Statewide Groups recognize community input (cont.)
  - LBACA Selected to participate in Mayor of Los Angeles/Long Beach's *Goods Movement Advisory Task Force* to identify “green” projects for infrastructure bond
  - Participation in the Coalition for Clean & Safe Ports working to improve the pollution from trucks and their working conditions at the port
  - LBACA Moms lobbied on Container Bill SB 927 and helped bring to the bill to the governor's desk





Students playing on school field near Terminal Island Freeway.

*LB Press Telegram photo, 2004.*



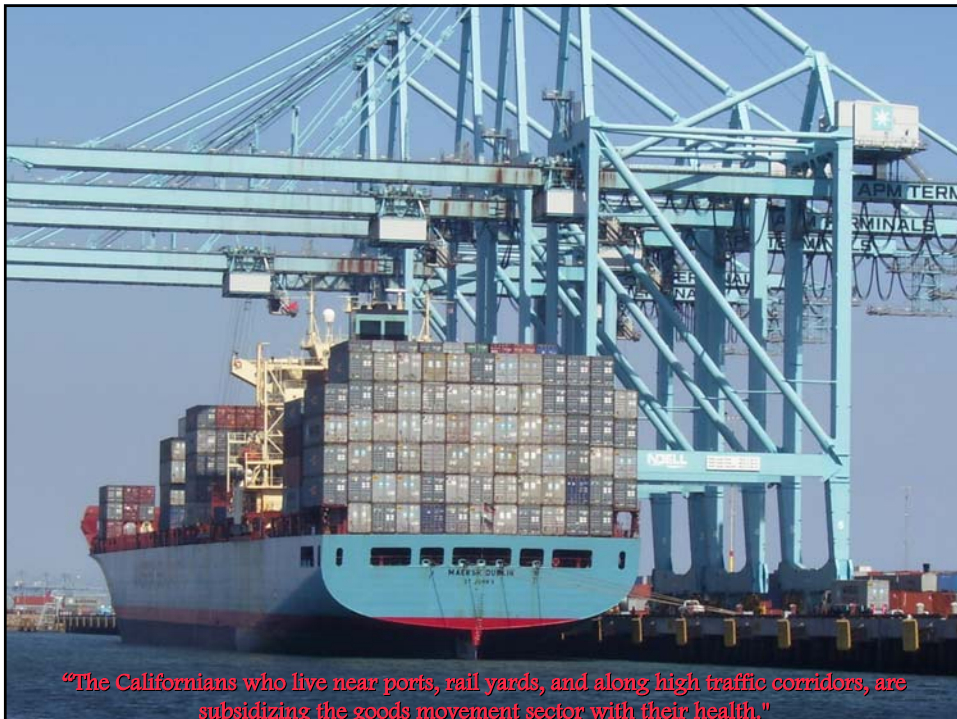
Day care center adjacent to Terminal Island Freeway

*Photo: Andrea Hricko, 2005*



Cabrillo H.S. student playing ball in field next to freeway and rail line

*Photo: Andrea Hricko, 2005*



*"The Californians who live near ports, rail yards, and along high traffic corridors, are subsidizing the goods movement sector with their health."*

## References

- Hansen, M. Do highways generate traffic? UC Berkeley Transportation journal, ACCESS. No.7, Fall 1995.
- CARB. EMFAC Modeling Change Technical Memo, 2002.  
[www.arb.ca.gov/msei/onraod/downloads/revisions/Web\\_Speedjrl.doc](http://www.arb.ca.gov/msei/onraod/downloads/revisions/Web_Speedjrl.doc)
- CARB announcement at AQMD AQMP meeting of 7/11/06, Diamond Bar.
- CARB's Emission Reduction Plan for Ports and Goods Movement in California. March 21, 2006
- Zhu et. al., Concentration and size distribution of ultrafine particles near a major highway. Air & Waste Management Assoc. 52: 1032-1042. 2002