Additional Considerations for Traffic and Health Review

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CALIFORNIA
AIR RESOURCES BOARD

California Transportation Policy Drivers

- Improve Air Quality
  - Meet NAAQS
  - Reduce diesel PM cancer risk 85%
- Reduce Environmental Disparities
- Decarbonize Economy
  - Reduce GHG 40% from 1990 levels by 2030
  - Reduce per capita VMT (vehicle miles traveled)
- Assist Land Use Decisions

NAAQS = National Ambient Air Quality Standards
PM = particulate matter
GHG = greenhouse gases

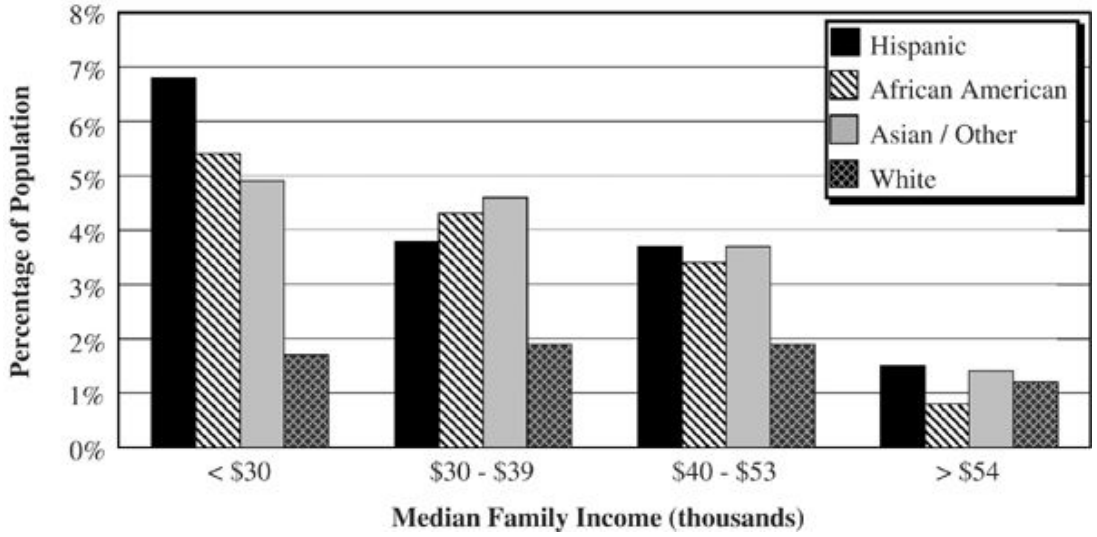
Additional Consideration: In-Vehicle Exposures

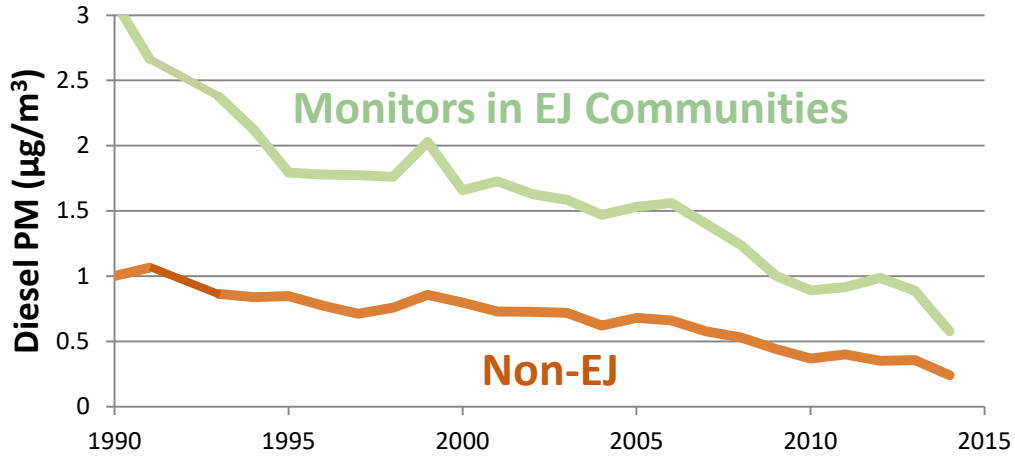
- Los Angeles School Bus Exposure Study
  - Commute represents 30% of daily BC exposure (Behrentz et al. 2005, *JAWMA*)
  - 40 children inhaled more self-pollution than all air basin residents combined (Marshall and Behrentz 2008, *EST*)
  - Options
    - Use cleanest buses for longest routes
    - Avoid caravanning
    - Transition to cleaner fuels/technologies
- California Commuters
  - In-vehicle contributions to total diesel PM exposures ranged from 30% to 55% (Fruin et al. 2004, *AE*)

BC = black carbon
JAWMA = Journal of the Air & Waste Management Assoc
EST = Environ Sci Technol
AE = Atmos Environ

Additional Consideration: Exposure Disparities

- California children of color 3 times more likely to live in high-traffic areas than white children (Gunier et al. 2003, *JESEE*)
- Compared to whites, nonwhites in Los Angeles have 16-29% higher mobility-based exposures for benzene, 1,3-butadiene, and diesel particles (Marshall 2008, *AE*)
- Diesel PM levels at monitors in EJ communities higher than in non-EJ communities (Alvarado et al., in review)



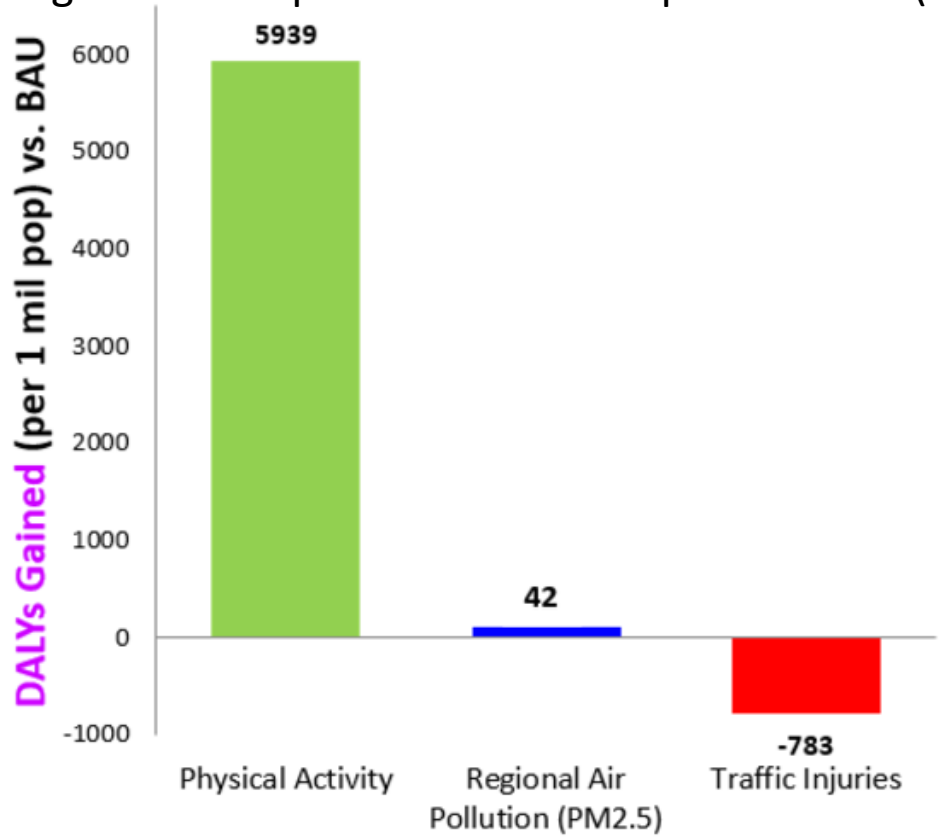


JESEE = Journal of Exposure Science & Environmental Epidemiology
AE = Atmos Environ
EJ = environmental justice

Additional Consideration: Integrated Health Impacts

- Factors usually considered by current models
  - Physical activity
  - Regional air pollution
  - Traffic injuries
- Other factors
  - Near-roadway exposure
  - In-vehicle exposure
  - Aging population
  - Noise

2035 Walk/Bike Scenario in San Francisco using the Integrated Transport and Health Impacts Model (ITHIM)

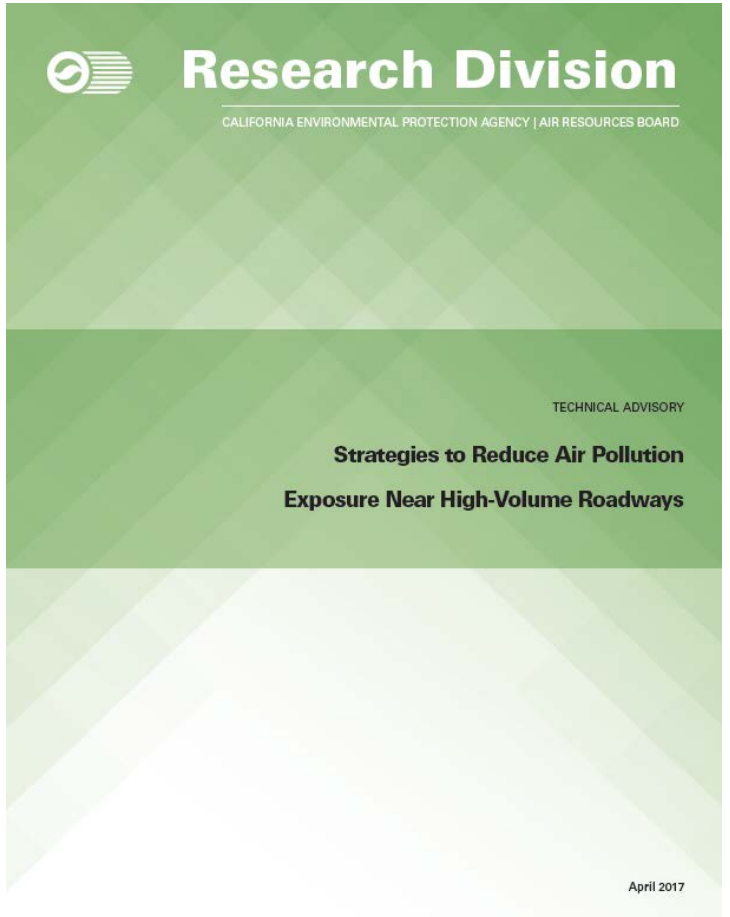


Maizlish et al. 2013, *AJPH*

AJPH = American Journal of Public Health

Additional Consideration: Exposure Mitigation

- Technical supplement to the 2005 Land Use Handbook
- Options for planners to reduce exposures near busy roadways:
  - Peer-reviewed literature through 2016
  - Consistent findings from multiple studies with diverse methods
  - 20-30% or higher exposure reductions
  - Information on tradeoffs, appropriate context, etc.
- Extensive expert review



The Technical Advisory and an accompanying fact sheet can be downloaded at: https://www.arb.ca.gov/ch/landuse.htm

Technical Advisory Strategies

Strategies that reduce traffic emissions	1. Speed reduction mechanisms including roundabouts 2. Traffic signal management 3. Speed limit reductions on high-speed roadways (>55 mph)

Strategies that reduce the concentration of traffic pollution	4. Urban design that promotes air flow and reduces the concentration of pollution along street corridors 5. Solid barriers such as sound walls 6. Vegetation that reduces the concentration of pollution

Strategies that remove pollution from indoor air	7. Indoor high efficiency filtration that removes pollution from the air