Additional Considerations for Traffic and Health Review

HEI Annual Conference
April 30, 2018

Bart Croes, Chief
Research Division

1-916-323-4519
bart.croes@arb.ca.gov
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  |