



Community Risk Reduction Plans, San Francisco Pilot: Modeling, Thresholds, Mitigations

CARE Task Force Meeting

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Overview

- Update
- Modeling Approach
 - Some preliminary results
- Citywide Thresholds
- Mitigations
- Next Steps



Update

Community Risk Reduction Plans (CRRPs):

- Can integrate risk/hazard mitigation into local planning processes
- Can address new and existing exposures
- Can provide a focal point for healthy-community discussions
- Need detailed information about pollution sources
- Need multi-agency collaboration
- Need new ideas, approaches



San Francisco Modeling Setup

- Emissions/Sources of Air Pollution
 - ☒ On-road, mobile
 - ☒ Permitted, stationary
 - ☐ Rail - CalTrain
 - ☐ Ships, harbor craft
 - ☐ Construction?
- High density receptors relevant for planning:
about 65 feet spacing
- Terrain & source heights, but no building effects
- Modeling only San Francisco emissions and only
directly emitted compounds

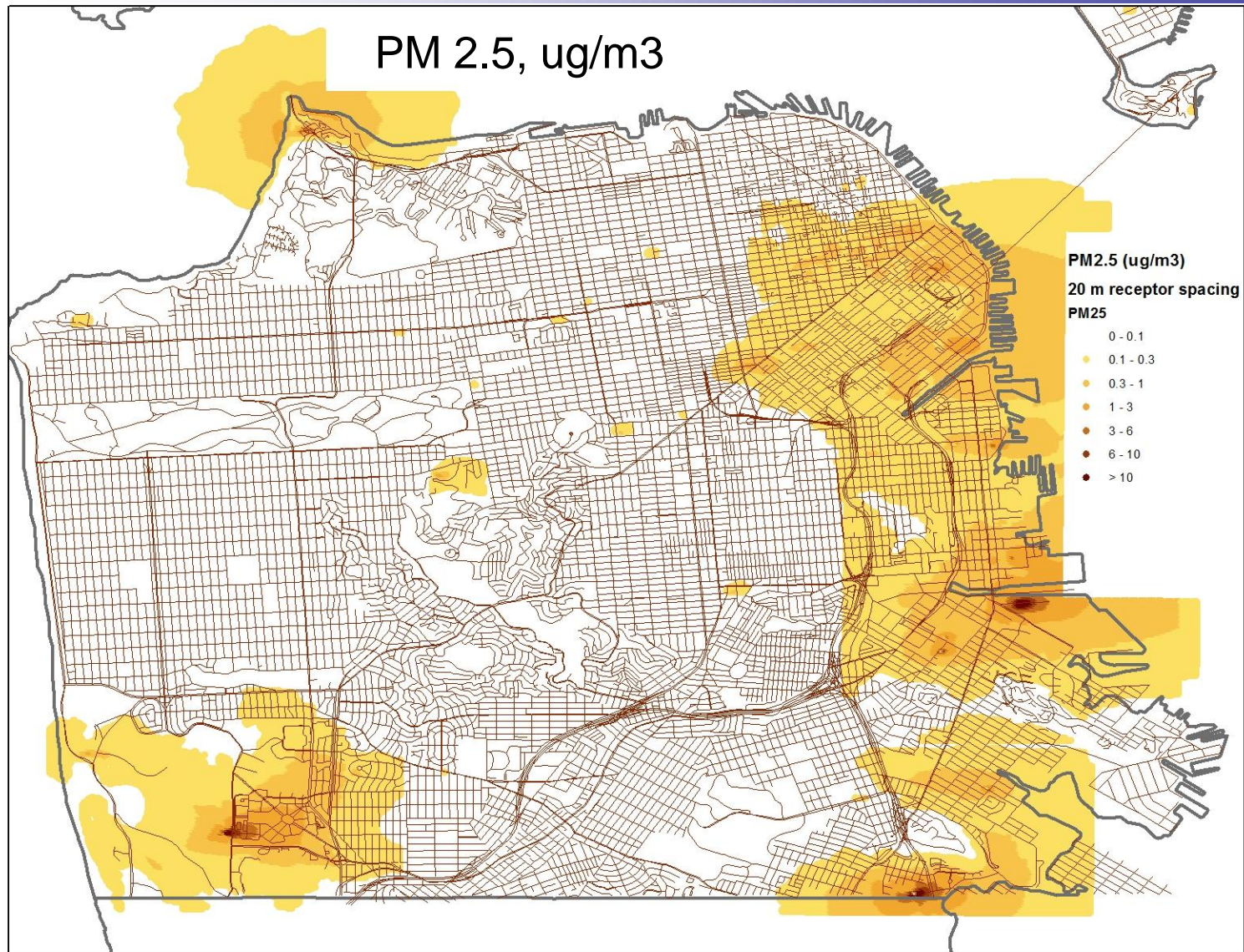


Preliminary Modeling Results: On-Road Mobile

2010 PM 2.5 Concentration



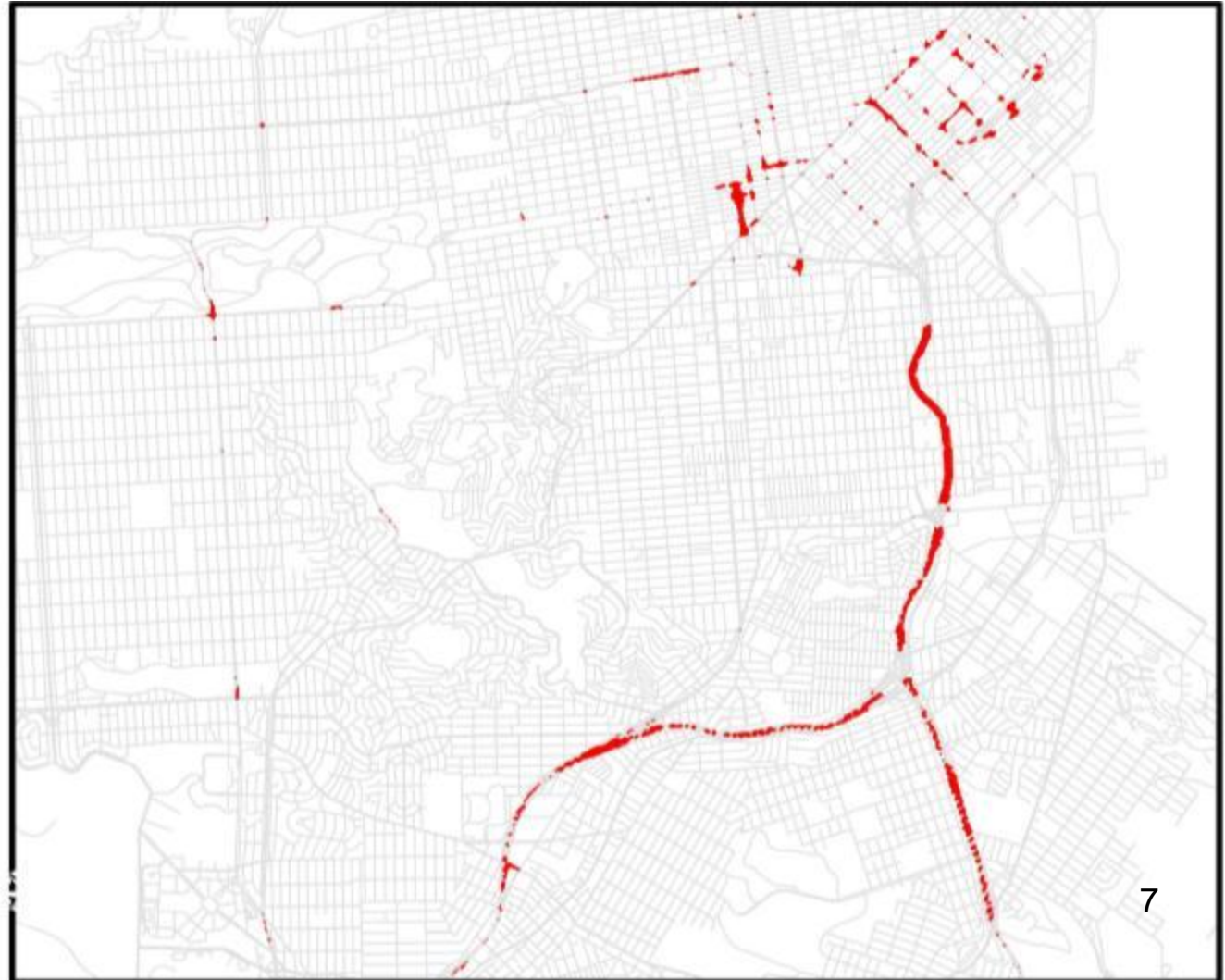
Preliminary Modeling Results: Permitted Stationary Sources



Preliminary Threshold Development

2010 PM_{2.5} from on-road mobile over 11 µg/m³

- Thresholds for
 - PM_{2.5}
 - Cancer Risk
 - Hazard Index
- Example:
 - 11 µg/m³
 - PM_{2.5}
 - threshold
- 2010 vs. 2025

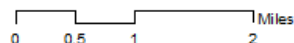
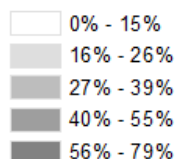


Assure Reductions in Impacted Communities

2010 PM_{2.5} from on-road mobile and stationary sources

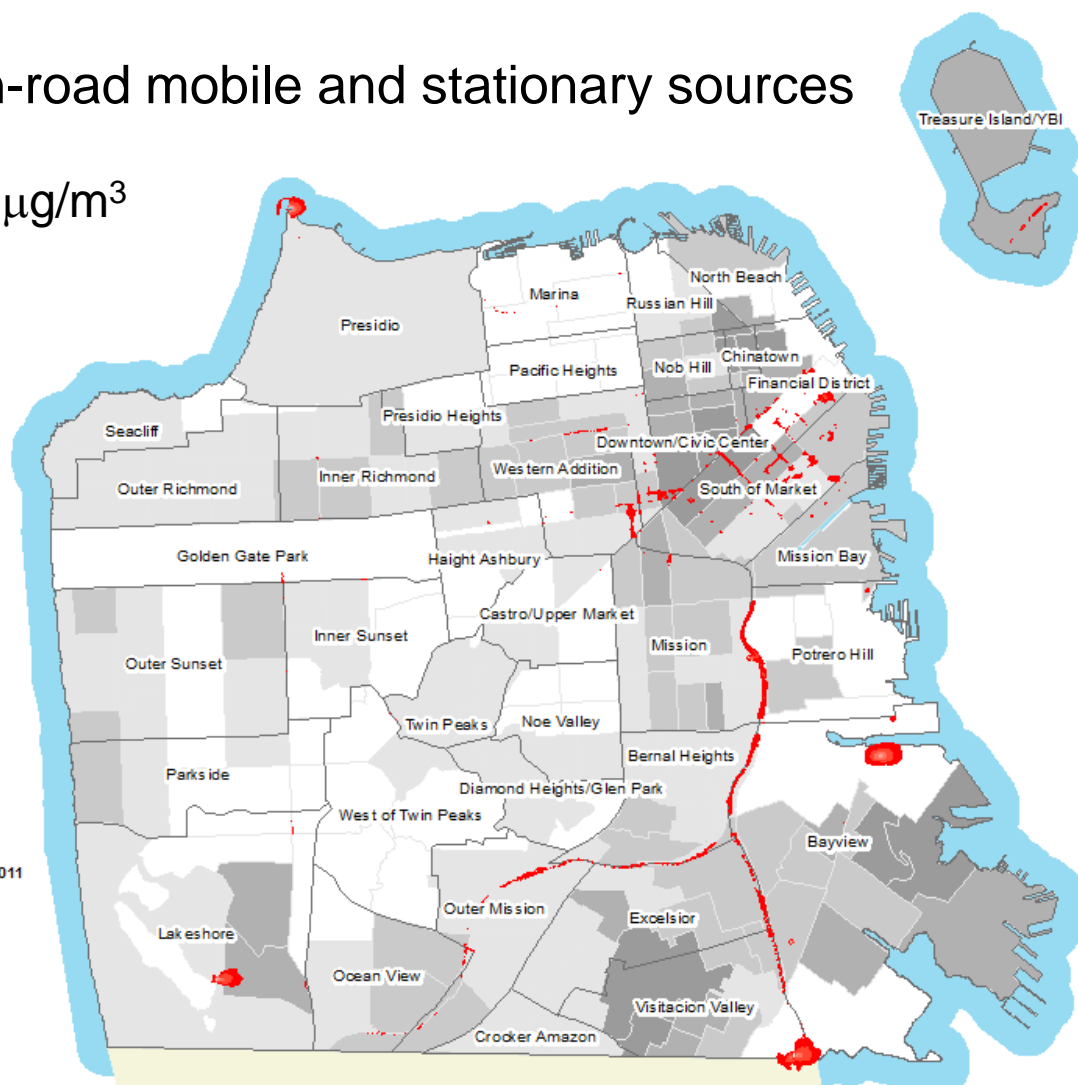
■ PM_{2.5} over 11 µg/m³

Proportion living below 200% of the federal poverty level



Source: BAAQMD, U.S. Census Bureau, 2011

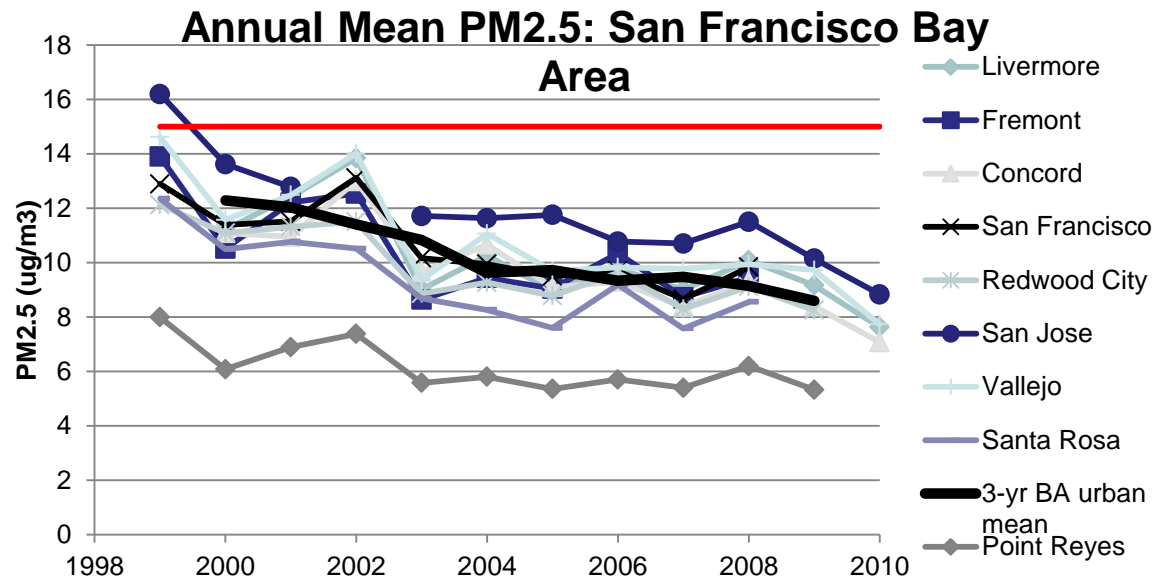
City and County of San Francisco
Department of Public Health
Environmental Health Section





Proposed Mitigations Approach

- Emission reductions outside CRRPs important
- CRRP mitigations should be quantifiable
- Mitigations for new development
 - Site design
 - Setback
 - Project timing
 - Filtration
 - Article 38



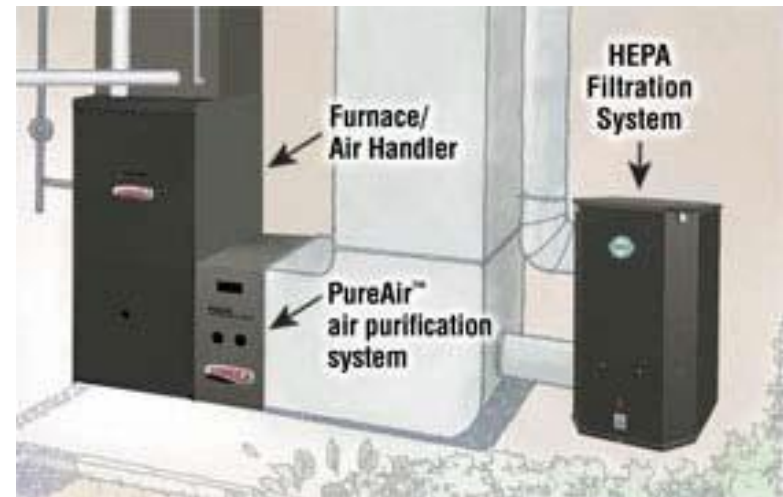
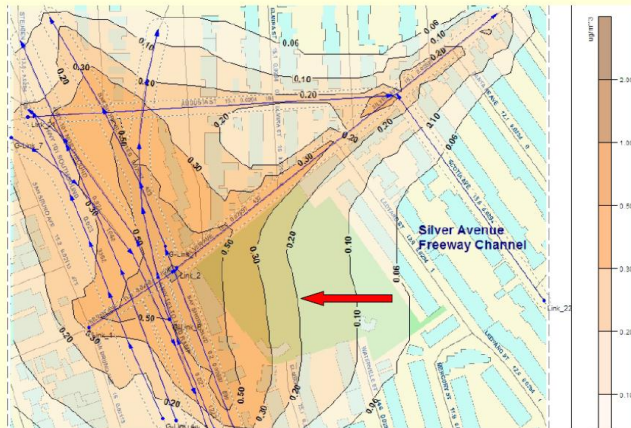


Proposed Mitigations Approach

- Mitigations for existing housing, schools
 - Sound walls
 - Vegetation
 - Retrofit filtration systems
 - Indoor air quality improvement study
 - Funding
- Source Control
 - Diesel generator controls
 - Truck routes

Mitigation: Focused Analysis to Identify High Risk Existing Residences for Filtration

Traffic-related Air Pollution (PM 2.5) - Silver Ave.



Centralized or Decentralized Filtration

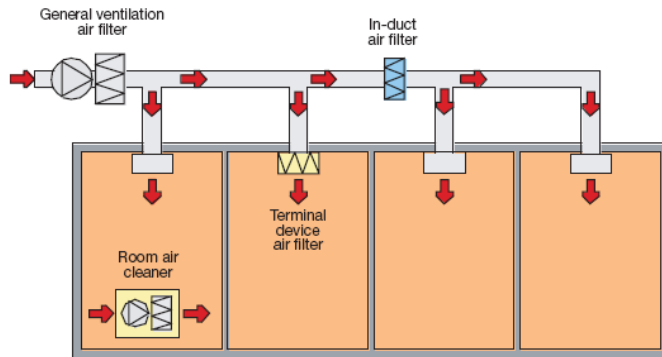
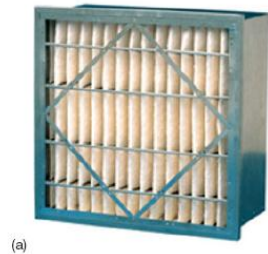


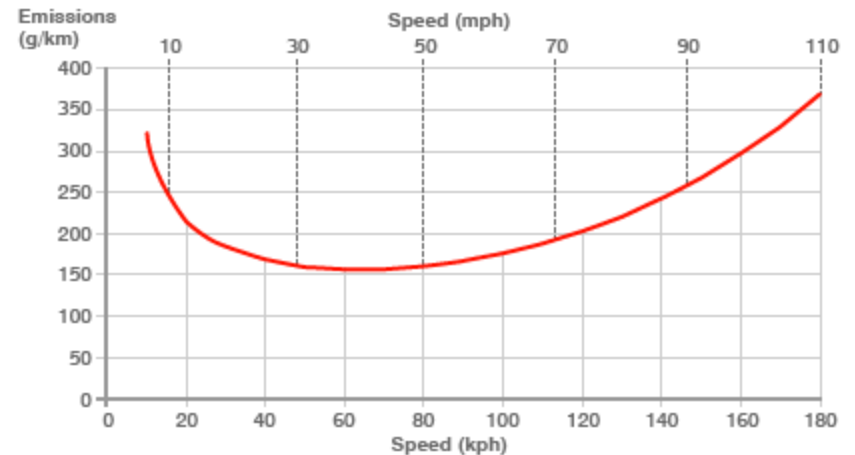
Figure 17. Decentralised air filtration.



Mitigation: 50 mph Speed Limit Enforcement on Hi.101



HOW CARBON EMISSIONS VARY WITH SPEED

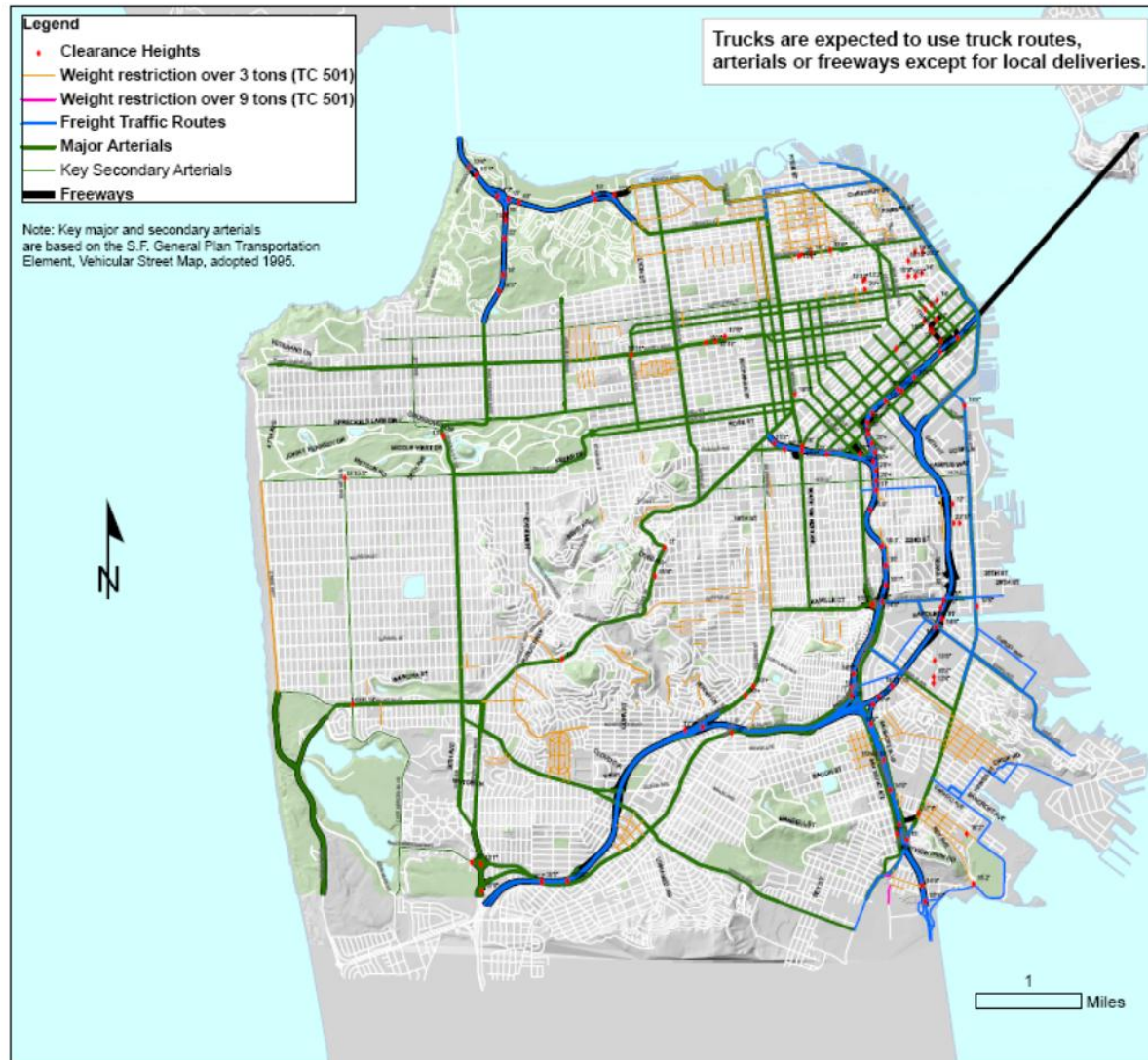


Figures based on 1.4-2.0 litre sized engine
Some newer engines may be more efficient

SOURCE: NAEI

Mitigation: Truck Rerouting

San Francisco Freight Traffic Routes

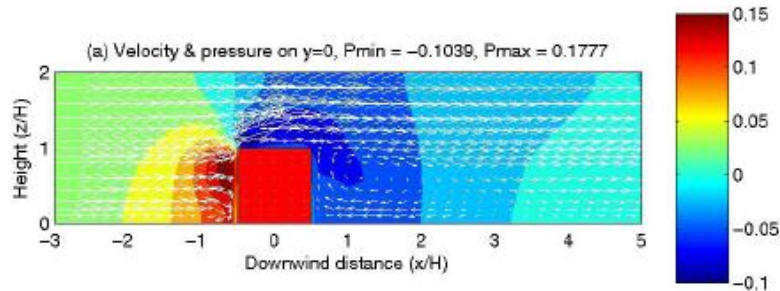


Mitigation: Sound Walls and Highway Greening

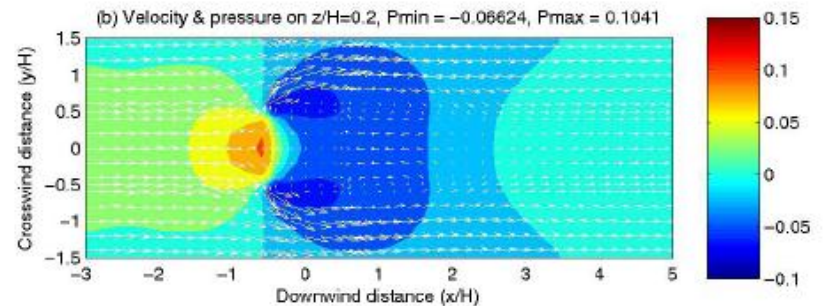
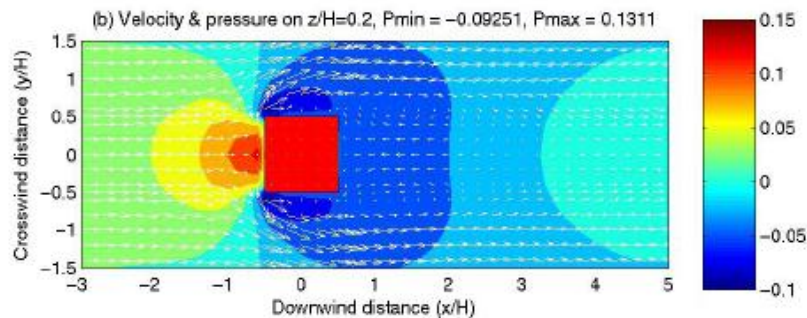
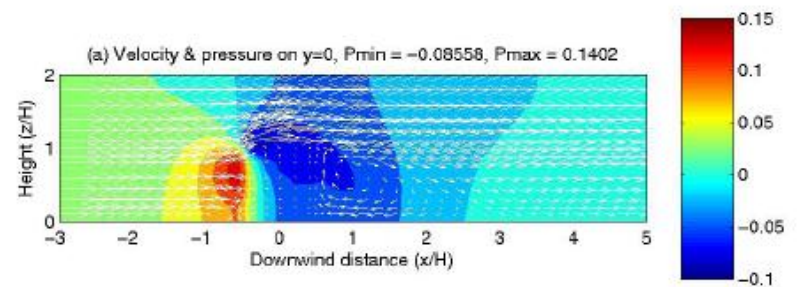


Air Quality Improves Downwind from Buildings and Barriers

(a) Solid building

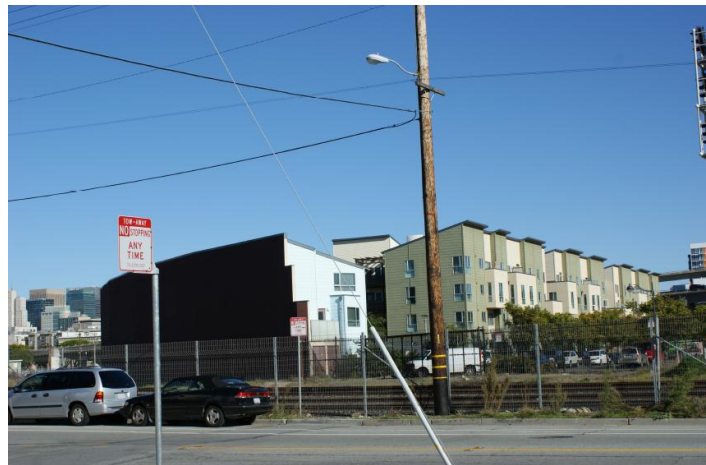


(b) Virtual building



888 Seventh St. near King

Example of Building Residential Housing Near Freeway and Train



Townhouse Layout Provides Air Pollution and Acousitical Barrier



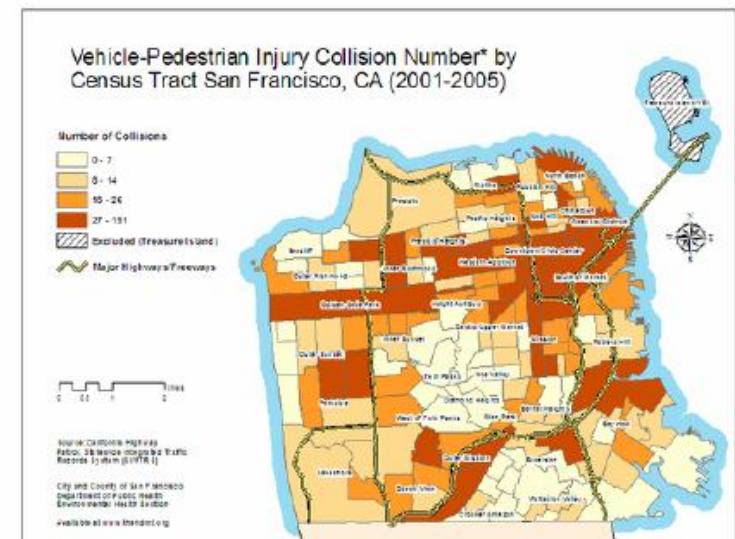
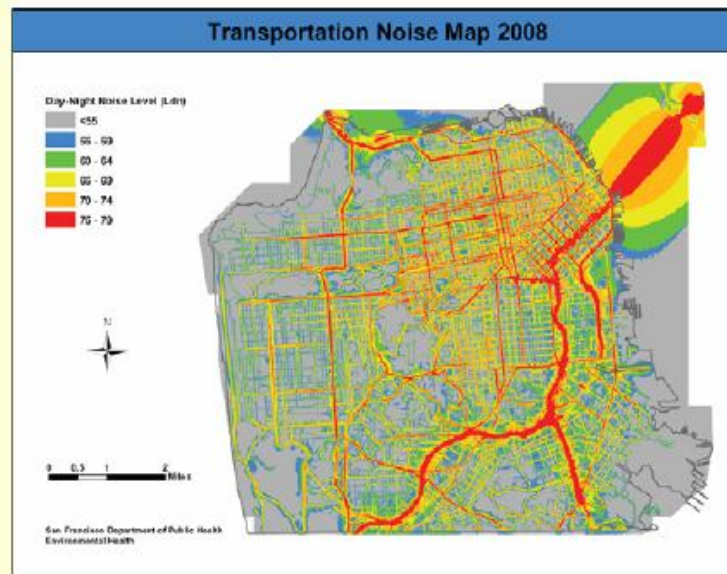
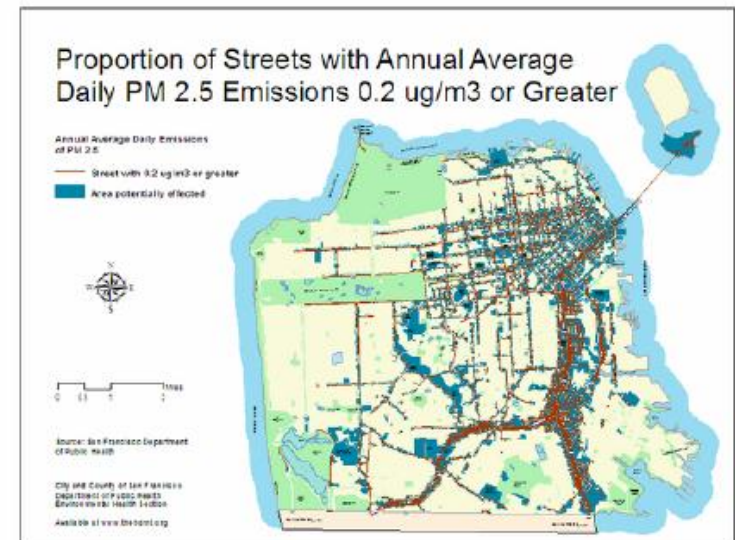
Prioritization of Disproportionately Impacted Communities for Improvements

- Double-paned windows
- Indoor ventilation systems
- Street improvements to improve safety and slow traffic – sidewalks, signalized crosswalks, covered bus stops, benches, lighting, murals, “gateways” near freeway off ramps
- Greening – trees, plantings
- Soundwalls near the freeway
- Vehicle or Parking Restrictions on Streets



Identification of Disproportionately Impacted Communities

- Residents experiencing negative health impacts of traffic exposure – on their ability to breath, to sleep, to have their children safely play outside.





Next Steps

- Complete emissions inventory
- Complete modeling 2010, 2025
- Expand public meetings & workshops
- Finalize thresholds
- Quantify mitigation measures
- More discussion of funding for mitigations for existing residents