



# 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

## 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

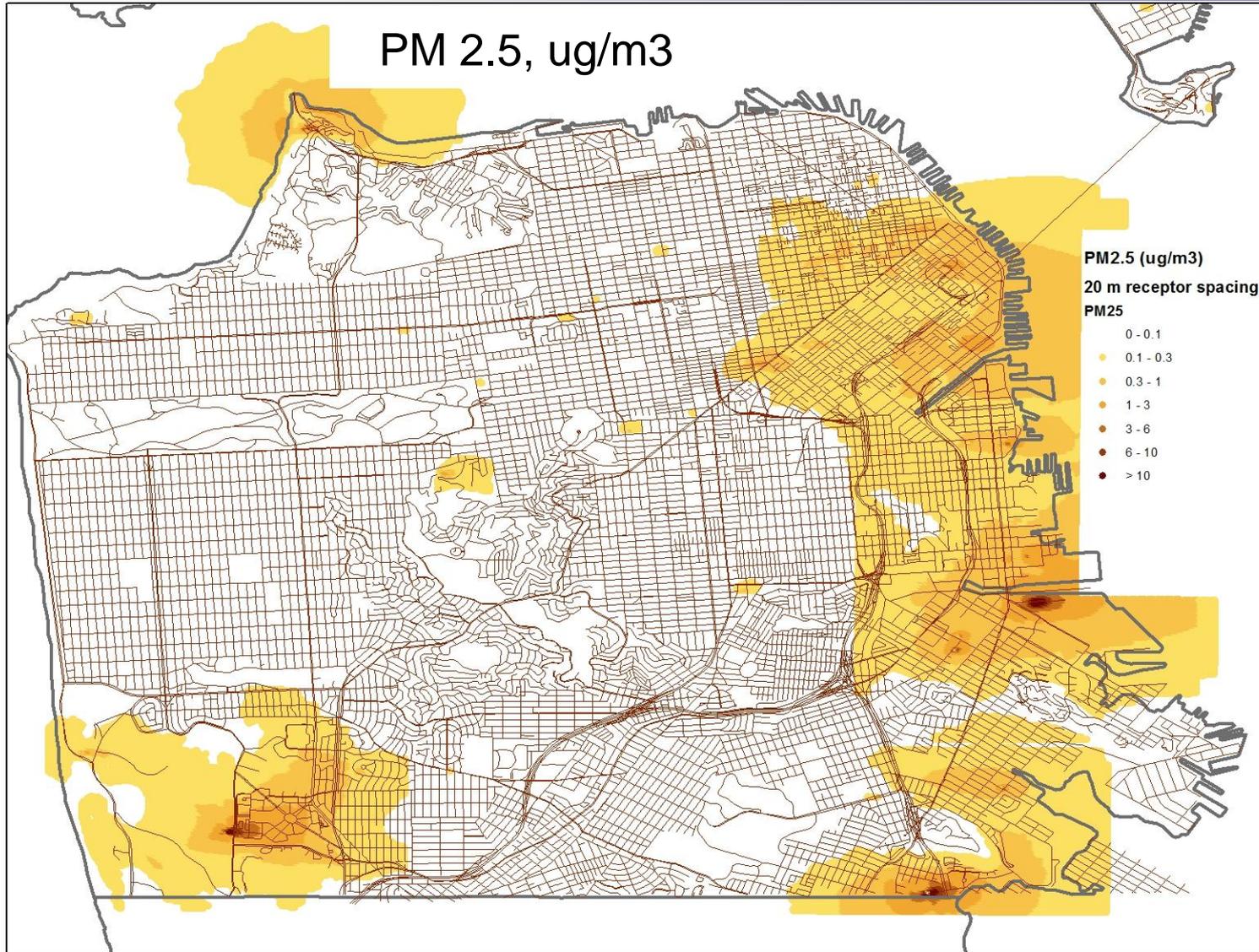
- Emissions/Sources of Air Pollution
  - On-road, mobile
  - Permitted, stationary
  - Rail - CalTrain
  - Ships, harbor craft
  - Construction?
- High density receptors relevant for planning:  
about 65 feet spacing
- Terrain & source heights, but no building effects
- Modeling only San Francisco emissions 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<sub>2.5</sub> from on-road mobile over 11 μg/m<sup>3</sup>

- Thresholds for
  - PM<sub>2.5</sub>
  - Cancer Risk
  - Hazard Index
- Example:
  - 11 μg/m<sup>3</sup>
  - PM<sub>2.5</sub>
  - threshold
- 2010 vs. 2025

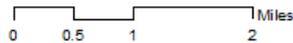
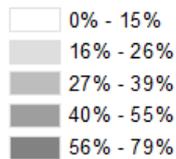


# Assure Reductions in Impacted Communities

2010 PM<sub>2.5</sub> from on-road mobile and stationary sources

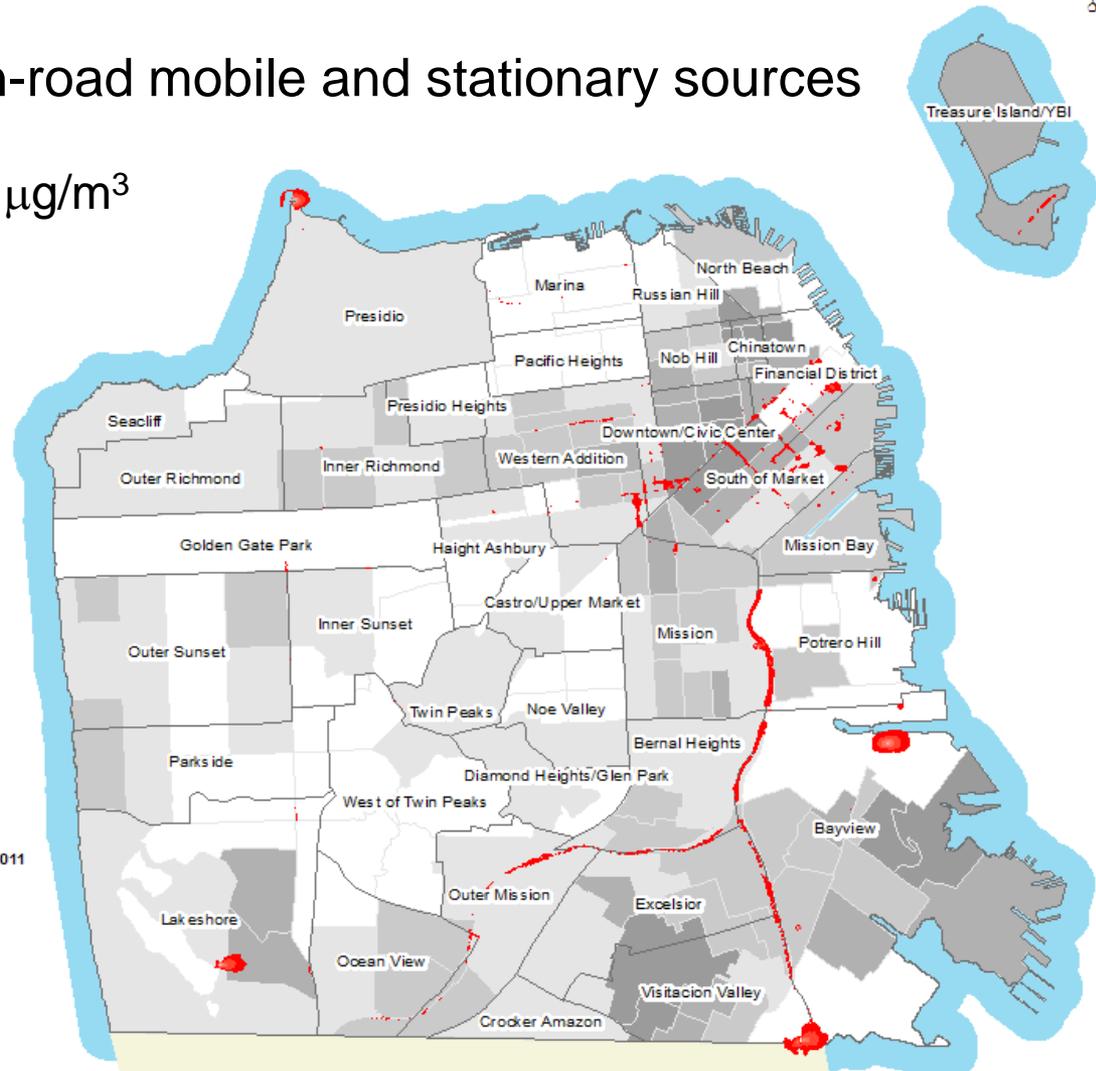
■ PM<sub>2.5</sub> over 11 µg/m<sup>3</sup>

Proportion living below 200% of the federal poverty level



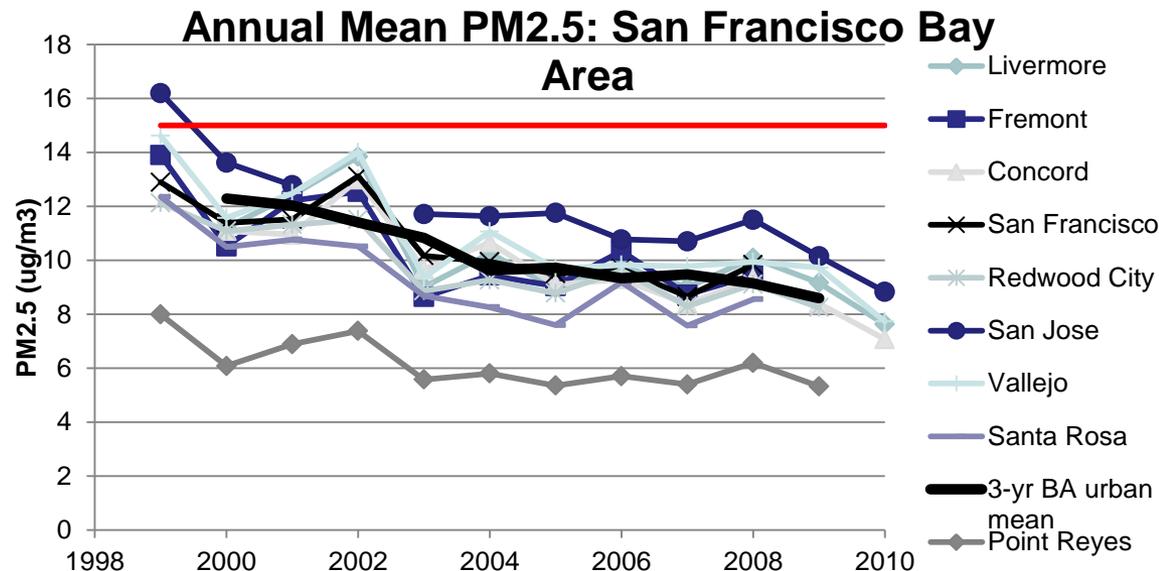
Source: BAAQMD, U.S. Census Bureau, 2011

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



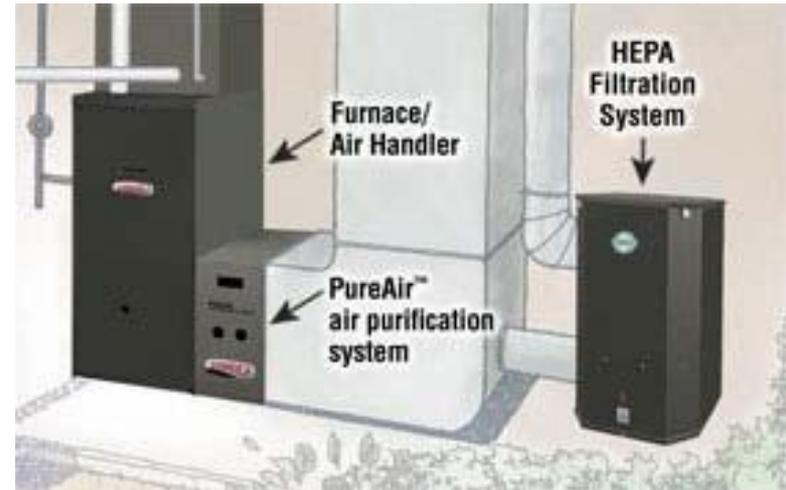
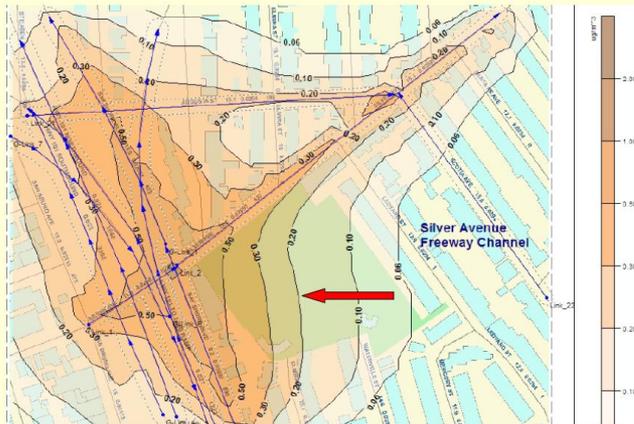


# Proposed Mitigations Approach

- 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

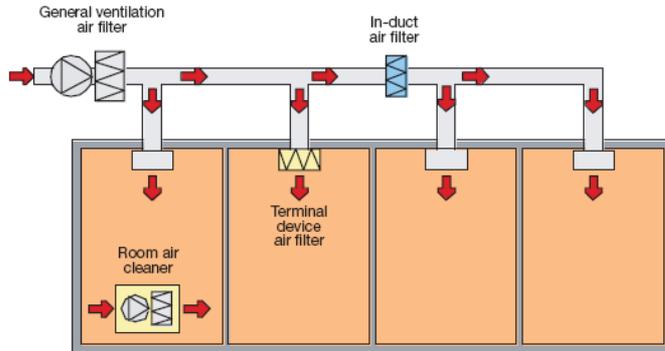
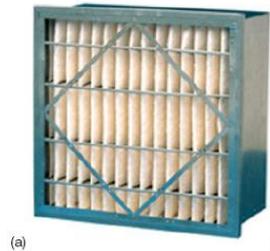


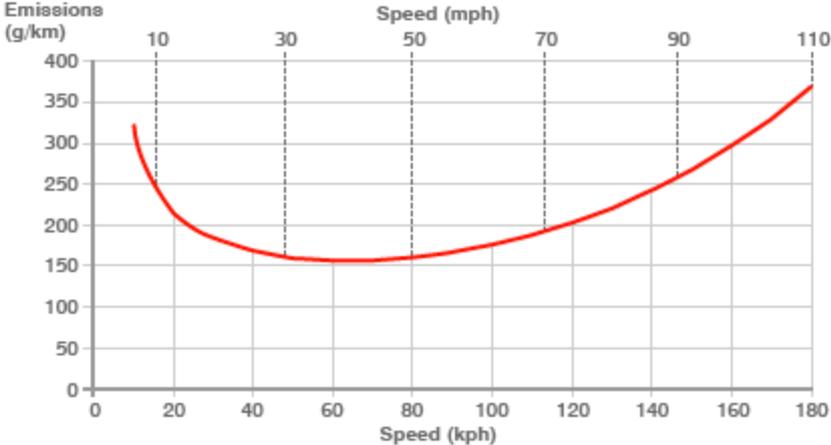
Figure 17. Decentralised air filtration.



# Mitigation: 50 mph Speed Limit Enforcement on Hi.101



HOW CARBON EMISSIONS VARY WITH SPEED

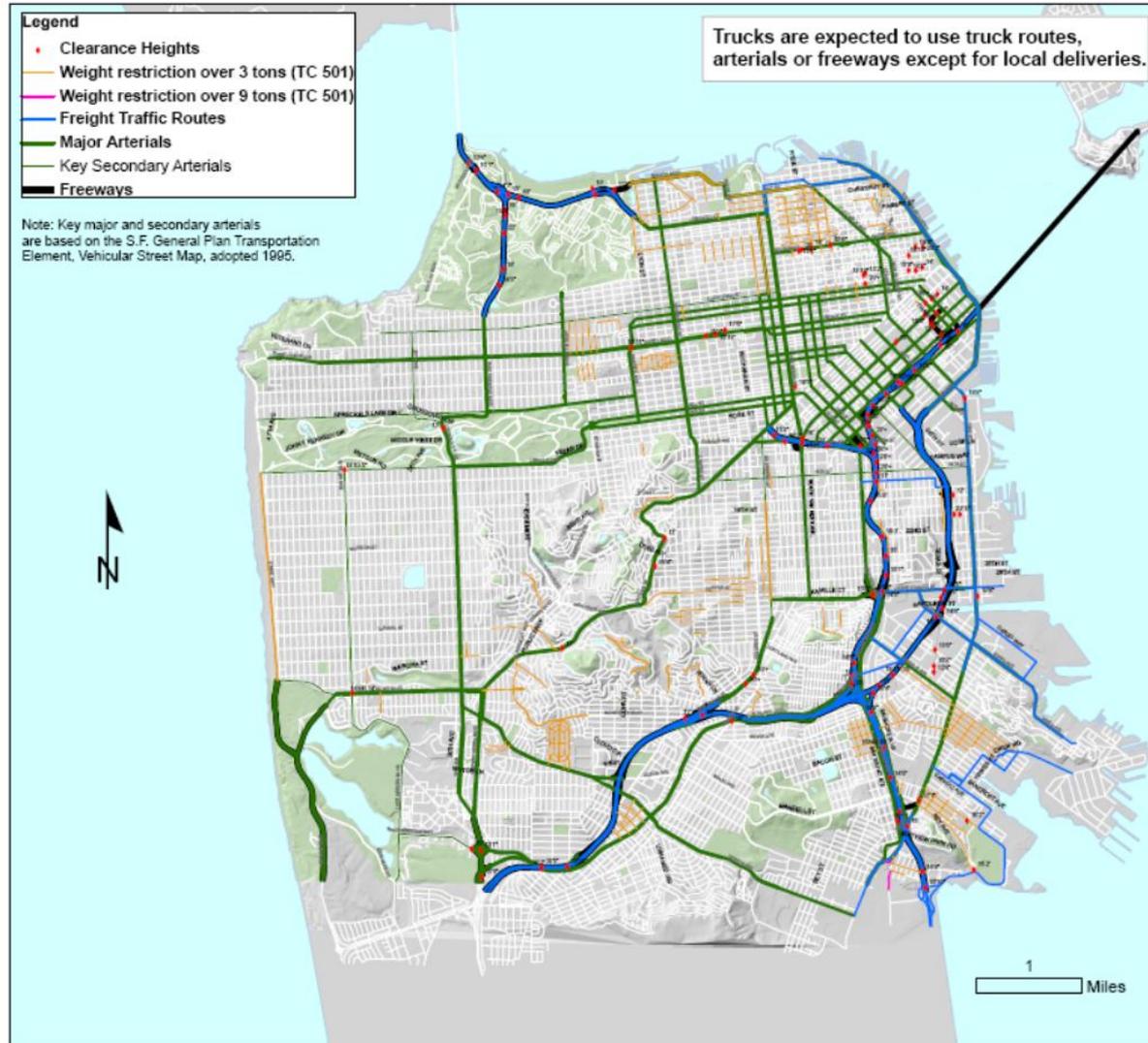


Figures based on 1.4-2.0 litre sized engine  
Some newer engines may be more efficient

SOURCE: NAEI

# Mitigation: Truck Rerouting

## San Francisco Freight Traffic Routes

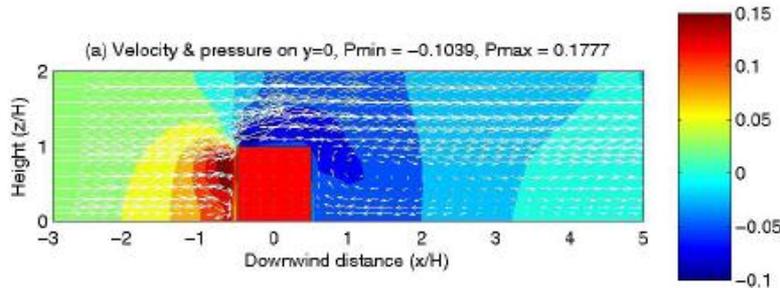


# Mitigation: Sound Walls and Highway Greening

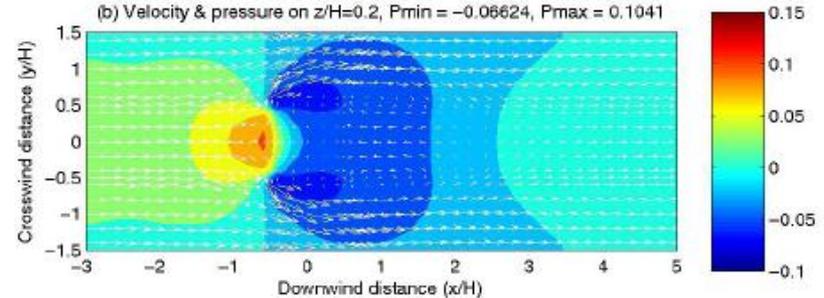
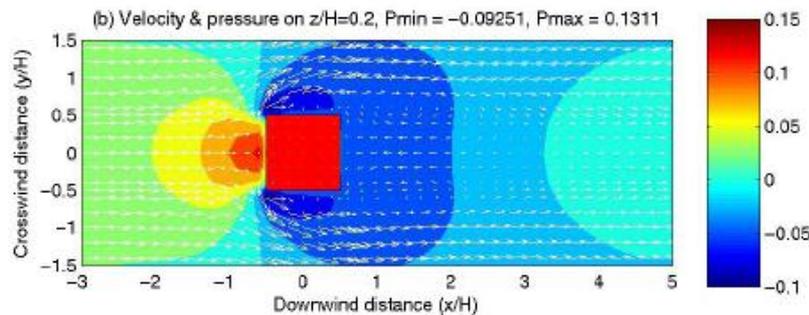
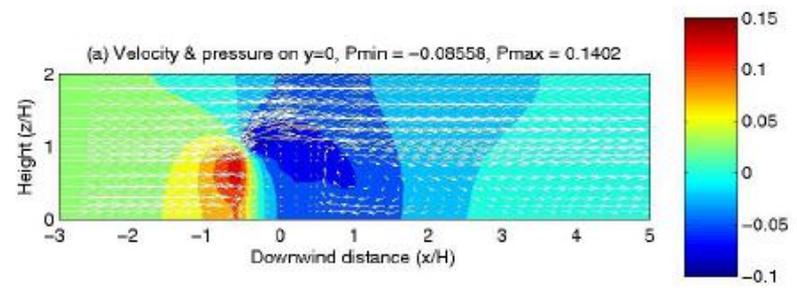


# Air Quality Improves Downwind from Buildings and Barriers

(a) Solid building

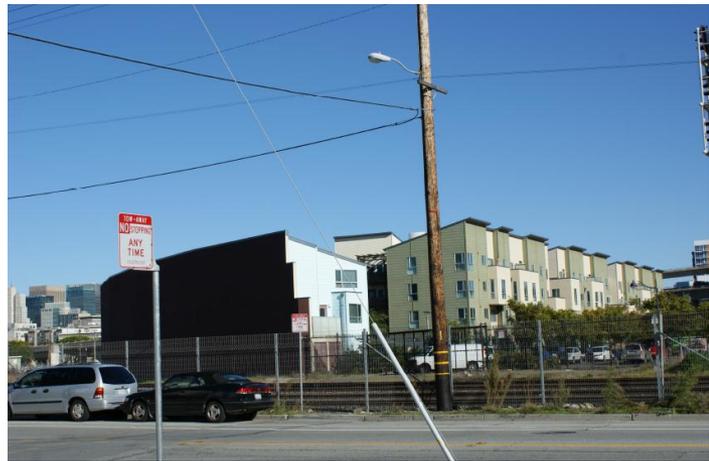


(b) Virtual building



# 888 Seventh St. near King

## Example of Building Residential Housing Near Freeway and Train



# Townhouse Layout Provides Air Pollution and Acousitical Barrier



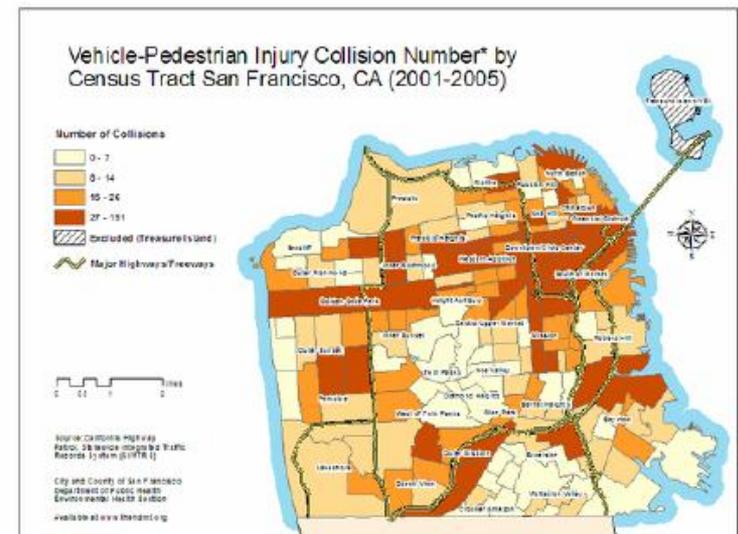
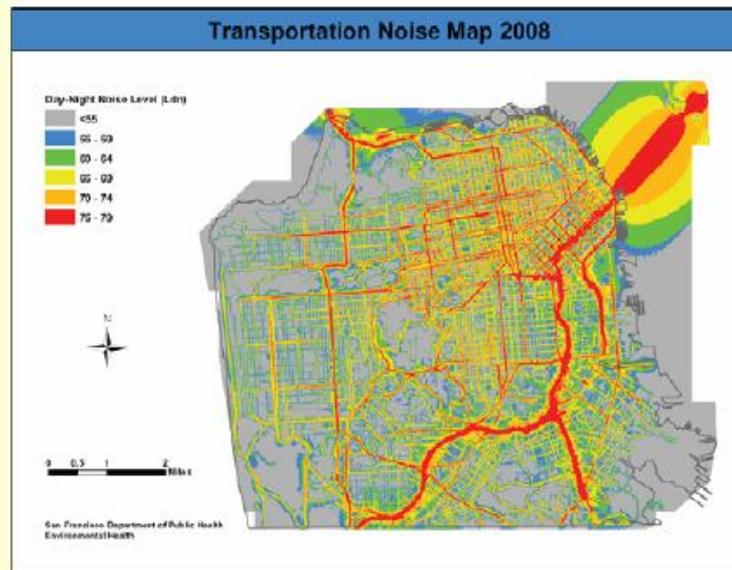
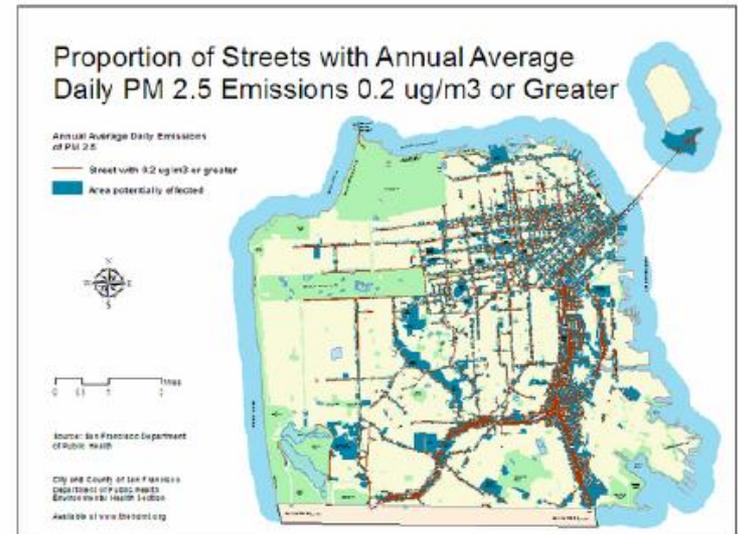
# Prioritization of Disproportionately Impacted Communities for Improvements

- 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