

# Identifying and Protecting Communities Impacted by Urban Air Pollutants



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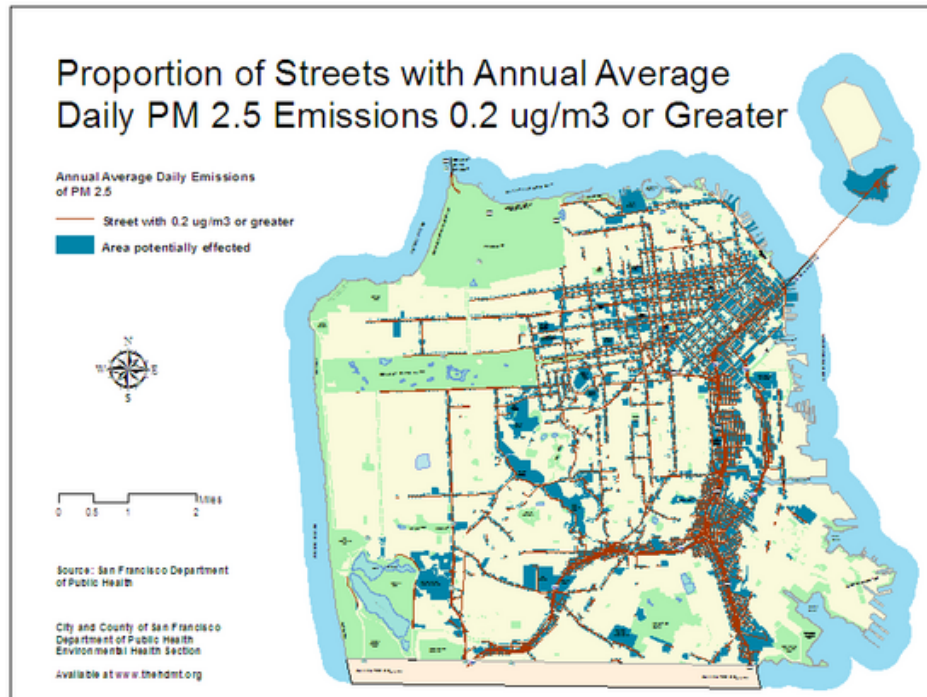
# Air Pollution Challenges for Infill Development

- **Benefits of reducing regional VMT**
  - Energy efficiency
  - lowered regional pollution emissions
  - Increased active transportation
- **Costs of increasing proximity to traffic density**
  - Increased exposure to urban air pollution sources
  - Increased exposure to noise sources
  - Greater hazards for pedestrians



# Sensitive Use Protections for Traffic Pollution Hot Spots

## San Francisco Health Code, Article 38, 2008



- Aimed to prevent new traffic-related impacts
- Requires projects in areas with traffic conflicts to assess and mitigate exposures
- Proponent conducts air quality modeling for site
- Law establishes an PM 2.5 based action level for mitigation
- Mitigation via building design or engineered ventilation to remove 80% of outdoor PM 2.5

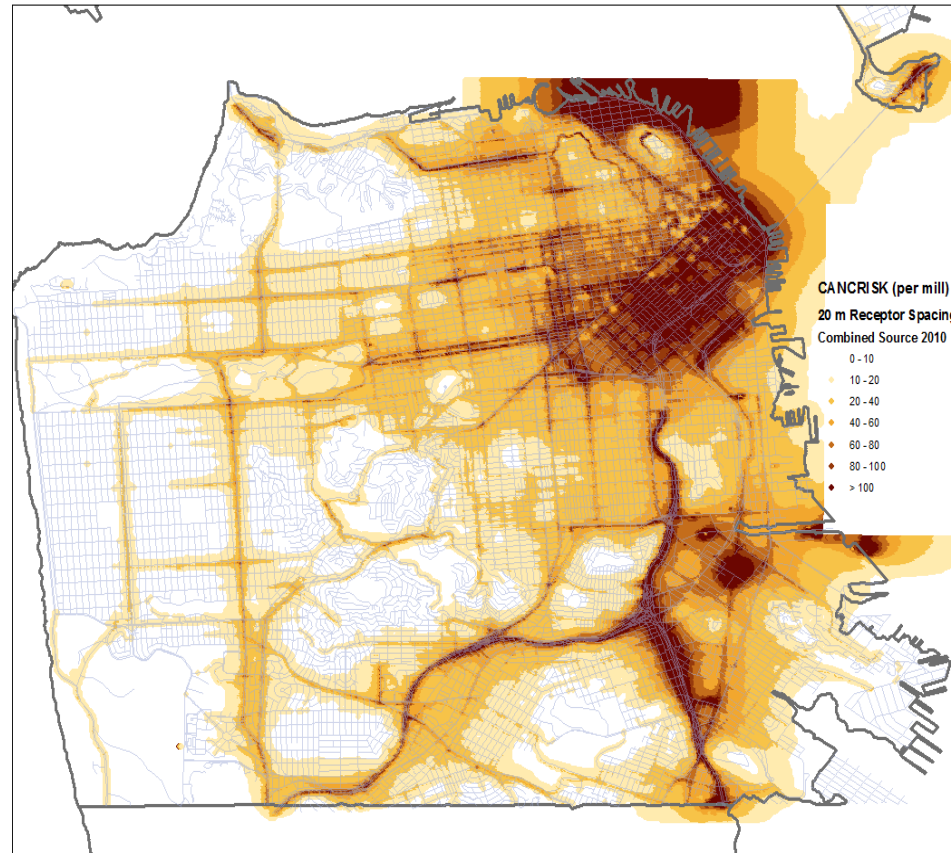
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# San Francisco Pollution Risk Reduction Planning

## Overarching Policy Goals

- **Reduce the extent and severity of pollution hotspots**
  - Air Pollution Cancer Risk
  - Fine Particulates (PM 2.5)
  - Nitrogen Dioxides
- **Mitigate exposures in air pollution hotspots**
- **Reduce disparities in exposure**

# Modeled Cumulative Cancer Risk from Air Toxics in San Francisco



# PM 2.5 >10 ug/m<sup>3</sup>

## Modeled Concentrations in San Francisco





# PM 2.5 >9 ug/m<sup>3</sup> Modeled Concentrations in San Francisco



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# SF Local Pollution Risk Reduction Strategies

## Emissions Reductions

- Limit growth of traffic density through land use, demand management, pricing, impact fees, improved transit and other strategies

## Exposure Management

- Extend article 38 protections to all areas with high fine particulate levels or high cancer risks
- Develop programs for retrofitting existing sensitive uses in hot spots



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## Ways to improve BAAQMD methodology

- Consider air pollution impacts in areas without vulnerable populations
    - Could increase political support for interventions
    - Attends to potential future demographic shifts
    - Treat population characteristics as risk modifiers
  
  - Include impacts due to NAAQS criteria air pollutants
    - Significant, proven health effects from fine particulate matter and nitrogen dioxide
    - Effects observed at observed concentration
    - PM 2.5 effect on mortality greater than effect on cancer
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# Thoughts for Cumulative Impacts Analysis

- ☐ Clearly distinguish emissions, exposures, and effects
- ☐ Combine cumulative impacts at any single level but not across multiple levels
- ☐ Treat population characteristics as factors that modify the relationships among types of impacts and ways to identify who is impacted

Sources

Emissions

Concentrations

Exposures

Biological & Health Effects

# Implications of Impact Analysis for Regional Policy

- Neighborhood-scale modeling and monitoring of local pollutants particularly PM 2.5 and Nitrogen Dioxides
  - Allows application of existing state and federal standards
- Limits on highway capacity expansion
- Regulation of traffic corridors as emissions sources
- Innovative solutions such as urban freeway speed control
- Greater attention to local sources

