Effects of Common Air Pollutants

**Respiratory Effects**
- Symptoms:
  - Cough
  - Phlegm
  - Chest tightness
- Increased sickness and premature death from:
  - Asthma
  - Bronchitis (acute or chronic)
  - Emphysema
  - Pneumonia
- Development of new disease:
  - Chronic bronchitis
  - Premature aging of the lungs

**Cardiovascular Effects**
- Symptoms:
  - Chest tightness
  - Chest pain (angina)
  - Palpitations
  - Shortness of breath
  - Unusual fatigue
- Increased sickness and premature death from:
  - Coronary artery disease
  - Abnormal heart rhythms
  - Congestive heart failure
  - Stroke

**How Pollutants Cause Symptoms**
- Alveoli filled with trapped air
- Airway inflammation
  - Influx of white blood cells
  - Abnormal mucus production
  - Fluid accumulation and swelling (edema)
  - Death and shedding of cells that line airways
- Effects on lung function
  - Narrowing of airways (bronchoconstriction)
  - Decreased air flow
- Increased susceptibility to respiratory infection

- Airway lining
  - Vascular inflammation
  - Increased risk of blood clot formation
  - Narrowing of vessels (vasoconstriction)
  - Increased risk of atherosclerotic plaque rupture

**How Pollutants Cause Symptoms**
- Normal heart rhythm
- Abnormal heart rhythm
- Effects on cardiovascular function
  - Low oxygenation of red blood cells
  - Abnormal heart rhythms
  - Altered autonomic nervous system control of the heart

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Reduce your risk by using the Air Quality Index (AQI) to plan outdoor activities – www.airnow.gov

<table>
<thead>
<tr>
<th>AQI Levels of Health Concern</th>
<th>AQI Values</th>
<th>What Action Should People Take?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>0-50</td>
<td>Enjoy Activities</td>
</tr>
<tr>
<td>Moderate</td>
<td>51-100</td>
<td>People unusually sensitive to air pollution: Plan strenuous outside activities when air quality is better</td>
</tr>
<tr>
<td>Unhealthy for Sensitive Groups</td>
<td>101-150</td>
<td>Sensitive Groups: Cut back or reschedule strenuous outside activities</td>
</tr>
<tr>
<td>Unhealthy</td>
<td>151-200</td>
<td>Everyone: Cut back on strenuous outside activities</td>
</tr>
<tr>
<td>Very Unhealthy</td>
<td>201-300</td>
<td>Everyone: Significantly cut back on outside physical activities</td>
</tr>
</tbody>
</table>

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[Source: EPA AirNow.gov]
Air Pollutant Exposure Zone Modeling
Health Code Article 38 for Enhanced Ventilation in Air Pollutant Exposure Zone
San Francisco
CLEAN CONSTRUCTION ORDINANCE
Implementation Guide for San Francisco Public Projects

FINAL
AUGUST 2015

San Francisco Department of the Environment
San Francisco Department of Public Health
San Francisco Planning Department
Modeling Overview

- Modeling will update Air Pollutant Exposure Zone map
- What is health risk modeling?
- Included in the modeling:
  - Mobile Source Data
  - Stationary Sources
  - Other sources
- Feedback on what is included in the model
Health Risk Assessment

The 4 Step Risk Assessment Process

- Hazard Identification: What health problems are caused by the pollutant?
- Dose-Response Assessment: What are the health problems at different exposures?
- Exposure Assessment: How much of the pollutant are people exposed to during a specific time period? How many people are exposed?
- Risk Characterization: What is the extra risk of health problems in the exposed population?

- Fine Particulate Matter (PM$_{2.5}$)
- Toxic Air Contaminants (TACs)
Mobile Sources: Roadways from SF-CHAMP
Maritime & Caltrain Emissions

CALTRAI
ELECTRIFICATION
PROJECT
STATUS UPDATE | July 2017
Permitted Stationary Sources
Modeling Air Pollution Exposure
CRRP Goals and Actions

- **5 Goals:**
  - Improve air quality citywide, especially in vulnerable areas
  - Reduce exposure to air pollution
  - Increase public understanding of air quality
  - Collaborate among public agencies regarding air quality
  - Monitor air quality
Improving Air Quality: Transportation

Transportation Sustainability Program

- Transportation Sustainability Program
- Goal: 80% trips by sustainable modes by 2030 (currently: over 50%)
- Transportation Impact Analysis Guidelines for Environmental Review
Improving AQ: Clean Construction

- Proposing to extend Clean Construction requirements to all projects within APEZ
  - Clean Construction requirements currently for public projects only
  - Extend Clean Construction requirements to private development projects through standard conditions of approval that require best available emissions controls.
Other Tasks

Diesel Particulate Filter: Common VDECS

- Investigate development of an Air Pollution Offset Mitigation Program, which could fund projects:
  - Rebates for purchasing cleaner construction equipment
  - Rebates for cleaner buses, VDECSs
  - Alternative fueling infrastructure, e.g. EV charging, hydrogen fueling stations.
  - Shorepower projects/replace marine diesel engines
Future Outreach and Next Steps

- Early outreach meeting
- Website: http://sf-planning.org/air-quality-community-risk-reduction-plan
- Email list for plan developments
- Releases through social media
- Draft CRRP release in ~early Spring 2018
- Following release will have further outreach, including stakeholder meetings and community events
- Aiming for Final CRRP release in Spring/Summer 2018

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