



Community-Level Cumulative Impacts Assessment Tools and Projects

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Air Resources Board
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Objective of Cumulative Impacts Assessment

- Goal is to evaluate impacts at community level
- Assess combined effects of multiple point area and mobile air emission sources
- Adequate resolution to identify localized effects
- Consider emissions, exposure, and risk



Barrio Logan Neighborhood Study

- First Neighborhood Assessment Program (NAP) pilot project
- Inventory and modeling for point and mobile sources
- Regional toxics modeling using photochemical airshed models



Barrio Logan - Study Components

- Ambient monitoring for ~60 pollutants
- Special monitoring for hexavalent chromium
- Detailed emission inventory, including small neighborhood sources
- Microscale modeling for point & mobile sources
- Regional toxics modeling using photochemical airshed models – annual/seasonal computations of concentrations



Barrio Logan – Lessons Learned

A. Monitoring Studies

- Existing, regional air monitoring network --
 - gives good indication of general population exposure for toxics
- Localized monitoring -- revealed limitations of regional network for identifying localized concentrations
- Chrome plater near residences had high near-source impact; impact dropped off quickly



Barrio Logan – Lessons Learned

B. Emission Inventory

- Microscale emission data and modeling are essential for diesel PM and near-source impacts
- Emission inventory needs very accurate spatial & release data, due to small zones of impact
- Majority of emissions are generally covered by data routinely reported to the ARB
- Supplemental data are often needed at the facilities such as release parameters and on-site diesel equipment and vehicles



Barrio Logan – Lessons Learned

C. Microscale and Regional Modeling

- Microscale modeling of all neighborhood sources appears to account for only a portion of overall exposure
- Air pollution from regional sources (outside the community) can overwhelm the contribution of local sources (e.g., as seen at monitors)
- Regional modeling not appropriate for pollutants emitted by a few localized sources



Barrio Logan – Lessons Learned

D. Integration of Modeling

- Microscale modeling represents near source impacts on scales of meters
- Regional modeling represents regional sources on scales of kilometers
- Combining microscale and regional modeling results is useful, but “double counts” some sources
- Barrio Logan mix of sources was relatively insensitive to “double counting” (because of small overall contribution of local sources)
- Sensitivity will vary by region and source-mix



Barrio Logan – Lessons Learned

E. Risk Summary

- Diesel PM contributes most to overall cancer risk
- Cancer risk estimates at Memorial Academy were similar to other San Diego monitoring locations
- Most Barrio Logan risk is estimated to be from Diesel PM (~70%), Benzene (~10%), and 1,3-Butadiene (~10%)



Wilmington Neighborhood Study

- Second Neighborhood Assessment Program (NAP) pilot project
- Very detailed emission inventory of large and small sources using multiple databases, surveys, and site visits
- Special focus on on-site, mobile diesel PM
- Link-based roadway emissions and modeling
- Worked with Ports of LA and Long Beach
- Microscale and regional toxics modeling



















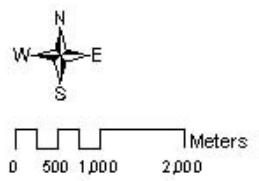
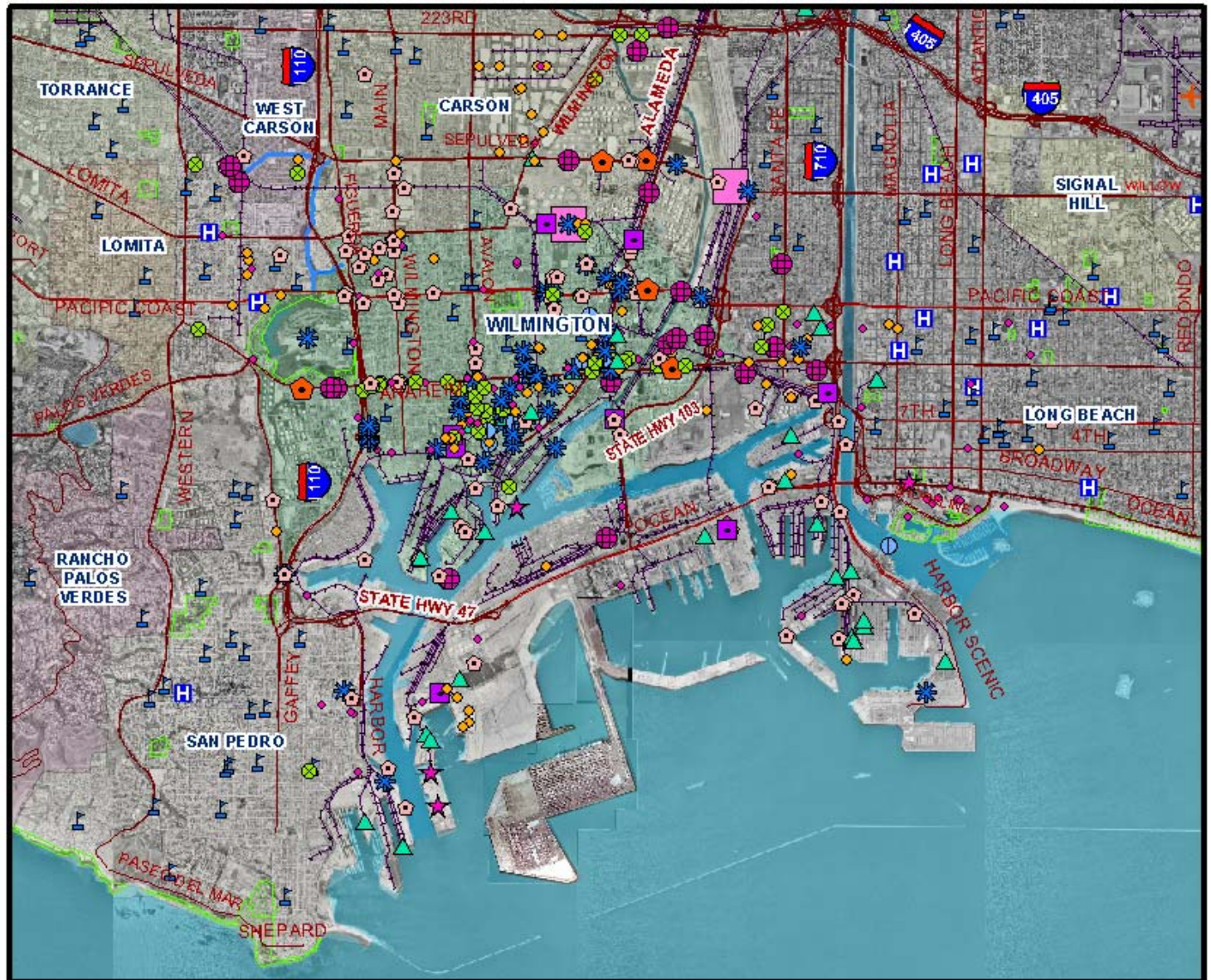
Wilmington – Lessons So Far

- On-site mobile diesel PM emissions are important at industrial/commercial sources
- Most major facilities were in traditional emission inventory, but estimates varied between data sources and diesel PM was not well covered
- Wilmington mix of sources may have more “double counting” between microscale and regional modeling
- Port-related emissions are significant
- Preliminary modeling suggests regional pollution predominant

Wilmington Neighborhood Assessment Program (NAP) Facilities

Legend

-  PETROLEUM REFINING
-  PETROL PRODN, DISTRIBN
-  CHEMICAL RELATED
-  POWER PLANTS & RELATED
-  TRUCKING / WAREHOUSING
-  MARINE & RELATED
-  AUTO RELATED
-  WELDING RELATED
-  GOVT / MILITARY
-  MISCIndustr / COMMERC
-  MISC SERVICES
-  Schools
-  Hospitals
-  Airports
-  Parks
-  Major Railyards
-  Railroads
-  Roads





Plan for Statewide Toxics Modeling

- Peer-reviewed plan, adapted from Wilmington modeling protocol
- Regional toxics modeling for photochemistry and transport
- Microscale modeling of roadway links and key point sources for localized impacts
- Automated tools
- Overlay and analysis tools for cumulative results



Plans for Toxics Assessment

- Test new modeling tools and overlay approach using Wilmington data
- Begin applying in southern California areas
- Coordinate with Children's Environmental Risk Reduction Plan (ChERRP) pilot projects