

West Oakland Diesel PM Emission Inventory: Truck-Related Businesses and Construction Projects

CARE Task Force Meeting
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Presented by
Dr. Phil Martien
CARE Program Manager

Background

ARB, the Port of Oakland, and BAAQMD are conducting a 3-part evaluation of health risks from diesel exhaust in West Oakland:

1. The Maritime Port of Oakland
2. The Union Pacific Railyard
3. Emission sources in West Oakland not associated with 1 and 2.



Scope of Work

For Part 3 of the HRA, Sonoma Technology, Inc. (STI) worked with BAAQMD staff to:

- Identify **truck-based businesses** in West Oakland that operate diesel trucks or off-road equipment
- Identify **construction projects** that were active in West Oakland during 2005
- Gather activity data (trucks per day, truck idling times, construction equipment types, hours of operation, etc.)
- Estimate year-2005 emissions (on-site activity)
- Prepare emission inputs for the CALPUFF model

Truck-based Businesses (1 of 6)

Sources used to identify facilities:

- InfoUSA commercial database
- Previous studies
- Port of Oakland list of trucking businesses
- Visits to West Oakland by STI and BAAQMD staff

Ultimately, **52 facilities** were identified and targeted for data collection activities.

Truck-based Businesses (2 of 6)



Truck-based Businesses (3 of 6)

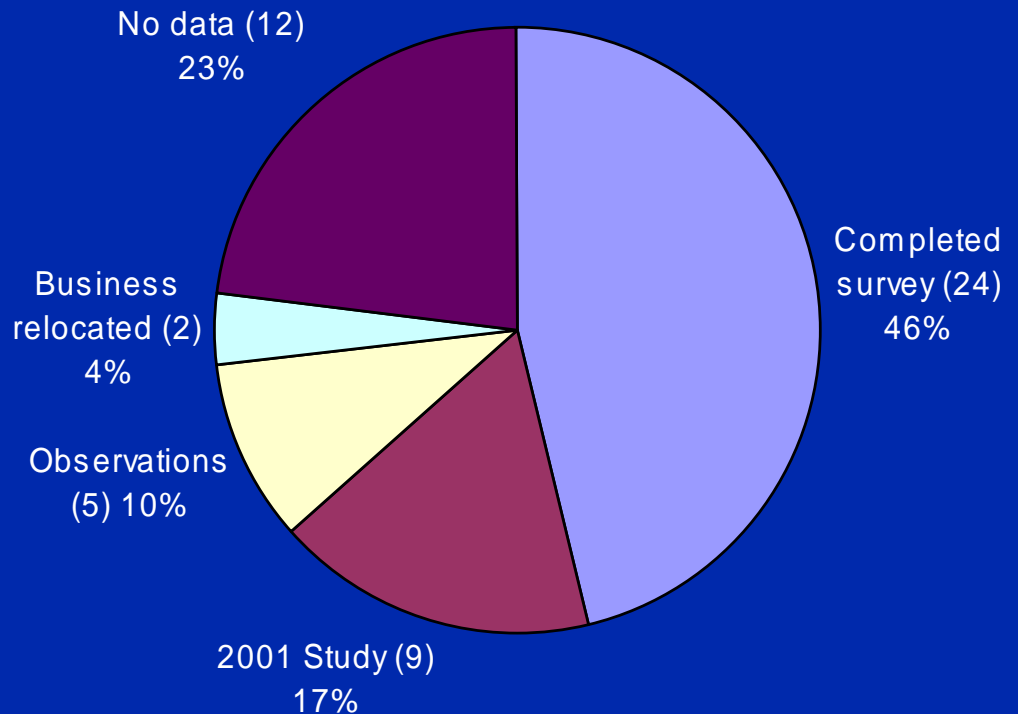
STI designed a one-page survey to collect the following data from each facility:

- General operating info (days per week, hours per day, etc.)
- Number of daily truck trips
- Truck sizes (# axles) and model years
- On-site travel distances and idling times
- Off-road diesel equipment populations, types, characteristics (horsepower, etc.)
- Off-road equipment operating hours

Truck-based Businesses (4 of 6)

The survey response rate was **46%**; after incorporating existing data and observations, activity estimates were made for **77%** of the facilities.

Note: The 12 sites for which no data were available were judged to be low-activity sites based on facility sizes and limited observations.



Truck-based Businesses (5 of 6)

Summary of results:

- Study estimated **2,937** truck trips per day (20% higher than the 2,491 estimated in the 2001 study)
- On-site DPM emissions at truck-based businesses = **2.2 tons/year** (total DPM from diesel trucks in Alameda County = 255 tons*)
- Over **75%** of estimated activity and emissions occurred at top 2 sites
- Average reported truck idling time was **10 minutes**
- Only **3** businesses reported the use of off-road diesel equipment

Business Name	Activity (trucks/day)	DPM (tons/year)
Oakland Maritime Support Services	1,250	1.414
US Postal Service	1,034	0.378
Golden Bear Produce	90	0.012
East Bay MUD	84	0.020
Central Concrete Co.	56	0.010
Greyhound Bus Station	55	0.005
California Waste	44	0.012
Matheson Postal Service	30	0.006
Narayan's Trucking	30	0.005
Online Trucking	30	0.004
Quintero Trucking	30	0.003
A M & S Transportation Co.	25	0.011
Roadway Express Inc.	25	0.206
Mutual Express	22	0.019
Custom Alloy and Scrap	20	0.004
Other Businesses	112	0.056
Total	2,937	2.166

*Alameda Co. estimate from ARB's online 2005 Almanac Inventory

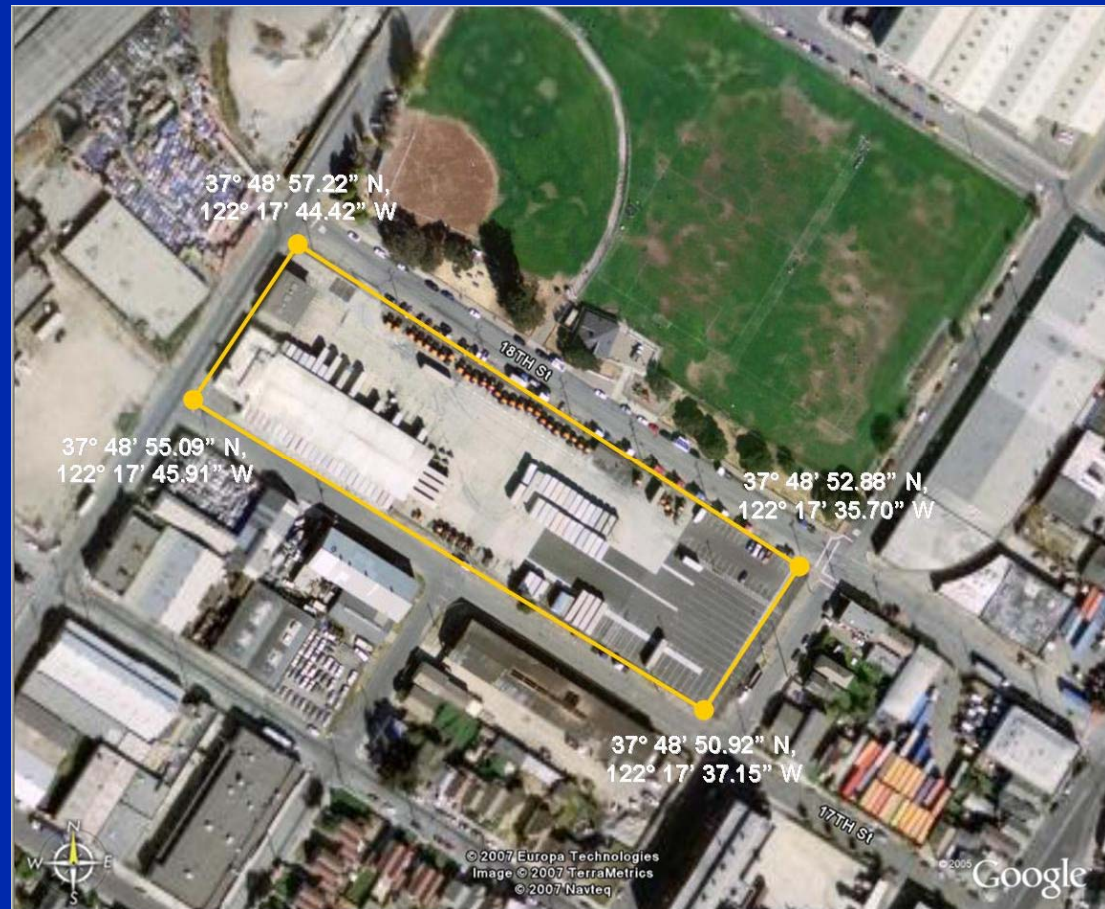
Note: Emissions were estimated from activity data using emission factors from ARB's EMFAC2007 model.



Truck-based Businesses (6 of 6)

Model-ready Emissions:

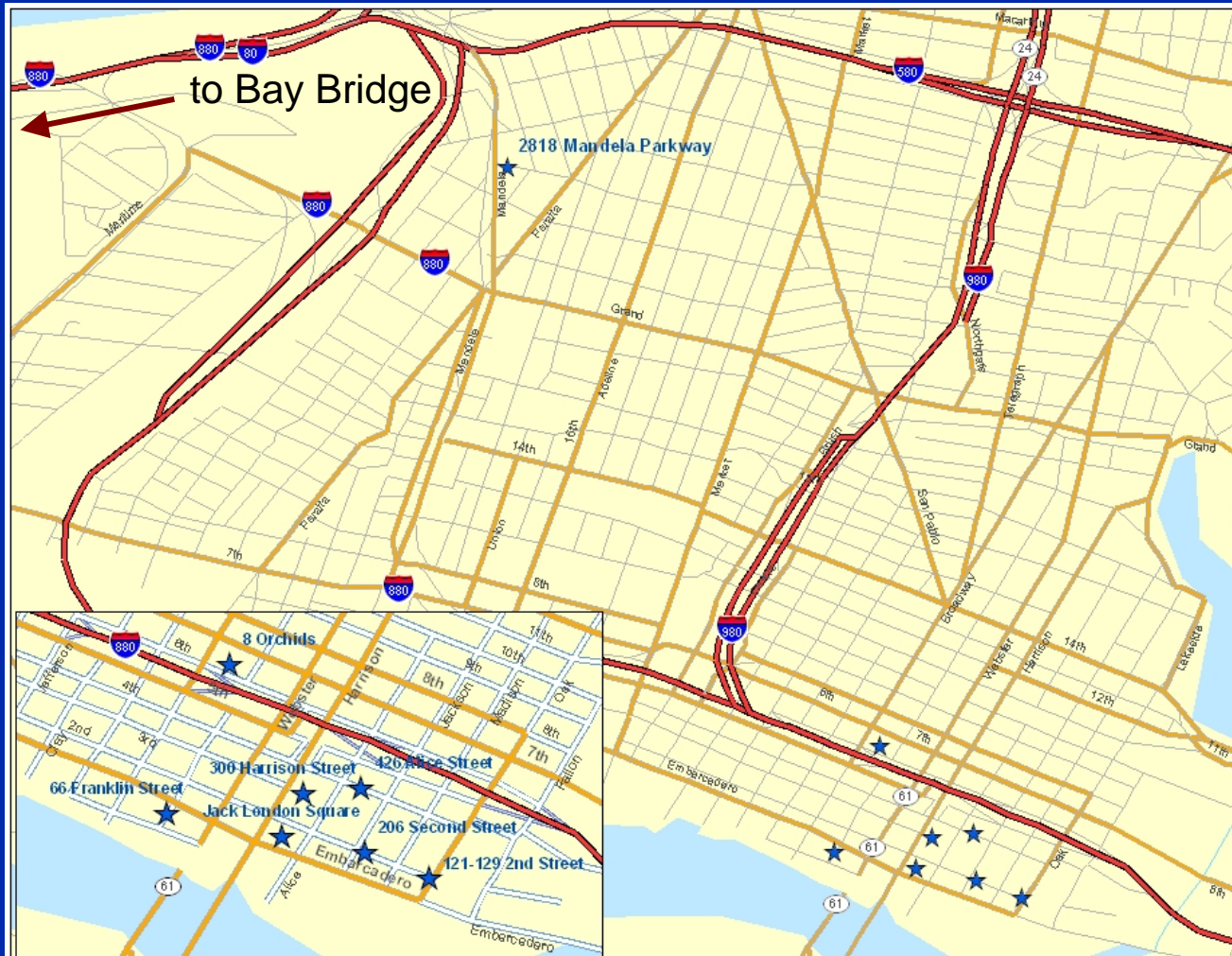
- Emissions spatially allocated to a polygon surrounding each facility (Roadway Express pictured here)
- Emissions temporally allocated based on operating information from individual facilities (e.g., days per week, hours per day)
- Emissions formatted for input to the CALPUFF model and provided to ARB



Construction Projects (1 of 5)

- The City of Oakland provided a list of 2005 construction and street paving projects (8 projects in West Oakland, including Bay Bridge reconstruction)
- STI and BAAQMD designed a one-page survey to gather activity data, including:
 - Equipment types and populations
 - Equipment characteristics (engine sizes, model years)
 - Number of days of operation in 2005
 - Typical hours per day of operation
- STI estimated emissions using emission factors and engine load factors from ARB's OFFROAD model

Construction Projects (2 of 5)



Note: Bay Bridge project not shown on map.

Construction Projects (3 of 5)

Survey Results

- Received a completed survey for **4 of 8** projects
- The 4 projects with no data were similar in scope to the **Harbor View Lofts** project, so equipment types and activity from that project were used as a surrogate
- Equipment **model year and horsepower** data were incomplete, so average values for Alameda County were derived from OFFROAD

Project	Address	Project Details	Completed Survey
206 Second Street	206 Second Street	2,380 ft ² of live/work; 1,310 ft ² of retail space; 70 condominium units	✓
300 Harrison Street	300 Harrison Street	91 condominium units	
66 Franklin Street	66 Franklin Street	Renovation of existing building (90,000 ft ²); part of the Jack London Square redevelopment project	✓
8 Orchids	620-636 Broadway	3,600 ft ² retail; 157 condominium units	
Ettie Street-Mandela Parkway	2818 Mandela Parkway	91 live/work units	
Harbor View Lofts (Aqua Via)	121-129 2nd Street	100 condominium units; 10,000 ft ² of retail	✓
Wheelink Project	426 Alice Street	94 residential units; 9,800 ft ² office	
Bay Bridge Construction	N/A	Replacement of eastern span	✓

Construction Projects (4 of 5)

Activity/Emission Estimates:

- The **206 Second Street** project was run by a “green” building company that primarily utilized electric equipment
- Conservative assumptions applied to **Bay Bridge reconstruction** (assumed equipment operated 8 hours per day)
- Total DPM emissions from construction projects = **12.7 tons** in 2005 (total DPM from construction equipment in Alameda County = 310 tons*)

Project	Pieces of Equipment	Days Active in 2005	DPM (tons/year)
66 Franklin Street	10	100	0.06
206 Second Street	1	120	0.02
Harbor View Lofts	9	180	0.11
300 Harrison Street	9	180	0.11
8 Orchids	9	180	0.11
Ettie Street/Mandela Parkway	9	180	0.11
Wheelink	9	180	0.11
Bay Bridge Construction	112	365	12.11
Total	168	1,485	12.71

*Alameda Co. estimate from a run of ARB's OFFROAD model



Construction Projects (5 of 5)

Model-ready Emissions:

- Emissions spatially allocated to a polygon surrounding each project (Bay Bridge pictured here)
- Emissions temporally allocated based on operating information from individual projects
- Emissions formatted for input to the CALPUFF model and provided to ARB



Recommendations

- Collect more detailed data on truck traffic patterns in West Oakland (this study was limited to on-site activities)
- Refine estimates of truck idling times (survey results are incomplete and times may be under-reported)
- Gather additional data on Bay Bridge construction activities (limited information was available on the spatial and temporal distribution of these activities)

Contacts

BAAQMD Project Manager:

Dr. Phil Martien

(415) 749-4660

PMartien@baaqmd.gov

STI Project Manager:

Steve Reid

(707) 665-9900

sreid@sonomatech.com

