Overview

2005 Emissions Inventory
Topics

- 2005 – What We’ve Been Working On
- Cargo Throughput Changes
- Changes between 2005 & 2002
- 2005 Results
- Comparison of 2005 & 2002
- Next Steps
2005 What We’ve Been Working On

- Coordinating w/regulatory agencies
- Validating results & comparing to 2002
- Collecting 2006 & 2007 data
- 2002 El Addendum
2005 What We’ve Been Working On
Collecting Real OGV Data

Vessel Boarding Program

Total POLA/POLB Boarding Stats

<table>
<thead>
<tr>
<th>Vessel Count</th>
<th>Program</th>
<th>Containership</th>
</tr>
</thead>
<tbody>
<tr>
<td>58</td>
<td>Ports of Long Beach and Los Angeles VBP (2005 – 2006)</td>
<td>66%</td>
</tr>
<tr>
<td>80</td>
<td>Vessel Fleet Data Provided (2003-2006)</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Sister Vessel Specifications Provided</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Puget Sound Boarding Program (2006)</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Port of Los Angeles Boarding Program (2001 - 2003)</td>
<td></td>
</tr>
<tr>
<td>270</td>
<td>Vessels Total</td>
<td></td>
</tr>
</tbody>
</table>
Cargo Throughput Changes
2005 vs. 2002

Ship Activity

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel Calls</td>
<td>2,767</td>
<td>3,166</td>
</tr>
<tr>
<td>Containerships</td>
<td>1,296</td>
<td>1,384</td>
</tr>
<tr>
<td>TEUs</td>
<td>4,526,365</td>
<td>6,709,818</td>
</tr>
<tr>
<td>Average TEUs/Call</td>
<td>3,492</td>
<td>4,848</td>
</tr>
</tbody>
</table>
Changes from 2002 to 2005
Two Types of Changes

- Changes due to:
  Agency Emission Estimating Methods

- Changes Due to:
  Better Data
### 2005 Results

**Overview**

#### Overall Total Emissions Results

<table>
<thead>
<tr>
<th>Category</th>
<th>PM$_{10}$</th>
<th>PM$_{2.5}$</th>
<th>DPM</th>
<th>NO$_x$</th>
<th>SO$_x$</th>
<th>CO</th>
<th>TOG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean Going Vessels</td>
<td>732.6</td>
<td>586.0</td>
<td>636.6</td>
<td>6,926.0</td>
<td>6,501.0</td>
<td>602.5</td>
<td>273.5</td>
</tr>
<tr>
<td>Harbor Craft</td>
<td>29.6</td>
<td>27.2</td>
<td>29.6</td>
<td>1,004.2</td>
<td>5.2</td>
<td>237.4</td>
<td>20.2</td>
</tr>
<tr>
<td>Cargo Handling Equipment</td>
<td>55.6</td>
<td>51.1</td>
<td>55.5</td>
<td>1,736.7</td>
<td>17.0</td>
<td>450.0</td>
<td>100.5</td>
</tr>
<tr>
<td>Heavy-Duty Vehicles</td>
<td>243.4</td>
<td>223.9</td>
<td>243.4</td>
<td>5,607.0</td>
<td>38.9</td>
<td>1,943.7</td>
<td>433.1</td>
</tr>
<tr>
<td>Locomotives</td>
<td>43.4</td>
<td>39.9</td>
<td>43.4</td>
<td>1,313.6</td>
<td>75.9</td>
<td>182.8</td>
<td>73.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,104.5</strong></td>
<td><strong>928.2</strong></td>
<td><strong>1,008.4</strong></td>
<td><strong>16,587.4</strong></td>
<td><strong>6,638.0</strong></td>
<td><strong>3,416.4</strong></td>
<td><strong>901.2</strong></td>
</tr>
</tbody>
</table>

The chart and table above illustrate the emissions from different categories in tons/year. The emissions are categorized into PM$_{10}$, PM$_{2.5}$, DPM, NO$_x$, SO$_x$, CO, and TOG. The chart provides a visual representation of the contributions from Ocean Going Vessels, Harbor Craft, Cargo Handling Equipment, Heavy-Duty Vehicles, and Locomotives to the overall total emissions.
How to Compare 2005 to 2002?
Apples & Volvos

- Inventory = Activity Record + Estimating Methodology
- Re-modeled 2002 Activity Record using 2005 Methodology
- Important to note: Activity for 2002 was not adjusted
Comparison 2005 to Adjusted 2002

Overview
All Source Categories

% Change 2005 vs Adjusted 2002

- PM10: 9%
- PM2.5: 9%
- DPM: 11%
- NOx: 15%
- SOx: 2%
- CO: 15%
- TOG: 19%
- TEU: 48%
Comparison 2005 to Adjusted 2002
By Source Category

Ocean-Going Vessels

OGV - % Change 2005 vs Adjusted 2001

- PM10: 9%
- NOx: 11%
- SOx: 2%
Comparison 2005 to Adjusted 2002
By Source Category

Heavy-Duty Vehicles

<table>
<thead>
<tr>
<th>Source</th>
<th>2005</th>
<th>Adjusted 2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM10</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>SOx</td>
<td>19%</td>
<td></td>
</tr>
</tbody>
</table>
Comparison 2005 to Adjusted 2002
By Source Category

Cargo-Handling Equipment

CHE - % Change 2005 vs Adjusted 2001

-42%  -22%  0%
Comparison 2005 to Adjusted 2002
By Source Category

Harbor
Craft

HC - % Change 2005 vs Adjusted 2001

PM10  NOx  SOx

-2%  1%  -2%
Comparison 2005 to Adjusted 2002
By Source Category

Rail

RAIL - % Change 2005 vs Adjusted 2001

PM10: 65%
NOx: 21%
SOx: 71%
# Emissions Improvement

## Emissions per TEU

In the right direction

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>2002</th>
<th>2005</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10}$</td>
<td>1.3</td>
<td>1</td>
<td>23% decrease</td>
</tr>
<tr>
<td>NO$_x$</td>
<td>20.7</td>
<td>16.6</td>
<td>20% decrease</td>
</tr>
<tr>
<td>SO$_x$</td>
<td>6.6</td>
<td>4.9</td>
<td>26% decrease</td>
</tr>
</tbody>
</table>
How Did We Get Here?

- Diesel Emissions Reduction Program
- **Retrofit Cargo-Handling Equipment**
- **Alternative Diesel Fuels**
- Harbor Craft Repowers through Carl Moyer Program
- Increased Efficiency
- Vessel Speed Reduction Program
- More Cargo by Rail
How Will We Improve?
Emission Reductions We Will See in the Future

- Clean Air Action Plan
- PHL Operating Agreement
- Clean Trucks Program
- Green Leases
  - Matson
  - ITS
- CARB Regulations
  - Cargo-Handling Equipment
  - Ocean-Going Vessels
  - Harbor Craft
Next Steps

- Tenant briefings
- Continue work on 2006 & 2007 Emissions Inventories
- Continue coordination w/ agencies
- Get better rail activity data