CARGO HANDLING EQUIPMENT
REGULATORY CONCEPTS

BUREAU OF MOBILE SOURCES

Stakeholder Meeting - September 16, 2020
OVERVIEW

• Concepts we are considering
• Types of cargo handling equipment
• CARB's regulations
• Answer questions and discuss issues
POLLUTION IMPACTS

Adverse health effects in surrounding communities at much higher rates:

• Premature mortality.
• Increased hospitalization rates for heart and lung disease.
• Increased cancer risk.
• Increased respiratory symptoms for sensitive populations.
CONTRIBUTION OF MOBILE SOURCES TO AIR POLLUTION

New Jersey 2017 Volatile Organic Compounds Projected Emissions Inventory Tons Per Year

- Nonroad Mobile: 20%
- Onroad Mobile: 17%
- Area: 58%
- Point: 5%

New Jersey 2017 Nitrogen Oxides Projected Emissions Inventory Tons Per Year

- Nonroad Mobile: 29%
- Onroad Mobile: 42%
- Area: 16%
- Point: 11%

New Jersey 2017 Carbon Monoxide Projected Emissions Inventory Tons Per Year

- Nonroad Mobile: 48%
- Onroad Mobile: 42%
- Area Other: 8%

New Jersey 2017 Fine Particulate Matter Projected Emissions Inventory Tons Per Year

- Nonroad Mobile: 13%
- Onroad Mobile: 14%
- Area Residential: 31%
- Area Other: 26%

Note: Area Source fugitive dust emissions are post-adjust.
CARGO HANDLING EQUIPMENT AT MARINE TERMINALS

Yard/terminal tractor
Rubber tire gantry crane
Container handlers

Straddle carrier
Reach stacker
Forklift
CARB
EXISTING CHE REGULATIONS

All diesel-fueled equipment used at a port or intermodal rail yard to lift or move containers, bulk or liquid cargo.

- Adopted December 2005
- Effective December 2006
- Applies to new and in-use equipment

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Start of Phase In</th>
<th>Compliant by</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Yard Truck</strong></td>
<td>certified on-rod engine meeting the current engine emission standards OR certified Tier 4f off-road</td>
<td>If option 1 is not available, verified diesel emission control strategy must be installed within 1 yr.</td>
<td>2007</td>
<td>2017</td>
</tr>
<tr>
<td><strong>New Non-Yard Truck Equipment</strong></td>
<td>certified on-rod engine meeting the current engine emission standards OR certified Tier 4f off-road</td>
<td></td>
<td>2007</td>
<td>2013</td>
</tr>
<tr>
<td><strong>In-use Yard Trucks</strong></td>
<td>Meet BACT performance stds through accelerated turnover of older trucks to those equipped with certified engines meeting current on-road engine emission standards or Tier 4f off-road stds.</td>
<td>Compliance phase in for owners and operators who have more than 3-yard trucks in their fleet</td>
<td>2007</td>
<td>2017</td>
</tr>
<tr>
<td><strong>In-use Non-Yard Trucks</strong></td>
<td>Meet BACT per a phased compliance schedule. Includes replacement to cleaner on-rod or off-rod engines and/or the use of retrofits.</td>
<td></td>
<td>2007</td>
<td>2013</td>
</tr>
</tbody>
</table>
CARB
PROPOSED CHE AMENDMENTS

- All CHE transition to zero emissions
- Amendments propose phase in for new equipment as well as infrastructure

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Proposed amendment</th>
<th>Board Consideration</th>
<th>Proposed Compliance Start</th>
<th>Proposed Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>All mobile equipment</td>
<td>Located at ports and railyards. *Considering warehouses</td>
<td>2022</td>
<td>2026</td>
<td>2031</td>
</tr>
</tbody>
</table>

- Emission Benefits
  - Criteria pollutants
  - Air toxics
  - Greenhouse Gases
CONTRIBUTIONS AT THE PORT - CARGO HANDLING EQUIPMENT

PANYNJ 2018 VOC TPY
- CHE: 14%
- HDDV: 38%
- Rail: 7%
- OGV: 36%
- HC: 5%

PANYNJ 2018 NOx TPY
- CHE: 8%
- HDDV: 34%
- Rail: 6%
- OGV: 44%
- HC: 8%

PANYNJ 2018 CO TPY
- CHE: 23%
- HDDV: 42%
- Rail: 5%
- OGV: 20%
- HC: 10%

PANYNJ 2018 PM2.5 TPY
- CHE: 16%
- HDDV: 45%
- Rail: 6%
- OGV: 25%
- HC: 8%
GHG FROM CARGO HANDLING EQUIPMENT

- Heavy-Duty Diesel Vehicles: 50%
- Ocean-Going Vessels: 25%
- Railroad Locomotives: 4%
- Harbor Craft: 4%
- Cargo Handling Equipment: 17%

PANYNJ 2018 CO2e TPY
<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Count</th>
<th>% of Pop</th>
<th>Avg MY</th>
<th>Avg hp</th>
<th>Avg hrs/yr</th>
<th>NOx</th>
<th>PM10</th>
<th>PM2.5</th>
<th>VOC</th>
<th>CO</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Tractor</td>
<td>432</td>
<td>34.30%</td>
<td>2011</td>
<td>175</td>
<td>1,486</td>
<td>64</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>27</td>
<td>25,465</td>
</tr>
<tr>
<td>Straddle Carrier</td>
<td>371</td>
<td>29.50%</td>
<td>2011</td>
<td>288</td>
<td>2,889</td>
<td>172</td>
<td>14</td>
<td>14</td>
<td>23</td>
<td>91</td>
<td>55,331</td>
</tr>
<tr>
<td>Forklift</td>
<td>185</td>
<td>14.70%</td>
<td>2006</td>
<td>88</td>
<td>707</td>
<td>22</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>106</td>
<td>3,631</td>
</tr>
<tr>
<td>Empty Container Handler</td>
<td>64</td>
<td>5.10%</td>
<td>2009</td>
<td>200</td>
<td>2,828</td>
<td>52</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>12</td>
<td>9,245</td>
</tr>
<tr>
<td>Rubber Tired Gantry Crane</td>
<td>53</td>
<td>4.20%</td>
<td>2005</td>
<td>516</td>
<td>2,270</td>
<td>36</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>10</td>
<td>7,244</td>
</tr>
<tr>
<td>Loaded Container Handler</td>
<td>58</td>
<td>4.60%</td>
<td>2008</td>
<td>317</td>
<td>1,550</td>
<td>62</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>33</td>
<td>8,961</td>
</tr>
<tr>
<td>Reach Stacker</td>
<td>14</td>
<td>1.10%</td>
<td>2007</td>
<td>329</td>
<td>1,410</td>
<td>17</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>2,737</td>
</tr>
<tr>
<td>Stacker</td>
<td>19</td>
<td>1.50%</td>
<td>2005</td>
<td>275</td>
<td>736</td>
<td>15</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5,487</td>
</tr>
<tr>
<td>Primary Equipment</td>
<td>1,196</td>
<td>95.00%</td>
<td>2010</td>
<td>223</td>
<td>1,898</td>
<td>441</td>
<td>31</td>
<td>30</td>
<td>45</td>
<td>287</td>
<td>118,100</td>
</tr>
</tbody>
</table>
GROUND SUPPORT EQUIPMENT AT AIRPORTS

- Baggage tug
- Aircraft tractor
- Cargo loaders
- Belt loaders
CARB
PROPOSED GSE REGULATIONS

- All GSE transition to zero emissions
- Amendments propose phase in for new equipment as well as infrastructure

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Proposed amendment</th>
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<th>Proposed Compliance Start</th>
<th>Proposed Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airport ground support equipment (GSE)</td>
<td>Zero-emission airport GSE</td>
<td>2020</td>
<td>2023</td>
<td>2032</td>
</tr>
</tbody>
</table>

- Emission Benefits
  - Criteria pollutants
  - Air toxics
  - Greenhouse Gases
### Summary of Selected Ground Support Equipment at Newark Liberty International Airport (10/2019)

<table>
<thead>
<tr>
<th>Type</th>
<th>Estimated #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forklift</td>
<td>193</td>
</tr>
<tr>
<td>Cargo Loader</td>
<td>71</td>
</tr>
<tr>
<td>Baggage Tugs/Other Tugs</td>
<td>693</td>
</tr>
<tr>
<td>Belt Loaders</td>
<td>316</td>
</tr>
<tr>
<td>Tractors (aircraft tractors, other undefined tractors)</td>
<td>89</td>
</tr>
</tbody>
</table>

#### 2017 GSE Emissions from Port Authority

<table>
<thead>
<tr>
<th>EWR</th>
<th>NOx</th>
<th>PM10</th>
<th>PM2.5</th>
<th>CO2e</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>769.39</td>
<td>34.26</td>
<td>33</td>
<td>66,775</td>
</tr>
</tbody>
</table>
NJ POSSIBLE CONSIDERATIONS

• Phase in approach
  • Focus on CHE/GSE that can easily be electrified now.
  • Tier 4 for CHE where electrification is not currently an option

• CHE operations – beyond ports
  • Warehouses/distribution centers
  • Airports
  • Bulk terminals
  • Landfills
Looking for feedback

- CHE regardless of location
- Define equipment type
  - CHE – yard tractors, hostlers, jockey trucks
  - GSE – baggage tug, tractor, aircraft tractor
- Technology Availability
  - Tier 4
    - Hybrid/Electric
- Return on investment
- Planning for infrastructure
- Automation
COMMENTS

Please send comments and/or technical support information to:

NJAirrulesmobile@dep.nj.gov

Subject Line of the email: Cargo Handling Equipment

By September 30, 2020