

# Warehouse Distribution Centers Facility-Based Mobile Source Measures



3<sup>rd</sup> Working Group Meeting  
October 4, 2017

FBMSM

# Agenda

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- Background
- FBMSM Development Framework
- Warehouse Distribution Center Emissions Inventory
- Emission Reduction Opportunities
- Next Steps

# Background



- 2016 AQMP adopted March 2017
- Facility-Based Mobile Source Measure (MOB-03): Emission Reductions at Warehouses and Distribution Centers



- Key topics discussed at previous working group meetings:
  - FBMSM Process
  - FBMSM Development Framework
  - SIP credit
  - Regulations, others

Background Information			Strategies (Discussion Topics for Working Groups)		Implementation (Discussion Topics for Working Groups)	
Emission Sources	Regulations & Other Commitments	Technologies	Emission Reduction Opportunities	Financial and Other Incentives*	Implementing Mechanisms	SIP Credit
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# Background – FBMSM Development Framework

- Stakeholders have requested more information on:
  - Assumptions in 2016 AQMP emissions inventory
  - Cost-effectiveness of proposed emission reduction measures

<b><u>Background Information</u></b>			<b><u>Strategies</u></b> <i>(Discussion Topics for Working Groups)</i>		<b><u>Implementation</u></b> <i>(Discussion Topics for Working Groups)</i>	
<i>Emission Sources</i>	<i>Regulations &amp; Other Commitments</i>	<i>Technologies</i>	<i>Emission Reduction Opportunities</i>	<i>Financial and Other Incentives*</i>	<i>Implementing Mechanisms</i>	<i>SIP Credit</i>
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<i>Emissions Inventory</i>
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<i>Cost-Effectiveness</i>
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# Key Considerations with FBMSM-Related Emissions Inventories

- Assumptions used in emissions inventory important to understand when developing and evaluating emission reduction opportunities
- Many facility-based emission reduction opportunities are local, whereas AQMP inventory is regional
- Common adjustments to AQMP emissions inventory:
  - Changes in assumptions (e.g., growth forecast, etc.)
    - Assumptions may affect both the base year and future baseline years
  - Emission reduction measures (e.g., new regulations, voluntary measures that satisfy SIP integrity elements, etc.)

## “Top-Down”

- Region-wide emissions applied to subareas based on surrogates
  - Example: RTP models truck activity based on average employment per square foot for warehousing

## “Bottom-Up”

- Local data used to generate facility-specific profiles
  - Example: Business-specific traffic and air quality analyses in CEQA documents

# Key Emissions Inventory Assumptions – 2012 Base Year

## On-Road Emissions

- CARB EMFAC 2014 emission factors applied to travel activity data provided by SCAG

## Off-Road Emissions

- Provided by CARB for multiple source categories (e.g., cargo handling equipment, construction equipment, etc.)

## Stationary/Area Source Emissions

- Emission factors based on SCAQMD rule limits and regional fuel consumption

# Key Emissions Inventory Assumptions – Future Baseline

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## Growth Forecast

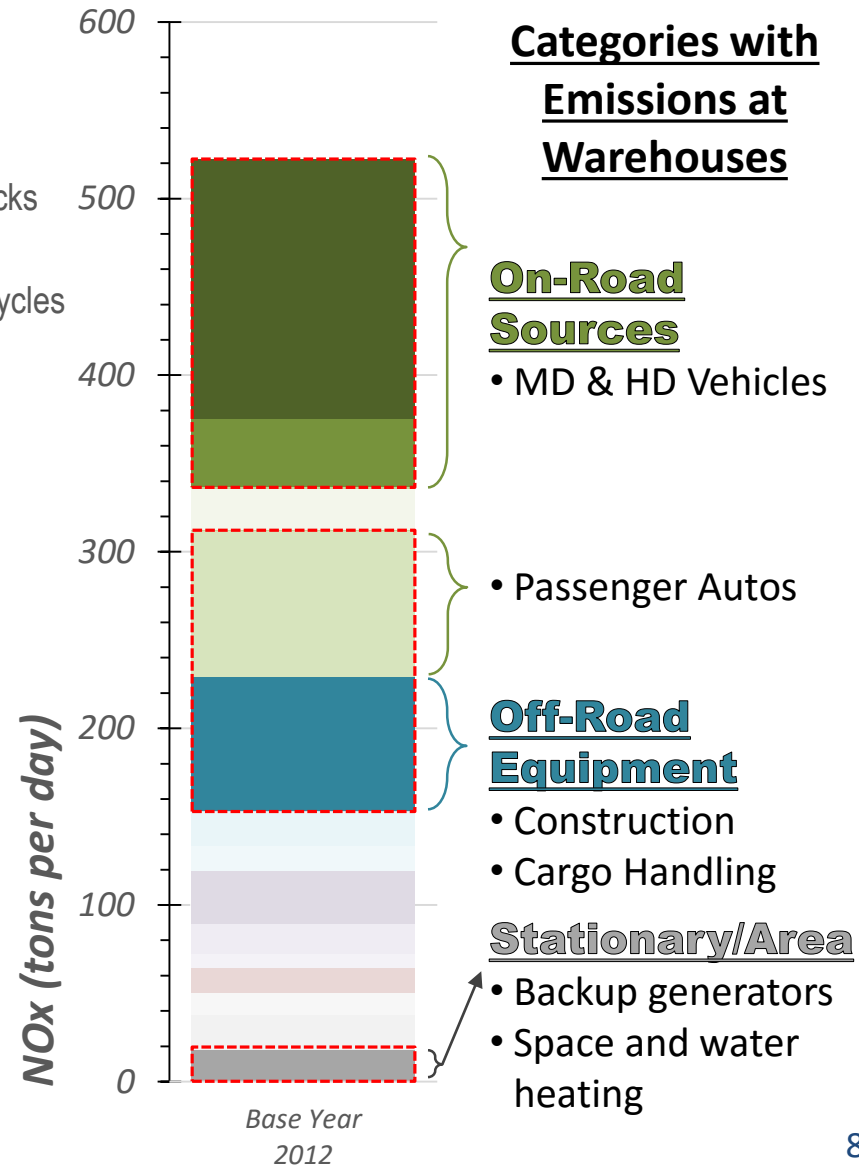
- Primarily based on demographic and economic growth projections provided by Southern California Association of Governments (SCAG)

## Regulations

- Emissions inventory accounts for emissions reductions resulting from:
  - SCAQMD regulation adopted or amended by December 2015, and
  - CARB regulations adopted by November 2015

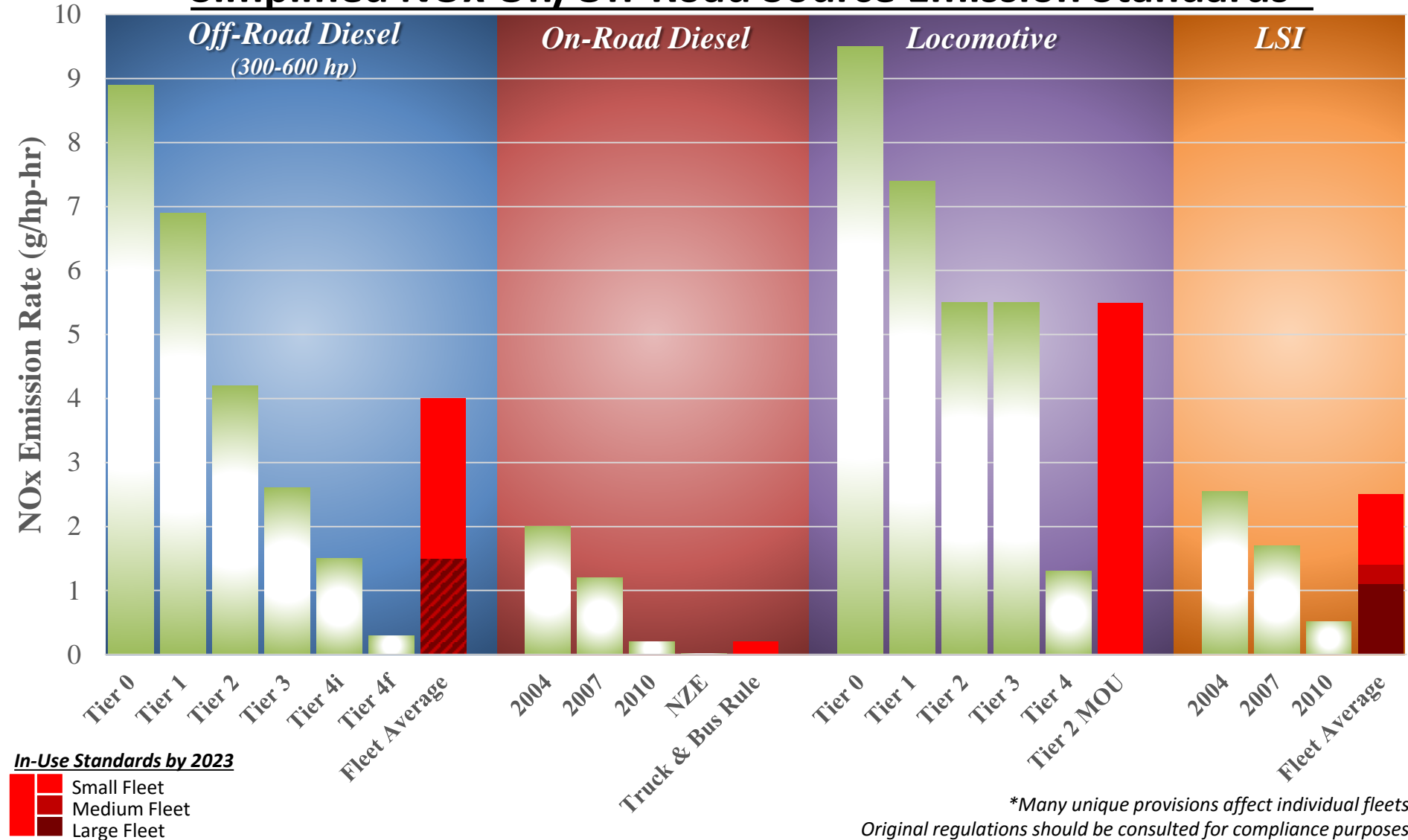
# 2016 AQMP – Base Year NOx Emissions

- Heavy-Duty Diesel Trucks
- Medium-Duty & Heavy-Duty Gas Trucks
- Buses
- Cars/Light-Duty Trucks/SUVs/Motorcycles
- Off-Road Equipment and Vehicles
- Locomotives
- Aircraft
- Ocean Going Vessels
- Commercial Harbor Craft
- Recreational Boats
- Residential Fuel Combustion
- Industrial Fuel Combustion
- RECLAIM
- Other Stationary





# Simplified NOx On/Off-Road Source Emission Standards\*



# Emissions Inventory Assumptions & Potential Opportunities – On-Road

Emissions Source	Emissions Inventory Assumptions	Potential Emission Reduction Opportunities
<ul style="list-style-type: none"><li>➤ Heavy-duty trucks</li></ul>	<ul style="list-style-type: none"><li>➤ Emission factors from ARB EMFAC 2014</li><li>➤ Activity data from SCAG Regional Transportation Plan (RTP)</li></ul>	<ul style="list-style-type: none"><li>➤ Provide financial or other incentives (e.g., preferential access) for ZE/NZE delivery trucks</li><li>➤ Infrastructure improvements to facilitate zero and near zero emission heavy-duty truck programs (e.g., combined battery+solar)</li><li>➤ Efficiency measures to reduce trips, trip lengths, and fuel usage (e.g., onsite automation, software for truckers, platooning, etc.)</li><li>➤ Provide parking/facilities for truckers to avoid offsite idling</li></ul>

# Emissions Inventory Assumptions & Potential Opportunities – Off-Road/Area

Emissions Source	Emissions Inventory Assumptions	Potential Emission Reduction Opportunities
<ul style="list-style-type: none"> <li>➤ Cargo Handling Equipment</li> <li>➤ Construction Equipment</li> <li>➤ Transportation Refrigeration Units (TRUs)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Growth and emission rates based on:               <ul style="list-style-type: none"> <li>➤ ARB OFFROAD (2011 - diesel, 2007 – large spark ignition), CHE, and TRU models</li> </ul> </li> <li>➤ Activity based on:               <ul style="list-style-type: none"> <li>➤ DOORS data + OFFROAD models</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>➤ Transition cargo handling equipment to cleanest technology available, such as: ZE -&gt; NZE -&gt; tier 4 final               <ul style="list-style-type: none"> <li>➤ Example: ZE yard trucks</li> </ul> </li> <li>➤ Zero and near-zero emission construction equipment policies</li> <li>➤ Replace TRUs with zero emission equipment (e.g., batteries, fuel cells, cryogenics)</li> </ul>
<ul style="list-style-type: none"> <li>➤ Space and water heating</li> <li>➤ Emergency generators</li> </ul>	<ul style="list-style-type: none"> <li>➤ Fuel usage based on utility-wide average</li> <li>➤ Emission rates based on SCAQMD rule limits</li> </ul>	<ul style="list-style-type: none"> <li>➤ Solar powered battery storage to replace e-gens and to provide all onsite power needs</li> </ul>

# Emissions Inventory – Additional Information Needed

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- Detailed emissions information related to:
  - Truck activity related to warehouses
    - SCAQMD/NAIOP-funded study with ITE
    - SCAG travel model
  - Cargo handling equipment information
  - Potential emissions reductions from trucking efficiency improvements

# Next Steps

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- Before March 2018 report to Board, staff needs the assistance of stakeholders to identify specific voluntary emission reduction commitments
- Continue to evaluate emissions inventory
- Develop voluntary and regulatory concepts
- Progress Report to Mobile Source Committee

# Staff Contacts

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