

Rail Yards and Intermodal Facilities

Facility-Based Mobile Source Measures



3rd Working Group Meeting
October 4, 2017

FBMSM

Agenda

- Background
- FBMSM Development Framework
- Railyards and Intermodal Facility Emissions Inventory
- Emission Reduction Opportunities
- Next Steps

Background



- 2016 AQMP adopted March 2017
- Facility-Based Mobile Source Measure (MOB-02): Emission Reductions at from Rail Yards and Intermodal Facilities



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

FBMSM Development Framework						
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

<u>Background Information</u>			<u>Strategies</u> <i>(Discussion Topics for Working Groups)</i>		<u>Implementation</u> <i>(Discussion Topics for Working Groups)</i>	
<i>Emission Sources</i>	<i>Regulations & 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”

- Statewide emissions applied to subareas based on surrogates
 - Example: cargo handling emissions are reported statewide (DOORS), then allocated by air basin

“Bottom-Up”

- Local data used to generate facility-specific profiles
 - Example: Facility-specific inventories developed for Health Risk Assessments

Key Emissions Inventory Assumptions – 2012 Base Year

Locomotive Emissions

- Locomotive emissions based on levels reported pursuant to 1998 MOU

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, TRUs, etc.)

Key Emissions Inventory Assumptions – Future Baseline

Growth Forecast

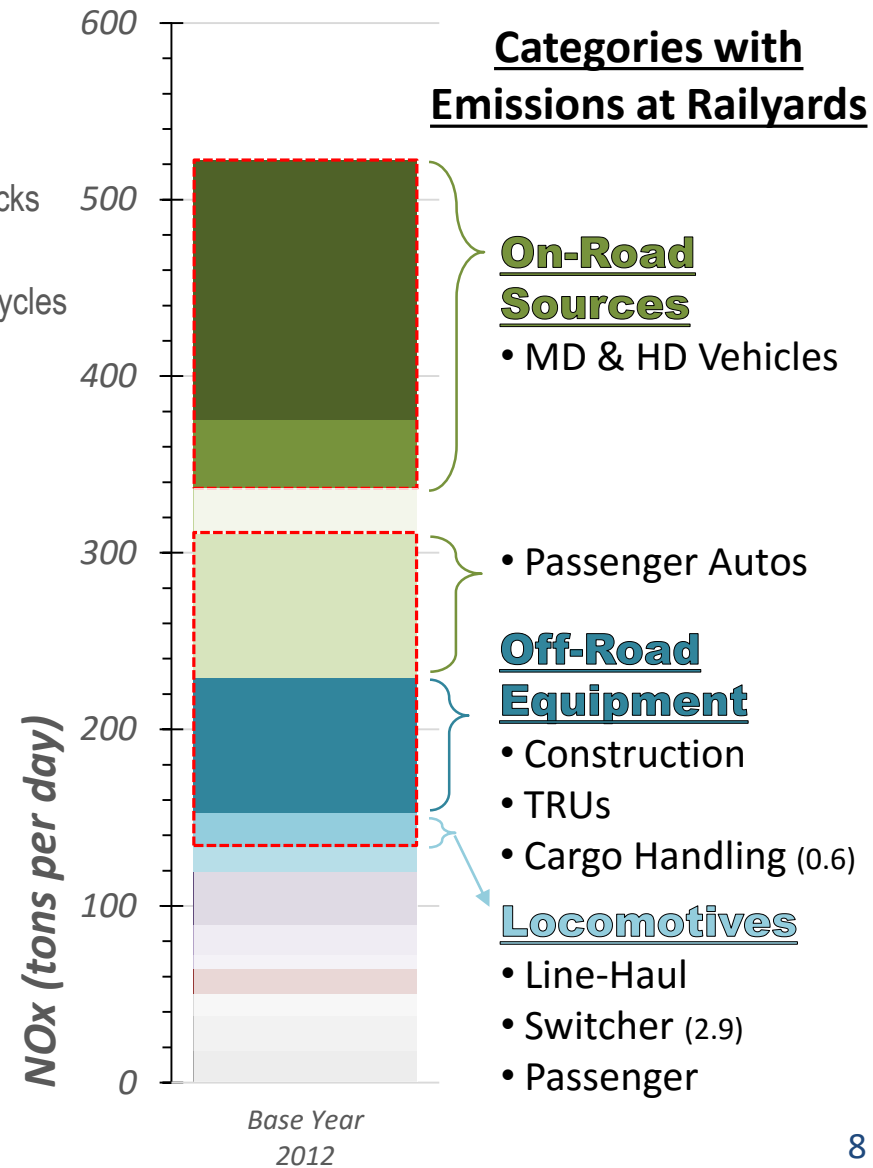
- Primarily based on demographic and economic growth projections provided by Southern California Association of Governments (SCAG) or US Dept. of Transportation

Regulations

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

2016 AQMP – Base Year NOx Emissions

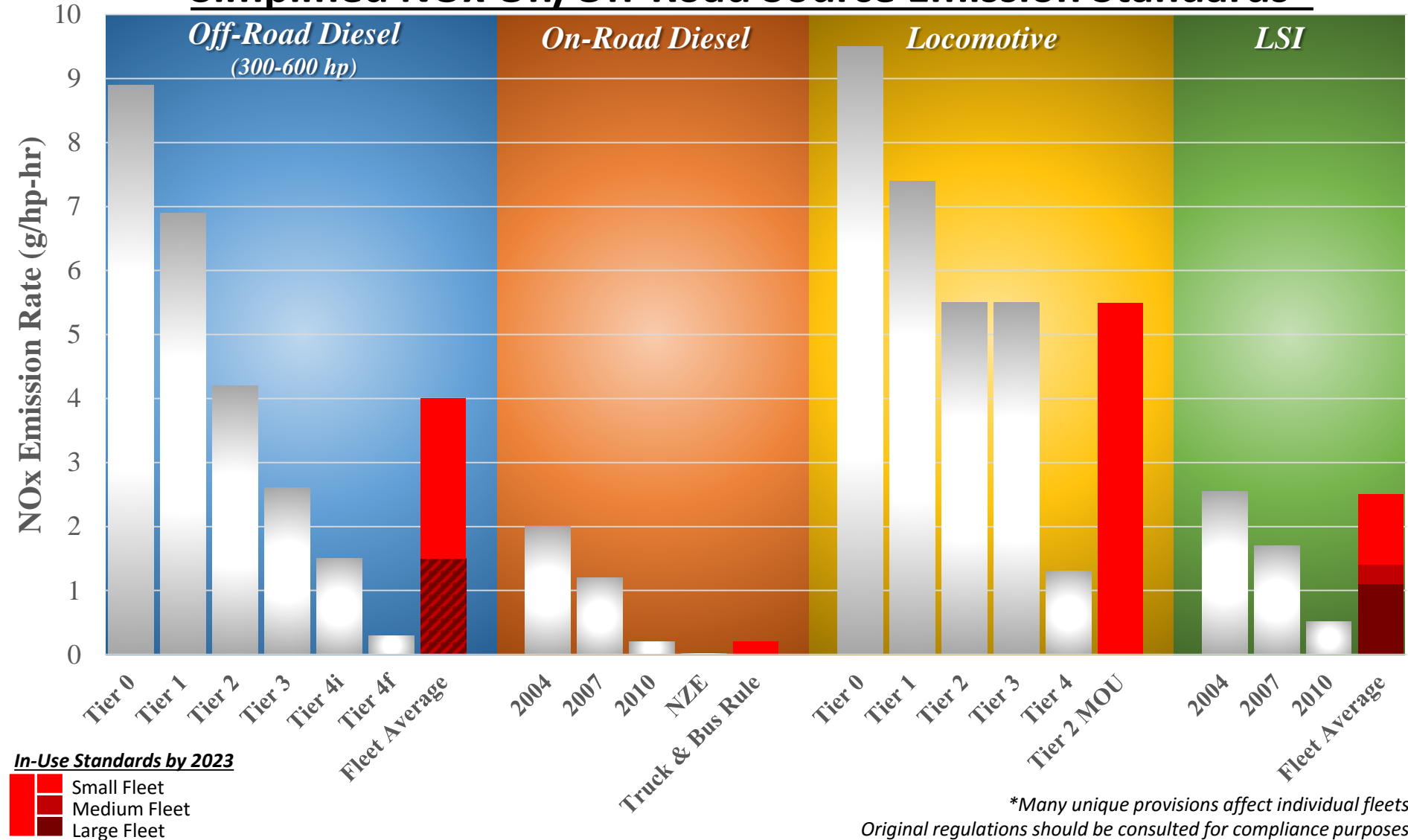
- Heavy-Duty Diesel Trucks
- Medium-Duty & Heavy-Duty Gas Trucks
- Buses
- Cars/Light-Duty Trucks/SUVs/Motorcycles
- Off-Road Equipment and Vehicles
- Locomotives
- Aircraft
- Ocean Going Vessels
- Commercial Harbor Craft
- Recreational Boats
- Residential Fuel Combustion
- Industrial Fuel Combustion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



Previous Rail Yard Emission Inventories - Health Risk Assessments

- In 2007-2009 BNSF/UP developed emissions inventories and HRAs for rail yards under 2005 MOU with ARB
 - 2005 base year
 - Future years (through 2020) estimated based on Mitigation Plans
- In 2014 Metrolink voluntarily developed an emissions inventory and HRA for its Central Maintenance Facility
 - 2010 base year
 - Future years (through 2017) estimated based on mitigation plan
- Current facility-specific emission inventories not available

Simplified NOx On/Off-Road Source Emission Standards*



Emissions Inventory Assumptions & Potential Opportunities – Locomotives

Emissions Source	Emissions Inventory Assumptions	Potential Emission Reduction Opportunities
<ul style="list-style-type: none"> ➤ Locomotives 	<ul style="list-style-type: none"> ➤ Activity based on: <ul style="list-style-type: none"> ➤ Surface Transp. Board data ➤ FHWA Freight Analysis Framework ➤ Population based on: <ul style="list-style-type: none"> ➤ 1998 MOU ➤ Assoc. Amer. Railroads data ➤ EPA survival rates ➤ Emission rates based on: <ul style="list-style-type: none"> ➤ EPA standards ➤ Passenger/switch locos activity based on: <ul style="list-style-type: none"> ➤ 2008 EPA rule and SCAG economic activity 	<ul style="list-style-type: none"> ➤ Operate cleaner locomotives in the South Coast Air Basin <ul style="list-style-type: none"> ➤ Tier 4 ➤ New technologies (hybrid, Tier 5, etc.) ➤ Operational efficiency improvements not already included in inventory <ul style="list-style-type: none"> ➤ Facility reconfigurations ➤ Fuel efficiency improvements (e.g., aerodynamics, Positive Train Control, etc.) ➤ Reduced load testing, etc. ➤ Onsite exhaust capture and control (e.g., ALECS)

Emissions Inventory Assumptions & Potential Opportunities – Off-Road

Emissions Source	Emissions Inventory Assumptions	Potential Emission Reduction Opportunities
<ul style="list-style-type: none"> ➤ Cargo handling equipment ➤ Railyard maintenance and construction equipment ➤ Railcar and truck Transportation Refrigeration Units (TRUs) 	<ul style="list-style-type: none"> ➤ Growth and emission rates based on: <ul style="list-style-type: none"> ➤ ARB OFFROAD (2011 - diesel, 2007 – large spark ignition), CHE, and TRU models ➤ Activity based on: <ul style="list-style-type: none"> ➤ DOORS data + OFFROAD models 	<ul style="list-style-type: none"> ➤ Transition cargo handling equipment to cleanest technology available, such as ZE -> NZE -> tier 4 final <ul style="list-style-type: none"> ➤ Examples: ZE yard trucks, electric hybrid gantries, etc. ➤ Zero and near-zero emission maintenance and construction equipment policies ➤ Replace TRUs with zero emission equipment (e.g., batteries, fuel cells, cryogenics)

Emissions Inventory Assumptions & Potential Opportunities – On-Road

Emissions Source	Emissions Inventory Assumptions	Potential Emission Reduction Opportunities
<ul style="list-style-type: none">➤ Heavy-duty trucks➤ Facility fleet	<ul style="list-style-type: none">➤ Growth and activity data from SCAG Regional Transportation Plan (RTP)➤ Emission Factors from EMFAC 2014	<ul style="list-style-type: none">➤ Provide financial or other incentives (e.g., preferential access) for ZE/NZE delivery trucks➤ ZE/NZE fleet modernization programs➤ Opportunity charging infrastructure for visiting delivery trucks

Emissions Inventory

Additional Information Needed

- **Locomotives**
 - Equipment upgrades and facility improvements that result in operational efficiencies
- **Off-road**
 - Facility-specific upgrades to cargo handling equipment (e.g., tier 4 equipment, zero emissions equipment, etc.)
- **On-road**
 - Heavy duty truck activity levels and facility-owned fleet mix (e.g., maintenance trucks)

Next Steps

- Before March 2018 report to Board, staff needs the assistance of stakeholders to:
 - Obtain detailed emissions information (e.g., existing facility-specific inventories)
 - Identify specific voluntary emission reduction commitments
- Develop voluntary and regulatory concepts
- Progress Report to Mobile Source Committee

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