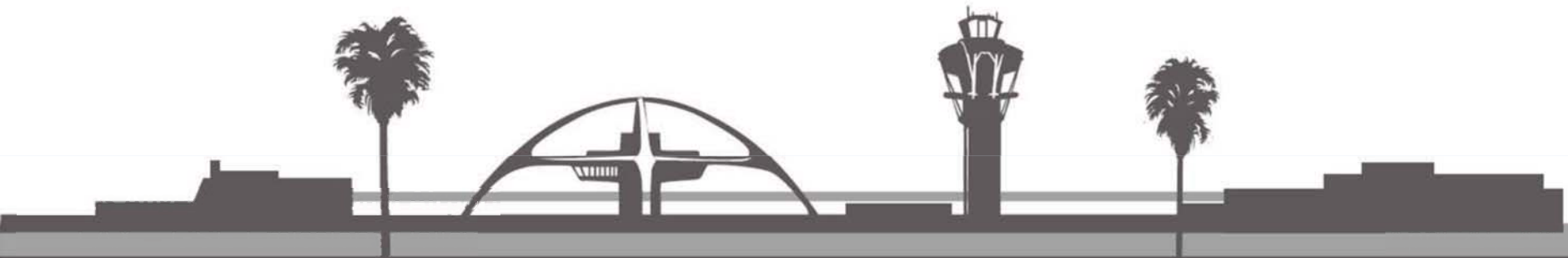


Los Angeles International Airport

LAX – Ground Service Equipment (GSE) and Green Construction Policies

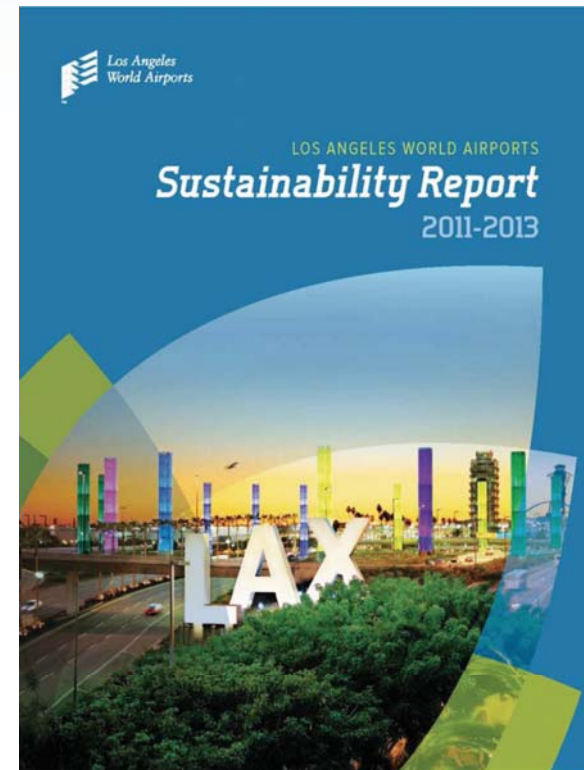
**AQMD Briefing
April 29, 2015**



LAWA & Sustainability



- Los Angeles World Airports (LAWA) is a proprietary department of the City of Los Angeles
 - Owns and operates LAX, Ontario Int'l Airport, Van Nuys Airport, and landholdings in Palmdale
- Sustainability Program
 - LAWA in midst of revamping its Sustainability Program
 - Updating goals and initiatives to better align with City's goals
 - Resuming annual reporting and developing metrics-based approach



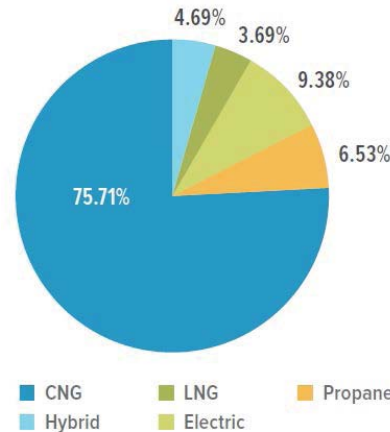
Current Air Quality Initiatives

Improve Air Quality/Reduce Emissions

- **Alternative Fuel Programs**

- Vehicle Fleet
- Ground Service Equipment
- EV Chargers
- CNG stations

LAX Alternative Fuel Vehicle Fleet



Current Air Quality Initiatives

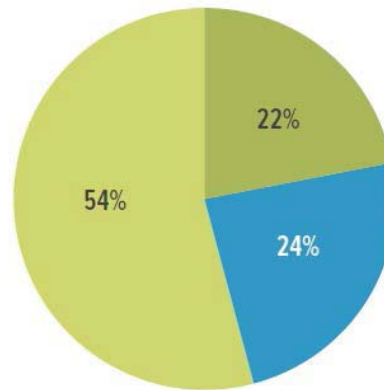
- **Trip Reduction Programs**
 - Rideshare/Vanpool
 - FlyAway

- **Clean construction equipment**

- **Ground Power to offset use of Auxiliary Power Units (APUs)**
 - Electrification of Remain Overnight (RON) gates, Cargo Parking Positions, Maintenance & Hangars
 - Provide Pre-conditioned air



LAX Rideshare Breakout



■ Vanpool ■ Transit ■ Carpool



LAX GSE Emissions Reduction Policy Goals

- Reduce GSE emissions factor at LAX to 2.65 g/bhp-hr of HC + NOx by Dec. 31, 2021
 - Target originated with South Coast GSE MOU, 2002
 - Included in LAX Community Benefits Agreement, 2005
- Airlines agree w/ State to comply w/ CARB rules, 2006
- LAWA will require Operators at LAX to meet statewide CARB targets *at LAX*
 - No later than Dec. 31, 2021
 - Must maintain target
 - Must submit annual report on fleet mix and emissions



2013 GSE Inventory and Feasibility Study

- 2013: LAWA Completed Comprehensive evaluation of existing GSE fleet at LAX
 - No other airport in the nation has such an exhaustive GSE inventory
 - Inventory provides update to 2006 LAX GSE inventory

GSE Type	Conventional	LNG/CNG	Electric	Total	% LNG/CNG	% Elec.
2013 GSE Inventory	1,281	444	999	2,724	16%	37%
2006 GSE Inventory	1,815	510	722	3,047	17%	24%

- Key Study Findings:
 - 37% of GSE fleet is zero-emission technology (ZEV)
 - 16% is low-emission technology (CNG or LNG)
 - Aggregate HC + NO_x emission rate is 5.17 g/bhp-hr
 - Ability to achieve 2.65 g/bhp-hr is feasible



LAX GSE Emissions Reduction Policy

- Requires GSE Operators to maintain a maximum of 2.65 g/bhp-hr of HC + NO_x by December 31, 2021
- Interim assessment on March 31, 2019
 - If operator exceeds composite emission factor of 3.0 g/bhp-hr, operator must provide action plan for achieving 2.65 target
- Requires GSE Operators to submit data on an annual basis
- Requires GSE Operators not to exceed 2.65 target after 2021
- Provides remedies to LAWA if GSE Operator fails to meet target, including potential loss of operating license at LAX
- Provides incentives for further emissions reduction
 - Particularly as related to eGSE and charging infrastructure but will not mandate eGSE
- Recognizes LAWA's responsibility to provide necessary infrastructure to support conversion to electric GSE
- Board of Airport Commissioners adopted Policy on April 16, 2015

GSE Next Steps

- Now – July 2015: LAWA staff working to craft implementation plan for GSE Policy, including:
 - Amendments to LAX Rules & Regulations
 - Emissions Calculator
 - Data collection & Reporting procedures
 - Ramp policies for common use terminals gates
- July 1, 2015 – Policy effective date
- July 1, 2015 – LAWA to hire consultant to assist with monitoring, analysis, and implementation of GSE rules and regulations



LAX Green Construction Policy





LAX Green Construction Policy

- LAX conducts between \$1 and \$3 Million in construction every day
- LAX has administered a green construction policy since 2005
- The green construction policy utilizes BACT and other controls to limit emissions
- Compliance is verified through a 3rd party monitor
- Beginning in 2014 all newly approved major projects included a goal of using Tier 4 equipment and 2010 haul truck (as commercially available)

Examples of completed green construction projects

SAIP

Relocated
Runway 25L &
Center Taxiway
Completed June
2008



Taxiway S

Completed on
April 13, 2012



Taxiway R

Crossfield
Taxiway
between North
& South Airfields
completed May
2010



American Airlines Hangar Demolition

Completed
December 2012



LAFD Station 80

Aircraft Rescue
& Firefighting
Facility
Completed
November 2010



Tom Bradley International Terminal

Central Core &
South
Concourse
Completed May
2013



TBIT - East Aprons - BACT & Exemptions Summary

Out of 343 Pieces of Equipment Reviewed...

Number that Meet or Exceed CBA Requirements	230
Number Certified to 2010 EPA Standard or Tier 4/Tier 4i	160
Number Retrofitted with Level 3 VDECS	42
“20-Day” Exemption Status	0
“Line of Sight” Exemption	22
Identified as Not Compatible with BACT Device	44



Photos: TBIT – East Aprons. Demolition Phase

Equipment ID & Verification Using ARB-DOORS*



*Air Resources Board - Diesel Off-Road One Reporting System

Verifying Equipment Data Using DOORS



ARB – DOORS: This One was Easy...



Vehicle Type	Excavators
Vehicle Manufacturer	HITACHI
Vehicle Model	ZX350
Vehicle Model Year	2013
Engine Model Year	2012
Engine Horsepower	300



Vehicle Type	Rubber_Tired_Loaders
Vehicle Manufacturer	CATERPILLAR
Vehicle Model	950K
Vehicle Model Year	2013
Engine Model Year	2013
Engine Horsepower	240

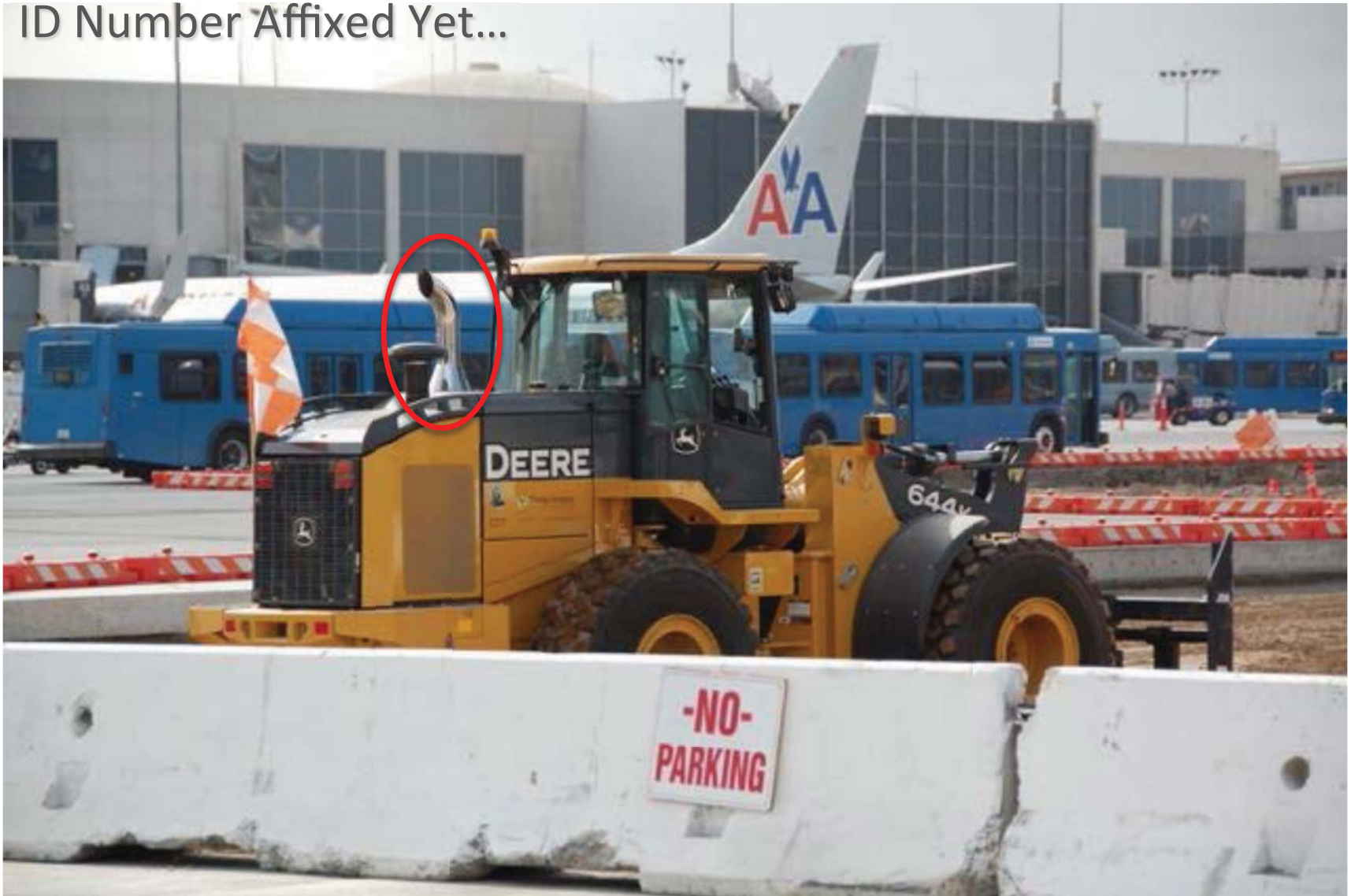
Equipment List Validation: TBIT – East Aprons

Roller	YW4X54	Griffith – Rubber Tire Loader – 3606	T4-I
Loader	DX4H54	Griffith – Backhoe – 3678	T4-I
Backhoe	FV5W99	Griffith – Skip Loader – 3713	T4-I
Skip Loader	KR3A59	Griffith – Skip Loader – 3712	T4-I
Skip Loader	HK8F43	Griffith – Backhoe - 3679	T4-I
Loader	HY7B78	Griffith-Skid Steer Loader – 3670	T4-I
Loader	UM6M78	Griffith - Rough Terrain Forklift – 3709	T4-I
Forklift	TB6V79	Griffith - Rough Terrain Forklift – 3710	T4-I
Forklift		So Cal Grading – Rubber Tire Loader– 810	
Excavator	GG9W87	John Deere 772 Grader -	Tier 4F
Motor Grader	ET8W73	Geerlings – CAT 824C Dozer - 1	Tier 3
Dozer	SV7U78	SoCal Grading – Motor Grader– 510	Tier 4F
Motor Grader	XV4K67	SoCal Grading – 336EL Excavator – 201	Tier 4
Excavator	LJ5F47	Fine Grade Equipment – Scraper – 623E -8	Tier 3
Scraper	GF7N56	SoCal Grading – Rubber Tire Loader 950K – KC809	T4-I
Loader	PR3L74	Fine Grade Equipment – Scraper – 623-10	Tier 3



Vehicle Type	Rubber_Tired_Loaders
Vehicle Manufacturer	CATERPILLAR
Vehicle Model	950K
Vehicle Model Year	2012
Engine Model Year	2012
Engine Horsepower	200

This Piece of Equipment was So New It Didn't Have a DOORS ID Number Affixed Yet...



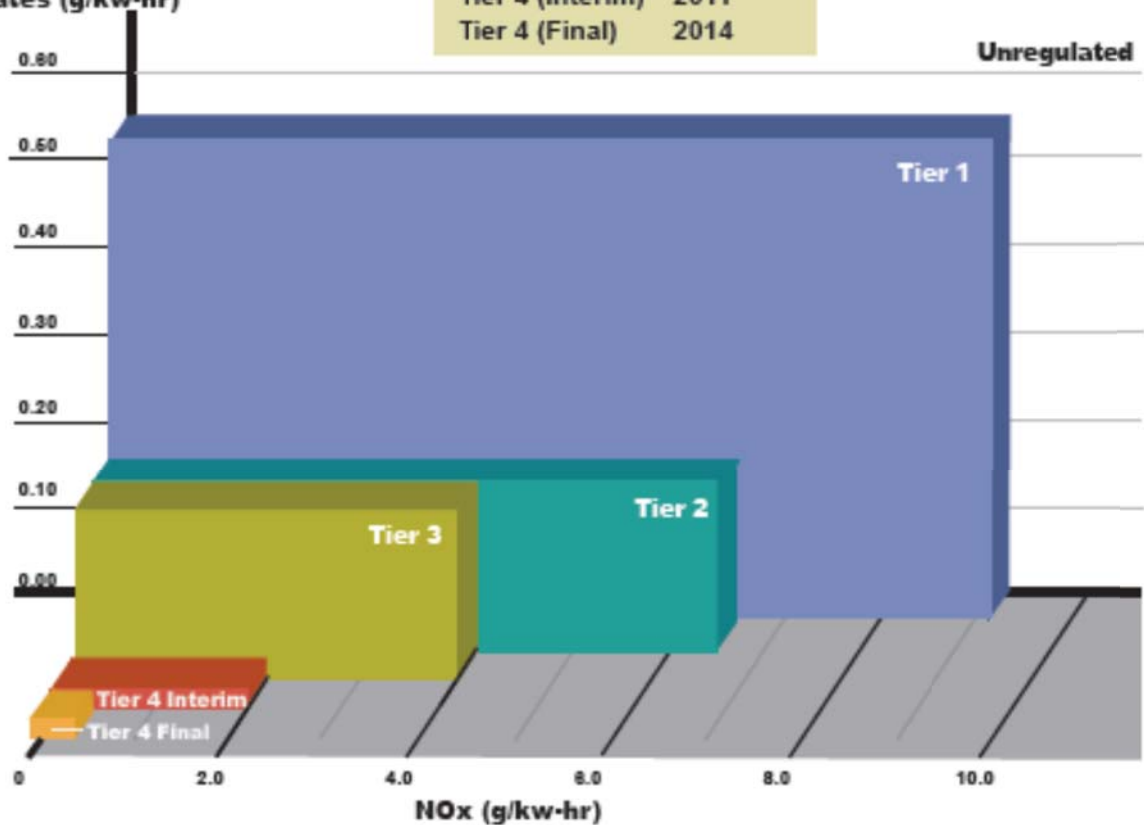
Emission reductions are significant

Let's Put it into Perspective...

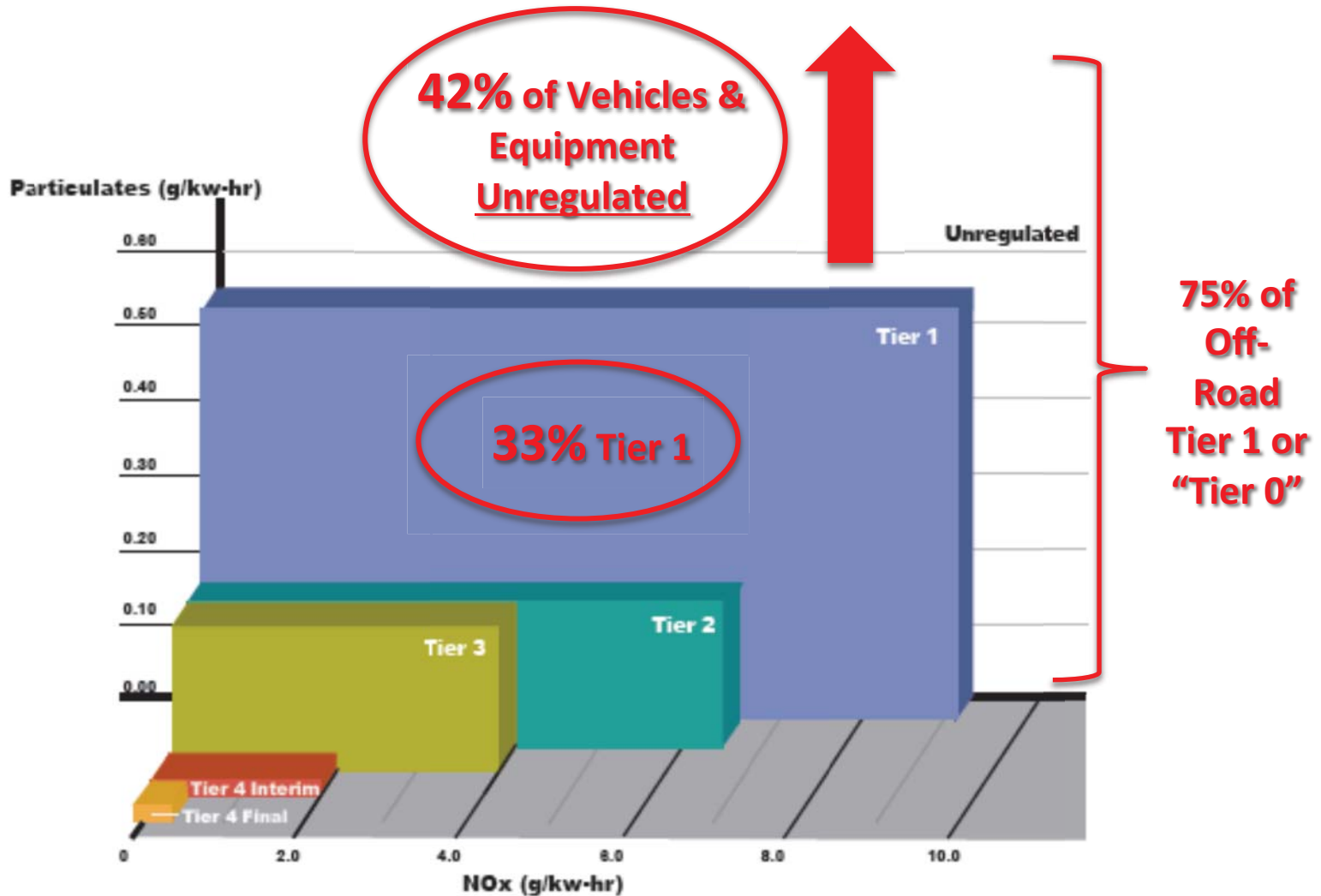
US EPA Non-Road Regulations (130-560kw)

Tier 1	1996
Tier 2	2001-2003
Tier 3	2005-2006
Tier 4 (Interim)	2011
Tier 4 (Final)	2014

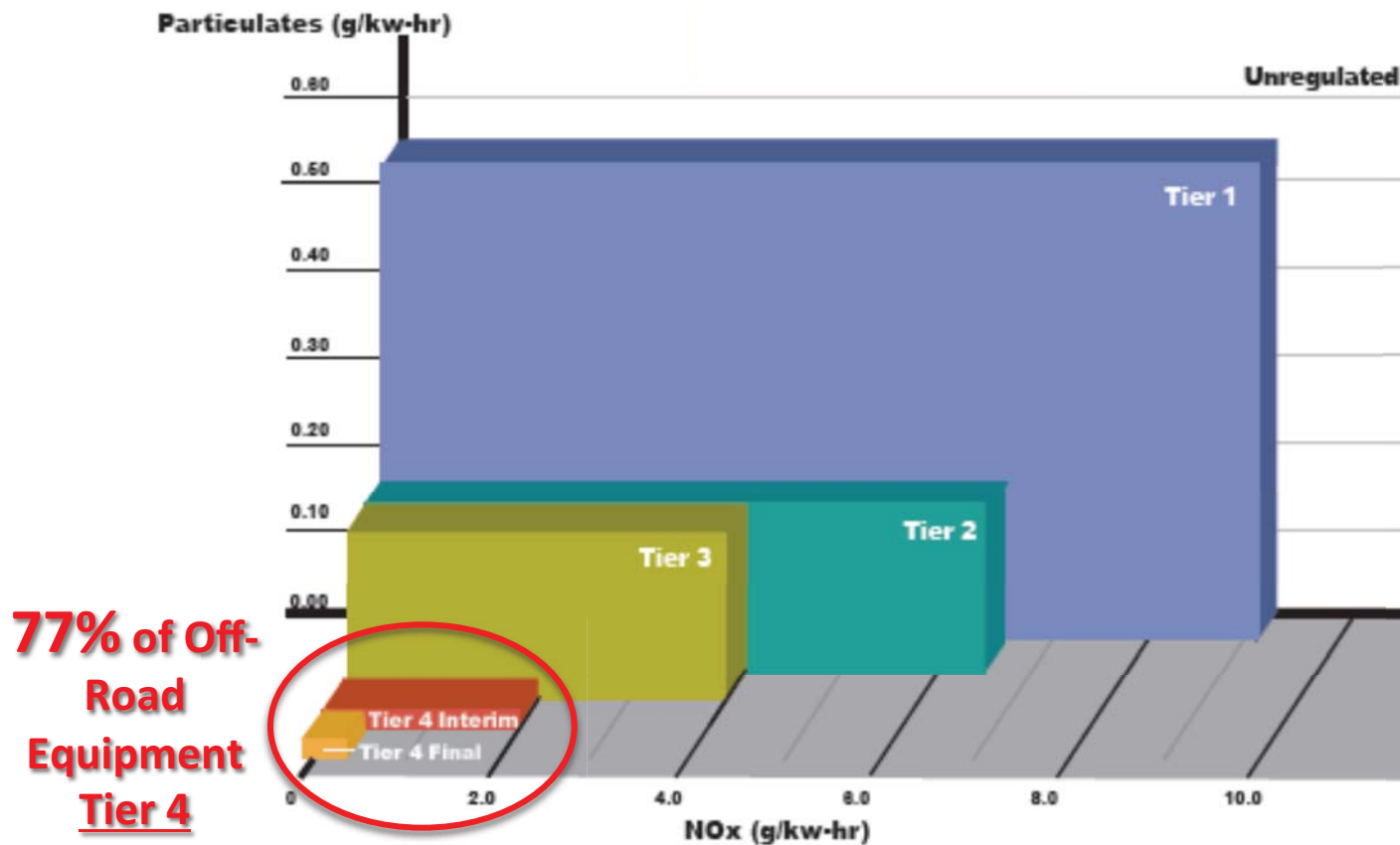
Particulates (g/kw-hr)



South Airfield Improvement Project – Circa 2006...



West Aircraft Maintenance Area – Today...



WAMA/Qantas- Task 1 & 4 Summary

Out of 156 Pieces of Equipment Reviewed...
124 Approved for Airfield Use

Number that Meet or Exceed CBA Requirements	124
Number Certified to 2010 EPA Standard or Tier 4/Tier 4i	80
“On-Road” Exemption Status	25
“Line of Sight” Exemption	19
Disallowed from Airfield Use	32

Vehicle Type	Excavators
Vehicle Manufacturer	CATERPILLAR
Vehicle Model	349E
Vehicle Model Year	2013
Engine Model Year	2013
Engine Horsepower	425



Master Plan Project First WAMA Using Solar Light Towers



Brand-New Water Trucks...



MFD BY: VALENTI

DATE OF MFR: MO Oct YR. 2014

GVWR: KG (58,000 LB)

GAWR-FRONT:

KG (18,000 LB)

WITH 315/80R22.5 TIRES,

22.5X9.00 RIMS, @ KPA

(PSI) COLD

GAWR-INTERMEDIATE(1):

KG (LB)

WITH TIRES,

RIMS, @ KPA

(PSI) COLD

GAWR-INTERMEDIATE(2):

KG (LB)

WITH TIRES,

RIMS, @ KPA

(PSI) COLD

GAWR-REAR:

KG (40,000 LB)

WITH 11R22.5 TIRES,

22.5X8.25 RIMS, @ KPA

(PSI) COLD

THIS VEHICLE HAS BEEN COMPLETED IN ACCORDANCE WITH THE PRIOR MANUFACTURERS' IVD, WHERE APPLICABLE. THIS VEHICLE CONFORMS TO ALL SAFETY PREVENTION



Cleanest Available Equipment Used When Higher Tier Equipment Not Available



XX6L37
M16064 FRONT

Vehicle Type	Scrapers
Vehicle Manufacturer	CATERPILLAR
Vehicle Model	637E
Vehicle Model Year	1990
Engine Model Year	2007
Engine Horsepower	450

LAX: Consistent Improvement Over Time

CBA Section X.F	SAIP Projects 2008	Crossfield Taxiway 2010	Taxiway S, Bradley Phase 1 2012	Taxilane T – Phase 1 2014	TBIT-East Aprons	WAMA/Qantas
BACT Requirements	11 Demonstration Devices Installed	33 BACT Devices	15 BACT Devices	48 meet CBA Requirements	61% of off-Road = Tier 4	77% of Off-Road =Tier 4
Noise Complaints	2 Received (Not Legitimate)	None Received	One Received	None to Date	None to Date	None to Date
Dust Complaints	10 Received by LAWA 1 AQMD NOV	No Complaints Logged	No Complaints Logged	No Complaints Logged	None to Date	None to Date
Curfew Violations	Several Violations Issued/Fines Levied	Several Violations/ Fines Resulted in Posted Sign	None (1 Erroneous)	None	None to Date	None to Date
Batch Plant	Powered by Diesel Generator	Powered by Grid Electricity Shroud/Bag house Dust Collection	Title 5 Compliant	Title 5 Compliant Grid Electricity	Title 5 Compliant Grid Electricity	Title 5 Compliant Grid Electricity Expected
Aggregate Crusher	Tier 0 Engine	Tier 3 Engine Lower Horsepower Water Spray Dust Suppression	Lower Horsepower Water Spray Dust Suppression	Grid Electricity Water Spray Dust Suppression	Grid Electricity Water Spray Dust Suppression	Expect Grid Electricity Water Spray Dust Suppression Expected

Opportunities for Future Success & Collaboration

- Develop low-emission equivalents for high-horsepower equipment
 - Provide monetary incentives to replace newer but dirtier equipment
 - Target incentives to assist smaller contractors so they can compete for airport and other clean construction projects
 - Offer incentives to use clean equipment on off-airport projects
 - Cultivate public and private relationships to develop similar programs
-