WHY SHOULD WE STILL CARE ABOUT LIGHT-DUTY HIGH EMITTING VEHICLES?

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Measurements and Equipment

Site and Measurement Dates

www.feat.biochem.du.edu

West Los Angeles
Southbound La Brea Blvd. to Eastbound I-10
March 28 – April 3 2015
(22,125 records)

DU FEAT
Single Measurement Stdev

NDIR – CO₂
CO ± 4 g/kg
HC ± 4 g/kg
%Opacity ± 0.8%

UV – NO ± 0.4 g/kg
NO₂ ± 0.3 g/kg
NH₃ ± 0.02 g/kg

Speed and Acceleration

License Plate Photo
West Los Angeles CO Emission Comparison

![Graph showing emission comparison between 1999 and 2015.]
West Los Angeles NO Emission Comparison

![Graph showing mean NO emissions by vehicle age for 1999 and 2015. The graph compares the emissions over different vehicle ages, with error bars indicating variability.]
West Los Angeles Percentage of CO Contributed by the 99\textsuperscript{th} Percentile

- 1999: 86%
- 2015: 14%

2015 99\textsuperscript{th} Percentile Averaged 463 gCO/kg of fuel (3.9 %CO)
West Los Angeles Percentage of HC Contributed by the 99th Percentile

1999

83%

2015

17%

2015 99th Percentile Averaged 58 gHC/kg of fuel (1600ppm HC)
Does One Car Matter?

349 gHC/kg of fuel (~80 grams/mile)
CARB Almanac Emissions Projection For South Coast Air Basin

• 2015 Inventory Year
• On-road Mobile Sources
• South Coast Air Basin
• TOG – 116.7 tons/day / ROG – 106.7 tons/day

I’m going to call it 120 tons/day

www.arb.ca.gov/app/emsinv/2013/emssumcat.php
One Car
Measured Twice, Avg. 330 gHC/kg of Fuel

• 30 miles per day @ 10mpg = 3 gallons / day
• 3 gal/day x 0.75 kg / liter = 8.5 kg fuel / day
• 8.5 kg x 330 gHC/kg = 2800 grams HC / day
• 120 short tons = 108,960,000 grams HC / day
• One car accounts for 0.003% of SCAB HC
• This one car is only 0.00001% of SCAB fleet assuming 10,000,000 vehicles.
2015 West Los Angeles Fleet as Surrogate for the Basin Fleet

- 5 vehicles (7 readings) all above 300 gHC/kg
- 5/17,360 unique vehicles = 0.03% WLA Fleet
- 10,000,000 vehicles in the SCAB
- 0.03% = 3000 vehicles in the SCAB
- 120 short tons TOG / day
- 3000 vehicles contribute ~ 8 tons / day
- Or ~ 6.5% of the SCAB 2015 TOG / day
Recent Research

Trends in selected ambient volatile organic compound (VOC) concentrations and a comparison to mobile source emission trends in California's South Coast Air Basin

Yanbo Pang*, Mark Fuentes, Paul Rieger
California Air Resources Board, 9828 Telstar Ave, El Monte, CA 91731, USA

HIGHLIGHTS

• Annual concentrations of ambient VOCs decreased 40% from 1999 to 2009 in the SoCAB.
• LDGV tailpipe emission reductions were a major factor for VOC concentration decreases.
• Benzene concentration normalized ratios of ambient VOCs remained stable 1999–2009.
• Isooctane increases prove that LDGV emissions were main contributor to ambient VOCs.
• LDGV tailpipe emissions remained the dominant contributor to ambient VOCs in 2009.

• Tailpipe emissions dominant contributor to 2009 ambient VOC’s
• EMFAC predicts evaporative emissions dominant contributor

Conclusions

• Yes we still believe High Emitters matter, especially for HC, and they matter more and more with each passing day!

• There is disagreement over the source (tailpipe or evaporative) and amount of HC emissions in the South Coast Air Basin

• The impact of increasingly skewed emission distributions may be one reconciling factor

• HC reductions will always reduce ozone