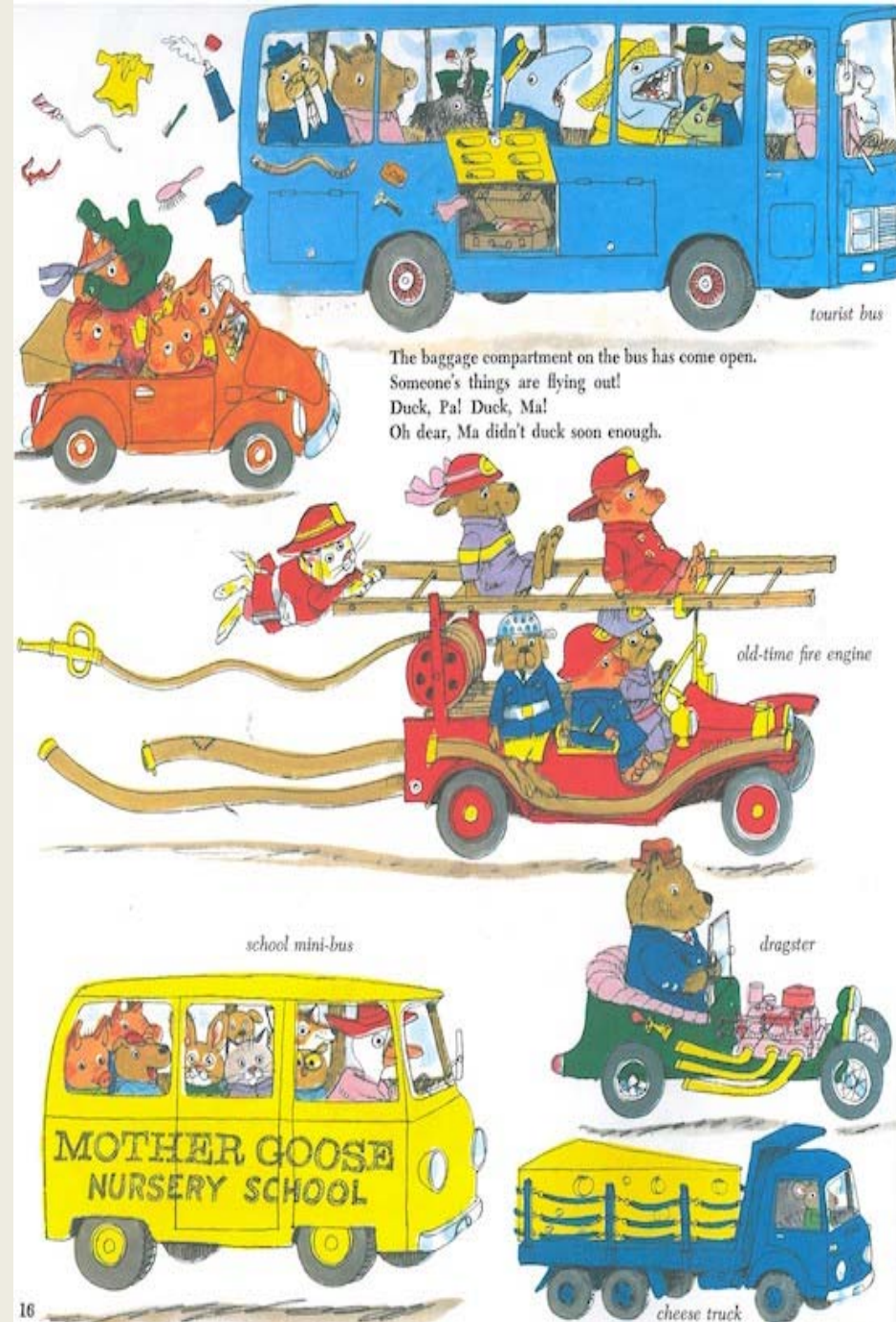


US EPA ARCHIVE DOCUMENT

# DEQ Training

MCDI 2012 Spring  
Conference

Carolyn Persoon





- Background
- Quantifier
- Specific problems/questions



Photo Credit:  
University of Denver (U)

# What to use the DEQ for....

"The Diesel Emissions Quantifier is intended as a helpful tool to prepare *estimates*, but is not designed to meet requirements under other types of air or transportation submissions."

Photo Credit:  
University of Denver (U)



The Quantifier is capable of the following:

- Estimating emissions from a single emissions reduction project;
- Comparing fleet emissions using different retrofit control technologies; and
- Assisting Smart Way carrier partners and DERA/ARRA grantees in developing proper data reports for submission to the EPA.

Photo Credit:  
University of Denver (U)

# What is behind DEQ?

- National Mobile Inventory Model (NMIM) & MOVES2010a with NONROAD
- 2008 Locomotive Engines and Marine Diesel Engines Emission Standards Regulations
- Reductions are verified technology averages or regulation standards
- Fields reflect EPA verified/certified technologies (i.e. anti-idling)

Photo Credit:  
University of Denver (U/D)

# NONROAD

Three key components:

$$EF = ZHL \times TAF \times DF$$

**ZHL** = “zero hour” levels -- *from new engine test data*

**TAF** = transient adjustment factor -- *adjusts the ZHLs that are derived from steady-state lab testing, to account for how engine speed and load variations in the field affect emissions.*

**DF** = deterioration factor -- *adjusts for age-related deterioration and malmaintenance*

Photo Credit:  
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# Base Emissions

Vehicle Type

Engine Year

horsepower

Emission Rate\*  
(per pollutant)

X

VMT/Usage

+

Idling

X

ER

**= Total Annual Emissions**

\*Emission Rates used are from either NMIM or MOVES and are based on retrofit year.

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# Emission Reductions

- Percent reduced is :
  - Engine Standards
  - Verified Technology Averages

Recreational Vehicle Exhaust Emission Standards

| Vehicle                    | Model Year     | Emission standards |               | Phase-in |
|----------------------------|----------------|--------------------|---------------|----------|
|                            |                | HC<br>g/kW-hr      | CO<br>g/kW-hr |          |
| Snowmobiles                | 2006           | 100                | 275           | 100%     |
|                            | 2010           | 75                 | 200           | 100%     |
|                            |                | HC+NOx*<br>g/km    | CO*<br>g/km   |          |
| Off-highway<br>Motorcycles | 2006           | 2.0                | 25.0          | 50%      |
|                            | 2007 and later | 2.0                | 25.0          | 100%     |
| ATVs                       | 2006           | 2.0                | 25.0          | 50%      |
|                            | 2007 and 2008  | 2.0                | 25.0          | 100%     |
|                            | 2009           | 1.0                | 25.0          | 50%      |
|                            | 2010 and later | 1.0                | 25.0          | 100%     |

Photo Credit:

University of Denver (U/D)

# Fuel Type and Fuel Amount

- Used to calculate  $\text{CO}_2$

- Type = Diesel  $\text{CO}_2$   
Factor

- $\Delta$  Amount of fuel  
gives the  $\text{CO}_2$   
emissions

Photo Credit:  
University of Denver (U)



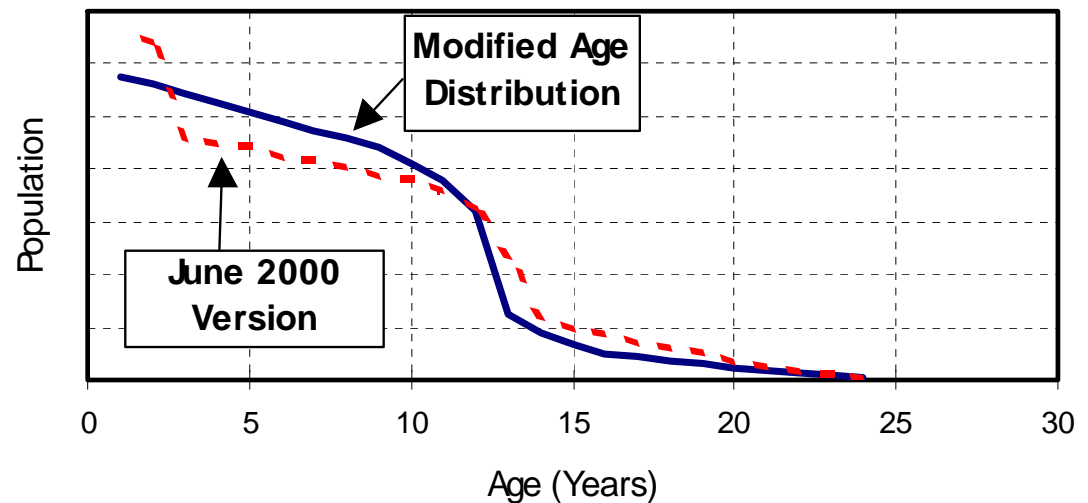
# Lifetime emissions

TABLE 2  
U.S. Average Vehicle Age (1995 - 2009)

| As of     | Passenger Cars | Light Trucks | All Light Vehicles |
|-----------|----------------|--------------|--------------------|
| 7/1/1995  | 8.4            | 8.3          | 8.4                |
| 7/1/1996  | 8.5            | 8.3          | 8.5                |
| 7/1/1997  | 8.7            | 8.5          | 8.6                |
| 7/1/1998  | 8.9            | 8.5          | 8.8                |
| 7/1/1999  | 9.1            | 8.5          | 8.8                |
| 7/1/2000  | 9.1            | 8.4          |                    |
| 7/1/2001  | 9.3            | 8.4          |                    |
| 7/1/2002  | 9.4            | 8.4          |                    |
| 7/1/2003  | 9.6            | 8.5          |                    |
| 7/1/2004  | 9.8            | 8.6          |                    |
| 7/1/2005  | 10.1           | 8.7          |                    |
| 7/1/2006  | 10.3           | 8.9          |                    |
| 7/1/2007  | 10.4           | 9.0          |                    |
| 7/1/2008  | 10.6           | 9.3          |                    |
| 10/1/2009 | 10.6           | 9.6          |                    |

Source: R. L. Polk & Co.

Year 2000 NONROAD Population by Age  
Ag Tractors 50-100 hp





# Examples

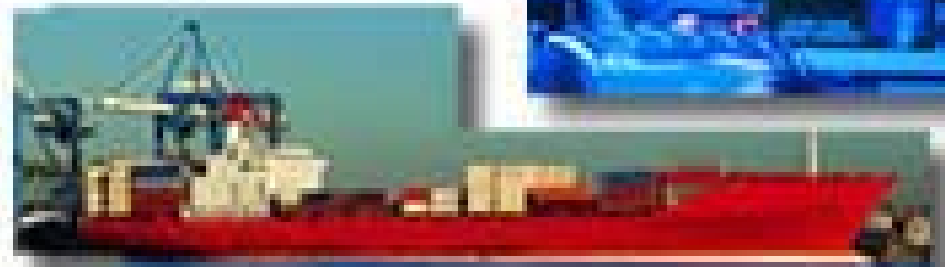


Photo Credit:  
University of Denver (U)



- <http://www.epa.gov/cleandiesel/quantifier/>



*Photo Credit:  
University of Denver (U)*