

Colorado Diesel Emissions Study

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Health Effects of Diesel Emissions

Many toxic components:

- Carbonaceous materials, including PAH, are carcinogenic.
- Sulfurous materials and oxides of nitrogen cause complex formations, irritate lungs.
- VOC's are toxic, per se, and react to form ozone, which is damaging to lungs

Exposures to Diesel Exhaust

- On-road: Large population (all road users) 2x/day; truck & bus drivers: 8 hrs.-plus
- Residential and workplaces near heavy traffic roadways
- Off-road: Smaller populations (construction workers, farmers) using or near diesel equipment -
- higher concentrations, longer periods.

Question/Hypothesis

- APCD questions preliminary NATA results, which indicate off-road vehicle contributions of diesel PM are 2-5 times those from on-road sources. General agreement that construction activity is not well characterized.
- Ubiquity of trucks, buses, would appear to offset higher per-vehicle emissions of off-road sources.

Colorado's Work for 1999 NEI

- Indicates overall lower emission totals for mobile source HAP
- But indicates an upward trend in highway diesel emissions due to growth (Silva, Wells)
- Diesel Study should inform further work.

Emission Factors

- Top-down approach: Current DPM emissions allocated based on population and/or construction dollars.
- These factors may not be best indicators of construction activity. Construction can occur where land is already graded/foundation exists, e.g., in pop-ups, renovations. (diesel equipment may not be used).

APCD to Tackle Bottom-Up Approach

- Survey construction firms regarding number and size of projects equipment, active hours
- Construction vehicle activity counts in field
- Urban & suburban residential; downtown; small towns and rural.

Equipment counts//Activity surveys

- **Survey Methods**

- Telephone
- On-site visits
- Drive-by counts
- (E-) Mailings

- **Locations**

- Downtown Denver business dist.
- Urban Residential (3)
- Suburban Residential (3)
- Business parks (3)
- Transportation project (T-REX)
- Small towns (10, incl. Eastern Colorado, mountain towns)

Survey Queries

- Fuel grade
- Gallons used/year
- Equipment type
- Age range
- Population by HP
- Annual hours in use (fuel type)
- County of operation

Check against

- State diesel fuel records – Off-road diesel not taxed
- County housing starts records
- Large construction project (> 25 acres, > 6 months duration) APCD permit records

DIESEL FUEL USAGE DATA

- Track through Colorado Dept. of Revenue, and Oil Inspection Section of Dept. of Labor
- Non-Taxed Dyed Diesel (High sulfur) – 2 grades
- On-road (Taxed) – 3 grades
- Account for overlap.

Study Components

ASSESS
CURRENT
EMISSION
CALC.
METHODS

FUEL USAGE

SURVEY CONSTR.
FIRMS, SOME AG
WITH
AGENCIES and
ASSN. ASSIST

HOUSING STARTS BY
COUNTY

LARGE PROJECT PERMITS

DRIVE-BY COUNTS
PHONE
E-MAIL

RURAL, CITY
SM TOWNS
SUBURBAN

Optimist's Schedule

- I.d. and assessment of current methods (nearly complete as of April 2002)
- Surveys and Counts: April – December '02
- Records research: April – August '02
- Number crunching and verifications: June – December '02
- Interim reports and meetings with peers throughout
- Final report: End of January 2003.