

Appendix D

SUMMARY OF COST ANALYSIS METHODOLOGIES

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Proposed Regulation to Limit School Bus Idling and Idling at Schools

Definitions:

- CHP – California Highway Patrol
 - DMV – Department of Motor Vehicles
 - ARB – Air Resources Board
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- 34 School bus contractors (Esbri, 2002)
 - 999 school buses of all fuel types associated with private/independent schools (Esbri, 2002)
 - 9,101 school buses of all fuel types operated by contractors (Esbri, 2002)
 - 15,396 school buses of all fuel types operated by California school districts (Esbri, 2002)
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- \$15 per hour clerical salary (ARB staff estimation)
 - \$30 per hour bus and heavy duty vehicle driver salary (ARB staff estimation)
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- 5 minutes for yearly reminder
 - 2.5 minutes for driver yearly reminder (ARB staff estimation)
 - 2.5 minutes for clerical to perform filing duties detailed by the proposed ATCM (ARB staff estimation)
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- \$2 per year per driver (Using above 2.5min. clerical labor and 2.5 min. driver labor, then rounding up to \$2)
 - One driver complaint approximately every 2-3 years. Derived from school district official stating that a fleet of 50 school buses will receive 1-2 complaints per month for the school year (10 months). (Miller, 2002)
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- Initial implementation costs.
 - ARB \$12,500 (\$.05 X 4 pages X 20,000 stakeholders) + \$7,500 postage + \$1000 design costs. (ARB staff estimation)
 - DMV \$1,150 (\$850.00 for reproduction & \$300 labor) (Boudreau, 2002)
 - CHP \$100,000 CHP yearly salary, ¼ year (\$25,000) needed for regulation development (ARB staff estimation)
 - CHP \$600 Creating questions for new bus driver test (Esbri, 2002)
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- Yearly statewide school bus fleet fuel savings (All California School Buses):
 - Using the formula: $F_s = (B)(F_u)(M_i)(P)[(.81)(180) + (.19)(250)]$
 - F_s = Fuel saved per year for entire school bus fleet in dollars
 - B = 25,176 school buses in California (gas & diesel) (Esbri, 2002)
 - F_u = Fuel used per minute idle. Use .5 gal/hour = .00833 gal/minute. (Oregon DOE, 1996; CenterViews, 2000; School Bus Fleet, 2000; Argonne National Laboratory, 2001 U.S. DOE, 2001)

- M_i = # of minutes idled per day by each bus. Range of 2min. – 20min. (ARB staff estimation)
 - P = Fuel price: 83.5 cents per gallon. (Miller, 2002)
 - $(.81)(180)$ represents 81% of fleet operates 180 days a year (Green, 2002)
 - $(.19)(250)$ represents 19% of fleet operates 250 days a year (Green, 2002)
 - Running through the calculation for a range of 2 – 20 minutes less idling time per bus per day, yields the results: ~\$68,000.00 - ~\$680,000.00 dollars saved per year.
 - ~81,000 – ~810,000 gallons ($\$68,000 / \$.835$ per gallon) & ($\$680,000 / \$.835$ per gallon)
- Yearly private school bus fleet fuel savings (999 Buses Statewide):
- Using the above formula: $F_s = (B)(F_u)(M_i)(P)[(.81)(180) + (.19)(250)]$ and parameters, yearly fuel savings for private schools operating school buses are estimated to be \$2,700 - \$27,000.
- Yearly contractor school bus fleet fuel savings (9,101 Buses Statewide):
- Using the above formula: $F_s = (B)(F_u)(M_i)(P)[(.81)(180) + (.19)(250)]$ and parameters, yearly fuel savings for private schools operating school buses are estimated to be \$24,500 - \$245,000.
- Yearly school district school bus fleet fuel savings (15,396 Buses Statewide):
- Using the above formula: $F_s = (B)(F_u)(M_i)(P)[(.81)(180) + (.19)(250)]$ and parameters, yearly fuel savings for private schools operating school buses are estimated to be \$41,400 - \$414,000.
- Yearly statewide heavy-duty vehicle fuel savings (other than school buses):
- Using the formula: $F_s = (S)(F_u)(M_i)(F_p)[(.81)(36) + (.19)(50)]$
 - F_s = Fuel saved per year for entire statewide fleet of other heavy-duty vehicles in dollars
 - S = Number of K-12 Public, Private and independent schools = Approx. 13,000 (CDE, 2002)
 - F_u = Fuel used per minute idle. Use .5 gal/hour = .00833 gal/minute. (Oregon DOE, 1996; CenterViews, 2000; School Bus Fleet, 2000; Argonne National Laboratory, 2001 U.S. DOE, 2001)
 - M_i = Assume 10 – 15 trips per week per school and 2 – 4 excessive minutes idled per trip. Yields a range of 20 – 60 minutes excessive idling per week per school for other heavy-duty vehicles.
 - 2 – 4 excessive minutes idled per trip (ARB staff estimation)
 - 10 – 15 trips per week per school (Miller, 2002; Sherrill, 2002)
 - P = Fuel price: 83.5 cents per gallon. (Miller, 2002)

- (.81)(36) represents 81% of heavy-duty vehicles 36 weeks (180 days/5 days per week) a year (Green, 2002)
- (.19)(50) represents 19% of heavy-duty vehicles 50 weeks (250 days/5 days per week) a year (Green, 2002)
- Running through the calculation for a range of 20 – 60 minutes less idling time per week per school, yields the results: ~\$70,000.00 - ~\$210,000.00 dollars saved per year.
- ~83,000 – ~249,000 gallons ($\$70,000 / \$.835$ per gallon) & (83,000 gallons X 3)