

COST MODEL METHODOLOGY FOR THE STATEWIDE TRUCK & BUS REGULATION

This paper discusses the methodology the staff of the Air Resources Board (ARB) is developing to estimate the costs associated with the proposed Statewide Truck and Bus Regulation. These costs relate to the installation and maintenance of particulate matter (PM) exhaust retrofits and the early replacement of vehicles to newer vehicles beyond what fleets have historically done. To conduct this analysis, ARB staff have developed a cost model to estimate the capital expenditures of normal vehicle replacement compared to the capital expenditures required to comply with the proposed regulation. The cost model examines actual individual company fleet actions each year between 2009 and 2030 with and without the proposed regulation. The results for each fleet included in the cost model are then scaled up to reflect the impacts on the statewide truck population, including out of state vehicles operating in California.

I. Overview of proposed regulation

The proposed regulation is intended to reduce emissions of oxides of nitrogen (NOx) and particulate matter from existing, in-use trucks and buses. For each pollutant, the proposed regulation provides compliance flexibility by allowing fleets to choose the option that best suits their situation from among 3 compliance options. In each year, for each pollutant, a company can comply by using either:

- the Best Available Control Technology (BACT) replacement schedule, or
- the BACT maximum percent requirements, or
- fleet averaging to meet the fleet target.

For fleets with 4 or more vehicles, the regulation would require PM exhaust retrofits in 2010 to 2013 and accelerated engine or vehicle replacement from 2012 to 2022. Fleets with one to three vehicles (small fleets) would need to show they have one 2004 model year engine (or newer) with a particulate matter exhaust retrofit by December 31, 2012. In 2017, this vehicle would need to be replaced with one meeting the 2010 engine emissions. Any other vehicles in a small fleet would need to be upgraded between 2013 and 2022. For school bus fleets, by December 31, 2013 all buses must be retrofitted with the highest level verified diesel emission control system device.

The proposal includes provisions to delay replacement of lower use vehicles and for vehicles operated in the less polluted areas of the state. Alternative compliance provisions are also included for various specialized farm vehicles and other less common vehicle types. Finally, options for early actions to reduce particulate matter emissions would delay engine replacement requirements.

II. Analysis Method Overview

ARB staff used the cost model to analyze over 6700 vehicles from 688 actual individual company fleets for each calendar year from 2009 to 2030 both with the regulation and without the regulation provisions. Although the regulation provisions end in 2022, the cost model analyzes actions through the calendar year of 2030 to allow time for the accelerated replacements to realign with the normal turnover process and for annual operating costs to be incorporated beyond 2023. The “baseline run” determines the capital costs for the normal vehicle replacements expected during the analysis period without the regulation. The “regulation run” determines the costs for the vehicle replacements and particulate matter exhaust retrofits required to comply with the regulation over the same time period. The costs attributable to the regulation are the net costs of the “regulation run” minus the costs of the “base run”. The “base run” costs represent the normal costs of doing business. The “regulation run” costs above the “base run” costs are the increased costs of doing business due to the regulation.

Costs for each calendar year are discounted at a 5 percent rate back to 2008 equivalent expenditure dollars. To compute the net present value (NPV) of the regulatory costs in 2008 dollars, the formula used is $NPV = Cost / (1+r)^{(CY-2008)}$, where r = the annual interest rate and CY = the calendar year for the cost. An annual 5 percent real interest rate is equivalent to a 7 percent nominal interest rate with a 2 percent inflation rate.

To determine the baseline fleet costs without the regulation, the cost model calculates an average normal replacement rate for each company fleet to reflect its usual historical business practice for vehicle replacement in the baseline. The normal replacement rate is a function of the fleet age and the age of the replacement vehicle, and will vary for different fleets.

Fleets with vehicles logging over 100,000 miles per year generally have vehicle replacement rates that are much higher than fleets with vehicles averaging less than 20,000 miles per year. For example, a long haul trucking operation that averages well over 120,000 miles per year may replace all of their vehicles with new vehicles in a 3 to 7 year period. In contrast, a truckload carrier who may average 70,000 miles per year may normally buy 3 year old vehicles and keep them for 10 years, and a local company fleet may average 20,000 miles per year and purchase a range of new and used vehicles often keeping them for over 20 years. Typically, fleets comprised of newer vehicles are already exceeding the requirements of the regulation, and will experience minimal cost impacts.

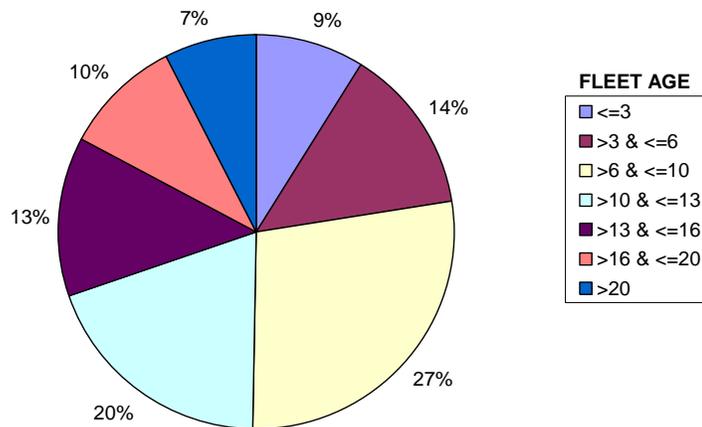
Understanding vehicle age distribution is necessary because newer fleets will have little or no compliance costs while older fleets would have higher compliance costs. For example, companies who replace their vehicles every 5 years would not be affected by the requirements and would have no costs associated with the regulation; whereas, a companies that replace their vehicles within 15 years would have to replace some earlier than normal but others would be replaced on a normal schedule. A company that commonly operates vehicles past 20 years old would have to replace most of their

vehicles at a higher rate than normal and would have the highest associated costs unless some of the vehicles qualify for the various provisions in the proposed regulation.

A. *Instate Heavy Heavy-Duty Vehicles*

To put fleet age distributions in perspective, the following figure provides statewide data showing the percentage of vehicles, by fleet age, for instate heavy heavy-duty vehicles registered in California, per 2006 Department of Motor Vehicle (DMV) data. As can be seen in this figure, 47% of California heavy heavy-duty vehicles reside in individual company fleets with an average vehicle age of 6 to 13 years. Only 7% of the vehicles are in fleets with an average age over 20 years and 9% of the vehicles are in fleets with an average age of less or equal to 3 years.

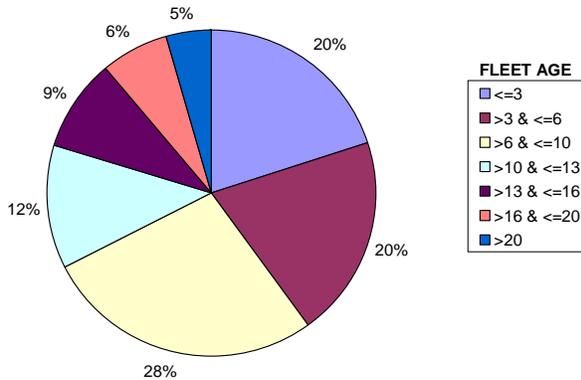
**Instate Heavy Heavy-Duty Vehicles by Fleet Age
(Per 2006 DMV data)**



B. *Instate Medium Heavy-Duty Vehicles*

Similar to the heavy heavy-duty, the following figure provides statewide data showing the percentage of vehicles, by fleet age, for instate medium heavy-duty vehicles registered in California, per 2006 DMV data. As can be seen in this figure, 48 percent of these vehicles reside in individual company fleets with an average vehicle age of over 3 to 10 years. Only 5% of the vehicles are in fleets with an average age over 20 years while 20% of the vehicles are in fleets with an average age of less or equal to 3 years.

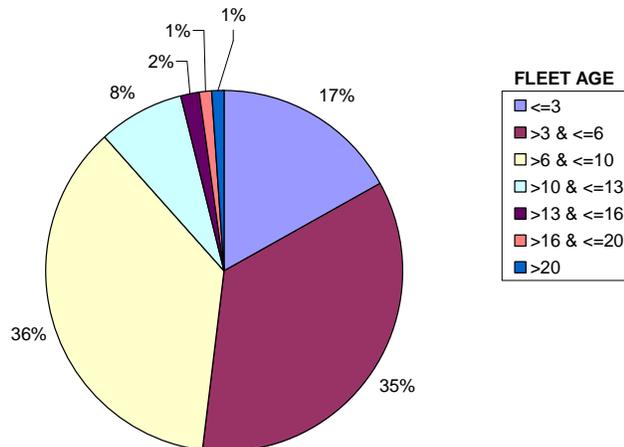
**Instate Medium Heavy-Duty Vehicles by Fleet Age
(Per 2006 DMV data)**



C. Interstate Vehicles

Interstate vehicle populations include instate registered vehicles, neighboring out-of-state vehicles (AZ, BC, ID, NV, OR, WA) and non-neighboring out-of-state vehicles. Neighboring out-of-state vehicles are expected to have the same vehicle age distributions as vehicles in the California International Registration Program (CA-IRP). Vehicle age distributions for the CA-IRP vehicles (per 2006 CA-IRP registration data) are shown in the figures below. Most or 52% of the CA-IRP vehicles reside in fleets with an average fleet age of less than or equal to 6 years, and only 10 percent are in fleets with an average age greater than 10 years.

**California International Registration (CA-IRP)
Vehicles by Fleet Age
(Per 2006 DMV data)**

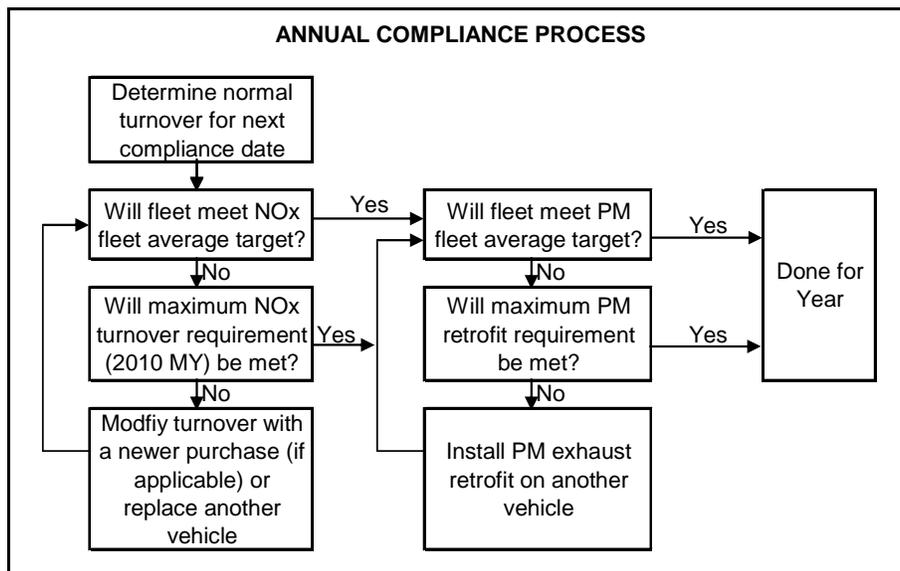


Interstate vehicles that are based in the mid-west and eastern states are the most likely to be newer than any other category. Non-neighboring interstate vehicles have an average age of 3.4 years per the emissions inventory database (in comparison to the 6 year age average of the CA-IRP vehicles), indicating that non-neighboring fleets are comprised mostly of very new vehicles that will already exceed the regulation requirements. Fleets that have vehicles older than 6 years old would also have the ability to route only their cleaner vehicles to California to comply with the regulations without any significant increase in costs.

III. Fleet Cost Model

The ARB on-road compliance model (cost model) uses Access and Visual Basic to model a compliance strategy and the resulting costs for fleets subject to the proposed regulation. The cost model starts with individual company fleet information for companies that completed the ARB fleet survey. The fleet survey collected information from fleets throughout the state regarding their company business operations (such as the fleet’s primary business use categories and number of vehicles in each fleet) and vehicle specific information for heavy-duty diesel vehicles (including model year, weight ratings, and annual mileage data). This reported fleet survey data provides base year information for the 2008 calendar year for each individual fleet, while the average age of the fleet establishes the average replacement rate and age of vehicle(s) purchased for the fleet. See Attachment 1 for fleet survey summary information on the reported vehicle counts by body type and by fleet size and age.

For the “baseline run”, the cost model evaluates one company at a time and each year replaces vehicles at the normal historical rate of vehicle replacement as indicated from the fleet survey data. The cost model continues this process from 2009 to 2030. To model actions taken to comply with the proposed regulation, the “regulation run” uses the same normal replacement rate and replacement vehicle age.



As shown in the figure above, for each year, the cost model determines if the normal actions taken by the fleet would comply with the proposed regulation. If not, the cost model will first replace one vehicle at a time until the NOx criteria were met then would apply PM exhaust retrofits until the PM criteria were met. The entire procedure is then repeated for each year from 2009 to 2030 for each fleet. After 2023, the model steps through each year using the normal company fleet average turnover rate and average vehicle replacement age. Due to accelerated turnover from the regulation requirements, an individual company fleet may be newer than normal and no actions may be needed for a number of years.

Every year, the “regulation run” determines whether the company fleet already meets the BACT criteria and if not, it determines the fleet actions required under the regulation for the fleet to meet the NOx & PM fleet targets or the maximum percent requirements for each year. The proposed regulation Best Available Control Technology (BACT) provisions that have been incorporated into the cost model include:

- No PM exhaust retrofits in 2010 if no pre-1994 model years (MYs) in fleet
- No PM exhaust retrofits in 2011 if no 2003-2004 MYs in fleet
- No vehicle replacements for 2007-2009 MYs until after 2020

For each calendar year, vehicles in an individual company’s fleet are sequenced for replacement based on the vehicle’s “relative age” which indicates their likelihood to be replaced. The relative age is computed by taking the ratio of the age of the vehicle compared to the half-life for the vehicle category most representative from the statewide emissions inventory. This sequence is not optimized to lower the cost of compliance estimate. The cost model will replace the vehicle with the oldest relative age first while vehicles with the newest relative age would be the first to receive PM exhaust retrofits.

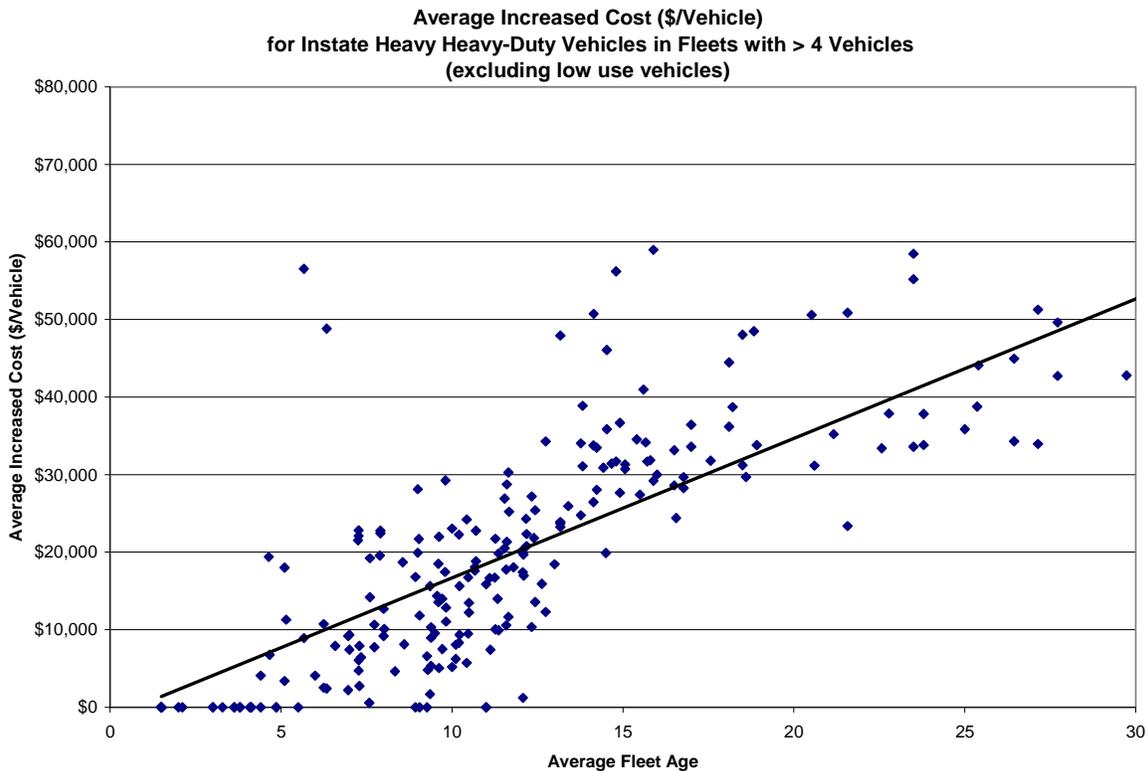
The ARB fleet survey requested the year each vehicle was purchased and the year each vehicle would normally be replaced. Using the purchase and replacement year and the model year data collected in the fleet survey, the normal vehicle replacement ages were computed for each vehicle. An average replacement vehicle age was calculated for each average fleet age group. Using statewide inventory population data, a weighted average replacement vehicle age was derived for use in the cost model, as shown in the following table. The cost model assigns a replacement vehicle age based on the average age of the individual fleet.

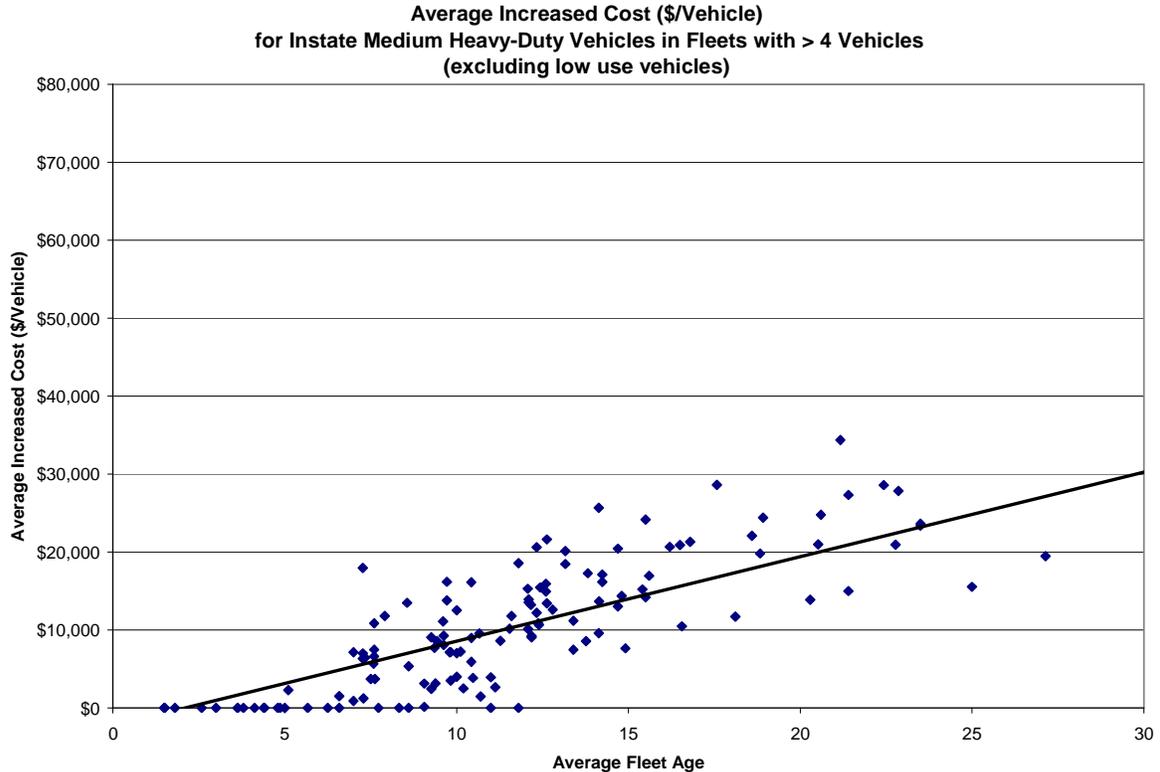
As the average age of a fleet increases, the average replacement vehicle age increases. For example, if an individual company fleet has an average age of 8 years, then the cost model would select a 1 year old vehicle as the normal replacement for all vehicles in that individual company’s fleet. For a company with an average vehicle age of 15 years, the replacement vehicle age would be 5 years old.

Vehicle Replacement Age

Fleet Average Age	Replacement Vehicle Age
0 to 3	0
>3 to 6	0
>7 to 10	1
>11 to 13	2
>14 to 16	5
>17 to 20	8
>20	10

The cost associated with the “regulation run” is compared with the “baseline run” cost to determine any increased cost due to the proposed regulation. The increased cost is then divided by the number of vehicles in the company fleet to determine the average increased cost per vehicle. For the statewide analysis, individual company fleet increased costs per vehicle are grouped by fleet age and fleet size. The average increased costs by fleet age and fleet size groups reflect that individual companies with newer fleets will have no increased costs while companies with older fleets will have increased costs due to the regulation. As shown in the following charts, the average increased cost per vehicle associated with the regulation varies by the average age of the fleet and depends upon the value of each vehicle. The value of a vehicle depends on the vehicle type, weight rating, number of axles, age, etc. (refer to the vehicle cost data section for more detailed information).





The analysis is repeated for lower use vehicles for which the regulations include provisions that delay the vehicle replacement requirements until 2020 and for smaller fleets which have alternative compliance requirements.

A. PM Filter Capital Costs

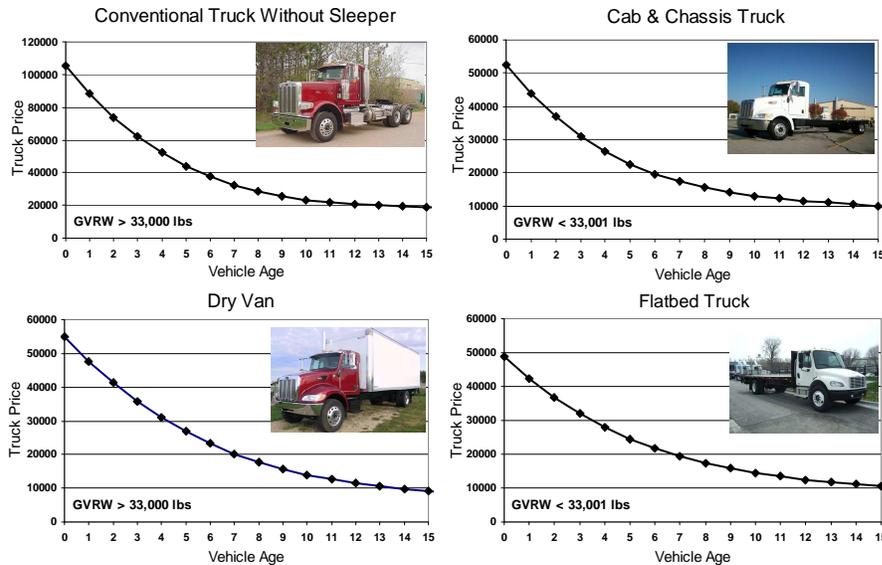
The cost model uses a cost of \$10,000 for post-1993 model year vehicles and a cost of \$20,000 for pre-1994 model year vehicles. Annual operating and maintenance costs are estimated with the results from the model and are discussed later.

B. Vehicle Capital Costs

To determine truck price inputs into the cost model, for sale vehicle price data was downloaded from Truckpaper.com and other online sources. Price curves, as shown in Attachment 2, were developed for over 50 truck body types (example price curves are shown below). Conventional tractor pricing data was compared to National Automobile Dealers Association (NADA) vehicle pricing information (http://www.nada.com/b2b/products/commerical_truck_guide.asp) and was found to match favorably to the price data from Truckpaper.com. Staff also assessed whether a truck body type could be transferred to a new cab and chassis and what the costs of the body transfer would be. If a body transfer is feasible and costs less than a replacement vehicle, the estimated transfer costs for the cab and chassis is another cost in addition

to the cab and chassis price. The vehicle price data and body transfer costs used in the cost model are shown in Attachment 2.

Example Truck Prices



Other type of vehicle costs that are included in the cost model include California state taxes of 8% on used and new vehicle purchases and Federal excise taxes of 12% on new vehicle purchases. An initial estimated loss in value due to the regulation has been included in the cost model with for tractors, heavy heavy-duty single unit vehicles and for medium heavy duty vehicles. This estimate is dependent on a number of factors and will be further evaluated for sensitivity. The staff estimate is that this cost should not exceed \$5,000 per vehicle and should be much lower for most tractors. An additional price premium estimate for engines manufactured after 2010 with selective catalytic reduction (SCR) may add up to \$5,000 for heavy heavy-duty and \$2,500 for medium heavy duty vehicles and is included in the cost estimate range. However, a number of manufacturers have indicated they will not be using SCR emission control devices for engines manufactured in 2010. However, engine manufacturers that plan to include SCR in their 2010 engines are claiming 3 to 5 percent fuel economy improvements that would likely offset any up-front cost very quickly.

IV. Emissions Inventory

The vehicle population counts derived from statewide emissions inventory database will be provided for statewide vehicle population group types including:

- Intrastate
 - Heavy Heavy-Duty Vehicles (HHD) – Tractors
 - Heavy Heavy-Duty Vehicles – NonTractors
 - Medium Heavy Duty (MHD) Vehicles
- Interstate

- California International Registration Plan (CA-IRP) Vehicles
- Out-of-state neighboring vehicles (AZ, BC, ID, NV, OR, WA)
- Out of state non-neighboring vehicles

In addition to the statewide vehicle population groups, there are some additional sub-group vehicle counts needed because the regulatory requirements differ, such as for:

- Low Mileage (<7500 for HHD & <5000 for MHD) Vehicles
- Small Fleets (1-3 Vehicles)

V. Statewide Costs

The cost model output provides the average increased costs per vehicle by fleet age and fleet size for individual company fleets (see Attachment 3 for sample individual company fleet annual costs). The characteristics of the fleet and vehicle information were used to match each vehicle to the emissions inventory categories. For example, a company may have some vehicles that are registered in the CA-IRP, and also some that are medium and heavy heavy-duty vehicles that are registered instate. Based on DMV instate and CA-IRP data, weighting percentages were developed by fleet age and size group to apply to the statewide emissions inventory populations to get the vehicle counts by fleet age and size groups. The statewide cost can be calculated for each fleet age group by multiplying the increased average cost per vehicle by the population vehicle counts.

The following table shows the preliminary results for the heavy heavy-duty vehicles subject to the large fleet requirements that would not qualify for any of the special provisions. In the emissions inventory this category is being change to create an ag fleet category and may change. The DMV data provides the weighting percentages (similar to the prior pie chart figure with all fleet sizes) to apply to the total vehicles from the statewide emissions inventory to get the number of vehicles by fleet age groups.

Instate Heavy Heavy-Duty Vehicles by Fleet Age for Non-Small Fleets (excluding fleets qualifying for special provisions)				
Fleet Age	# Vehicles (Per Preliminary Emissions Inventory Data for 2010)	% (per 2006 DMV Data)	\$/Vehicle (Per Model Output)	Statewide \$
<=3	7,038	12.3%	\$ 1,395	\$ 9,820,793
>3 & <=6	9,673	17.0%	\$ 7,688	\$ 74,368,382
>6 & <=10	16,544	29.0%	\$ 13,981	\$ 231,302,715
>10 & <=13	10,688	18.8%	\$ 20,274	\$ 216,685,634
>13 & <=16	7,470	13.1%	\$ 25,668	\$ 191,734,179
>16 & <=20	3,661	6.4%	\$ 31,961	\$ 117,024,855
>20	1,673	2.9%	\$ 53,537	\$ 89,545,011
Unknown	254	0.4%	\$ 16,324	\$ 4,151,247
	57,000	100.0%		\$ 934,632,817

The statewide cost estimate for this sub-population can then be estimated by multiplying the number of vehicles by the increased \$/vehicle for each age group and summing the statewide \$ per fleet age. In the above example based on preliminary emissions inventory data, the highest increased costs due to the regulation are found in the >20 fleet age category with an average \$/vehicle of \$53,537 and the least cost increases due to the regulation are found in the <=3 fleet age category with an average \$/vehicle of \$1,395. Medium duty vehicles and vehicles qualifying for the special provisions including low use vehicles would have separate population counts and lower costs.

Similar analysis is done for all the remaining population categories including:

- Low mileage vehicles (by MHD and HHD groups)
- Higher use instate HHD vehicles for small fleets
- Higher use instate MHD vehicles (by small & non-small fleets)
- Higher use CA-IRP and neighboring out-of-state vehicles (by small & non-small fleets)
- Bus Fleets (by MHD and HHD)
- Non-Neighboring out-of-state vehicles

Other populations that have differing requirements and are modeled separately include:

- Port Trucks
- Public and Utility Fleets (2017-2023 requirements)
- School Buses (PM only)
- Specialty Farm Vehicles

A. *School buses*

School buses are subject only to the PM requirements on a differing schedule than the trucks and buses and are generally not subject to vehicle replacement requirements. However, the proposed regulation would require replacement of the oldest buses. Many buses with 2 stroke engines are no longer suitable for PM exhaust retrofits and would likely need to be replaced by 2013.

The statewide cost estimates can be determined by using the statewide school bus age distribution and population. The statewide costs with PM aftermarket controls are dependent on the costs of the PM exhaust retrofits, number of vehicles that need to be retrofit and the timing of the requirements. As buses are normally replaced over time, the number of buses without PM exhaust retrofit controls decreases over time. Some of the costs attributable to the regulation could be offset by the incentive funds, including \$200 million already allocated by Proposition 1B for the cleanup of school buses.

VI. Annual Operating Costs

In addition to capital costs, various annual operational and maintenance costs are attributable to the regulation. Changes in these annual costs are added to the total statewide capital cost estimates. Operational and maintenance costs associated with PM controls would include annual filter cleaning expenses, fuel economy losses and costs associated with regeneration of active systems. Other costs or savings include fuel economy improvements with replacement of older vehicles with newer vehicles. At this time, staff has not included cost savings associated with lower maintenance and lower down time with newer vehicles compared to older vehicles.

The operating and maintenance costs associated with the use of PM exhaust controls are determined using the population of aftermarket PM controls and population of 2007 and newer engines by calendar year. The number of PM controls in each calendar year are estimated by extrapolating the results of the capital cost model to the affected vehicle population. Costs attributable to the regulation for PM exhaust retrofits are broken into three main categories: regeneration cost, fuel penalty, and annual maintenance. Costs associated with PM controls on 2007 and newer engines are from annual maintenance. Engines manufactured after 2009 with SCR would also have annual costs associated with the use of urea; however, there is likely to be a fuel economy improvement and associated cost savings with SCR that may offset the cost. At this time, staff is not including an annual cost estimate associated with engines utilizing SCR technology.

The costs associated with regeneration of active PM exhaust retrofits is calculated using the estimated number of pre-1994 trucks, expected number regenerations per week, and the cost of electricity or fuel used per regeneration. PM exhaust retrofits are expected to decrease fuel economy by 2%. Total statewide fuel costs are estimated by the average fuel economy and annual miles traveled by vehicles with aftermarket PM controls and a diesel fuel cost of \$5.00 per gallon. Annual maintenance includes the estimated average filter cleaning cost of \$250.

VII. Cumulative Costs

ARB staff will also examine the cumulative cost impact of the truck and bus regulation in conjunction with other ARB regulations. Staff have evaluated a small number of individual companies already affected by other regulations and has committed to analyze industry data once provided to us. To further assess the cost impacts various regulations will have on the individual companies or industries, staff will continue to work with individual companies to obtain additional information. Some of the key adopted or proposed regulations that could impact the same fleets include the:

- In-use, off-road diesel vehicle regulation
<http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>
- Transportation refrigeration unit (TRU) regulation
<http://www.arb.ca.gov/diesel/tru.htm>

- Portable diesel-fueled engine registration and air toxic control measure
<http://www.arb.ca.gov/diesel/peatcm/peatcm.htm>
- Heavy duty vehicle greenhouse gas emission reduction measure proposal
<http://www.arb.ca.gov/cc/hdghg/hdghg.htm>
- On-road heavy-duty diesel-fueled public and utility fleet regulation
<http://www.arb.ca.gov/msprog/publicfleets/publicfleets.htm>

REPORTED FLEET SURVEY DATA

Vehicle Counts by Body Type	
Beverage HHDDT	1
Beverage MHDDT	8
Bucket/Boom HHDDT	8
Bucket/Boom MHDDT	3
Bus - Coach HHDDT	171
Bus - Coach MHDDT	25
Bus - Shuttle MHDDT	60
Cab & Chassis HHDDT single	29
Cab & Chassis HHDDT tandem	502
Cab & Chassis MHDDT	579
Car Carrier HHDDT	2
Crane HHDDT	14
Crane MHDDT	1
Drill Rig HHDDT	2
Dump HHDDT	247
Dump MHDDT	88
Dump/Transfer HHDDT	72
Expeditor/Hot Shot HHDDT	2
Farm/Grain HHDDT	23
Flatbed HHDDT	92
Flatbed MHDDT	274
Flatbed-Dump HHDDT	6
Flatbed-Dump MHDDT	9
Fuel/Lube HHDDT single	3
Fuel/Lube HHDDT tandem	13
Fuel/Lube MHDDT	12
Garbage Trucks: Packer HHDDT	4
Garbage Trucks: Packer MHDDT	1
Garbage Trucks: Roll-Off HHDDT	5
Logging HHDDT	119
Mixer/Asphalt/Concrete HHDDT	36
Other	336

Vehicle Counts by Body Type	
Service/Utility/Mechanic HHDDT	22
Service/Utility/Mechanic MHDDT	92
Stake MHDDT	2
Sweeper HHDDT	9
Tank Truck: Chemical HHDDT	11
Tank Truck: Chemical MHDDT	1
Tank Truck: Gasoline/Fuel HHDDT	51
Tank Truck: Gasoline/Fuel MHDDT	13
Tank Truck: LPG HHDDT	24
Tank Truck: LPG MHDDT	23
Tank Truck: Vacuum HHDDT	4
Tank Truck: Water HHDDT tandem	68
Tow Truck: Roll-back HHDDT tandem	1
Tow Truck: Roll-back MHDDT	19
Tow Truck: Wrecker HHDDT	7
Tow Truck: Wrecker MHDDT	27
Tractor: Cab-Over HHDDT single	12
Tractor: Cab-Over HHDDT tandem	122
Tractor: Cab-Over MHDDT	5
Tractor: Conventional HHDDT single	102
Tractor: Conventional HHDDT tandem	2549
Tractor: Conventional MHDDT	282
Tractor: Sleeper HHDDT	289
Van: Dry HHDDT single	2
Van: Dry HHDDT tandem	21
Van: Dry MHDDT	104
Van: Moving MHDDT	4
Van: Reefer HHDDT	1
Van: Reefer MHDDT	1
Winch HHDDT	1
Yard Spotter HHDDT	90

FLEET SIZE BY AVERAGE FLEET AGE

Fleet Age Group	Fleet Size (# of Vehicles)		
	1to3Vehicles	>3 Vehicles	Total
<=3	50	110	160
>3 & <=6	103	1315	1418
>6 & <=10	69	2601	2670
>10 & <=13	81	918	999
>13 & <=16	190	687	877
>16 & <=20	64	200	264
>20	115	200	315
Totals	672	6031	6703

ATTACHMENT 2

HHD Vehicle Type	Rear Axle	Price Used	Transfer Body Cost	Age in 2008																	
				0	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40	
Beverage	Single			\$ 75,611	\$ 61,861	\$ 50,456	\$ 41,113	\$ 33,565	\$ 27,565	\$ 22,881	\$ 19,301	\$ 16,628	\$ 14,683	\$ 13,307	\$ 10,539	\$ 7,895	\$ 5,619	\$ 4,307	\$ 2,994	\$ 1,682	
Bucket/Boom	Tandem	Cab & Chassis, HD, Tandem	\$ 25,000	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Bus (Motor Coach)	Tandem			\$ 449,954	\$ 404,277	\$ 360,925	\$ 320,078	\$ 281,879	\$ 246,436	\$ 213,822	\$ 184,072	\$ 157,187	\$ 133,131	\$ 111,832	\$ 81,687	\$ 58,633	\$ 44,475	\$ 32,127	\$ 21,515	\$ 14,000	
Cab & Chassis	Single			\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Cab & Chassis	Tandem			\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Cab & Chassis Dual Frame	Tandem			\$ 105,738	\$ 90,581	\$ 77,693	\$ 66,800	\$ 57,649	\$ 50,010	\$ 43,674	\$ 38,451	\$ 34,171	\$ 30,679	\$ 27,841	\$ 19,764	\$ 15,742	\$ 12,201	\$ 9,069	\$ 6,974	\$ 5,136	
Car Carrier	Tandem			\$ 261,761	\$ 228,860	\$ 199,472	\$ 173,394	\$ 150,421	\$ 130,351	\$ 112,980	\$ 98,103	\$ 85,517	\$ 75,018	\$ 66,403	\$ 44,448	\$ 38,338	\$ 32,228	\$ 26,118	\$ 20,008	\$ 13,898	
Chipper	Single	Cab & Chassis, HD, Single	\$ 10,500	\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Cotton Module	Tandem	Cab & Chassis Dual Frame, HD, Tandem	\$ 10,500	\$ 105,738	\$ 90,581	\$ 77,693	\$ 66,800	\$ 57,649	\$ 50,010	\$ 43,674	\$ 38,451	\$ 34,171	\$ 30,679	\$ 27,841	\$ 19,764	\$ 15,742	\$ 12,201	\$ 9,069	\$ 6,974	\$ 5,136	
Crane	Same			\$ 152,706	\$ 129,256	\$ 109,978	\$ 94,253	\$ 81,524	\$ 71,294	\$ 63,121	\$ 56,616	\$ 51,440	\$ 47,303	\$ 43,956	\$ 33,087	\$ 24,646	\$ 18,559	\$ 16,142	\$ 13,350	\$ 10,558	
Drill Rig	Tandem			\$ 756,478	\$ 652,807	\$ 565,406	\$ 492,256	\$ 431,507	\$ 381,463	\$ 340,583	\$ 307,469	\$ 280,861	\$ 259,631	\$ 242,777	\$ 196,921	\$ 170,102	\$ 137,416	\$ 102,037	\$ 74,408	\$ 51,422	
Dump	Tandem	Cab & Chassis, HD, Tandem	\$ 9,250	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Dump: Transfer	Single			\$ 208,875	\$ 180,973	\$ 157,445	\$ 137,712	\$ 121,248	\$ 107,578	\$ 96,272	\$ 86,948	\$ 79,265	\$ 72,923	\$ 67,661	\$ 50,749	\$ 39,311	\$ 29,234	\$ 22,401	\$ 19,262	\$ 14,000	
Expeditor/Hot Shot	Tandem			\$ 114,960	\$ 88,866	\$ 72,526	\$ 61,322	\$ 52,460	\$ 44,944	\$ 36,917	\$ 29,803	\$ 23,518	\$ 18,478	\$ 14,980	\$ 11,473	\$ 9,678	\$ 7,883	\$ 6,088	\$ 4,293	\$ 2,498	
Farm/Grain	Same			\$ 113,235	\$ 97,606	\$ 84,512	\$ 73,630	\$ 64,662	\$ 57,339	\$ 51,415	\$ 46,669	\$ 42,903	\$ 39,939	\$ 37,622	\$ 31,543	\$ 27,867	\$ 22,990	\$ 17,262	\$ 11,945	\$ 6,627	
Flatbed	Tandem			\$ 79,035	\$ 69,876	\$ 61,783	\$ 54,662	\$ 48,426	\$ 42,989	\$ 38,271	\$ 34,195	\$ 30,689	\$ 27,684	\$ 25,118	\$ 16,904	\$ 12,423	\$ 8,344	\$ 5,517	\$ 3,757	\$ 1,997	
Flatbed: Dump	Tandem			\$ 80,422	\$ 70,173	\$ 61,191	\$ 53,369	\$ 46,602	\$ 40,790	\$ 35,838	\$ 31,656	\$ 28,158	\$ 25,262	\$ 22,892	\$ 16,568	\$ 14,534	\$ 11,399	\$ 8,264	\$ 5,129	\$ 1,994	
Fuel/Lube	Single	Cab & Chassis, HD, Single	\$ 25,500	\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Fuel/Lube	Tandem	Cab & Chassis, HD, Tandem	\$ 25,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Garbage: Packer	Tandem	Cab & Chassis, HD, Tandem	\$ 24,000	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Garbage: Roll-off	Tandem	Cab & Chassis, HD, Tandem	\$ 11,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Grapple	Tandem	Cab & Chassis, HD, Tandem	\$ 18,000	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Hooklift	Tandem	Cab & Chassis, HD, Tandem	\$ 8,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Logging	Tandem			\$ 200,744	\$ 162,704	\$ 132,920	\$ 109,845	\$ 92,155	\$ 78,722	\$ 68,598	\$ 60,997	\$ 55,272	\$ 50,902	\$ 47,474	\$ 35,827	\$ 25,964	\$ 17,956	\$ 13,636	\$ 9,316	\$ 4,996	
Mixer/Concrete	Tandem			\$ 160,796	\$ 145,511	\$ 130,973	\$ 117,235	\$ 104,339	\$ 92,314	\$ 81,179	\$ 70,941	\$ 61,598	\$ 53,140	\$ 45,548	\$ 34,939	\$ 26,349	\$ 18,792	\$ 14,063	\$ 9,836	\$ 6,578	\$ 3,400
Service/Utility	Single	Cab & Chassis, HD, Single	\$ 9,000	\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Stake	Single			\$ 106,567	\$ 85,350	\$ 67,970	\$ 53,902	\$ 42,672	\$ 33,849	\$ 27,045	\$ 21,913	\$ 18,146	\$ 15,472	\$ 13,654	\$ 11,046	\$ 9,836	\$ 8,626	\$ 7,416	\$ 6,206	\$ 4,996	
Sweeper	Single			\$ 207,024	\$ 180,509	\$ 157,184	\$ 136,727	\$ 118,842	\$ 103,254	\$ 89,707	\$ 77,969	\$ 67,827	\$ 59,085	\$ 51,567	\$ 37,283	\$ 27,840	\$ 19,840	\$ 14,633	\$ 10,185	\$ 6,748	
Tank: General	Tandem	Cab & Chassis, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Tank: Asphalt	Same	Tank: Liquid Fuel, HD		\$ 108,330	\$ 96,090	\$ 85,561	\$ 76,531	\$ 68,806	\$ 62,210	\$ 56,582	\$ 51,778	\$ 47,668	\$ 44,137	\$ 41,085	\$ 30,293	\$ 22,710	\$ 16,427	\$ 12,298	\$ 8,948	\$ 5,598	
Tank: Chemical	Same	Tank: Liquid Fuel, HD		\$ 108,330	\$ 96,090	\$ 85,561	\$ 76,531	\$ 68,806	\$ 62,210	\$ 56,582	\$ 51,778	\$ 47,668	\$ 44,137	\$ 41,085	\$ 30,293	\$ 22,710	\$ 16,427	\$ 12,298	\$ 8,948	\$ 5,598	
Tank: Liq. Fuel	Same			\$ 108,330	\$ 96,090	\$ 85,561	\$ 76,531	\$ 68,806	\$ 62,210	\$ 56,582	\$ 51,778	\$ 47,668	\$ 44,137	\$ 41,085	\$ 30,293	\$ 22,710	\$ 16,427	\$ 12,298	\$ 8,948	\$ 5,598	
Tank: LPG	Same	Tank: Liquid Fuel, HD		\$ 108,330	\$ 96,090	\$ 85,561	\$ 76,531	\$ 68,806	\$ 62,210	\$ 56,582	\$ 51,778	\$ 47,668	\$ 44,137	\$ 41,085	\$ 30,293	\$ 22,710	\$ 16,427	\$ 12,298	\$ 8,948	\$ 5,598	
Tank: Milk	Tandem	Tank: Liquid Fuel, HD		\$ 108,330	\$ 96,090	\$ 85,561	\$ 76,531	\$ 68,806	\$ 62,210	\$ 56,582	\$ 51,778	\$ 47,668	\$ 44,137	\$ 41,085	\$ 30,293	\$ 22,710	\$ 16,427	\$ 12,298	\$ 8,948	\$ 5,598	
Tank: Vacuum	Same			\$ 162,565	\$ 137,737	\$ 117,636	\$ 101,496	\$ 88,633	\$ 78,442	\$ 70,393	\$ 64,027	\$ 58,949	\$ 54,827	\$ 51,385	\$ 38,161	\$ 25,565	\$ 17,483	\$ 12,988	\$ 8,493	\$ 3,998	
Tank: Water	Single	Cab & Chassis, HD, Single	\$ 9,500	\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Tank: Water	Tandem	Cab & Chassis, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Toter	Same			\$ 140,987	\$ 118,185	\$ 98,844	\$ 82,549	\$ 68,917	\$ 57,599	\$ 48,276	\$ 40,658	\$ 34,486	\$ 29,524	\$ 25,565	\$ 15,122	\$ 10,747	\$ 6,878	\$ 3,641	\$ 2,577	\$ 2,363	
Tow: Roll-back	Single	Cab & Chassis, HD, Single	\$ 9,500	\$ 59,836	\$ 51,269	\$ 43,898	\$ 37,589	\$ 32,218	\$ 27,670	\$ 23,840	\$ 20,634	\$ 17,963	\$ 15,750	\$ 13,923	\$ 8,621	\$ 6,250	\$ 4,520	\$ 3,127	\$ 2,515	\$ 2,640	
Tow: Roll-back	Tandem	Cab & Chassis, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136	
Tow: Wrecker	Tandem			\$ 300,478	\$ 270,655	\$ 243,293	\$ 218,257	\$ 195,415	\$ 174,638	\$ 155,799	\$ 138,776	\$ 123,449	\$ 109,703	\$ 97,424	\$ 84,347	\$ 70,475	\$ 55,840	\$ 41,144	\$ 27,444	\$ 18,014	
Tractor: Cabover w/o Sleeper	Single	Tractor: Conventional w/o Sleeper		\$ 92,201	\$ 77,615	\$ 65,065	\$ 54,362	\$ 45,327	\$ 37,789	\$ 31,582	\$ 26,554	\$ 22,558	\$ 19,456	\$ 17,119	\$ 12,965	\$ 10,644	\$ 8,322	\$ 6,001	\$ 3,679	\$ 1,358	
Tractor: Cabover w/o Sleeper	Tandem	Tractor: Conventional w/o Sleeper		\$ 105,151	\$ 88,278	\$ 73,997	\$ 62,035	\$ 52,132	\$ 44,044	\$ 37,539	\$ 32,401	\$ 28,425	\$ 25,422	\$ 23,216	\$ 18,968	\$ 16,275	\$ 13,044	\$ 10,334	\$ 7,624	\$ 4,914	
Tractor: Cabover w/ Sleeper	Tandem	Tractor: Conventional w/ Sleeper		\$ 131,961	\$ 101,674	\$ 78,671	\$ 61,516	\$ 48,967	\$ 39,964	\$ 33,617	\$ 29,193	\$ 26,099	\$ 23,873	\$ 22,166	\$ 15,628	\$ 12,128	\$ 9,988	\$ 7,848	\$ 5,708	\$ 3,568	
Tractor: Conventional w/ Sleeper	Tandem			\$ 131,961	\$ 101,674	\$ 78,671	\$ 61,516	\$ 48,967	\$ 39,964	\$ 33,617	\$ 29,193	\$ 26,099	\$ 23,873	\$ 22,166	\$ 15,628	\$ 12,128	\$ 9,988	\$ 7,848	\$ 5,708	\$ 3,568	
Tractor: Conventional w/o Sleeper	Single			\$ 92,201	\$ 77,615	\$ 65,065	\$ 54,362	\$ 45,327	\$ 37,789	\$ 31,582	\$ 26,554	\$ 22,558	\$ 19,456	\$ 17,119	\$ 12,965	\$ 10,644	\$ 8,322				

ATTACHMENT 2 (continued)

MHD Vehicle Type	Rear Axle	Price Used	Transfer Body Cost	Age in 2008																
				0	1	2	3	4	5	6	7	8	9	10	15	20	25	30	35	40
Beverage	Single			\$ 55,205	\$ 46,492	\$ 39,040	\$ 32,712	\$ 27,380	\$ 22,926	\$ 19,241	\$ 16,226	\$ 13,787	\$ 11,842	\$ 10,315	\$ 6,781	\$ 6,129	\$ 5,477	\$ 4,163	\$ 2,663	\$ 1,501
Bucket/Boom	Single			\$ 52,071	\$ 48,687	\$ 45,518	\$ 42,553	\$ 39,785	\$ 37,207	\$ 34,809	\$ 32,583	\$ 30,521	\$ 28,615	\$ 26,856	\$ 19,985	\$ 15,560	\$ 12,548	\$ 9,915	\$ 6,628	\$ 1,653
Bus/Shuttle	Single			\$ 71,850	\$ 54,703	\$ 40,872	\$ 29,945	\$ 21,534	\$ 15,274	\$ 10,821	\$ 8,141	\$ 7,293	\$ 6,618	\$ 6,068	\$ 4,344	\$ 3,427	\$ 2,852	\$ 2,235	\$ 1,617	\$ 1,000
Bus (Motor Coach)	Single			\$ 99,081	\$ 83,136	\$ 69,485	\$ 57,870	\$ 48,052	\$ 39,814	\$ 32,953	\$ 27,287	\$ 22,649	\$ 18,887	\$ 15,866	\$ 8,085	\$ 5,813	\$ 4,490	\$ 3,252	\$ 2,529	\$ 1,649
Cab & Chassis (Cabover)	Single			\$ 40,972	\$ 35,101	\$ 30,075	\$ 25,804	\$ 22,206	\$ 19,197	\$ 16,701	\$ 14,645	\$ 12,962	\$ 11,590	\$ 10,470	\$ 7,127	\$ 5,534	\$ 4,651	\$ 3,767	\$ 2,884	\$ 2,000
Cab & Chassis	Single			\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Car Carrier	Single			\$ 66,424	\$ 57,786	\$ 50,344	\$ 43,959	\$ 38,508	\$ 33,874	\$ 29,951	\$ 26,643	\$ 23,862	\$ 21,530	\$ 19,575	\$ 13,487	\$ 10,112	\$ 7,224	\$ 4,591	\$ 2,701	\$ 1,488
Chipper	Single	Cab & Chassis, MD, Single	\$ 10,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Crane	Single			\$ 95,284	\$ 86,348	\$ 77,713	\$ 69,498	\$ 61,800	\$ 54,689	\$ 48,216	\$ 42,413	\$ 37,293	\$ 32,852	\$ 29,074	\$ 18,741	\$ 15,902	\$ 13,177	\$ 10,452	\$ 7,727	\$ 5,002
Dump	Single			\$ 55,561	\$ 49,636	\$ 44,323	\$ 39,584	\$ 35,383	\$ 31,683	\$ 28,445	\$ 25,633	\$ 23,210	\$ 21,138	\$ 19,381	\$ 14,116	\$ 11,919	\$ 9,950	\$ 7,068	\$ 4,389	\$ 3,000
Expeditor/Hot Shot	Single	Cab & Chassis, MD, Single	\$ 6,000	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Farm/Grain	Single	Cab & Chassis, MD, Single	\$ 8,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Flatbed	Single			\$ 48,792	\$ 42,264	\$ 36,681	\$ 31,933	\$ 27,917	\$ 24,539	\$ 21,713	\$ 19,362	\$ 17,415	\$ 15,807	\$ 14,482	\$ 10,535	\$ 8,408	\$ 6,591	\$ 5,346	\$ 4,729	\$ 4,074
Flatbed: Dump	Single			\$ 53,143	\$ 47,313	\$ 42,108	\$ 37,473	\$ 33,357	\$ 29,712	\$ 26,491	\$ 23,654	\$ 21,160	\$ 18,973	\$ 17,061	\$ 10,613	\$ 7,399	\$ 5,763	\$ 4,842	\$ 3,921	\$ 3,000
Fuel/Lube	Single			\$ 84,104	\$ 75,392	\$ 67,746	\$ 61,038	\$ 55,155	\$ 49,992	\$ 45,455	\$ 41,461	\$ 37,933	\$ 34,805	\$ 32,019	\$ 21,652	\$ 14,762	\$ 10,055	\$ 7,493	\$ 6,719	\$ 5,484
Garbage: Packer	Same	Garbage: Packer, HD, Tandem	\$ 24,000	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Garbage: Roll-off		Garbage: Roll-off, HD,	\$ 11,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Grapple		Grapple, HD, Tandem	\$ 18,000	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Hooklift	Single	Cab & Chassis, MD, Single	\$ 8,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Landscape	Single			\$ 50,056	\$ 43,888	\$ 38,641	\$ 34,205	\$ 30,476	\$ 27,361	\$ 24,773	\$ 22,634	\$ 20,872	\$ 19,422	\$ 18,227	\$ 14,483	\$ 11,748	\$ 8,454	\$ 4,873	\$ 2,140	\$ 1,280
Logging	Tandem	Logging, HD, Tandem		\$ 200,744	\$ 162,704	\$ 132,920	\$ 109,845	\$ 92,155	\$ 78,722	\$ 68,598	\$ 60,997	\$ 55,272	\$ 50,902	\$ 47,474	\$ 35,827	\$ 25,964	\$ 17,956	\$ 13,636	\$ 9,316	\$ 4,996
Mixer/Concrete	Same	Mixer/Concrete, HD, Tandem		\$ 160,796	\$ 145,511	\$ 130,973	\$ 117,235	\$ 104,339	\$ 92,314	\$ 81,179	\$ 70,941	\$ 61,598	\$ 53,140	\$ 45,548	\$ 19,439	\$ 8,792	\$ 6,634	\$ 6,578	\$ 5,189	\$ 4,000
Service/Utility	Single	Cab & Chassis, MD, Single	\$ 9,000	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Stake	Single			\$ 39,214	\$ 35,236	\$ 31,640	\$ 28,405	\$ 25,511	\$ 22,938	\$ 20,666	\$ 18,673	\$ 16,939	\$ 15,445	\$ 14,170	\$ 10,358	\$ 8,954	\$ 7,466	\$ 5,977	\$ 4,489	\$ 3,000
Tank: General	Single	Cab & Chassis, MD, Single	\$ 9,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Tank: Asphalt	Single	Tank: General, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Tank: Chemical	Single	Tank: General, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Tank: Liq. Fuel	Same	Tank: General, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Tank: LPG	Same	Tank: General, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Tank: Milk	Single	Tank: General, HD, Tandem	\$ 9,500	\$ 96,685	\$ 82,337	\$ 70,285	\$ 60,228	\$ 51,895	\$ 45,038	\$ 39,433	\$ 34,881	\$ 31,202	\$ 28,238	\$ 25,852	\$ 18,928	\$ 14,717	\$ 10,651	\$ 8,813	\$ 6,974	\$ 5,136
Tank: Vacuum	Single			\$ 95,088	\$ 80,568	\$ 68,202	\$ 57,740	\$ 48,951	\$ 41,623	\$ 35,562	\$ 30,590	\$ 26,548	\$ 23,291	\$ 20,689	\$ 13,907	\$ 11,272	\$ 8,751	\$ 5,883	\$ 3,383	\$ 736
Tank: Water	Single	Cab & Chassis, MD, Single	\$ 9,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Tow: Roll-back	Single	Cab & Chassis, MD, Single	\$ 9,500	\$ 52,409	\$ 43,888	\$ 36,822	\$ 31,026	\$ 26,326	\$ 22,564	\$ 19,591	\$ 17,270	\$ 15,477	\$ 14,102	\$ 13,045	\$ 9,896	\$ 6,781	\$ 4,774	\$ 3,849	\$ 2,924	\$ 1,999
Tow: Wrecker	Single			\$ 62,830	\$ 56,319	\$ 50,345	\$ 44,884	\$ 39,911	\$ 35,402	\$ 31,332	\$ 27,676	\$ 24,409	\$ 21,507	\$ 18,945	\$ 9,335	\$ 6,372	\$ 5,221	\$ 4,071	\$ 2,920	\$ 1,997
Tractor: Cabover w/o Sleeper	Single			\$ 45,893	\$ 40,029	\$ 34,923	\$ 30,501	\$ 26,692	\$ 23,429	\$ 20,651	\$ 18,301	\$ 16,326	\$ 14,677	\$ 13,310	\$ 9,376	\$ 7,693	\$ 6,216	\$ 4,811	\$ 3,406	\$ 2,001
Tractor: Conventional w/o Sleeper	Single			\$ 61,565	\$ 53,654	\$ 46,531	\$ 40,174	\$ 34,559	\$ 29,650	\$ 25,408	\$ 21,790	\$ 18,745	\$ 16,223	\$ 14,169	\$ 8,983	\$ 7,595	\$ 5,897	\$ 4,492	\$ 3,247	\$ 2,002
Van: Dry	Single			\$ 52,868	\$ 45,055	\$ 38,506	\$ 33,051	\$ 28,532	\$ 24,806	\$ 21,743	\$ 19,223	\$ 17,143	\$ 15,409	\$ 13,944	\$ 8,755	\$ 6,752	\$ 4,754	\$ 3,836	\$ 2,918	\$ 2,000
Van: Moving	Single			\$ 60,621	\$ 51,703	\$ 43,969	\$ 37,314	\$ 31,636	\$ 26,838	\$ 22,828	\$ 19,518	\$ 16,824	\$ 14,666	\$ 12,971	\$ 9,116	\$ 8,135	\$ 6,351	\$ 4,567	\$ 2,783	\$ 999
Van: Reefer	Single			\$ 74,028	\$ 58,819	\$ 47,295	\$ 38,667	\$ 32,267	\$ 27,537	\$ 24,021	\$ 21,355	\$ 19,257	\$ 17,521	\$ 16,003	\$ 9,985	\$ 7,698	\$ 6,148	\$ 4,598	\$ 3,048	\$ 1,498
Winch	Single			\$ 90,712	\$ 82,206	\$ 74,232	\$ 66,787	\$ 59,863	\$ 53,450	\$ 47,537	\$ 42,109	\$ 37,151	\$ 32,644	\$ 28,570	\$ 13,938	\$ 6,715	\$ 3,955	\$ 3,205	\$ 3,106	\$ 2,800
Yard Spotter (Goat)	Single			\$ 58,484	\$ 52,833	\$ 48,465	\$ 44,869	\$ 41,678	\$ 38,650	\$ 35,651	\$ 32,633	\$ 29,613	\$ 26,661	\$ 23,873	\$ 15,473	\$ 13,378	\$ 11,283	\$ 9,188	\$ 7,093	\$ 4,998

**ATTACHMENT 3
SAMPLE INDIVIDUAL COMPANY FLEET COSTS**

**Capital Cost Analysis
(\$2008)**

Number of Vehicles: 15
Average Age: 8.3

Year	Normal Replacement			Minimum Actions Required by Regulation						Total	Net Difference	
	# Vehicles	Cost	%	Replacement			Retrofit					
				# Vehicles	Cost	%	# Vehicles	Cost	%			
Fleet 8.3												
2008	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0	
2009	1	\$78,378	6.7%	1	\$79,330	6.7%	0	\$0	0.0%	\$79,330	\$952	
2010	1	\$64,271	6.7%	1	\$65,178	6.7%	0	\$0	0.0%	\$65,178	\$907	
2011	1	\$86,021	6.7%	1	\$86,021	6.7%	2	\$18,659	13.3%	\$104,680	\$18,659	
2012	1	\$81,925	6.7%	1	\$81,925	6.7%	3	\$26,656	20.0%	\$108,580	\$26,656	
2013	1	\$76,062	6.7%	4	\$288,278	26.7%	1	\$8,462	6.7%	\$296,741	\$220,679	
2014	1	\$73,389	6.7%	1	\$57,533	6.7%	0	\$0	0.0%	\$57,533	(\$15,855)	
2015	1	\$70,770	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$70,770)	
2016	1	\$51,929	6.7%	2	\$125,206	13.3%	0	\$0	0.0%	\$125,206	\$73,277	
2017	1	\$49,756	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$49,756)	
2018	1	\$50,201	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$50,201)	
2019	1	\$58,222	6.7%	1	\$58,222	6.7%	0	\$0	0.0%	\$58,222	\$0	
2020	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0	
2021	1	\$52,809	6.7%	2	\$104,965	13.3%	0	\$0	0.0%	\$104,965	\$52,156	
2022	1	\$53,359	6.7%	3	\$130,651	20.0%	0	\$0	0.0%	\$130,651	\$77,292	
2023	1	\$48,444	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$48,444)	
2024	1	\$46,572	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$46,572)	
2025	1	\$35,989	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$35,989)	
2026	1	\$32,073	6.7%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$32,073)	
2027	1	\$40,230	6.7%	1	\$40,230	6.7%	0	\$0	0.0%	\$40,230	\$0	
2028	1	\$38,315	6.7%	1	\$38,315	6.7%	0	\$0	0.0%	\$38,315	\$0	
2029	1	\$36,490	6.7%	1	\$36,490	6.7%	0	\$0	0.0%	\$36,490	\$0	
2030	1	\$34,752	6.7%	1	\$34,983	6.7%	0	\$0	0.0%	\$34,983	\$231	
											\$121,148	
				\$1,227,328			\$53,777			\$1,281,104		\$121,148
											<i>Average Cost/Vehicle</i>	<i>\$8,077</i>

**ATTACHMENT 3 (Continued)
SAMPLE INDIVIDUAL COMPANY FLEET COSTS**

**Capital Cost Analysis
(\$2008)**

Number of Vehicles: 50
Average Age: 10.0

Year	Normal Replacement			Minimum Actions Required by Regulation						Total	Net Difference	
	# Vehicles	Cost	%	Replacement			Retrofit					
				# Vehicles	Cost	%	# Vehicles	Cost	%			
Fleet 10												
2008	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0	
2009	3	\$175,097	6.0%	3	\$177,954	6.0%	0	\$0	0.0%	\$177,954	\$2,857	
2010	3	\$190,469	6.0%	3	\$190,469	6.0%	0	\$0	0.0%	\$190,469	\$0	
2011	2	\$118,728	4.0%	2	\$118,728	4.0%	0	\$0	0.0%	\$118,728	\$0	
2012	3	\$181,419	6.0%	12	\$725,675	24.0%	16	\$142,163	32.0%	\$867,838	\$686,419	
2013	3	\$175,676	6.0%	13	\$747,716	26.0%	1	\$8,462	2.0%	\$756,178	\$580,501	
2014	3	\$169,844	6.0%	5	\$283,073	10.0%	0	\$0	0.0%	\$283,073	\$113,229	
2015	2	\$109,185	4.0%	2	\$109,185	4.0%	0	\$0	0.0%	\$109,185	\$0	
2016	3	\$157,349	6.0%	4	\$207,972	8.0%	0	\$0	0.0%	\$207,972	\$50,623	
2017	3	\$150,470	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$150,470)	
2018	3	\$143,830	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$143,830)	
2019	2	\$91,487	4.0%	4	\$182,474	8.0%	0	\$0	0.0%	\$182,474	\$90,987	
2020	3	\$131,411	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$131,411)	
2021	3	\$125,834	6.0%	5	\$189,998	10.0%	0	\$0	0.0%	\$189,998	\$64,163	
2022	3	\$120,491	6.0%	5	\$184,341	10.0%	0	\$0	0.0%	\$184,341	\$63,851	
2023	3	\$115,371	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$115,371)	
2024	2	\$73,643	4.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$73,643)	
2025	3	\$105,391	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$105,391)	
2026	3	\$100,728	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$100,728)	
2027	3	\$81,967	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$81,967)	
2028	2	\$58,973	4.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$58,973)	
2029	3	\$84,401	6.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$84,401)	
2030	3	\$80,236	6.0%	3	\$80,236	6.0%	0	\$0	0.0%	\$80,236	\$0	
\$2,742,000				\$3,197,820			\$150,625			\$3,348,445		\$606,445
<i>Average Cost/Vehicle</i>											<i>\$12,129</i>	

**ATTACHMENT 3 (Continued)
SAMPLE INDIVIDUAL COMPANY FLEET COSTS**

**Capital Cost Analysis
(\$2008)**

Number of Vehicles: 8
Average Age: 17.3

Year	Normal Replacement			Minimum Actions Required by Regulation						Total	Net Difference
	# Vehicles	Cost	%	Replacement			Retrofit				
				# Vehicles	Cost	%	# Vehicles	Cost	%		
Fleet 17.3											
2008	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2009	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2010	1	\$17,456	12.5%	1	\$35,311	12.5%	1	\$9,796	12.5%	\$45,106	\$27,650
2011	0	\$0	0.0%	0	\$0	0.0%	2	\$18,659	25.0%	\$18,659	\$18,659
2012	0	\$0	0.0%	2	\$70,860	25.0%	0	\$0	0.0%	\$70,860	\$70,860
2013	1	\$16,202	12.5%	2	\$82,970	25.0%	0	\$0	0.0%	\$82,970	\$66,768
2014	0	\$0	0.0%	1	\$19,969	12.5%	0	\$0	0.0%	\$19,969	\$19,969
2015	0	\$0	0.0%	1	\$30,918	12.5%	0	\$0	0.0%	\$30,918	\$30,918
2016	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2017	1	\$7,817	12.5%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$7,817)
2018	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2019	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2020	1	\$8,565	12.5%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$8,565)
2021	0	\$0	0.0%	1	\$8,490	12.5%	0	\$0	0.0%	\$8,490	\$8,490
2022	0	\$0	0.0%	1	\$7,904	12.5%	0	\$0	0.0%	\$7,904	\$7,904
2023	1	\$19,725	12.5%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$19,725)
2024	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2025	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2026	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2027	1	\$6,732	12.5%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$6,732)
2028	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2029	0	\$0	0.0%	0	\$0	0.0%	0	\$0	0.0%	\$0	\$0
2030	1	\$6,649	12.5%	0	\$0	0.0%	0	\$0	0.0%	\$0	(\$6,649)
				\$256,422			\$28,455			\$284,877	\$201,731
											<i>Average Cost/Vehicle</i>
											\$25,216