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A Final Report to the
Joint Standing Committee on Natural Resources

**High Pollution Vehicle
Retirement Pilot Program**

March 2003

Prepared by:

Maine Department of Environmental Protection

Bureau of Air Quality

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High Pollution Vehicle Retirement Pilot Program

Program Overview

10 M.R.S.A. § 394 et seq. established the High Pollution Vehicle Retirement Pilot Program (hereafter referred to as the Program) for the retirement of high-polluting vehicles by providing owners with incentives for scrapping these vehicles and purchasing cleaner vehicles.

The Maine Legislature established the Program in an effort to encourage the purchase of cleaner cars and the removal of high-polluting vehicles from the vehicle fleet. This 3-year voluntary pilot program provided owners of high-polluting vehicles¹ a cash incentive to retire (or “scrap”) their vehicle and replace it with a 1996 or newer vehicle that meets the California low emission vehicle certification standard.

The legislature established the Program without funding, but authorized funds from the Clean Fuel Vehicle Fund² administered by FAME to redeem Incentive Vouchers for the purchase of cleaner cars. The Clean Fuel Vehicle Fund was created in 1998 to offer direct loans through FAME to finance clean fuel vehicle projects such as fueling infrastructure and the purchase of clean fuel vehicles. In 1998 the Fund had a balance of approximately \$110,000. Section 3 10 MRSA § 1023-K, sub-§3-A was enacted to read: FAME may use money in the Clean Fuel Vehicle Fund to redeem vouchers from money deposited from a public bond issue or an air pollution penalty imposed pursuant to a consent agreement. This allowed the Clean Fuel Vehicle Fund to receive an additional \$66,353.56 in air pollution penalties in 2001.

The Department promulgated rules for the Program and the Board of Environmental Protection adopted Chapter 147, the High Pollution Vehicle Retirement Pilot Program on October 19, 2000.

Those rules established the following procedures:

- The Department issued Letters of Assurance (LOA’s) and Certificates of Verification (COV’s) on a first come, first serve basis to owners of eligible high pollution vehicles who wished to participate in the Program. Each Letter of Assurance stated there was money available in the Fund and the owner was eligible to receive an Incentive Voucher redeemable upon purchase of a qualifying vehicle.
- The owner had 90 days to drive the vehicle to a participating automobile scrapper on the list provided by the DEP. The owner brought the high polluting vehicle

¹ A high pollution vehicle is defined as being a 1987 model year or older that has been registered in the State for the last 24 months, is presently operational, and driven under its own power to the site where it is scrapped.

² The Clean Fuel Vehicle Fund was established within the Finance Authority of Maine under 10 M.R.S.A Section 1023-K, and is funded primarily through grants, air pollution penalties, and bond issues.

and the Certificate of Verification to an automobile scrapper who then certified that an eligible vehicle was scrapped.

- The owner submitted this Certificate of Verification to the DEP, which issued a Clean Vehicle Voucher for the purchase of an eligible low-polluting vehicle. The Clean Vehicle Voucher was submitted to FAME for redemption. DEP verified that the owner purchased a qualifying vehicle and authorized FAME to redeem the Clean Vehicle Voucher.

Amendments to Chapter 147

The Program became effective on November 1, 2000, with over 500 requests for participation on the first day. The public could request participation in the Program via e-mail, fax, and telephone or in person. The interest in the program far exceeded expectations. As of the end of December 2001, there were over 1000 people on the participation list.

The implementation of the Program was delayed due to lack of participation of the automobile recyclers. To resolve this problem, the first regular session of the 120th Maine Legislature amended the statute to define automobile scrapper as automobile graveyards, licensed junkyards, as well as automobile recycling businesses as defined in Title 30-A M.R.S.A., § 3752. This allowed facilities other than auto recyclers to participate. In addition, this legislation allowed FAME to compensate automobile scrappers up to \$350.00 for each high-polluting vehicle scrapped under the Program.

The Board of Environmental Protection adopted these amendments to Chapter 147 on October 18, 2001. The regulation became effective on November 13, 2001.

Summary

To date, the DEP has received a total of 73 Certificate of Verifications (COV's) and sent out 73 Clean Vehicle Vouchers. The 73 vouchers sent out were in the following denominations³:

- Forty four \$1000 vouchers,
- Eighteen \$1500 vouchers, and
- Eleven \$2000 vouchers.

Although 73 vehicles were scrapped, only 23 automobile scrappers requested reimbursement. Fifty of the participants took their vehicles to a scrapper who volunteered to forego reimbursement. Of those that charged for scrapping, 16 charged the full \$350 allowed.

³ Clean Vehicle Vouchers were issued in the following amounts, according to engine size: \$1,500 for a pickup truck or sport utility vehicle (SUV) with a 6 cylinder engine; \$2,000 for a pickup truck or SUV with an 8 cylinder engine; and \$1,000 for any other high pollution vehicle.

In accordance with a requirement of Chapter 147, a list of the vehicles to be scrapped is posted on the DEP web site for automobile enthusiasts or other interested parties. Table 1 lists the vehicles scrapped and purchased to date. Five participants have not yet redeemed his or her voucher. Those five are not included in Table 1.

Table 1
Vehicles Scrapped and Purchased to Date

	Scrapped Vehicle			Purchased Vehicle		
	Year	Make	Model	Year	Make	Model
1	1983	Oldsmobile	Delta 88	2000	Dodge	Neon
2	1983	Ford	Pickup	2001	Nissan	Altima
3	1972	Ford	LTD	2000	Oldsmobile	Bravada
4	1987	Volkswagon	Golf	1997	Ford	Escort
5	1986	Buick	LeSabre	2000	Buick	LeSabre Custom
6	1986	Chevrolet	Celebrity	2000	Lincoln	Town Car
7	1984	Nissan	Sentra	2001	Toyota	Avalon
8	1986	Chevrolet	Celebrity	2002	Ford	Focus
9	1982	Dodge	D-150	2000	Ford	Taurus
10	1986	Saab	900	2002	Volkswagon	Jetta
11	1986	Chevrolet	Monte Carlo	1998	Volkswagon	Beetle
12	1980	Ford	F-150	2000	Saturn	SL
13	1986	Toyota	Tercel	1999	Dodge	Grand Caravan
14	1986	Chevrolet	Truck	2002	Subaru	Outback
15	1986	Ford	F-150	2002	Ford	Ranger
16	1985	Chevrolet	Caprice	2002	Chevrolet	Silverado
17	1984	Dodge	Truck	2002	Toyota	Prius
18	1985	Ford	F-150	2001	Chevrolet	Silverado
19	1986	Chevrolet	F-10	2002	Chrysler	PT Cruiser
20	1985	Mercury	Marquis	2000	Chevrolet	Lumina
21	1984	Dodge	D-100	1999	Ford	F-150
22	1973	Chevrolet	Truck	2000	Suzuki	Swift
23	1986	Pontiac	Parisienne	2001	SAAB	95 SE
24	1984	Chevrolet	Caprice	2002	Volkswagon	Jetta
25	1985	GMC	Suburban	2000	Subaru	Legacy Outback
26	1987	Ford	Ranger	1998	Dodge	Grand Caravan
27	1986	Isuzu	Pickup	2002	Jeep	Liberty
28	1984	Jeep	Wagoneer	2001	Volvo	V70 XC
29	1985	Toyota	Camry	2000	Suzuki	Esteem
30	1982	Chevrolet	S10	2000	Chevrolet	S-10
31	1987	Ford	Escort	2003	Nissan	Maxima

Table 1 Cont.

	Scrapped Vehicle			Purchased Vehicle		
	Year	Make	Model	Year	Make	Model
32	1971	Jeep	Commando	2002	Volkswagon	Jetta
33	1982	Cadillac	Eldorado	2002	Subaru	Forester
34	1987	Mazda	323	2002	Chrysler	PT Cruiser
35	1982	Chevrolet	S-10	2002	Toyota	Prius
36	1987	Chevrolet	Celebrity	2002	Chevrolet	S-10
37	1981	Chevrolet	Pickup	Purchased a non qualifying car		
38	1986	Plymouth	Reliant	Purchased a non qualifying car		
39	1984	Mazda	GLC	2002	Honda	Civic LX Sedan
40	1987	Dodge	Dakota	2003	Chevrolet	Impala
41	1987	Jeep	Cherokee	2001	Chrysler	PT Cruiser
42	1986	Toyota	Tercel	2002	Subaru	Legacy
43	1986	Oldsmobile	Cutlass	2002	Ford	Taurus
44	1986	Toyota	Corolla	2002	Ford	Focus
45	1985	Ford	Pickup	2001	Ford	Taurus
46	1978	Ford	F-100	2001	Ford	F-150
47	1981	Chrysler	LeBaron	Same as 01 Ford Taurus Voucher the vouchers were combined		
48	1984	Mercury	Grand Marquis	2002	Toyota	Camry
49	1987	Ford	Ranger	1999	Volkswagon	Jetta
50	1984	Buick	Skylark	Never Purchased another vehicle-voucher expired		
51	1981	Ford	Fairmount	2003	Mercury	Grand Marquis
52	1986	Pontiac	Bonneville	2002	Honda	Accord EX sedan
53	1987	Chevrolet	S-10	2001	Toyota	Highlander
54	1985	SAAB	900	Purchased a non qualifying car		
55	1986	Oldsmobile	Delta	2002	Buick	Park Avenue
56	1986	Ford	F-150	1999	Chevrolet	Cavalier
57	1986	Ford	F-150	Purchased a non qualifying car		
58	1986	Toyota	Van	2003	Honda	Civic Hybrid
59	1982	Buick	Skylark	2002	Toyota	Camry
60	1981	Ford	F-150	2003	Buick	Century
61	1987	Plymouth	Horizon	Same as 02 Buick Regal Voucher the vouchers were combined		
62	1978	Pontiac	Lemans	2000	Ford	Escort
63	1987	Honda	Civic	1996	Honda	Civic
64	1986	Chevrolet	Van	2002	Buick	Regal
65	1979	Volvo	240	2000	Honda	Insight

Table 1 Cont.

	Scrapped Vehicle			Purchased Vehicle		
	Year	Make	Model	Year	Make	Model
66	1987	Nissan	200 SX	2003	Honda	Civic Hybrid
67	1984	Nissan	Pickup	2003	Honda	CRV
68	1987	Dodge	600	Purchased a non qualifying car		

To date, FAME has redeemed \$79,000 worth of Clean Vehicle Vouchers sent by owners who purchased qualifying vehicles, and \$7,050 was paid to those automobile scrappers requesting reimbursement.

Due to budget issues in October 2002, the Legislature decided to lapse the Program one year. To ensure that everyone with an outstanding LOA received the money promised, the Department calculated the funds necessary for the participants and the amount to be requested by an automobile scrapper. At that time the Legislature removed \$69,468 from the Fund leaving \$61,150 in the Fund to cover the money promised. As of December 31, 2002, \$105,450 was promised, potentially spent or actually paid out to participants or automobile scrappers.

Table 2 shows the Program Summary as of December 31, 2002. Table 3 shows the financial history of the program.

**TABLE 2
Program Summary**

Total number of LOA's sent since 11/29/01	141
Total number of Vouchers redeemed	62
Total number of Vouchers sent to date	73
Number of LOA's that lapsed without a vehicle being scrapped	68
Number of LOA's outstanding	0
Number of Vouchers Outstanding	5
Number of lapsed Vouchers (expired)	1
Number of vouchers denied for purchase of a non-qualifying vehicle	5

(Note to Table 2: In one case the participant scrapped his or her vehicle but never purchased another vehicle. In two cases two vouchers (representing the scrapping of two vehicles) were combined to purchase only one vehicle giving a net gain in emission reductions. Five vouchers were denied payment for the purchase of a non-qualifying vehicle and one expired.)

TABLE 3
Program Financial History

Initial balance with all additions as of December 2001	\$178,517
Additional money added to the fund on June 25, 2002	\$2,500
Amount promised, spent or potentially spent as of December 31, 2002	\$105,450
Amount lapsed by Legislature	\$69,468
Total amount in vouchers sent out to date	\$92,000
Vouchers redeemed since November 29, 2001	\$79,000
Amount paid to automobile scrappers since November 29, 2001	\$7,050
Amount promised or potentially paid but not redeemed to date. (includes vouchers not yet redeemed, LOA's pending and potential payments to scrappers)	\$7,900 (\$5,500, \$0, \$2,400)

Air Quality Benefits

The Program required the purchase of a newer, cleaner vehicle. A cleaner vehicle is defined by Chapter 147 as a vehicle that is 1996 or newer and has a Vehicle Emission Control Information Label under the hood or Manufacturers Certificate of Origin (MCO) which certifies that the vehicle is one of the following:

- National Low Emission Vehicle (NLEV);
- Low Emission Vehicle (LEV);
- Ultra Low Emission Vehicle (ULEV);
- Super Ultra Low Emission Vehicle (SULEV); or
- Zero Emission Vehicle (ZEV).

The emissions benefits were calculated using a program established by the Environmental Defense Fund. This program, called Tailpipe Tally, calculates fuel cost, fuel usage, hydrocarbon emissions, and NOx emissions. The program prompts the user to enter the make, model, and year of the vehicle, as well as the emissions certification and miles per year driven. The program then calculates the emissions per year produced by the vehicle.

The results showed very little difference between the fuel usage of the scrapped vehicles and the new vehicles purchased under the Program. The average fuel usage for the scrapped vehicles was 633 gallons per year compared to the 541 gallons per year average fuel usage for the new vehicles. (See Table 4)

However, calculations for hydrocarbon and nitrogen oxide (NOx) emissions show significant differences. The average hydrocarbon emissions for the scrapped vehicles was 33.52 lbs/year compared to an average 4.31 lbs/year from the new vehicles. This represents an 87 percent decrease in emissions. (See Table 5)

The average NOx emissions from the scrapped vehicles was 57.07 lbs/year compared to 11.72 lbs/year from the new vehicles. This represents an 80 percent reduction in emissions from the scrapped vehicle to the new vehicle. (See Table 6)

(Note: In two separate cases, two vehicles were scrapped but only one new vehicle was purchased. In these cases the emissions from the scrapped vehicles not replaced were included in the final calculations for emission benefits. Also, if the particular vehicle purchased was not available on Tailpipe Tally, a comparable vehicle was substituted. When calculating all of the emission benefits, the six scrapped vehicles representing the denied or expired vouchers were not included. Because the voucher was denied or expired without use, the purchased vehicle information was not recorded in our data so it was not possible to provide a comparison of the emissions. Vouchers not yet redeemed were also not included in the emission calculations.)

Table 4
Fuel Savings

Scrapped Vehicle					Purchased Vehicle				
	Year	Make	Model	Fuel Use gal/year	Year	Make	Model	Fuel Use gal/year	Benefits gal/year
1	1983	Oldsmobile	Delta 88	543	2000	Dodge	Neon	430	113
2	1983	Ford	Pickup	875	2001	Nissan	Altima	504	371
3	1972	Ford	LTD	782	2000	Oldsmobile	Bravada	797	-15
4	1987	Volkswagon	Golf	404	1997	Ford	Escort	418	-14
5	1986	Buick	LeSabre	569	2000	Buick	LeSabre Custom	550	19
6	1986	Chevrolet	Celebrity	544	2000	Lincoln	Town Car	607	-63
7	1984	Nissan	Sentra	285	2001	Toyota	Avalon	522	-237
8	1986	Chevrolet	Celebrity	544	2002	Ford	Focus	425	119
9	1982	Dodge	D-150	737	2000	Ford	Taurus	554	183
10	1986	Saab	900	569	2002	Volkswagon	Jetta	502	67
11	1986	Chevrolet	Monte Carlo	625	1998	Volkswagon	Beetle	418	207
12	1980	Ford	F-150	934	2000	Saturn	SL	403	531
13	1986	Toyota	Tercel	368	1999	Dodge	Grand Caravan	680	-312
14	1986	Chevrolet	Truck	778	2002	Subaru	Outback	540	238
15	1986	Ford	F-150	934	2002	Ford	Ranger	720	214
16	1985	Chevrolet	Caprice	658	2002	Chevrolet	Silverado	821	-163
17	1984	Dodge	Truck	875	2002	Toyota	Prius	257	618
18	1985	Ford	F-150	1000	2001	Chevrolet	Silverado	809	191
19	1986	Chevrolet	F-10	632	2002	Chrysler	PT Cruiser	631	1
20	1985	Mercury	Marquis	625	2000	Chevrolet	Lumina	530	95
21	1984	Dodge	D-100	875	1999	Ford	F-150	909	-34

Table 4 Cont.

Scrapped Vehicle					Purchased Vehicle				
	Year	Make	Model	Fuel Use gal/year	Year	Make	Model	Fuel Use gal/year	Benefits gal/year
22	1973	Chevrolet	Truck	824	2000	Suzuki	Swift	357	467
23	1986	Pontiac	Parisienne	625	2001	SAAB	95 SE	547	78
24	1984	Chevrolet	Caprice	569	2002	Volkswagon	Jetta	502	67
25	1985	GMC	Suburban	934	2000	Subaru	Legacy Outback	525	409
26	1987	Ford	Ranger	609	1998	Dodge	Grand Caravan	680	-71
27	1986	Isuzu	Pickup	637	2002	Jeep	Liberty	796	-159
28	1984	Jeep	Wagoneer	560	2001	Volvo	V70 XC	638	-78
29	1985	Toyota	Camry	417	2000	Suzuki	Esteem	410	7
30	1982	Chevrolet	S10	483	2000	Chevrolet	S-10	711	-228
31	1987	Ford	Escort	391	2003	Nissan	Maxima	544	-153
32	1971	Jeep	Commando	824	2002	Volkswagon	Jetta	502	322
33	1982	Cadillac	Eldorado	569	2002	Subaru	Forester	529	40
34	1987	Mazda	323	447	2002	Chrysler	PT Cruiser	631	-184
35	1982	Chevrolet	S-10	483	2002	Toyota	Prius	257	226
36	1987	Chevrolet	Celebrity	544	2002	Chevrolet	S-10	732	-188
37	1984	Mazda	GLC	338	2002	Honda	Civic LX Sedan	381	-43
38	1987	Dodge	Dakota	778	2003	Chevrolet	Impala	549	229
39	1987	Jeep	Cherokee	667	2001	Chrysler	PT Cruiser	633	34
40	1986	Toyota	Tercel	368	2002	Subaru	Legacy	529	-161
41	1986	Oldsmobile	Cutlass	625	2002	Ford	Taurus	549	76
42	1986	Toyota	Corolla	404	2002	Ford	Focus	425	-21
43	1985	Ford	Pickup	1000	2001	Ford	Taurus	571	429
44	1978	Ford	F-100	778	2001	Ford	F-150	874	-96

Table 4 Cont.

Scrapped Vehicle					Purchased Vehicle				
	Year	Make	Model	Fuel Use gal/year	Year	Make	Model	Fuel Use gal/year	Benefits gal/year
45	1981	Chrysler	LeBaron	658	Same as 01 Ford Taurus Voucher the vouchers were combined				658
46	1984	Mercury	Grand Marquis	544	2002	Toyota	Camry	489	55
47	1987	Ford	Ranger	609	1999	Volkswagon	Jetta	418	191
48	1981	Ford	Fairmount	521	2003	Mercury	Grand Marquis	629	-108
49	1986	Pontiac	Bonneville	625	2002	Honda	Accord EX sedan	474	151
50	1987	Chevrolet	S-10	637	2001	Toyota	Highlander	813	-176
51	1986	Oldsmobile	Delta	569	2002	Buick	Park Avenue	555	14
52	1986	Ford	F-150	934	1999	Chevrolet	Cavalier	479	455
53	1986	Toyota	Van	637	2003	Honda	Civic Hybrid	262	375
54	1982	Buick	Skylark	447	2002	Toyota	Camry	489	-42
55	1981	Ford	F-150	824	2003	Buick	Century	539	285
56	1987	Plymouth	Horizon	481	Same as 02 Buick Regal Voucher the vouchers were combined				481
57	1978	Pontiac	Lemans	596	2000	Ford	Escort	416	180
58	1987	Honda	Civic	379	1996	Honda	Civic	403	-24
59	1986	Chevrolet	Van	1000	2002	Buick	Regal	567	433
60	1979	Volvo	240	596	2000	Honda	Insight	194	402
61	1987	Nissan	200 SX	544	2003	Honda	Civic Hybrid	262	282
62	1984	Nissan	Pickup	609	2003	Honda	CRV	590	19
	Totals			39240				32478	6762
	Ave.			632.90				541.30	

Table 5
HC Emissions

Scrapped Vehicle					Purchased Vehicle				
	Year	Make	Model	HC Emissions lbs/year	Year	Make	Model	HC Emissions lbs/year	Emis. Benefits lbs/year
1	1983	Oldsmobile	Delta 88	25.9	2000	Dodge	Neon	5.8	20.1
2	1983	Ford	Pickup	73.5	2001	Nissan	Altima	4.1	69.4
3	1972	Ford	LTD	55.4	2000	Oldsmobile	Bravada	7.4	48
4	1987	Volkswagon	Golf	25.9	1997	Ford	Escort	9.6	16.3
5	1986	Buick	LeSabre	25.9	2000	Buick	LeSabre Custom	4.7	21.2
6	1986	Chevrolet	Celebrity	25.9	2000	Lincoln	Town Car	5.8	20.1
7	1984	Nissan	Sentra	25.9	2001	Toyota	Avalon	4.1	21.8
8	1986	Chevrolet	Celebrity	25.9	2002	Ford	Focus	4.1	21.8
9	1982	Dodge	D-150	73.5	2000	Ford	Taurus	5.8	67.7
10	1986	Saab	900	25.9	2002	Volkswagon	Jetta	4.1	21.8
11	1986	Chevrolet	Monte Carlo	25.9	1998	Volkswagon	Beetle	5.8	20.1
12	1980	Ford	F-150	73.5	2000	Saturn	SL	5.8	67.7
13	1986	Toyota	Tercel	25.9	1999	Dodge	Grand Caravan	13.9	12
14	1986	Chevrolet	Truck	46.3	2002	Subaru	Outback	4.1	42.2
15	1986	Ford	F-150	46.3	2002	Ford	Ranger	5.6	40.7
16	1985	Chevrolet	Caprice	25.9	2002	Chevrolet	Silverado	5.6	20.3
17	1984	Dodge	Truck	46.3	2002	Toyota	Prius	0.8	45.5
18	1985	Ford	F-150	46.3	2001	Chevrolet	Silverado	5.6	40.7
19	1986	Chevrolet	F-10	46.3	2002	Chrysler	PT Cruiser	4.6	41.7
20	1985	Mercury	Marquis	25.9	2000	Chevrolet	Lumina	5.8	20.1

Table 5 Cont.

	Scrapped Vehicle				Purchased Vehicle				Emis. Benefits lbs/year
	Year	Make	Model	HC Emissions lbs/year	Year	Make	Model	HC Emissions lbs/year	
21	1984	Dodge	D-100	46.3	1999	Ford	F-150	13.9	32.4
22	1973	Chevrolet	Truck	81.5	2000	Suzuki	Swift	5.8	75.7
23	1986	Pontiac	Parisienne	25.9	2001	SAAB	95 SE	4.1	21.8
24	1984	Chevrolet	Caprice	25.9	2002	Volkswagon	Jetta	3.3	22.6
25	1985	GMC	Suburban	46.3	2000	Subaru	Legacy Outback	5.8	40.5
26	1987	Ford	Ranger	46.3	1998	Dodge	Grand Caravan	13.9	32.4
27	1986	Isuzu	Pickup	46.3	2002	Jeep	Liberty	5.6	40.7
28	1984	Jeep	Wagoneer	46.3	2001	Volvo	V70 XC	5	41.3
29	1985	Toyota	Camry	25.9	2000	Suzuki	Esteem	5.8	20.1
30	1982	Chevrolet	S10	73.5	2000	Chevrolet	S-10	7.4	66.1
31	1987	Ford	Escort	25.9	2003	Nissan	Maxima	4.1	21.8
32	1971	Jeep	Commando	81.5	2002	Volkswagon	Jetta	4.1	77.4
33	1982	Cadillac	Eldorado	25.9	2002	Subaru	Forrester	5	20.9
34	1987	Mazda	323	25.9	2002	Chrysler	PT Cruiser	4.6	21.3
35	1982	Chevrolet	S-10	73.5	2002	Toyota	Prius	0.8	72.7
36	1987	Chevrolet	Celebrity	25.9	2002	Chevrolet	S-10	5.6	20.3
37	1984	Mazda	GLC	25.9	2002	Honda	Civic LX Sedan	3.3	22.6
38	1987	Dodge	Dakota	46.3	2003	Chevrolet	Impala	4.1	42.2
39	1987	Jeep	Cherokee	46.3	2001	Chrysler	PT Cruiser	5.6	40.7
40	1986	Toyota	Tercel	25.9	2002	Subaru	Legacy	4.1	21.8
41	1986	Oldsmobile	Cutlass	25.9	2002	Ford	Taurus	4.1	21.8

Table 5 Cont.

	Scrapped Vehicle				Purchased Vehicle				Emis Benefits lbs/year
	Year	Make	Model	HC Emis. lbs/year	Year	Make	Model	HC Emissions lbs/year	
42	1986	Toyota	Corolla	25.9	2002	Ford	Focus	4.1	21.8
43	1985	Ford	Pickup	46.3	2001	Ford	Taurus	4.1	42.2
44	1978	Ford	F-100	81.5	2001	Ford	F-150	5.6	75.9
45	1981	Chrysler	LeBaron	25.9	Same as 01 Ford Taurus Voucher the vouchers were combined				25.9
46	1984	Mercury	Grand Marquis	25.9	2002	Toyota	Camry	3.3	22.6
47	1987	Ford	Ranger	46.3	1999	Volkswagon	Jetta	9.6	36.7
48	1981	Ford	Fairmount	25.9	2003	Mercury	Grand Marquis	4.1	21.8
49	1986	Pontiac	Bonneville	25.9	2002	Honda	Accord EX sedan	3.3	22.6
50	1987	Chevrolet	S-10	46.3	2001	Toyota	Highlander	5.6	40.7
51	1986	Oldsmobile	Delta	25.9	2002	Buick	Park Avenue	3.3	22.6
52	1986	Ford	F-150	46.3	1999	Chevrolet	Cavalier	9.6	36.7
53	1986	Toyota	Van	46.3	2003	Honda	Civic Hybrid	3.3	43
54	1982	Buick	Skylark	25.9	2002	Toyota	Camry	3.3	22.6
55	1981	Ford	F-150	73.5	2003	Buick	Century	4.1	69.4
56	1987	Plymouth	Horizon	25.9	Same as 02 Buick Regal Voucher the vouchers were combined				25.9
57	1978	Pontiac	Lemans	55.4	2000	Ford	Escort	5.8	49.6
58	1987	Honda	Civic	25.9	1996	Honda	Civic	9.6	16.3
59	1986	Chevrolet	Van	73.5	2002	Buick	Regal	4.1	69.4
60	1979	Volvo	240	55.4	2000	Honda	Insight	4.7	50.7
61	1987	Nissan	200 SX	25.9	2003	Honda	Civic Hybrid	3.3	22.6
62	1984	Nissan	Pickup	46.3	2003	Honda	CRV	5.6	40.7
	Totals			2078.4				258.4	1820
	Ave.			33.52				4.31	

Table 6
NOx Emissions

	Scrapped Vehicle				Purchased Vehicle				Emis. Benefits lbs/year
	Year	Make	Model	NOx Emissions lbs/year	Year	Make	Model	NOx Emissions lbs/year	
1	1983	Oldsmobile	Delta 88	44.9	2000	Dodge	Neon	17.9	27
2	1983	Ford	Pickup	89.2	2001	Nissan	Altima	9.4	79.8
3	1972	Ford	LTD	66.1	2000	Oldsmobile	Bravada	28.1	38
4	1987	Volkswagon	Golf	44.9	1997	Ford	Escort	20.9	24
5	1986	Buick	LeSabre	44.9	2000	Buick	LeSabre Custom	17.9	27
6	1986	Chevrolet	Celebrity	44.9	2000	Lincoln	Town Car	17.9	27
7	1984	Nissan	Sentra	44.9	2001	Toyota	Avalon	9.4	35.5
8	1986	Chevrolet	Celebrity	44.9	2002	Ford	Focus	9.4	35.5
9	1982	Dodge	D-150	89.2	2000	Ford	Taurus	17.9	71.3
10	1986	Saab	900	44.9	2002	Volkswagon	Jetta	9.4	35.5
11	1986	Chevrolet	Monte Carlo	44.9	1998	Volkswagon	Beetle	17.9	27
12	1980	Ford	F-150	89.2	2000	Saturn	SL	17.9	71.3
13	1986	Toyota	Tercel	44.9	1999	Dodge	Grand Caravan	36.4	8.5
14	1986	Chevrolet	Truck	89.2	2002	Subaru	Outback	9.4	79.8
15	1986	Ford	F-150	89.2	2002	Ford	Ranger	15.7	73.5
16	1985	Chevrolet	Caprice	44.9	2002	Chevrolet	Silverado	15.7	29.2
17	1984	Dodge	Truck	89.2	2002	Toyota	Prius	0.8	88.4
18	1985	Ford	F-150	89.2	2001	Chevrolet	Silverado	17	72.2
19	1986	Chevrolet	F-10	89.2	2002	Chrysler	PT Cruiser	10.5	78.7
20	1985	Mercury	Marquis	44.9	2000	Chevrolet	Lumina	17.9	27

Table 6 Cont.

	Scrapped Vehicle				Purchased Vehicle				Emis. Benefits lbs/year
	Year	Make	Model	NOx Emissions lbs/year	Year	Make	Model	NOx Emissions lbs/year	
21	1984	Dodge	D-100	89.2	1999	Ford	F-150	36.4	52.8
22	1973	Chevrolet	Truck	102.8	2000	Suzuki	Swift	17.9	84.9
23	1986	Pontiac	Parisienne	44.9	2001	SAAB	95 SE	9.4	35.5
24	1984	Chevrolet	Caprice	44.9	2002	Volkswagon	Jetta	9.4	35.5
25	1985	GMC	Suburban	89.2	2000	Subaru	Legacy Outback	17.9	71.3
26	1987	Ford	Ranger	89.2	1998	Dodge	Grand Caravan	36.4	52.8
27	1986	Isuzu	Pickup	89.2	2002	Jeep	Liberty	15.7	73.5
28	1984	Jeep	Wagoneer	89.2	2001	Volvo	V70 XC	15.2	74
29	1985	Toyota	Camry	44.9	2000	Suzuki	Esteem	17.9	27
30	1982	Chevrolet	S10	89.2	2000	Chevrolet	S-10	28.1	61.1
31	1987	Ford	Escort	44.9	2003	Nissan	Maxima	9.4	35.5
32	1971	Jeep	Commando	102.8	2002	Volkswagon	Jetta	9.4	93.4
33	1982	Cadillac	Eldorado	44.9	2002	Subaru	Forrester	14.1	30.8
34	1987	Mazda	323	44.9	2002	Chrysler	PT Cruiser	10.5	34.4
35	1982	Chevrolet	S-10	89.2	2002	Toyota	Prius	0.8	88.4
36	1987	Chevrolet	Celebrity	44.9	2002	Chevrolet	S-10	15.7	29.2
37	1984	Mazda	GLC	44.9	2002	Honda	Civic LX Sedan	9.4	35.5
38	1987	Dodge	Dakota	89.2	2003	Chevrolet	Impala	9.4	79.8
39	1987	Jeep	Cherokee	89.2	2001	Chrysler	PT Cruiser	17	72.2
40	1986	Toyota	Tercel	44.9	2002	Subaru	Legacy	9.4	35.5
41	1986	Oldsmobile	Cutlass	44.9	2002	Ford	Taurus	9.4	35.5
42	1986	Toyota	Corolla	44.9	2002	Ford	Focus	9.4	35.5

Table 6 Cont.

	Scrapped Vehicle				Purchased Vehicle				
	Year	Make	Model	NOx Emis. lbs/year	Year	Make	Model	NOx Emissions lbs/year	Emis. Benefits lbs/year
43	1985	Ford	Pickup	89.2	2001	Ford	Taurus	9.4	79.8
44	1978	Ford	F-100	102.8	2001	Ford	F-150	17	85.8
45	1981	Chrysler	LeBaron	44.9	Same as 01 Ford Taurus Voucher the vouchers were combined				44.9
46	1984	Mercury	Grand Marquis	44.9	2002	Toyota	Camry	9.4	35.5
47	1987	Ford	Ranger	89.2	1999	Volkswagon	Jetta	20.9	68.3
48	1981	Ford	Fairmount	44.9	2003	Mercury	Grand Marquis	9.4	35.5
49	1986	Pontiac	Bonneville	44.9	2002	Honda	Accord EX sedan	9.4	35.5
50	1987	Chevrolet	S-10	89.2	2001	Toyota	Highlander	17	72.2
51	1986	Oldsmobile	Delta	44.9	2002	Buick	Park Avenue	9.4	35.5
52	1986	Ford	F-150	89.2	1999	Chevrolet	Cavalier	20.9	68.3
53	1986	Toyota	Van	89.2	2003	Honda	Civic Hybrid	9.4	79.8
54	1982	Buick	Skylark	44.9	2002	Toyota	Camry	9.4	35.5
55	1981	Ford	F-150	89.2	2003	Buick	Century	9.4	79.8
56	1987	Plymouth	Horizon	44.9	Same as 02 Buick Regal Voucher the vouchers were combined				44.9
57	1978	Pontiac	Lemans	66.1	2000	Ford	Escort	17.9	48.2
58	1987	Honda	Civic	44.9	1996	Honda	Civic	20.9	24
59	1986	Chevrolet	Van	89.2	2002	Buick	Regal	9.4	79.8
60	1971	Jeep	Commando	102.8	2002	Volkswagon	Jetta	9.4	93.4
61	1979	Volvo	240	66.1	2000	Honda	Insight	17.9	48.2
62	1987	Nissan	200 SX	44.9	2003	Honda	Civic Hybrid	9.4	35.5
63	1984	Nissan	Pickup	89.2	2003	Honda	CRV	15.7	73.5
	Totals			3538.5				703.2	2835.3
	Ave			57.07				11.72	

Relative Cost Effectiveness

One vehicle emission reduction program in the State is the Low Emission Vehicle Program (LEV). In 1998, Maine adopted the California Low Emission Vehicle standards for all new light-duty vehicles, beginning with model year 2001. The Program will cover all new medium-duty vehicles beginning in 2003. That means they must meet California's emission standards, which are more stringent than federal.

Maine does not have any specific cost effective analyses for the LEV program and therefore relied upon the analyses done by California. The *Staff Report on Low-Emission Vehicle and Zero-Emission Vehicle Program Review* by the California Air Resources Board (November 1996) reported that replacing a conventional vehicle with a California-certified low emission vehicle reduced NO_x and reactive organic gasses at a cost of approximately \$2000 per ton. Costs of motor vehicle control measures typically range up to \$10,000 per ton of pollutants reduced while stationary source controls range up to \$20,000 per ton.

Another emission reduction strategy in Maine is the federal Onboard Diagnostics Program (OBD). OBD systems monitor for emission related vehicle components and systems for malfunction and/or deterioration. The intent of the OBD program is to assure proper emission system operation of each and every vehicle and light duty truck over its lifetime. All 1996 model year and newer vehicles are equipped with OBD. In Cumberland County the Enhanced Inspection and Maintenance Program includes an inspection of the OBD in the vehicle safety inspection. The vehicle fails inspection if there are any malfunctions of the emission systems. The required repairs to the vehicles are estimated by EPA to reduce hydrocarbons and NO_x at a cost of \$500 per ton.

From a cost perspective, the High Pollution Vehicle Retirement Pilot Program is not as effective as the above programs. Table 7 presents the cost per ton, based on the difference in hydrocarbon and NO_x emissions removed from the scrapped vehicle and the new vehicle. The total cost effectiveness for the removal of hydrocarbons and NO_x per ton for 62 cars is \$73,017 per ton reduced, although a lower cost/ton could be realized over time based on the assumption that the old vehicle would have continued to be driven up to four more years. If the older vehicle remained on the road for four additional years the cost effectiveness improved to \$18,254/ton. Note, however, that the cost effectiveness evaluation did not address the reduced carbon monoxide, carbon dioxide and air toxics such as benzene resulting from retirement of these vehicles.

Table 7
Cost Effectiveness per ton of Emission Reductions**

Vehicle Scrapped	New Vehicle	New Vehicle + 1 yr	New Vehicle + 2 yr	New Vehicle + 3 yr	New Car + 4 yr
37 Cars	\$30,751	\$15,376	\$10,250	\$7,688	\$6,150
16- 6-Cylinder Trucks/SUV's	\$24,756	\$12,378	\$8,252	\$6,189	\$4,951
9-8-Cylinder Truck/SUV	\$17,510	\$8,755	\$5,837	\$4,378	\$3,502
Total Cost for 62 Vehicles	\$73,017	\$36,509	\$24,339	\$18,254	\$14,603

**The cost effectiveness for the Program was derived from calculating the difference between the combined NOx and hydrocarbon emissions of the scrapped vehicle and the new vehicle. The cost per ton was calculated based upon engine size. Of the 62 vehicles removed from the road and replaced with a cleaner car, 37 were cars, 16 were 6-cylinder trucks or SUV's and 9 were 8-cylinder trucks or SUV's. The emissions from the hydrocarbons and NOx were added together to obtain the cost per ton for each vehicle group. In addition there were five other vehicles scrapped (3 cars, 1 6-cylinder truck or SUV and 1 8-cylinder truck or SUV) that never redeemed vouchers and only one of those took their vehicle to an automobile scrapper that charged. Four of the five purchased non-qualifying vehicles the fifth simply allowed his voucher to expire, it is unknown if he purchased another vehicle.

Conclusion

This pilot program was to be repealed on November 1, 2003. However, due to significant budget issues the Legislature ended the program one year early on October 8, 2002. Although the program ended early, we believe that the Program is a success for the following reasons:

- The Program received enormous public support for providing a benefit to both the public *and* the environment.
- The Program provided public awareness of the impacts to air quality from mobile sources, the largest in-state source of ozone pollution in Maine. Many of those participating in this program now have a greater understanding of what defines a Low Emission Vehicle.
- From this experience, the public may continue to seek the cleanest cars available.
- In fact, five of the vehicles purchased were hybrid electric.
- The Program benefited those who may not have otherwise been able to purchase a newer cleaner car.
- The Program has also helped to enforce Maine's requirement that only California-certified vehicles are offered for sale in Maine. Participants are requesting low emission vehicles at the dealerships. In some cases dealerships have sought clarification of the LEV regulation from the DEP to ensure the vehicles they are selling to the participants are qualifying vehicles.