Climate Change Measure B.1.ii – Provide Pay-as-you-drive Auto Insurance

Description

This is an analysis of the potential impact of the "Pay-as-you-drive Auto Insurance (PAYD)". It provides the motorists the option of purchasing auto insurance per mile rather than in a lump sum. The program is assumed to begin in January 2010.

The current lump-sum pricing of auto insurance is inefficient and inequitable. Drivers who are similar in other respects—age, gender, location, driving safety record—pay nearly the same premiums if they drive five thousand or fifty thousand miles a year. Just as an all-you-can-eat restaurant encourages more eating, all-you-can-drive insurance pricing encourages more driving. That means more accidents, congestion, carbon emissions, local pollution, and dependence on oil. This pricing system is inequitable because low-mileage drivers subsidize insurance costs for high-mileage drivers, and low-income people drive fewer miles on average.

Eligibility

Light Duty Vehicles: Cars, Vans, Pickup Trucks and SUVs.

Heavy Duty Vehicles are not eligible because their premiums may already closely reflect mileage.

Analysis Approach

Use sketch planning analysis to calculate greenhouse gas emission reductions which result from the program implementation by estimating the emissions with and without the pay-as-you-drive insurance option. (This analysis is based on the information from the report "Pay-As-You-Drive Auto Insurance: A Simple Way to Reduce Driving-Related Harms and Increase Equity", The Brookings Institution). Pilot program is in North Central Texas. This study monitored the response of three thousand customers.

Assumptions

- This analysis considers all the vehicles in metropolitan Washington region.
- PAYD is available for light duty vehicles (cars, vans, pickup trucks, SUVs).
- Per-mile insurance premium and Per-mile Fuel cost are constant as of the year 2007.
- The driving reduction for the total light duty vehicles in the region is 7.8 % (weighted among DC, MD, VA) when all the light duty vehicle owners switch to PAYD.
- Beginning 2010, 5% of the eligible light duty vehicle owners will switch to PAYD each year and 30% of all eligible owners will switch within 6 years.
- The monitoring cost of PAYD is $40 per vehicle per year. There could be additional cost involved such as marketing the program.
- CO2 estimates are based on 8,788 grams CO2/gallon of gasoline.
- Number of vehicles is based on 2008 vehicle registration data and the growth rate is 1.94%. (Based on the historical growth rate used in the region.)

Impact

Travel

The VMT reductions for all the light duty vehicles are estimated to be 100,414,209 miles in the first year (2010) of the program. The cumulative VMT reductions are estimated to be 2,187,532,826 miles after the sixth year (2015) of the program.

Emissions

The CO2 emissions reductions for all the light duty vehicles are estimated to be 48,979 tons in the first year (2010) of the program. The cumulative CO2 emissions reductions are estimated to be 991,468 tons after the sixth year (2015) of the program.

Cost

The cost is estimated to be $ 6,711,022 in the first year (2010) of the program and the cumulative cost is estimated to be $ 42,146,096 after the sixth year (2015) of the program.

Cost Effectiveness

The cost effectiveness for the first year of the program is estimated to be $137 per ton of CO2 in 2010 and the cost effectiveness for the last year of the program is estimated to be $27 per ton of CO2 in 2015.

Details of the analysis are shown in the following page.

Table 1. Estimation of Annual VMT Reduction(Light Duty Vehicles)

Year	Vehicles Switch%	Total Driving Reduction by PAYD	Annual VMT Reduction%	Forecasted Annual VMT(LDV/LDT)	Annual VMT Reduction(miles)
2010	5%	7.81%	0.39%	25,714,266,170	100,414,209
2011	10%	7.81%	0.78%	26,002,667,226	203,080,831
2012	15%	7.81%	1.17%	26,291,068,281	307,999,865
2013	20%	7.81%	1.56%	26,579,469,337	415,171,311
2014	25%	7.81%	1.95%	26,867,870,393	524,595,169
2015	30%	7.81%	2.34%	27,156,271,449	636,271,440
				Cumulative	2,187,532,826

Table 2. Estimation of CO2 Reduction Benefits from PAYD Insurance

Year	VMT Reduction(miles)	Average MPG(miles/gallon)	Fuel Saving(gallons)	CO2 Reduction(tons)
2010	100,414,209	19.86	5,056,103	48,979
2011	203,080,831	20.15	10,078,453	97,631
2012	307,999,865	20.64	14,922,474	144,556
2013	415,171,311	21.18	19,602,045	189,887
2014	524,595,169	21.75	24,119,318	233,646
2015	636,271,440	22.27	28,570,788	276,768
			Cumulative	991,468

Table 3. Estimation of Cost and Cost Effectiveness from PAYD Insurance

Year	No.LD Vehicles newly Involved	CO2 Reduction(ton)	Cost($)	Cost Effectiveness($/ton)
2010	167,776	48,979	6,711,022	137
2011	170,909	97,631	6,836,353	70
2012	174,042	144,556	6,961,684	48
2013	177,175	189,887	7,087,015	37
2014	180,309	233,646	7,212,346	31
2015	183,442	276,768	7,337,677	27
Cumulative	1,053,652	Cumulative	42,146,097	