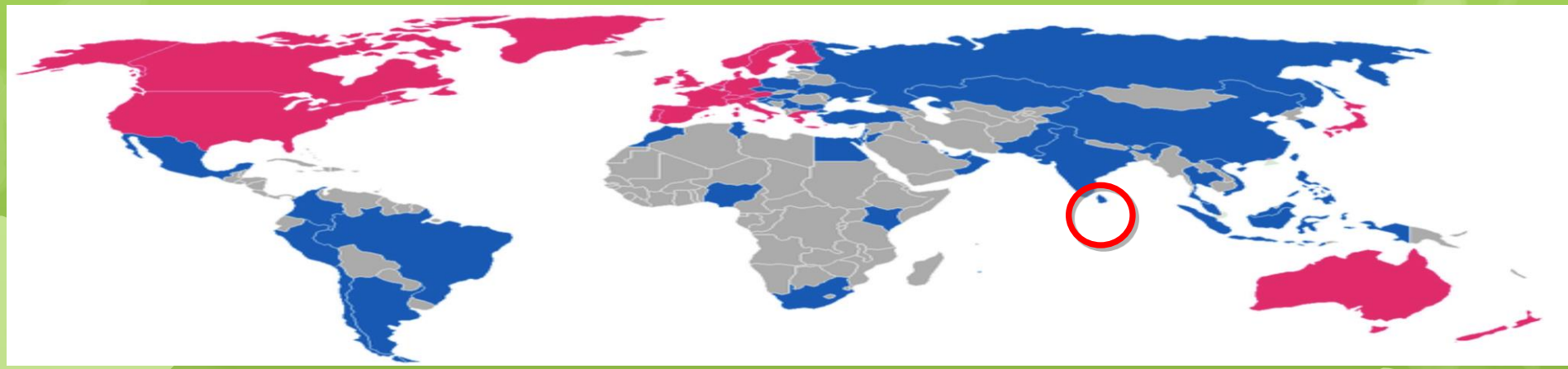
How Sri Lanka has addressed the problem of dieselization with fiscal measures and fuel standards roadmap to curb diesel pollution



Don S. Jayaweera

Director General, Sri Lanka Tourist Development Authority, Director General, Sri Lanka Institute of Hotel Management, Senior Lecturer, Institute of Financial Studies, Ministry of finance and Planning, and Senior Consultant, Strategic Enterprise Management Agency, President Secretariat, SRI LANKA

Silent Features of Mobility Market in Sri Lanka

A. Road Sector serves 94.9% of Passenger and 99% of Freight transport;
B. Railways serves only 3.4% of Passengers and less than 0.8% of freight transport in the country;
C. The total fossil fuel consumption for mobility accounted US $ 3.87 billion in 2013;
D. Current Active Vehicle Fleet has reached to 3.793 million (as at October 31st, 2014);
E. The total Passenger Trips per day recorded as 17.2 million per day for all mode of transport

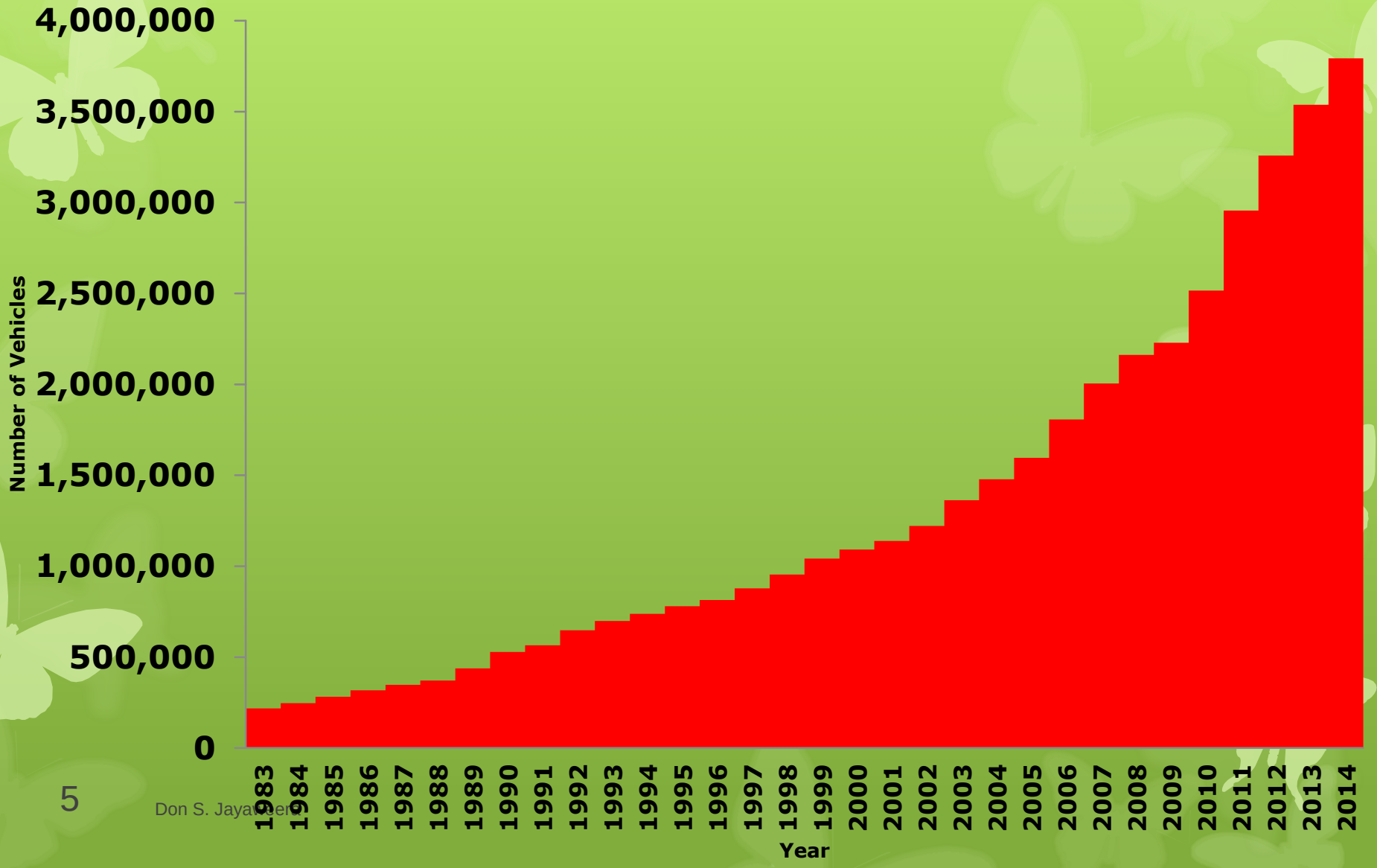
Present Characteristics of Road Use Vehicle Fleet

- Motor Cycles as at August 31st, 2013 is 1.834 million and Three Wheelers are 691,597 (Petrol 655,535 Diesel 36,062);
- All four wheel road use vehicles as at August 31st, 2013 is 903,182;
- This shows that 74% are two or three wheelers (20% Three Wheelers and 54% Motor Cycles);
- Government has implemented to get fuel efficient and less polluted fleet to the country by introducing tax benefits for Hybrid Electric technology and reducing age of used vehicle importation

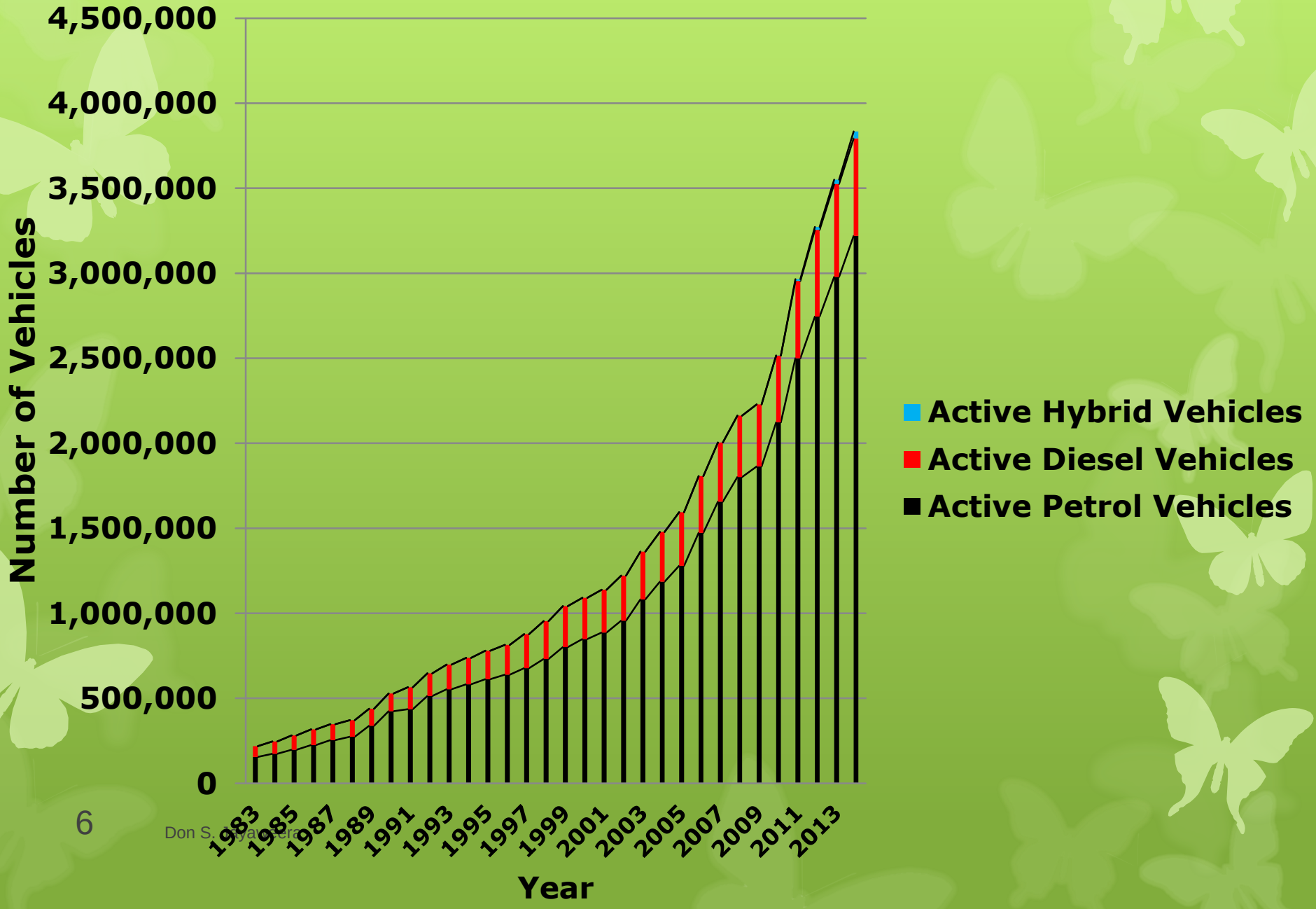
Passenger Modal Share

Passenger Km's	2008	2009	2010	2011	2012	2013	2014
Motor Cars	7.2%	7.8%	8.8%	13.0%	13.8%	16.4%	15.3%
Vans	11.8%	11.4%	11.6%	12.8%	12.4%	12.1%	12.2%
Buses	64.1%	61.4%	56.9%	49.2%	47.6%	44.5%	45.1%
Three Wheelers	5.9%	7.4%	9.3%	11.0%	12.0%	13.2%	12.5%
Trucks/Lorry	1.7%	1.6%	1.7%	3.4%	3.3%	2.6%	2.7%
Motor Cycles	4.6%	5.7%	7.1%	6.2%	6.7%	6.0%	5.5%
Railways	4.7%	4.5%	4.6%	4.4%	4.2%	5.1%	6.8%

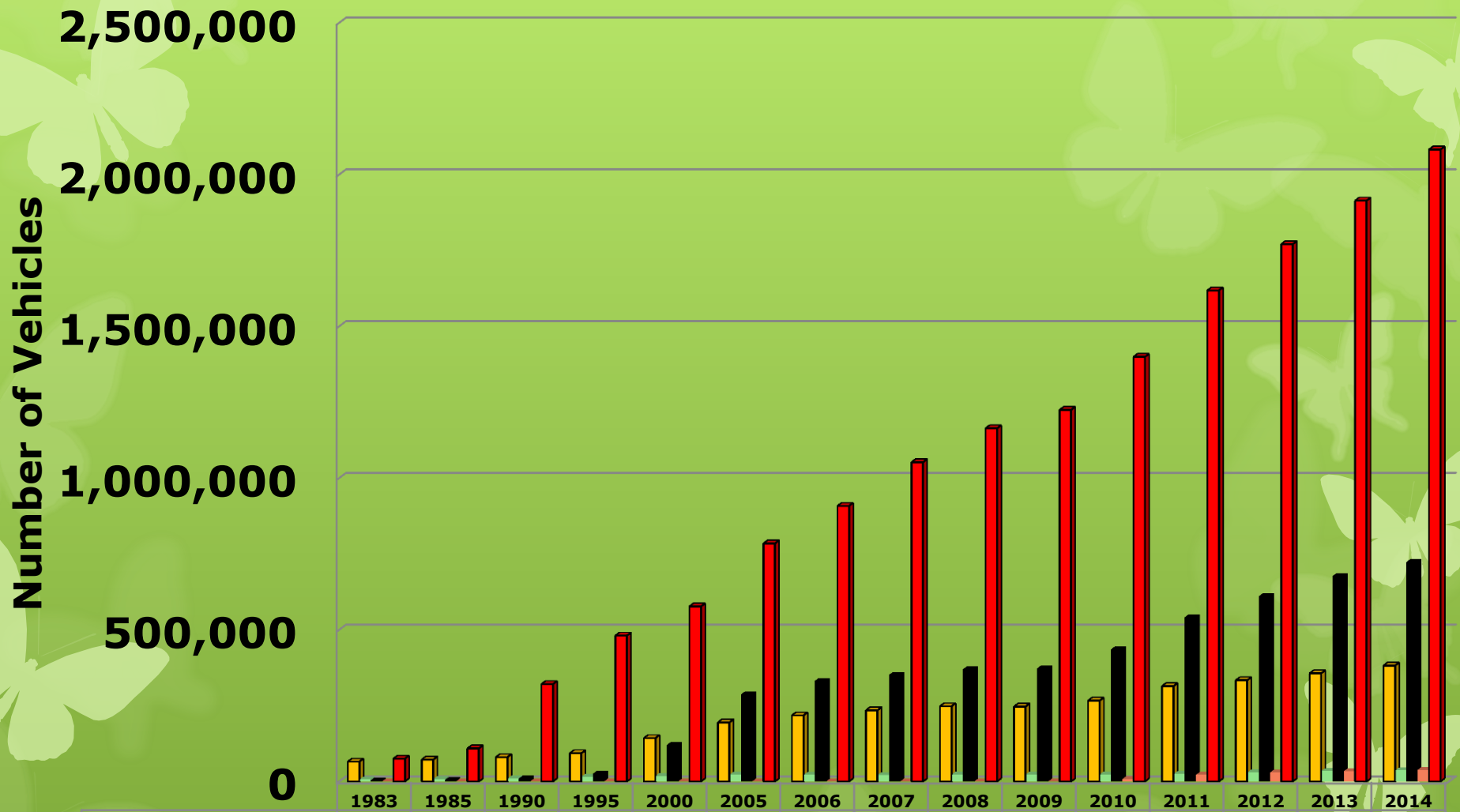
Active Vehicle Fleet Growth from 1983 to end, October 2014



Change of Active Vehicle Fleet by

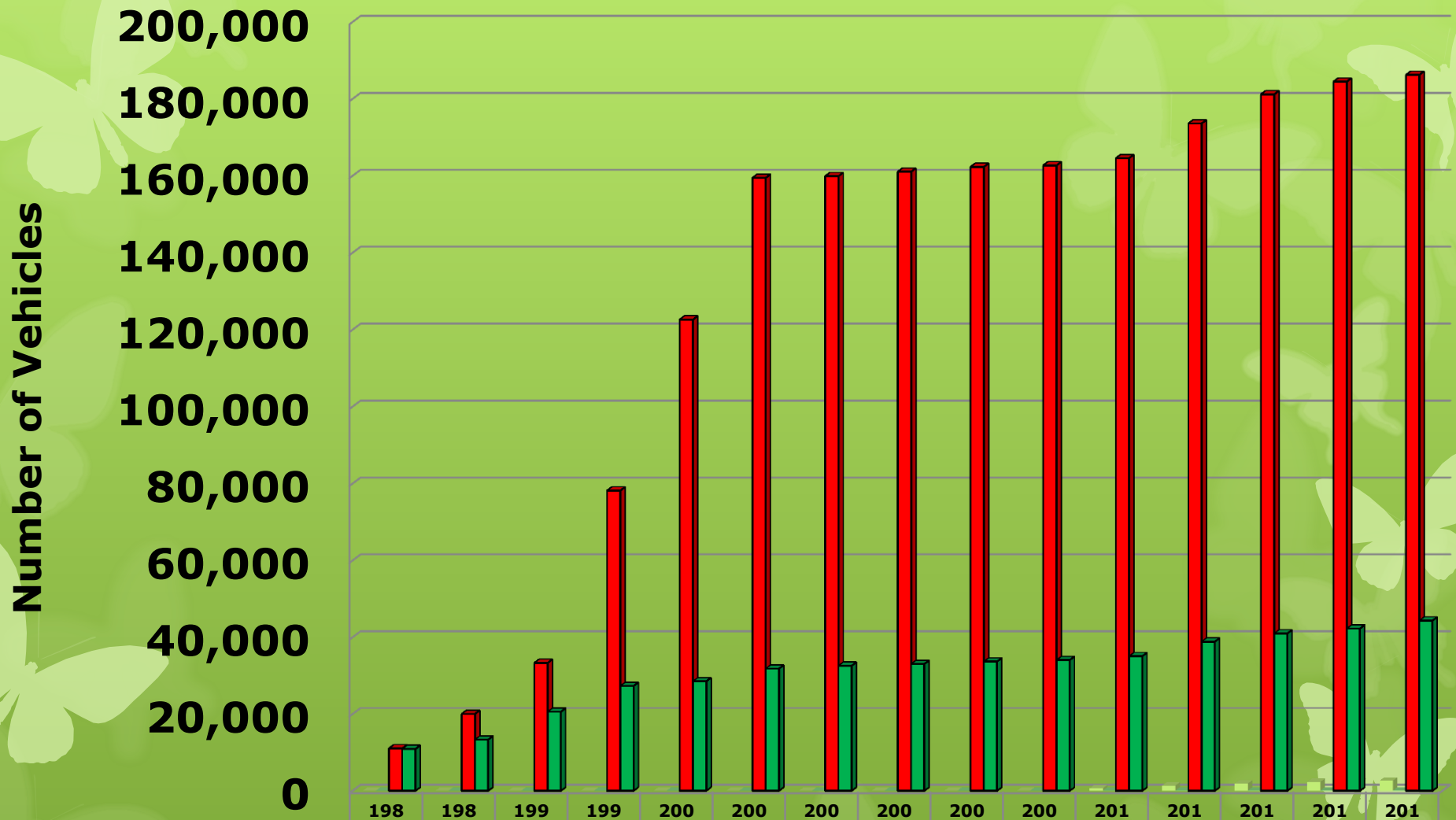


Growth of Private Passenger Vehicle Fleet 1983 to end October , 2014



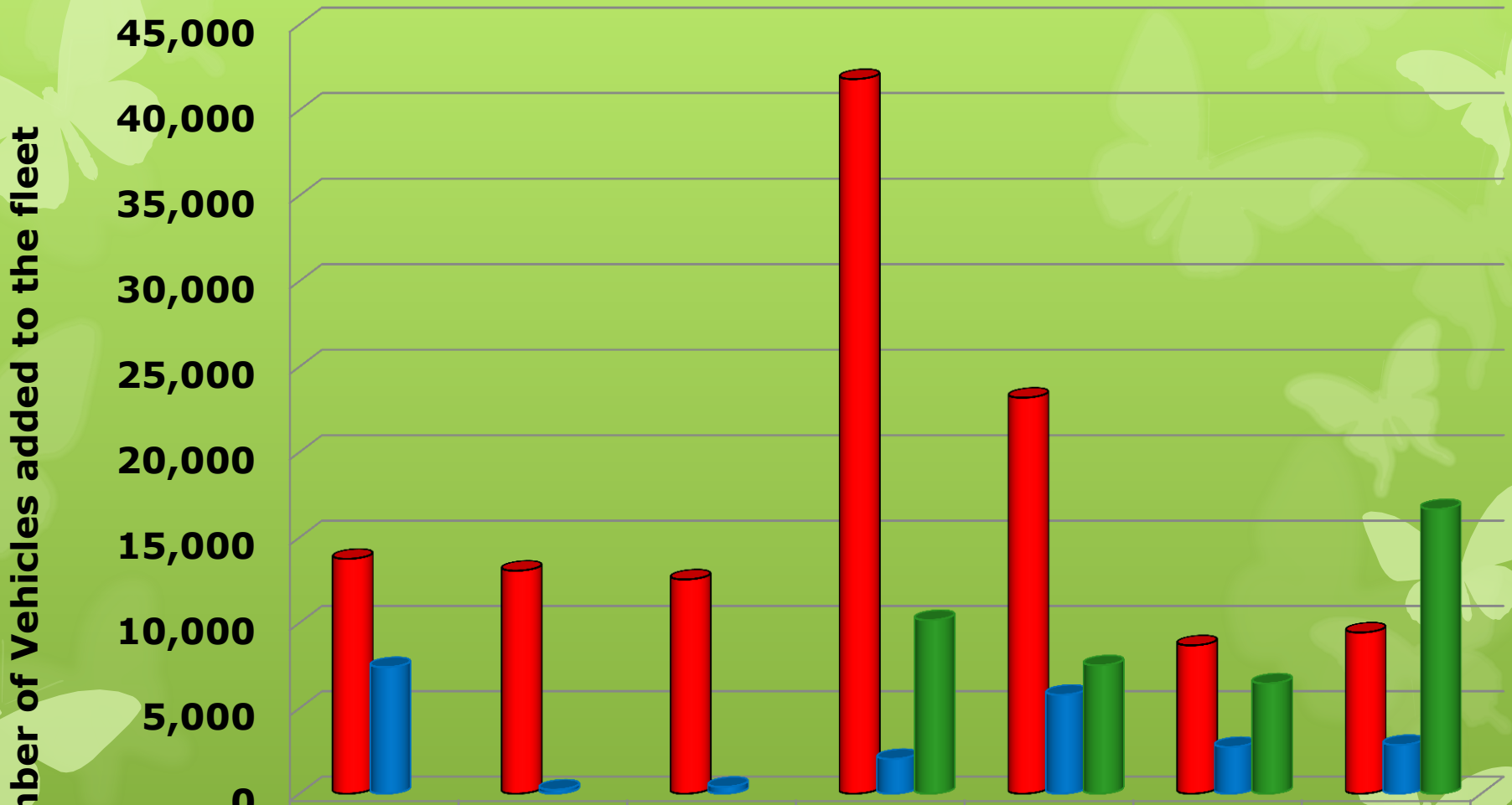
	1983	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Car(petrol)	64,947	72,000	79,760	92,802	142,66	194,42	217,47	234,36	247,44	246,43	265,97	313,69	333,24	356,01	381,53
Cars(Diesel)	6,546	8,037	9,608	15,715	18,267	22,089	21,695	21,097	22,563	22,539	22,580	24,608	29,721	34,230	36,480
Three Wheelers (petrol)	3,290	4,071	9,365	24,905	120,08	286,45	331,13	350,68	369,25	371,86	434,98	540,99	609,61	676,47	722,87
Three Wheelers (Diesel)	0	0	0	0	0	0	0	0	0	0	7,361	22,134	29,098	33,686	38,301
Motorcycles (petrol)	74,769	108,50	320,45	480,39	576,42	784,12	907,64	1,051,	1,163,	1,224,	1,398,	1,617,	1,770,	1,913,	2,081,

Growth of Public Passenger Vehicle Fleet from 1983 to end October, 2014



	1983	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Dual Purpose/4WD/Van (petrol)	0	0	0	0	0	0	0	0	0	0	604	1,339	1,880	2,295	2,623
Buses (petrol)	0	0	0	0	0	0	0	0	0	0	19	30	33	35	36
Dual Purpose/4WD/Van (Diesel)	11,036	20,000	33,295	78,155	122,61	159,43	159,87	161,04	162,29	162,68	164,55	173,57	181,15	184,43	186,22
Buses Diesel	10,893	13,304	20,571	27,290	28,501	31,803	32,554	33,018	33,638	34,033	35,043	38,827	40,966	42,238	44,310

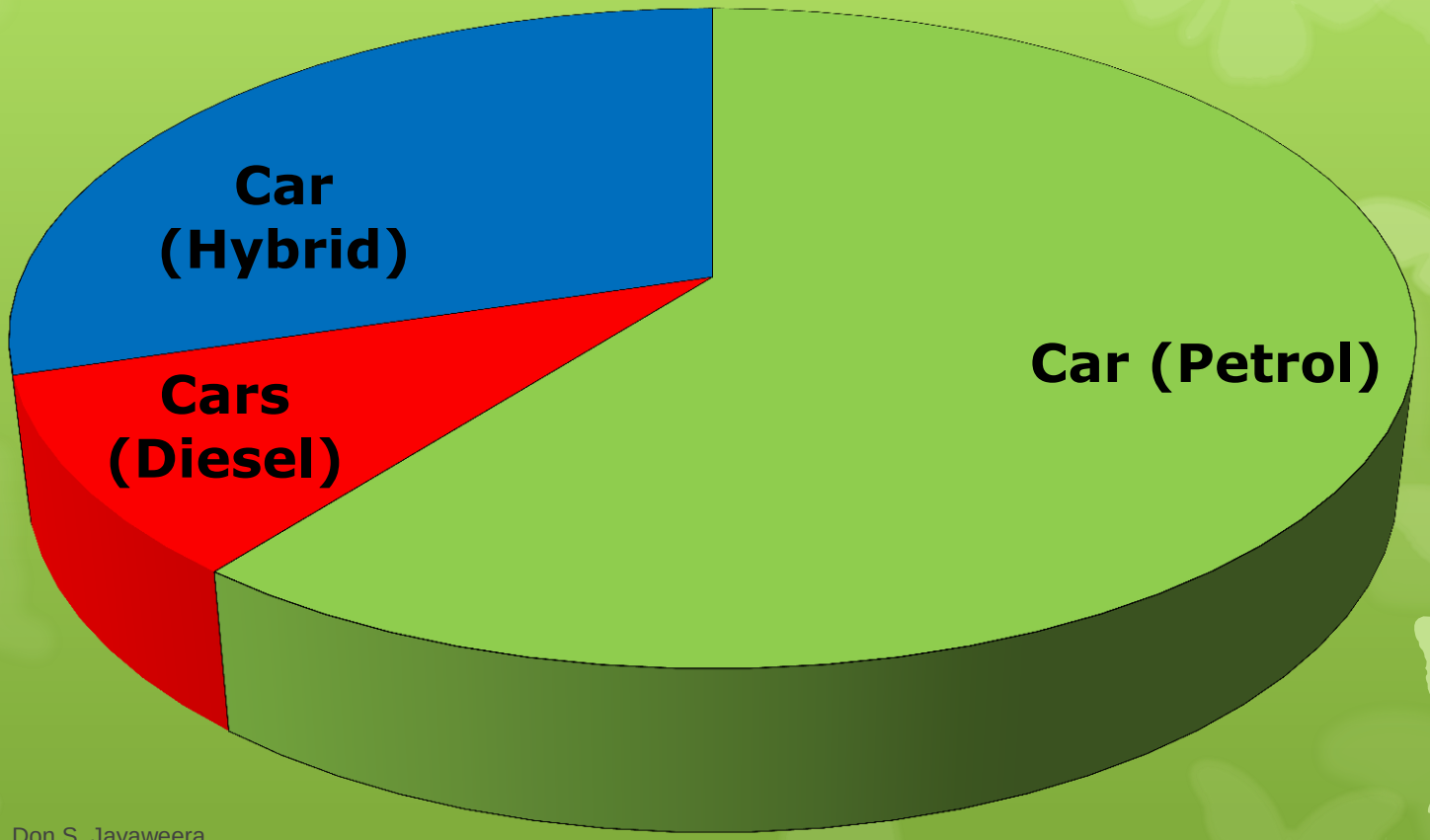
Actual response from the customers for Hybrid Cars



	1993	2000	2005	2011	2012	2013	2014
Car (Petrol)	13,746	13,054	12,541	41,806	23,184	8,683	9,436
Cars (Diesel)	7,406	234	393	2,028	5,787	2,730	2,846
Car (Hybrid)				10,164	7,514	6,451	16,658

Source: Department of Customs

Fleet Characteristics for less than 5 Years old Motor Cars by Fuel Type as at October 31st, 2014



	Fuel Consumption and Operated Vehicle Km's by Transport Sector (in millions)							
	2007	2008	2009	2010	2011	2012	2013	2014
Petrol	667	668	695	776	708	999	829	538
Vehicle Km	7,679	7,737	10,074	11,473	11,116	15,939	15,243	10,369
Diesel	2,087	1,801	1,885	1,782	1,721	2,142	1,553	1,183
Vehicle Km	9,001	6,696	8,139	7,685	9,286	11,535	10,378	7,902

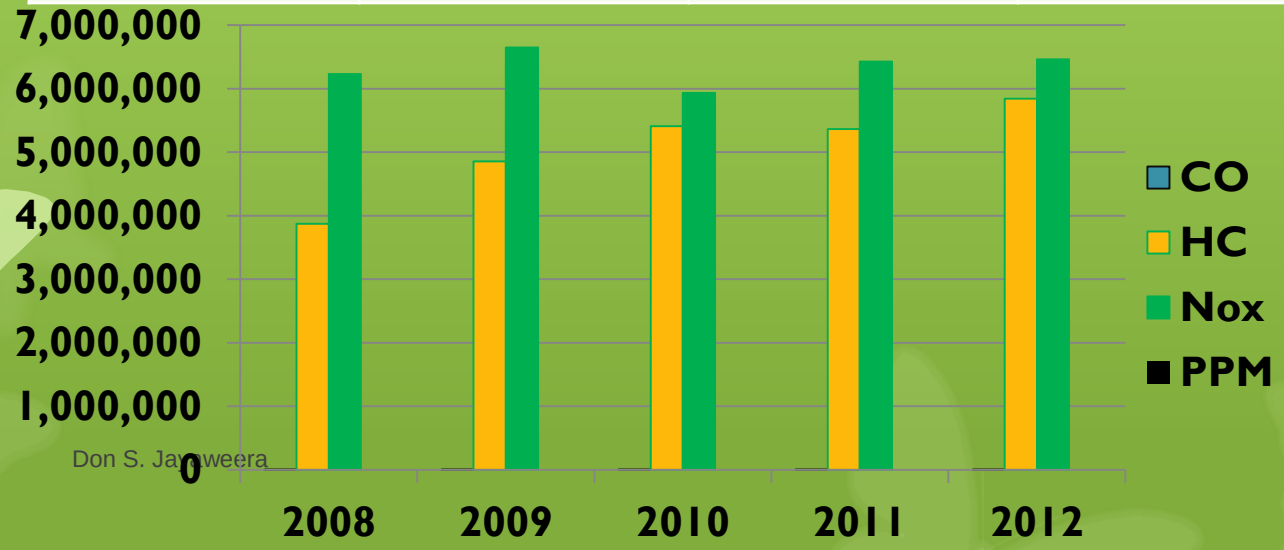
	Fuel Efficiency - Km's per liter							
	2007	2008	2009	2010	2011	2012	2013	2014
Petrol	11.5	11.6	14.5	14.8	15.7	16.0	18.4	19.3

Average Vehicle Occupancy by Vehicle Type

Mode/Vehicle Category	2008	2009	2010	2011	2012
Motor Cars	2.0	2.0	2.0	2.8	2.8
Vans	3.0	3.1	3.1	3.0	3.0
Buses	52.0	52.0	47.1	46.1	46.1
Three Wheelers	2.2	2.2	2.2	3.1	3.1
Trucks/Lorry	1.3	1.3	1.3	2.9	2.9
Motor Cycles	1.3	1.3	1.3	1.3	1.3
Railways	434.7	437.1	440.7	480.0	480.0

Emission Emitted by Vehicles (Estimates) – Time Series Data

	Summery of Emission Transport Sector in'000 MT			
	CO	HC	Nox	PPM
2008	1,948	3,872,240	6,230,936	1,077
2009	2,397	4,853,498	6,649,152	1,401
2010	2,631	5,408,608	5,929,915	1,372
2011	2,684	5,362,001	6,427,923	1,590
2012	2,902	5,842,370	6,458,606	1,550



Economic Policy Intervention for Demand Management on Vehicles to shift from dieselization Fleet

1. ***Introduction of Economic Instruments on Vehicle Technology for emission reduction in 2011;***
2. ***High Taxes (import duty, Exercise Duty based on fuel efficiency) revised in 2013 January;***
3. ***High Taxes on importation of used cars less than 1 year taking price of brand new for tax purposes;***
4. ***High Tax threshold introduced for less fuel consumption motor cars and jeeps on special permits given by the government***

Demand Elasticity on Motor Car Prices

Type of fuel	k	Income elasticity	Own-price elasticity	Cross-price elasticity	R^2
Gasoline	+1.76	α_p =.296	β_p = -.078	φ = +.250	0.67
	(9.71)[a]	(6.78)	(1.49)	(5.23)	
Diesel	+1.83	α_d =.129	β_d = -0.136	γ = +.105	0.88
	(8.80)	(2.58)	()	(1.75)	

Elasticity on Operated Vehicle-km's (based on private cost of vehicle owner)

Vehicle category	Elasticity of the average private cost
Cars (Diesel/Petrol)	-0.349
Light Truck (Diesel)	-0.230
Medium Truck (Diesel)	-0.443
Heavy Truck (Diesel)	-0.260
Medium Buses (Diesel)	-0.150
Large Buses (Diesel)	-0.130
Motor Cycles (Petrol)	-0.462

Taxes Applied from 2007 up to 2013

I. **Customs Duty;**
II. **Value Added Tax;**
III. **Social Responsibility Levies;**
IV. **Ports and Airport Development Levies;**
V. **Value Added Tax;**
VI. **Cess;**
VII. **Excise Duties;**
VIII. **Nation Building Tax and**
IX. **Road Infrastructure Development Levies**

Fiscal Levies on Motor Vehicles - 2015

	Present							Scenario 11 Cumulative		Change
	CD	PAL	Excise	VAT	NBT	Cess	Total	Excise	Total	
Petrol Car										
Golf Cars	25%	5%	45%	12%	2%	0%	124%	100%	115%	-9%
Less than 1,000 CC	25%	5%	92%	12%	2%	0%	202%	150%	173%	-29%
1,000 - 1,599 cc	25%	5%	92%	12%	2%	0%	202%	150%	173%	-29%
1,600 cc - 1,999 cc	25%	5%	92%	12%	2%	0%	202%	150%	173%	-29%
2,000 cc - 2,999cc	25%	5%	122%	12%	2%	0%	251%	200%	230%	-21%
Exceeding 3,000 cc	25%	5%	137%	12%	2%	0%	276%	220%	253%	-23%
Diesel - Car										
Less than 1,600 CC	25%	5%	122%	12%	2%	0%	251%	200%	230%	-21%
1,600 CC - 2,000 CC	25%	5%	137%	12%	2%	0%	276%	220%	253%	-23%
2,000 CC - 2,500 CC	25%	5%	152%	12%	2%	0%	301%	240%	276%	-25%
Exceeding 2,500 CC	25%	5%	183%	12%	2%	0%	352%	300%	345%	-7%
Hybrid Petrol Car										
Less than 1,000 CC	15%	5%	14%	12%	2%	0%	60%	50%	58%	-2%
1,000 - 1,599 CC	15%	5%	14%	12%	2%	0%	59.75%	50%	57.50%	-2%
1,600 cc - 1,999 cc	15%	5%	14%	12%	2%	0%	60%	50%	58%	-2%
2,000 cc - 2,999cc	15%	5%	40%	12%	2%	0%	100%	85%	98%	-2%
Exceeding 3,000 cc	15%	5%	57%	12%	2%	0%	126%	100%	115%	-11%
Hybrid Diesel Car										
Less than 1,600 CC	15%	5%	21%	12%	2%	0%	71%	60%	69%	-2%
1,600 CC - 2,000 CC	15%	5%	21%	12%	2%	0%	71%	60%	69%	-2%
2,000 CC - 2,500 CC	15%	5%	40%	12%	2%	0%	100%	85%	98%	-2%
Exceeding 2,500 CC	15%	5%	57%	12%	2%	0%	126%	100%	115%	-11%
Electric Car										
Car - Electric	15%	5%	0%	12%	2%	0%	38%	22%	25%	-13%

	Present							Scenario 11 Cumulative		Change
	CD	PAL	Excise	VAT	NBT	Cess	Total	Excise	Total	
Diesel Van										
Less than 13 person	25%	5%	122%	12%	2%	0%	251%	200%	230%	-21%
13 - 25 Person	25%	5%	46%	12%	2%	0%	126%	85%	98%	-28%
Petrol Van										
Less than 13 person	25%	5%	92%	12%	2%	0%	202%	150%	173%	-29%
13 - 25 person	25%	5%	46%	12%	2%	0%	126%	85%	98%	-28%
Limousines										
Diesel	25%	5%	183%	12%	2%	0%	352%	300%	345%	-7%
Petrol	25%	5%	152%	12%	2%	0%	301%	240%	276%	-25%
Three Wheelers										
Petrol	15%	5%	53%	12%	2%	0%	120%	105%	121%	1%
LP Gas	15%	5%	45%	12%	2%	0%	107%	95%	109%	2%
Diesel	15%	5%	53%	12%	2%	0%	120%	105%	121%	1%
Electric	7.5%	5%	29%	12%	2%	0%	72%	65%	75%	3%
Electric Cargo	25%	5%	16%	12%	2%	0%	76%	20%	23%	-53%
Auto - Trishaws - Electric	15%	5%	_	12%	2%	0%	38%	26%	30%	-8%
Lorries - Trucks										
Less than 800Kg P/D	15%	5%	_	12%	2%	0%	38%	26%	30%	-8%
800 Kg - 2,00 Kg P/D	25%	5%	3%	12%	2%	0%	55%	45%	52%	-3%
2,000 Kg - 5,000 Kg	15%	5%	14%	12%	2%	0%	60%	50%	58%	-2%
05 - 20 MT	0%	5%	29%	12%	2%	0%	61%	50%	58%	-3%
More than 20 MT	0%	5%	35%	0%	2%	0%	50%	40%	46%	-4%
Petrol More than 08 MT	8%	5%	29%	12%	2%	0%	72%	60%	69%	-3%

Road Map for Cleaner Fuel

- Led Fee Petrol introduced in 2002;
- Market fully given low sulphur diesel since 2003
- Introduction of low sulphur Diesel (10 ppm)from June 1st, 2014;
- Reduction of regular diesel sulphur level to 1,000 ppm from December 31st, 2015;
- Low sulphur diesel (10 ppm) will be fully dominated in 2020

Regulatory Regime for Cleaner Fuel

- Stringent Fuel Quality Standards to be introduced from 2015;
- Fuel Quality parameters to be tested by independent audit;
- Petroleum Refinery to be rehabilitated or new construction to produce Euro-IV diesel fuel;
- Pricing of fuel to be use as tool to get cleaner fuel demand increased through taxes

Thank You !!