

Supporting Information

Variability in Light Duty Gasoline Vehicle Emission Factors from Trip-Based Real-World Measurements

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Mini-Summary

This supporting information contains details regarding the routes on which vehicle measurements were conducted, the instruments used, the data processing procedures, how emission factors were estimated for hybrid electric vehicles, discussion of one vehicle that was identified as a high emitter, and references pertaining to these details. Furthermore, this supporting information contains figures pertaining to vehicle specific power (VSP) modal average emission rates for multiple pollutants for selected vehicle types, comparison of measured versus modeled emission factors for 100 vehicles and nearly 600 driving cycles, comparison of cycle average emission rates for Tier 1 and Tier 2 passenger cars and passenger trucks, comparison of cycle average emission rates for selected vehicle groups based on ranges of cycle average speed, comparison of cycle average emission rates for selected vehicle groups based on road types, comparison of accumulated mileage versus vehicle age, comparison of the frequency of time in each VSP mode for selected driving cycles, characteristics of the selected routes, definition of VSP modes, regression model parameters for evaluation of sensitivity of emission rates to vehicle age and mileage, summary of measured vehicles, and summary of driving cycles.

ROUTE

In study design, Routes A and C are alternative routes between NCSU and NR. Routes 1 and 3 are alternative routes between NR and RTP. Routes A, C, 1 and 3 have roundtrip distances of 20, 22, 32, and 35 miles, respectively. By distance, Route C is 40% freeway, and Route 1 is 80% freeway. Therefore, there are six cycles including two freeways C_F and 1_F, and four non-freeway cycles A, 3, C_NF, and 1_NF. The characteristics of the six cycles are in [Table SI-1](#).

INSTRUMENT

The Portable Emission Measurement Systems (PEMS) is used to measure tailpipe concentrations of CO₂, CO, HC and NO. CO₂, CO, and HC concentrations were measured using Non-Dispersive Infrared (NDIR) detectors. NO is measured using an electrochemical cell. NO is a good surrogate for total NO_x, which is comprised of NO and NO₂, because typically 95 percent of NO_x, by volume, is NO for light duty gasoline vehicles.

PEMS has been evaluated for its accuracy and precision comparing to the emission results for chassis dynamometer testing for each of the three vehicles (1998 Chevrolet Cavalier, 1997 Chevrolet Tahoe, and 1998 Ford Taurus) and each of two dynamometer test cycles (Federal Test Procedure (FTP) and US06).¹ For the relative bias, the smallest one is for NO_x, at $1.96 \pm 3.90\%$, and the largest is for HC, at $34.8 \pm 9.56\%$. It has smaller average bias for NO_x, CO₂, and CO (-0.14, 8.09% and 21.3%, respectively), and larger bias for HC (63.9%). The larger bias for HC is expected, because NDIR does not respond as much as FID does, particularly to higher molecular weight hydrocarbons. PEMS has good precision for CO₂, NO_x, CO, and HC for almost all the tested driving cycles and vehicles with coefficient of variance of less than 5%.

To maintain the accuracy of PEMS measurement results, PEMS were span calibrated every week during the data collection period using cylinder gas with labeled concentration of NO_x, CO, and HC. PEMS were also zero calibrated before each measurement with ambient air.

DATA PROCESSING

Raw data from three instruments are obtained, including second by second data for pollutant concentrations from PEMS, second by second data for latitude, longitude, elevation, speed from GPS, and engine data from On-Board Diagnostic (OBD) scantool. Recorded engine data include engine Revolutions Per Minute (RPM), Intake Air Temperature (IAT), Intake Manifold Absolute Pressure (MAP), Mass Fuel Flow rate (MFF), Mass Air Flow rate (MAF), and Vehicle Speed (VSS). For vehicles for which MFF was not reported by the OBD, fuel use rate was estimated based on MAF and air-to-fuel ratio inferred from exhaust concentrations using a combustion mass balance. If neither MFF nor MAP was reported, MAF was estimated using the Speed-Density method based on MAP, RPM, IAT, engine displacement, and engine volumetric efficiency.²

OBD data is converted to second by second basis. Road grade is estimated based on the change of elevation.³

PEMS, OBD, and GPS data are synchronized and combined to one file. Synchronization between PEMS and OBD is based on peaks of CO and NO_x concentrations from PEMS for throttle snap at the end of each route, and the corresponding peak RPM from OBD. Synchronization between OBD and GPS is based on speed.

For quality assurance (QA), the combined file of PEMS, OBD, and GPS data are check through a QA software developed using LabView² The combined files are checked throught the software for to remove the abnormal values of pollutants concentrations, invalid concentrations when PEMS bench is zeroing, abnormal values of MAP and RPM data. The QAed data are 1Hz valid data and used in estimating modal emission rates.

Vehicle Specific Power (VSP) is used as the basis for modal emission rates that are binned into 14 modes.⁴ The definition of 14 VSP modes are in Table SI-2.

To evaluate the method that we use to estimate the mass flow of fuel, air, and exhaust is estimated from OBD data and exhaust composition data, we compare the summation of our estimates of second-by-second fuel use to the actual total fuel use for each vehicle. We have done this based on 118 vehicles (we have collected data on some additional vehicles since the time that this manuscript was prepared). The average estimated total fuel use among the 118 vehicles was 98.2 percent of the actual fuel use, with a 95 percent confidence interval from 96.2 percent to 100.1 percent. Thus, the estimated fuel use is approximately the same as the actual fuel use, with a mean bias of approximately only 2 percent. The actual fuel use ranged from 2.4 gallons to 10 gallons among the 118 measured vehicles, depending primarily on vehicle size and power train. Overall, the estimated fuel use rate agrees well with the actual fuel use rate.

EMISSION FACTORS FOR ELECTRIC HYBRID VEHICLES

For MOVES, emission factors are estimated based on entire driving cycles for engine on + engine off.

For empirical data, emission factors of electric hybrid vehicles are estimated based on VSP modal emission rates, and driving cycles for engine on only.

$$EF_{p,hveh,c} = \frac{\sum_1^{14} ER_{p,hveh,m} \times t_{m,c,on}}{L_c} \quad (SI-1)$$

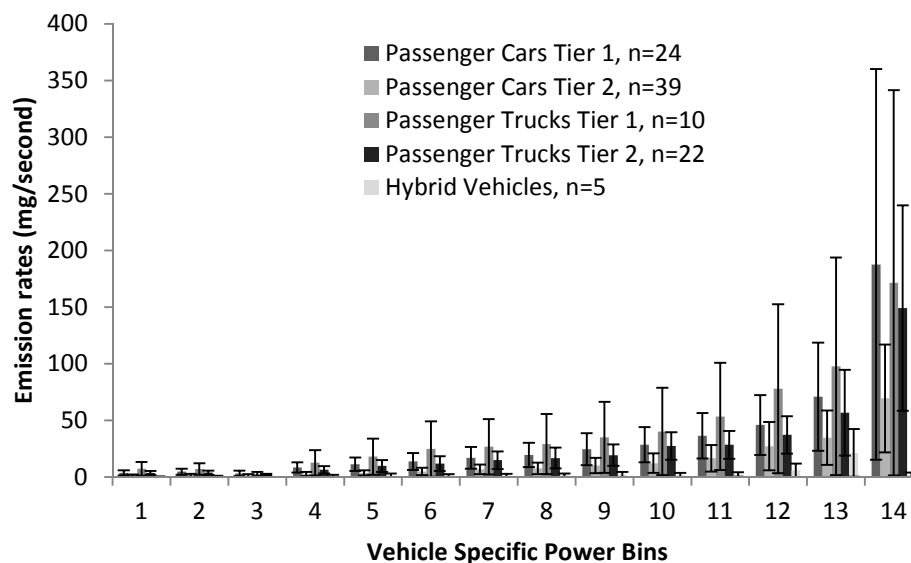
$EF_{p,hveh,c}$	=	empirical cycle average emission factor for pollutant p, for specific measured hybrid vehicle, cycle c, grams per mile
$ER_{p,hveh,m}$	=	empirical modal emission rates for pollutant p, for specific measured hybrid vehicle, the mth VSP mode, grams per second
$t_{m,c}$	=	engine on time spent on the mth VSP mode, cycle c, second
L_c	=	length of the cycle c, mile (engine on + engine off)
p	=	pollutants of CO ₂ , NO _x , CO, HC,

DISCUSSION OF A HIGH EMITTER

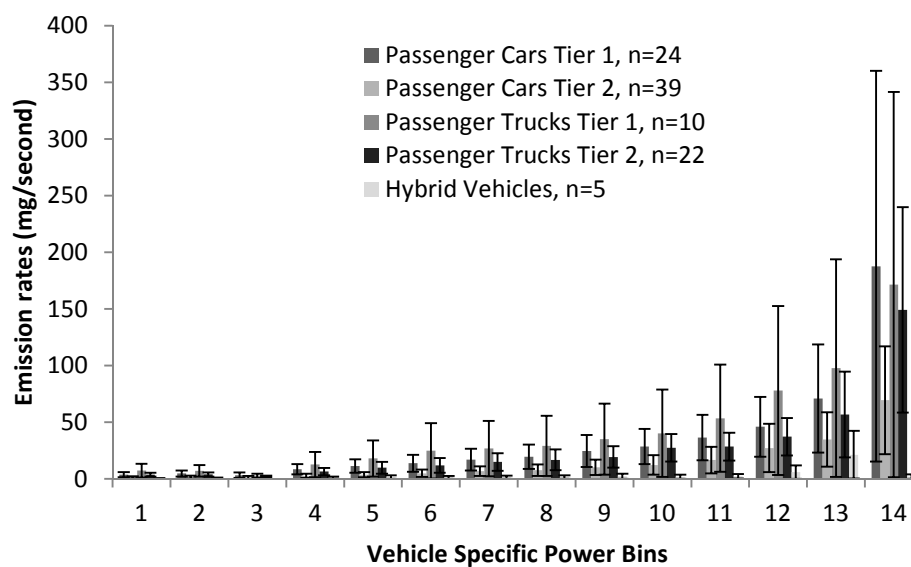
There are six outliers of NO_x empirical cycle average emission factors. The highest six values for the empirical emission factors, ranging from 3.5 g/mi to 5.8 g/mi, are for a 2004 Honda Civic. VSP modal emission rates of this vehicle are about 40 times higher than the average of other 2004 PCs. Therefore, this vehicle is deemed to be a “high emitter.” If the six outliers are excluded, the highest empirical NO_x emission factor is 1.5 g/mi and the average empirical emission factor is 0.15 g/mi for 99 vehicles.

REFERENCES

1. Battelle, Environmental Technology Verification Report, Prepared by Battelle for the U. S. Environmental Protection Agency, Ann Arbor, MI, June. 2003.
2. Sandhu, G.S.; Frey, H. C. Effects of Errors on Vehicle Emission Rates from Portable Emissions Measurement Systems, In Transportation Research Record: Journal of the Transportation Research Board, No. 2340, Transportation Research Board of the National Academies, Washington, D.C., 2013, pp. 10–19.
3. Yazdani B.; Frey, H. C. Road Grade Quantification Based on Global Positioning System Data Obtained from Real-world Vehicle Fuel Use and Emissions Measurements, Atmospheric Environment, 2014, 85, 179-186.
4. Frey, H.C.; Unal, A.; Chen, J. Recommended Strategy for On-Board Emission Data Analysis and Collection for the New Generation Model, Prepared by North Carolina State University for U.S. Environmental Protection Agency, Ann Arbor, MI. February 2002.



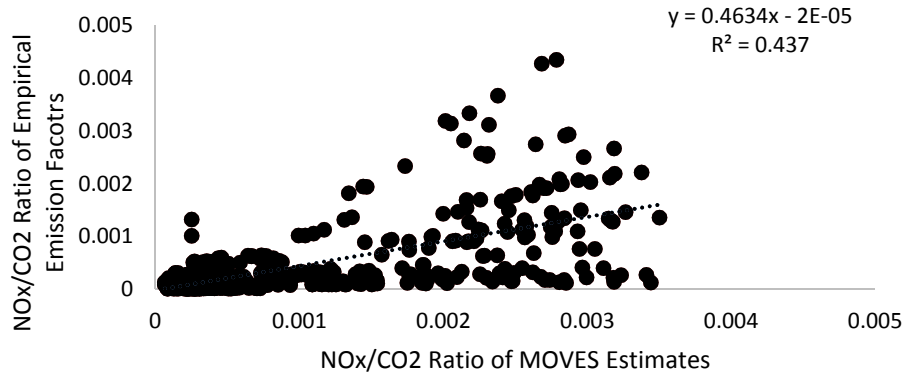
(c) CO



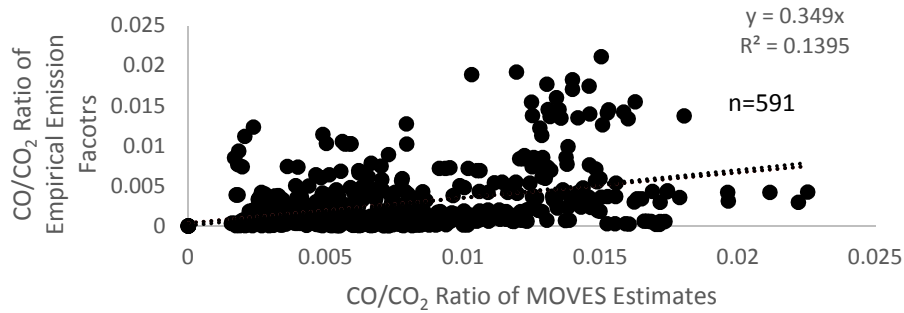
(d) HC

Figure S1 Average of CO and HC VSP Modal Emission Rates for Passenger Cars (PCs), Passenger Trucks (PTs), and Hybrid Electric Vehicles (HEVs)

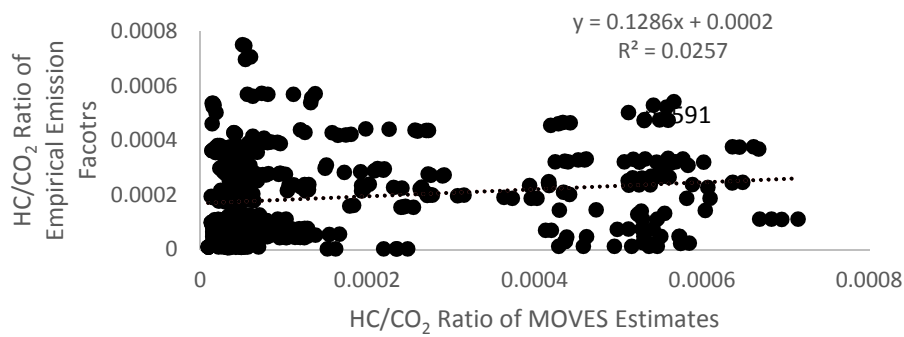
n=585



(a) NO_x/CO₂ Ratio of Cycle Average Emission Factors



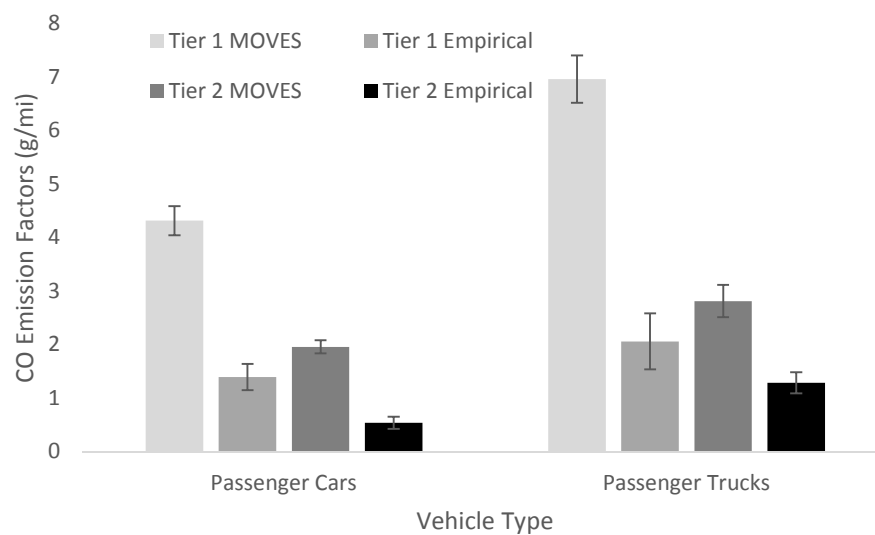
(b) CO/CO₂ Ratio



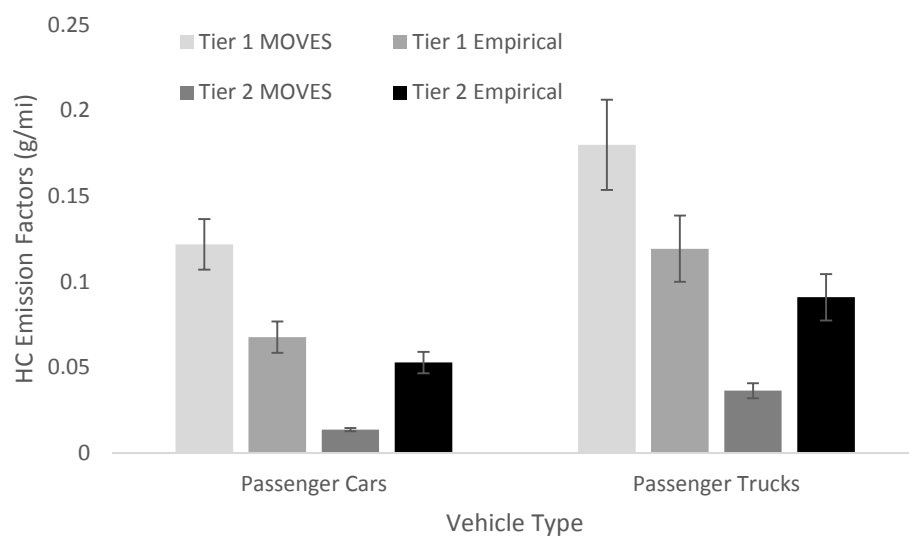
(c) HC/CO₂ Ratio

Figure S2 Empirical Versus MOVES estimates of Fuel-Based Emission Rates for 100 Vehicles:

(a) NO/CO₂ ratios; (b) CO/CO₂ Ratios; and (c) HC/CO₂ ratios.

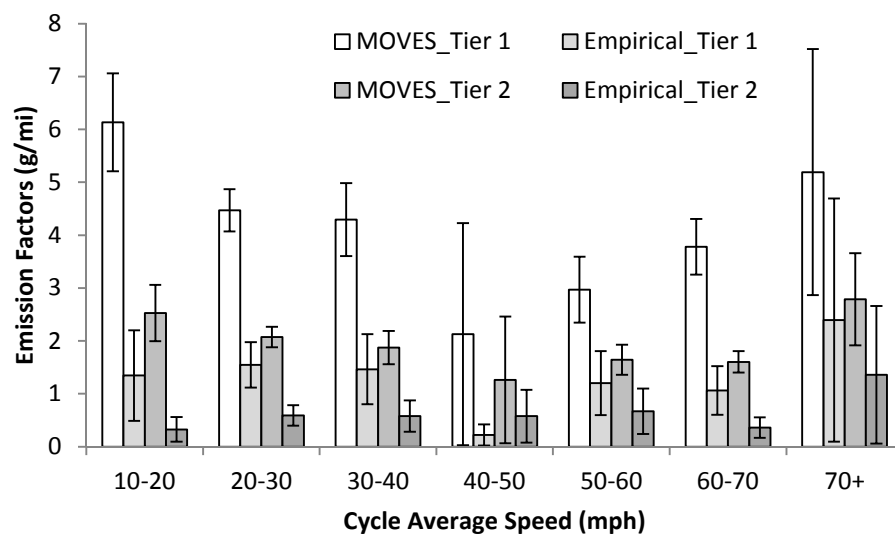


(c) CO

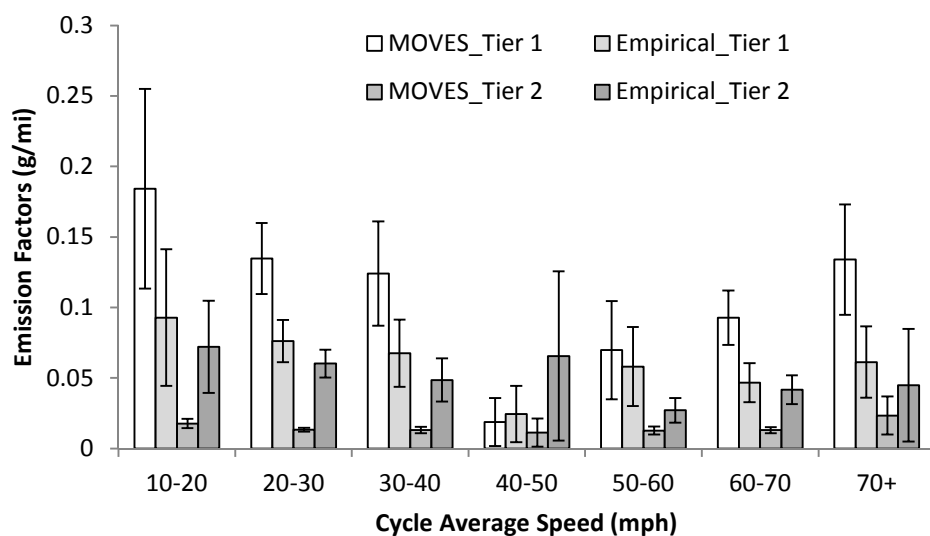


(d) HC

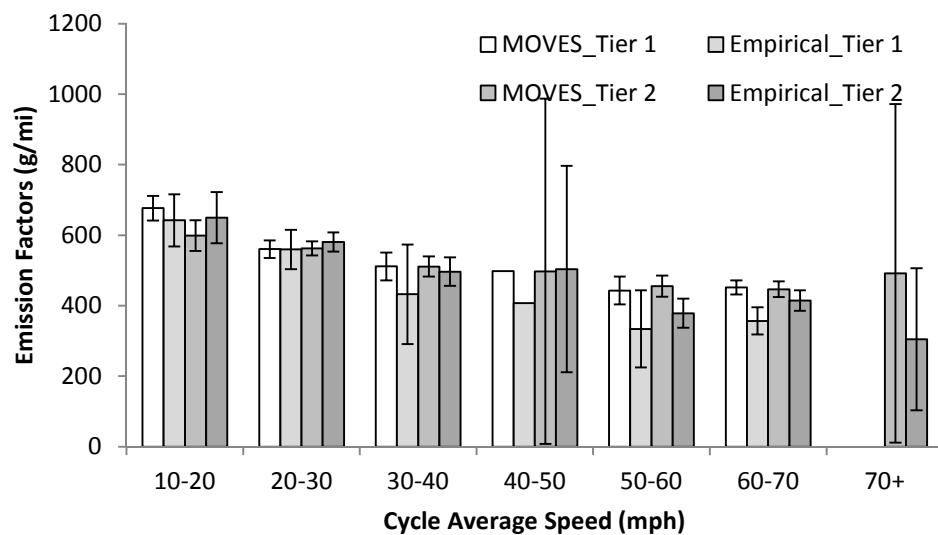
Figure S2 Average CO and HC Emission Factors of PCs, PTs, and HEVs for MOVES and Empirical Data



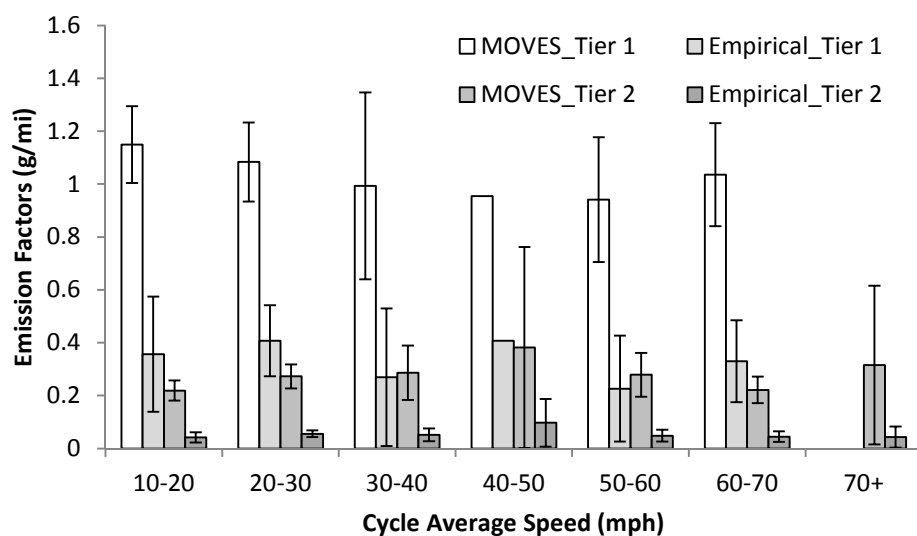
(c) Passenger Cars CO



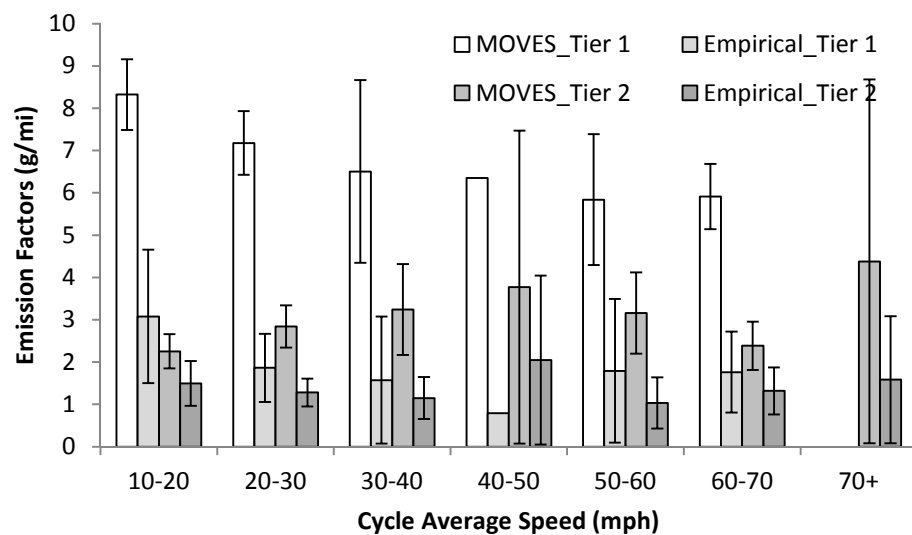
(d) Passenger Cars HC



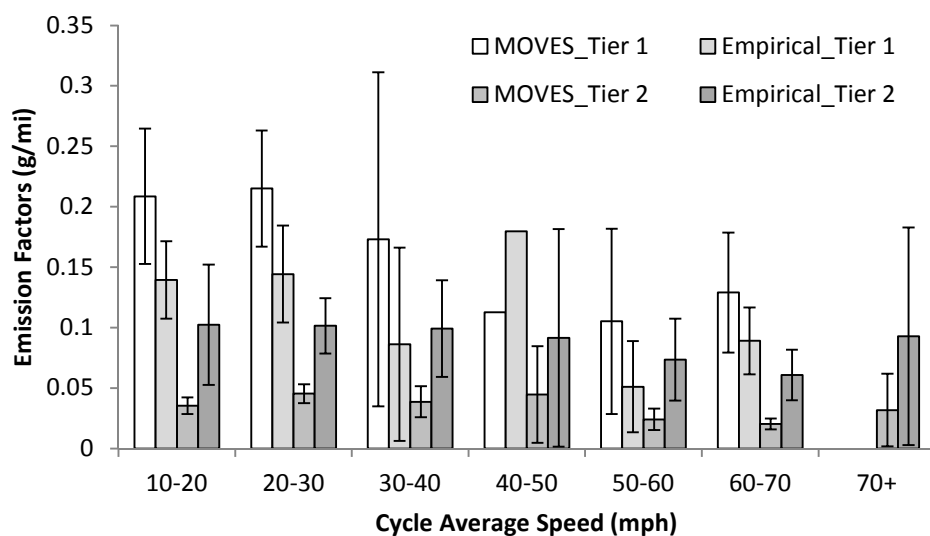
(e) Passenger Trucks CO₂



(f) Passenger Trucks NO_x

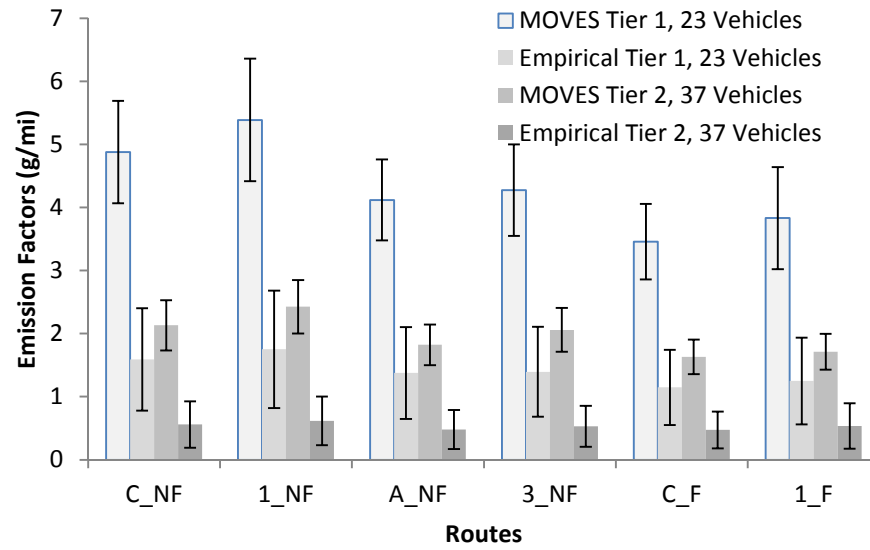


(g) Passenger Trucks CO

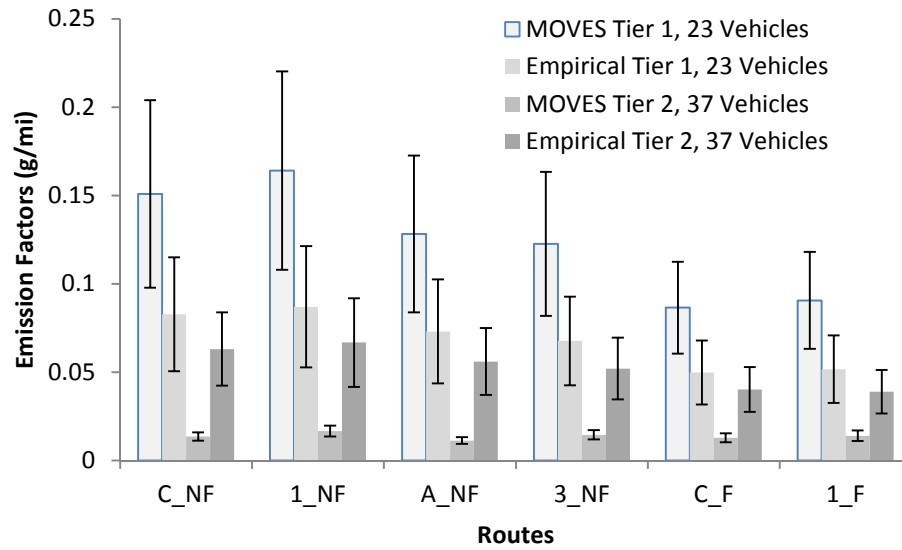


(h) Passenger Trucks HC

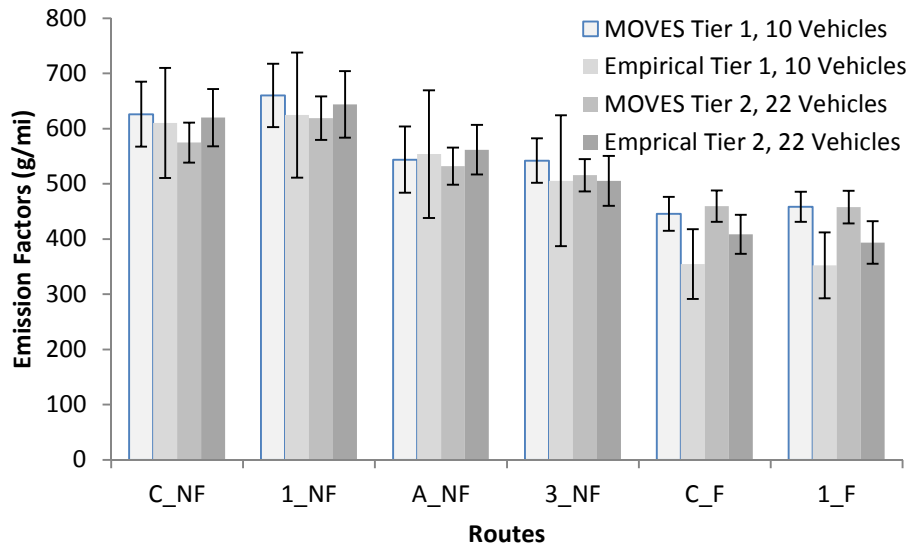
Figure S3 Average CO₂, NO_x, CO, and HC Emission Factors of Cycle Average Speed for MOVES and Empirical Data for Passenger Cars and Passenger Trucks for Tier 1 and Tier 2



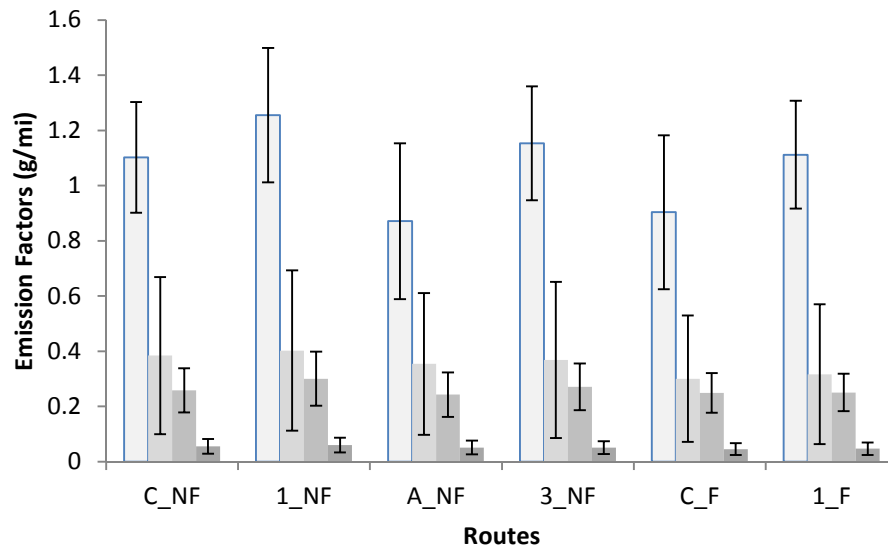
(c) Passenger Cars CO



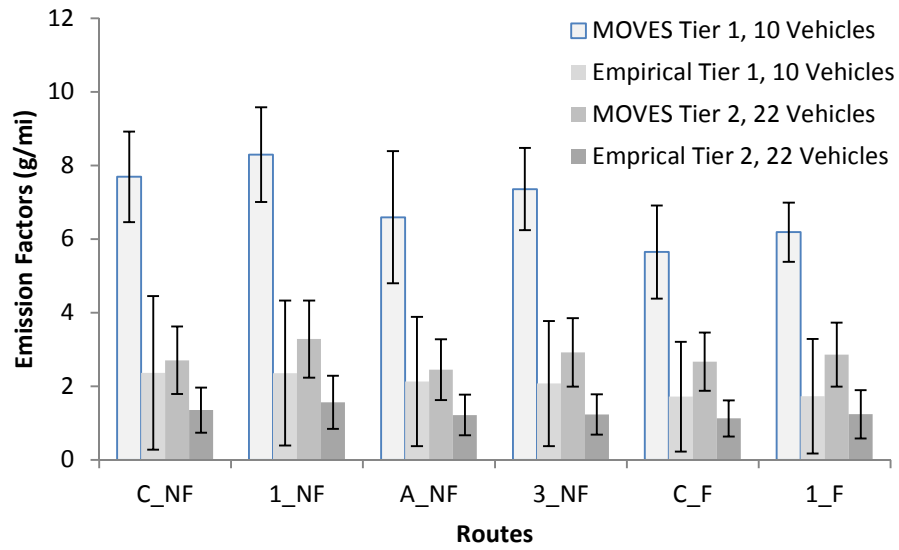
(d) Passenger Cars HC



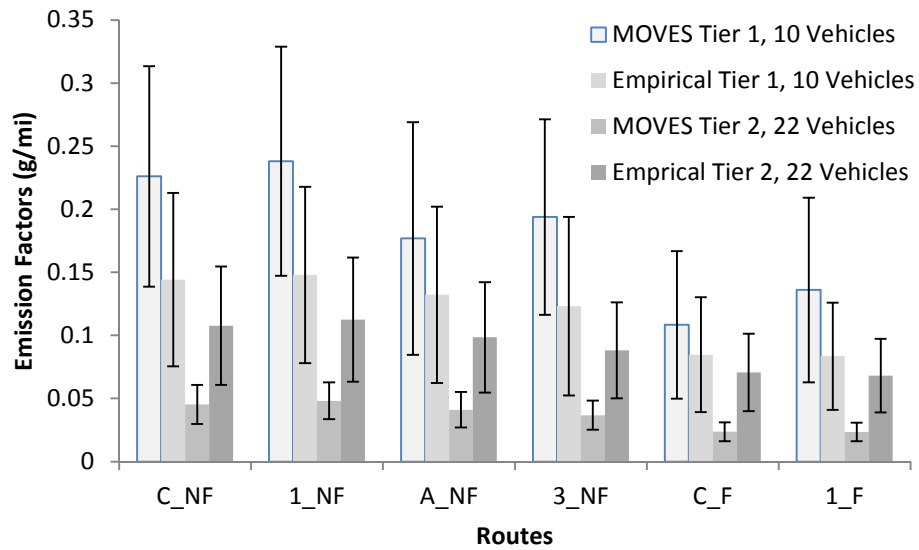
(e) Passenger Trucks CO₂



(f) Passenger Trucks NO_x



(g) Passenger Trucks CO



(h) Passenger Trucks HC

Figure S4 Average CO₂, NO_x, CO, and HC Emission Factors of Road Types for MOVES and Empirical Data for Passenger Cars and Passenger Trucks for Tier 1 and Tier 2

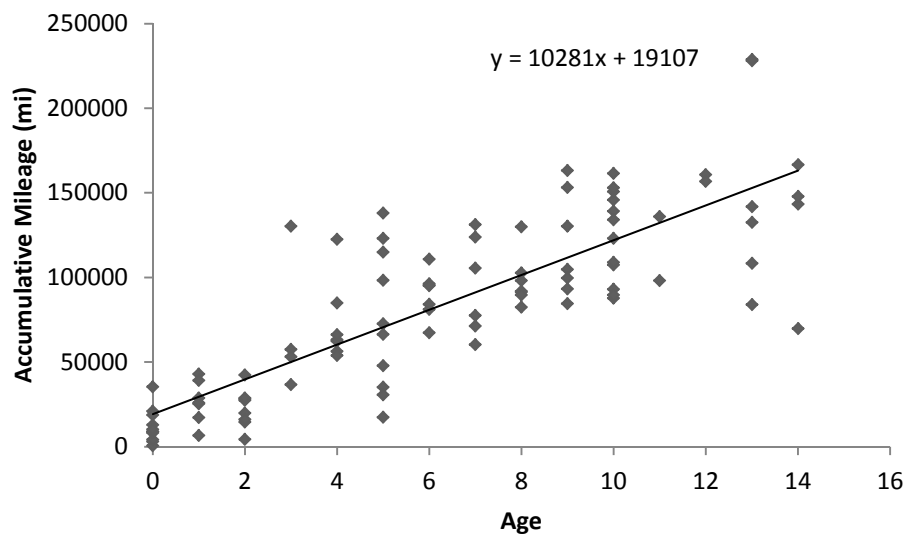


Figure S5 Vehicle Age and Accumulated Mileage for 100 Vehicles

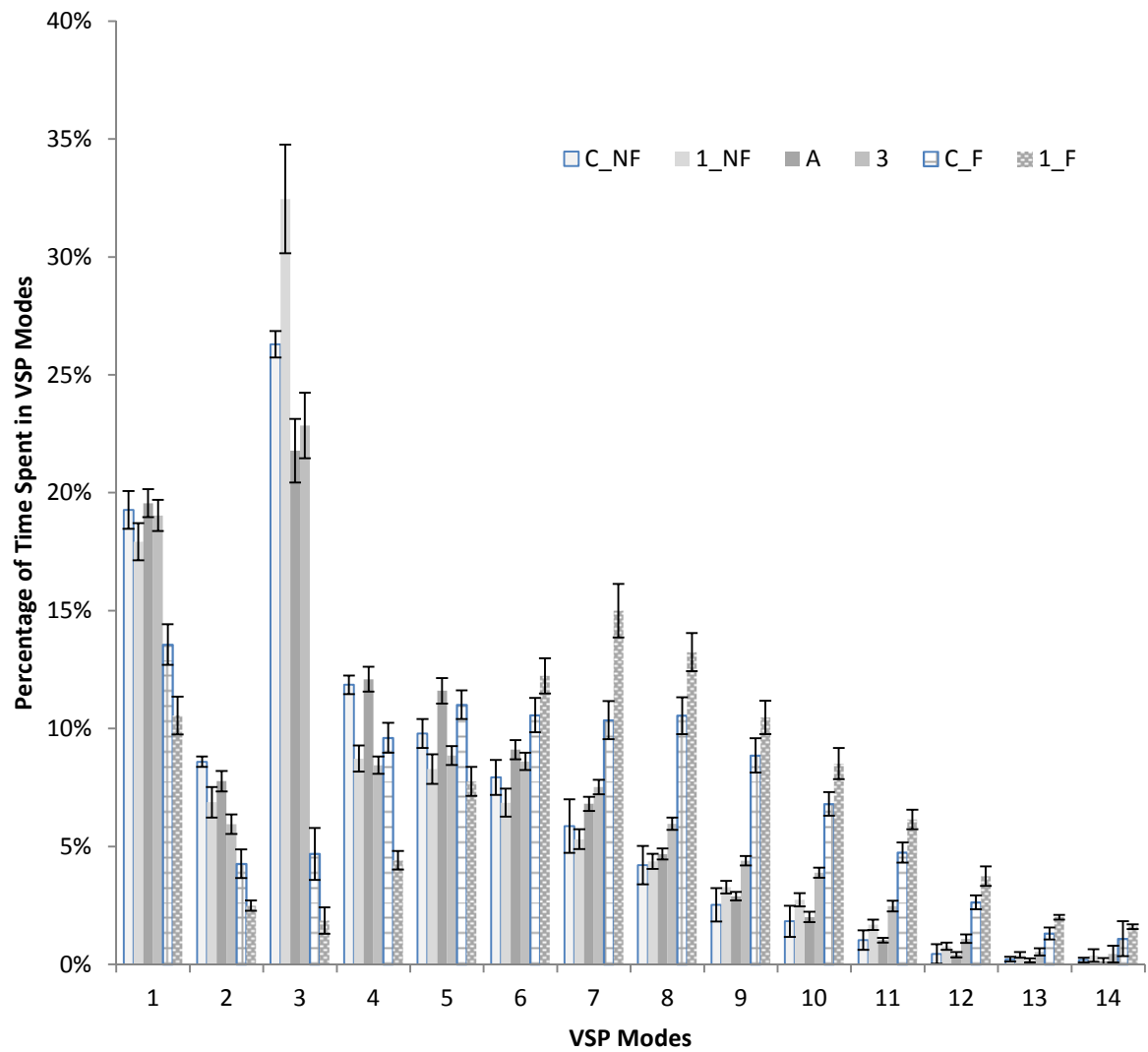


Figure S6 Percentage of Time Spent in VSP Modes for Six Cycles based on Average of 100 Vehicles

Table S1 Characteristics of Six Routes

Road Type	Cycle ^a	Average Speed (mph)	Length (mile)
Non-freeways	C_NF	22.5	13
	1_NF	22.6	6
	A_NF	26.6	20
	3_NF	31.4	35
Freeways	C_F	56.9	9
	1_F	64.5	26

^a: By distance, Route C is 40% freeway, and Route 1 is 80% freeway.

Table S2 Definition of Vehicle Specific Power (VSP) Modes

VSP mode	Definition (kW/ton)
1	$VSP < -2$
2	$-2 \leq VSP < 0$
3	$0 \leq VSP < 1$
4	$1 \leq VSP < 4$
5	$4 \leq VSP < 7$
6	$7 \leq VSP < 10$
7	$10 \leq VSP < 13$
8	$13 \leq VSP < 16$
9	$16 \leq VSP < 19$
10	$19 \leq VSP < 23$
11	$23 \leq VSP < 28$
12	$28 \leq VSP < 33$
13	$33 \leq VSP < 39$
14	$39 \leq VSP$

Table S3 Parameters for Regression Model For MOVES estimates for Tier 1 Passenger Cars,

n=141

	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.003	0.43	0.33	0.41
Intercept	NOT SIG	-0.21	0.26	-0.12
age	NOT SIG	0.088	0.38	0.023

Table S4 Parameters for Regression Model For MOVES estimates for Tier 2 Passenger Cars,

n=228

	CO ₂	NO _x	CO	HC
R²	0.03	0.69	0.51	0.57
Intercept	360	0.027	1.05	0.0067
age	3.6	0.017	0.24	0.0019

Table S5 Parameters for Regression Model for MOVES estimates for Tier1 Passenger Trucks,

n=60

	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.087	NOT SIG 0.072	NOT SIG 0.077	0.37
Intercept	NOT SIG	NOT SIG	NOT SIG	-0.36
age	NOT SIG	NOT SIG	NOT SIG	0.051

Table S6 Parameters for Regression Model for MOVES estimates for Tier 2 Passenger Trucks,

n=132

	CO ₂	NO _x	CO	HC
R²	0.16	0.48	0.37	0.36
Intercept	482	0.12	1.46	0.017
age	12	0.040	0.37	0.0054

Table S7 Parameters for Regression Model for Empirical data for Tier 1 Passenger Cars, n=141

PC_TIER I	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.07	0.12	0.25	0.21
Intercept	NOT SIG	-1.0	-6.6	-0.14
age	NOT SIG	0.11	0.55	0.012
Mileage	NOT SIG	0.00001	0.00008	0.000002
A*M	NOT SIG	-0.0000008	-0.000006	-0.0000001

Table S8 Parameters for Regression Model for Empirical data for Tier 2 Passenger Cars, n=228

PC_TIER II	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.03	NOT SIG 0.04	0.07	0.17
Intercept	NOT SIG	NOT SIG	0.43	0.019
age	NOT SIG	NOT SIG	0.06	0.02
Mileage	NOT SIG	NOT SIG	0.000005	0.0000005
A*M	NOT SIG	NOT SIG	NOT SIG	-0.0000002

Table S9 Parameters for Regression Model for Empirical Data for Tier 1 Passenger Trucks, n=60

PT_TIER I	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.07	0.23	NOT SIG 0.02	0.29
Intercept	NOT SIG	NOT SIG	NOT SIG	NOT SIG
age	NOT SIG	0.10	NOT SIG	NOT SIG
Mileage	NOT SIG	0.000004	NOT SIG	0.000001
A*M	NOT SIG	NOT SIG	NOT SIG	NOT SIG

Table S10 Parameters for Regression Model for Empirical Data for Tier 2 Passenger Trucks,

n=132

PT_TIER II	CO ₂	NO _x	CO	HC
R²	NOT SIG 0.05	0.44	NOT SIG 0.06	0.18
Intercept	NOT SIG	0.0013	NOT SIG	NOT SIG
age	NOT SIG	0.010	NOT SIG	0.005
Mileage	NOT SIG	0.0000006	NOT SIG	0.0000006
A*M	NOT SIG	NOT SIG	NOT SIG	NOT SIG

Table S11 Parameters for Regression Model for Empirical Data for Hybrid Electric Vehicles,

n=30

PT_TIER II	CO ₂	NO _x	CO	HC
R²	0.28	0.37	0.91	0.61
Intercept	206	NOT SIG	NOT SIG	0.066
age	38	0.016	-0.16	-0.027
Mileage	NOT SIG	0.0000008	0.000006	-0.0000007
A*M	NOT SIG	-0.0000003	0.000002	0.0000005

Table S12 Summary of Vehicles Measured

Test Date (yyyymmdd)	Model Year	Make	Model	Vehicle Type	Engine Displacement (L)	Transmission (A/M)	Mileage (mi)	Curb Weight (lb)
20081025	2008	Honda	Civic	sedan	1.8	A	3,109	2690
20081101	2003	VW	Passat	sedan	2.8	M	72,597	3373
20090328	2001	Mazda	Millenia	sedan	2.5	A	91,354	3358
20090329	2005	Mazda	3S	sedan	2.3	A	62,428	2762
20090330	2003	Pontiac	Vibe	sedan	1.8	A	67,283	2980
20090331	2007	Nissan	Sentra	sedan	2.0	A	19,885	2897
20090405	2007	Honda	Civic	sedan	1.8	A	4,393	2628
20091017	1999	Chevy	Malibu	sedan	2.4	A	123,036	3051
20091018	2006	Ford	Taurus	sedan	3.0	A	57,502	3322
20091024	2009	VW	Jetta	sedan	2.5	M	37,417	3230
20091025	2000	Buick	LeSabre	sedan	3.8	A	130,342	3591
20091026	1999	Pontiac	Grand Prix	sedan	3.1	A	145,818	3396
20091106	2007	Honda	Civic	sedan	1.8	A	14,558	2628
20101016	2004	Honda	Civic	sedan	1.7	M	96,307	2449
20101017	2000	Mitsubishi	Galant	sedan	2.4	A	139,146	3075
20101018	2006	Toyota	Corolla	sedan	1.8	A	63,197	2530
20101020	1997	Toyota	Camry	sedan	2.2	M	228,000	3086
20101028	2006	Honda	Civic Hy.	sedan	1.3	A	84,944	2875
20101030	2000	Honda	Civic	sedan	1.6	M	150,813	2339
20101031	2000	Nissan	Altima	sedan	2.4	A	161,560	3057
20101101	2006	Toyota	Prius	sedan	1.5	A	56,440	2890
20101105	1998	Ford	Expedition	SUV	5.4	A	160,732	5177
20101106	2005	Buick	LaCrosse	sedan	3.8	A	123,031	3502
20101110	1997	Honda	Accord	sedan	2.2	A	228,780	2855
20101114	1996	Toyota	Tacoma	PICKUP	3.4	M	166,598	2560
20110122	2003	Chevrolet	Impala	sedan	3.4	A	129,967	3389
20110123	2001	Honda	Accord V6	sedan	3.0	A	107,344	3241
20110126	2004	Honda	Civic	sedan	1.7	A	71,346	2606
20110204	2000	Chevrolet	Blazer	SUV	4.3	A	98,114	3692
20110206	2006	Honda	Accord	sedan	2.4	A	66,377	3201
20110212	2001	Chevrolet	Silverado	PICKUP	5.3	A	87,679	3975
20110214	2006	VW	Jetta	sedan	2.0	M	114,930	3259

20110219	2006	Scion	tC	sedan	2.4	A	17,400	2970
20110829	2007	GMC	Sierra	PICKUP	5.3	A	122,585	5371
20110830	2001	Toyota	Camry	sedan	2.2	A	93,090	2998
20110831	2006	Chevrolet	Silverado	PICKUP	5.3	A	138,109	4348
20110903	2005	Saab	9-2x	sedan	2.5	A	81,170	3070
20110907	2001	Buick	LeSabre	sedan	3.8	A	108,864	3567
20110909	2008	Toyota	Sienna	MINIVAN	3.5	A	53,113	4270
20110910	2008	Honda	Civic	sedan	1.8	A	36,687	2650
20110911	2006	Honda	Accord	sedan	2.4	A	35,189	3201
20110916	2007	Honda	Accord	sedan	2.4	A	66,120	3197
20110918	1998	Chevrolet	S10	PICKUP	4.3	A	141,843	3740
20110919	2005	Chevrolet	Tahoe	SUV	5.3	A	110,886	5192
20110921	2005	Honda	Element	SUV	2.4	A	95,429	3508
20111017	2002	Ford	Ranger	PICKUP	2.3	M	153,119	3030
20111024	1998	Chrysler	Sebring Lxi	sedan	2.5	A	132,507	3197
20111216	2012	Nissan	Versa	sedan	1.8	A	613	2759
20111219	2011	Chevrolet	HHR	SUV	2.2	A	21,045	3208
20111220	2011	Toyota	Camry	sedan	2.5	A	8,826	3263
20120120	2005	Toyota	Camry SE	sedan	2.4	A	105,455	3164
20120121	2003	Chrysler	Pt Cruiser	SUV	2.4	A	84,493	3108
20120124	1998	Buick	Century	sedan	3.1	A	69,732	3335
20120126	2010	Toyota	Highlander	SUV	3.3	A	27,455	4050
20120127	2010	Ford	F-150	PICKUP	4.6	A	28,206	4693
20120128	2012	Fiat	500	sedan	1.4	A	12,874	2363
20120131	2006	Mitsubishi	Eclipse	sedan	2.4	A	95,056	3274
20120204	2004	Dodge	Stratus	sedan	2.7	A	82,540	3225
20120205	2007	Jeep	Wrangler	SUV	3.8	M	30,646	3760
20120211	1999	Honda	Accord LX	sedan	2.3	A	83,916	2987
20120212	1998	Honda	Accord	sedan	2.3	A	143,297	3086
20120226	2006	Toyota	Tundra	PICKUP	4.7	A	84,234	4965
20120907	2002	Lexus	RX300	SUV	3.0	A	134,065	3692
20120908	2005	Mazda	6	sedan	2.3	A	77,458	3102
20120909	2008	Honda	Fit	sedan	1.5	A	53,924	2432
20120910	2004	Honda	Civic	sedan	1.7	A	91,966	2612
20120913	2004	Toyota	Tacoma	PICKUP	3.4	A	89,590	3475
20120914	1998	Volvo	S70-T5	sedan	2.3	A	147,879	3333
20120915	2003	Acura	RSX	COUPE	2.0	M	104,687	2767

20120917	2010	Chevrolet	Silverado	PICKUP	4.8	A	26,551	5110
20120917 B	2011	Ford	F150	PICKUP	5.0	A	28,779	5577
20120919	2011	Ford	F150	PICKUP	5.0	A	17,208	5577
20120921	2010	Chevrolet	Silverado	PICKUP	4.8	A	42,431	5110
20120927	2002	Chevy	Silverado	PICKUP	4.8	A	152,910	4910
20120928	2005	Toyota	Tacoma	PICKUP	4.0	A	131,334	3810
20120929	2013	GMC	Yukon	SUV	5.3	A	4,104	5820
20120930	2003	Toyota	Camry	sedan	2.4	A	163,265	3219
20121001	2012	Toyota	Camry	sedan	2.5	A	18,773	3190
20121002	2002	Jeep	Wrangler	SUV	4.0	M	89,705	3316
20130201	2012	Nissan	Rogue	SUV	2.5	A	6,686	3329
20130202	2013	Kia	Forte	sedan	2.0	A	8,941	2791
20130204	2001	Mazda	Protégé	sedan	2.0	A	156,845	2687
20130205	2000	Pontiac	Grand Prix	sedan	3.8	A	108,430	3414
20130207	2005	Honda	Civic	sedan	1.7	A	98,131	2560
20130208	2005	Toyota	Corolla	sedan	1.8	M	102,696	2530
20130210	2004	Chevrolet	Trailblazer	SUV	4.2	A	99,635	4612
20130212	2011	Hyundai	Elantra Touring	sedan	2.0	A	16,077	2937
20130215	2002	Jeep	Wrangler	SUV	4.0	M	135,987	3316
20130218	2006	Ford	Excaped	SUV	2.3	A	60,245	3627
20130220	2004	Pontiac	Grand	COUPE	3.4	A	93,256	3091
20130222	2008	Nissan	Xterra	SUV	4.0	A	47,883	4387
20130223	2013	Chevrolet	Impala	sedan	3.6	A	8,176	3555
20130224	2012	Ford	Fusion SE	sedan	2.5	A	42,946	3285
20130302	2012	VW	Passat	sedan	2.5	A	25,379	3166
20130515	2013	GMC	Terrain	SUV	2.4	A	10,135	3853
20130520	2013	Toyota	Sienna	MINIV AN	3.5	A	35,378	4310
20130528	2012	Ford	Fusion	sedan	2.5	A	25,894	3285
20130601	2006	Dodge	Caravan	Carava n	3.3	A	123,929	3908
20130609	2008	Chevy	Impala	Sedan	3.5	A	98,363	3555
20130623	2012	Dodge	Avenger	sedan	2.4	A	39,165	3400

Table S13 Summary of Driving Cycles: Mean of Speed, Standard Deviation of Speed, and
Standard Deviation of Acceleration

Cycle ID	Test Date (yyyymmdd)	Make	Model	Model year	Cycle	Mean_speed (mph)	SD_speed (mph)	SD_acceleration (mph/s)
1	20081025	Honda	Civic	2008	A	24.6	16.0	1.5
2	20081025	Honda	Civic	2008	C_F	61.2	6.6	0.7
3	20081025	Honda	Civic	2008	C_NF	20.3	16.2	1.5
4	20081025	Honda	Civic	2008	1_F	63.9	5.9	0.5
5	20081025	Honda	Civic	2008	1_NF	23.7	17.5	1.5
6	20081025	Honda	Civic	2008	3	33.5	19.1	1.3
7	20081101	VW	passat	2003	A	28.8	17.2	1.6
8	20081101	VW	passat	2003	C_F	59.2	4.3	0.8
9	20081101	VW	passat	2003	C_NF	21.5	15.6	1.7
10	20081101	VW	passat	2003	1_F	63.8	5.7	0.6
11	20081101	VW	passat	2003	1_NF	28.1	19.6	1.8
12	20081101	VW	passat	2003	3	32.3	20.9	1.7
13	20090328	Mazda	Millenia	2001	A	32.6	21.9	1.5
14	20090328	Mazda	Millenia	2001	C_F	53.3	6.3	1.0
15	20090328	Mazda	Millenia	2001	C_NF	23.4	17.8	2.0
16	20090328	Mazda	Millenia	2001	1_F	64.9	6.4	0.7
17	20090328	Mazda	Millenia	2001	1_NF	26.8	18.5	1.7
18	20090328	Mazda	Millenia	2001	3	26.3	20.8	1.6
19	20090329	Mazda	3S	2005	A	29.6	23.0	1.4
20	20090329	Mazda	3S	2005	C_F	53.5	7.4	1.0
21	20090329	Mazda	3S	2005	C_NF	27.0	19.3	1.6
22	20090329	Mazda	3S	2005	1_F	70.8	7.6	0.8
23	20090329	Mazda	3S	2005	1_NF	20.2	20.4	1.9
24	20090329	Mazda	3S	2005	3	29.3	19.9	1.4
25	20090330	Pontiac	Vibe	2003	A	33.1	19.6	1.5
26	20090330	Pontiac	Vibe	2003	C_F	49.1	11.7	2.1
27	20090330	Pontiac	Vibe	2003	C_NF	23.0	18.2	2.0
28	20090330	Pontiac	Vibe	2003	1_F	66.0	5.4	0.7
29	20090330	Pontiac	Vibe	2003	1_NF	21.4	19.0	1.9
30	20090330	Pontiac	Vibe	2003	3	25.5	19.0	1.5
31	20090331	Nissan	Sentra	2007	A	31.7	21.9	1.7
32	20090331	Nissan	Sentra	2007	C_F	44.5	15.6	1.5
33	20090331	Nissan	Sentra	2007	C_NF	26.6	19.0	1.7
34	20090331	Nissan	Sentra	2007	1_F	66.9	6.8	0.6
35	20090331	Nissan	Sentra	2007	1_NF	22.1	18.7	2.0

36	20090331	Nissan	Sentra	2007	3	25.4	19.9	1.6
37	20090405	Honda	Civic	2007	A	33.5	20.6	1.4
38	20090405	Honda	Civic	2007	C_F	44.0	19.0	1.1
39	20090405	Honda	Civic	2007	C_NF	28.1	18.7	1.6
40	20090405	Honda	Civic	2007	1_F	65.9	5.9	0.6
41	20090405	Honda	Civic	2007	1_NF	21.5	18.5	1.7
42	20090405	Honda	Civic	2007	3	27.7	20.1	1.5
43	20091017	Chevrolet	Malibu	1999	A	26.4	18.6	1.7
44	20091017	Chevrolet	Malibu	1999	C_F	61.6	11.5	1.0
45	20091017	Chevrolet	Malibu	1999	C_NF	22.7	16.6	2.0
46	20091017	Chevrolet	Malibu	1999	1_F	71.1	7.8	0.7
47	20091017	Chevrolet	Malibu	1999	1_NF	22.9	19.6	2.2
48	20091017	Chevrolet	Malibu	1999	3	34.7	22.1	1.9
49	20091018	Ford	Taurus	2006	A	25.8	17.4	1.7
50	20091018	Ford	Taurus	2006	C_F	63.0	5.4	0.9
51	20091018	Ford	Taurus	2006	C_NF	23.7	17.2	1.9
52	20091018	Ford	Taurus	2006	1_F	67.1	6.1	0.7
53	20091018	Ford	Taurus	2006	1_NF	26.5	20.0	2.1
54	20091018	Ford	Taurus	2006	3	35.6	21.2	1.7
55	20091025	Buick	Lesabre	2000	A	27.7	18.0	1.7
56	20091025	Buick	Lesabre	2000	C_F	66.3	7.2	0.9
57	20091025	Buick	Lesabre	2000	C_NF	22.9	17.0	1.9
58	20091025	Buick	Lesabre	2000	1_F	71.0	6.9	0.7
59	20091025	Buick	Lesabre	2000	1_NF	22.4	19.6	2.0
60	20091025	Buick	Lesabre	2000	3	35.1	22.6	1.7
61	20091026	Pontiac	Grand Prix	1999	A	23.7	16.8	1.7
62	20091026	Pontiac	Grand Prix	1999	C_F	57.8	6.6	0.9
63	20091026	Pontiac	Grand Prix	1999	C_NF	20.6	14.8	1.7
64	20091026	Pontiac	Grand Prix	1999	1_F	65.8	7.7	0.7
65	20091026	Pontiac	Grand Prix	1999	1_NF	14.0	17.5	1.7
66	20091026	Pontiac	Grand Prix	1999	3	30.8	20.7	1.7
67	20091106	Honda	Civic	2007	A	21.7	16.9	1.8
68	20091106	Honda	Civic	2007	C_F	58.0	6.7	0.9
69	20091106	Honda	Civic	2007	C_NF	19.2	14.3	1.8
70	20091106	Honda	Civic	2007	1_F	67.2	5.8	0.7
71	20091106	Honda	Civic	2007	1_NF	26.3	17.6	2.3
72	20091106	Honda	Civic	2007	3	31.6	20.9	1.7
73	20101016	Honda	Civic	2004	A	27.0	16.6	1.7
74	20101016	Honda	Civic	2004	C_F	66.5	4.8	0.8
75	20101016	Honda	Civic	2004	C_NF	19.3	16.1	1.7
76	20101016	Honda	Civic	2004	1_F	70.9	5.4	0.6

77	20101016	Honda	Civic	2004	1_NF	21.1	19.8	2.0
78	20101016	Honda	Civic	2004	3	33.1	20.5	1.8
79	20101017	Mitsubishi	Galant	2000	A	28.1	16.4	1.5
80	20101017	Mitsubishi	Galant	2000	C_F	64.5	3.4	0.5
81	20101017	Mitsubishi	Galant	2000	C_NF	21.8	15.7	1.7
82	20101017	Mitsubishi	Galant	2000	1_F	68.2	4.1	0.5
83	20101017	Mitsubishi	Galant	2000	1_NF	24.7	19.1	1.8
84	20101017	Mitsubishi	Galant	2000	3	32.6	16.7	1.6
85	20101018	Toyota	Corolla	2006	A	25.2	17.0	1.7
86	20101018	Toyota	Corolla	2006	C_F	62.7	3.9	0.8
87	20101018	Toyota	Corolla	2006	C_NF	22.6	16.0	1.9
88	20101018	Toyota	Corolla	2006	1_F	73.8	6.7	0.7
89	20101018	Toyota	Corolla	2006	1_NF	25.3	20.5	2.6
90	20101018	Toyota	Corolla	2006	3	30.0	21.9	1.8
91	20101020	Toyota	Camry	1997	A	21.5	15.9	3.3
92	20101020	Toyota	Camry	1997	C_F	60.6	2.5	0.6
93	20101020	Toyota	Camry	1997	C_NF	21.7	15.8	2.9
94	20101020	Toyota	Camry	1997	1_F	64.9	2.7	0.5
95	20101020	Toyota	Camry	1997	1_NF	21.7	18.8	4.3
96	20101020	Toyota	Camry	1997	3	30.0	17.4	3.3
97	20101028	Honda	Civic Hybrid	2006	A	24.2	16.5	1.8
98	20101028	Honda	Civic Hybrid	2006	C_F	25.5	20.1	1.6
99	20101028	Honda	Civic Hybrid	2006	C_NF	20.4	15.4	1.7
100	20101028	Honda	Civic Hybrid	2006	1_F	67.5	3.3	0.5
101	20101028	Honda	Civic Hybrid	2006	1_NF	19.1	19.0	1.9
102	20101028	Honda	Civic Hybrid	2006	3	34.4	20.6	1.6
103	20101030	Honda	Civic	2000	A	28.7	17.2	1.7
104	20101030	Honda	Civic	2000	C_F	64.4	3.7	0.6
105	20101030	Honda	Civic	2000	C_NF	26.1	15.5	1.8
106	20101030	Honda	Civic	2000	1_F	55.2	23.6	1.5
107	20101030	Honda	Civic	2000	1_NF	21.9	18.9	2.0
108	20101030	Honda	Civic	2000	3	37.0	21.9	1.7
109	20101031	Nissan	Altima	2000	A	26.4	15.7	1.4
110	20101031	Nissan	Altima	2000	C_F	64.2	4.1	0.8
111	20101031	Nissan	Altima	2000	C_NF	23.3	16.4	1.6
112	20101031	Nissan	Altima	2000	1_F	65.8	3.9	0.7
113	20101031	Nissan	Altima	2000	1_NF	22.2	18.4	1.5
114	20101031	Nissan	Altima	2000	3	34.6	20.0	1.8
115	20101101	Toyota	Prius Hybrid	2006	A	23.5	17.0	1.7
116	20101101	Toyota	Prius Hybrid	2006	C_F	65.6	5.5	0.8
117	20101101	Toyota	Prius Hybrid	2006	C_NF	20.9	16.0	1.7

118	20101101	Toyota	Prius Hybrid	2006	1_F	70.5	5.1	0.8
119	20101101	Toyota	Prius Hybrid	2006	1_NF	24.1	20.0	2.0
120	20101101	Toyota	Prius Hybrid	2006	3	27.4	20.8	1.6
121	20101105	Ford	Expedition	1998	A	22.6	16.3	1.7
122	20101105	Ford	Expedition	1998	C_F	63.4	3.2	0.7
123	20101105	Ford	Expedition	1998	C_NF	21.3	16.2	1.7
124	20101105	Ford	Expedition	1998	1_F	66.6	3.3	0.7
125	20101105	Ford	Expedition	1998	1_NF	24.6	19.5	1.8
126	20101105	Ford	Expedition	1998	3	27.2	20.4	1.6
127	20101106	Buick	Lacrosses	2005	A	28.1	16.9	1.6
128	20101106	Buick	Lacrosses	2005	C_F	60.9	3.2	0.7
129	20101106	Buick	Lacrosses	2005	C_NF	25.1	14.7	1.6
130	20101106	Buick	Lacrosses	2005	1_F	67.1	4.2	0.6
131	20101106	Buick	Lacrosses	2005	1_NF	26.2	19.5	1.7
132	20101106	Buick	Lacrosses	2005	3	35.3	20.1	1.5
133	20101110	Honda	Accord	1997	A	26.8	17.0	1.6
134	20101110	Honda	Accord	1997	C_F	61.8	2.8	0.6
135	20101110	Honda	Accord	1997	C_NF	18.2	14.6	1.6
136	20101110	Honda	Accord	1997	1_F	70.6	5.6	0.6
137	20101110	Honda	Accord	1997	1_NF	24.2	18.5	2.1
138	20101110	Honda	Accord	1997	3	32.2	21.4	1.6
139	20110122	Chevrolet	Impala	2003	A	28.6	16.2	1.7
140	20110122	Chevrolet	Impala	2003	C_F	43.3	22.4	1.5
141	20110122	Chevrolet	Impala	2003	C_NF	24.8	14.7	2.1
142	20110122	Chevrolet	Impala	2003	1_F	61.3	7.8	0.9
143	20110122	Chevrolet	Impala	2003	1_NF	25.0	19.4	2.4
144	20110122	Chevrolet	Impala	2003	3	32.7	20.5	1.8
145	20110123	Honda	Accord V6	2001	A	27.8	16.3	1.4
146	20110123	Honda	Accord V6	2001	C_F	56.3	16.0	1.0
147	20110123	Honda	Accord V6	2001	C_NF	24.0	15.1	1.5
148	20110123	Honda	Accord V6	2001	1_F	59.2	19.8	1.1
149	20110123	Honda	Accord V6	2001	1_NF	26.5	19.8	1.5
150	20110123	Honda	Accord V6	2001	3	31.2	21.2	1.4
151	20110126	Honda	Civic	2004	A	24.1	14.5	1.5
152	20110126	Honda	Civic	2004	C_F	53.1	10.3	0.9
153	20110126	Honda	Civic	2004	C_NF	20.2	14.7	1.5
154	20110126	Honda	Civic	2004	1_F	60.9	6.6	0.6
155	20110126	Honda	Civic	2004	1_NF	15.4	17.3	1.4
156	20110126	Honda	Civic	2004	3	26.7	19.8	1.6
157	20110204	Chevrolet	Blazer	2000	A	17.1	16.4	1.1
158	20110204	Chevrolet	Blazer	2000	C_F	53.1	5.5	0.8

159	20110204	Chevrolet	Blazer	2000	C_NF	20.9	16.0	1.3
160	20110204	Chevrolet	Blazer	2000	1_F	60.5	4.9	0.6
161	20110204	Chevrolet	Blazer	2000	1_NF	17.2	18.5	1.2
162	20110204	Chevrolet	Blazer	2000	3	25.0	18.7	1.2
163	20110206	Honda	Accord	2006	A	24.5	16.0	1.6
164	20110206	Honda	Accord	2006	C_F	59.7	5.6	0.9
165	20110206	Honda	Accord	2006	C_NF	27.9	18.5	1.4
166	20110206	Honda	Accord	2006	1_F	65.1	5.6	0.6
167	20110206	Honda	Accord	2006	1_NF	22.9	18.4	2.3
168	20110206	Honda	Accord	2006	3	32.0	19.7	1.6
169	20110212	Chevrolet	Silverado	2001	A	24.4	14.8	1.4
170	20110212	Chevrolet	Silverado	2001	C_F	62.1	5.7	0.9
171	20110212	Chevrolet	Silverado	2001	C_NF	21.6	15.6	1.6
172	20110212	Chevrolet	Silverado	2001	1_F	62.0	4.9	0.5
173	20110212	Chevrolet	Silverado	2001	1_NF	14.8	16.9	1.9
174	20110212	Chevrolet	Silverado	2001	3	29.9	20.3	1.4
175	20110214	VW	Jetta	2006	A	23.0	16.2	1.5
176	20110214	VW	Jetta	2006	C_F	38.8	24.8	1.2
177	20110214	VW	Jetta	2006	C_NF	20.6	21.1	1.5
178	20110214	VW	Jetta	2006	1_F	69.2	5.3	0.6
179	20110214	VW	Jetta	2006	1_NF	21.9	18.3	1.9
180	20110214	VW	Jetta	2006	3	31.7	21.4	1.6
181	20110219	Scion	tC	2006	A	28.3	15.8	1.9
182	20110219	Scion	tC	2006	C_F	59.8	7.0	1.1
183	20110219	Scion	tC	2006	C_NF	23.3	17.0	2.3
184	20110219	Scion	tC	2006	1_F	65.1	3.1	0.8
185	20110219	Scion	tC	2006	1_NF	20.9	20.0	2.8
186	20110219	Scion	tC	2006	3	31.7	20.1	1.7
187	20110829	GMC	Sierra	2007	A	22.6	17.8	1.5
188	20110829	GMC	Sierra	2007	C_F	61.9	6.3	0.8
189	20110829	GMC	Sierra	2007	C_NF	19.2	17.8	1.3
190	20110829	GMC	Sierra	2007	1_F	63.1	15.0	0.9
191	20110829	GMC	Sierra	2007	1_NF	21.1	18.7	1.8
192	20110829	GMC	Sierra	2007	3	26.4	21.5	1.6
193	20110830	Toyota	Camry	2001	A	31.2	23.9	1.3
194	20110830	Toyota	Camry	2001	C_F	57.7	9.9	1.0
195	20110830	Toyota	Camry	2001	C_NF	23.4	19.5	1.5
196	20110830	Toyota	Camry	2001	1_F	59.7	14.6	0.8
197	20110830	Toyota	Camry	2001	1_NF	18.8	18.3	1.8
198	20110830	Toyota	Camry	2001	3	27.1	20.4	1.4
199	20110831	Chevrolet	Silverado	2006	A	23.3	15.1	1.3

200	20110831	Chevrolet	Silverado	2006	C_F	50.3	19.2	1.1
201	20110831	Chevrolet	Silverado	2006	C_NF	20.0	14.4	1.6
202	20110831	Chevrolet	Silverado	2006	1_F	55.7	18.0	0.9
203	20110831	Chevrolet	Silverado	2006	1_NF	17.8	18.0	1.5
204	20110831	Chevrolet	Silverado	2006	3	28.3	20.1	1.4
205	20110903	Saab	9-2x	2005	A	29.0	16.8	2.6
206	20110903	Saab	9-2x	2005	C_F	66.0	4.7	1.1
207	20110903	Saab	9-2x	2005	C_NF	25.8	16.3	2.8
208	20110903	Saab	9-2x	2005	1_F	65.9	13.0	1.2
209	20110903	Saab	9-2x	2005	1_NF	17.1	19.5	3.9
210	20110903	Saab	9-2x	2005	3	35.6	19.6	2.7
211	20110907	Buick	Lesabre	2001	A	22.7	16.9	1.5
212	20110907	Buick	Lesabre	2001	C_F	60.7	7.3	0.9
213	20110907	Buick	Lesabre	2001	C_NF	17.3	15.1	1.4
214	20110907	Buick	Lesabre	2001	1_F	60.6	12.7	0.9
215	20110907	Buick	Lesabre	2001	1_NF	16.8	18.6	1.9
216	20110907	Buick	Lesabre	2001	3	23.6	21.6	1.3
217	20110909	Toyota	Sienna	2008	A	22.7	15.0	1.5
218	20110909	Toyota	Sienna	2008	C_F	39.5	20.5	2.1
219	20110909	Toyota	Sienna	2008	C_NF	21.6	14.6	1.7
220	20110909	Toyota	Sienna	2008	1_F	55.6	16.5	1.2
221	20110909	Toyota	Sienna	2008	1_NF	23.8	17.8	1.9
222	20110909	Toyota	Sienna	2008	3	28.2	19.6	1.5
223	20110910	Honda	Civic	2008	A	26.9	16.1	1.3
224	20110910	Honda	Civic	2008	C_F	60.7	5.8	0.7
225	20110910	Honda	Civic	2008	C_NF	19.6	15.3	1.5
226	20110910	Honda	Civic	2008	1_F	61.5	12.3	1.0
227	20110910	Honda	Civic	2008	1_NF	21.6	19.8	1.6
228	20110910	Honda	Civic	2008	3	31.1	20.0	1.4
229	20110916	Honda	Accord	2007	A	27.9	16.6	1.7
230	20110916	Honda	Accord	2007	C_F	50.4	20.3	1.2
231	20110916	Honda	Accord	2007	C_NF	18.9	15.3	1.7
232	20110916	Honda	Accord	2007	1_F	65.1	8.2	1.0
233	20110916	Honda	Accord	2007	1_NF	23.3	18.1	2.0
234	20110916	Honda	Accord	2007	3	30.2	21.9	1.7
235	20110918	Chevrolet	S10	1998	A	24.3	16.5	1.4
236	20110918	Chevrolet	S10	1998	C_F	62.1	3.2	0.9
237	20110918	Chevrolet	S10	1998	C_NF	21.9	15.5	1.7
238	20110918	Chevrolet	S10	1998	1_F	65.3	4.4	0.7
239	20110918	Chevrolet	S10	1998	1_NF	22.5	17.6	1.9
240	20110918	Chevrolet	S10	1998	3	33.7	20.1	1.6

241	20110919	Chevrolet	Tahoe	2005	A	24.4	15.9	1.4
242	20110919	Chevrolet	Tahoe	2005	C_F	62.4	6.5	0.7
243	20110919	Chevrolet	Tahoe	2005	C_NF	21.5	16.5	1.5
244	20110919	Chevrolet	Tahoe	2005	1_F	69.8	7.6	0.7
245	20110919	Chevrolet	Tahoe	2005	1_NF	16.6	17.6	1.4
246	20110919	Chevrolet	Tahoe	2005	3	27.7	21.0	1.5
247	20110921	Honda	Element	2005	A	22.6	15.8	1.2
248	20110921	Honda	Element	2005	C_F	62.8	5.1	0.8
249	20110921	Honda	Element	2005	C_NF	20.5	14.4	1.4
250	20110921	Honda	Element	2005	1_F	63.8	6.0	0.7
251	20110921	Honda	Element	2005	1_NF	20.4	17.9	1.4
252	20110921	Honda	Element	2005	3	26.7	20.4	1.3
253	20111017	Ford	Ranger	2002	A	22.3	17.2	1.5
254	20111017	Ford	Ranger	2002	C_F	58.8	6.5	0.7
255	20111017	Ford	Ranger	2002	C_NF	16.4	15.6	1.4
256	20111017	Ford	Ranger	2002	1_F	65.2	6.4	0.7
257	20111017	Ford	Ranger	2002	1_NF	15.1	18.1	1.6
258	20111017	Ford	Ranger	2002	3	23.1	20.1	1.3
259	20111024	Chrysler	Sebring	1998	A	21.5	16.9	1.3
260	20111024	Chrysler	Sebring	1998	C_F	60.4	5.2	0.9
261	20111024	Chrysler	Sebring	1998	C_NF	20.7	17.0	1.6
262	20111024	Chrysler	Sebring	1998	1_F	56.3	21.0	1.1
263	20111024	Chrysler	Sebring	1998	1_NF	17.9	17.3	1.4
264	20111024	Chrysler	Sebring	1998	3	30.5	20.9	1.6
265	20111216	Nissan	Versa	2012	A	17.5	17.4	1.6
266	20111216	Nissan	Versa	2012	C_F	50.2	21.8	1.9
267	20111216	Nissan	Versa	2012	C_NF	17.1	15.7	1.9
268	20111216	Nissan	Versa	2012	1_F	68.3	6.2	0.8
269	20111216	Nissan	Versa	2012	1_NF	26.0	17.8	2.3
270	20111216	Nissan	Versa	2012	3	33.4	21.9	2.0
271	20111219	Chevrolet	HHR	2011	A	18.7	18.7	1.6
272	20111219	Chevrolet	HHR	2011	C_F	23.8	22.9	1.5
273	20111219	Chevrolet	HHR	2011	C_NF	17.3	17.1	1.4
274	20111219	Chevrolet	HHR	2011	1_F	71.6	12.7	1.2
275	20111219	Chevrolet	HHR	2011	1_NF	12.3	18.4	1.6
276	20111219	Chevrolet	HHR	2011	3	29.0	23.4	1.5
277	20111220	Toyota	Camry	2011	A	22.1	18.6	2.9
278	20111220	Toyota	Camry	2011	C_F	30.8	24.3	1.6
279	20111220	Toyota	Camry	2011	C_NF	18.5	16.2	2.7
280	20111220	Toyota	Camry	2011	1_F	68.3	11.7	1.2
281	20111220	Toyota	Camry	2011	1_NF	16.6	20.1	2.9

282	20111220	Toyota	Camry	2011	3	24.7	23.5	2.3
283	20120120	Toyota	Camry	2005	A	24.1	16.3	1.5
284	20120120	Toyota	Camry	2005	C_F	54.7	9.8	1.2
285	20120120	Toyota	Camry	2005	C_NF	19.3	15.4	1.5
286	20120120	Toyota	Camry	2005	1_F	65.1	5.7	0.9
287	20120120	Toyota	Camry	2005	1_NF	14.7	17.2	1.7
288	20120120	Toyota	Camry	2005	3	29.3	19.9	1.5
289	20120121	Chrysler	PtCruise	2003	A	26.3	14.2	1.4
290	20120121	Chrysler	PtCruise	2003	C_F	57.4	8.3	0.9
291	20120121	Chrysler	PtCruise	2003	C_NF	21.5	14.9	1.9
292	20120121	Chrysler	PtCruise	2003	1_F	61.3	6.9	0.8
293	20120121	Chrysler	PtCruise	2003	1_NF	23.4	16.9	2.0
294	20120121	Chrysler	PtCruise	2003	3	31.3	19.8	1.4
295	20120124	Buick	Century	1998	A	22.9	15.9	1.6
296	20120124	Buick	Century	1998	C_F	58.7	4.2	0.8
297	20120124	Buick	Century	1998	C_NF	18.1	15.2	1.7
298	20120124	Buick	Century	1998	1_F	63.7	7.7	0.8
299	20120124	Buick	Century	1998	1_NF	18.9	19.0	1.7
300	20120124	Buick	Century	1998	3	31.1	19.7	1.5
301	20120126	Toyota	Highlander Hybrid	2010	A	33.6	12.8	2.6
302	20120126	Toyota	Highlander Hybrid	2010	C_F	60.0	9.9	2.2
303	20120126	Toyota	Highlander Hybrid	2010	C_NF	25.4	6.9	3.6
304	20120126	Toyota	Highlander Hybrid	2010	1_F	65.9	6.4	0.7
305	20120126	Toyota	Highlander Hybrid	2010	1_NF	37.7	11.2	3.6
306	20120126	Toyota	Highlander Hybrid	2010	3	40.5	14.3	2.4
307	20120127	Ford	F-150	2010	A	20.8	17.3	1.7
308	20120127	Ford	F-151	2010	C_F	63.2	8.6	0.9
309	20120127	Ford	F-152	2010	C_NF	18.8	16.3	1.9
310	20120127	Ford	F-153	2010	1_F	67.9	8.4	1.0
311	20120127	Ford	F-154	2010	1_NF	10.4	17.4	1.7
312	20120127	Ford	F-155	2010	3	29.3	22.6	1.8
313	20120128	Fiat	500	2012	A	28.4	16.5	1.5
314	20120128	Fiat	500	2012	C_F	57.4	8.3	0.8
315	20120128	Fiat	500	2012	C_NF	21.6	15.5	1.6
316	20120128	Fiat	500	2012	1_F	65.6	6.4	0.5
317	20120128	Fiat	500	2012	1_NF	22.1	18.6	1.7
318	20120128	Fiat	500	2012	3	34.3	19.8	1.4

319	20120131	Mitsubishi	Eclipse	2006	A	24.4	17.8	1.6
320	20120131	Mitsubishi	Eclipse	2006	C_F	53.6	15.2	1.5
321	20120131	Mitsubishi	Eclipse	2006	C_NF	19.6	16.0	1.6
322	20120131	Mitsubishi	Eclipse	2006	1_F	66.2	15.0	1.1
323	20120131	Mitsubishi	Eclipse	2006	1_NF	23.0	19.6	1.8
324	20120131	Mitsubishi	Eclipse	2006	3	30.1	20.4	1.6
325	20120204	Dodge	Stratus	2004	A	26.6	16.7	1.5
326	20120204	Dodge	Stratus	2004	C_F	52.6	18.4	1.0
327	20120204	Dodge	Stratus	2004	C_NF	20.7	16.2	1.7
328	20120204	Dodge	Stratus	2004	1_F	66.6	5.2	0.7
329	20120204	Dodge	Stratus	2004	1_NF	22.2	18.7	1.8
330	20120204	Dodge	Stratus	2004	3	33.2	20.7	1.5
331	20120205	Jeep	Wrangler	2007	A	26.9	16.2	1.5
332	20120205	Jeep	Wrangler	2007	C_F	59.4	5.5	0.8
333	20120205	Jeep	Wrangler	2007	C_NF	22.4	15.2	1.6
334	20120205	Jeep	Wrangler	2007	1_F	62.7	7.3	0.8
335	20120205	Jeep	Wrangler	2007	1_NF	25.7	18.7	1.9
336	20120205	Jeep	Wrangler	2007	3	33.1	19.7	1.6
337	20120211	Honda	Accord	1999	A	27.9	16.5	1.5
338	20120211	Honda	Accord	1999	C_F	52.9	21.8	1.2
339	20120211	Honda	Accord	1999	C_NF	21.2	15.3	1.7
340	20120211	Honda	Accord	1999	1_F	66.7	5.7	0.7
341	20120211	Honda	Accord	1999	1_NF	24.2	19.3	1.9
342	20120211	Honda	Accord	1999	3	34.1	19.7	1.5
343	20120212	Honda	Accord	1998	A	28.2	15.0	1.1
344	20120212	Honda	Accord	1998	C_F	56.3	7.7	0.9
345	20120212	Honda	Accord	1998	C_NF	23.5	15.7	1.6
346	20120212	Honda	Accord	1998	1_F	62.6	5.4	0.7
347	20120212	Honda	Accord	1998	1_NF	21.8	17.4	1.7
348	20120212	Honda	Accord	1998	3	31.4	20.3	1.4
349	20120226	Toyota	Tundra	2006	A	28.3	16.3	1.3
350	20120226	Toyota	Tundra	2006	C_F	60.8	6.2	1.2
351	20120226	Toyota	Tundra	2006	C_NF	21.9	15.0	2.0
352	20120226	Toyota	Tundra	2006	1_F	65.4	5.3	0.8
353	20120226	Toyota	Tundra	2006	1_NF	24.3	18.1	1.9
354	20120226	Toyota	Tundra	2006	3	34.5	17.8	1.5
355	20120907	Lexus	RX300	2002	A	19.9	16.2	1.7
356	20120907	Lexus	RX300	2002	C_F	60.2	10.6	1.2
357	20120907	Lexus	RX300	2002	C_NF	15.8	15.5	1.6
358	20120907	Lexus	RX300	2002	1_F	61.7	7.1	0.8
359	20120907	Lexus	RX300	2002	1_NF	14.4	16.7	1.5

360	20120907	Lexus	RX300	2002	3	31.4	19.8	1.7
361	20120908	Mazda	6	2005	A	27.7	16.0	1.6
362	20120908	Mazda	6	2005	C_F	59.9	7.1	1.0
363	20120908	Mazda	6	2005	C_NF	21.3	15.2	1.9
364	20120908	Mazda	6	2005	1_F	62.3	6.7	0.7
365	20120908	Mazda	6	2005	1_NF	17.6	19.1	2.1
366	20120908	Mazda	6	2005	3	33.5	20.6	1.7
367	20120909	Honda	Fit	2008	A	27.1	16.0	1.4
368	20120909	Honda	Fit	2008	C_F	59.0	13.2	1.0
369	20120909	Honda	Fit	2008	C_NF	22.0	16.7	1.6
370	20120909	Honda	Fit	2008	1_F	66.4	6.5	0.8
371	20120909	Honda	Fit	2008	1_NF	18.9	18.4	1.6
372	20120909	Honda	Fit	2008	3	32.9	21.4	1.5
373	20120910	Honda	Civic	2004	A	24.2	15.9	1.6
374	20120910	Honda	Civic	2004	C_F	45.7	23.4	1.3
375	20120910	Honda	Civic	2004	C_NF	18.5	16.1	1.6
376	20120910	Honda	Civic	2004	1_F	70.0	6.8	1.2
377	20120910	Honda	Civic	2004	1_NF	18.5	16.1	1.6
378	20120910	Honda	Civic	2004	3	26.4	22.6	1.8
379	20120913	Toyota	Tacoma	2004	A	20.7	16.6	1.6
380	20120913	Toyota	Tacoma	2004	C_F	37.3	23.4	1.4
381	20120913	Toyota	Tacoma	2004	C_NF	20.5	14.8	1.8
382	20120913	Toyota	Tacoma	2004	1_F	59.6	17.3	1.3
383	20120913	Toyota	Tacoma	2004	1_NF	22.3	18.8	1.8
384	20120913	Toyota	Tacoma	2004	3	32.7	20.7	1.7
385	20120914	Volvo	S70-T5	1998	A	24.5	18.3	1.9
386	20120914	Volvo	S70-T6	1998	C_F	65.1	7.4	1.0
387	20120914	Volvo	S70-T7	1998	C_NF	19.3	16.9	1.8
388	20120914	Volvo	S70-T8	1998	1_F	69.9	8.5	0.9
389	20120914	Volvo	S70-T9	1998	1_NF	19.1	18.7	2.0
390	20120914	Volvo	S70-T10	1998	3	31.6	22.4	1.6
391	20120917	Chevrolet	Silverado	2010	A	29.2	16.5	1.7
392	20120917	Chevrolet	Silverado	2010	C_F	55.9	19.4	1.1
393	20120917	Chevrolet	Silverado	2010	C_NF	20.6	16.1	1.9
394	20120917	Chevrolet	Silverado	2010	1_F	67.9	13.6	1.2
395	20120917	Chevrolet	Silverado	2010	1_NF	22.7	19.6	2.0
396	20120917	Chevrolet	Silverado	2010	3	31.1	22.9	1.7
397	20120917 B	Ford	F150	2011	A	25.4	17.9	1.7
398	20120917 B	Ford	F150	2011	C_F	62.2	10.0	1.8
399	20120917	Ford	F150	2011	C_NF	20.8	17.4	1.9

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400	20120917 B	Ford	F150	2011	1_F	67.4	9.1	1.5
401	20120917 B	Ford	F150	2011	1_NF	16.3	19.6	2.2
402	20120917 B	Ford	F150	2011	3	32.0	23.7	2.2
403	20120919	Ford	F150	2011	A	25.4	19.0	1.7
404	20120919	Ford	F150	2011	C_F	42.5	28.5	1.3
405	20120919	Ford	F150	2011	C_NF	19.5	17.8	1.8
406	20120919	Ford	F150	2011	1_F	67.8	8.5	1.3
407	20120919	Ford	F150	2011	1_NF	14.4	19.6	2.2
408	20120919	Ford	F150	2011	3	34.4	22.7	1.7
409	20120921	Chevrolet	Silverado	2010	A	23.7	16.1	1.6
410	20120921	Chevrolet	Silverado	2010	C_F	59.1	10.3	1.0
411	20120921	Chevrolet	Silverado	2010	C_NF	19.7	14.7	1.7
412	20120921	Chevrolet	Silverado	2010	1_F	69.3	9.3	0.7
413	20120921	Chevrolet	Silverado	2010	1_NF	20.8	18.5	1.8
414	20120921	Chevrolet	Silverado	2010	3	31.3	20.1	1.5
415	20120927	Chevrolet	Silverado	2002	A	25.2	17.0	1.5
416	20120927	Chevrolet	Silverado	2002	C_F	46.5	20.4	1.3
417	20120927	Chevrolet	Silverado	2002	C_NF	20.0	14.8	1.5
418	20120927	Chevrolet	Silverado	2002	1_F	67.8	7.1	0.8
419	20120927	Chevrolet	Silverado	2002	1_NF	21.0	18.9	1.7
420	20120927	Chevrolet	Silverado	2002	3	27.2	21.9	1.5
421	20120928	Toyota	Tacoma	2005	A	23.7	17.1	1.9
422	20120928	Toyota	Tacoma	2005	C_F	59.4	13.6	1.3
423	20120928	Toyota	Tacoma	2005	C_NF	20.8	17.1	2.0
424	20120928	Toyota	Tacoma	2005	1_F	72.4	7.5	1.6
425	20120928	Toyota	Tacoma	2005	1_NF	22.9	20.8	2.3
426	20120928	Toyota	Tacoma	2005	3	32.0	22.0	1.9
427	20120929	GMC	Yukon	2013	A	28.2	17.0	1.6
428	20120929	GMC	Yukon	2013	C_F	61.0	10.5	0.9
429	20120929	GMC	Yukon	2013	C_NF	23.5	15.4	2.0
430	20120929	GMC	Yukon	2013	1_F	66.5	7.4	0.8
431	20120929	GMC	Yukon	2013	1_NF	24.3	19.1	2.1
432	20120929	GMC	Yukon	2013	3	37.6	20.6	1.7
433	20120930	Toyota	Camry	2003	A	29.1	16.6	1.7
434	20120930	Toyota	Camry	2003	C_F	59.1	16.5	1.1
435	20120930	Toyota	Camry	2003	C_NF	24.4	16.2	1.9
436	20120930	Toyota	Camry	2003	1_F	67.9	12.4	1.0
437	20120930	Toyota	Camry	2003	1_NF	22.0	20.8	2.0

438	20120930	Toyota	Camry	2003	3	38.6	20.8	1.6
439	20121001	Toyota	Camry	2012	A	24.5	18.2	3.2
440	20121001	Toyota	Camry	2012	C_F	32.5	24.6	2.4
441	20121001	Toyota	Camry	2012	C_NF	18.4	17.3	3.0
442	20121001	Toyota	Camry	2012	1_F	67.7	6.0	1.8
443	20121001	Toyota	Camry	2012	1_NF	21.9	19.4	3.8
444	20121001	Toyota	Camry	2012	3	29.1	22.7	3.0
445	20121002	Jeep	Wrangler	2002	A	23.1	15.0	1.5
446	20121002	Jeep	Wrangler	2002	C_F	57.8	5.3	0.9
447	20121002	Jeep	Wrangler	2002	C_NF	18.0	14.4	1.5
448	20121002	Jeep	Wrangler	2002	1_F	64.2	6.2	1.0
449	20121002	Jeep	Wrangler	2002	1_NF	18.0	17.5	1.5
450	20121002	Jeep	Wrangler	2002	3	25.2	19.9	1.7
451	20121011	Honda	Insight Hybrid	2012	A	24.3	17.8	1.6
452	20121011	Honda	Insight Hybrid	2012	C_F	24.1	21.2	1.2
453	20121011	Honda	Insight Hybrid	2012	C_NF	20.1	15.5	1.7
454	20121011	Honda	Insight Hybrid	2012	1_F	68.7	7.5	0.8
455	20121011	Honda	Insight Hybrid	2012	1_NF	20.9	20.0	2.0
456	20121011	Honda	Insight Hybrid	2012	3	31.3	20.6	1.8
457	20130201	Nissan	Rogue	2012	A	24.7	16.9	1.8
458	20130201	Nissan	Rogue	2012	C_F	58.9	15.0	1.1
459	20130201	Nissan	Rogue	2012	C_NF	19.4	15.7	2.0
460	20130201	Nissan	Rogue	2012	1_F	67.5	8.9	0.9
461	20130201	Nissan	Rogue	2012	1_NF	21.5	18.7	2.1
462	20130201	Nissan	Rogue	2012	3	30.2	20.6	1.7
463	20130202	Kia	Forte	2013	A	24.7	18.5	1.6
464	20130202	Kia	Forte	2013	C_F	57.9	11.4	1.0
465	20130202	Kia	Forte	2013	C_NF	22.3	16.2	1.8
466	20130202	Kia	Forte	2013	1_F	64.1	7.4	0.7
467	20130202	Kia	Forte	2013	1_NF	23.7	21.6	1.9
468	20130202	Kia	Forte	2013	3	33.9	20.1	1.6
469	20130204	Mazda	Protégé	2001	A	26.6	17.5	1.9
470	20130204	Mazda	Protégé	2001	C_F	63.2	8.4	1.1
471	20130204	Mazda	Protégé	2001	C_NF	19.2	16.0	1.9
472	20130204	Mazda	Protégé	2001	1_F	68.6	6.9	0.9
473	20130204	Mazda	Protégé	2001	1_NF	19.1	19.3	2.0
474	20130204	Mazda	Protégé	2001	3	31.9	21.1	1.7

475	20130205	Pontiac	Grand Prix	2000	A	25.7	16.1	1.5
476	20130205	Pontiac	Grand Prix	2000	C_F	61.6	7.5	0.9
477	20130205	Pontiac	Grand Prix	2000	C_NF	19.3	15.3	1.7
478	20130205	Pontiac	Grand Prix	2000	1_F	65.6	5.8	0.8
479	20130205	Pontiac	Grand Prix	2000	1_NF	21.5	17.7	1.7
480	20130205	Pontiac	Grand Prix	2000	3	33.3	20.1	1.5
481	20130207	Honda	Civic	2005	A	21.2	16.9	1.6
482	20130207	Honda	Civic	2005	C_F	56.6	15.0	1.1
483	20130207	Honda	Civic	2005	C_NF	21.3	15.2	1.9
484	20130207	Honda	Civic	2005	1_F	70.5	6.7	2.2
485	20130207	Honda	Civic	2005	1_NF	16.2	18.2	2.0
486	20130207	Honda	Civic	2005	3	35.5	21.2	1.7
487	20130208	Toyota	Corolla	2005	A	25.1	16.9	1.4
488	20130208	Toyota	Corolla	2005	C_F	62.6	7.5	0.8
489	20130208	Toyota	Corolla	2005	C_NF	19.5	14.7	1.6
490	20130208	Toyota	Corolla	2005	1_F	66.4	6.3	0.8
491	20130208	Toyota	Corolla	2005	1_NF	23.6	18.1	1.8
492	20130208	Toyota	Corolla	2005	3	34.1	19.7	1.5
493	20130210	Chevrolet	Trailblazer	2004	A	27.8	15.6	1.6
494	20130210	Chevrolet	Trailblazer	2004	C_F	59.9	7.1	0.8
495	20130210	Chevrolet	Trailblazer	2004	C_NF	23.5	15.2	2.4
496	20130210	Chevrolet	Trailblazer	2004	1_F	67.3	6.9	0.8
497	20130210	Chevrolet	Trailblazer	2004	1_NF	43.4	27.4	2.2
498	20130210	Chevrolet	Trailblazer	2004	3	34.8	20.4	2.1
499	20130212	Hyundai	Elantra Touring	2011	A	24.7	15.1	1.5
500	20130212	Hyundai	Elantra Touring	2011	C_F	58.7	10.1	1.1
501	20130212	Hyundai	Elantra Touring	2011	C_NF	19.4	14.4	1.7
502	20130212	Hyundai	Elantra Touring	2011	1_F	64.8	7.5	0.8
503	20130212	Hyundai	Elantra Touring	2011	1_NF	21.6	17.2	1.8
504	20130212	Hyundai	Elantra Touring	2011	3	31.3	20.9	1.7
505	20130215	Jeep	Wrangler	2002	A	23.0	17.8	2.1
506	20130215	Jeep	Wrangler	2002	C_F	57.4	13.3	2.2
507	20130215	Jeep	Wrangler	2002	C_NF	16.7	14.7	2.6
508	20130215	Jeep	Wrangler	2002	1_F	65.8	7.3	0.7
509	20130215	Jeep	Wrangler	2002	1_NF	19.3	17.3	2.6
510	20130215	Jeep	Wrangler	2002	3	29.9	21.3	2.7
511	20130218	Ford	Escape	2006	A	24.5	16.7	1.7

			Hybrid					
512	20130218	Ford	Escape Hybrid	2006	C_F	58.5	10.6	0.9
513	20130218	Ford	Escape Hybrid	2006	C_NF	19.0	15.5	1.9
514	20130218	Ford	Escape Hybrid	2006	1_F	65.5	6.6	0.7
515	20130218	Ford	Escape Hybrid	2006	1_NF	20.9	16.7	1.8
516	20130218	Ford	Escape Hybrid	2006	3	30.9	20.1	1.6
517	20130220	Pontiac	Grand Am GT	2004	A	24.4	15.5	1.4
518	20130220	Pontiac	Grand Am GT	2004	C_F	59.9	9.4	0.9
519	20130220	Pontiac	Grand Am GT	2004	C_NF	16.5	15.5	1.6
520	20130220	Pontiac	Grand Am GT	2004	1_F	64.9	7.7	0.8
521	20130220	Pontiac	Grand Am GT	2004	1_NF	21.6	17.4	1.7
522	20130220	Pontiac	Grand Am GT	2004	3	25.6	21.2	1.4
523	20130222	Nissan	Exterra	2008	A	24.9	16.6	1.4
524	20130222	Nissan	Exterra	2008	C_F	38.9	20.4	1.2
525	20130222	Nissan	Exterra	2008	C_NF	17.2	14.3	1.7
526	20130222	Nissan	Exterra	2008	1_F	67.8	7.0	0.8
527	20130222	Nissan	Exterra	2008	1_NF	21.5	18.8	1.8
528	20130222	Nissan	Exterra	2008	3	31.3	18.9	1.5
529	20130223	Chevrolet	Impala	2013	A	31.5	16.5	1.5
530	20130223	Chevrolet	Impala	2013	C_F	61.3	7.5	1.0
531	20130223	Chevrolet	Impala	2013	C_NF	23.9	16.3	1.6
532	20130223	Chevrolet	Impala	2013	1_F	65.6	7.1	0.8
533	20130223	Chevrolet	Impala	2013	1_NF	23.9	19.6	1.9
534	20130223	Chevrolet	Impala	2013	3	33.9	21.1	1.6
535	20130224	Ford	Fusion	2012	A	26.2	17.1	1.7
536	20130224	Ford	Fusion	2012	C_F	62.0	6.9	0.9
537	20130224	Ford	Fusion	2012	C_NF	21.3	17.4	1.7
538	20130224	Ford	Fusion	2012	1_F	67.3	7.6	0.8
539	20130224	Ford	Fusion	2012	1_NF	24.5	20.3	2.1
540	20130224	Ford	Fusion	2012	3	37.2	20.8	1.8
541	20130302	VW	Passat	2012	A	26.5	15.2	1.7
542	20130302	VW	Passat	2012	C_F	58.8	11.0	1.0
543	20130302	VW	Passat	2012	C_NF	25.4	16.1	2.1
544	20130302	VW	Passat	2012	1_F	68.1	10.1	0.9
545	20130302	VW	Passat	2012	1_NF	22.2	18.4	2.0
546	20130302	VW	Passat	2012	3	37.0	19.6	1.9
547	20130515	GMC	Terrain	2013	A	24.5	17.2	1.4

548	20130515	GMC	Terrain	2013	C_F	56.2	16.7	1.2
549	20130515	GMC	Terrain	2013	C_NF	21.5	14.4	1.6
550	20130515	GMC	Terrain	2013	1_F	61.1	18.2	1.0
551	20130515	GMC	Terrain	2013	1_NF	18.0	19.5	1.8
552	20130515	GMC	Terrain	2013	3	33.2	19.4	1.5
553	20130520	Toyota	Sienna	2013	A	24.1	14.6	1.5
554	20130520	Toyota	Sienna	2013	C_F	56.6	11.0	1.2
555	20130520	Toyota	Sienna	2013	C_NF	21.2	15.6	1.7
556	20130520	Toyota	Sienna	2013	1_F	58.5	6.6	0.9
557	20130520	Toyota	Sienna	2013	1_NF	18.4	17.2	1.6
558	20130520	Toyota	Sienna	2013	3	28.9	21.0	1.6
559	20130528	Ford	Fusion	2012	A	25.1	14.6	1.5
560	20130528	Ford	Fusion	2012	C_F	55.9	9.6	0.9
561	20130528	Ford	Fusion	2012	C_NF	21.8	13.5	1.5
562	20130528	Ford	Fusion	2012	1_F	61.7	7.0	0.7
563	20130528	Ford	Fusion	2012	1_NF	22.7	16.9	1.8
564	20130528	Ford	Fusion	2012	3	32.9	18.2	1.5
565	20130601	Dodge	Caravan	2006	A	25.9	16.7	1.5
566	20130601	Dodge	Caravan	2006	C_F	50.4	21.1	1.0
567	20130601	Dodge	Caravan	2006	C_NF	26.6	17.8	2.1
568	20130601	Dodge	Caravan	2006	1_F	61.0	5.9	0.6
569	20130601	Dodge	Caravan	2006	1_NF	23.0	18.7	1.7
570	20130601	Dodge	Caravan	2006	3	35.0	19.3	1.6
571	20130609	Chevy	Impala	2008	A	26.5	15.8	1.6
572	20130609	Chevy	Impala	2008	C_F	56.9	15.9	1.1
573	20130609	Chevy	Impala	2008	C_NF	25.9	15.6	1.7
574	20130609	Chevy	Impala	2008	1_F	62.1	5.9	0.7
575	20130609	Chevy	Impala	2008	1_NF	22.2	17.7	1.9
576	20130609	Chevy	Impala	2008	3	34.5	19.3	1.6
577	20130623	Dodge	Avenger	2012	A	30.9	15.4	1.5
578	20130623	Dodge	Avenger	2012	C_F	53.3	18.1	1.1
579	20130623	Dodge	Avenger	2012	C_NF	23.3	14.8	1.6
580	20130623	Dodge	Avenger	2012	1_F	65.0	7.8	0.8
581	20130623	Dodge	Avenger	2012	1_NF	23.3	20.3	2.0
582	20130623	Dodge	Avenger	2012	3	36.3	18.8	1.7
583	20091024	VW	Jetta	2006	A	30.5	20.2	1.4
584	20091024	VW	Jetta	2006	1_F	40.3	17.9	1.3
585	20091024	VW	Jetta	2006	1_NF	23.5	18.8	1.5
586	20110911	Honda	Accord	2006	A	24.0	17.0	2.0
587	20110911	Honda	Accord	2006	1_F	64.4	7.1	0.8
588	20110911	Honda	Accord	2006	1_NF	16.8	19.7	2.4

589	20120915	Acura	RSX	2003	A	24.6	16.5	1.6
590	20120915	Acura	RSX	2003	1_F	65.2	5.7	0.7
591	20120915	Acura	RSX	2003	1_NF	21.0	17.3	2.6

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