

## CARBON REDUCTION SPREADSHEET - SCHOOL TRANSPORTATION NEWS, JULY 2010

Created by Dr. Joseph Schwieterman  
 The Chaddick Institute for Metropolitan Development  
 DePaul University

### Inputs and Assumptions

School Buses in service	480,000	Assumption	
Student-trips daily per bus	54	Assumption	
Bus boardings/year per child to school	400	Assumption	(includes limited summer operations)
Number of days buses operator for extracurricular events	300		
Number of kids daily, extracurricular trips (roundtrips)	5,000,000		
Number of kids using school buses daily	25,920,000	Calculation (D8*D9)	
Total school-kid boardings/year to/from School	10,368,000,000	Calculation (d10*D11)	
Estimated extra-curricular trips	3,000,000,000		
Total estimated trips	13,368,000,000		
Average student miles per bus mile driven	15	Assumption	(includes adjustment for empty miles to service/storage)
School bus mileage/gallon	7	Assumption	
Auto mileage/gallon	25	Assumption	
Carbon per gallon - diesel/jet fuel	22	Assumption	
Carbon per gallon - gasoline	19	Assumption	
Average miles/trip on school bus (each way)	5	Assumption	
Average miles/trip in cars (each way)	5	Assumption	
Student transported per car trip	2	Assumption	
Share of auto miles "deadhead" (no kids; e.g., return mileage)	0	Assumption	(miles wasted due to mileage without students in car, such as parent return from drop-off)

### Fuel Reduction/Carbon Reduction Calculations

<i>Inputs and Assumptions in Italics</i>							
	<b>Passenger miles/gallon</b>	<b>Share of Trips</b>	<b>Trips</b>	<b>Psg Miles</b>	<b>Gallons</b>	<b>Carbon Emissions</b>	
<i>Travel that would occur without School Buses</i>							
Drive	23	1	11,362,800,000	56,814,000,000	2,525,066,667	48,986,293,333	
Public Transit	40	0	668,400,000	3,342,000,000	83,550,000	1,838,100,000	
Walk/bike/stay home	None	0	1,336,800,000	6,684,000,000	0	0	
Total		1	13,368,000,000	66,840,000,000	2,608,616,667	50,824,393,333	
				<i>Average mpg</i>	26		
<i>Travel occurring on school buses</i>							
School bus total	98	1	13,368,000,000	66,840,000,000	685,538,462	15,081,846,154	
<b>Carbon emission savings - lbs.</b>						<b>35,742,547,179</b>	
<b>Carbon emission savings - tons</b>						<b>17,871,274</b>	

EPA gasoline: CO<sub>2</sub> emissions from a gallon of gasoline = 2,421 grams x 0.99 x (44/12) = 8,788 grams = 8.8 kg/gallon = 19.4 pounds/gallon

EPA Diesel: CO<sub>2</sub> emissions from a gallon of diesel = 2,778 grams x 0.99 x (44/12) = 10,084 grams = 10.1 kg/gallon = 22.2 pounds/gallon

Source: Dr. Joseph Schwieterman, DePaul University. All rights reserved.