



Draft Pledge Summary

Transportation Mode	# Pledges	% Pledges
Bike (bicycles)	1,166	26%
Rail (Metrorail, MARC, VRE)	1,035	23%
Bus (Metrobus, local bus systems, and commuter buses)	829	18%
Walk	614	14%
Telework	349	8%
Pool (carpools and vanpools)	375	8%
No Mode Selected	129	3%
	4,497	100%

Usual Travel Status	# of Pledges	% of Pledges	Miles Saved on CFD	% of Miles
Alternative Travel Modes	3,233	72%	66,373	71%
Normally SOV	1,097	24%	23,319	25%
No response given	167	4%	3,409	4%
	4,497	100%	93,101	100%

State	# Pledges	% Pledges
Virginia	1489	33.1%
District	1325	29.5%
Maryland	1474	32.8%
No State Selected	105	2.3%
Other	104	2.3%
	4,497	100.0%

Jurisdiction (Sorted by Pledges)	# Pledges	% Pledges
DC District of Columbia	1,368	30%
MD Montgomery County	992	22%
VA Arlington County	405	9%
VA Fairfax County	404	9%
Other/no response given	205	5%
VA Loudoun County	189	4%
VA Prince William County	185	4%
MD Prince George's County	168	4%
VA Alexandria City	141	3%
MD Frederick County	89	2%
MD Howard County	58	1%
VA Stafford County	57	1%
MD Anne Arundel County	47	1%
MD Baltimore City	40	1%
VA Spotsylvania County	30	1%
MD Charles County	28	1%
MD Baltimore County	22	0%
MD Calvert County	21	0%
MD Washington County	16	0%
WV Jefferson County	8	0%
MD St. Mary's County	7	0%
VA Fauquier County	6	0%
WV Berkeley County	6	0%
VA Culpeper County	3	0%
VA Warren County	2	0%

4,497

100%

Jurisdiction (Sorted by Name)	# Pledges	% Pledges
DC District of Columbia	1,368	30.4%
MD Anne Arundel County	47	1.0%
MD Baltimore City	40	0.9%
MD Baltimore County	22	0.5%
MD Calvert County	21	0.5%
MD Charles County	28	0.6%
MD Frederick County	89	2.0%
MD Howard County	58	1.3%
MD Montgomery County	992	22.1%
MD Prince George's County	168	3.7%
MD St. Mary's County	7	0.2%
MD Washington County	16	0.4%
VA Alexandria City	141	3.1%
VA Arlington County	405	9.0%
VA Culpeper County	3	0.1%
VA Fairfax County	404	9.0%
VA Fauquier County	6	0.1%
VA Loudoun County	189	4.2%
VA Prince William County	185	4.1%
VA Spotsylvania County	30	0.7%
VA Stafford County	57	1.3%
VA Warren County	2	0.0%
WV Berkeley County	6	0.1%
WV Jefferson County	8	0.2%
Other/no response given	205	4.6%

4,497

100%



MEMORANDUM

TO: Nick Ramfos, Director, Transportation Operations Programs
FROM: Jinchul (JC) Park
SUBJECT: Emissions Savings from 2016 Car Free Day
DATE: October 28, 2016
CC: Ron Milone, Dusan Vuksan

In response to a request by the Commuter Connections unit, this memo documents the method of estimating emissions based on vehicle miles traveled (VMT) savings ('pledged' VMT) derived from the number of pledges to use alternative modes of travel on the 2016 Car Free Day (CFD) program. This is the fourth year MOVES rates were used to estimate the emissions.

DATA SOURCE

To respond to the Commuter Connections' request, daily emission rates are necessary for pollutants such as volatile organic compounds (VOCs), Oxides of Nitrogen (NOx), fine particles (PM2.5) and greenhouse gases (GHG, represented by CO2 equivalent). The emission rates of those pollutants, with the exception of GHG, can be found in TERMS analysis calculated for the air quality conformity analysis of the 2016 CLRP, which has been released for public comment. GHG rates are available from the MOVES output calculated for the 2016 CLRP. VMT data required for this calculation ('pledged' VMT) reflect VMT savings generated through use of alternative "non-car" modes. They were estimated and supplied by the Commuter Connections unit.

ASSUMPTION

The emissions rates are calculated only for passenger cars and passenger trucks, as those pledged are assumed to use either passenger cars or passenger trucks.

Emission rates and savings are calculated for the TPB Planning Area geography (without the urbanized portion of Fauquier County). Calvert County is a part of the Ozone non-attainment area and is included in NOx and VOC calculations.

METHOD

The method for estimating the emissions is straightforward. Daily emission rates of VOC, NOx, PM2.5 and greenhouse gases are calculated regionally, as described below:

$$\text{Emission Rate} = [\text{Emission}] / [\text{VMT}] \text{ of passenger cars and passenger trucks}$$

Emissions savings are calculated as below:

$$\text{Emissions Savings} = [\text{Emission rate}] \times [\text{Pledged VMT}]$$

ANALYSIS & SUMMARY:

The method has been applied to estimate emissions savings from the Car Free Day program since 2013. Table 1 shows the comparisons of the pledged VMT, emission rates and emissions savings for those years.

Table 1. Emissions Savings from 2013 to 2016 Car Free Day Program

Year	Pledged VMT	Rates (in gr/mile)				Emissions Savings (in short tons/day)				CLRP	AQ Model
		NOX	VOC	GHG	PM2.5	NOX	VOC	GHG	PM2.5		
2013	128,928	0.513	0.351	427.990	0.021	0.073	0.050	60.83	0.00298	2013	MOVES2010a
2014	109,428	0.501	0.344	452.100	0.022	0.060	0.041	54.53	0.00265	2014	MOVES2010a
2015	61,730	0.472	0.372	425.963	0.017	0.032	0.025	28.98	0.00116	2015	MOVES2014
2016	93,101	0.407	0.337	417.199	0.016	0.042	0.035	42.82	0.00164	2016	MOVES2014a

The emissions savings are driven by the amount of the ‘pledged’ VMT. The VMT savings generated through use of other modes were decreasing until 2015, but they did bounce back up in 2016, but not to the 2013 or 2014 levels. The daily emissions savings follow the trend of VMT change.

