

# Commuter Connections TERM Evaluation FY 2015-17 Results- Updated

Presentation to  
Commuter Connections  
Subcommittee  
September 19, 2017  
LDA Consulting  
with  
ESTC, CIC Research, CUTR





Overview and Overall  
Impact Summary



# Objective of Evaluation

- Apply methodology outlined in Evaluation Framework to:
- Estimate effectiveness of 4 TERMS
  - Telework Assistance (MD/VA)
  - Guaranteed Ride Home
  - Employer Outreach
  - Mass Marketing
- Document results of Commuter Operations Center (COC)
- **Changes from Interim Report**
  - Added Telework! VA results
  - Revised results to add CC activity during Jan-Jun 2017 – GRH, Employer Outreach, Mass Marketing, COC, Software Upgrades
  - Added societal benefit cost saving calculation



## Impacts for All TERMS + COC (Jul 2014 – June 2017)

Comparison of collective goals against collective impacts, including  
Commuter Operations Center

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Trips reduced</u>	144,311	155,988	<b><u>11,677</u></b>	<b>+8%</b>
<u>VMT reduced</u>	2,751,265	3,000,953	<b><u>249,688</u></b>	<b>+9%</b>
NOx reduced	1.215 T	0.769 T	<b>(0.446) T</b>	<b>- 37%</b>
VOC reduced	0.639 T	0.548 T	<b>(0.091) T</b>	<b>-14%</b>

### Met vehicle trip and VMT goals.

Shortfall in emission goals due to reduced emission factors  
for 2017 (cleaner cars) and shift to MOVES emission model.

## TERM Analysis Observations

- The four TERMS met the collective goals for both vehicle trips (+14%) and VMT reduced (+17%)
- CC programs overall (TERMs + COC) exceeded the VT reduction goal (+8%) and VMT goal (+9%)
- Telework and Employer Outreach greatly exceeded individual vehicle trip and VMT goals
- Vehicle trip/VMT shortfalls for individual GRH, COC were generally related to lower than expected participation
- TERMS did not meet emissions goals, but this was due to reductions in the 2017 emission factors, compared to the factors used when the goals were established

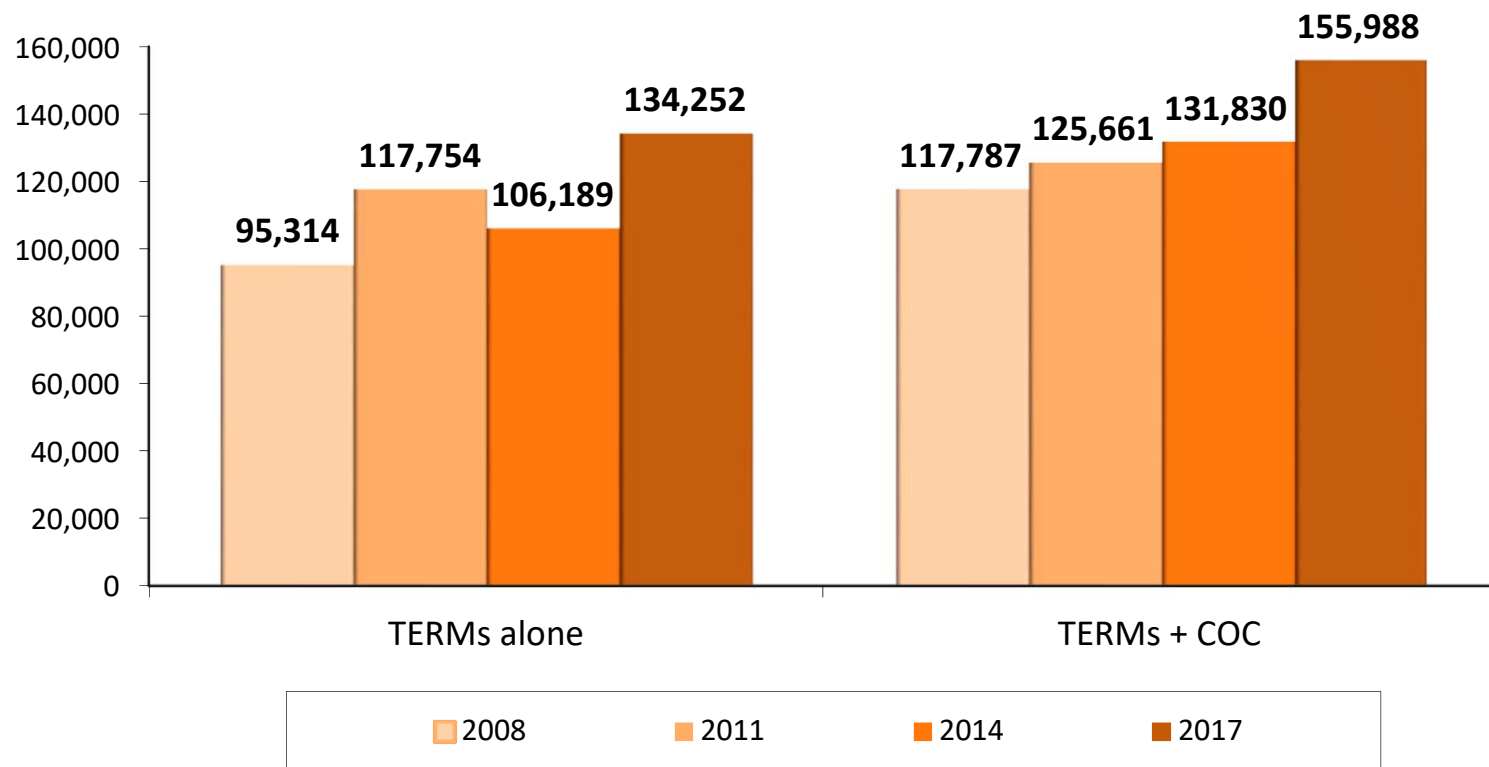


# Veh Trip Reduction – 2005-08, 2009-11, 2012-14, 2015-17

TERMs Alone and TERMs + Commuter Operations Center

TERMs + COC reduced 156,000 vehicle trips in 2017, 32% above 2008

## Daily Vehicle Trips Reduced

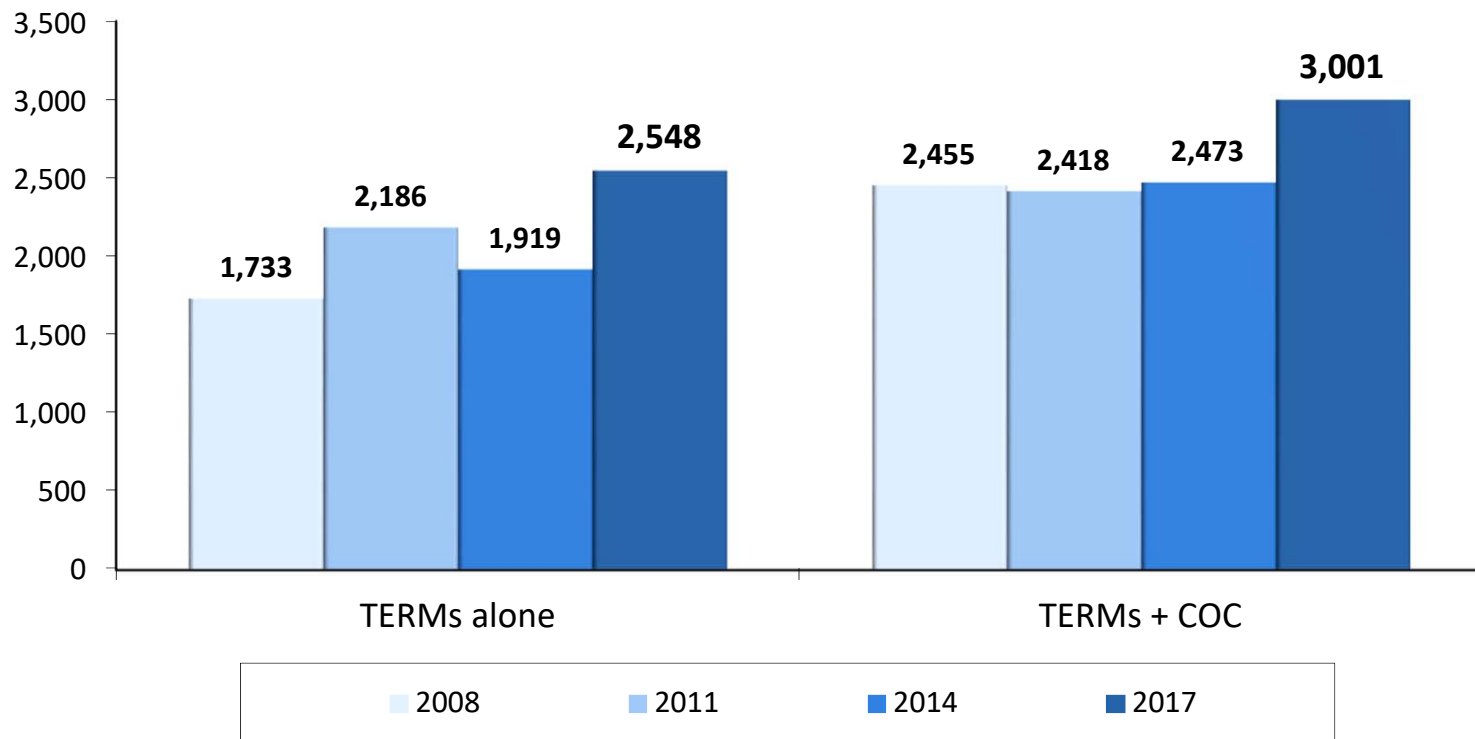


# VMT Reduction – 2005-08, 2009-11, 2012-14, 2015-17

TERMs Alone and TERMs + Commuter Operations Center

TERMs + COC Reduced 3.0 million VMT in 2017, 22% more than in 2008

Daily VMT Reduced (1,000s)



## TERM Societal Benefits

- TERM analysis primarily undertaken to Report TERM performance against regional air quality conformity goals
- TERM also are likely to offer societal benefits – e.g., congestion mitigation, climate change mitigation, improved health/safety
- 2017 TERM analysis added new component to estimate regional cost savings for selected societal benefits:
  - Air pollution/emissions reduction (NO<sub>x</sub>, VOC, PM<sub>2.5</sub>)
  - Global climate change mitigation (reduced CO<sub>2</sub>)
  - Reduction in congestion (reduced hours of peak period delay)
  - Reduction in fuel consumption (gasoline cost saving)
  - Improved health/safety (accidents reduced per 1M VMT)
  - Noise pollution reduction (reduced motor vehicle noise)





# Societal Benefit Cost Savings = Nearly \$1.2 M per Day

Generated by TERM and Commuter Operations Center VT/VMT Impacts

<b>Societal Benefit</b>	<b><u>Benefit Unit</u></b>	<b><u>Base Units</u></b>	<b><u>Cost per Unit</u></b>	<b><u>Daily Cost Saving</u></b>
– Air pollution	Tons pollutants	Varies	Varies	<b>\$3,239</b>
– Climate change	Tons CO2	1,241 T	\$36	<b>\$44,673</b>
– Noise pollution	VMT reduced	3.0 M VMT	\$0.0223	<b>\$66,921</b>
– Congestion	Hr. delay reduced	24,399 hr	\$25.13	<b>\$613,138</b>
– Fuel saving	Gallons fuel saved	166,720 gal	\$2.51	<b>\$418,466</b>
– Health/safety*	Accidents avoided	3.035 acc.	\$15,952	<b>\$48,416</b>
<b>All benefits</b>				<b>\$1,198,091</b>

\* Health/safety - Benefit unit is accidents avoided per 1M VMT;  
Benefit cost per unit is a weighted average of accident occurrence by severity



Telework  
Assistance

## Maryland Telework TERM Impacts

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Number of TCs</u>	31,854	44,350	<b><u>12,496</u></b>	+ 39%
<u>Trips reduced</u>	11,830	14,839	<b><u>3,009</u></b>	+ 25%
<u>VMT reduced</u>	241,208	361,204	<b><u>119,996</u></b>	+ 50%
<u>NOx reduced</u>	0.122 T	0.096 T	<b>(0.026) T</b>	- 22%
<u>VOC reduced</u>	0.072 T	0.070 T	<b>(0.0024) T</b>	- 3%

**Met participation, vehicle trip, and VMT.** Did not meet emissions goals

- TW continues to grow in the region and CC/COG continue to be telework info source
- Impacts represent only CC contribution to regional TW (about 5% of regional TW trips reduced)



## Telework! VA Impacts



	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Number of TCs</u>	800	1,531	<b><u>731</u></b>	<b>+ 91%</b>
<u>Trips reduced</u>	155	490	<b><u>335</u></b>	<b>+ 216%</b>
<u>VMT reduced</u>	2,548	9,356	<b><u>6,808</u></b>	<b>+ 267%</b>
<u>NOx reduced</u>	0.003 T	0.003 T	<b><u>0.000 T</u></b>	<b>0%</b>
<u>VOC reduced</u>	0.001 T	0.002 T	<b><u>0.001 T</u></b>	<b>+ 50%</b>

**Met participation, vehicle trip, and VMT. Also met emissions goals.**



Guaranteed  
Ride Home



## GRH Impacts



	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
GRH participants	36,992	16,742	(20,250)	- 55%
Trips reduced	12,593	5,890	(6,195)	- 49%
VMT reduced	355,136	181,361	(173,775)	- 49%
NOx reduced	0.177 T	0.040 T	(0.137 T)	- 78%
VOC reduced	0.097 T	0.023 T	(0.074 T)	- 77%

Pre FY 2015 “Retained” placements accounted for 11% of trips/VMT reduced

Did not meet goals – declining GRH participation possibly due to lower awareness; in 2016, only 21% of commuters knew a regional GRH program existed vs 59% in 2004



# Employer Outreach



## Employer Participation – Substantial New/Expanded

<u>Employer Group</u>	<u>Employers</u>	<u>Employees</u>
Counted in impacts		
■ Maintained (no change)	1,281	446,035
■ Expanded since June 2014	188	110,207
■ New in 2017 analysis	<u>577</u>	<u>136,028</u>
Total in impact	2,046	692,270
Not counted in impacts		
■ Deleted since June 2014	285	115,011





## EO – Analysis of Vehicle Trip Reduction

- Percentage vehicle trip reduction by program type
  - Overall EO program 9.4% reduction
  - Maintained (base) 8.7% reduction
  - Expanded (additional) 3.2% reduction
  - New 10.0% reduction



### ■ EO – Bicycle

- 597 employers offered bike services (260 new/expanded)
- 346,107 employees at bike worksites
- 0.1% vehicle trip reduction from bike

## EO Impacts – Overall

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Employers</u>	1,844	2,046	<b><u>202</u></b>	<b>+ 11%</b>
<u>Trips reduced</u>	82,120	102,625	<b><u>20,505</u></b>	<b>+ 25%</b>
<u>VMT reduced</u>	1,391,3621	1,841,429	<b><u>450,067</u></b>	<b>+ 32%</b>
<u>NOx reduced</u>	0.559 T	0.474 T	<b>(0.085) T</b>	<b>- 15%</b>
VOC reduced	0.318 T	0.350 T	<b><u>0.032 T</u></b>	<b>+ 10%</b>

**Met participation, vehicle trip, and VMT goals;**  
**Also met VOC goal, but not NOx goal**



## EO Impacts – New / Expanded Programs

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Employers</u>	96	765	<b><u>669</u></b>	<b>+ 697%</b>
<u>Trips reduced</u>	8,618	25,936	<b><u>17,318</u></b>	<b>+ 201%</b>
<u>VMT reduced</u>	140,622	482,153	<b><u>341,531</u></b>	<b>+ 243%</b>
<u>NOx reduced</u>	0.072 T	0.123 T	<b><u>0.051 T</u></b>	<b>+ 70%</b>
<u>VOC reduced</u>	0.046 T	0.090 T	<b><u>0.044 T</u></b>	<b>+ 97%</b>

### Met all goals.

High impact due to large number of employers with new/expanded programs - 765 in 2017.



# Mass Marketing



# Mass Marketing

## Six MM components

- Direct Influence – Commuter changed mode after hearing ad; no other CC contact
- “Referred” Influence – Heard ad, then contacted CC:
  - Share of GRH impact assigned to MM
  - Share of COC (rideshare app) assigned to MM
- ‘Pool Rewards carpool incentive
- Bike to Work Day
- Car Free Day



**'POOL REWARDS**  
it pays to rideshare



## Mass Marketing Impacts

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
<u>Placements</u>	23,168	22,803	(365)	- 2%
<u>Trips reduced</u>	10,809	9,900	(909)	- 8%
<u>VMT reduced</u>	181,932	154,696	(27,236)	- 15%
<u>NOx reduced</u>	0.085 T	0.041 T	(0.044) T	- 52%
VOC reduced	0.025 T	0.018 T	(0.007) T	- 32%

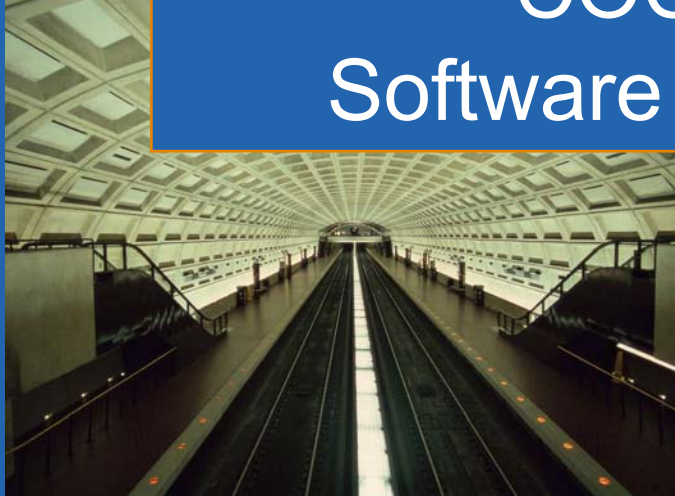
MM was slightly under the placement goal. Deficits were larger for trips and VMT reduced. VMT deficit was larger than VT deficit, because a sizeable share of shifts were to bike/walk and transit, which have shorter than average trip lengths

- 68% of vehicle trip impact from “direct influence,”
- 9% from “referred” influence
- 23% from ‘Pool Rewards, BTW Day, and CF Day events



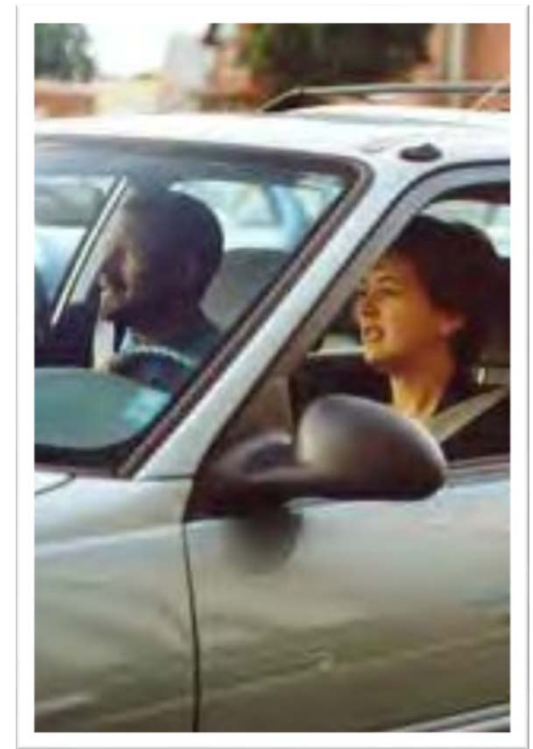


# COC and Software Upgrades



# Commuter Operations Center

- Three components: Commuter Operations Center “basic services,” “Integrated Rideshare–Software Upgrades,” and assisted telework for commuters not covered by the MD/VA Telework TERM
- 77,662 commuters assisted by COC from July 2014-June 2017
  - 35,616 new/reapply, 42,046 follow-up
  - 40% placed into new alt modes  
= 30,953 new alt mode users
- 3,651 Pre-FY 2015 past uses added to analysis for “retention” credit; 20% were still using new alt mode = 710 “retained” alt mode users
- Direct assistance provided to 36,109 teleworkers who live and work outside MD
  - 7.4% of non-MD telecommuters cited CC/COG as TW info source





## COC Impacts – Basic Services (including non-MD TW)

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
Total apps	N/A	N/A	N/A	
Trips reduced	24,425	19,957	(4,468)	- 18%
VMT reduced	512,637	401,567	(111,070)	- 22%
NOx reduced	0.241 T	0.105 T	(0.136) T	- 56%
VOC reduced	0.115 T	0.079 T	(0.036) T	- 31%

Did not meet goals – participation was lower than anticipated

Non-MD telework accounted for

- 64% of COC vehicle trips reduced
- 49% of COC VMT reduced



## Software Upgrades

	<u>Goal</u>	<u>Impact</u>	<u>Net</u>	
Placements	N/A	4,178	N/A	
Trips reduced	2,379	1,779	(600)	- 25%
VMT reduced	66,442	51,340	(15,102)	- 23%
NOx reduced	0.028 T	0.011 T	(0.017) T	- 60%
VOC reduced	0.011 T	0.006 T	(0.005) T	- 42%

Did not meet goals – participation was lower than anticipated





## Questions?

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