

Memorandum

March 24, 2009

To: Travel Management Subcommittee
From: Erin Morrow, COG/DTP
Subject: Progress on Analysis of Greenhouse Gas Reduction Strategies

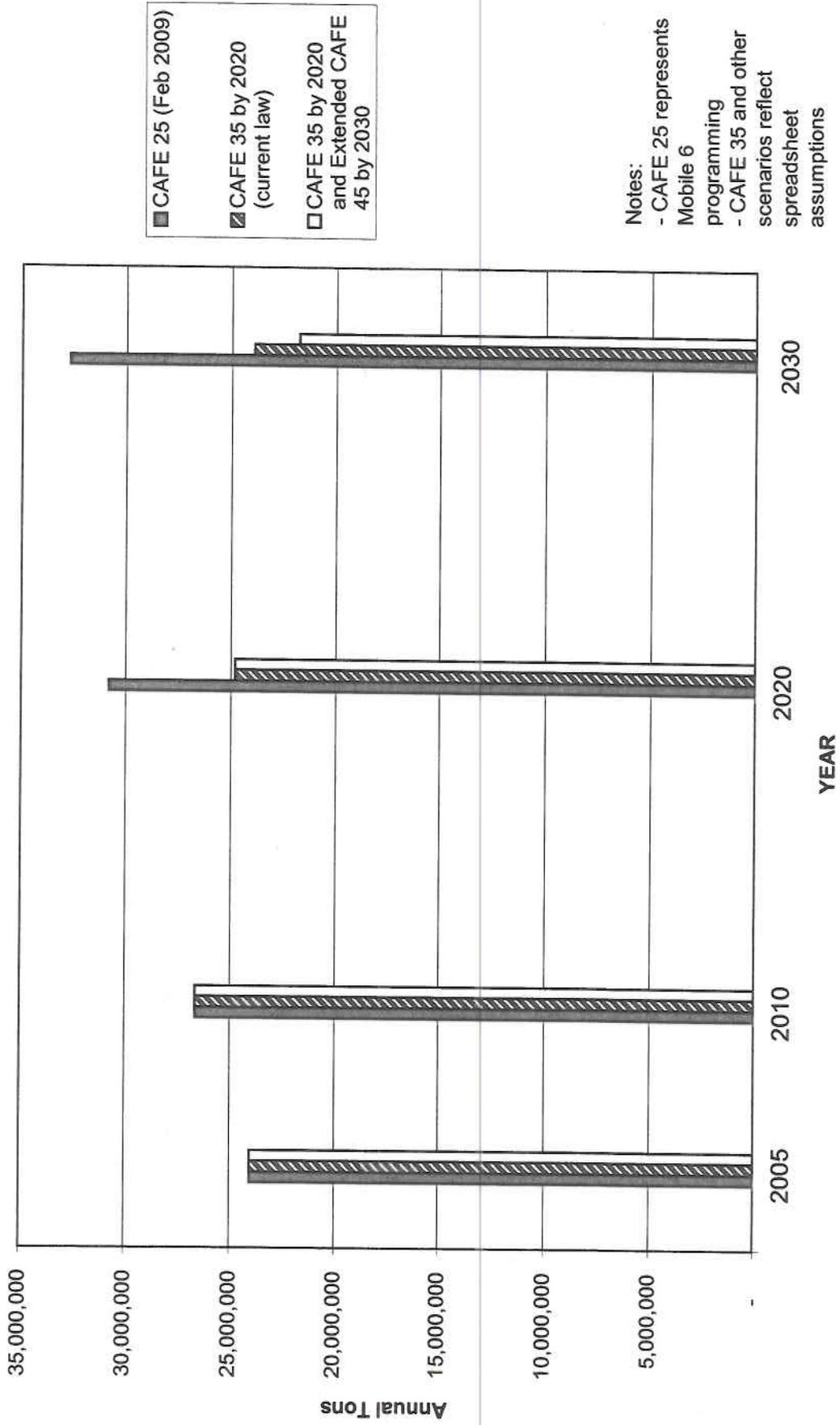
This document contains progress made by staff on the analysis of transportation-related greenhouse gas reduction strategies from the *National Capital Region Climate Change Report*.

Each of the measures has been analyzed for CO₂ emissions reductions using rates that reflect CAFE 35 by 2020. Rates were calculated for inventory years 2010, 2020, and 2030. Linear interpolation was used to calculate rates for other years. These are intermediate rates that will be used until the final GHG rates are prepared.

Attachments

CO₂ Emissions Inventories with Different CAFE Assumptions

Climate Change Measure A.1.ii –Promote Adoption of Clean Vehicles, Including CAL LEV II



Climate Change Measure B.4.i – Expand Commuter Connections Program

Description

Building on the accomplishments of the Commuter Connections Program, develop specific targets for shifting modes from single-occupancy vehicles to transit, walking, and bicycling for commuting and non-commuting trips.

Analysis Approach

- Review TERM evaluation reports
- Determine which existing programs could be expanded
- Discuss opportunities for new programs with the Commuter Connections Program Director
- Develop reasonable goals and target non-commuting trips since most of the existing programs are targeted at commute trips and have reached maturity.

Assumptions

- Based on preliminary three potential new Commuter Connections programs will be evaluated. 1) Develop a Regional Vanpool Incentive Program; 2) Evaluate a regional carpool incentive program (a pilot program is to be implemented in FY 2009); and 3) Expand the regional Telework Program
- Annual CO2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators.

Impact

Travel

Emissions

Costs

Cost-Effectiveness

Climate Change Measure B.4.i – Expand Commuter Connections Program - Carpool Incentive
DRAFT - March 23, 2009

Assumptions

The assumptions for this measure are based on the National Capital Region Transportation Planning Board Commuter Connections Program's *Carpool Incentive Program Demonstration Project Study* which was released on January 27, 2009. A three month pilot project is scheduled to begin in November 2009. Based on commuter information from the Commuter Connections 2004 *State of the Commute*, the average commute in the metropolitan Washington region is approximately 15.5 miles (each way)

The goal of this Carpool Incentive Program is to increase carpooling in selecte corridors in the Washington, DC region. Participants will receive \$1 for each work trip taken by carpool (up to \$2/day/person). Participants must be switching from SOV.

In the report, the VT/VMT reductions were calculated per hour. This measure assumes benefits for two hours in the AM peak and two hours in the PM peak period.

Table 4.6 from the Carpool Incentive Program Demonstration Project Study

Benefits Per Corridor					
	I-66	I-395	I-495 B→T	I-495 295→270	I-270
VT Reduction (per hr)	48	111	124	123	61
VMT Reduction (per hr)	747	1720	1915	1900	941
NOX (ton/hr)	0.0003	0.0008	0.0008	0.0008	0.0004
VOC (ton/hr)	0.0002	0.0005	0.0005	0.0005	0.0003
CO2 (ton/hr)	0.3828	0.8815	0.9816	0.9740	0.4825
PM2.5 (ton/hr)	0.0000	0.0000	0.0000	0.0000	0.0000

Emissions Rates (light-duty vehicles)

2010	462.67	CO2 g/mi
2020	360.03	CO2 g/mi
2030	316.37	CO2 g/mi

Travel Impact

VT Reduction/Hour (all corridors) =	466
VMT Reduction/Hour (all corridors) =	7,223

Daily VT Reduction (all corridors) =	1,864
Daily VMT Reduction (all corridors) =	28,892

VT/year reduced =	7,223,106
VMT/year reduced =	7,223,106

YEAR	Annual CO2 Reductions (ton)	Cumulative CO2 Reductions (tons)
2010	3,684	3,684
2011	3,602	7,286
2012	3,520	10,806
2013	3,439	14,245
2014	3,357	17,602
2015	3,275	20,877
2016	3,193	24,071
2017	3,112	27,182
2018	3,030	30,212
2019	2,948	33,161
2020	2,867	36,027
2021	2,832	38,859
2022	2,797	41,656
2023	2,762	44,419
2024	2,728	47,146
2025	2,693	49,839
2026	2,658	52,497
2027	2,623	55,120
2028	2,588	57,709
2029	2,554	60,262
2030	2,519	62,781

Climate Change Measures B.4.iii-vi – Bicycle and Pedestrian Programs

Description

Fully fund the construction of bicycle/pedestrian paths in the region, as outlined in the regional bicycle/pedestrian plan

Provide incentives to developments that speed improvements in bicycle/pedestrian access and park/ride lots

Address the need for on-road bicycle accommodations and facilities

Promote regional implementation of SmartBike program similar to the ZipCar concept

Analysis Approach

- Estimate reduction in trips reduced if the regional priority (submitted to TPB at the November meeting) bicycle plan is completed

Assumptions

- Use analysis method similar to the one currently used to evaluate bicycle TERMS
- Annual CO2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators.

Impact

Travel

Emissions

Costs

Cost-Effectiveness

Climate Change Measure B.4.iii – Bicycle and Pedestrian Programs - Fully fund the construction of the regional bicycle/pedestrian plan
DRAFT - March 20, 2009

Assumptions

The miles of existing bicycle/pedestrian path and the total miles of proposed bicycle/pedestrian path in the regional plan used for this measure are from TPB's *Bicycle and Pedestrian Plan for the National Capital Region* report (June 2006). Since that report, more bicycle/pedestrian facilities have been constructed. Once staff has an inventory of those facilities, this measure can be updated.

This measure assumes that construction of new facilities begins in 2010 and benefits begin in 2011. Scenario 1 assumes full completion by 2020 and Scenario 2 assumes full completion by 2030.

Table 6-1. Bicycle and Pedestrian Plan for the National Capital Region (June 2006)

Facility Type	Total Miles in 2005	Total miles planned new facilities/upgrades	Total miles in 2030
Bicycle Lane	56	223	279
Shared Use Path	490	461	951
Total	546	684	1230

Emissions Rates (light-duty vehicles)

2010	462.67	CO2 g/mi
2020	360.03	CO2 g/mi
2030	316.37	CO2 g/mi

Scenario 1: Full Completion by 2020

# new cyclists/day per mile of bicycle lane/trail constructed (Ref: TERM 102 (Revised) Priority Bicycle Project =	180
# new cyclists/day due to the full construction of the bicycle/pedestrian plan =	221,845
Motorized trips reduced each day (2/person) =	443,689
% SOV in region =	63%
SOV trips reduced each day =	279,524
average trip length (mi) =	3
VMT reduced each day in 2020 =	838,573
VMT reduced annually in 2020 =	306,078,965

YEAR	Total Miles	Daily VMT Reduction	Annual VMT Reduction
2010	0	-	-
2011	123	83,857	30,607,896
2012	246	167,715	61,215,793
2013	369	251,572	91,823,689
2014	492	335,429	122,431,586
2015	615	419,286	153,039,482
2016	738	503,144	183,647,379
2017	861	587,001	214,255,275
2018	984	670,858	244,863,172
2019	1107	754,715	275,471,068
2020	1230	838,573	306,078,965
2021	1230	838,573	306,078,965
2022	1230	838,573	306,078,965
2023	1230	838,573	306,078,965
2024	1230	838,573	306,078,965
2025	1230	838,573	306,078,965
2026	1230	838,573	306,078,965
2027	1230	838,573	306,078,965
2028	1230	838,573	306,078,965
2029	1230	838,573	306,078,965
2030	1230	838,573	306,078,965

YEAR	Annual CO2 Reductions (tons)	Cumulative CO2 Reductions (tons)
2010	-	-
2011	15,264	15,264
2012	29,835	45,099
2013	43,714	88,813
2014	56,900	145,713
2015	69,394	215,107
2016	81,194	296,301
2017	92,303	388,604
2018	102,718	491,322
2019	112,442	603,764
2020	121,472	725,236
2021	119,999	845,235
2022	118,526	963,761

2023	117,053	1,080,814
2024	115,580	1,196,393
2025	114,107	1,310,500
2026	112,634	1,423,134
2027	111,161	1,534,294
2028	109,688	1,643,982
2029	108,214	1,752,196
2030	106,741	1,858,938

Scenario 2: Full Completion by 2030

# new cyclists/day per mile of bicycle lane/trail constructed (Ref: TERM 102 (Revised) Priority Bicycle Project =		180
# new cyclists/day due to the full construction of the bicycle/pedestrian plan =		221,845
Motorized trips reduced each day (2/person) =		443,689
% SOV in region =		63%
SOV trips reduced each day =		279,524
average trip length (mi) =		3
VMT reduced each day in 2030 =		838,573
VMT reduced annually in 2030 =		306,078,965

YEAR	Total Miles	Daily VMT Reduction	Annual VMT Reduction
2010	0	-	-
2011	62	41,929	15,303,948
2012	123	83,857	30,607,896
2013	185	125,786	45,911,845
2014	246	167,715	61,215,793
2015	308	209,643	76,519,741
2016	369	251,572	91,823,689
2017	431	293,500	107,127,638
2018	492	335,429	122,431,586
2019	554	377,358	137,735,534
2020	615	419,286	153,039,482
2021	677	461,215	168,343,431
2022	738	503,144	183,647,379
2023	800	545,072	198,951,327
2024	861	587,001	214,255,275
2025	923	628,929	229,559,224
2026	984	670,858	244,863,172
2027	1046	712,787	260,167,120
2028	1107	754,715	275,471,068
2029	1169	796,644	290,775,016
2030	1230	838,573	306,078,965

YEAR	Annual CO2 Reductions (tons)	Cumulative CO2 Reductions (tons)
2010	-	-
2011	7,632	7,632
2012	14,918	22,550
2013	21,857	44,407
2014	28,450	72,857
2015	34,697	107,553
2016	40,597	148,151
2017	46,151	194,302
2018	51,359	245,661
2019	56,221	301,882
2020	60,736	362,618
2021	65,999	428,617
2022	71,116	499,733
2023	76,084	575,817
2024	80,906	656,723
2025	85,580	742,303
2026	90,107	832,410
2027	94,487	926,897
2028	98,719	1,025,615
2029	102,804	1,128,419
2030	106,741	1,235,161

Climate Change Measure B.4.vi – Bicycle and Pedestrian Programs - Promote regional implementation of SmartBike program similar to the ZipCar concept
DRAFT - March 20, 2009

Assumptions

The assumptions for this measure are based on an analysis completed by DTP staff in September 2008. On March 19, 2009, DDOT announced the an expansion of the total number of SmartBikes to approximately 500 at 50 racks. In this measure, the DC project will be used as a starting point and increased by 30% to study a regional expansion.

- Each bike is used by 5 people per day
- Trips are 2 miles each, round trip
- Bikes will be used for 20 years (life of contract)
- Cost of project: \$3 million (stimulus money)

Emissions Rates (light-duty vehicles)

2010	462.67	CO2 g/mi
2020	360.03	CO2 g/mi
2030	316.37	CO2 g/mi

Travel Impact

Year 2010

total bicycles =	650
# people / day who use each bike	5
length of trip (roundtrip) mi =	2
VT reduced / bicycle =	10
VMT reduced / bicycle =	10
VT/day reduced =	6,500
VMT/day reduced =	6,500
VT/year reduced =	2,372,500
VMT/year reduced =	2,372,500

YEAR	Annual CO2 Reductions (tons)	Cumulative CO2 Reductions (tons)
2010	1,210	1,210
2011	1,183	2,393
2012	1,156	3,549
2013	1,129	4,679
2014	1,103	5,782
2015	1,076	6,857
2016	1,049	7,906
2017	1,022	8,928
2018	995	9,924
2019	968	10,892
2020	942	11,834
2021	930	12,764
2022	919	13,682
2023	907	14,590
2024	896	15,486
2025	884	16,370
2026	873	17,243
2027	862	18,105
2028	850	18,955
2029	839	19,794
2030	827	20,621