ANALYSIS OF GREENHOUSE GAS REDUCTION STRATEGIES MOBILE SOURCE MEASURES IN MWCOG CLIMATE CHANGE REPORT

DRAFT
OCTOBER 20, 2008

PREPARED FOR DISCUSSION AT THE TRAVEL MANAGEMENT SUBCOMMITTEE

OCTOBER 21, 2008

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD

This document lists the "recommendations for reducing greenhouse gas emissions from transportation and land use" from the *National Capital Region Climate Change Report* which was prepared by the Climate Change Steering Committee for the Metropolitan Washington Council of Governments Board of Directors. The purpose of this document is to begin laying a framework to quantitatively evaluate greenhouse gas reductions from the measures in this report. The description for each of the recommendations comes from the report. The analysis approach and assumptions were prepared by TPB staff. The measure number and name refers to Table 8.III in the climate change report. Changes have been made to some of the titles and the former title from the table is noted. The measures have been divided into three groups. Group A are the measures that will be analyzed by staff and they are: 1-5, 7-11, 17-18, and 20-22. Group B are measures which are goals rather than measures and will not be analyzed and they are: 6, 12-16, and 19. Group C are measures will be analyzed either under the scenario analysis are belong to land use design and outside the scope of this committee and the measures are: 23-28

Climate Change Measure #1 –Promote Adoption of Clean Vehicles, Including CAL LEV II

Description

This work activity will involve evaluating options for promoting use of clean vehicles. The work task will build upon TPB's FY 2009 CO2 mobile source emissions inventory work program. Evaluate the greenhouse gas reduction impacts for options that would increase fleet fuel economy.

I. Evaluate the impact of possible changes to corporate average fuel economy (CAFÉ) standards including
a. different miles per gallon (mpg) and phasing assumptions
b. extension of CAFÉ to cover heavy trucks (19% of mobile CO2 emissions in the region are from heavy-duty trucks). Currently CAFÉ only covers vehicles up to 10,000 lbs.
II. Assess hybrid vehicles/trends
III. Evaluate the impact of CAL LEVII

Analysis Approach

- Any analysis will use the 2008 CLRP and Round 7.1 land use
- Baseline analysis will include 35 mpg CAFÉ by 2020 (on the books)
- Use TPB consultant spreadsheet to evaluate different fleet fuel economy goals (including CAL LEV II) through 2020
- For years beyond 2020, TPB consultant spreadsheet will need to be updated
- The impact of hybrid vehicles in the fleet can be estimated through off-line calculations using 2005 and 2008 registration data

Assumptions

- What is the target mpg standard or range of standards to analyze for the CAFÉ extension e.g., 45, 50 and 55 mpg?
- What would be the CAFÉ target for heavy trucks? (e.g. increasing for the HDDV8B from 5 mpg to 7 mpg which is a 40% increase)
- What should be considered in the cost calculations? (e.g., incremental cost to consumer, savings to the consumer due to reduced fuel usage)

Impact

Travel

Emissions

Annual CO_2 emissions benefit, revised inventories and reductions from 2005, and reductions from 'Business as Usual' in 2020 and 2030 would be calculated.

Costs
Cost-Effectiveness

Climate Change Measure #2 – Provide Incentives for Early Vehicle Retirement

Description

Evaluate the impact of implementing a "Cash-for-Clunkers" program to remove older, higher emitting passenger vehicles (both cars and light-duty trucks such as SUVs) from the roads

Analysis Approach

- Baseline analysis will include 35 mpg CAFÉ by 2020
- Use off-line analysis to calculate emissions reductions which result from the program implementation

Assumptions

- What is the minimum vehicle age and maximum fuel economy for eligibility?
- Should only vehicles that are driven a minimum number of miles each year (e.g. 10,000 miles) be eligible?
- What should the minimum fuel economy requirement for the new vehicle (35 mpg or 45 mpg) purchased be or what should the minimum fuel economy improvement between the old vehicle and new vehicle be (10mpg or 15 mpg)?
- What would the financial incentives be?
- How many vehicles would be eligible each year?
- How many years would the program last?

Impact

Travel

Emissions

Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs

Cost of the incentive program, additional capital cost to the consumer, savings to reduced fuel use to the consumer.

Cost-Effectiveness

Climate Change Measure #3 – Green Fleet Policy

Description

Evaluate the impact of establishing a regional green fleet policy with measurable goals and time tables

Analysis Approach
- Determine which fleets are subject to state and/or local regulation and determine what percentage of the vehicle fleet they comprise.
- Survey public and private fleets (such as transit, taxicabs, rental cars, and refuse haulers) for total number in fleet, current age distribution of fleet, and current vehicle replacement policies and schedules
- Research "green fleet" policies in other areas
- Use offline analysis to calculate emissions benefits for specific region-wide "green fleet" conversion percentages for comparison to the baseline

Assumptions

- Determine definition of "green fleet"
    o Measured by average vehicle age?
    o Measured by average fleet fuel economy?
    o Measured by percentage of fleet comprised of hybrids, etc?
- What are the emission reduction goals?
- What timetables would be established?

Impact

Travel

Emissions

Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs

Cost of the incentive program, additional capital cost to the consumer, savings to reduced fuel use to the consumer.

Cost-Effectiveness

Climate Change Measure #4 – Traffic Engineering and Roadway Improvements

Description

Identify and promote best practices for traffic engineering improvements and roadway management to reduce VMT, congestion and greenhouse gases

Identify locations of significant recurrent congestion, and prioritize investments to reduce congestion

Implement the Metropolitan Area Transportation Operations Coordination Program (improve coordination among traffic agencies for data sharing, incident management)

Analysis Approach

- Research "Traffic Engineering improvements that had a positive impact on greenhouse gas emissions" in other areas
- Cite the benefits of existing TERMS
- Discuss with local DOTs any existing plans for improvements
- Extrapolate TERMS/local programs to the entire region, i.e. review the TERM tracking sheet for local programs that could be applicable throughout the region

Assumptions
- Are there already intersections/areas that local DOTs are already targeting for traffic engineering improvements (such as signal retiming or round-a-bouts) which could be a starting point for analysis?
- Are before/after studies for completed traffic engineering improvement studies available for study?

Impact
    Travel

    Emissions
        Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs
Possibly capital investment for traffic engineering improvements

Cost-Effectiveness

Climate Change Measure #5 – Anti-Idling Initiatives: Rules and Enforcement

Description

Increase enforcement of existing idling regulations to prevent extended vehicle idling

Analysis Approach

- Survey the existing rules for each jurisdiction; enforcement practices; recommendations
- Use spreadsheet analysis to calculate the average CO2 emission rate while idling and the incremental reductions resulting from increased enforcement

Assumptions
- Which vehicle fleets should be studied?
- How many vehicles which are subjected to this rule are in the region on an average day? Is this a year-round measure or peak season?
- What percentage of these vehicles is currently exceeding the idling time limit and by how much?
- How much would enforcement be increased (person hours and/or area)?
- What is the fine assessed for violating idling regulations?

Impact
Travel

Emissions
Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs
Cost of person-hours for increased enforcement (both patrolling and administrative)

Cost-Effectiveness

Climate Change Measure #7 – Shift Short Vehicle Trips to Non-motorized Modes
(formerly: VMT Reduction: Shift Short Trips)

Description

Identify the percentage of auto trips 3, 2, 1, and 0.5 miles and develop a strategy to shift half of these trips to bike, pedestrian, or transit modes and evaluate the benefits

Analysis Approach

- Use household travel survey to identify the number and purpose of short auto trips in the region
- Use a spreadsheet calculation to estimate the CO2 emissions benefit if half of the trips are shifted away from auto mode

Assumptions
- The assumptions for this measure would be a discussion topic for the subcommittee

Impact
    Travel

    Emissions
        Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

Climate Change Measure #8 – Pricing to Reduce Vehicle Travel *(formerly : VMT Reduction: Financial Incentives)*

Description

Evaluate the potential greenhouse gas reduction benefits and costs of using financial incentives (e.g., pay as you travel insurance or congestion pricing) to reduce VMT

Analysis Approach

- Conduct a literature review on financial incentives such as a VMT-based car tax or VMT-based insurance
- Use the travel demand model elasticity values to study congestion pricing strategies such as cordon/area pricing, high occupancy toll lanes, and/or variable priced lanes

Assumptions

Impact
Travel

Emissions
Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

Climate Change Measure #9 – Car Sharing *(formerly: VMT Reduction: Car Sharing)*

Description
Promote car sharing

Analysis Approach

- Conduct a literature review of existing car sharing programs
- Review results of the "Commuter Connections Carshare Survey 2008"
- Identify specific target locations in MD/VA/DC and analyze impact
-

Assumptions

Impact
Travel

Emissions
Annual CO_2 emissions benefit in 2020 and 2030 and cumulative
reductions would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

Climate Change Measure #10 – Parking Policies *(formerly: VMT Reduction: Parking Policies)*

Description
> Examine parking policies and their relation to VMT, and implement new parking policies to reduce VMT

Analysis Approach

- Complete a literature review of parking policies which reduce vehicle travel
- Study on-street parking strategies which reduce the time drivers spend searching for a space
- Use the travel demand model to study the effect of increased parking costs of VMT

Assumptions

Impact
> Travel
>> Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

> Emissions

Costs

Cost-Effectiveness

Climate Change Measure #11 – Financial and Other Incentives to Reduce Vehicle Travel *(formerly: Financial and Other Incentives)*

Description

Strengthen financial and other incentives (e.g., tax rebates, higher parking costs, and transit benefits) to encourage residents to drive less

Analysis Approach

- Study financial incentives for carpools
- Study expansion of the Metrocheck program above the participation reported in the *2005 State of the Commute* report
- Study the impact of preferential and/or subsidized parking currently in the region and possible increase

Assumptions

Impact

Travel

Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Emissions

Costs

Cost-Effectiveness

Climate Change Measure #17 – Alternative Modes: Promote Increased Transit Use

Description
- Examine options to promote the increased use of existing transit capacity
- Evaluate funding requirements for transit incentives and an expanded Metrocheck program

Analysis Approach
- This will no longer be a stand-alone measure
- The expanded Metrocheck program will be studied under Measure #11.
- Options to promote increased transit use are incorporated into Measure #15

Climate Change Measure #18 – Expand Commuter Connections Program *(formerly: Targets for Shifting Modes)*

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

Assumptions
- 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.

Impact

Travel

Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Emissions

Costs

Cost-Effectiveness

Climate Change Measure #20 – Expand Travel Management Plan for New Developments *(formerly: Travel Management Plan for New Developments)*

Description
> Encourage new commercial construction to include a "travel management plan"

Analysis Approach
- Review literature and local experience with travel management plans offered for big developments and their impacts.
- Qualitatively study the effects of amenities such as sidewalks, crosswalks, bike racks and lockers, areas for bus pull-offs and shelters, shower facilities in office buildings, and good pedestrian access

Assumptions

Impact
> Travel

> Emissions

Costs

Cost-Effectiveness

Climate Change Measure #21 – Equalize Transit and Parking Benefits

Description

Promote the equalization of transit and parking benefits. Advocate for federal income tax benefits for transit use that equal or exceed the benefits for employer provides/subsidized parking.

Analysis Approach
- This is similar to TERM M7 – parking cash-out

Assumptions

Impact

Travel

Annual CO_2 emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Emissions

Costs

Cost-Effectiveness

Climate Change Measure #22 – Alternative Modes: Bicycle/Pedestrian Programs

Description

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

Analysis Approach

-   Estimate reduction in trips reduced if the regional bicycle plan is completed

Assumptions
-   Use analysis method similar to the one currently used to evaluate bicycle TERMS

Impact

Travel

Emissions

Annual CO_2 emissions benefit in 2012, 2020 and 2030 would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

<div align="center">**GROUP B**</div>

The following transportation-related recommendations were listed in the *National Capital Region Climate Report*. These recommendations will not be analyzed because they are goals, rather than measures. Some of these goals are currently being studied as part of a "what would it take?" scenario analysis.

Climate Change Measure #6 – VMT Reduction: Goals

Description

> Collaborate with the Transportation Planning Board (TPB) to develop VMT reduction goals for 2012 and 2020 and associated options for meeting those goals

Climate Change Measure #12 – Develop Conformity Process for GHGs

Description

Evaluate how a regional process modeled after the current regional conformity process for air quality planning might be adapted to address greenhouse gas emissions

Climate Change Measure #13 – Stated Goal of GHG Reduction in Transportation Planning

Description

Make greenhouse gas reduction a stated goal of regional transportation planning activities, including the newly launched multi-task stakeholder Greater Washington 2050 Initiative, poised to generate additional growth scenarios, a growth compact, and quality growth strategies

Climate Change Measure #14 – Direct development to TODs

Description
- Evaluate the benefits from achieving a range of possible goals (up to 95%) for directing new residential and commercial growth to designated regional activity centers, including growth around transit as well as mixed-use higher-density development
- Encourage local governments to evaluate opportunities to provide incentives (including zoning changes) to encourage mixed-use development, including workforce housing at transit stations and hubs to reduce sprawl and VMT
- Encourage localities to revisit current land-use plans, in light of current shifts in the real estate market, coupled with high energy costs
- Establish TOD as the region's preferred growth strategy

Climate Change Measure #15 – Expanded Transit Infrastructure and Use

Description

With WMATA, MARC, VRE, and the local transit operators, evaluate the greenhouse gas reduction benefits of specific incremental expansion of transit capacity and commuter rail service

Climate Change Measure #16 – Alternative Modes: Exclusive Transit Use

Description

Evaluate the greenhouse gas reduction benefits of expanding existing and establishing new bus transit routes, lanes, on-ramps, corridors, and intercity high-speed rail

Climate Change Measure #19 – Alternative Modes: Enhance Access

Description

Expand existing and fund new programs to enhance access to transit and alternative modes, commuter connections, guaranteed ride home, telework programs, bike/pedestrian access, and park/ride lots.

GROUP C

The following recommendations are listed in the Climate Report under "land use planning" and will not be studied as part of this analysis.

Climate Change Measure #23 – Land Use Planning – Tree Canopy Preservation

Description

Preserve the region's tree canopy
- Establish a goal and develop a program and plan to achieve "no net loss" in the region's tree canopy. Evaluate the associated benefits and costs
- Consider associated issues related to density and height requirements for buildings

Climate Change Measure #24 – Land Use Planning – Promote Location and Design of New Development Around Regional Activity Centers

Description

Carefully plan the location and design of new, infill, and redevelopment projects

Climate Change Measure #25 – Land Use Planning – Promote Walkable Communities and Affordable Housing Near Transit

Description

Promote regional policies that support walkable communities and affordable housing near transit, and that protect green infrastructure

Climate Change Measure #26 – Evaluate LEED-ND Standards

Description

Evaluate the US Building Council's Leadership in Energy and Environmental Design – Neighborhood Development (LEED-ND) standards for its utility in guiding new development

Climate Change Measure #27 – Comprehensive Planning: Best Practices

Description

Identify best practices enabling local governments to include greenhouse gas reduction and energy efficiency/conservation as elements in their local comprehensive planning

Climate Change Measure #28 – Comprehensive Planning: Environment Review

Description

In cooperation with COG's Planning Directors Committee and local government environmental and energy planners, convene a working group to devise a consistent, standardized methodology for evaluating the greenhouse gas emissions from proposed individual development projects.