

National Capital Region Transportation Planning Board

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November 7, 2008

Memorandum

To: TPB Technical Committee

From: Daivamani Sivasailam

Subject: Transportation and Land Use Strategies for Greenhouse Gas Reduction

This memorandum updates the greenhouse gas (GHG) reduction materials that were mailed to the Committee in support of agenda item # 9, "Report on the Travel Management Subcommittee Activities".

Since the last Travel Management Subcommittee (TMS) meeting on October 21, the COG Board's Climate Change Steering Committee met and made changes to the recommended transportation and land use strategies for greenhouse gas reduction in its draft "National Capital Region Climate Change Report". In order to reflect these changes and staff's recommended next steps, we prepared a matrix which identifies those strategies to be analyzed by DTP staff as technical measures, either under the TMS umbrella or the TPB Scenario Task Force, and those strategies to be discussed as policy measures by the TPB or its Scenario Task Force. Staff also updated the draft "Analysis of GHG Reduction Strategies" report (outline describing the strategies and identifying the approach / assumptions for each measure), which was discussed at the October TMS meeting. In addition the previously developed ranges of CO₂ cost-effectiveness table would be used in the strategy analysis.

The following documents are transmitted in support of these work activities:

- A) Matrix recommending an analysis approach for each transportation and land use measure in the COG Board's draft climate change report,
- B) Revised "Analysis of GHG Reduction Strategies" report, and
- C) Ranges of CO₂ cost-effectiveness for categories of already implemented or planned / programmed TERMS.

Attachments (3)

Analysis Approach for Recommended Measures in the "National Capital Region Climate Report"

Recommendations for Reducing GHG from Transportation and Land Use
Local and Regional Strategies for Government and Business

	Type of Analysis ¹			Comment
	TERM	Scenario	Policy	
A. Increase Fuel Efficiency and Use of Clean Fuel Vehicles				
<i>1. Promote Clean Fuel Vehicles (cars, trucks, buses)</i>				
i. Promote/accelerate adoption of efficient clean-fuel vehicles, including hybrids (cars, trucks, and buses).			X	This is a policy measure rather than a technical measure
ii. Evaluate options for promoting CA LEV-II, extending CAFE requirements past 2020 and to cover heavy trucks, and facilitating adoption of high-mileage vehicles through incentives and tax policies	X			Scope out scenarios for additional CAFÉ regulations and phasing
iii. Assess the benefits from a "Cash-for-Clunkers" program and rebates or tax incentives for the purchase of hybrid vehicles	X			Analyze as a Cash-for-Clunker
<i>2. Adopt regional green fleet policy</i>				
i. Establish a regional green fleet policy with measurable goals and timetables. Target public and private fleets, transit, taxicabs, rental cars, and refuse haulers. Evaluate the benefits of specific "green fleet" conversion percentages	X			Analysis approach: (1) Survey public fleet to assess market (2) Research green fleet policies in other regions (3) Propose and test scenarios accordingly
<i>3. Promote use of clean fuels</i>				
		X		See TPB Scenario Study
B. Reduce Vehicle Miles Traveled (VMT)				
<i>1. Adopt VMT reduction goals</i>				
i. Collaborate with the TPB to develop VMT reduction goals for 2012 and 2020 and associated options for meeting the goals			X	Policy, not technical
ii. Evaluate the potential greenhouse gas emission reduction benefits and costs of using financial incentives (e.g., pay as you travel insurance, tolling, or congestion pricing) to reduce VMT		X		See TPB Scenario Study
iii. Identify the percentage of auto trips under 3, 2, 1, and ½ miles; develop a strategy to shift half of these trips to bike, pedestrian, or transit modes; and evaluate the benefits of such a shift	X			different shift % to be studied
<i>2. Expand transit use (incentives, exclusive transit lanes)</i>				
i. Examine options to promote the increased use of existing transit capacity		X	X	
ii. Evaluate funding requirements for transit incentives and an expanded metrocheck program			X	Policy, not technical
<i>3. Invest/Expand transit infrastructure</i>				
i. With the Washington Metropolitan Area Transit Authority, MARC, VRE, and the local transit operators, evaluate the greenhouse gas reduction benefits of specific incremental expansion of transit capacity and commuter rail service		X		Scenario analysis
ii. Evaluate the greenhouse gas reduction benefits of expanding existing and establishing new exclusive bus transit routes, lanes, on-ramps, corridors, and intercity high-speed rail		X		Scenario analysis
<i>4. Expand commuter options (car sharing, bicycle/pedestrian, financial incentives)</i>				
i. Building on the accomplishments of Commuter Connections, develop specific targets for shifting modes from single-occupancy vehicles to transit, walking, and bicycling for commuting and noncommuting trips.	X			See State of the Commute Report and previous TERM analysis including cost-effectiveness ranges
ii. 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	X			"
iii. Fully fund the construction of bicycle/pedestrian paths in the region, as outlined in the regional bicycle/pedestrian plan.	X			"
iv. Provide incentives to developments that speed improvements in bicycle/pedestrian access, including improvements in sidewalks, curb ramps, crosswalks, and lighting	X			"
v. Address the need for on-road bicycle accommodations and facilities	X			See "Commuter Connections Carshare Survey 2008"
vi. Promote regional implementation of SmartBike program similar to the Zipcar concept	X			Needs further review

5. Promote transit-oriented development/Concentrate future growth in Regional Activity Centers				
i. Evaluate the benefits from achieving a range of possible goals (up to 95 percent) for directing new residential and commercial growth to designated regional activity centers, including growth around transit as well mixed-use, higher-density development		X		Scenario analysis
ii. 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		X		Scenario analysis
iii. Encourage localities to revisit current land-use plans, in light of current shifts in the real estate market, coupled with high energy costs		X		Scenario analysis
iv. Establish TOD as the region's preferred growth strategy			X	Policy, not technical
6. Examine parking policies to reduce VMT				
i. Examine parking policies and their relation to VMT, and implement new parking policies to reduce VMT			X	Policy, not technical
ii. Strengthen financial and other incentives (e.g., tax rebates, higher parking costs, and transit benefits) to encourage residents to drive less			X	"
iii. Advocate for federal income tax benefits for transit use that equal or exceed the benefits for employer provided/subsidized parking			X	"
C. Travel Efficiency				
1. Adopt best practices for traffic engineering improvements and road management to reduce VMT and congestion. Identify locations of significant recurrent congestion, and prioritize investments to reduce	X			See TERM cost-effectiveness ranges
2. Implement the Metropolitan Area Transportation Operations Coordination Program to improve coordination among transportation agencies for data sharing and incident management	X			See TERM cost-effectiveness ranges
3. Enforce existing idling regulations	X			Review regulations and quantify existing conditions
4. Aviation				Refer to Aviation Subcommittee (?)
D. Land Use				
1. Tree canopy preservation - prepare plan to meet "increase regional canopy"				Outside transportation
2. Evaluate LEED-ND standards for new development				Outside transportation
3. Carefully plan the location and design of new, infill, and redevelopment projects				
i. Promote regional policies that support walkable communities and affordable housing near transit, and that protect green infrastructure.		X		Scenario analysis
4. Integrate GHG analyses into comprehensive planning, new capital projects				
i. Quantify projected greenhouse gas emissions from major new transportation and other new capital projects			X	Policy, not technical
ii. Identify best practices enabling local governments to include greenhouse gas reduction and energy efficiency/conservation as elements in their local comprehensive planning			X	"
iii. In cooperation with COG's Planning Directors Technical Advisory Committee and local government environmental and energy planners, convene a working group to devise a consistent, standard methodology for evaluating the greenhouse gas emissions from proposed individual development projects			X	"
iv. Encourage new commercial construction to include a "travel management plan."			X	"
E. Regional Metropolitan Planning Process				
1. Develop regional metropolitan planning process for GHGs				
i. Collaborate with the TPB to evaluate how a regional process modeled after the current regional metropolitan planning process for transportation and air quality planning might be adapted to address greenhouse gas emissions			X	Policy, not technical
2. Make greenhouse gas reduction a stated goal of regional transportation planning activities, including the newly launched multi-stakeholder Greater Washington 2050 initiative, poised to generate additional growth scenarios, and quality growth scenarios.			X	"

<i>3. Consult with other regions around the country to broadly evaluate options for regional approaches to greenhouse gas reductions that include cap and trade and other approaches that might be relevant to our region (e.g., California SB 375), or that might be under consideration in upcoming national climate, energy or transportation legislation</i>			X
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¹ TERM - Sketch planning analysis methods employed in previous SIP and air quality conformity analysis
Scenario - TPB's Scenario Task Force work activities
Policy - TPB policy/goal, rather than a technical assessment

ANALYSIS OF GREENHOUSE GAS REDUCTION STRATEGIES

Transportation and Land Use Measures in the Draft National Capital Region
Climate Change Report

OCTOBER 21, 2008

**REVISED
NOVEMBER 7, 2008**

DRAFT

NATIONAL CAPITAL REGION TRANSPORTATION PLANNING BOARD

This document lists the “recommendations for reducing greenhouse gas emissions from transportation and land use” from the draft *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 recommendations in the report. The description for each of the recommendations comes from the report. The analysis approach and assumptions were prepared by TPB staff.

The recommendations are divided into three groups by the type of analysis which they require. The first group is “TERMs Analysis” which contains technical measures that will be analyzed by staff. The second group is “Scenario Analysis” which contains recommendations to be analyzed in some form by the TPB Scenario Task Force. The third group is “Policy Analysis” which reflects those strategies to be discussed as policy measures by the TPB or its Scenario Task Force.

I. TERMS ANALYSIS SECTION

Climate Change Measure A.1.ii –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 CO₂ 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 A.1.iii – 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 CO₂ 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 A.2.i – 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 CO₂ 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 B.1.iii – Shift Short Vehicle Trips to Non-motorized Modes

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 CO₂ emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

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

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 CO₂ emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Emissions

Costs

Cost-Effectiveness

Climate Change Measure B.4.ii – Programs to Enhance Access to Transit and Alternative Modes

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.

Analysis Approach

Assumptions

Impact

Travel

Annual CO₂ emissions benefit in 2020 and 2030 and cumulative reductions would be calculated using spread sheet calculators

Emissions

Costs

Cost-Effectiveness

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 bicycle plan is completed

Assumptions

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

Impact

Travel

Emissions

Annual CO₂ emissions benefit in 2012, 2020 and 2030 would be calculated using spread sheet calculators

Costs

Cost-Effectiveness

Climate Change Measures C.1 and C.2 – Adopt Best Practices for Traffic Engineering Improvements/MATOC

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 CO₂ 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 C.3 – Enforce Existing Idling Regulations

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 CO₂ 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

II. SCENARIO ANALYSIS SECTION

Climate Change Measure A.3 – Promote Use of Clean Fuel

Description

Promote use of clean fuel

Climate Change Measure B.1.ii – 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

Climate Change Measure B.2.i - Promote Increased Use of Existing Transit Capacity

Description

Examine options to promote the increased use of existing transit capacity

Climate Change Measure B.3.i – 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 B.3.ii - 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 B.5.i-iii – Promote Transit-oriented Development/Concentrate Future Growth in Regional Activity Centers

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

Climate Change Measure D.3.i – 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 D.4.iii – Develop Standard Methodology for Evaluating GHG Emissions

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.

Climate Change Measure D.4.iv - Travel Management Plan for New Developments

Description

Encourage new commercial construction to include a “travel management plan”

III. POLICY ANALYSIS SECTION

Climate Change Measure B.1.i – Develop 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 B.2.i - Promote Increased Use of Existing Transit Capacity

Description

Examine options to promote the increased use of existing transit capacity

Climate Change Measure B.2.ii - Evaluate Funding Requirements for Transit Incentives

Description

Evaluate funding requirements for transit incentives and an expanded Metrocheck program

Climate Change Measure B.5.iv – Establish TOD as Region’s Preferred Growth Strategy

Description

Establish TOD as the region’s preferred growth strategy

Climate Change Measure B.6.i – Examine Parking Policies and Their Relation to VMT

Description

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

Climate Change Measure B.6.ii - Financial and Other Incentives to Reduce Vehicle Travel

Description

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

Climate Change Measure B.6.iii - Equalize Federal 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.

Climate Change Measure D.4.ii – 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 E.1.i – Evaluate a Regional Process to Evaluate GHG Emissions

Description

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

Climate Change Measure E.2 - 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 E.2 – Evaluate Options for Regional Approaches to Greenhouse Gas Reductions

Description

Consult with other regions around the country to broadly evaluate options for regional approaches to greenhouse gas reductions that include cap and trade and other approaches that might be relevant to our region (e.g., California SB 375), or that might be under consideration in upcoming national climate, energy or transportation legislation

Attachment C

CO2 Cost-Effectiveness of TERMS		
	(TIP Projects)	
Number	Category Description	CO2 Cost Effectiveness Range *
1	Access Improvements to Transit/ HOV	\$100 to \$400
2	Bicycle / Pedestrian projects	\$50 to \$100
3	Transit Service improvements	\$100 to \$800
4	Rideshare Assistance Programs	\$30 to \$300
5	Park & Ride Lots (Transit and HOV)	\$100 to \$500
6	Telecommute Programs	\$10 to \$40
7	Signal Optimization	\$30 to \$50
8	Bus Replacement Programs	\$525 to \$775
	* Several locations / applications studied	