Testimony of Steve Winkelman, Center for Clean Air Policy

Senate Committee on Environment and Public Works
"Transportation's Role in Climate Change and Reducing Greenhouse Gases"

July 14, 2009

Chairman Boxer, Ranking Member Inhofe and Members of the Committee: good afternoon. My name is Steve Winkelman. I am the Director of the Transportation Program at the Center for Clean Air Policy (CCAP), an environmental think tank with offices in Washington, DC, New York, Paris, California and Brussels. Since 1985, CCAP has been a recognized world leader in climate, transportation and air quality policy. We work with private and public sector leaders to develop and implement market-based solutions to climate, air quality and energy problems, balancing environmental and economic interests.

Our behind-the-scenes dialogues educate policymakers and help them find economically and politically workable solutions. Our Future Actions Dialogue (FAD) provides in-depth analyses and a "shadow process" for climate negotiators from 30 nations from around the world to help them develop the post-2012 international response to climate change. We also facilitate policy dialogues with leading businesses, environmental groups and governments in the European Union and the U.S. on designing the details of future national and transatlantic climate change mitigation, adaptation and transportation policies.

CCAP played a major role in the design and passage of the SO2 trading system enacted in the 1990 Clean Air Act Amendments and was the lead consultant in the original design of the European Union's Emissions Trading System. It has also helped develop national, regional, state and local climate policies in the U.S. and many other nations, including emission mitigation policies, smart growth initiatives, forestry policies and innovative approaches to climate adaptation. We have ongoing programs in China, India, Mexico and Brazil developing bottom up analysis of what is possible in their major industrial sectors, including steel, cement and electricity.

CCAP's **Vehicle Miles Traveled (VMT) and Climate Policy Dialogue** brings together high-level decision makers and experts on transportation, smart growth and climate policy from all levels of government, private industry, non-profits, and academia. Participants in the dialogue include the secretaries and deputy secretaries of transportation from Kansas, Maryland, Pennsylvania, executives from, the American Association of State Highway and Transportation Officials (AASHTO), the California Air Resources Board and the Sacramento Area Council of Governments (SACOG), and senior representatives from the Federal Highway Administration, the Environmental Protection Agency (EPA), the American Public Transit Association (APTA), New York City, the Brookings Institution, the Bi-partisan Policy Commission, British Petroleum, Exxon, Ford, Honda, Environmental Defense Fund, Natural Resources Defense Council, Smart Growth America and Transportation for America.

The goal of my testimony today is to encourage you to consider the importance of **travel efficiency** measures as you craft comprehensive climate change legislation. Travel efficiency measures include smart growth, public transit, transit-oriented development, improved pedestrian and cycling facilities, travel demand management, transportation system efficiency improvements and freight rail improvements.

In my short time with you today, I would like to leave you with a few key messages:

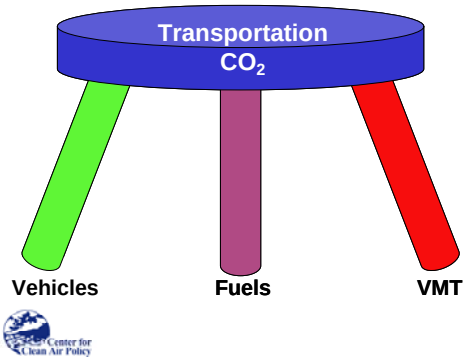
- Reducing vehicle miles traveled (VMT) is critical for climate protection;
- Travel efficiency measures can reduce per capita VMT by 10 percent, reducing emissions growth by 145 $MMTCO_2$ -- equivalent to taking 30 million cars off the road;
- Travel efficiency measures reduce household transportation costs and yield net economic benefits per ton of CO_2 reduced, unlike some other mitigation strategies;
- There are many short-term GHG savings opportunities for communities with new, economic developments and those reinvesting in existing infrastructure; and
- CCAP and the participants in our VMT and Climate Policy Dialogue recommend that Congress dedicate significant cap-and-trade allowance value to fund the **planning, implementation, and measurement** of travel efficiency policies and projects.

The Problem: Growth in Driving is a Major Contributor to GHG Emissions

Nearly one third of GHG emissions in the U.S. come from the transportation sector, making it the nation's largest end-use source of emissions.[1] Moreover, transportation is a rapidly growing source of U.S. emissions, accounting by itself for almost half of the net increase in total U.S. emissions between 1990 and 2007. Climate change policy that ignores transportation will neglect opportunities to meet overall emission reduction goals while increasing the burden on other sectors of the economy.

Transportation GHG emissions result from three factors that can be viewed as a "three-legged stool": vehicle fuel efficiency; the lifecycle GHG emissions of fuels; and how much people drive, as measured in VMT. Each of these elements is important in reducing GHG emissions from the transportation sector.

Congress has taken steps to address the GHG emissions from two legs of the transportation stool. The Energy Independence and Security Act of 2007 (EISA 2007) mandated a 35 mpg Corporate Average Fuel Economy (CAFE) standards by 2035, and an approximately 10 percent reduction in the GHG intensity of motor fuels by 2020. However, that legislation did not address emissions from the third leg of the stool— how much people drive.



As the Senate considers climate legislation in the coming months and evaluates the American Clean Energy and Security Act (ACESA) that recently passed the House of Representatives, you

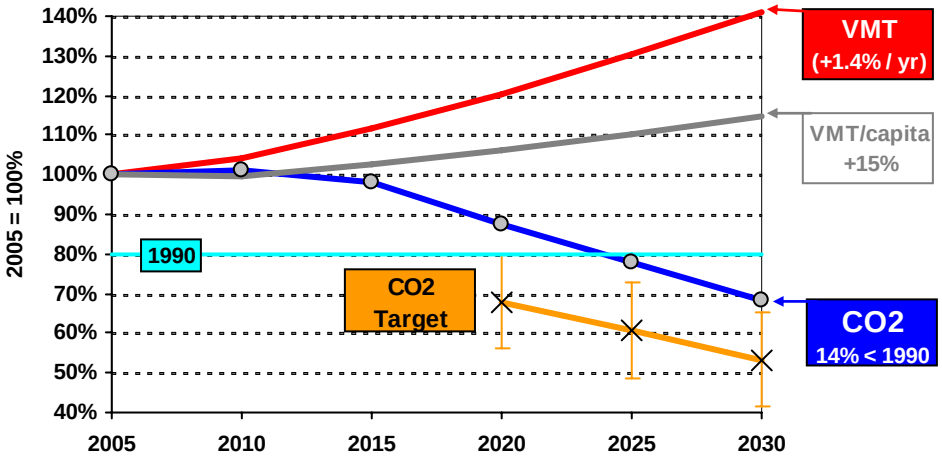
[1] U.S. Department of Energy (USDOE), Energy Information Administration (EIA), "Emissions of Greenhouse Gases in the United States 2007," ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057307.pdf

have an opportunity to make travel more efficient by not only offering Americans healthier, more energy efficient choices for getting from Point A to Point B, but also creating incentives to grow our communities in ways that bring Points A and B closer together.

We need new thinking to move beyond our old transportation policies and investments which have tended to encourage more driving, thereby increasing overall transportation sector GHG emissions. Recent history demonstrates this clearly. Between 1977 and 2007, driving, measured in VMT, grew 110 percent, even though the U.S. population increased only 37 percent. If we do not change how we invest in transportation, driving will continue to increase. If we continue to increase our driving anywhere near this pace, the increased emissions will overwhelm the reductions in emissions from increasing fuel economy standards and lower carbon fuels.

According to the Energy Information Administration (EIA), per-capita VMT will rise 15 percent by 2030.[2] Although this is a slower growth rate than the recent past, it will effectively offset the emissions savings expected from the improved fuel efficiency and low carbon fuels requirements in EISA 2007,[3] and even the new vehicle standards proposed by the Administration (35.5 mpg by 2016). Using EIA's projected growth of travel demand, and assuming major improvements in vehicle efficiency (55 mpg CAFE in 2030) and fuel GHG intensity (15 percent reduction in 2030), CCAP calculates that by 2030 GHG emissions from passenger vehicles would be 14 percent below 1990 levels. While this is an impressive improvement, it is not enough to be on track to economy-wide GHG emissions levels of 60-80 percent below 1990 levels by 2050. In our estimate, the path to the 2050 goal would require GHG emissions to be 20-47 percent below 1990 levels by 2030 (Figure 1).[4]

Figure 1. Passenger Vehicle GHG Emissions Forecast: Business-as-Usual VMT



Source: CCAP calculations based on assumptions of +1.4 percent VMT/year, 35.5 mpg CAFE standard in 2016 and 55 mpg in 2030, 15 percent reduction in fuel lifecycle GHG intensity.

[2] USDOE/EIA, *Annual Energy Outlook 2009*, Table A7. http://www.eia.doe.gov/oiaf/aeo/

[3] Ewing, Reid, Keith Bartholomew, Steve Winkelman, Jerry Walters and Don Chen, *Growing Cooler: The Evidence on Urban Development and Climate Change*, Urban Land Institute, 2008.

[4] This target level assumes equal reductions from all sectors. From a cost-effectiveness standpoint, it is likely that those sectors with cheaper reductions would achieve greater relative reductions. It is also likely, given the deep reductions required, that major efforts will be required from all sectors of the economy – including transportation.

Why Doesn't the Price Signal from Cap and Trade Create Enough Incentive to Reduce VMT?

The price signal from a cap-and-trade system, such as the one proposed in the *American Clean Energy Security act*, will be insufficient to slow growth in VMT. An economy-wide cap-and-trade system effectively sets a price on emissions and, theory says, will stimulate the most cost-effective GHG reductions, as sectors with cheaper emissions reduction potential will achieve greater reductions relative to other sectors. The theory works well when applied to large point sources of emissions. However, it breaks down when it comes to driver behavior for three reasons: (1) modest changes in fuel prices have not historically changed driving behavior, (2) citizens in many parts of the country are stuck in their cars because they do not have convenient travel choices, and (3) transportation infrastructure and land use decisions are made by a multitude of government and private entities such that no single party is in a position to make comprehensive changes in response to a price signal.[5]

In most parts of the country, safe and convenient alternatives to driving, even for very short distance trips like going to the grocery store or soccer field, are limited or non-existent. This lack of transportation choices extends to all types of communities: growing cities, established cities, and revitalizing urban, suburban and rural areas. To address the lack of transportation options, states, metropolitan planning organizations (MPOs) and local governments need funding to expand travel choices for their citizens, reduce VMT growth, improve transportation system efficiency, and achieve GHG reduction goals.

The Solution: Smart Growth, Improved Transportation Choices, and System Efficiency

Smart growth has many definitions, but in general, this term can mean mixed-use, compact, transit-oriented, and infill development. These patterns all promote growth that reduce land and resource consumption and are reinforced by improvements to public transportation and bicycle and pedestrian networks, travel demand management and system efficiency.

The technical literature confirms what common sense dictates – people drive less in places with rich transportation choices. The empirical evidence shows that a typical resident of a traditional, walkable neighborhood emits significantly less transportation GHG emissions than typical auto-oriented development – 30 percent lower on average.[6] For example, there is 40 percent lower VMT in Chapel Hill, North Carolina's Southern Village and 59 percent lower in Atlanta's Atlantic Station development than the regional average. That is more effective than driving a Toyota Prius, and, as I like to say, "sidewalks are as sexy as hybrids!"

The transportation infrastructure and land use decisions we make now will have a tremendous impact on future GHG emissions. In fact, according to Professor Arthur C. Nelson of the University of Utah, more than half of the built environment of the United States we will see in 25 years does not yet exist, giving us an unprecedented opportunity to reshape the landscape.[7] Similarly, while cars last 10-15 years, transportation infrastructure and land use patterns can last

[5] Winkelman, Steve, Tim Hargrave, and Christine Vanderlan, "Transportation and Domestic Greenhouse Gas Emissions Trading." Center for Clean Air Policy, April 2000. http://www.ccap.org/docs/resources/558/Transportation20&20GHG20Trading20(CCAP%202000).pdf.
[6] Ewing et al. (2008), *op cit.*
[7] Nelson, A.., "Leadership in a New Era." *Journal of the American Planning Association* 72, no. 4 (2006): 393-407

for centuries. The opportunity cost of not improving our development patterns is too great to ignore. Just as it may make more sense to fund renewable energy, to displace more carbon intensive fuel sources, it makes sense to prioritize travel efficiency and efficient land use patterns, instead of building additional energy-intensive transportation infrastructure projects.

Market studies, real estate trends, and demographic shifts indicate robust demand for compact, walkable development. A recent study found that 83 percent of Americans want to live in communities that allow them to use their car less often.[8] The current real estate market is saturated with large-lot homes, even as compared to projected demand, while demand for small-lot single family and attached housing types could exceed 18 million and 17 million additional units, respectively, over the next 20 years.[9] In *The Option of Urbanism*, developer Chris Leinberger explains that there is pent-up demand for walkable neighborhoods, and that compact development is poised to dominate the real estate development market in the coming years, as the regulatory and financial environment allows.[10] Federal climate policy can help improve travel options and supportive land use patterns to meet this unmet and growing market demand.

Potential GHG Reductions Available from Transportation in the Long Term

Unchecked VMT growth is a policy choice, not a foregone conclusion. By funding transportation planning and low-carbon transportation projects, and applying comprehensive best practices, the U.S. can achieve the 10 percent per capita reduction needed. In the report, "Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices: An economic case for investment of cap-and-trade revenues," CCAP estimated achievable GHG reductions by looking at case studies of measured and modeled VMT reductions at the states, regional and local levels.[11] CCAP would like to submit this report for the record; the Executive Summary is attached as Appendix A.

Overall, CCAP expects that with comprehensive application of best practices, the transportation sector could reduce VMT per capita by 10 percent. **This 10 percent decline in per-capita VMT would result in annual savings of 145 MMTCO$_2$ in 2030, amounting to 5-6 percent of the 2030 GHG reduction goal in the ACES Act of 2009, passed by the U.S. House of Representatives, and equivalent to the annual emissions of some 30 million cars or 35 large coal plants.**[12]

Examples of Measured VMT Reductions

1) Through comprehensive investments in transit, bicycle and pedestrian infrastructure, the Portland-Vancouver region saw a per capita VMT reduction of 8-10 percent, while national VMT per capita grew by 8 percent. During this same time, population grew by 14 percent and the region grew as an economic center.

[8] National Association of REALTORS®, "2007 Growth and Transportation Survey," 2007. http://www.realtor.org/smart_growth.nsf/Pages/pollingresults?OpenDocument
[9] Nelson, *op cit.*
[10] Leinberger, Christopher. *The Option of Urbanism: Investing in a New American Dream*. Island Press. 2007.
[11] Steve Winkelman, Allison Bishins and Chuck Kooshian, "Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices: An economic case for investment of cap-and-trade revenues" Center for Clean Air Policy, 2009. Available at www.ccap.org.
[12] GHG savings from VMT reduction would be higher if we had assumed lower mpg or fuel GHG savings. Coal plant and car estimates based on current US averages for a 600 MW coal plant and on-road light duty vehicle fleet.

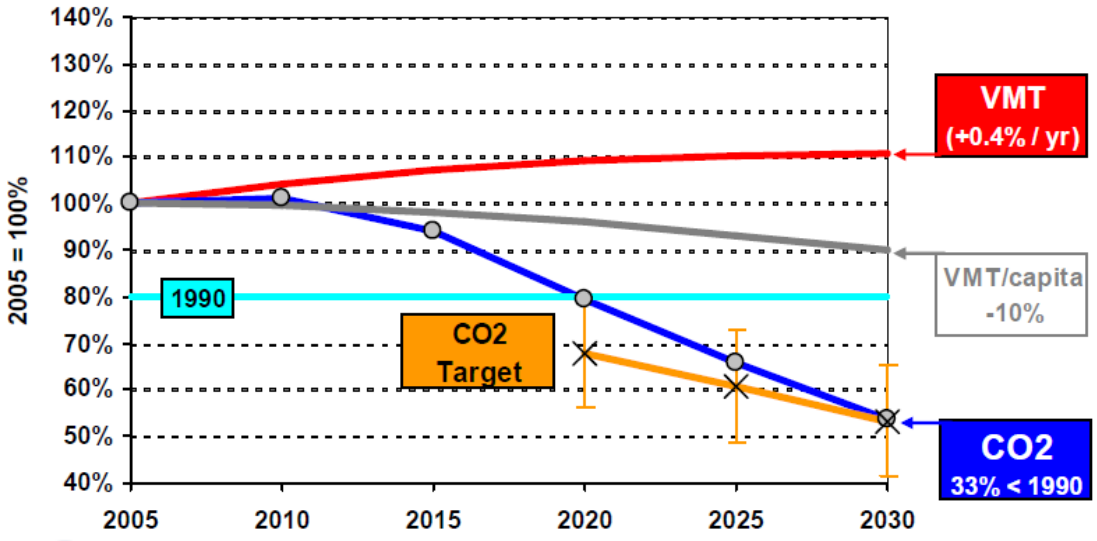
2) In Arlington, Virginia, extensive transit-oriented development policies led to population growth of more than 1 percent per year with no growth in VMT. This would be equivalent to a 20-30 percent reduction in VMT per capita from 1980 to 2005.
3) The Atlantic Station development was projected to reduce per capita VMT by 30 percent, and initial site review indicates a 59 percent reduction in resident VMT and a 36 percent reduction for employee VMT.

Projections of VMT Reductions

1) Sacramento found that the Preferred Blueprint land use scenario will reduce VMT per capita between 6 and 10 percent in 2035.
2) A McKinsey and Company study for Georgia, which included a number of transit, system efficiency and TDM measures, projects a 7 percent reduction in VMT per capita for the Atlanta metropolitan area, from 2010 to 2030.
3) In Growing Cooler, Ewing et al. found that increased density, slower growth in highway construction, faster growth in transit use, and widespread pricing policies could reduce VMT per capita 17 percent below 2007 levels by 2030.
4) The Federal Highway Administration looked at various pricing and transportation management strategies to cut GHGs, and found multiple strategies that individually can yield VMT and GHG reductions of 10 percent or more each.

A 10 percent reduction in VMT per capita from 2005 levels could be achieved with a VMT growth rate of 0.4 percent per year, which, in conjunction with projected population growth rates, would raise overall VMT in 2030 to 10 percent higher than 2005 levels (or 30 percent below EIA projections). Assuming improved vehicle efficiency (55 mpg CAFE in 2030) and fuel GHG intensity (15 percent reduction by 2030), passenger vehicle CO2 emissions would be 33 percent below 1990 levels in 2030 — well on path to meeting GHG reduction goals (Figure 2).

Figure 2. Passenger Vehicle GHG Emissions Forecast: Smart Growth Case



Source: CCAP calculations based on assumptions of +0.4 percent VMT/year, 35.5 mpg CAFE standard in 2016 and 55 mpg in 2030, 15 percent reduction in fuel lifecycle GHG intensity

This reduction in per-capita VMT and GHG emissions is achievable through many different measures, which are outlined below. Some of these reductions are achievable in the short-term, e.g., 1 to 2 years, while others will take longer to implement, similar to investments in GHG reduction technology like carbon capture or plug-in hybrids. Additionally, long-term GHG reduction strategies have short-term benefits that grow as penetration rates increase. Each new transit line, bicycle lane or telecommuting program reduces GHGs, just as each new hybrid vehicle sold or compact fluorescent light bulb installed reduces GHGs.

Economic Benefits of Smart Growth and Improved Travel Choices

Using cap-and-trade revenues to fund smart growth and improved transportation choices is an investment in energy efficiency that yields energy cost savings dividends, similar to switching to an energy-efficient light bulb. Unlike a light bulb, though, travel efficiency investments can also reduce net infrastructure costs, attract private investment and generate new revenue streams. If we ignore the full economic benefits of smart growth and improved travel choices, we will miss inexpensive and money-saving GHG reductions that provide additional benefits to our communities. Many communities are realizing the benefits of smart growth planning and implementations; below I offer a few examples from CCAP's new report.[13] The multiple co-benefits of travel efficiency measures include:

- Reduced infrastructure costs (roads, water, sewer, schools, community services);
- Leveraged private investment and increased local revenues for community development;
- Reduced overall household costs from transportation and utility bills;
- Improved public health and lower health care costs; and
- Improved U.S. energy security.

The Sacramento Area Council of Government's (SACOG) Blueprint planning process used cutting-edge planning software in an extensive public outreach process to explore alternative growth scenarios through 2050. The adopted Preferred Blueprint Scenario features infill development and transportation investments that will reduce GHG emissions and lower infrastructure costs for transportation capital, local streets, water, sewer, flood control, sidewalks, gas, electric and communication facilities. Sacramento calculated the price tag of the Base Case Scenario to be $47.4 billion through 2050 versus $38 billion for the Preferred Blueprint Scenario — a savings of $9.4 billion dollars. One third of the savings are from transportation infrastructure, another third from water infrastructure, and the last third from flood control and dry utilities. SACOG calculates that transit operating costs would increase by about $120 million per year under the Preferred Blueprint Scenario. CCAP calculates that annual consumer fuel expenditures would be $380 million lower under the Blueprint Scenario, and the net present value of the increased transit costs, fuel cost savings and avoided infrastructure costs will be $1.4 billion — not bad for a $4 million investment in visioning! Implementation of the Blueprint plan is projected to reduce emissions by 7.2 $MMTCO_2$ through 2050, which would yield a net economic *benefit* of $198 per ton CO_2 saved.

In Atlanta, CCAP calculates that the Atlantic Station project will reduce CO_2 by a total of 0.63 $MMTCO_2$ over 50 years at a net cost savings, because municipal tax revenues from the project

[13] CCAP 2009, *op cit.*

will be greater than what is required to pay back the initial project loan. Portland, Oregon's investment in bicycle infrastructure is projected to cut 0.7 $MMTCO_2$ with net economic *benefits* of more than $1,000 per ton CO_2. A McKinsey and Co. analysis for Georgia concludes that strategic investments in transit, demand management, and freight could yield net economic benefits of over $400 billion over 30 years. CCAP calculates associated transportation GHG savings of 18 $MMTCO_2$, which totals an economic benefit of $22,000 per ton of CO_2 saved.

Other communities have seen a rapid return on investment from their streetcar projects, where transit investments, coupled with compact land-use strategies can help attract significant levels of private investment, leveraging scarce public resources toward even higher returns. The Center for Transit Oriented Development estimates $1 in public transit investment can leverage up to $31 in private investment. Little Rock, Arkansas spent $20 million of public money on the Little Rock Streetcar, which helped leverage $200 million in private investment; Tampa, Florida spent $60 million in public money in the TECO Streetcar, which helped leverage $1 billion in private investment; and Portland, Oregon spent $73 million on the Portland Streetcar, which helped attract $2.3 billion in private investments within two blocks of the line, a more than 30-fold return on investment. Thanks to orders from Portland Streetcar, Oregon Iron Works began manufacturing the first U.S.-built modern streetcar in 2008, creating more that 20 new local jobs. In general, investment in public transit represents an important opportunity for job creation and economic development. A 2004 study by the Surface Transportation Policy Project (STPP) found that every $1.25 billion spent on public transit creates approximately 51,300 jobs, while the same expenditure on roads and bridges would create 43,200 jobs.

Achieving such long-term savings requires upfront and sustained investments in transit (capacity and operation), cycling and walking infrastructure, smart growth planning and travel demand management. The climate bill can help jump start these efforts, providing critical resources to states, MPOs and local governments to plan, implement and measure travel efficiency policies and projects. Financial support from climate legislation would enhance state and local capacity to achieve and measure GHG reductions from travel efficiency. This experience will be a critical step toward performance-based federal surface transportation policy that rewards GHG reductions.

Measures that Can Reduce Transportation GHG Emissions in the Short Term

While significant long-term GHG reductions are achievable in the transportation sector, a number of emissions reductions strategies can yield results quickly and at a net savings to society. These strategies fall into three general categories: travel demand management, short term infrastructure projects, and system efficiency. A brief list of these strategies is included below; a more complete list is included in Appendix B. These short term strategies not only support longer term strategies, but many long-term strategies will also have important short-term benefits as well.

1) Travel Demand Management

The term travel demand management includes a wide range of strategies that are aimed at reducing demand for single occupancy vehicle use.

- Comprehensive, Statewide Travel Demand Management Programs

    - In its first two years, the Washington State Commute Trip Reduction Performance Program 1.3 million vehicle trips were avoided, cutting 34 million VMT.
- Telecommuting/Teleworking (working from home)
    - Telecommuters currently save 55-78 MMTCO2 per year, if an additional 10 percent of workers began telecommuting, the US could reduce emissions by about 42 $MMTCO_2$ per year.
- Compressed Work Week (working fewer days) can cut VMT by 10-20 percent.
- Carpooling (commuting with others)
- Parking Cash-out/Parking Pricing (removing the subsidies for parking)
    - One study estimated that firms in Southern California saw a 12 percent reduction in commute VMT when offering parking cash out to their employees.
- Public Information Campaigns (publicizing alternate behaviors)
- Pay as You Drive (PAYD) Insurance (making car insurance based on amount of travel)
    - Changing all car insurance policies to Pay as You Drive Insurance can save money for consumers and insurance companies: up to $60 billion annually, while reducing VMT by 8 percent and reducing crash rates.
- VMT-based Registration Fees (making registration fees based on amount of travel)
- General VMT Fees (charging fees for travel in general)
- Congestion Pricing (charging fees for travel in specific areas)
    - Stockholm instituted a pilot program for congestion charging in 2006 which led to a 22 percent reduction in vehicles entering the zone, reduced injuries by up to 10 percent, and reduced carbon emissions by 14 percent in the central city, and up to 3 percent citywide. During the first year, public transportation use was up 6 percent city wide, 9 percent on inner city routes, and the average morning commute was reduced by almost an hour.

2) Immediate Infrastructure Projects that can Reduce Transportation Demand

Many strategies that are viewed as long term can have short-term impacts, including changes to infrastructure project priority, changes to the land development code, and road design.

- Improving Pedestrian and Bicycle Infrastructure and Accessibility
    - Portland, Oregon, reduced its GHG emissions by 26,500 tons CO_2 in 5 years, and another 36,700 tons CO_2 over the following 5 years, by investing in bicycle infrastructure.
- High Occupancy Toll (HOT) and HOV (High Occupancy Vehicle) Lanes
- Improving Transit and Making Transit More Accessible
    - Reducing headways, extending peak-level service, and reducing fares are all ways to improve transit ridership.
    - Bus Rapid Transit and Dedicated Bus Lanes
    - New York City statistics show that it is possible to have growth in population and employment without a concomitant increase in traffic. Between 2003 and 2007 the city's population grew 2 percent and employment grew 6 percent. Yet citywide traffic went down by 1 percent. How did the new residents and employees travel? How did the system handle all of this growth? With transit, sidewalks and bike lanes. Transit ridership went up by 8 percent during that time period and bicycle commuting rose by 70 percent between 2002 and 2007.

- Reforming Parking Requirements at the Local Level

3) System Efficiency
The term system efficiency generally includes a wide range of strategies that are aimed at improving the flow of traffic, reducing stop-and-go traffic, reducing congestion, and stabilizing travel speeds.

Recommendations for Travel Efficiency in the Climate Bill

As part of CCAP's VMT and Climate Policy Dialogue, we sought the input of a diverse set of transportation stakeholders. The result is our proposal for a Transportation GHG Reduction Incentive Program, which represents CCAP's best attempt to capture the core areas of agreement from the dialogue. The proposal is not intended to represent the specific views of any individual agency, organization or company. In the course of our dialogue some stakeholders indicated they would prefer more performance accountability, while others would prefer more flexibility than presented in this proposal.

The proposal aims to ensure that climate legislation will promote cost-effective GHG reductions. Key elements include:

- Congress would dedicate approximate 10 percent of cap-and-trade allowance value to fund the planning, implementation, and measurement of travel efficiency policies and projects.
- Funding and technical support for improving state and regional data and capacity for planning, implementation and monitoring travel efficiency policies and projects.
- A public, bottom-up goal-setting and planning process for states and MPOs to reduce GHG emissions by improving travel efficiency.
- Competitive grants designed to provide greater funding to entities that achieve greater GHG emissions, or what we call, "Do More, Get More."
- Finally, support is needed to measure results as we move toward performance-based accountability within the program. The proposal includes CCAP's Travel Data and Modeling Recommendations to Support Climate Policy and Performance-Based Transportation Policy.

Conclusions

Our daily travel decisions have a significant impact on GHG emissions. Many Americans are frustrated with their limited travel choices, the time and money they waste stuck in traffic, and their vulnerability to increases in global oil prices. Where high quality choices are available, more and more Americans are riding transit, telecommuting, carpooling, walking and biking.

The legislation you are considering will allow all Americans to align their personal needs, like going to work and spending time with their families, with our national objectives to reduce GHG emissions, achieve energy independence, and create jobs. By investing now in transportation and land use strategies that make our communities more efficient, we can empower people to reduce GHG emissions in ways that are good for the economy and improve their quality of life.

*To save money, improve our communities, and reduce GHG emissions, Congress should dedicate cap-and-trade allowance value to fund the **planning, implementation, and measurement** of travel efficiency policies and projects.*

Giving states, MPOs and the local governments a set of tools and incentives to expand and improve low-carbon travel choices, enhance system efficiency, reduce congestion, and encourage compact growth patterns is an effective way to help achieve local, state and national GHG reduction goals. Directing a significant percent of cap-and-trade allocation values toward travel efficiency measures would not only provide immediate and long-term economic benefits, but would strengthen our communities and help build the foundation for a healthy, vibrant and equitable future.

Thank You.

APPENDIX A
EXECUTIVE SUMMARY

Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices

An economic case for strategic investment of cap-and-trade revenues

The Need to Connect Transportation and Climate Change Policies

Nearly one third of greenhouse gas (GHG) emissions in the U.S. come from the transportation sector, making it the nation's largest end-use source of emissions. Moreover, transportation is the fastest growing source of U.S. emissions, accounting for almost half of the net increase in total U.S. emissions between 1990 and 2007.[14] Transportation GHG emissions are a result of three drivers — vehicle fuel efficiency, fuel emissions and how much people drive, as measured in vehicle miles traveled (VMT). In 2007, Congress addressed the first two drivers by improving Corporate Average Fuel Economy (CAFE) standards and mandating reduced GHG intensity of motor fuels. However, Congress has not put the same effort into improving travel choices to address how much people drive. Historically, U.S. transportation policy and infrastructure investments tend to encourage more driving. If we do not change how we invest in transportation, driving will continue to increase, effectively offsetting the emissions savings expected from the recently improved fuel efficiency and low carbon fuels requirements.

Cap-And-Trade Models Ignore Smart Growth and Transportation GHG Reductions

The price signal from a cap-and-trade system will not be effective in reducing VMT, due to market imperfections and limited transportation choices in many parts of the country.[15] Typical GHG reduction analyses miss the emissions reductions and economic benefits of improved transportation choices and assume a high "cost per ton" for these reductions. They also overlook broader benefits of smart growth and transportation pricing including lower infrastructure costs, consumer fuel cost savings, time saved, lower insurance costs and increased local tax revenues.

Smart Growth and Transportation Choices Reduce Emissions and Save Money

In this report, the Center for Clean Air Policy (CCAP) analyzes the benefits of reducing GHG emissions through smart growth, improved transportation choices, and transportation pricing. With input from Transportation for America, Smart Growth America, Natural Resources Defense Council, Environmental Defense Fund, and HDR Inc., we estimate that comprehensive **application of best practices could reduce VMT per capita by 10 percent** and reduce annual GHG emissions 145 $MMTCO_2$ in 2030 — equivalent to the annual emissions of some 30 million cars or 35 large coal plants.[16] These GHG reductions total approximately 6 percent of the 2030

[14] Energy Information Administration, Office of Integrated Analysis and Forecasting, U.S. Department of Energy. "Emissions of Greenhouse Gases in the United States 2007," ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057307.pdf

[15] Winkelman, Steve, Tim Hargrave, and Christine Vanderlan. "Transportation and Domestic Greenhouse Gas Emissions Trading." Center for Clean Air Policy, April 2000. http://www.ccap.org/docs/resources/558/Transportation20&20GHG20Trading20(CCAP%202000).pdf.

[16] Our calculations assume 55 mpg CAFE standards in 2030 and a 15 percent reduction in fuel GHG intensity. GHG savings from VMT reduction would be higher if we had assumed lower mpg or fuel GHG savings. Coal plant and car estimates based on current US averages for a 600 MW coal plant and on-road light duty vehicle fleet.

GHG reduction goal proposed in the American Clean Energy and Security Act.[17] **Our analysis indicates that these reductions can be achieved profitably,** when factoring in avoided infrastructure costs, consumer savings and projected tax revenue growth. When viewed holistically, many transportation-related emissions reductions are not only cheaper than reductions in the utility and petroleum sectors, but also would help ease the cost of compliance on those sectors.

According to our review of the economic impacts of smart growth, integrated planning can:

- **Reduce infrastructure costs** by approximately 25 percent or more;
- **Attract private investment**, increasing municipal revenues through real estate taxes;
- **Reduce household costs**, freeing up disposable income, especially for working families;
- **Improve energy security** by reducing dependency on oil; and
- **Increase walking and bicycling**, **improve public health** and reduce medical costs.

The report contains case studies at the local, regional, state and national level, which include:

- The **Sacramento** region's smart growth plan is projected to reduce emissions by 7.2 $MMTCO_2$ through 2050. CCAP calculates a net economic *benefit* of $198 per ton CO_2 saved through $9 billion dollars savings on infrastructure and consumer fuel savings.
- In **Atlanta**, CCAP calculates that the Atlantic Station project will reduce CO_2 by a total of 0.63 $MMTCO_2$ over 50 years at a net cost savings, because municipal tax revenues from the project will be greater than what is required to pay back the initial project loan.
- A McKinsey analysis for **Georgia** concludes that strategic investments in transit, demand management, and freight could yield net economic benefits of over $400 billion over 30 years. CCAP calculates associated transportation GHG savings of 18 $MMTCO_2$.
- Rails-to-Trails calculates that **Portland, Oregon's** investment in bicycle infrastructure will cut 0.7 $MMTCO_2$ with net economic *benefits* of more than $1,000 per ton CO_2. The Center for Transit Oriented Development reports that $73 million invested in the Portland Streetcar helped attract $2.3 billion in private investment within two blocks of the line.
- A Brookings Institution study shows that shifting to per-mile car insurance **pricing** could cut VMT and related GHGs by 8 percent yielding insurance cost savings for two thirds of households, averaging $270/vehicle/year and annual societal savings of $50-60 billion.

Conclusion

Smart growth is not only cost-effective compared to other mitigation measures, it can be profitable. If we ignore the full economic benefits of smart growth and improved transportation choices, we miss inexpensive GHG reductions that also provide additional community benefits and reduce the burden on other sectors to reduce their emissions. Dedicating a meaningful portion of allowance value to smart growth planning would be a cost-effective investment that can lower economy-wide GHG mitigation costs. For a more in-depth look of these issues, look for our forthcoming report, "Growing Wealthier: The Economic Benefits of Smart Growth."

[17] 145 MMTCO2 is 5.8 percent of the 2030 savings from covered sources or 4.8 percent of economy-wide GHG reductions in House Report 111-137: http://thomas.loc.gov/cgi-bin/cpquery/R?cp111:FLD010:@1(hr137).

APPENDIX B

Examples of Short Term VMT and GHG Reduction Strategies

1) Travel Demand Management

The term travel demand management includes a wide range of strategies that are aimed at reducing demand for single occupancy vehicle use.

Comprehensive, Statewide Travel Demand Management Programs

- In its first two years, the Washington State Commute Trip Reduction Performance Program avoided 1.3 million vehicle trips were avoided, cutting 34 million VMT. The program exceeded its initial goal by 41 percent.[18]
- Washington State's Regional Mobility Grant Program began supports local efforts to improve transit mobility and reduce congestion with estimated savings of 6.7 million vehicle trips and 130 million VMT since 2006.[19]

Telecommuting/Teleworking (working from home)

- Individual companies like AT&T find that allowing telecommuting increases productivity and job satisfaction among telecommuters, and for AT&T, reducing vehicle emissions by approximately 44,000 metric tons.[20]
- WorldatWork estimated in 2008 that 8 percent of the workforce telecommutes almost daily. The Consumer Electronics Association estimates that telecommuters emit 17 and 23 kg of CO_2 less per day. Therefore, existing telecommuters save between 55-78 $MMTCO_2$ per year.[21]
- According to the American Consumers Institute, if an additional 10 percent of workers began telecommuting, the US could reduce emissions by about 42 $MMTCO_2$ per year. [22]

Compressed Work Week (working fewer days)

- Allowing employees to work a compressed work week, either 40 hours in 4 days or 80 hours in 9 days, reduces that employee's VMT by 20 and 10 percent, respectively. Even a small portion of workers switching to compressed workweeks could significantly impact overall and peak VMT.

Carpooling (commuting with others)

- Providing incentives to employees can reduce single occupancy vehicle trips to the worksite by up to 20 percent. The Organisation for Economic Co-operation and Development (OECD) estimates that adding one additional passenger to every commute trip would reduce overall VMT by 14 percent.[23]

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[18] WSDOT Commute Trip Reduction Performance Grant Program, 2003-2005 Program Report.
[19] WSDOT. Transit Mobility Programs 2008 Annual Report.
[20] World Wildlife Federation, *From Workplace to Anyplace: Accessing the Opportunities to Reduce Greenhouse Gas Emissions with Virtual Meetings and Telecommuting*. 2009
[21] World Wildlife Federation, , *op cit.*
[22] Joseph Fuhr and Stephen Pociask. "Broadband services: economic and environmental benefits," The American Consumer Institute, October, 2007
[23] OECD/IEA *Saving Oil in a Hurry*. 2005. www.iea.org/textbase/Papers/2008/cd_energy_efficiency_policy/5-Transport/5-SavingOil2005.pdf

- The Washington, DC area Commuter Connections program estimates that the ridematching portion of the program reduces 82,000 tons of CO_2 annually.[24]
- The Washington State Vanpool Grant Program has funded 2,360 vans carrying 19,000 daily riders. Since the Grant Program's inception, ridership has increased 53 percent.[25]

Parking Cash-out/Parking Pricing (removing the subsidies for parking)

- One study estimated that firms in Southern California saw a 12 percent reduction in commute VMT when offering parking cash out to their employees.[26]
- Case studies of employer-based programs that involved raising employee parking fees to market rates have shown significant decreases in vehicle use, in the range of a 26 to 81 percent decrease in solo driving.[27]

Public Information Campaigns (publicizing alternate behaviors)

- The OECD estimates that a public information campaign on transportation demand management, plus employer commitments to these strategies, costs only $0.05 per barrel of oil saved , and can save the US 523,000 barrels per day, a daily savings of $26,123,850 per day - fuel not purchased at $50/barrel.[28]
- The OECD estimates that an "eco-driving" campaign could reduce global emissions by 3 percent, while McKinsey and Co. estimates that altering driving behaviors could save 35 $MMTCO_2$ in North America, by 2030 at a net savings to society.[29]
- Portland's SmartTrips Programs provides information to residents each year on reducing drive-alone trips. In 2007, drive alone trips were reduced by 9.4 percent in the target area, the equivalent of 19.4 million vehicle miles of travel or 8,400 tons CO_2 reduced.[30]

Pay as You Drive (PAYD) Insurance (making car insurance based on amount of travel)

- According to the Brookings Institute, changing all car insurance policies to Pay as You Drive Insurance can save money for consumers and insurance companies: up to $50-60 billion annually, while reducing VMT by 8 percent and reducing crash rates.[31]
- While universal Pay as You Drive Insurance may take a decade to be fully implemented, providing tax credits to early adopters could achieve some VMT reductions – about 1000 miles not driven per Pay as You Drive insurance policy - within approximately 2 years. If one percent of policies converted to Pay as You Drive, this would equate to approximately 1.8 billion miles not driven, or 770,000 tons of CO_2.

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[24] National Capital Region Commuter Connections Program, Transportation Emission Reduction Measure Analysis Report, FY2006-2008

[25] WSDOT Vanpool Grant Program, 2007 Status Report

[26] Donald C. Shoup, "The High Cost of Free Parking." Journal of Planning Education and Research, Vol. 17, No. 1, 1997

[27] Federal Highway Administration. *Strategies to Reduce Greenhouse Gas Emissions from Transportation Sources.* pg. 45. 1998

[28] OECD/IEA, *op cit.*

[29] OECD/IEA, *op cit.*

[30] Portland Office of Transportation, *SmartTrips Southeast Final Report*. December 2007

[31] Bordoff, Jason E. and Pascal J. Noel. "Pay-As-You-Drive Auto Insurance: A Simple Way to Reduce Driving-Related Harms and Increase Equity." Brookings Institution. July 2008 http://www.brookings.edu/~/media/Files/rc/papers/2008/07_payd_bordoffnoel/07_payd_bordoffnoel.pdf

VMT-based Registration Fees (making registration fees based on amount of travel)

- The U.S. Environmental Protection Agency estimated that charging registration fees that were based on VMT would reduce overall VMT by up to 3.6 percent.[32]

General VMT Fees (charging fees for travel in general)

- The U.S. Environmental Protection Agency estimated that a VMT fee of $0.02 per mile would reduce overall VMT by up to 5.6 percent.[33]

Congestion Pricing (charging fees for travel in specific areas)

- London instituted a central congestion charge in 2003. In July 2005 the basic charge was raised from £5 to £8 per day. In February 2007 the original central London congestion charging zone was extended westwards, creating a single enlarged congestion charging zone. The number of vehicles in the zone decreased more than 16 percent from 2002 to 2007. Within those five years, bicycle numbers in the zone increased 66 percent. Transport for London estimates that the congestion charge (currently £8) has achieved a 6.5 percent reduction in CO_2.[34]
- Stockholm instituted a pilot program for congestion charging in 2006 which led to a 22 percent reduction in vehicles entering the zone, reduced injuries by up to 10 percent, and reduced carbon emissions by 14 percent in the central city, and up to 3 percent citywide. During the first year, public transportation use was up 6 percent city wide, 9 percent on inner city routes, and the average morning commute was reduced by almost an hour. The trial charge was variable depending on the time of day, but was no more than approximately $2.50. The scheme was made permanent in 2007, and the maximum charge is now approximately $3.75.[35]
- New York's proposed congestion charge – $8 for passenger vehicles, $21 for truck and $1 for taxis – would have produced an estimated 6.8 percent reduction in VMT and 34.3 percent reduction in stop and go traffic in Manhattan south of 86th Street.[36]

2) Immediate Infrastructure Projects that Can Affect Transportation Demand

Many strategies that are viewed as long term can have short-term impacts, including changes to infrastructure project priority, changes to the land development code, and road design.

Adopting Complete Streets Principles and Improving Pedestrian and Bicycle Access to Transit

- Making streets more attractive and safe, through "Transit Connectivity Initiatives," Complete Streets programs, or other enhancement programs tend to increase usage, which in turn can reduce the number of short vehicle trips, increase transit use and reduce GHG emissions.

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[32] OECD/IEA, *op cit.*
[33] OECD/IEA, *op cit.*
[34] Transport for London. *Central London Congestion Charging: Impacts Monitoring, Sixth Annual Report*. July 2008
[35] Leslie Abboud and Jenny Clevstrom, "Stockholm's Syndrome," August 29, 2006, Wall Street Journal, http://online.wsj.com/article/SB115681726625048040.html
[36] Recommendation of the Traffic Congestion Mitigation Commission, 2008 https://www.nysdot.gov/portal/page/portal/programs/repository/TCMC_FINAL_REPORT.pdf

Creating Safe Routes to Schools Programs and Improving Pedestrian and Bicycle Connections

- The Safe Routes to School program in Columbia, Missouri, has five participating schools and reduces GHG emissions by an estimated 19 tons CO_2 per year (within two years of starting the program), with participation of an average of just 280 students (6 percent of student population of those schools). [37]
- Las Cruces, New Mexico, started at Safe Routes Pilot Program for just one school, which was estimated to reduce GHG emissions by 2 tons per year. If the existing rate of implementation is applied to all schools in Las Cruces, it will reduce emissions by 77 tons per year.[38]

Adding Bicycle Lanes and Mixed Use Trails

- Portland, Oregon, reduced its GHG emissions by 26,500 tons CO_2 in 5 years, and another 36,700 tons of CO_2 over the following 5 years, by investing in bicycle infrastructure.[39]
- The New York City Department of Transportation completed its initial 3-year, 200 mile on-street network of bike lanes. This nearly doubles New York City's on street bike network and has led to a 45 percent growth in commuter cycling.[40]
- In Minneapolis, the Toyota Prius would have to comprise 12 percent of the rolling fleet to equal the current contribution of biking and walking. The actual market share of Prius today is less than one per of the new car market.[41]
- There are hundreds of ready-to-go bicycle and pedestrian projects, representing $3.7 billion in unmet need in the U.S.[42]

High Occupancy Toll (HOT) and HOV (High Occupancy Vehicle) Lanes

- Lanes dedicated to high occupancy vehicles, like carpools and buses, allow lower carbon vehicles to travel more quickly, which creates an incentive to use these methods of travel.
- Studies show that converting existing lanes to carpool lanes (such as HOV or HOT), reduces VMT by 0.2 to 1.4 percent.[43]

Improving Transit and Making Transit More Accessible

- Reducing headways, extending peak-level service, and reducing fares are all ways to improve transit ridership[44].
- New York City statistics show that it is possible to have growth in population and employment without a concomitant increase in traffic. Between 2003 and 2007 the city's population grew 2 percent and employment grew 6 percent. Yet citywide traffic went down by 1 percent. How did the system handle all of this growth? With transit,

[37] "Safe Routes to School Steps to a Greener Future: How walking and bicycling to school reduces carbon emissions and air pollutants" Dec 2008, http://www.saferoutespartnership.org/media/file/SRTS_GHG_lo_res.pdf
[38] *Ibid*.
[39] Thomas Gotschi, Rails to Trails, personal communication, July 2009.
[40] Jon Orcutt, NYC Department of Transportation, personal communication, July 2009.
[41] Rails-to-Trails Conservancy. "The Short Trip with Big Impacts: Walking, Biking and Climate Change." August 2007
[42] America Bikes, "Ready to Go Bike and Pedestrian Projects." 2009. www.americabikes.org/docs/America_Bikes_Ready_to_Go_Projects_lr.pdf
[43] OECD/IEA, *op cit.*
[44] American Public Transit Association. *Rising Fuel Costs: Impacts on Transit Ridership and Agency Operations*. September 2008

sidewalks and bike lanes. Transit ridership went up by 8 percent during that time period and bicycle commuting rose by 70 percent between 2002 and 2007.[45]

- The City of Freiburg, Germany saw an increase in transit ridership when it introduced a city-wide, single-fare transit pass. The "Eco-Ticket" was introduced in 1985 and resulted in an increase in transit ridership by 23 percent.[46]
- While ridership is reaching record levels, funding losses are forcing many public transit agencies to cut routes, raise fares, and lay off employees.[47]
- 78 regions in 37 states have proposed 400 new transit projects worth $248 billion.[48]

Bus Rapid Transit and Dedicated Bus Lanes

- In 2007, Eugene, Oregon joined launched a Bus Rapid Transit route that serves Eugene and nearby Springfield in Lane County, which have a combined population of just 200,000. Since the Green Line opened, corridor ridership has jumped by almost 50 percent over the previous bus line.[49]
- The Kansas City Metro Area Express (MAX), the city's first Bus Rapid Transit system opened in 2005. The project was completed in under four years and total capital costs were less than $21M. Daily ridership increased more than 50 percent since service commenced and nearly double the previous ridership along the corridor.[50]
- The Los Angeles Orange Line, which opened in 2005, exceeded the ridership for 2020 within 7 months of opening. By December 2005, the Orange Line had taken approximately 2,200single occupancy vehicles off the road every weekday (14 percent of 16,100 weekday riders). The Orange Line has been estimated to reduce southbound traffic on Highway 101 by 7 percent.[51]

Reforming Parking Requirements at the Local Level

- Local governments can require that developers "unbundle" parking spaces from the sale or rental of housing units, which allows parking to be charged at market rates.
- Local governments can remove parking minimums, which prevents the over-provision of parking. Many local governments are considering parking maximums, to reverse the over-provision of parking in future developments.

3) System Efficiency

The term system efficiency generally includes a wide range of strategies that are aimed at improving the flow of traffic, reducing stop and go traffic, reducing congestion, and stabilizing travel speeds.

[45] New York City Department of Transportation Sustainable Streets Index 2008
[46] Beatley, Timothy. *Green Urbanism: Learning from European Cities*. 2000)
[47] American Public Transit Association, *op cit.*
[48] Center for Transit Oriented Development. "Jump Starting the Transit Space Race." October 2008. http://reconnectingamerica.org/public/display_asset/jumpstartingtransit
[49] Lane Transit District 2009
[50] Kansas City Area Transportation Authority
[51] William Vincent and Lisa Callahan, A Preliminary Evaluation of the Metro Orange Line Bus Rapid Transit Project, 2007, http://www.nbrti.org/docs/pdf/Orange_Line_Preliminary_Evaluation_by_BTI.pdf

Traffic Efficiency and Flow Smoothing (reducing congestion and traffic)

- McKinsey and Co. estimates that smart navigation could save 3 $MMTCO_2$ in North America by 2030, at a net savings to society.[52]
- McKinsey and Co. estimates that highway smart routing could save 12 $MMTCO_2$ in North America, by 2030, at a net savings to society. [53]
- University of California Riverside estimates that congestion mitigation (e.g. ramp metering, incident management), speed management (e.g. enforcement), and traffic flow smoothing techniques (e.g. variable speed limits) can reduce CO2 by 5-12 percent each.[54]

[52] Roads toward a low-carbon future: Reducing CO2 emissions from passenger vehicles in the global road transportation system March 2009, McKinsey & Company
[53] McKinsey & Company, *op cit.*
[54] Professor Matthew Barth, University of California Riverside