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PUBLIC TRANSPORTATION: A CORE CLIMATE SOLUTION

HEARING

BEFORE THE

SUBCOMMITTE ON HOUSING, TRANSPORTATION, AND COMMUNITY DEVELOPMENT

OF THE

COMMITTEE ON
BANKING, HOUSING, AND URBAN AFFAIRS
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

ON

THE IMPACT OF CLEAN TRANSPORTATION INFRASTRUCTURE PROJECTS AND INCENTIVIZING SENSIBLE LAND USE POLICIES AROUND THOSE PROJECTS TO ADEQUATELY ADDRESS EMISSIONS REDUCTION IN THE TRANSPORTATION SECTOR

JULY 7, 2009

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CONTENTS

TUESDAY, JULY 7, 2009

	Page
Opening statement of Senator Menendez	1
Opening statements, comments, or prepared statements of:	
Senator Merkley	2
Senator Dodd	3
Senator Johnson	29
Senator Crapo	29

WITNESSES

Michael A. Replogle, Global Policy Director, Institute for Transportation and Development Policy, and Policy and Strategy Consultant, Environmental Defense Fund	7
Prepared statement	29
Response to written questions of:	
Senator Menendez	51
Clinton J. Andrews, Professor, Urban Planning and Policy Development, Bloustein School of Planning and Public Policy Program, Rutgers University	9
Prepared statement	37
Response to written questions of:	
Senator Menendez	51
Christopher Cabaldon, Mayor, City of West Sacramento, California, and Transportation Vice Chair, Sacramento Area Council of Governments	10
Prepared statement	40
Response to written questions of:	
Senator Menendez	53
Randal O'Toole, Senior Fellow, The Cato Institute	13
Prepared statement	43
Response to written questions of:	
Senator Vitter	54
Ernest Tollerson, Director, Policy and Media Relations, New York State Metropolitan Transportation Authority	15
Prepared statement	49
Response to written questions of:	
Senator Menendez	56

PUBLIC TRANSPORTATION: A CORE CLIMATE SOLUTION

TUESDAY, JULY 7, 2009

U.S. SENATE,
SUBCOMMITTEE ON HOUSING, TRANSPORTATION, AND COMMUNITY DEVELOPMENT,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Subcommittee convened at 9:37 a.m., in room SD–538, Dirksen Senate Office Building, Senator Robert Menendez, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF SENATOR ROBERT MENENDEZ

Senator MENENDEZ. This hearing will now be in order. Let me thank you all for joining us today.

Let me start by congratulating the House of Representatives on passing a cap and trade bill last month. It is quite an accomplishment, something I hope that we can repeat here in the Senate. But one thing that troubled me about the bill, however, was that it fails to chart a course toward lowering emissions in the transportation sector. It has the right targets, but we need the right transportation policies to get there.

The Environment and Public Works Committee is holding a hearing this morning about that Waxman-Markey bill and I think the witness list is telling. They have a witness from the EPA, the Department of Energy, the USDA, the Department of the Interior, but there is no witness for the Department of Transportation. Transportation accounts for nearly one-third of our emissions and yet it does not appear to be on Congress's radar screen as one-third of the solution.

My message in calling this hearing should be crystal clear. If we do not provide substantial resources in the Senate's comprehensive climate bill to fund clean transportation infrastructure projects and incentivize sensible land use policies around those projects, then we will fail to adequately address emissions reduction in the transportation sector.

There is a perception swirling around Washington that we have already done what we can on transportation. After all, Congress and President Obama are raising fuel efficiency standards and we are providing important funding and incentives for plug-in hybrids, electric vehicles, and advanced biofuels, so doesn't that solve the problem. The answer, to put it bluntly, in my view, is no. Pursuing strategies to increase fuel efficiency and cleaning our fuel mix alone will result in failure. We will fail to achieve energy security

in the next 50 years and we will fail to lower carbon emissions in the transportation sector.

Now, why? Well, because the carbon and petroleum savings from these strategies are projected to be completely wiped out by increases in vehicle miles traveled. A recent study projects that even with improvements in fuel efficiency and low-carbon fuels, increased driving will lead to a 34 percent increase in transportation carbon emissions in 2030 from the 1990 levels.

This begs the question: How do we get people out of their cars, or at least give them shorter trips to make in their cars? And the answer is transit coupled with sensible transit-oriented development policies.

I know firsthand from New Jersey's experience with the Hudson-Bergen Light Rail Project and its Transit Villages Program that if you build the right transit project in the right place and couple it with the right incentives, you can completely change development patterns and in turn create more livable communities. But this will not magically happen on its own. We need to finally provide the Federal Transit Administration with the resources it needs to meet local demand.

Right now, there are over $400 billion worth of transit projects on the drawing board just waiting for funding. We are only allowing the FTA to spend roughly $1.5 billion per year. We need to make sure this climate bill provides resources so we can truly give people alternatives to hopping in their cars.

We also need to provide resources to local and regional planners so that they can incentivize more compact development around transit hubs. This creates more sustainable communities where people can walk to the store or take a short trip to the movies.

Together, this substantial investment in transit coupled with transit-oriented development will lower vehicle miles traveled and give us the ability to truly succeed in lowering emissions in the transportation sector.

Let me recognize other colleagues before we start to the witnesses, if they wish to do so. Senator Merkley?

STATEMENT OF SENATOR JEFF MERKLEY

Senator MERKLEY. Thank you very much, Mr. Chair, for convening the hearing, and thank you to our witnesses. This is a very important hearing and it couldn't be more timely. Unfortunately, I will be running to Environment and Public Works in a few minutes and I apologize to all of you that we are double- and triple-booked during this busy time.

I think that it is so important to be diving into this issue. The title of the hearing is correct. Public transit is a core climate solution, but it is also a core energy solution. Two-thirds of our oil is consumed in transportation. We can't address our dependence on foreign oil without reducing oil consumption in the transportation sector. And it is an important solution for our economy. Public transportation creates 19 percent more jobs per dollar invested than road projects do.

In Oregon, we have learned by experience that giving Americans better transportation options and planning communities that make it easier to use public transportation can play a big role in reducing

oil dependence and global warming pollution. I think Portland is sometimes looked at as a model, and by critics sometimes a favorite city to attack, but as we review the statistics, we can't help but keep coming back to the fact that the 1970s plan that would have put highways all over the Portland metro area, yet people would just be sitting on those highways today if we had not built the transit system. In fact, more people go to the downtown now by transit than go by car.

We have had a 44 percent increase since 1998 in transit ridership and we start to see significant savings, $1.5 billion annually on fuel, an enormous factor in an economy the size of Portland, a reduction in vehicle miles traveled per capita, while the same figure has been growing substantially nationally.

The Texas Transportation Institute estimates Portland has 20 percent less congestion than it would otherwise. Total carbon emissions in Portland are below the 1990 levels. And so on and so forth.

So I look forward to reports on the hearing and working with the Chair and others to maximize the role public transit can play in addressing our energy and climate challenges. My home State is now producing the first streetcars that have been built in America in more than a generation and we are excited that many cities are in talks about the possibility of expanding streetcars as an important part of the urban landscape that will improve both the shape of the city, the quality of the inner core, but also allow us to shift to electricity and then generate that electricity from renewable resources. It could have a huge impact on carbon dioxide production and the ability of people to get in a timely manner to and from work and around the city for other activities. Thank you.

Senator MENENDEZ. Thank you, Senator Merkley.

We recognize the distinguished Chairman of the full Committee, Senator Dodd.

STATEMENT OF CHAIRMAN CHRISTOPHER J. DODD

Chairman DODD. Thank you very, very much, and let me thank all of our witnesses this morning for being here and those in the audience who follow these issues as carefully as you do. Let me particularly thank Senator Menendez for holding this hearing and chairing the hearing this morning.

I am going to be leaving briefly. We are still in the mark-up of the health care proposal. We are not quite done with that yet, and with Senator Kennedy's absence, I have been asked to fill in for him in that role. We have had 9 days of mark-ups and we are back at it again this week, so I apologize for not being able to stay as long as I would like, but you are in good hands with Bob Menendez, who knows an awful lot about this issue and cares deeply about it. I was impressed with Senator Merkley's comments, as well, about his State and what they are doing in Oregon, as well.

Just to share a few thoughts with you, the choices we make when it comes to transportation have an enormous impact on our economy, our communities, and our planet, as is obvious to more and more people. Currently, the transportation sector is responsible for nearly a third of all carbon emissions, something I know that our witnesses here will talk about this morning, and is the fastest growing source of greenhouse gas emissions. Automobile transpor-

tation alone accounts for nearly half of the typical two-car family's carbon footprint, by far the largest source of household emissions.

Public transportation, in addition to creating economic opportunity, reducing congestion, and bringing our communities closer together, is incredibly effective in reducing carbon emissions. Already, public transit and the land use it makes possible combine to save more than four billion gallons of gasoline each year, reducing our greenhouse gas output by 37 million metric tons.

Americans understand the dangers of climate change and many families have taken steps to reduce their own carbon footprint. When it comes to transportation, too often, the choices we make are directed by choices that we have, and for far too many families, including in my home State of Connecticut and across the country, public transportation isn't an option as of yet.

Later this month, the Environment and Public Works Committee will take up legislation that seeks to address the climate crisis. We have heard that debate already. It has been ongoing in the other body, the House of Representatives. Already, we have begun to make progress by requiring vehicles to become more fuel efficient and encouraging the development of cleaner energy sources. But the Environmental Protection Agency Administrator, Lisa Jackson, told this Committee only a few weeks ago, and I quote her, she said:

> More efficient vehicles and cleaner fuels simply will not be enough to meet our greenhouse gas reduction and energy independence goals. Reducing the number of miles we drive must be a part of the solution.

End of quote.

I happen to believe she is right. In a typical household, one driver switching to public transportation, we are told, could reduce the family's annual carbon footprint by 8 percent. And as Administrator Jackson added, there is no need to wait for technological breakthroughs in this area to reduce the amount of driving we do. Technology to help people drive less exists today. It is called smart growth.

Investing in public transportation as part of a focus on sustainable development isn't just part of the solution to the climate crisis. It cuts down on traffic congestion, and being from a small State like Connecticut with a lot of congestion, I know a little bit about traffic congestion, as does my colleague from New Jersey. We hear about it and have heard about it for years.

Public transportation saves families money and time, as well. When we combine it with smart land use policy, we can better protect our farmlands and green spaces, and when we combine it with a commitment to build more housing near job centers, we can better connect people with good jobs and economic stability.

For instance, in my State, Connecticut is in serious need of more and better transit options. I have long been an advocate of the so-called Tri-City Corridor between New Haven and Springfield, Massachusetts, that will create new transit villages, get people off our roads, and revitalize our regional economy. We will accomplish this by initiating new commuter rail service and 110-mile-per-hour intercity train service between New Haven and Springfield, with direct connections to New York City and eventually Boston. This project is one of my to priorities and I am going to work with lead-

ers in the State as well as Secretary LaHood to try and get this done.

But we need to do more than simply fund public transportation. We need to rethink the way we approach it as a matter of Federal policy. Earlier this year, I wrote a letter to President Obama urging him to establish better coordination between Federal authorities responsible for transportation, housing, energy, and environmental policy. I was very excited to hear when the President last month—Administrator Jackson was joined by Secretaries LaHood and Donovan to discuss the administration's commitment, not just to sustainable development, but to a more holistic approach as these agencies work together to help our communities grow in a sustainable way in the 21st century.

I think that kind of coordination which is now going on at the White House will help us really develop these kind of sustainable development ideas in a holistic fashion that will bring these respective agencies together in a way that will allow us to address these matters in a far more comprehensive way than the sort of stovepiping that we have done in the past, where agencies and their agendas go off without a lot of thought given to the others and how they all interconnect in a very constructive and positive way to achieve these common and multiple goals that we have, but are unattainable if left simply on their own to try to achieve. They really do depend on each other if you are going to bring them together in a comprehensive, thoughtful manner.

With that, let me thank Bob Menendez again for doing this, and my apologies to the witnesses. I am deeply sorry to all of you, I am not going to be here to listen to your comments and thoughts this morning, but I am very grateful to all of you for your willingness to step up and deal with this.

I have expressed my concerns about this announcement about an 18-month delay I know we are talking about in dealing with these issues. I had hoped that would not be the case, candidly, but there is a lot on the agenda, obviously, to deal with. But this is a critical issue and my hope is that we can move some of these ideas along without necessarily having to wait. This Committee doesn't have to wait for 18 months. We can begin to do an awful lot here in this Committee to highlight the interest and the concerns about these matters and be prepared to take advantage of the moment when it arrives to move forward with a more thoughtful, comprehensive, and progressive and 21st century ideas for transit.

I thank all of you. Thank you, Mr. Chairman.

Senator MENENDEZ. Thank you, Mr. Chairman, and thank you for your leadership in this regard. I have been in those meetings with you and you have made some forceful arguments for a longer-term extension, a full 6-year extension—renewal, I should say, reauthorization—as well as your advocacy on transit has been fantastic, so thank you very much.

Chairman DODD. Thank you.

Senator MENENDEZ. Thanks for joining us.

So now we would like to hear from our witnesses. Let me introduce you all first, and then we will start your testimony.

Michael Replogle is the Global Policy Director at the Institute for Transportation and Development Policy, a New York-based non-

profit group he founded in 1985. As the leading global expert on transportation and the environment, he is a resource and has frequently testified before Congress and State legislatures on transportation policy, finance, pricing, and planning. Both the ITDP and the Environmental Defense Fund have been active in seeking practical solutions to environmental challenges, and we welcome you.

Clinton Andrews is a Professor of Urban Planning and Policy Development at the Rutgers University, Edward J. Bloustein School of Planning and Public Policy in New Brunswick, New Jersey. His research seeks to improve both the process and the substance of environmental decisionmaking. Much of his recent work addresses the link challenges of global warming, energy sector reform, and improving the built environment, spanning transportation, settlement patterns, and buildings. Rutgers has launched initiatives in transportation, energy, and green policy, so thank you for joining us.

Mayor Christopher Cabaldon is serving his fifth term as Mayor, first elected to the West Sacramento City Council in 1996. Being mayor is a labor of love, Mayor, because I did that for 6 years, and I always respect those who have decided to become the mayor, the first line of governmental responsibility. Everybody knows how to get hold of the mayor. During his tenure as Chair of the Sacramento Area Council of Governments, the Metropolitan Planning Organization for the six-county Sacramento region, he led the region's historic blueprint project charting land use strategies and smart growth for future generations. Mayor Cabaldon is a board member and Chair of the Yolo County Transportation District and Capital Corridor Rail Service Board, where he has advocated for expanded transit service, so we welcome you.

Randal O'Toole is a Cato Institute Senior Fellow working on urban growth, public land and transportation issues. In addition to pursuing research on Federal, State, and local planning laws and land use, he is also an expert on forestry practices and he has authored numerous articles and books, and we welcome you.

And Mr. Ernest Tollerson is Director of Policy and Media Relations for the New York Metropolitan Transportation Authority. He joined the Authority as the MTA's Director of Policy and Media Relations in January of 2007. The MTA is the country's largest transit agency. It has put together the Blue Ribbon Commission on Sustainability,[1] staffed by Mr. Tollerson, and the Commission completed a report on sustainability which the MTA is now implementing, and we thank you for joining us, as well.

With that, we will hear from all of you. I ask you to keep your testimony to around 5 minutes. Your full written testimony as you presented to the Committee will be entered into the record.

With that, Mr. Replogle, let us start with you.

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[1] The *Final Report of the Blue Ribbon Commission on Sustainability and the MTA* is available for viewing in Committe files.

STATEMENT OF MICHAEL A. REPLOGLE, GLOBAL POLICY DIRECTOR AND FOUNDER, INSTITUTE FOR TRANSPORTATION AND DEVELOPMENT POLICY, AND POLICY AND STRATEGY CONSULTANT, ENVIRONMENTAL DEFENSE FUND

Mr. REPLOGLE. Thank you very much. Good morning, Mr. Chairman and members of the Committee. Thank you for the chance to testify on behalf of ITDP and Environmental Defense Fund, representing 700,000 members.

We urge you to boost funding and planning requirements for public transportation and other greenhouse gas-reducing transportation initiatives as part of the climate bill that the Senate is considering. The Clean-T bill proposal, S. 575, would appropriately set aside 10 percent of greenhouse gas auction revenues for this purpose, providing a valuable framework to help ensure progress in planning and implementing transit as a core climate solution.

Curbing U.S. transportation emissions is vital to effective climate policy. Transportation accounts for 28 percent of U.S. greenhouse emissions and accounts for 47 percent of the net increase in greenhouse gases between 1990 and 2003. The contribution to global warming of the U.S. transportation sector is larger than any nation's entire economy, with the exception of China. To avert the worst impacts of global warming, we must substantially cut America's transportation greenhouse gases.

We strongly support a national cap on greenhouse gases as a cost-effective framework for climate action. But in transportation, complementary policies are needed to boost vehicle efficiency, reduce carbon fuel intensity, improve system operations, and damp the growth of vehicle miles traveled.

While Congress and the administration have recently taken action to require more fuel-efficient vehicles and encourage lower-carbon fuel, this leaves unaddressed key opportunities for highly cost-effective reductions in transportation greenhouse gases through smart transportation investment and system management.

Transportation greenhouse gas growth stems mainly from increased vehicle use, which will again double by 2030, barring changes in policy. This threatens to counter the greenhouse gas benefits of new CAFE standards and fuel requirements. Effective climate protection requires Federal action to expand efficient transportation options with requirements that transportation plans and programs achieve climate protection goals, with funding tied to performance.

Personal vehicle travel is among the least efficient of passenger modes and makes up 62 percent of transportation greenhouse gases. Policies to expand and improve transit, rail, walking, biking, and ride sharing are crucial to achieving transportation-related greenhouse gas emissions. If U.S. transit use tripled by 2020, annual transportation greenhouse gas emissions would fall by 142 million metric tons, an 8-percent drop.

The potential for transit to cut greenhouse gases can be multiplied four times or more when integrated with the effective development patterns of livable communities, which expand travel options and allow families to live closer to their daily needs. This cuts emissions by shortening or eliminating motor vehicle trips.

The 2008 Growing Cooler study found that best practice transportation and livable community policies together can reduce transportation greenhouse gases up to 38 percent. Such investments also create more middle-class jobs per dollar of spending than expanding roads and cut consumer transportation, health costs, and infrastructure costs.

A new report by the Center for Clean Air Policy showed how investing in greenhouse gas reductions through transportation and livable communities strategies can reduce the cost of meeting greenhouse gas reduction goals, yielding net negative costs per ton. But in order to value these, we need to recognize the co-benefits that transportation investments produce in reducing health costs, reducing vehicle operating costs, and the like.

A recent EDF report shows how urban, suburban, exurban, and rural communities are investing in innovative cost-effective transit to boost mobility and cut emissions using streetcars, vanpools, and bus rapid transit. A recent study done by ITDP and EDF together for Mexico City showed how a bus rapid transit system there that is being developed as we speak will cut greenhouse gases by six million metric tons by 2012. Similar opportunities exist throughout the Americas, in Asia, and Africa.

To conclude, if we are to ensure transit and transportation policies contribute their full potential to cost-effective, timely greenhouse gas reduction, Congress should restructure transportation funding programs into performance-driven system preservation and competitive capacity expansion programs, as recently recommended by the bipartisan Transportation Commission and Transportation For America.

Two, Congress should lower regulatory and procedural barriers to expansion and improvement of transit systems, speeding the process of delivering and financing well-designed transit projects while encouraging innovation in transit system design and operations planning, such as bus rapid transit and paratransit.

Three, Congress should ensure that transportation plans and programs contribute proportionally with other sectors to meet greenhouse gas goals by tying funding to performance, ensuring modal and operational alternatives that advance timely achievement of national goals are considered in the planning process, and allocating a portion of climate revenues to plan and implement greenhouse gas-reducing transportation plans.

Four, Congress should support initiatives for livable communities, such as the partnership being formed by the Obama administration, as well as forthcoming legislation on this being promoted in this Committee.

And finally, Congress should ensure U.S. foreign assistance and trade promotion programs, carbon finance incentives, and climate negotiation policies give attention to boosting greenhouse gas efficient transportation and urban development.

Thank you.

Senator MENENDEZ. Thank you.

Professor Andrews?

STATEMENT OF CLINTON J. ANDREWS, PROFESSOR, URBAN PLANNING AND POLICY DEVELOPMENT PROGRAM, BLOUSTEIN SCHOOL OF PLANNING AND PUBLIC POLICY, RUTGERS UNIVERSITY

Mr. ANDREWS. Good morning, Chairman Menendez and Senator Warner and other interested parties here. Thanks for inviting me to testify today.

What I want to do is make three points in the next few minutes. The first is that the problem of global warming is large enough that it requires sustained efforts on multiple fronts and transit is definitely one of those fronts.

The second point I want to make is that to be cost effective, transit projects should be tailored to local conditions, settlement patterns, and unmet demands.

And the final point that I want to make is that there are many additional reasons to enhance the viability of the transit option in the nation's transportation system beyond its greenhouse gas reduction benefits.

I want to elaborate on the first two of those points a little bit. First, there are really three main types of greenhouse gas emission reduction options. The first is using energy much more efficiently or more frugally. The second is switching to low-carbon and no-carbon energy sources. And the third is sequestering carbon in natural sinks, such as trees and soil, or by means of geoengineering techniques.

In transportation, we can achieve energy efficiency by increasing miles per gallon, of course, or by reducing vehicle miles traveled by changing settlement patterns, altering the structure of travel demand, such as with telecommuting, or shifting to other modes, including transit and biking and walking. None of these options can do the whole job, and hence there is a need for a multi-pronged approach to the problem.

The appropriate analogy, I think, is to a portfolio of investments in which the Nation balances risks and returns overall by choosing a diverse mix of solutions with complementary strengths and weaknesses. For the transportation sector, this boils down to pursuing higher miles per gallon and lower carbon emissions per gallon, biofuels and electric vehicles, private vehicles and public transit, smarter long-distance networks and more walkable neighborhoods.

While it is tempting to demand a marginal analysis that asks what single choice is most cost effective, there really is no universal answer to that question that applies nationwide and for all time. So it is appropriate to delegate some—not all, but some of these decisions to the States and the MPOs and to the marketplace.

States and MPOs in particular can play key roles in decarbonizing the U.S. transportation sector by developing locally appropriate portfolios of solutions. It is only in the context of specific timeframes, settlement patterns, transportation networks, and natural resource endowments that one can identify which solutions are the most cost effective.

In the short run, local and regional transportation planners must work with the settlement patterns they have. Empty buses and trains are not greenhouse gas efficient or cost effective. In the

longer run, the problems of low ridership often disappear and transit investments can actually catalyze growth based on the experience to date with transit-oriented development, such as we have seen along the Hudson-Bergen Light Rail Line that the Senator mentioned.

A hard-nosed policy, however, would more often build transit in response to demand rather than ahead of it. This suggests that the marginal transit dollar should be aimed at existing and obvious capacity constraints, such as the needed additional rail tunnel under the Hudson River connecting New Jersey and New York.

In sum, transit serves as a core climate change solution. However, the specific type of transit and appropriate level of investment varies by locality, implying that more decisionmaking authority over the allocation of funds among modes should devolve to the regional planning agencies. Each such agency should be expected to create and follow a greenhouse gas action plan that guides investment priorities in a way that reflects national greenhouse gas emission reduction targets, regional network needs, local land use patterns, and adaptation requirements, because we are already experiencing the impacts of climate change on our networks.

So to conclude, as the Senate prepares to address the problem of global warming and as it considers how to finance the nation's future transportation infrastructure needs, I urge you to keep transit in mind. Transit brings multiple benefits and deserves greater support than it currently receives. Transit can cost effectively help reduce greenhouse gas emissions, provided the projects are tailored to local conditions and land uses. The Federal Government should direct regional transportation planning agencies to do greenhouse gas action planning for transportation, and within that transit that pursues both mitigation and adaptation objectives. And finally, I believe that the funding should follow the planning.

Thank you for the opportunity to testify.

Senator MENENDEZ. Thank you.

Mayor?

STATEMENT OF CHRISTOPHER CABALDON, MAYOR, CITY OF WEST SACRAMENTO, CALIFORNIA, AND TRANSPORTATION VICE CHAIR, SACRAMENTO AREA COUNCIL OF GOVERNMENTS

Mr. CABALDON. Thank you, Mr. Chairman——

Senator MENENDEZ. Do you want to turn your microphone on?

Mr. CABALDON. The "talk" button? We don't have "talk" buttons in California, but thank you. Thanks for the opportunity to be here and for your leadership on this issue.

The Sacramento region is a region of about 2.3 million people, and although we are way out in California, we look a lot like America in terms of our urban, suburban, exurban, and rural distribution. Most of our region is rural and our Board of Directors for the region is split exactly evenly among the two political parties plus five people who will not tell us what their partisan affiliation is.

In 2002, we adopted a regional transportation plan for the next 20 years' worth of investments, and as a former mayor and as a former Governor, you know the kinds of demands that we faced. Business interests wanted to put all of our money into roads and

bridges. Environmental groups said, put it all into transit, 100 percent of your money. Neighborhood groups said, put it all into sidewalks and bike lanes.

We decided to call their bluff and model those ideas in the extreme and said, what would our region look like if we put 100 percent of the next $30 billion in our region into just transit, or into just roads, or into just bike lanes and sidewalks, and we suspected that we would get wildly different performance outcomes on air quality and congestion and all the other things that matter for quality of life.

But here is the big lesson, number one, that we learned. Those extreme investment strategies produced exactly the same outcomes. The differences on air pollution and on congestion were in the second to third decimal point between those different strategies. And it was a big eye opener, and we thought, why is that? How could that be? How could you have such radically different investment strategies and not produce significantly different outcomes? The answer is that transportation investments have to be tightly coupled with other policies, and in particular, policies related to land use, which we had not done.

So we adopted that plan 7 years ago and we said, we will do the best we can. We will put a lot more money into transit, into bike lanes, but we need to do something about land use. And so we spent the next several years adopting and preparing what is called in our region the Blueprint,[2] which is a regional land use plan that enacts exactly the sorts of strategies that have been described here so far, and we adopted it and converted it into a transportation plan in 2008 based on that epiphany. It was a groundbreaking 50-year growth strategy for the whole region that incorporated a regional land use plan in addition to a regional transportation strategy that invested in exactly that land use distribution.

Despite the political differences in the region and all those various interests, it was adopted unanimously and was universally acclaimed by business and the environmentalists, the social justice advocates, the newspapers, everyone else. It was a big deal and fundamentally transformed the way that the State of California is addressing its own approach to greenhouse gas emissions by looking at land use and at transit.

So in doing that, we learned big lesson number two, which was that the four key policy outcomes that we were interested in—greenhouse gas reductions, urban revitalization, preserving farmland by reducing the demand for exurban sprawl, and transportation mobility—could only be achieved at the regional scale together. We couldn't tackle them as one-off strategies, one at a time. And public transit is the key linchpin for all of those to work together.

So we adopted a new land use and transportation strategy, as I said, in 2008 that focuses a lot more growth into transit corridors, through transit-oriented development, but widespread changes in the way that we zone and do our general plans locally, and substantially increased our local investments and regional investments

[2] The *Blueprint Transportation Land Use Study* Special Report is available for viewing in Committee files.

in transit, and that produces big changes in outcomes. Transit trips grow in our plan at more than twice the growth in population, and the growth rate for commute transit trips is about four times the population growth. That may not seem like very much, because transit trips account for a small amount, but even a 1-percent increase in transit trips produces a 10-percent reduction in congestion and significant improvements in both air pollution and in greenhouse gas emissions.

So we are projecting and experiencing overall improvements in transit ridership, but also in transit productivity as we make use of the existing system that is already there in addition to adding additional ones.

So what we are achieving here is an absolute decline in greenhouse gas emissions and vehicle miles traveled per capita. That is an outcome, a performance outcome that very few regions in the Nation have been able to achieve, but it is based on the tight marriage between land use and transportation and breaking the chains that have constrained us everywhere else.

It also provides a big benefit for auto drivers. This is not just about providing additional services for bus riders. This reduces congestion and it makes it possible for the auto riders to make more efficient use of the system that exists as it is.

This year, we have ramped it up even further based on our State's commitment to much more severe greenhouse gas targets, and so we have achieved even greater reductions in greenhouse gas emissions and in transit ridership and in urban revitalization and reducing the pressure on farmland growth. That has also led us to big lesson number 3, which is that transit investments have to happen early. They have to precede growth and development for them to work, that businesses and residents develop non-transit-based patterns even if you develop land use plans that are oriented toward transit.

If you don't have the transit, people get used to cars. They demand at City Council meetings that you start building more parking lots. The changes that you want to achieve cannot be done by building the transit afterwards if you want the land use and sustainability outcomes to work. And we think citizens support that.

Last November, as it was clear that we were in the depths of a major economic crisis, voters in my own city adopted a new sales tax just for a new streetcar system, and we have done that in places throughout California. And we are experiencing substantial increases in transit ridership throughout the State.

So it is important that the Federal Government provide not just financial support, but also the policy context that allows us to move forward at the local and regional scales to achieve this. The House bill, as you mentioned, starts to address this. There is a good start in Section 222 of the House bill in looking at issues around land use and transit, but it is only a start and we would encourage you to move even further in aligning infrastructure and transportation planning and investments with greenhouse gas reduction goals and dealing with the substantial bureaucratic and red tape issues that have to do with constraining us in our ability to deliver the transit projects, as Michael mentioned at the beginning, because it is not just about adding more buses. Transit is not a one-size-fits-all, ev-

erybody get on the bus kind of solution. It is about rail and streetcars and neighborhood shuttles and vans. It is a wide range of solutions for a wide range of the market.

Now, this is not about the government and the region saying to our residents that we want you to change your behavior, that we are going to, as planners, decide for the region what everyone is going to do, how they are going to live, work, and get around. What we have discovered in the development of this blueprint through both polling, focus groups, lots and lots and lots and lots of regional workshops, and looking at market data, is what we are doing is allowing the market to express what is already there in terms of demand, that home buyers and businesses want exactly this pattern of development that can only be achieved by transit, but our existing investment strategy essentially precludes it because we don't allow ourselves and we don't rebuild the infrastructure for that market demand to be realized.

And so it is our job at the local, regional, and Federal level to change our policies and investment strategies to allow the choices that individuals and folks in the market want to make to be realized.

So we very much appreciate the Committee's interest in these issues. We are firmly committed to doing our part at the regional scale and look forward to working with you to assure that the climate bill and the transportation reauthorization help us to achieve that. Thank you.

Senator MENENDEZ. Thank you, Mayor.

Mr. O'Toole?

STATEMENT OF RANDAL O'TOOLE, SENIOR FELLOW, THE CATO INSTITUTE

Mr. O'TOOLE. Thank you, Mr. Chairman. Although I work for the Cato Institute, which is here in Washington, D.C., I actually live in Central Oregon. I grew up in Portland. I am a native Oregonian. I love trains. I bicycle thousands of miles a year. I have never commuted to work by car.

And yet when I look at the question of transit and climate change, I have serious questions about whether transit can play a significant role in reducing greenhouse gas emissions for two reasons. We have 40 years of experience of trying to get people out of their cars by spending more money on transit. Since 1970, this country has spent more than three-quarters of a trillion dollars subsidizing transit. Those subsidies have massively increased over that time.

The operating subsidies have increased by more than 1,200 percent in that time in real dollars, adjusted for inflation, and yet transit ridership has grown by only 45 percent. That has not even kept up with the population growth of our urban areas. Per capita, urban transit ridership has significantly declined in the last 40 years. Driving has significantly increased on a per capita basis. And so 40 years ago, 4 percent of all urban travel was by transit. Today, it is 1.6 percent. That decline is in spite or, or maybe because of, the huge government investments we have spent on transit.

In my own home town of Portland, Oregon—my former home town of Portland, Oregon—transit and smart growth have proven to be a failure when you sit down and look at the actual numbers. Between 2000 and 2007, the Portland urban area gained more than 70,000 new jobs. Virtually every single one of those new commuters drives to work, and transit actually lost commuters. Fewer people take transit to work today than took transit to work in 2000.

That is true in downtown Portland, as well. A 100 percent survey of downtown employers has found that the number of people commuting to downtown Portland has actually declined since 2001. And since two out of three transit commuters in Portland are downtown Portland commuters, that is one of the main reasons why transit is failing in Portland. So everything you hear about transit in Portland, you have to look at the actual numbers to find out whether it is actually true.

Now, the second reason why I am suspicious about whether transit is a core climate solution is because transit itself consumes massive amounts of energy and emits enormous amounts of greenhouse gases. With all due respect to the honorable Mayor here, transit in Sacramento produces, on average, as much greenhouse gas emissions as the average SUV and consumes far more energy than the average SUV, and that is true in almost every city, every urban area in the country.

Moreover, data show, which you can see in Figure 3 on page 48 of my testimony, data show that energy consumption and greenhouse gas emissions of automobiles has been actually declining, whereas the energy consumption and greenhouse gas emissions per passenger mile for transit have been increasing. These trends are likely to continue if the Obama—if the auto manufacturers are able to meet Obama's fuel economy targets and then fail to increase energy efficiencies any further after 2016, by 2025, the average car on the road today will be consuming less energy and emitting less greenhouse gases than any transit system in America. So unless transit finds a way to make itself far more energy efficient and far more greenhouse gas friendly, transit is going to be the culprit, not the savior, in reducing greenhouse gas emissions.

The trends are that transit is getting worse, and transit is very slow to change. If you build a rail line, you are stuck with that technology for at least three to four decades before you can make any changes, whereas the automobile fleet turns over about every 18 years, so it can rapidly change.

Now, it is interesting to compare public transit with private buses. Today, public buses are among the worst offenders in energy consumption and greenhouse gas emissions on a per passenger mile basis. They do far worse in energy consumption and are about equal to SUVs on greenhouse gas emissions. However, private buses, including private intercity buses, are among the most energy efficient and most greenhouse gas friendly modes of transportation around.

Today, at least 14 different bus companies together carry more passengers and more passenger miles between Boston and Washington than Amtrak does and does so at less than half the energy consumption and less than half the greenhouse gas emissions than Amtrak uses in the Boston-to-Washington corridor. Those private

companies have an incentive to fill the seats. Public transit agencies that get three-fourths of their money out of tax dollars and only one-fourth from fares have incentives to build urban monuments, not to fill the seats.

And so we see our public transit systems running, on average, one-sixth full. Five out of six seats or standing room on transit buses or transit vehicles are empty, on average, over the course of any day, any weekday of the year. So we need to radically revise transit if transit is to become more energy efficient, if transit is to meet its own greenhouse gas targets, and I don't think even with such radical revisions are we going to significantly impact the amount of greenhouse gas emissions coming from automobiles because we are not going to be able to significantly get people out of their cars.

Instead, what we need to do is what we did with toxic air pollution. We need to make cars more energy efficient. We need to make cars more climate friendly. There are many ways that we can do this, very low-cost techniques such as traffic signal coordination that will reduce greenhouse gas emissions from cars, and there are techniques on the horizon for significantly reducing congestion at a very low cost using our existing infrastructure. And I think those are the things we need to look at, not trying to change people's behavior in ways that they don't want to change.

Thank you very much.

Senator MENENDEZ. Thank you, Mr. O'Toole.

Mr. Tollerson?

STATEMENT OF ERNEST TOLLERSON, DIRECTOR, POLICY AND MEDIA RELATIONS, NEW YORK STATE METROPOLITAN TRANSPORTATION AUTHORITY

Mr. TOLLERSON. Good morning, Chairman Menendez. Thank you very much, and Senator Warner. Thanks again for the opportunity to testify today on the major role transit networks in metropolitan areas throughout the United States can play in reducing carbon dioxide emissions and shrinking the carbon footprint of our cities and metropolitan regions, as you all know, home to 65 percent of Americans and the source of 75 percent of the nation's GDP.

First, just a brief word about the MTA. The MTA network is one of the world's largest. We provide 8.5 million subway, bus, and commuter rail rides daily, or 2.7 billion rides each year, accounting for nearly one-third of all transit riders in the nation. The MTA also operates seven bridges and two tunnels that carry nearly 300 million vehicles a year.

Now, we all know that there is no silver bullet that will enable the Nation to cut carbon emissions 80 percent by 2050. We need an integrated strategy and set of tools, including renewable sources of energy, the right breakthroughs in battery technology, and a smart grid. Transit ought to be a major part of a comprehensive strategy.

The climate legislation the Senate is drafting offers an opportunity to fund transit networks in a way that will unlock our carbon cutting potential. Unlocking it will yield more transit, greener transit, and most important of all, greener communities, places

where the amount of carbon it takes to live, work, and enjoy life is dramatically lower than it is today.

As a sector, we are reaching the point where we can accurately score the climate-stabilization benefits of transit through mode shift, getting people from cars onto transit, transit's role in minimizing congestion, and then the most powerful source of carbon reduction, the integration of transit and green density, both residential and commercial, around transit stations, which as we know reduces trip length and frequency while encouraging walking and biking.

The MTA's carbon footprint totaled 2.7 million metric tons of greenhouse gas emissions in 2008. However, the greenhouse gas emissions the MTA generates are offset many times over by the carbon emissions the MTA helps avoid by getting people out of cars and, again, onto subways, buses, commuter rail, bus rapid transit. For every metric ton of carbon an MTA service emits, the MTA helps avoid more than 8.24 metric tons of greenhouse gases, which is a weighted average for the MTA's 5,000-square-mile region. Put another way, the MTA's 2008 carbon footprint resulted in a net reduction of nearly 20 million metric tons. That is the equivalent of the carbon stored annually by a healthy forest of 7.7 million acres.

Now, transit's full climate stabilization benefits will only be unlocked if the new investment in upgrading transit infrastructure and expanding transit networks also encourages the clustering of green commercial and residential development around transit. Transit-oriented development offers much more than new housing and lifestyle choices. TOD makes it easy to dramatically reduce greenhouse gas produced by the way you life, shop, and you pursue leisure activities.

Throughout the United States, upgrading transit and expanding transit is already creating green density in places many of you represent. It is visible in thousands of housing units developed around the Hudson-Bergen Light Rail Line in New Jersey, in your neck of the woods, Mr. Chairman, the explosion in residential development around the Metro North Station in Yonkers in the MTA's region, and in places like the Euclid Avenue Corridor project in Cleveland, where a $168 million public investment attracted billions in private investment.

The revised Waxman-Markey bill allocates 1 percent of the value of allowances to transit networks. In light of the carbon-cutting potential of U.S. transit agencies, especially transit's potential to give people the option of living in communities with fewer cars per household and lower auto usage, the MTA and other transit agencies believe that allocating a larger share of allowances to transit would enable the Nation to accelerate its efforts to reduce greenhouse gases.

Within the MTA, we suggest that Congress invest 7.5 percent of allowances in transit, with 5 percent to increase access and expand transit networks, including the following services: New lines, line extensions, feeder and distributor services, all of which foster transit-oriented development; signal upgrades that boost the frequency of service; new green fleets; LEED standards for stations, bus depots, and rail yards.

We also suggest that you allocate 2.5 percent to green and improve the carbon efficiency of existing transit infrastructure. That involves smart fleet projects, lightweighting rolling stock, regenerative braking, onboard power, wayside power, and again, green station renovation.

This call for allocating 7.5 percent of allowances to transit is consistent with the American Public Transportation Association's call for a minimum of 10 percent of allowances for transit and other strategies to reduce VMT.

Every day, America's transit networks bring about major greenhouse gas reductions the old-fashioned way, through mode shift and reducing congestion. With the appropriate provisions in your climate bill, you can advance the nation's greenhouse gas reduction goals by, first, again, expanding transit's capacity to get people out of cars and onto transit, and upgrading existing transit lines and expanding transit networks so that transit can transform our cities and metro regions into communities with low-carbon lifestyles and low-carbon places to work.

This solution set can be deployed now, not in 5 years or in 10 years. In short, your bill can unlock transit's potential to green the way we live, work, and enjoy life and communities throughout the nation.

Thank you again for the opportunity to testify and I would be happy to answer any questions you have.

Senator MENENDEZ. Thank you all very much for your testimony.

We will start a round of questions, and since there are only two of us, at least at this point, we will be a little flexible in that process. If more join, then we will go back to regular order.

Let me say that I would be remiss if I ignored Mr. O'Toole's views that, in fact, we are wasting our money in transit, at least certainly as we have it devised now. I don't say that I join that view, I hear it. What would the rest of the panel say? Is there a divergence here? I don't want it to just be silent at the end of the day. Yes?

Mr. REPLOGLE. With all due respect to Mr. O'Toole, I think the analysis that he brings comes out of a sort of very narrow perspective on statistical division of one set of numbers by another set of numbers, looking quite narrowly at taking vehicle miles of travel by different vehicles and dividing by energy use to calculate the impact on greenhouse emissions when, in fact, the proper way to evaluate the question of the impacts of transit on greenhouse gas is to look at its impact on how the system operates.

If we think only of what happens when transit goes on strike in a major city like New York or Chicago and disappears for the day, we witness how traffic congestion gets much worse, the economy shrinks, a host of other problems occur. And if that were to persist in the long run, in fact, we would not be able to sustain our metropolitan economies as we do. Transit is indeed the foundation that underpins our ability to organize cities efficiently so that people can live and work and play in close proximity to each other without having to be dependent on a car for every trip, and it enables the clustering of those trips in ways that don't force us to provide a parking space for every trip end so that we can have the kinds of places that we enjoy most as human beings, where the things that

draw us to cities aren't parking lots but, in fact, the intense array of activities that enable us to be close to each other in community and in economic relationships. That is what is supported by transit.

Transit also enables us to have a lot more shared walls between buildings so that we see typically 30 or 40 percent higher overall building energy efficiency and 30 or 40 percent lower utility costs for dense mixed-use activity centers compared to auto-dependent sprawl neighborhoods. We have seen the market for car-dependent sprawl collapse in the wake of our current credit crunch and economic downturn. The places where real estate value is holding up are the places that people can get to with less dependence on cars because those are the places that have the best chance to be economically competitive in the future, a future in which we are likely to face higher energy costs and a world in which carbon matters.

Senator MENENDEZ. Anyone else? Professor Andrews?

Mr. ANDREWS. Thank you. I think I actually agree with Mr. O'Toole on the importance of filling transit seats. Empty buses are a disaster. Empty trains are even more of a disaster. I think we disagree——

Senator MENENDEZ. How about cars that only have one out of five seats——

Mr. ANDREWS. Another disaster, I agree. I think I disagree with him on the characterization of the technologies, though. There is a dynamic of technological improvement for cars, absolutely, but it also applies to transit, and there is no reason not to expect both to be improving over time.

Also, we have demonstrated by creating the highway system how it is possible to change settlement patterns and transit becomes the key tool in the long run for trying to change them again, I think.

And then finally, something we haven't really talked about much is how important transit is to those who don't have cars or who are not old enough to have a driver's license or are too old to have a driver's license. I am always impressed when I go to places that have good transit with how much happier the kids are because they can have a little bit of independence to do things.

Senator MENENDEZ. Mayor?

Mr. CABALDON. Mr. Chairman, if I might, just Mr. O'Toole's analysis is not totally inconsistent with what I said at the beginning with regard to how we did our own regional planning. We said, what if we did put all of our money into transit? But what it ignores is that we have been in the last generation spending more and more money on transit, trying to keep up with a land use pattern that does not support it, and so each—at the increment, at the margin, it costs a lot more to have the bus stop at every little cul-de-sac to get around. So the relative productivity of that transit dollar has been declining as a result of not mirroring it with land use.

That is not unique to transit. It is also true with the road systems that we are building. And so if we were to do the same analysis, we would find the same performance metrics for roads, that the relative amount of money that we have been spending on them has also been declining in its performance and we are not achieving our goals with respect to mobility or congestion there, as well.

So it is—I think the lesson isn't that transit doesn't work, it is that transit in a vacuum without paying attention to the places that it is intended to serve is not effective because it does result in either empty buses or super-long transit trips that make it impossible to achieve both the greenhouse gas benefits but also the community building benefits.

Mr. TOLLERSON. Mr. Chairman, as I listened to Mr. O'Toole's analysis, I just sort of quickly envisioned New York kind of grinding to a halt. The economy of the city and the economy of the region is really based on being able to attract people and their brainpower and their talent in the private sector and higher education. Frankly, our buses are full. I would rather have more full hybrid electric buses on the streets of New York than everyone sort of think they could buy a Prius and move around the city, move around a region. It just won't work.

So again, if you are concerned about the economic output of these sort of major metropolitan areas over the decades ahead and continue to have cities like New York and Chicago to be powerhouses for this nation, you are going to have to have a balanced solution. You are going to have to have a lot of rapid transit. You just simply can't say everyone can have a Prius or a plug-in car. Regions will just come to a halt.

Senator MENENDEZ. Mr. O'Toole?

Mr. O'TOOLE. Well, there has been a lot of talk about land use patterns. I like to say there are two kinds of cities in America. There is New York, then there is everywhere else. New York is one situation where transit does seem to be vital, although it is not financially sustainable. It requires heavy subsidies from motorists and it is in a perpetual state of financial crisis. It does seem to need transit to maintain that high-density core area.

Other cities are different. Transit is not vital to those cities. Transit is important to people who don't have access to the automobile, and I don't have any objections to transit. What I object to is pouring huge amounts of money into transit with the thought that we are going to significantly reduce auto driving.

I don't think changing land use patterns is going to work. It hasn't worked in my home State of Oregon, where we have been attempting to change land use patterns for several decades. It hasn't worked in getting people out of their cars. What it has done is it has gotten people out of the Portland area. We have made housing unaffordable in Portland, and so families with children have moved to Vancouver, Washington. They have moved to Salem, Oregon. And now they are commuting 50 miles a day each way instead of five miles a day because that is the only way they can work in Portland, is to live far outside of Portland. That is one of the reasons why we end up seeing fewer people commuting to work by transit and more people commuting to work by car.

So changing land use patterns, trying to give people incentives to live in high-density developments is not working in Portland and I don't think it is going to work anywhere else.

Right now, 1.6 percent of urban travel is by transit. It is much higher in New York, but just about everywhere else, it is lower. That means more than 95 percent is by automobile. If we want to significantly reduce energy consumption, if we want to significantly

reduce greenhouse gas emissions, it is better to work on the things that people use the most. It is better to work on the automobiles and make them more energy efficient and make them more greenhouse friendly than it would be to try to get people out of their cars, an effort that we have been trying to do for the last 40 years and an effort that has failed.

Senator MENENDEZ. I thank you all for your answers and I want to turn it over to Senator Warner. Before I do, I just want to make some observations for the record.

We have spent in the last transportation bill $200 billion on highways. Now, that is a subsidy. That is a subsidy, but we don't seem to think of it in that respect.

I look at some of the things that—not the New Yorks, but the St. Louis Metro Link Light Rail System did a survey. They found nearly 60 percent of their 14 million riders would be on the road in their cars if trains weren't running. I look at the fact that that same survey found that among bus riders, 70 percent said they did not drive or had no car available while just 17 percent of train riders similarly had no means to drive.

And on average, most of the seats, if we look at a car, I hear about transit systems not having every seat filled, but cars have slightly more than one out of five seats filled during rush hour. About 21 percent of seats in cars are filled, according to the Federal Transit Administration, versus more than 40 percent of seats during transit rides.

So I think we have to have the totality of the picture here to understand what we are talking about.

With that, Senator Warner?

Senator WARNER. Thank you, Mr. Chairman, and thank you for holding this hearing. It is a very interesting panel.

I have got a couple of questions. One, I was very interested in the difference between Professor Andrews and Mayor Cabaldon on the way you approach the notion of transit. Professor Andrews is saying sometimes it is better to think about putting in a system after you have already identified the choke points, Mayor Cabaldon's point being let us do it more on the front end in terms of the planning. I would love to hear an exchange between the two of you on that subject.

And then Mr. Cabaldon, as somebody who was not perhaps as successful as you with transportation referendums—I still bear the scars from my effort as Governor back in 2002—I am interested in your Blueprint plan, and I am a big believer that you have got to have metrics, and I am just curious whether, as you kind of laid out your plan, you have got a measurement based upon job creation or density around transit locations.

Again, I hear Mr. O'Toole's comments. I can cite one other example that may not be New York, but in Northern Virginia, because there was a community, not mine, but an adjacent community. Arlington County planned its development around transit stops on our Metro and it is, I think, viewed as one of the more successful examples of high increased density around transit stops. It sure as heck has not alleviated our traffic congestion. We still have that and big challenges throughout Northern Virginia. But it seems to be a case where transit and planning has worked in terms of job

creation. I would be curious to see, Mr. Cabaldon, whether you have gotten any questions that way.

But first of all, perhaps the Mayor and Professor Andrews can go back and forth in terms of your approach on where you site.

Mr. ANDREWS. I will give the Mayor the last word. I basically said there are very good reasons if you don't have much money to invest in transit that clearly has immediate use, and that was the analogy to—giving the example of the tunnel under the Hudson, where we desperately need that capacity. That won't waste any public dollars or private dollars in the short run. It will be immediately used to capacity.

But if we are trying to also be thinking about the long run, and I was using the portfolio analogy before, saying we need to balance our risks and rewards, then building transit ahead of demand can help with that slow, decades-, really generations-long process of changing land use patterns.

The Hudson-Bergen example is somewhere in the middle, where we very quickly changed settlement patterns in response to the commitment of having that light rail system. We knew where to invest, and so we did it quickly. It was a good market. Other places, it may take longer, so then it becomes a question of how patient is our capital.

Mr. CABALDON. If I might comment on that——

Senator WARNER. I apologize about mispronouncing your name earlier, but Mr. Mayor?

Mr. CABALDON. Thank you. Yes, I don't think there is a disagreement on this issue. I wish my community had more transit choke points. We just don't because of the—I am in a fast-growing region that suburbanized heavily in the 1970s and 1980s and we don't have a lot of the things like the tunnel, where you look and you say this is obviously a place where you have a lot of unmet demand and the service is already being provided.

But we are trying to shape development into the future, and I think the Portland streetcar example is actually a good example of this in that—in terms of its ability to shape development and migration patterns and trip-taking patterns as people are moving in and in ways that putting a sign up that says, 20 years from now, a bus system will be here or a light rail system doesn't do.

And you have to get around when you first move in. And so it is essential that those choices get adopted immediately. If you just adopt a general plan that is heavy on density but you don't provide any means for people to get around, they will find ways to move and it will often involve an automobile and the quality of life will deteriorate. So it is just a question of, as new places are being created, making those investments early.

Now, we don't just throw transit services up everywhere. I mean, it has to be part of a very strategic investment strategy of other resources to make sure that development is actually going to happen and that people are actually going to be there, because we don't have a lot of transit dollars to be spending running empty buses or streetcars or light rail systems. So it is not as though we just throw it up willy nilly, hoping that some rider will show up, but as part of a more fully developed, funded development project,

it is really critical that that development, that the transit system be there at the outset. Otherwise, other habits get developed.

Senator WARNER. Talk to me about how you then weigh in the job creation component around transit and what kind of metrics you use to measure that.

Mr. CABALDON. We have been principally interested, because we have been such a fast-growth region, we haven't been focused as much on job creation because we have been very jobs-rich. Now, that is changing somewhat as it is elsewhere, but it hasn't been one of the formal metrics. The actual development of business in the region has been, though, regions around the transit stops.

And so we are very attentive at the regional and the local scale to what is actually occurring around these stations, around the bus stops and other transit facilities, and we don't provide funding for them unless we know that there is going to be—you know, there is a development plan that aligns with that and that there are actual investors ready to make that work.

In addition to money for transit, we also provide money at the regional scale for housing and other things that all gets wrapped in this together. So we know that if you are asking to open up a new light rail station that there is also going to be money to help support the housing. You also have already signed up developers. You already have the businesses that are going to locate nearby before we start deploying the scarce dollars that are there.

And we are seeing that. I mean, in terms of our—the change in demand in just the 4 years since we adopted the land use plan, kind of the Blueprint-oriented housing project, small lot housing, attached housing with shared walls and what have you has gone from 20 percent of the market share to 70 percent of the market share. That is not because planners announced that we have decided that every member of the public will suddenly now be forced to buy these products. There was a huge pent-up demand for exactly this kind of development pattern, and the employers have followed suit.

For us, attracting the kind of employment that depends—the creative industries and other things that depend on a more diverse urban environment than we have had in the Sacramento region, transit has been a key part of that economic development strategy in terms of attracting new jobs.

Senator WARNER. Mr. Chairman, could I ask another question? Let me take a different tack than Mr. O'Toole. I would be anxious to hear your comments on this, as well.

I am intrigued with some of your comments about the growth of the private company bus competition in the Boston-to-Washington corridor. Another area that I have had some interest in for some time as Governor, and we have kind of an interesting phenomena here, again, in the greater Washington area, is the use of vanpools, ride shares, and we have a phenomena that I don't think is completely unique to greater Washington, but pretty famous, where we have kind of a self-formed market of what is called "slug riders" who form at park-and-rides and there is kind of an informal system that has been created where people can come up the 95 corridor kind of sharing rides together.

We had a hard, hard time, though, really expanding those ride-share opportunities, or really expanding van markets. And I have seen—and there is a question—there have been a couple of companies that are out there that work with private companies to try to create that, but we have never been able to seem to get the incentives right. And I would love to hear from the whole panel, beyond just the idea of a formal State or metropolitan-driven transit system, this whole concept and kind of an interim between a formal public system and perhaps Mr. O'Toole's total free market approach here.

But what are the barriers, or are there some other best practices that we ought to be thinking about in terms of ride sharing, vanpooling, and other kinds of in between options, particularly when you have got not straight single corridors that so many growing communities don't have. Anybody on the panel? Please.

Mr. REPLOGLE. Sir, well, I think there are a lot of opportunities to fill empty seats in both private cars, in paratransit vehicles, and in buses and trains that we haven't exploited that we could exploit through principally providing better information and communication support for the marketplace. And that information needs to come in two forms. One is sort of the classic form of simply giving people a more visible marketplace where they can go and find people to fill empty seats if they have them to offer, or to find empty seats if they want to ride. But two, the form of information that comes in the form of pricing—pricing parking, pricing car insurance, pricing transit, pricing road access at times of peak demand.

We are making progress on all of those things. There are new companies, like *NewRide.com*, which has been operating in Northern Virginia in the Washington region, and some other markets which are helping employers and ordinary travelers find those empty seats on a dynamic real-time ride-matching basis, and those can make a difference, but they are competing in a marketplace in which 90 percent of employers in the suburbs are offering free parking at the workplace that is often worth $2 or $3 or $4 a day as a subsidy for driving. It is actually worth more than if your employer paid for your gasoline to go to work.

And that comes also in a marketplace in which our car insurance payments are distorted by fixed-price insurance pricing, where you buy a policy for a 6-month period that doesn't really matter much if you drive 3,000 miles or 30,000 miles in that 6-month or year period. You are going to pay about the same for your car insurance.

Now, there are some companies coming into the market like Progressive——

Senator WARNER. I am familiar with that company.

Mr. REPLOGLE.——like MileMeter in Texas. Progressive is now in eight or nine States, GMAC insurance in about 19 States, offering mileage-based car insurance, where you pay by the mile. And that actually translates into an opportunity for consumers to put money back in their wallet if they drive fewer miles, if they chain their trips together, if they share a ride or take the bus to go to work rather than drive. They get to save on their car insurance, and that savings on car insurance is worth like eight cents a mile. It is about the equivalent in terms of affecting behavior that you get from a $1-a-gallon increase in the price of gasoline.

And yet it comes in a way that this pay-as-you-drive insurance—Brookings did a study last summer showing that two-thirds of households would save money under a pay-as-you-drive insurance system, with the average of those households saving about $270 per vehicle per year, and disproportionate savings going to low- and moderate-income people who tend to drive less than the higher-income people.

So we need to get a number of these pieces of information right and we need to also be looking for new opportunities. I think Randal O'Toole is right in saying that there are some real opportunities in the market that public-subsidized transit often displaces and bars from happening, and we need to be looking at ways of reallocating street space for things like bus rapid transit, so we don't have to spend as much money by building a subway but instead can manage that transit service with a subway-like quality of service, with bus lanes, with stations, but at a tenth the cost of building a new underground rail line. So there are a lot of ways we can do this.

Mr. O'TOOLE. Can I respond to this question?

Senator WARNER. Please.

Mr. O'TOOLE. There are at least three transit systems in this country that are entirely private and entirely unsubsidized. One is the New York Waterway System, Arthur Imperatore's system between New Jersey and Manhattan. One is the Atlantic City jitney system. And one is the Publico System in Puerto Rico. These systems are owned by their operators, in the case of Atlantic City and Puerto Rico. The buses are generally standardized. They follow fixed or variable routes and they charge a fare and the fares cover all of the costs. It is sort of like a shared taxi system, especially in San Juan.

And there is no reason why we can't have those kinds of systems in other cities except, first of all, it is illegal. If I were to try to start a jitney or a shared taxi system in most cities in America, I would not be allowed to do so because the taxi industry and the transit industry have successfully passed laws preventing any competition. Even if it was legal, I would be competing against a heavily funded, heavily subsidized transit system which would make it very hard for me to compete.

I know somebody tried to start a jitney system in Denver, Colorado. They were allowed to operate on one route only. They said if they were allowed to expand onto more routes, that they would be able to become profitable and they were not allowed to expand onto other routes and so eventually they went out of business.

So I think there are opportunities. We need to start thinking about private transit because private transit has an incentive to be efficient. We need to take away the barriers that prevent private transit. And if we are going to subsidize people because we think transit is good, instead of subsidizing transit agencies that tend to build urban monuments, maybe we should give those subsidies to the transit users and let them decide are they going to use their transit vouchers on a taxi, are they going to use it on a public transit system, on a private transit system, on Greyhound, on Amtrak, or on United Airlines? That kind of a system, I think, will be far

superior to a system where we are spending huge amounts of money and not getting much in return.

Senator WARNER. Others, please?

Mr. ANDREWS. Two comments. I think there is a clear role for private operators and an expanded role. It does spring up naturally in our cities. If I think of Paterson, New Jersey, in my home State, the immigrant population has created jitney services on their own and it works great except that there are safety dangers. And so with the private enterprise comes the need to regulate for health and safety, and that is something that has not been consistently done, in my opinion.

The second thing I wanted to raise, and really the intercity private bus services illustrate this, is that we are living in a new era where we can get transit and travel information easily on the cell phone and that is how you find out where to get the bus and when it is leaving, and that is something that should be much more prevalent, public and private. This is a way to make the system smarter and get the riders to the system.

Senator WARNER. Please, Mr. Tollerson?

Mr. TOLLERSON. First, I would first want to echo what Michael Replogle was saying. Essentially, in our region, what people don't have is the information that says, out of 5 days in going to work, these 3 days I could take some form of rapid transit. There might be 2 days where you need to drive. But what they don't have is sort of the all-in costs of those options in a real-time way and it is something that we are looking at and trying to provide people. But mainly, it is people don't think about the all-in cost of insurance, maintenance costs, and actually where they are going and whether it makes sense if you are sitting in an office or you are sort of visiting various sites.

Senator WARNER. My last point, and again, thank you for giving me this time, Mr. Chairman, I just want to say I am very interested in these ride-sharing approaches. But being familiar, for example, with New Ride, which we have supported in Virginia, it is—and there are lots of other competitors with them—it is tough to find, though, an economically viable methodology for the company to sustain itself. They have actually found that in Houston, they have had the best luck because there is a community down there that supports with, in effect, incentives to folks to share those rides together.

And again, I share the Chairman's view that we are talking about massive subsidies when we talk about the cost of building additional highway capacity, which is extraordinarily expensive, and so how, whether it is through transit or through sharing rides we can increase the capacity, increase the utilization and the capacity we have got, and it seems to me that ride sharing, vanpooling, and these other options ought to be a bigger part of the mix. But thank you, Mr. Chairman.

Senator MENENDEZ. Thank you, Senator. Thank you for the line of questioning. There are a lot of interesting things that came up. One or two observations, one question, and then we will close the hearing and move on.

You know, on van sharing and ride sharing, I think it is one of the important things we need to look at. I know that in New Jer-

sey, Professor Andrews mentioned Paterson, but I can tell you all along the Hudson River waterfront, even though there is a light rail system, even though there is trans-Hudson crossing to the Lincoln and Holland Tunnel and the George Washington Bridge, that there is a whole universe of vans that are operating against New Jersey Transit, against New York Waterway—which, by the way, Mr. O'Toole, is subsidized to a significant degree. The ferry terminals that were created, I happened to be the Congressman at the time, and $10 million of Federal money went to create the ferry terminal. After September 11, they were subsidized by the Port Authority of New York and New Jersey to have crossings going on in light of the PATH tunnel being closed to the World Trade Center. So it is a good system. It is another means of transportation, which is important, but it is not without subsidy.

And these vans, they basically get an interstate charter and they get a license and then they are allowed to have all types of routes. The difficulty is, of course, the safety and insurance issues. A lot of them go largely unregulated and so when we have an accident, it is sometimes deadly, and that is the one thing. But it is another system that is actually working and largely by blue collar and immigrant communities that are doing it.

Getting it right is important, but the possibility of existing alongside transit, taxi, subway, ferries, all exist. So the competition is there, and yet it flourishes, so it is possible.

The one thing I would ask is that, or make the observation, while ride sharing and vanpool options are important as part of this transportation mix, one of the challenges, however, is that what it doesn't do, it doesn't change land use patterns in the way that a transit hub can. And clearly, in that context, when you join the development issues that the Mayor has talked about and some of you, as well, what developers are looking at is is there a fixed point in which there will be an opportunity for the community that I help develop here have access to a transit line that will get me to work, pleasure, hospital, whatever, and I think that that is one of the fundamental differences.

And Mayor, I would jus like to ask you, it seems to me that what you have done there in the Sacramento region is not just an emissions reduction strategy, but it is also a growth strategy, a smart growth strategy that can also create billions of dollars in investment. Have you all through the Commission looked at what are the economic benefits? Senator Warner asked particularly about jobs, but have you looked at what the economic benefits have derived from virtue of your planning?

Mr. CABALDON. We have. I did not bring that with me, but we have, because it wasn't—you know, we began this process before the national policy interest in climate change. We didn't start this because of the greenhouse gases. We started it because we saw a growth pattern that was not economically or environmentally sustainable just on its own terms. And so it is about for us directing growth and economic activity toward urban revitalization and protecting the rural heritage of the place. And so we did model all of that.

And when we invited citizens to come in and work on exactly these issues, they sat down with development and finance tools to

figure out, OK, you want a light rail line to go to your cul-de-sac. Here is the economics. Here is what would have to be built around it. And citizens became very, very aware and engaged about the tight relationship between their environmental and transportation policies, but also the economy, and that became critical to building this broad universal consensus toward it——

Senator MENENDEZ. Is it fair to say—and while you can't quantify it for me right now, we would love to have that for the record subsequently—is it fair to say that that type of policy created very significant investments, drove investments at the end of the day?

Mr. CABALDON. Yes.

Senator MENENDEZ. Listening to what you are describing, clearly, you had to have private capital come in to go ahead and build around those regions that you created opportunities for only if that investment is going to exist.

Mr. CABALDON. Right. That is absolutely correct, and in large part because there really was a demand in the market by employers, builders, home buyers, everyone else, that we just were not acknowledging. We were doing this—we were just repeating our old plans over and over and over again, not acknowledging that there were a lot of changes in the economy that we were not exploiting.

Senator MENENDEZ. My own experiences along the Hudson River waterfront, what was abandoned railroad yards, toxic and lying fallow not only because they were toxic, but also their ratable basis had gone, is that the creation of a light rail system connecting all of the communities along that to trans-Hudson crossings created a new generation of rebirth of businesses, of jobs, of ratable bases, all in a very sustained area for which a light rail system runs to a trans-Hudson crossing to a ferry or through PATH into the city of New York and has clearly reduced the incredible amount of traffic that would have existed if the development had just been without such a system. As a matter of fact, probably we would have had to have significant acquisitions of land in order to provide for the car services that would have been necessary but for a transit line.

So I think those are examples of the type of smart growth that we are talking about, the type of transit-related opportunities around development, joined with development that at the end of the day makes it for high ridership, makes it for less cars, less emissions, more ratables, greater economic opportunity, and employment. I mean, I think that is the Committee's vision of how we would like to structure the policy and the incentives to move in the right direction.

With that, I appreciate your testimony. Seeing no other members before the Committee to ask any questions, we will conclude our hearing on Public Transportation and Climate. I want to thank all of you for participating and helping the Committee prepare for the upcoming debate.

This record is going to remain open for 1 week to allow Senators who may have had other obligations the chance to ask follow-up questions in writing. We ask that if you actually get any questions submitted to you, and I know that I have several that I didn't want to belabor the hearing with that I am going to be sending you, we would love to have your response promptly.

With that, the hearing is now closed.

[Whereupon, at 11:04 a.m., the hearing was adjourned.]
[Prepared statements and responses to written questions follow:]

PREPARED STATEMENT OF SENATOR TIM JOHNSON

It is no exaggeration to say that our economy is currently experiencing extraordinary stress and volatility. As Congress and the Administration look at corrective policy changes, I am pleased to hold this hearing today to take a closer look at the role smaller financial institutions, specifically community banks and credit unions, play in our economy, especially in many rural communities. Throughout our nation's economic crisis there has often been too little distinction made between troubled banks and the many banks that have been responsible lenders.

There are many community banks and credit unions that did not contribute to the current crisis—many rural housing markets that didn't experience the boom that other parts of the country did, and community lending institutions didn't sell as many exotic loan products as other lenders sold. Nonetheless, small lending institutions in rural communities and their customers are feeling the effects of the subprime mortgage crisis and the subsequent crisis in credit markets. Jobs are disappearing, ag loans are being called, small businesses can't get the lines of credit they need to continue operation, and homeowners are struggling to refinance.

Smaller banks play a crucial role in our economy and in communities throughout our nation; we need to be mindful that some institutions are now paying the price for the risky strategies employed by some larger financial institutions.

In coming weeks, the Banking Committee will continue its review of the current structure of our financial system and develop legislation to create the kind of transparency, accountability, and consumer protection that is now lacking. As this process moves forward, it will be important to consider the unique needs of smaller financial institutions and to preserve their viability as we come up with good, effective regulations that balance consumer protection and allow for sustainable economic growth.

I would like to welcome our panel of witnesses, and thank them for their time and for their thoughtful testimony on how small lending institutions in rural communities have been affected by our troubled economy. I would also like to thank Senator Kohl for his interest in today's hearing topic. I will now turn to Senator Crapo, the Subcommittee's ranking member, for his opening statement.

PREPARED STATEMENT OF SENATOR MIKE CRAPO

Many community banks and credit unions have tried to fill the lending gap in rural communities caused by the credit crisis. Even with these efforts, it is apparent that many consumers and businesses are not receiving the lending they need to refinance their home loan, extend their business line of credit, or receive capital for new business opportunities. Today's hearing will assist us in identifying these obstacles.

As we began to explore options to modernize our financial regulatory structure, we need to make sure our new structure allows financial institutions to play an essential role in the U.S. economy by providing a means for consumers and businesses to save for the future, to protect and hedge against risk, and promote lending opportunities. These institutions and the markets in which they act support economic activity through the intermediation of funds between providers and users of capital.

One of the more difficult challenges will be to find the right balance between protecting consumers from abusive products and practices while promoting responsible lending to spur economic growth and help get our economy moving again. Although it is clear that more must be done to protect consumers, it is not clear that bifurcating consumer protection from the safety and soundness oversight is the best option. If that is not the best option, what is and why? It is my intention to explore this topic in more detail with our witnesses. Again, I thank the Chairman for holding this hearing and I look forward to working with him on these and other issues.

PREPARED STATEMENT OF MICHAEL A. REPLOGLE

GLOBAL POLICY DIRECTOR AND FOUNDER, INSTITUTE FOR TRANSPORTATION AND DEVELOPMENT POLICY, AND POLICY AND STRATEGY CONSULTANT, ENVIRONMENTAL DEFENSE FUND

JULY 7, 2009

Good morning Mr. Chairman and members of the Committee. I appreciate the opportunity to testify on the important, issues of transportation and climate change, and the opportunities we have to reduce greenhouse gasses while enhancing mobility. This Subcommittee can play a key role in promoting policies to accomplish these

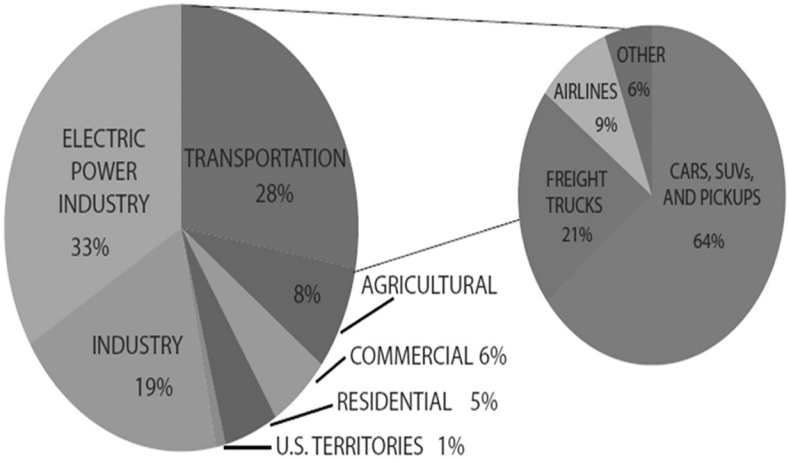
shared goals, while also creating jobs, enhancing housing affordability, and reducing transportation costs for consumers and governments.

I am presenting testimony today on behalf of the Institute for Transportation and Development Policy (ITDP) and Environmental Defense Fund (EDF). ITDP is a non-profit group with its headquarters in New York City that since 1985 has promoted environmentally sustainable and socially equitable transportation worldwide, working with city governments and local advocacy groups to implement projects that reduce poverty, pollution, and oil dependence. EDF is an environmental organization with over 700,000 members that integrates law, science, and economics to find practical solutions to environmental problems.

Transportation and Climate Change: A Critical Connection

Reducing emissions in the U.S. transportation sector is integral to effective climate and energy policy. Currently, 28 percent of total U.S. greenhouse gas (GHG) emissions originate from the transportation sector, making it the nation's second largest source (Figure 1).[1] When electricity use is distributed across sectors, transportation becomes our nation's largest end-use source.

Figure 1: U.S. Transportation's Contribution to Greenhouse Gas Emissions



Source: U.S. Environmental Protection Agency, Inventory of Greenhouse Gas Emissions and Sinks: 1990-2006, April 2008. Graphic reproduced from FTA publication Public Transportation's Role in Responding to Climate Change, *January 2009.*

The contribution to global warming of the U.S. transportation sector is larger than any nation's *entire economy,* with the exception of China.[2] In order to meet and preferably exceed the targets that scientists are calling for to avoid the worst impacts of global warming, it is necessary to achieve significant GHG reductions in the U.S. transportation sector.

Congress has recently taken several important steps to begin reducing transportation-related GHG. The 2007 Energy Independence and Security Act (H.R. 6) mandated new vehicle efficiency standards of 35 miles per gallon, to be achieved by 2020, and required a 10 percent reduction in the carbon content of vehicle fuels. In May, President Obama announced an even more aggressive national vehicle efficiency standard that will increase fuel efficiency and reduce greenhouse gas emissions for all new cars and trucks sold in the United States beginning in 2012. By 2016, U.S. new passenger vehicle efficiency must average 35.5 mpg (39 mpg for cars and 30 mpg for light trucks and SUVs).

Unfortunately, these critical policy tools will not fully address transportation-related GHG. Out current policy framework guiding the development of surface trans-

[1] U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2006.

[2] Greene, David L. and Schafer, Andreas. Reducing Greenhouse Gas Emissions From U.S. Transportation. 2003.

portation infrastructure in the U.S. is not designed to take into account GHG emissions. Over the past several decades, while our cars have become more efficient and our fuels have become cleaner,[3] transportation-related GHG emissions have continued to grow.[4]

Growth in energy-related carbon dioxide emissions in recent years has mostly been the result of increased electric power generation and transportation fuel use. Other major sectoral emissions sources (*i.e.,* direct residential, commercial, and industrial fuel use) have shown stable or reduced emissions.[5] Statistics show that this has primarily been a result of increased use of increased personal vehicle use and freight trucking activity. Between 1977 and 2001, the U.S. population increased by 30 percent; driving rates, measured in vehicle-miles traveled (VMT), grew by 151 percent.[6] In this same time period, average trip lengths, trips per capita, and the proportion of drivers traveling alone all increased to varying degrees.[7] Freight trucking has seen a similar increase, with truck ton-miles growing by 56 percent between1993 and 2002.[8]

Driven by these trends, the growth of national VMT is projected to continue increasing into the foreseeable future, doubling nationwide by 2030, barring changes in policy.[9] This is due in large part to limited options for transportation, inefficient land use and development patterns, and inadequate traffic and road management.[10] As a result, despite progress on vehicle efficiency, transportation has for many years been the nation's fastest growing source of U.S. GHG emissions, accounting for 47 percent of the net increase in total U.S. emissions between 1990 and 2003.[11] Though recent economic and demographic impacts have begun to moderate this growth trend, transportation remains our second fastest growing source of GHG emissions.[12] Growth in energy-related carbon dioxide emissions has resulted largely from increases associated with electric power generation and transportation fuel use. All other energy-related carbon dioxide emissions (from direct fuel use in the residential, commercial, and industrial sectors) have been either flat or declining in recent years.

Analyses of emissions trends in the transportation sector show that additional GHG emissions from the projected growth in driving will overwhelm the GHG emissions reductions expected to occur as a result these policies (Figure 2), unless there are changes in policy. This will leave overall transportation-sector GHG emissions to 26 percent greater than 1990 levels in 2030.[13] Transportation-related emissions need to be at least 30 percent below 1990 levels to be on a commensurate path toward the reduction targets necessary to avert the worst global warming impacts. Congress must enact policies that moderate the growth of VMT and improve efficient transportation system management or the transportation-related GHG emissions from increased CAFE standards and low carbon fuel requirements will be effectively undermined.

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[3] Transportation Energy Data Book 2008. Table 11.10: Average Annual Carbon Footprint by Vehicle Classification, 1975 and 2008.

[4] U.S. DOE, Energy Information Administration. *Emissions of Greenhouse Gases in the United States,* 2007.

[5] Ibid.

[6] Polzin, Steven E., Ph.D. The Case for Moderate Growth in Vehicle Miles of Travel. 2006.

[7] Ibid.

[8] Bureau of Transportation Statistics: "Freight Shipments in America," Table 2—Modal Change in Shipment Value, Tonnage, and Ton-Miles: 1993 and 2002.

[9] U.S. Department of Energy/Energy Information Agency (USDOE/EIA): Annual Energy Outlook, 2007.

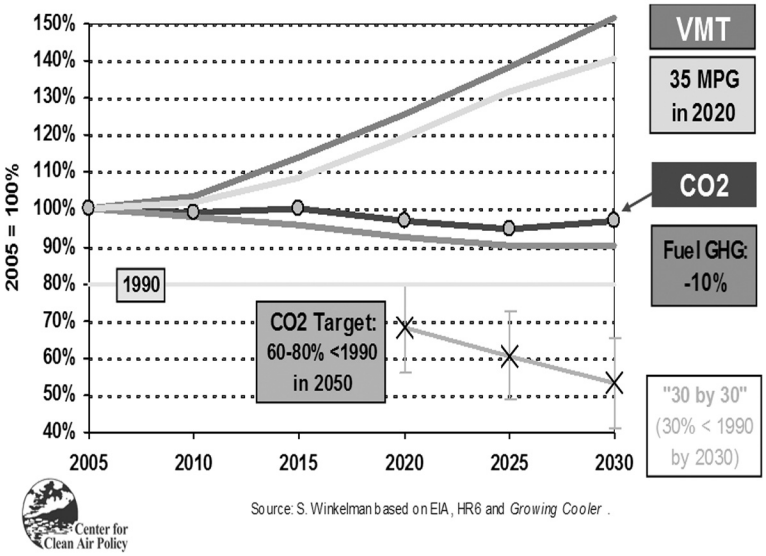
[10] Ewing, Reid, Pendall, Rolf, and Chen, Don. Measuring Sprawl and It's Impact. 2002.

[11] U.S. EPA, accessed at *http://www.epa.gov/omswww/climate/index.htm* on 6/30/09.

[12] U.S. DOE, Energy Information Administration. Emissions of Greenhouse Gases in the United States, 2007.

[13] Winkelman, Steve. Center for Clean Air Policy.

Figure 2: Transportation Sector CO_2 Emissions Forecast 2005-2030



In addition to policies such as vehicle efficiency and low-carbon fuel standards, Congress has spent much time debating the implementation a cap-and-trade system for reducing GHG across the U.S. economy. Environmental Defense Fund and ITDP both strongly support efforts to cap carbon emissions at the Federal level as a necessary framework for slowing climate change. While a market-based system for reducing GHG emissions can be a powerful tool for cost-effectively reducing overall emissions, analysis of travel behavior and price sensitivity has led many transportation and climate policy experts to conclude that we should not expect a cap-and-trade policy to bring about an efficient reduction in transportation-related GHG emissions.[14] Complementary transportation policies that make the operation of existing transportation system more efficient and that provide Americans with more efficient transportation options are both needed to accomplish this goal, especially in the long run.[15]

Public Transit and Climate Change: A Key (and Missing) Solution

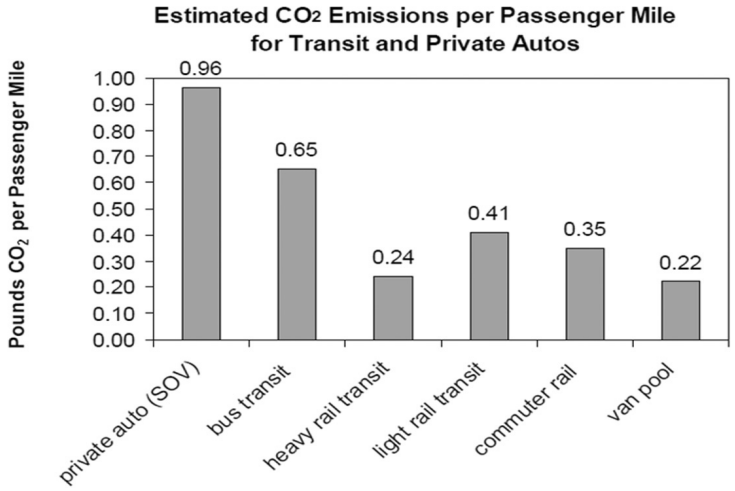
Travel by personal vehicle, which makes up the majority of U.S. travel, is among the least efficient passenger travel modes. As a result, 62 percent of transportation-related GHG emissions are due to gasoline consumption in personal vehicles (an additional 19 percent come from freight trucks).[16]

Public Transit is a Clean Transportation Solution

Public transportation, on the other hand, is one of our most efficient modes of passenger travel (Figure 3).

[14] Greene, David L. Ph.D. Oak Ridge National Laboratory. Testimony to the Senate Environment and Public Works Committee, June 2008.
[15] Ibid.
[16] U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2003.

Figure 3.



Data Sources: Private auto: single occupancy, 20.3 mpg average fuel economy, U.S. Environmental Protection Agency. Transit modes: Based on passenger miles and fuel and electricity consumption in the Federal Transit Administration's 2007 National Transit Database. Figures are national averages weighted by passenger miles. Emissions factors for fuels from U.S. Department of Energy. Emissions factors for electricty from eGRID subregion data, U.S. Environmental Protection Agency.

Reproduced from FTA presentation "Transit and Reducing Greenhouse Gases: A Look at the Numbers," by Tina Hodges October, 29, 2008.

Existing public transportation in the United States is already making significant contributions toward GHG emissions reduction. In 2005, public transportation reduced CO_2 (the main GHG) emissions by 6.9 million metric tons.[17] This includes both emissions reductions from reduced VMT, as well as emissions reductions resulting from reduced traffic congestion. On average, transit reduces nationwide CO_2 emissions by 37 million metric tons each year. This is equivalent to the combined household electricity use of New York City, Washington, D.C., Atlanta, Denver, and Los Angeles.[18]

Expanding and improving public transportation options is an important strategy to build on these achievements and continue reducing transportation-related GHG. At the local level, this means developing transit systems such as bus rapid transit, rapid bus service, heavy rail, light rail, commuter rail, van pools, and flexible paratransit and bus services. For longer-distance intercity travel, especially for trips between 50 and 500 miles, passenger rail, such as the service provided by Amtrak and several State departments of transportation, and intercity coach buses are energy-efficient options that can help reduce the GHG emissions of long-distance travel. A key to achieving the highest energy efficiency is effective utilization of capacity. Largely empty vehicles are less efficient.

Policies to expand and improve public transportation and other efficient transportation modes, such as passenger and freight rail, are critical to reducing transportation-related GHG emissions. There is great potential for further emission reductions; a single commuter can reduce their CO_2 emissions by on average 20 pounds per day, or more than 4,800 pounds annually, by commuting on public transportation instead of driving.[19] If transit ridership in the U.S. were to double by 2020, transportation-related GHG emissions would fall by 83 million metric tons each year. Tripling ridership by 2020 would cut annual GHG emissions 141.9 million

[17] Davis, Todd and Monica Hale. "Public Transportation's Contribution to U.S. Greenhouse Gas Reduction." SAIC. September 2007.

[18] *The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reductions,* ICF International. 2008.

[19] Ibid.

metric tons per year by 2020, representing an 8 percent reduction in transportation sector emissions.[20]

Demand for this level of public transportation service is real and growing. Between 1995 and 2008, growth of public transportation ridership has grown significantly faster than both highway travel and population.[21] Public transportation has also seen significant innovation and development in recent years, allowing a greater number and variety of communities across America to offer efficient transit service for residents. In a recent report titled *Reinventing Transit: American Communities Finding Smarter, Cleaner, Faster Transportation Solutions,* Environmental Defense Fund highlights eleven case studies that demonstrate this trend. In urban, suburban, exurban, and rural communities, cutting edge transit technologies and operations have been implemented cost effectively and quickly, enhancing mobility and reducing harmful emissions.

As local and State governments continue to innovate and seek to expand transit service tailored to community needs, the Federal Government should keep pace to support and encourage them. As Congress works to reform our surface transportation policy, it should promote greater transit equity. This means ensuring that State and local officials can make transportation investments on a level playing field, including parity in procedural requirements for obtaining Federal grants as well as equal access to Federal matching funds. Today local officials seeking to invest in a transit project typically must put up one dollar of local match for every dollar of Federal funds, while garnering four dollars of Federal funds for every dollar of local match if they are seeking to invest in a new or wider road. Today major transit capacity expansion projects face a much higher set of regulatory hurdles to win Federal support while highway capacity expansion projects face much lower regulatory hurdles. As a result, Federal transportation policy implicitly favors expansion of roads over expansion of transit, exacerbating GHG emissions growth, since in the long run added road capacity induces more travel and GHG pollution, while transit investment increases transportation system GHG efficiency.

The Connection to Livable Communities

Public transportation is a more efficient mode of travel, but the potential of public transportation to cut GHG emissions is much greater than the mere difference in emissions between transit travel and highway travel on passenger-mile basis. Public transportation infrastructure also helps facilitate more GHG-efficient land use and development patterns, which substantially increase the net reduction in transportation-related GHG emissions over time.[22]

In addition to incorporating more transportation options, including transit, such "livable communities" allow families to live closer to their daily needs such as schools, jobs, shopping, recreation, health care, and other services. This has a compounding effect on reducing GHG emissions by reducing the overall amount that people must drive in four key ways. In addition to allowing people to use efficient public transportation for some of their travel needs, livable communities also reduce the length of car trips that are taken, cut down on vehicle-hours of travel due to less traffic congestion, and eliminate the need for some motor vehicle trips altogether. For example, according to the Center for Transit Oriented Development, of Americans who live near public rail transit, 33 percent regularly use it, and 44 percent also regularly travel by walking or cycling.

The impact on GHG emissions of transit service paired with the efficient land use patterns of livable communities has been conservatively estimated at three to four times the direct effect of transit service.[23] As Chairman Dodd and other members of the Banking Committee have noted in recent hearings, strategies to increase transit service and foster the growth of more livable communities can help to reduce transportation-related GHG emissions while enhancing mobility, affordability, and quality of life.

A major study published in 2008 entitled *Growing Cooler: The Evidence on Urban Development & Climate Change,* looked deeper into this question. This landmark study surveyed decade's worth of data related to travel behavior and development patterns, and found that implementing the efficient development strategies that make up livable communities in a portion of new growth could slow travel growth and associated GHG emissions by 12–18 percent in metropolitan areas and 10–14

[20] American Public Transportation Association calculations.

[21] American Public Transportation Association statistics.

[22] *The Broader Connection between Public Transportation, Energy Conservation and Greenhouse Gas Reductions,* ICF International. 2008.

[23] Ibid.

percent nationally by 2050.[24] The authors concluded that achieving this level of reduction is achievable with changes in development patterns alone, excluding complementary measures such as transportation pricing or significant expansions of public transit service. In 2030, such a scenario would yield GHG reductions of 80 million metric tons of CO_2, equal to half the cumulative savings of a 35 mile per gallon fuel economy standard.

The study also documents the demographic and market trends that make this scenario a realistic goal in the next several decades. Altogether, the results of the study showed that such a package of complementary policies can have a significant impact on transportation-related GHG emissions. Given convenient alternatives at reasonable costs, Americans will take advantage of more efficient travel options in their communities, choosing to drive less.[25] Aggregated nationwide, this could yield a profound reduction in transportation-sector GHG, making it more likely that America meets economy-wide reduction targets. The authors calculated a transportation-related GHG emissions reduction potential of up to 38 percent with a comprehensive set of transportation and development policies, including the promotion of livable communities, transit expansion, and slower growth in highway expansion and pricing measures, not accounting for recent fuel price changes.

Transit's Triple Bottom Line: Social and Economic Benefits Beyond Climate Change

While investments to improve and expand pubic transportation can yield significant benefits for our climate and environment, they also produce other benefits to society that should not be ignored. Reducing GHG emissions through investments in clean transportation and promotion of livable communities helps create jobs, lower consumer transportation costs, reduce overall municipal infrastructure costs, and provide local tax revenue and economic benefits through real estate development.

Job Creation

A 2007 report from the University of Massachusetts, Amherst found that investment of $1 billion in mass transit produces an average of 19,795 jobs, with an average annual compensation of $44,462.[26] The report also found that these jobs are mainly created in the transportation, professional business and service, and manufacturing sectors, with the majority providing compensation of between $32,000 and $64,000 annually.

Consumer Transportation Costs

Transportation costs are a large part of part of most household budgets. However, transportation costs are lower for households in more livable communities with greater access to a variety of transportation option, including public transportation. Such households can spend less than 10 percent of their income on transportation, while households in areas without transportation options beyond auto travel can spend more than 25 percent.[27] Moreover, inefficient land use patterns and development have been shown to increase the cost of housing by 8 percent, or $13,000 per dwelling unit.[28]

Public Infrastructure Costs

Public infrastructure costs at both the regional and State level have been found to be substantially lower in development that demonstrates traits of livability. While spending on some infrastructure categories may be higher, studies analyzed by the Center for Clean Air Policy suggest a net overall savings.[29] In particular, auto-dependant and inefficient land use and development patterns can increase water and sewer costs by 6.6 percent and increases local road costs by 9.2 percent.[30]

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[24] Ewing, Bartholomew, Winkelman, Walters, and Chen. Urban Land Institute, 2008.

[25] Ewing, Reid et al., *Growing Cooler: The Evidence on Urban Development and Climate Change. 2007.*

[26] Pollin and Garrett-Peltier, "The U.S. Employment Effects of Military and Domestic Spending Priorities." October 2007.

[27] Statistics from Housing & Transportation Affordability Index and *Realizing the Potential: Expanding Housing Opportunities Near Transit.*

[28] Burchell, R. and S. Mukherji. "Conventional Development Versus Managed Growth: The Costs of Sprawl." *American Journal of Public Health* . 93 (2003): 1534–1540.

[29] Winkelman, Bishins, and Kooshian. *Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices.* 2009.

[30] Burchell, R. and S. Mukherji. "Conventional Development Versus Managed Growth: The Costs of Sprawl." American Journal of Public Health. 93 (2003): 1534–1540.

Local Economic Development

One estimate by the Center for Transit Oriented Development has shown that $1 in public transit investment can leverage up to $31 in private investment. The Center for Clean Air Policy has collected several examples of local transit investments have borne this trend out.[31] For example, Little Rock, Arkansas invested $20 million of public money to build a local streetcar. This investment leveraged $200 million in private investments. Likewise, the streetcar in Tampa, Florida cost $60 million in public funds, but it leveraged $1 billion in private investments. The nation's transit success story in Portland, Oregon is even more compelling; the city has spent $73 million on streetcar service, which helped attract $2.3 billion in private investments within two blocks of the line, a more than 30-fold return on investment. Further, the city's long-term commitment to transit has led a local industrial fabricator to begin manufacturing streetcars in 2008. This represented the first domestically produced modern streetcar; Portland's streetcars had previously been purchased from a company in Eastern Europe.

Restoring American Transportation and Environmental Leadership

During much of the 20th century, America's political and business leadership ensured investment and steady innovation in the transportation sector. America was viewed by many nations as a key model for transportation development. But in recent years, America's national vision for transportation lost clarity. U.S. leadership on environmental issues also eroded.

Our nation requires leadership to articulate an inspiring new vision and framework for transportation that will support climate, health, safety, equity, mobility, and economic development goals, while ensuring more accountable governance and system management. Without that, public confidence to support the required higher levels of transportation investment may be sorely lacking, holding America back from again achieving global leadership in transportation development and environmental protection.

In this moment, there is much for America to learn from transportation best practices abroad, from Europe, Asia, and Latin America. The United States has begun to manufacture modern streetcars once produced in Eastern Europe; to adapt best practices in Bus Rapid Transit from cities like Bogota and Curitiba; to create Bikestations at transit centers as has been done for decades in Japan, Denmark, and Germany; to explore ways to manage street space for high productivity as in Singapore, London, and Stockholm; to encourage more transit oriented development as in Germany, Canada, and England.

These examples provide many lessons about how transit can reduce GHGs. A recent ITDP–EDF study for Mexico City, for example, documented how a 10-corridor Bus Rapid Transit (BRT) system now being developed in that city will cut GHGs by 6 million metric tons by 2012.[32] Similar opportunities exist worldwide in Asia, Africa, and elsewhere in the Americas.

It is in the interests of all Americans for other nations to pursue these opportunities because transportation GHG emissions from developing countries like China and India are growing at an especially rapid pace. In 2006 transport accounted for 13 percent of global greenhouse gas emissions (GHG). Between 1970 and 2006, global GHG emissions from the transport sector increased by 130 percent. Transport-related CO_2 emissions are expected to increase a further 57 percent worldwide in the period 2005–2030 and transport in developing countries will contribute about 80 percent of this increase, from both passenger and freight transport.

Congress should consider how it can foster better support for transit to reduce greenhouse gas emissions worldwide. The U.N. Global Environmental Facility has helped aid the development of BRT in Jakarta and Dar es Salaam. The U.S. Agency for International Development formerly provided similar support to promote BRT in several developing countries. United States foundations like Climate Works are financing efforts to promote low carbon transportation in China, India, and the Americas. New carbon finance mechanisms that will be developed to guide international climate policy in future years could help advance sound transit and livable community development across the world. But this will happen only if more attention is paid to the key role transportation plays in determining future global greenhouse

[31] Winkelman, Bishins, and Kooshian. *Cost-Effective GHG Reductions through Smart Growth & Improved Transportation Choices.* 2009.

[32] Modelistica, *Transportation Modeling for the Analysis of Transportation Policies for the Metropolitan Area of Mexico City*, Environmental Defense Fund and Institute for Transportation and Development Policy, New York, July 2008. Page 158.

gas emissions and if the large co-benefits of transportation investments that reduce GHGs are recognized in cost analysis.[33]

Conclusion and Recommendations

Expanded and improved public transportation is a critical tool for addressing climate change in the United States and around the world. Combined with strategies to enhance the livability of our communities and manage our existing transportation system, transit offers a powerful tool for addressing one of the most significant domestic sources of GHG emissions and could help address the growing global GHG problem.

To ensure transit and transportation policies contribute to their full potential to cost-effective, timely GHG reduction, Congress should:

1) Restructure Federal transportation funding programs into performance-driven formula-based system preservation and competitive capacity expansion programs, as recommended by the Bi-Partisan Transportation Commission[34] and Transportation for America;[35]
2) Lower regulatory and procedural barriers to expansion and improvement of transit systems, speeding the process of delivering and financing well-designed transit projects while encouraging innovation in transit system design and operations planning, such as bus rapid transit and para-transit;
3) Ensure that transportation plans and programs contribute proportionately with other sectors to meet GHG goals by tying funding to performance and ensuring modal and operational alternatives that advance timely achievement of national goals are considered in the transportation planning process;
4) Support initiatives for livable communities such as the livability partnership formed by the Obama administration, as well as forthcoming livable communities legislation recently mentioned by Senator Dodd;
5) Ensure U.S. foreign assistance and trade promotion programs, carbon finance initiatives, and climate negotiation policies give attention to strategies that boost GHG efficient transportation and urban development and enhance the institutional capacity of governments and the private sector to work together to advance these strategies.

Thank you for your attention. I would be happy to respond to any questions.

PREPARED STATEMENT OF CLINTON J. ANDREWS

PROFESSOR, URBAN PLANNING AND POLICY DEVELOPMENT PROGRAM,
BLOUSTEIN SCHOOL OF PLANNING AND PUBLIC POLICY, RUTGERS UNIVERSITY

JULY 7, 2009

Good morning Chairman Menendez, Ranking Member Vitter and members of the Committee. Thank you for inviting me to testify today. My name is Clinton Andrews and I am a professor at Rutgers, The State University of New Jersey. For the past 6 years, I have been privileged to direct the University's urban planning program, which is part of the Edward J. Bloustein School of Planning and Public Policy.

My testimony discusses the role that transit can play in reducing greenhouse gas emissions and addressing climate change. I want to make three points here, as follows:

- The problem of global warming is large enough that it requires sustained efforts on multiple fronts, and transit is definitely one of those fronts.
- To be cost-effective, transit projects should be tailored to local conditions, settlement patterns, and unmet demands.
- There are many additional reasons to enhance the viability of the transit option in the nation's transportation system beyond its greenhouse gas reduction benefits.

In what follows I elaborate upon each of these points.

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[33] *Bellagio Declaration on Transportation and Climate Change,* May 2009, *http://www.sutp.org/bellagio-declaration/.*

[34] National Transportation Policy Project, *Performance Driven: A New Vision for U.S. Transportation Policy, BiPartisan Policy Center, Washington, DC, June 2009.*

[35] Transportation for America, *The Route to Reform: Blueprint for a 21st Century Federal Transportation Policy,* Washington, DC, May 2009. *http://t4america.org/blueprint.*

Transit as part of a portfolio of global warming solutions

The U.S. economy produces 21 percent of the world's greenhouse gas emissions, with 28 percent of U.S. emissions due to the transportation sector.[1] We know with confidence that: (1) global warming is already underway; (2) human activities are a key driver of this climate change; (3) the effects of other air pollutants are actually masking the extent of the global warming to date; (4) the trajectory of future greenhouse gas emissions indicates that some fairly dire scenarios are plausible; and (5) the impacts on human health, food and fiber production, coastal areas, water availability, and ecosystem health will scale upwards with the trajectory of emissions.[2]

This scientific consensus has spurred policy action in many U.S. States: to date 22 States have established greenhouse gas emissions targets, 36 States have completed or are working on climate change action plans, and 48 States have completed greenhouse gas inventories.[3] The Federal Government is also beginning to respond to the problem of climate change by complementing its longstanding support of research with specific, practical policies of the sort that passed the House last month and are being discussed here today.

There are three main types of greenhouse gas emission-reduction options: using energy much more efficiently or more frugally, switching to low-carbon and no-carbon energy sources, and sequestering carbon in natural sinks such as trees and soil or by means of geo-engineering techniques. In transportation, we can achieve energy efficiency by increasing vehicular miles per gallon, or reducing vehicle miles traveled by (1) changing settlement patterns, (2) altering the structure of travel demand such as with telecommuting, or (3) shifting to other modes including transit, walking, biking. None of these options can do the whole job, and hence there is a need for a multi-pronged approach to the problem.[4]

The United States should be, and is, pursuing energy efficiency and renewable energy and next-generation nuclear power and re-growing its forests. The appropriate analogy is to a portfolio of investments, in which the Nation balances risks and returns overall, by choosing a diverse mix of solutions with complementary strengths and weaknesses.

For the transportation sector, this boils down to pursuing higher miles per gallon and lower carbon emissions per gallon, biofuels and electric vehicles, private vehicles and public transit, smarter long-distance networks and more walkable neighborhoods. While it is tempting to demand a marginal analysis that asks "what single choice is most cost-effective?," there is no universal answer to that question that applies nationwide and for all time. So it is appropriate to delegate some—but not all—of these decisions to the States and MPOs, and to the marketplace.

There remains a clear role for the Federal Government to collect data that measures the performance of the transportation sector, fund research to expand our range of low-carbon mobility options, aggressively drive vehicle fuel efficiency standards in the right direction, continue to support State and local transportation infrastructure investments on a matching basis, help coordinate and fund interstate transportation initiatives, and encourage utilities and private actors to establish the necessary infrastructures (such as the smart grid) that are preconditions for fruitful competition among gasoline, biofuels, electricity, and even hydrogen as alternative transportation fuels.[5]

Roles for regional transportation planning agencies

States and MPOs can play key roles in decarbonizing the U.S. transportation sector by developing locally appropriate portfolios of solutions. It is only in the context of specific timeframes, settlement patterns, transportation networks, and natural resource endowments that one can identify which solutions are most cost-effective.

To illustrate the variation in baseline emissions, and therefore, suitable solutions, I will share results of a study we recently performed in New Jersey. Moving along a gradient from rural to urban, we see decreasing per-capita transportation-related greenhouse gas emissions, with towns served by commuter rail systems having lower emissions than towns having similar population densities but lacking that op-

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[1] Energy Information Administration, U.S. Department of Energy. 2008. *Emissions of Greenhouse Gases in the United States* 2007. Report DOE/EIA–0573(2007). Downloaded on July 3, 2009 from *www.eia.doe.gov/oiaf/1605/ggrpt*.

[2] Intergovernmental Panel on Climate. 2007. *Climate Change 2007: Synthesis Report,* Summary for Policymakers. Downloaded July 3, 2009 from *www.ipcc.ch*.

[3] Pew Center on Global Climate Change. 2009. *State Action Maps.* Downloaded on July 3 from *www.pewclimate.org*.

[4] Stephen Pacala and Robert Socolow. 2004. Stabilization wedges: Solving the climate problem for the next 50 years with current technologies. *Science* (13 August) 305 (5686): 968–972.

[5] Clinton Andrews. 2006. Formulating and implementing public policy for new energy carriers. *Proceedings of the IEEE* (October) 94(10): 1852–1863.

tion.[6] Table 1 shows the numbers for a few illustrative towns. Access to rail service coincides with a 10–15 percent reduction in per-capita greenhouse gas emissions for a given settlement pattern, and a change in settlement patterns from exurb to suburb to city ties to even larger emissions reductions from the transportation sector.

Table 1: Illustrative GHG Emissions per Capita along the Rural-to-Urban Gradient (Source: Andrews 2008)

New Jersey Municipality	Per-capita transportation-related greenhouse gas emissions (metric tons CO_2-equivalent per year)	Population density (persons per square mile)	Is there a railway station in town?
Exurb:			
Woolwich	3.74	145	No
Post-war suburb:			
East Brunswick	3.21	2,130	No
Cherry Hill	2.81	2,885	Yes
Inner-ring suburb:			
Highland Park	2.81	7,614	No
Montclair	2.44	6,184	Yes
City:			
Hoboken	1.23	30,239	Yes

These cross-sectional results suggest correlation but do not confirm causation, so they are by no means definitive. However, there are many other studies with similar findings that allow us to be confident that transit already plays a role in reducing greenhouse gas emissions.[7]

In the short run, local and regional transportation planners must work with the settlement patterns they have. Empty buses and trains are not greenhouse gas-efficient or cost-effective. Regional public policy can help build demand in marginal locations by providing targeted incentives such as transit passes for students, but there are limits.

The policy prescription for the area near exurban Woolwich is not to build a light rail system because it lacks the population density to make such a system viable. It can make more progress by getting kids to bike to school, and getting adults to car-pool or commute by bus. The policy prescription for the region near a post-war suburb like East Brunswick would be similar, although it might also be able to support a bus rapid transit system along its commercial strip. An inner-ring suburb like Highland Park has the density to support a shuttle bus or bus rapid transit stops linking to nearby train stations and employment centers. A city like Hoboken can—and does—support rail transit. This implies that MPOs and other regional planning organizations must engage with the land-use planners and urban designers in selecting which transportation—and which transit—investments are appropriate for each context.

In the longer run, problems of low ridership often disappear and transit investments can actually catalyze growth, based on the experience to date with transit-oriented developments.[8] However, a hard-nosed public policy would more often build transit in response to demand rather than ahead of it. This suggests that the marginal transit investment dollar should target existing and obvious capacity con-

[6] Clinton Andrews. 2008. Greenhouse gas emissions along the rural to urban gradient. *Journal of Environmental Planning and Management* (November) 51(6): 1–20.

[7] For a good survey of this literature see Reid Ewing, Keith Bartholomew, Steve Winkelman, Jerry Walters, and Don Chen with Barbara McCann and David Goldberg. 2008. *Growing Cooler: The Evidence on Urban Development and Climate Change.* Washington, DC: Urban Land Institute. See also Jared VandeWeghe and Christopher Kennedy. 2007. A spatial analysis of residential greenhouse gas emissions in the Toronto Census Metropolitan Area. *Journal of Industrial Ecology* 11(2): 133–144. Also see Jonathan Norman, Heather MacLean and Christopher Kennedy. 2006. Comparing high and low residential density: Life-cycle analysis of energy use and greenhouse gas emissions. *Journal of Urban Planning and Development* (March) 132(1): 10–21.

[8] Key references include: Cervero, R., Murphy, S., Ferrell, C., Goguts, N., Tsai, Y-H., Arrington, G. B., et al. 2004. *Transit-oriented development in the United States: Experiences, challenges, and prospects* (TCRP Report No. 102). C. Gorewitz et al. 2006. *Communicating the benefits of TOD: The city of Evanston's transit-oriented redevelopment and the Hudson Bergen light rail transit system.* Retrieved July 19, 2007 from *http://www.policy.rutgers.edu/vtc/tod/Communicating_Benefits_TOD.pdf.* Nelson-Nygard Associates. 2006. *MTC's Resolution 3434 Transit-Oriented Development Policy interim evaluation* (Report prepared for the Metropolitan Transportation Commission). Retrieved October 28, 2007, from *http://www.mtc.ca.gov/planning/smart_growth/tod/TOD_Policy_Evaluation.pdf.*

straints such as the needed additional rail tunnel under the Hudson River connecting New Jersey and New York.

Adaptation of transit systems to climate change is another key responsibility for regional transportation planning agencies. Much transit infrastructure is vulnerable to sea level rise, coastal or riverine flooding, and equipment failure due to high temperatures. Existing facilities need hardening, and more precise elevation data are needed to help plan new facilities.

In sum, transit serves as a core climate change solution. However, the specific type of transit and appropriate level of investment varies by locality, implying that more decisionmaking authority over the allocation of funds among modes should devolve to the regional planning agencies. Each such agency should be expected to create and follow a greenhouse gas action plan that guides investment priorities in a way that reflects national greenhouse gas emission reduction targets, regional network needs, local land use patterns, and adaptation requirements.

Other reasons to encourage transit

There are many other good reasons for encouraging transit. This is well-trodden ground, so I will not be lengthy. Transit reduces road congestion, delays, accidents, and pollution. Transit stabilizes and increases property values. Transit provides mobility options for children, the elderly, and others who cannot drive or afford a car. Transit helps people live more actively, thereby reducing obesity and related health problems.[9] Transit offers scale economies that are unavailable in other transportation modes. Transit improves energy security because its rolling stock can be readily converted to non-petroleum fuels. A recent, and very rigorous, economic analysis of the net internal and external benefits of transit has concluded that current subsidies to transit in U.S. cities are far below their optimal levels.[10] In other words, transit is under-supported in the United States.

Conclusions

As the Senate prepares to address the problem of global warming and as it considers how to finance the nation's future transportation infrastructure needs, I urge you to keep transit in mind. Transit brings multiple benefits and deserves greater support than it currently receives. Transit can cost-effectively help reduce greenhouse gas emissions, provided the projects are tailored to local conditions and land uses. The Federal Government should direct regional transportation planning agencies to do greenhouse gas action planning for transportation—and within that, transit—that pursues both mitigation and adaptation objectives. Finally, I believe the funding should follow the planning. Thank you for the opportunity to testify today.

PREPARED STATEMENT OF CHRISTOPHER CABALDON

MAYOR, CITY OF WEST SACRAMENTO, CALIFORNIA , AND TRANSPORTATION VICE CHAIR, SACRAMENTO AREA COUNCIL OF GOVERNMENTS

JULY 7, 2009

Chairman Menendez and Members of the Subcommittee: Thank you for the opportunity to appear before you today to discuss how public transportation can be a critical lever for significant progress toward our nation's climate and energy objectives.

The Sacramento Area Council of Governments (SACOG) represents 6 counties, 22 cities and a population of 2.3 million people in the region surrounding California's Capitol. We are representative of the economic, social, and industrial diversity of the nation, with a rural agricultural sector worth nearly $2 billion annually.

In 2002, the SACOG Board of Directors adopted a Metropolitan Transportation Plan 2025 (MTP). I chaired the broad-based stakeholder roundtable which wrote that plan, and we faced the competing demands you might expect. Business interests wanted us to put our money into roads and bridges, neighborhood groups pushed instead for sidewalks and bike lanes, and environmentalists and bus riders demanded that we go all-in for public transit.

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[9] Cross-national comparisons show a clear inverse relationship between the prevalence of obesity and the percent of trips taken by non-automobile modes (transit, walking and biking). See David Bassett, Jr., John Pucher, Ralph Buehler, Dixie Thompson, and Scott Crouter. 2008. Walking, Cycling, and Obesity Rates in Europe, North America, and Australia. *Journal of Physical Activity and Health* 5, 795–814.

[10] Ian Parry and Kenneth Small. 2009. Should urban transit subsidies be reduced? *American Economic Review* 99(3): 700–724. They find that the external benefits of transit are not internalized until fares are set substantially below 50 percent of operating costs.

We decided to model their ideas in the extreme. What would our region look like, and what would it live like, if we spent virtually all of our money for two decades on just roads? What about just transit? Or just sidewalks? I must tell you that we thought we were creating straw men to help shoot down the partisans at the edges. An all-roads scenarios might reduce congestion but blanket our air in poison, while the other options should have slowed congestion to total gridlock even if they improved air quality.

But here's Big Lesson #1: extreme investment strategies produced the same outcomes. There was virtually no significant difference in performance on congestion, travel time, vehicle miles traveled, or emissions. Why? Because transportation investments must be tightly coupled with changes in land-use in order to make any sort of difference. But when the two are married, the impact is powerful.

We ramped up investment in transit and other alternative modes in that 2002 transportation plan, but, more importantly, we learned that Big Lesson #1 and immediately got to work on the next-generation plan that would integrate the full range of policies AND investments necessary to reduce both travel time and emissions. At the same time, we wanted to arrest the ex-urban sprawl that was sapping vitality from the cores of our cities and towns while consuming prime farmland at an alarming rate.

In 2008 SACOG adopted an MTP 2035 that performed significantly better than the prior plan on virtually every indicator, including transit ridership, vehicle miles traveled, congestion, air quality and greenhouse gas emissions. Between those two plans, SACOG adopted a 50 year Blueprint growth strategy for the region that provided the needed technical analysis capabilities, political support and smart growth planning strategies to optimize system performance through integrated land use, transportation and air quality planning. I chaired SACOG for the Blueprint, and we achieved universal consensus on the boldest regional transportation and land use plan in the nation. In doing so, we learned Big Lesson #2: four key policy outcomes—greenhouse gas reductions, urban revitalization, farmland preservation, and transportation mobility-can be achieved only in concert with one another. That's why the plan was heralded and embraced by business, housing, transit, environmental, and social justice advocates, and won awards from U.S. EPA and two California Governors. That's why it is now the official model for the State of California and for regions of every type and scale. And public transportation is the plan's critical linchpin.

Through this process SACOG has learned a great deal about the very close connections between increased transit ridership and: land use patterns, air quality and overall transportation system performance. The table below provides the short story of the improvements we will realize by 2035 through the MTP we adopted in 2008 compared to the MTP we adopted in 2002. The MTP we adopted in 2008 significantly increased investments in transit and focuses much more growth into transit corridors. As a result transit service hours and boardings will grow dramatically. Transit trips grow at an average annual rate of 4 percent, more than double the population growth rate. The growth rate for commute transit trips is even higher, nearly 8 percent.

Overall transit productivity (boardings/service hour) will increase substantially. This will improve the fare-box recovery rate for transit operators and widen the margin of fossil fuel energy savings realized by transit versus automobile travel. The big win: Greenhouse gas emissions and vehicle miles traveled per capita decline instead of increase or stay constant, breaking a decades- long trend that regions throughout the country have experienced. With the transportation sector accounting for such a large share of greenhouse gas emissions, we cannot avert catastrophic climate change without forcing an absolute decline in vehicle miles traveled.

Increased transit ridership also provides major benefits to automobile drivers. The amount of time people have spent sitting in their cars in congested traffic has risen significantly over the past several years. Our 2008 MTP essentially breaks that trend as well, reducing the time people spend in congestion in 2035 from a 114 percent increase to just a 16 percent increase. There are many reasons for this, but targeted transit investments is one of the most important. Our state-of-the-art modeling indicates that we realize approximately a 10 percent reduction in congestion for every 1 percent of total trips that we are able to shift from cars to transit. This is because much of the increase in transit ridership we are forecasting is for commute trips, which are longer and occur during the peak, most congested, hours. When your roadways are at capacity, shifting even relatively small percentages of total trips out of cars and onto transit produces large benefits to all users of the system. It also reduces greenhouse gas emissions because stop and go, slow moving traffic creates more greenhouse gas emissions than moderate speed smoothly flowing traffic.

Percent Change from 2005 in:	2035 (2002 MTP)	2035 (2008 MTP)
Transit Service Hours	+111%	+28%
Transit Boardings	+98%	+184%
Transit Productivity	+6%	+35%
Greenhouse Gas Emissions/Capita	0%	−8%
Weekday Vehicle Miles Traveled/Capita	+1%	−6%
Congested Vehicle Miles Traveled/Capita	+114%	+16%

In California we are in the midst of implementing the nation's most comprehensive law linking regional transportation, land use, housing and climate change planning. SB375 was sponsored by California Senate Pro Tem Darrell Steinberg—Sacramento, and patterned after the SACOG Blueprint. The bill was signed by Governor Schwarzenegger last fall. The law is follow-up legislation to AB32, the California Global Solution Act, which requires us to reduce total greenhouse emissions levels by 2020 to 1990 levels. SB375 requires regional planning agencies like SACOG to meet greenhouse gas emissions targets for 2020 and 2035 that will be set by the California Air Resources Board. As part of our preparations for meeting the provisions of SB375 SACOG has prepared a TOD (transit oriented development) scenario for 2020 that makes further improvements on both the smart growth land use pattern and the transit investments compared to our adopted 2008 MTP. Specifically, the scenario shifts an additional 15 percent of the growth in our 2008 plan from ex-urban and rural areas into transit corridors, and it expedites the construction of the 2035 transit system to 2020.

The data in the table below clearly suggest that even greater performance improvements are possible if land use patterns and funding for transit improves. In the 2020 TOD Scenario greenhouse gas emissions per capita decline more by 2020 than they do by 2035 in our current MTP. That's Big Lesson #3: substantial, quantifiable reductions in per capita greenhouse gas emissions can be achieved through a combination of land use and investments in transit. Congested vehicle miles traveled per capita is also better, only a 2 percent increase from current conditions.

Percent Change from 2005 in:	2020 (2008 MTP)	2020 (TOD Scenario)
Transit Service Hours	+39%	+184%
Transit Boardings	+64%	+247%
Transit Productivity	+11%	+38%
Greenhouse Gas Emissions/Capita	−4%	−9%
Weekday Vehicle Miles Traveled/Capita	−2%	−6%
Congested Vehicle Miles Traveled/Capita	+21%	+2%

Which brings me to Big Lesson #4: transit investments must occur early if they are to effectively stimulate the shift in land use patterns to build substantial amounts of transit oriented development (higher density, mixed use, walkable development near high quality transit service). Expecting developers to build these new products on the expectation that sometime in the future the funds will be forthcoming to put in the transit lines is not realistic. We have to find a way to do both at the same time. The transit and land use have a strong synergistic relationship that is lost if they are not done together.

We don't think that building transit earlier rather than later is an unreasonable expectation. There is abundant evidence that citizens support this. Last fall, in the middle of the worst economy of our generation, voters in diverse places like my city, West Sacramento, Los Angeles, and Marin County approved substantial tax measures dedicated exclusively to increased transit service. The large increases in transit ridership and improved fare-box recovery rates that we have experienced locally over the past year are national trends. A combination of demographic, economic and social trends, along with changes in our built environment, create a unique opportunity for transit to finally be a center piece of not only our nation's transportation strategy, but also our aspirational energy and climate change strategy. We strongly encourage the Federal Government, through the Energy and Climate Bill, as well as the Transportation reauthorization and appropriations, to provide financial and policy support for this.

The House bill on energy and climate change, H.R. 2454, is a good start in this regard. Section 222 of that measure, championed by our own region's Representative Doris Matsui, builds on these big lessons from the pioneering work at the regional scale by SACOG and many of our colleagues across the nation. It aligns infrastructure and transportation planning with greenhouse gas reduction goals, and puts a heavy emphasis on public transit. And it does so by giving the frameworks—and some catalytic funding—to States, regions, and communities to get the job done.

In addition to increasing the total amount of transit investment in its 2008 MTP, SACOG also diversified the transit system. Transit is not a one-size-fits-all investment. In order to serve rural communities, a growing urban core, and older suburban areas alike, the Sacramento region is planning for a wide spectrum of services that suit particular needs. These include: light rail, to connect communities with high population and employment densities; streetcars, to connect regional job centers and also make it easy and simple to get around in pedestrian-oriented urban and town centers; regional rail and express buses, to accommodate long-distance commuters; dial-a-ride or neighborhood shuttles, for rural and suburban communities; as well as fixed-route service, bus rapid transit, paratransit, and subscription buses. In my own community, for instance, we have doubled our bus service and are now working to launch a streetcar system as part of our greenhouse gas strategy, but Federal policies have not caught up, stuck with a byzantine set of rules and regulations originally designed for massive heavy rail projects. The population is diverse and the transit system must recognize this.

The key elements of the land use pattern in our 2008 MTP include major market shifts away from large-lot single family construction to small-lot single family and attached products (rowhouses, townhomes, apartments), increased amounts of growth through redevelopment and infill opportunities, especially within walking distance of existing and planned transit, and a new style of suburban growth that emphasizes mixed use and walkable neighborhoods. A number of national studies document that market demand is now high for urban and walkable suburban neighborhoods. We certainly have witnessed this in our region, with small-lot and attached housing products growing from 20 percent to 70 percent market share in just the first 4 years of implementing our Blueprint plan. That's Big Lesson #5: citizens want to live, work, shop, and play in the kinds of places that transit and smart land-use planning can create. Expanding the choices available for consumers for a wider range of housing types and transportation options will allow them to live the lives they want and produce measurable and astounding reductions in our carbon footprint. It is our job to change our policies and investment priorities to make those choices possible, and in doing so we also protect our rural future and help avert catastrophic climate change.

The significant commitment our region has made to smarter growth and smarter transportation investments has occurred because these concepts have broad public and political support. People from across the political spectrum see this type of future for our region as important to both our economic and environmental health. This broad political consensus did not happen by accident. For the better part of the past decade SACOG has engaged in extensive, innovative citizen and stakeholder outreach activities. We have conducted hundreds of workshops with thousands of citizens, engaging them with interactive computer technology and asking them to help make the decisions about growth patterns and transportation investments. We discovered that there is broad support for improving the range of housing choices, expanding viable transportation choices, locating jobs and housing near each other, and making maximum use of our existing developed areas instead of focusing most of our growth on lands with high agricultural and natural resource values that often are far away from employment and services.

We very much appreciate the Committee's interest in these issues and our story. I would be happy to answer any questions you have and to provide any follow-up information that would be helpful to you.

PREPARED STATEMENT OF RANDAL O'TOOLE

SENIOR FELLOW, THE CATO INSTITUTE

JULY 7, 2009

Urban transit is important for those who lack access to automobiles. But the history of the last four decades shows that transit cannot and will not play a significant role in saving energy or preventing climate change.

Forty years ago, American cities were choked with air pollution, so Congress passed the Clean Air Act of 1970 and created the Environmental Protection Agency

(EPA) to administer the law. The EPA adopted two strategies to reduce pollution. First, it required automakers to make cars that polluted less. Second, it also encouraged cities to promote transit and adopt other policies aimed at getting people to drive less.

Today, we know what worked and what did not. Automotive air pollution has declined by at least two-thirds since 1970. This entire decline was due to technological changes in automobiles. Far from responding to transit investments by reducing driving and taking transit more, Americans today drive far more than they did in 1970. As the late University of California (Irvine) economist Charles Lave demonstrated in the October, 1979 Atlantic Monthly, investing in transit fails to save energy or reduce air pollution for two reasons:

- First, spending more money on transit does not significantly reduce driving.
- Second, transit uses just about as much energy as cars, so even if we could persuade people to take transit it would not save energy (see *http://www.theatlantic.com/doc/197910/197910*).

Dr. Lave's arguments are as valid today as they were in 1979, and as valid for greenhouse gas emissions as for energy and other pollutants. The difference between 1979 and today is that today we have much more evidence to back up Dr. Lave's points.

Transit Investments Do Not Significantly Increase Transit Ridership

Transit subsidies have historically had only a trivial effect on ridership. Between 1987 and 2007, annual subsidies in real dollars grew by 68 percent. Yet annual ridership grew by only 18 percent. While capital subsidies are sketchy before 1987, operating subsidies increased by 1240 percent since 1970. Yet ridership grew by only 45 percent.

More importantly, despite total real subsidies of well over three-quarters of a trillion dollars since 1970, per-capita transit ridership and passenger miles actually declined. Figure one shows that per-capita transit travel declined more-or-less steadily from 1970 through 1995. Although per-capita transit usage has grown a little since 1995, it remains below 1988, and far below 1970, levels.

Moreover, as figure two shows, while per-capita transit travel was declining, per-capita urban driving grew by 120 percent. Transit carried more than 4 percent of urban travel in 1970; but it fell below 2 percent in 1990 and now stands at 1.6 percent.

My former hometown of Portland, Oregon has invested more than $2 billion in light rail and streetcars. Yet this has had almost no effect on Portland travel habits. In 1980, before Portland built its first light-rail line, the census found 9.8 percent of Portland urbanized area commuters took transit to work. Today, Portland has four lightrail routes and a streetcar line, yet the Census Bureau's American Community Survey says only 6.5 percent of Portland commuters take transit to work.

The number of Portland-area residents taking transit to work actually declined between 2000 and 2007. These census numbers are confirmed by a 100-percent census of downtown employers conducted by the Portland Business Alliance in 2001 through 2007. More than two-thirds of all Portland-area transit commuters work in downtown Portland, but this census found that 7 percent fewer downtown workers took transit to work in 2007 than in 2001.

Transit Is Not Significantly Cleaner than Driving

Even if more subsidies to transit could attract significant numbers of people out of their cars, it would not save energy or reduce greenhouse gas emissions because transit uses as much energy and generates nearly as much greenhouse gas per passenger mile as urban driving. As described in my Cato Institute Policy Analysis no. 615 (*http://www.cato.org/pubs/pas/pa-615.pdf*), the following data are based on the Department of Energy's Transportation Energy Data Book, the Federal Transit Administration's National Transit Data base, and the Federal Highway Administration's *Highway Statistics.*

In 2006, the nation's transit systems used an average of 3,444 BTUs and emitted 213 grams of CO_2 per passenger mile. The average passenger car used 3,445 BTUs—just 1 BTU more-and emitted 245 grams of CO_2 per passenger mile, just 15 percent more. While transit appears slightly cleaner than autos, as shown in figure three, auto and light truck energy efficiencies have rapidly improved, while transit energy efficiencies have declined. Since CO_2 emissions are proportional to energy consumption, these trends hold for greenhouse gas production as well.

We can expect these trends to continue. If auto manufacturers meet the Obama administration's new fuel-economy standards for 2016—even if they fail to improve energy efficiencies beyond that—by 2025 the average car on the road will consume

only 2,600 BTUs and emit only about 186 grams of CO_2 per passenger mile—considerably less than most transit systems (figure four).

This rapid improvement is possible because America's auto fleet almost completely turns over every 18 years. By comparison, cities that invest in rail transit are stuck with the technology they choose for at least 30 years. This means potential investments in transit must be compared, not with today's cars, but with cars 15 to 20 years from now.

In much of the country, the fossil-fuel-burning plants used to generate electricity for rail transit emit enormous amounts of greenhouse gases. Washington's Metrorail system, for example, generates more than 280 grams of CO_2 per passenger mile—considerably more than the average passenger car. Light-rail systems in Baltimore, Cleveland, Denver, Philadelphia, and Pittsburgh all emit more greenhouse gases per passenger mile than the average SUV.

In places, such as the West Coast, that get much of their electricity from renewable sources, it would be wiser and more cost-effective to apply that electricity to plug-in hybrids or other electric cars that can recharge their batteries at night when renewable power plants generate surplus energy. As Professor Lave said, the "law of large proportions" dictates that "the biggest components matter most." In other words, since more than 90 percent of urban travel is by auto and only 1.6 percent is by transit, small improvements in autos can be far more significant than large investments in transit.

Transit has several other disadvantages as a way of reducing greenhouse gas emissions. First, even where electric-powered rail transit generates less greenhouse gases than cars or buses, the trains are supported by feeder bus systems that emit lots of greenhouse gases. While the trunk line buses that new rail transit lines replace typically run fairly full, the feeder buses that support rail transit run fairly empty because many rail riders drive to transit stations. The result is that greenhouse gas emissions on many transit systems increase after opening rail transit lines. After opening its first light-rail line, CO_2 emissions from St. Louis' transit system climbed from 340 to 400 grams per passenger mile, while Houston's grew from 218 to 263 grams per passenger mile.

Construction of rail transit also consumes huge amounts of energy and releases enormous amounts of greenhouse gases. Portland planners estimated that the energy cost of constructing one of the city's light-rail lines would equal 170 years worth of energy savings.

Highway construction also generates greenhouse gases, but because highways are much more heavily used than most rail transit lines, the emissions per passenger mile are far lower. Contrary to claims that rail transit can carry as many people as four or more freeway lanes, the New York City subway is the only rail transit line in America that carries more passenger miles per rail mile than one urban freeway lane mile. Outside of New York, the average urban freeway lane mile carries 12 times as many passenger miles as the average commuter rail mile, 7.5 times as many as the average light-rail mile, and 2.4 times as many as the average subway/elevated mile.

Further, as we tragically learned in the recent Washington Metrorail crash, rail transit systems must be completely rebuilt or rehabilitated every 30 years or so. The energy costs and greenhouse gas emissions from such reconstruction must be taken into account when considering rail transit. As a recent Federal Transit Administration report calculated, rehabilitation of rail lines in the nation's seven largest transit systems will cost at least $50 billion—money those agencies don't have. This is just one more indication that rail transit is not financially sustainable.

In the rare case where a transit investment really will reduce greenhouse gas emissions, the cost is exorbitantly high. McKinsey & Company says the United States can cut its greenhouse emissions roughly in half by 2030 by investing in technologies that cost no more than $50 per ton of CO_2 equivalent. But transit investments, if they reduce emissions at all, do so at costs of $5,000 per ton or more.

The American Transit Model Is Broken

Transit's poor performance is symptomatic of government-subsidized transit systems. Transit agencies that typically get three-quarters of their funds from taxpayers and only a quarter from transit users are politically obligated to run transit throughout their taxing districts no matter how few people want to use transit. The result is that the average transit vehicle, whether bus, light rail, subway, or commuter-rail car, runs an average of only one-sixth full.

Far from being short of funds, transit agencies have too much money, which they spend in the wrong places. Instead of providing economical transportation to users, they spend it on urban monuments such as light-rail and streetcar lines whose transportation value is negligibly different from buses. Agencies often go heavily

into debt building these lines and are also obligated to huge operations and maintenance costs. Almost inevitably, they suffer budget crises that force them to significantly curtail service.

On a passenger-mile basis, transit buses typically consume as much energy and emit as much CO_2 per passenger mile as SUVs. By comparison, private bus companies have an incentive to fill as many seats as possible, so they typically operate half to two-thirds full and consume little more than 10 percent as much energy per passenger mile as public transit buses. Between Boston and Washington, for example, at least 14 bus companies carry more passengers each day than Amtrak and do so using less than half as much energy and emitting about half as much greenhouse gases.

To make transit more environmentally friendly, we need to completely redesign our transit systems. This means either privatizing transit systems or, at the least, operating them entirely out of user fees rather than subsidies. If States feel the need to support people who have no access to automobiles, they can give such people transportation vouchers that they can use on any public conveyances.

Transport Strategies to Reduce Greenhouse Gas Emissions

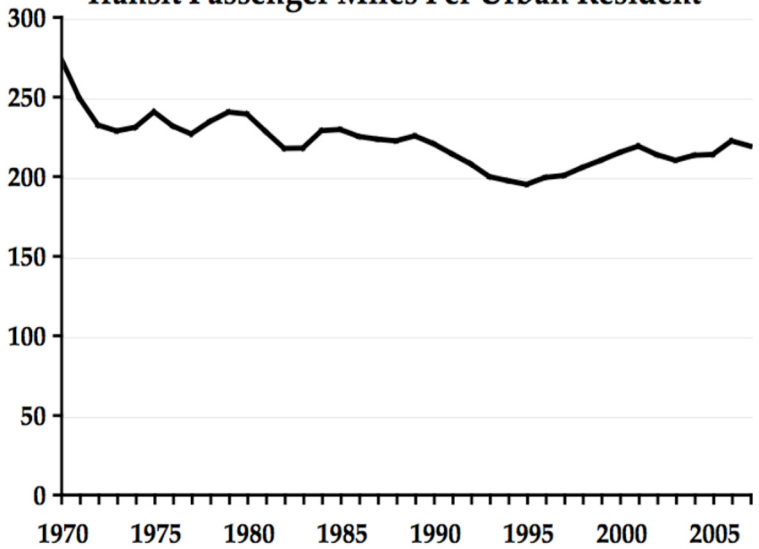
At the same time, we can significantly reduce greenhouse gas emissions from automobiles without engaging in futile efforts to try to get people to stop driving. The Texas Transportation Institute says urban congestion wastes nearly 3 billion gallons of fuel each year. Simple, low-cost techniques to relieve this congestion can do far more to reduce greenhouse gas emissions than investing more in a failed transit model.

One such technique is traffic signal coordination. A small investment in signal coordination can do more to reduce greenhouse gas emissions than billions invested in transit. For example, San Jose recently coordinated signals at 223 intersections, which reduced emissions by 4,200 tons per year at a cost of about $7 per ton. When the savings to motorists are counted, the project actually saved $200 per ton of reduced emissions. Yet the Federal Highway Administration estimates that three-quarters of the nation's traffic signals are obsolete or have no coordination at all.

Congestion pricing on existing HOV lanes and all new urban highways will also significantly reduce congestion. Looking to the future, accelerated investments in vehicle-to-vehicle and vehicle-to-infrastructure communications can greatly reduce congestion and increase personal mobility while saving energy and greenhouse gas emissions.

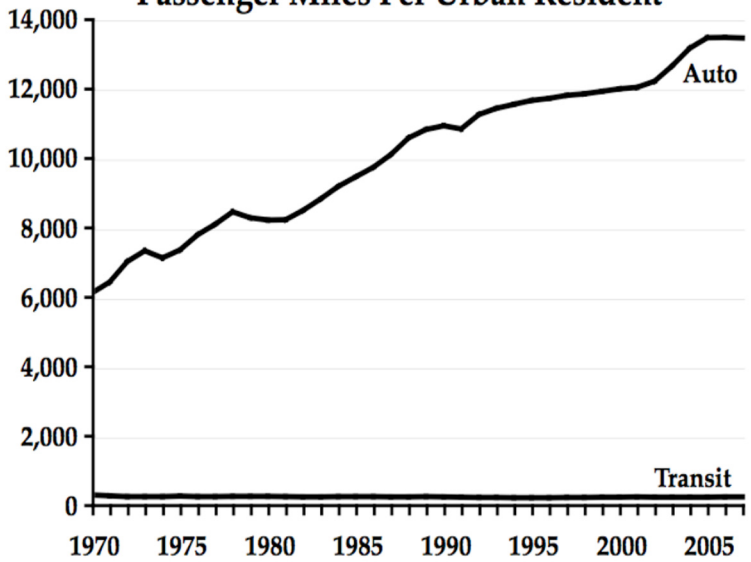
In short, instead of a futile effort to change American lifestyles, we simply need to make the form of transportation used most by Americans (as well as most Europeans and Japanese) even more efficient than it is today.

Figure One
Transit Passenger Miles Per Urban Resident



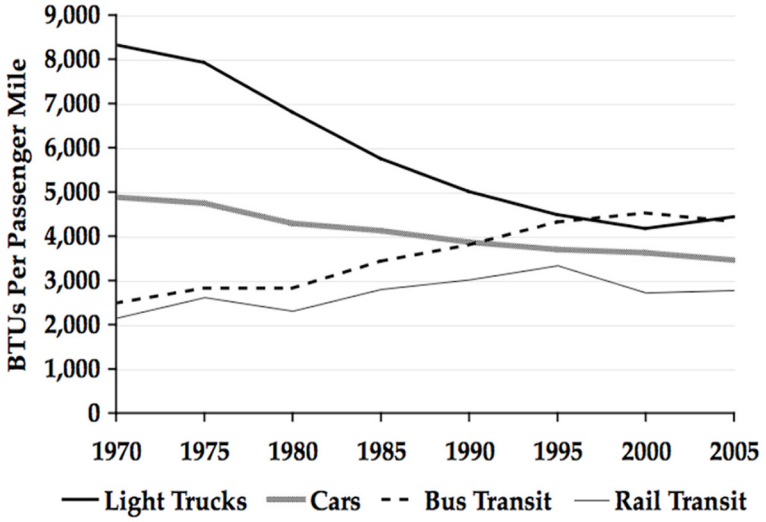
Source: APTA Fact Book, Census Bureau

Figure Two
Passenger Miles Per Urban Resident



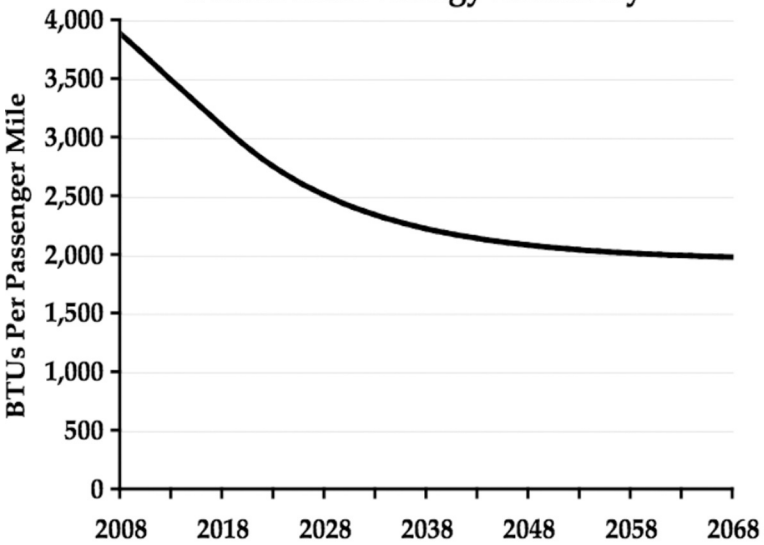
Source: APTA Fact Book, FHwA Highway Statistics

Figure Three
Energy Intensity of Passenger Transport



Source: DOE, Transportation Energy Data Book

Figure Four
Future Auto Energy Efficiency



Source: Calculations based on Obama's fuel-economy mandates

PREPARED STATEMENT OF ERNEST TOLLERSON

DIRECTOR, POLICY & MEDIA RELATIONS, NEW YORK STATE
METROPOLITAN TRANSPORTATION AUTHORITY

JULY 7, 2009

Good Morning Chairman Menendez, Ranking Member Vitter and Members of the Subcommittee. I want to thank you for the opportunity to testify today on the major role transit networks in metropolitan areas throughout the United States can play in reducing carbon dioxide and shrinking the carbon footprint of our cities and metropolitan regions, home to 65 percent of Americans and the source of 75 percent of the nation's GDP.

First, a brief word about the Metropolitan Transportation Authority. The MTA network is one of the world's largest. We provide 8.5 million subway, bus and commuter railroad rides daily—or 2.7 billion rides each year, accounting for nearly one-third of all transit riders in the nation. The MTA also operates seven bridges and two tunnels that carry nearly 300 million vehicles a year—the most heavily used bridge and tunnel system in the nation.

We all know that there is no silver bullet that will enable this nation to cut carbon emissions 80 percent by 2050. We need an integrated set of strategies and tools, including renewable sources of energy, the right breakthroughs in battery technology and a smart grid. Transit ought to be a major part of the strategy. If new investments in the transit sector are used to maximize transit's carbon-cutting potential, the Nation can achieve its near- and long-term goals. The climate legislation the Senate is drafting offers an opportunity to fund transit networks in a way that will unlock our carbon-cutting potential. Unlocking it will yield more transit, greener transit and, most important of all, greener communities—places where the amount of carbon it takes to live, work and enjoy life is dramatically lower than it is today.

As a sector, we are reaching the point where we can accurately score the climate-stabilization benefits of transit through: mode shift (from cars to transit); transit's role in minimizing congestion; and, the most powerful source of carbon-reduction, the integration of transit and green density (residential and commercial) around transit stations, which reduces trip length and frequency while encouraging walking and biking.

The MTA's carbon footprint totaled 2.7 million metric tons of greenhouse-gas emissions in 2008. However, the greenhouse-gas emissions the MTA generates are offset many times over by the carbon-emissions the MTA helps avoid by getting people out of cars and onto subways, buses, bus rapid transit and commuter rail.

For every metric ton of carbon an MTA service emits, the MTA helps avoid more than 8.24 metric tons of greenhouse gases, which is a weighted average for the MTA's 5,000-square mile region. Put another way, the MTA's 2008 carbon footprint of 2.7 million tons resulted in a net reduction of nearly 20 million metric tons (19.8 million tons). That's the equivalent of the carbon stored annually by a healthy forest of 7.7 million acres.

Transit's full climate-stabilization benefits will only be unlocked if the new investment in upgrading transit infrastructure and expanding transit networks also encourages the clustering of green commercial and residential development around transit. Transit-oriented development offers much more than more new housing and lifestyle choices. TOD makes it easy to dramatically reduce the greenhouse gases produced by the way you live, shop, work and recreate. Throughout the US, upgrading transit and expanding transit is already creating green density in places many of you represent. It's visible in the thousands of housing units developed around the Hudson Bergen Light Rail line in New Jersey, the explosion of residential development around the MTA Metro-North rail station in Yonkers and in the Euclid Avenue corridor project in Cleveland, Ohio, a $168.4-million public investment that has attracted billions in private investment.

The revised Waxman-Markey bill allocates 1 percent of the auction of carbon permits to transit networks. In light of the carbon-cutting potential of US transit agencies, especially transit's potential to give people the option of living in communities with fewer cars per household and lower auto use, the MTA and other transit agencies believe that allocating a larger share of auction proceeds to transit would enable the Nation to accelerate its efforts to reduce greenhouse gases. We suggest that Congress invest 7.5 percent of auction permit proceeds in transit, with 5 percent to increase access and expand transit networks and services, including:

- New lines, system extensions, bus rapid transit, light rail, feeder and distributor services, all of which foster TOD,

- Signal upgrades that boost the frequency of service an hour,
- New green fleets (buses and rail cars); and
- LEED standards for stations, bus depots and rail yards.

We also suggest that you allocate 2.5 percent to green and improve the carbon efficiency of existing transit infrastructure, including:

- Smart Fleets projects (light-weighting rolling stock, regenerative braking, on-board power, wayside power); and
- Green station renovations.

Every day America's transit networks bring about major greenhouse-gas reductions the old-fashioned way—through mode shift and reducing congestion. With the appropriate provisions in your climate bill, you can advance the nation's GHG-reduction goals:

- Expand transit's capacity to get people out of cars and onto transit, and
- Upgrade existing transit lines and expand transit networks so that transit can transform our cities and metro regions into communities with low-carbon lifestyles and low-carbon places to work. This solution set can be deployed now, not in five or 10 years.

In short, your bill can unlock transit's potential to green the way we live, work and enjoy life in communities throughout the nation. Again, thank you for the opportunity to testify today. I'm happy to answer any questions you may have.

RESPONSE TO WRITTEN QUESTION OF SENATOR MENENDEZ FROM MICHAEL A. REPLOGLE

Q.1. Your testimony reveals that we cannot reduce transportation emissions through technology alone, but that we need to provide transportation alternatives and also change development patterns. Some are skeptical, however, that we can truly change development patterns in time. Can we affect the change we need between now and 2050?

A.1. Did not respond by publication deadline.

Q.2. Are there other indirect environmental benefits of transit oriented development? In addition to providing alternatives to driving is such development also inherently more efficient because it is more compact? Has anyone measured those benefits?

A.2. Did not respond by publication deadline.

RESPONSE TO WRITTEN QUESTION OF SENATOR MENENDEZ FROM CLINTON J. ANDREWS

Q.1. Professor Andrews, given your experience with statewide greenhouse gas target plans and regional transportation planning, what barriers are there to reducing transportation emissions and what do you think the Federal Government can do to help overcome those barriers?

A.1. Thank you for the opportunity to answer this follow-up question. My answer first addresses barriers and then offers suggestions for how the Federal Government could act to reduce greenhouse gas emissions from transportation.

Barriers

In my view, the key barriers to reducing transportation-related emissions in the United States are our lack of a clear national commitment to greenhouse gas reduction and the slow pace of innovation in the relevant domestic industries.

These problems relate to one another and also tie in with other challenges. Specifically, dominant firms in the automobile, petroleum, road-building, and real estate industries have great incentives and abilities to defend their current practices and business models against change that might—might—favor new entrants or inconvenience current managers and workers. Public financing of transportation infrastructure is one important policy arena where this defense of the status quo occurs. Others include the regulatory and tax policies governing these industries.

Many consumers, firms, and public officials are unaccustomed to thinking about the long-term consequences of current decisions, and they often and uncritically mix short- and long-range solutions to problems. In this context of short-termism, the marketplace often fails to support solutions that may have a higher first cost but a lower life-cycle cost. Arguments about the supposed lack of cost-effective alternatives need reframing to emphasize a more appropriate definition of longer-term cost-effectiveness.

In this growing, land-rich nation, standards of good land-use and transportation planning are relatively immature, and policy debates on these topics are relatively unsophisticated. Settlement

patterns have reflected the cheapness of our land and we have only recently begun to recognize the adverse, unintended consequences of creating automobile-dependent landscapes. It is time to recognize that the nation's wide-open spaces no longer define the lived experience of most Americans. Most people instead live in metropolitan areas and experience traffic congestion, air pollution, and unnecessarily expensive transportation choices.

Recommended Federal Actions

To solve these problems, the Federal Government should first make a clear national commitment to reducing greenhouse gas emissions. Elements of this commitment eventually should include laws that establish carbon accounts for tracking our progress; regulations such as cap-and-trade that will limit emissions, starting with point sources; a carbon tax to encourage reduced emissions economy-wide; and a redirection of infrastructure financing to acknowledge this new, national objective.

The Federal Government also should provide funding directly to Metropolitan Planning Organizations and their counterparts instead of to the States. This will reduce the rural bias that hinders rational, state-level transportation infrastructure resource allocations. This will yield more resources for under-funded, less carbon-intensive transit, walking and biking infrastructures in most areas.

The Federal Government should promote life-cycle thinking by mandating the use of life cycle cost analysis that assesses the total cost of ownership for all federally funded projects. This requirement will help tilt financial decisionmaking toward a longer-term perspective that accounts for greenhouse gas emissions policies and adaptation to climate change.

The Federal Government should reduce the reasons for affected industries to defend the status quo. Make tax credits for research and development, and for investment, more permanent. Enact social policies that better protect workers from the consequences of disruptive change, by making health insurance and pensions transferable, and by providing personal incentives for education and retraining.

The Federal Government should symmetrically reduce the ability of beneficiaries of the status quo to defend their privileged positions. Most important are good government reforms that reduce the financial roles of lobbyists and special interests in political decisionmaking and increase the transparency of political and administrative decisions.

Finally, the Federal Government should undertake a systematic initiative to improve the quality of the U.S. built environment. Most important, there should be additional support for evaluation research to assess the performance—and unintended consequences of—major transportation projects, land use regulations, urban designs, and buildings in terms of greenhouse gas emissions and livability. There should also be a focus on educating professional planners to a higher standard by encouraging more widespread requirements for licensure of planners; providing greater NSF/HUD/DHS fellowship support for graduate students in planning, architecture, and civil engineering; and more regularly requesting National Academy-style advice and analysis from experts in the field. The

relevant expertise for addressing transportation-related greenhouse gas emissions should extend beyond the engineering-oriented Transportation Research Board membership to include experts in land-use planning and urban design.

RESPONSE TO WRITTEN QUESTION OF SENATOR MENENDEZ FROM CHRISTOPHER CALBALDON

Q.1. Mayor Cabaldon, the Sacramento Blueprint and SB 375 establish aggressive goals for reducing greenhouse gas emissions and energy consumption. How is it that your region was able to transform the way it planned its transportation future when so much of the country seems stuck in existing patterns? What can we learn from your experience and apply elsewhere?

A.1. There were two keys to our success. We used state-of-the-art data and modeling tools to objectively analyze the impacts and trade-offs of different futures for the region, and we had a very aggressive, innovative citizen engagement process.

Our commitment to developing first-rate, unbiased information created a great of credibility across the political spectrum. Examples of what we did include:

—Housing market preference survey (co-funded and designed by development and business interests) to identify current preferences for higher density, mixed use, walkable neighborhood projects.

—Long-range demographic forecast, in part so we could estimate how current market preferences might change in the future, especially with the fast growing aging population.

—Development of parcel specific region-wide Geographic Information System (GIS) database, important for analyzing technical impacts and political acceptability of land use changes at the neighborhood level.

—Expansion of regional travel model so that it could explicitly account for how changing land use patterns would influence travel behavior and air emissions (most standard models do a poor job of this because they are too coarse grained).

—Development of a web-based version of the PLACE3S software (**PL**anning for **C**ommunity **E**nvironment, **E**nergy and **E**conomic **S**ustainability) so that technically accurate modeling for the entire region could be conducted fast enough to use "live" at small group tables of citizens in dozens of interactive community workshops.

Our commitment to new methods of citizen engagement involved thousands of citizens, many of whom were new faces to on-going local land use politics and developed a high degree of consensus on the final Blueprint plan across the region. Examples of what we did include:

—Used a full partnership with Valley Vision, a civic non-governmental organization, to recruit participation in dozens of workshops.

—Specifically recruited people for the workshops to represent a spectrum of citizens, housing advocates, business and property interests, members of the development industry, and affected public agencies.

—Assigned participants to ensure a wide diversity of interests was present at each small group table.

—Supported effective small group decision-making with trained facilitators and computer modeling at each table (using PLACE3S software described above).

—Within the 22 cities and 6 counties who are members of SACOG actively involved all key parties, including elected officials, city managers/county executives, planning directors, and planning commissioners.

—Conducted 1500 person regional conference to have citizens identify their preferred regional future scenario.

—Conducted first-ever regional summit with all local government elected officials to make final changes to the draft preferred regional future scenario (the Blueprint).

—Had endorsement for the final scenario from broad range of interests groups, including environmentalists, developers/builders, chamber of commerce, architects and housing advocates.

—Supported implementation of the Blueprint with grants, development of additional graphic and technical tools, and technical assistance to local governments and stakeholders.

Q.2. Mayor, the central point you repeat is the importance of increasing transit ridership. Some still seem to think that it is difficult to convince people to leave their car at home in favor of transit. Has that been your experience in West Sacramento?

A.2. Did not respond by publication deadline.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR VITTER FROM RANDAL O'TOOLE

Q.1. Mr. O'Toole, can you think of a single public transportation system that has reduced greenhouse gas emissions over traditional automobiles?

A.1. No, public transit systems have not reduced greenhouse gas emissions anywhere in the United States for two reasons. First, despite tens of billions of dollars of annual subsidies to public transit—more than the total subsidies to highways even though highways carry close to 100 times as much travel as transit—transit's share of urban travel is declining almost everywhere in the country. While transit's share may have increased in some areas in 2007 and 2008 due to high fuel prices, the long-term trends are down and will no doubt remain negative as people adapt to higher fuel prices by buying more fuel-efficient cars.

Second, transit itself produces huge amounts of greenhouse gas emissions. The average public transit bus produces far more emissions, per passenger mile, than the average car. The average rail transit line, such as the Washington MetroRail system, produces as much or more emissions than the average car if the electricity used to power the system is generated by burning fossil fuels (as it is for Washington MetroRail). Even where electric transit is powered by renewable energy sources, rail transit is almost always supported by buses whose emissions per passenger mile are high.

The average passenger automobile emits about 0.54 pounds of CO_2 per passenger mile, and this is expected to decline to well under 0.4 pounds per passenger mile by 2025. As shown on page 14 of my Cato report, "Does Rail Transit Save Energy or Reduce Greenhouse Gas Emissions?" the transit systems in all but a handful of urban areas—New York, Atlanta, San Francisco, Portland, Boston, Chicago, and Cincinnati—emit more than 0.54 pounds of CO_2 per passenger mile.

Transit systems in only three urban areas—New York, San Francisco, and Portland—emit less than 0.4 pounds of CO_2 per passenger mile. Yet even in these urban areas, we cannot say that transit has reduced greenhouse gas emissions because transit's share of travel is declining in each of them. In Portland, for example, the number of people who take transit to work declined between 2000 and 2007, while the number of people who drive to work increased by about 75,000.

While automobiles are getting more energy efficient, transit has been getting less energy efficient. As we build more rail lines into suburban areas that do not heavily use transit, we can expect transit's energy efficiency to decline even further, and that means that greenhouse gas emissions per passenger will increase.

Q.2. Mr. O'Toole, what do you think of the premise that brings us all here today—that if you build more public transit, we will as a nation reduce greenhouse gas emissions?

A.2. The data show that building more public transit will not reduce greenhouse gas emissions. First, construction itself releases large volumes of greenhouse gas emissions. Even if operating a new transit line could reduce greenhouse gas emissions, it would take many decades of savings to make up for the emissions released during construction.

Second, except in places such as the Pacific Coast States where most electrical energy is generated from renewable sources, operating those public transit lines does not significantly save greenhouse gas emissions. If our goal is to reduce greenhouse gas emissions, building more transit lines is exactly the opposite of what we want to do.

Even where most electrical energy comes from renewable sources, it makes more sense to invest in electric or plug-in hybrid cars, whose batteries can be recharged overnight when electrical demand is low, than in electric transit that will use power during the day when demand is high.

Instead of building expensive new transit lines, we need to take a cue from the private bus industry. On a per-passenger-mile basis, public transit buses are some of the worst generators of greenhouse gases. But private buses are the least, generating far less greenhouse gases per pound than almost any transit line. The difference is that private bus operators have an incentive to fill as many seats as possible, while public transit agencies are politically driven to serve every corner of their taxation districts even if few people in many parts of those districts ride transit.

If we are serious about using transit to reduce greenhouse gas emissions, our best choice would be to privatize transit systems and allow the operators to serve the routes that will fill the most

seats and do the most to minimize costs—both financial and environmental—per passenger mile.

RESPONSE TO WRITTEN QUESTIONS OF SENATOR MENENDEZ FROM ERNEST TOLLERSON

Q.1. Mr. Tollerson, we've heard about how the marketplace should dictate transit development. Did the MTA's Blue Ribbon Panel have members from the private sector on it? Can we create economic growth with such planning while still being sustainable?

A.1. Yes, the **Blue Ribbon Commission on Sustainability and the MTA** did have members of the private sector on it. The chair of the Commission, Jonathan F. P. Rose, is the president of Jonathan Rose Companies. The company is a real estate policy, planning, development and investment firm with projects worth $1.5 billion. The firm has been involved in developing sustainable communities nationwide. The firm's mixed-use development in Denver was awarded the Urban Land Institute's Award for Excellence. Currently, Jonathan Rose Companies has broken ground for the first-ever affordable and mixed-income residential development designed to LEED (Leadership in Energy and Environmental Design) Certification standards in East Harlem.

The chair of the Commission's Facilities Working Group, Robert Fox, is a founder and partner in the architectural firm of Cook & Fox. Among the firm's marquee projects is the new Bank of America Tower at One Bryant Park in Manhattan. This skyscraper is considered one of the most efficient and ecologically friendly buildings in the world. It's the only skyscraper to achieve LEED platinum—the highest LEED rating.

The other private-sector members of the MTA commission were: Anna-Marie Francello, the Executive Director of Regional Travel and Ecology at the UBS Investment Bank; Susan Metzger, the former owner of the multi-disciplinary environmental sciences and engineering consulting firm of Lawler, Matusky & Skelly Engineers, which was recently acquired by HDR, Inc. a full-service economics, financial and engineering firm; and Nancy Shevell, Vice President for Administration at New England Motor Freight Inc. and Shevell Group of Companies. Both Susan Metzger and Nancy Shevell are current members of the MTA Board of Directors.

Q.2. Can we create economic growth with such planning while still being sustainable?

A.2. Yes, economic growth and environmental sustainability are mutually compatible objectives. The pursuit of environment sustainability in the public transit sector will spur long-term economic growth in the form of new jobs and growth in GDP. The reverse is also true: economic growth in the form of green transit jobs and increases in GDP related to green transit policies will help metropolitan regions reduce their carbon footprints and give metro regions a major tool for meeting any interim and long-term greenhouse gas reductions goals that the Congress and White House set. The strategies and policies proposed by the MTA's **Blue Ribbon Commission on Sustain ability and the MTA** promote environ-

mental sustainability and project the economic benefits of green transit operations and greening transit capital programs.

The economic development benefits of green public transit were so important to the commission that the commissioners invited economist David Lewis to score and forecast the economic benefits of pursuing a comprehensive sustainability agenda at the MTA. David Lewis' section of the report, pages 8 and 9, briefly summarize Transit's Four Green Economic Impacts, which are *Avoiding Carbon Emissions, Managing Regional Congestion, Optimizing Land Use and Generating Higher Values.*

In particular, the fourth economic impact, Generating Higher Values, describes the positive impact that public transit has on the value of residential real estate. David Lewis also forecast that the stimulatory effect of green transit investments recommended by the commission would generate a possible yield of 105,500 net new jobs a year, employment income of $5.1 billion a year and regional economic output of $17 billion a year between 2010 and 2019.

On pages 72 to 74 of the final report of the MTA commission, David Lewis summarizes the methodology for forecasting SROI, the Sustainable Return on Investment in a section on public transit's triple bottom line (TBL). The use of various SROI models is likely to grow as States, metro areas, communities and the Federal Government seek to evaluate and compare the likely impact of various green strategies.

In addition, recently published studies reveal that the failure to achieve deep reductions in greenhouse gases (GHG) will result in overall costs from climate change that will be equal to the loss of between 5 percent to 20 percent of global GDP. This provides a clear example of the deep connection between environmental sustainability and economic viability. The commission's recommendations recognize the role of transit in promoting economic productivity and sustainability—and reducing exposure to losses from effects of climate change that cannot be reversed.

In short, expanding transit networks in the major metropolitan regions of the United States, where 65 percent of Americans live and where three-fourths of the nation's GDP is generated, not only lowers carbon emissions, it demonstrably raises property values. It not only reduces dependence on fossil fuels but also allows for high-value businesses to concentrate in metropolitan areas.

Obtaining these dual benefits of environmental sustainability and economic growth requires the collaboration among the three major sectors of U.S. society, the public sector—including communities, counties, cities, States, public benefit corporations like the MTA—the private sector and the independent sector (including CBOs, CDCs, EDCs, NGO's, foundations and other donors). These dual benefits, environmental sustainability and economic growth, are not likely to be achieved by a sole reliance on any one sector.

Recent developments in transit-oriented development (TOD) in the MTA's 5,000-square-mile service territory make the need for collaboration among sectors abundantly clear. The MTA has been directly involved in planning such sustainable economic growth. Metro-North Railroad, one of two MTA commuter rail services in the region, worked with the city of Yonkers to rehabilitate the Metro-North station and the environs around the station. Metro-

North's station improvements complemented Yonkers' waterfront development projects and assisted in the downtown revitalization efforts.

As part of the station renovation, Metro-North built a corridor through the station's concourse, providing direct access to the Hudson River waterfront for residents, visitors and commuters. The new riverfront portal complemented the city's new riverfront esplanade. This collaborative effort attracted private developers to build a significant mixed-use residential, commercial and retail development plus a waterfront park at the station. This cluster of development projects, in turn, generated greater ridership volume at the Yonkers station.

This collaborative effort between the city of Yonkers, Metro-North and a private developer resulted in:

- Approximately 600 residential units;
- 28,000 sq. ft. of office space; and
- 17,000 sq. ft. of retail restaurant space.

Yonkers is also planning more private development near the station.

The revitalization of Yonkers increased ridership on Metro-North while decreasing automobile usage among the TOD residents. This translated into the following:

- 40 percent increase in ridership at the Yonkers Station; and
- Less than 1 (0.89) car per household compared to national average of 1.89.

There are other recent examples of private-public collaborative efforts in creating TOD in the MTA service territory. In Tarrytown, New York, a compact, mixed-use development was recently opened near the Metro-North Tarrytown station. This resulted in:

- Approximately 240 residential units;
- 65,000 sq. ft. of commercial space;
- 15,000 sq. ft. of retail space.

Metro-North is a catalyst in a number of other TOD projects, including the *Be in Beacon* project and the *Happening in Harrison* project. The MTA's other commuter rail service, the Long Island Rail Road, is working with the Town of Brookhaven to develop a TOD zone around the LIRR's Ronkonkoma station.

Multiple studies have shown the environmental benefits of TOD, in particular the reduction of vehicle-miles traveled. The Urban Land Institute recently published a study, "Growing Cooler: The Evidence of Urban Development and Climate Change," which showed that mixed-use, compact development by transit stops is a key contributor to combating GHG emissions. The study warned that if sprawling development continues to fuel driving, the projected 48 percent increase in VMT between 2005 and 2030 will overwhelm expected gains in vehicle fuel efficiency and low-carbon fuels. Even if the most stringent fuel-efficiency proposals are enacted, vehicle emissions would be 34 percent above the 1990 levels in 2030. Depending on several factors, from the mix of land uses to a pedestrian-friendly design, TOD reduces driving from 20 percent to 40 percent and more in some instances. Residents living in

compact developments have the option of using public transit and are not restricted to automobiles only. With a range of transportation choices, these residents drive a third fewer miles than those in automobile-dependent areas. The MTA commission recognizes the need to develop and actively promote a TOD program.

Evidence of the way in which environmental sustainability and economic growth are intertwined is visible in the MTA's involvement in clean, renewable energy. As the MTA pursues a variety of strategies for lowering its carbon emissions and for gaining access to renewable power, the MTA always looks for opportunities to incubate and support renewable and cutting-edge energy entrepreneurs, industries and suppliers.

Finally, the MTA is one of the New York City region's largest consumers of electricity, primarily for traction power for subways and commuter rail as well as a large consumer of fuel for a fleet of more than 6,000 buses. MTA NYCT has played an important role in the development of hybrid technology. In 1998, MTA NYCT partnered with Orion bus and BAE Systems on 10 diesel hybrid buses. After 6 years of in-service experience, MTA NYCT ordered 125 production hybrids. The experience was positive. In our hybrid fleet, we saw an average 30 percent increase in fuel economy compared to the conventional diesel buses those hybrids had replaced. We ordered 200 in 2004, 500 in 2006, and 850 in 2008. We now have these buses in all boroughs with numerous duty cycles, and are monitoring the component life cycle data to inform future purchase decisions. The MTA has the largest diesel hybrid fleet in North America, and the MTA's efforts to build that fleet have helped to drive the market for diesel hybrid technology.

Q.3. The FTA has numerous programs under SAFETEA–LU. As we move forward with reauthorization, which programs will we have to strengthen so transit can be one of our tools to fight climate change? Do those programs need more resources, policy changes or both?

A.3. Both. Transit needs a combination of more resources *and* policy changes in order to unlock its true carbon-cutting potential. As the urgency for proven climate-change mitigation strategies increases, transit is, and should be, viewed as a major solution that can be deployed now on a national scale. The MTA recommends the following:

- **Create a robust state-of-good repair (SOGR) program.** Target the rehabilitation and preservation of existing infrastructure investments in areas where the environmental and economic benefits are the greatest. The value of maintaining existing transit assets, which have too often been neglected, is critical to making progress in the fight against climate change. The foundations of our existing transit systems, which are already providing key greenhouse gas (GHG) reductions in major metropolitan areas, must be adequately funded and maintained. The Federal Transit Administration's (FTA) recent *Rail Modernization Study* estimated the SOGR backlog at the nation's seven largest rail transit agencies to be roughly $50 billion. Two points made recently by the FTA administrator are worth keeping in mind. First, deferred maintenance items, if

deferred long enough or left undetected, can become critical safety risks. Second, the issues of the conditions of our transit infrastructure and the safety of our transit systems are inextricably linked.

Therefore, the Congress should establish a separate SOGR investment fund with an expedited approval and award process. It should be noted that transit investments in densely developed areas with a high transit-mode share serve to maintain existing densities and ensure riders do not switch to relying on automobiles. SOGR investments also encourage more public and private development, creating opportunities to increase densities near quality public transit.

- **Encourage intermodal projects to make transit a more viable option thereby reducing congestion and vehicle miles traveled (VMT).** Provide incentives for the planning and development of regional transportation services which connect multiple modes, jurisdictions and systems. The provision of better linkages and more seamless travel options encourages transit use and reduces GHG emissions. The development of a single regulatory process for FTA and Federal Highway Administration (FHWA) to follow for multi-modal projects will allow for faster implementation of projects that provide connections between modes and highway projects that include transit components. Funding is also needed for improving access and connections to transit, especially in areas with existing low-density development. By improving feeder systems (buses, shuttles, trolleys, ferries, vans, etc.) to rail stations as well as distributor systems from stations to employment centers, metropolitan regions will be able to address the "last mile" problem. All aspects of improving transit connections should be considered, including: types of vehicles; scheduling; fares; the provision of real-time customer information and way-finding signage; the condition and quality of bus stops, shelters, and stations; and car-sharing and carpooling systems. In addition, this program should include local projects that improve transit and station access through sidewalks, "smart streets," pedestrian ways, bike lanes and paths, bike parking, park-and-ride lots, and roadway improvements.
- **Streamline the project approval process.** In order for communities to realize transit's climate-stabilization benefits, projects must be approved and completed more quickly. Procedural changes to the project-development process would decrease approval-related delays. That in turn will speed project delivery and reduce costs. New programs and policies that promote better coordination of transportation decisions and investments with land use, housing, energy and environment investments should be implemented—and this new level of coordinated decisionmaking and investments should be accompanied by a streamlining of Federal processes.
- **Authorize additional resources for transit.** Fundamentally, there is a need for increased levels of Federal investment in transit. Expanding transit capacity and maintaining and upgrading existing transit networks—including station-access im-

provements—is a proven GHG reduction strategy. Additional resources and the streamlining of Federal processes can quickly advance implementation of Bus Rapid Transit (BRT) and Light Rail Transit (LRT) lines in many metropolitan areas around the nation. Federal investment is critical in and of itself, but increased Federal investment guarantees also attract much needed State, local and private sector investment in transit and Transit-Oriented Developments (TODs). TODs have the power to reduce GHG emissions by transforming the way in which we live and work by reducing car trips, reducing distances between activities and encouraging transit use, biking and walking.

- **Encourage and broaden experimentation with pricing programs and policies.** Pricing strategies and parking policies that increase the cost of single-occupancy-vehicle (SOV) travel should be experimented with and viewed as complimentary to transit. Persuading people to switch from driving their cars to transit will in all likelihood take price signals. Pricing programs should also be considered additional revenue sources, which can be used to finance higher levels of transit investment. Congestion pricing and public transportation generate mutual benefits—road pricing yields benefits for transit by improving public transportation speeds and the reliability of public transportation service, increasing public transportation ridership, lowering costs for public transportation providers, and expanding the source of revenue that may be used for public transportation.

Public transportation benefits road pricing by absorbing commuters who shift their travel from automobile to bus or rail, according to a FHWA primer, entitled *Transit and Congestion Pricing*. This primer succinctly lays out the way in which road pricing and transit work well together.

- **Provide funding for implementation of new green technologies and adherence to green standards embraced by the transit sector in the United States.** Transit agencies should be encouraged to invest in sustainability improvements that will make their operations more energy efficient. Greening transit operations will require the deployment of new technologies, including: regenerative braking, aluminum third rail, subway car light-weighting, battery technologies, clean fuels and the transformation of transit support facilities (bus depots, train yards and stations) into high-performance, lower-carbon facilities; using LEED or LEED-like standards for new construction and major renovation of facilities can accelerate the greening power and greening potential of transit. The American Public Transportation Association (APTA) and its members have had discussions about drafting green transit standards for transit agencies; those standards would cover many areas, including facility design and vehicle types.
- **Transforming existing transit infrastructure into lower-carbon transit services.** In older metropolitan areas there is an opportunity to create lower-carbon transit services based on adaptive re-use of existing transit infrastructure. The Long Is-

land Rail Road's East End Shuttle service is a case in point. It ran shorter shuttle trains more frequently between Speonk and Montauk during construction work on a county road in 2007 and 2008. This so-called scoot service provided an improved suburb-to-suburb transit option. In light of the scoot service's success, there are probably many opportunities to provide similar transit services on underutilized rail right of ways in other parts of the MTA region and in many metropolitan regions around the nation.