



ITS AMERICA

ITS AMERICA'S STRATEGIC PLAN FOR SUSTAINABLE TRANSPORTATION



Prepared by

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September 2008



ACKNOWLEDGEMENT

ITS America expresses gratitude to the professionals who generously shared time and expertise in creating this document. They are listed here with their organization or affiliation at the time of their contribution.

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BACKGROUND

The Intelligent Transportation Society of America is the leading advocate for technologies that improve the safety, security and efficiency of the nation's surface transportation system. These *transportation technologies* generally apply information technology to the traditional system elements of driver, vehicle and infrastructure. Our nearly 500 members include private corporations, public agencies, and academic institutions involved in the research, development, design, and deployment of Intelligent Transportation Systems (ITS) technologies that enhance safety, increase mobility, and sustain the environment.

It is widely acknowledged that our surface transportation system is in great need of repair, expansion, and diversification to accommodate the nation's travel demands. Traffic congestion is cited by Americans as a significant source of frustration, and it results in the loss of billions of dollars due to wasted time, fuel and productivity while stuck in traffic. The Federal Highway Administration's Freight Analysis Framework projects that the volume of freight and commercial vehicles on our nation's highways will continue to grow.¹ Transportation officials recognize that *transportation technologies* can help meet these needs because they are cost-effective measures that help increase the mobility and safety of the traveling public, thereby providing net economic, social and environmental benefits. *Transportation technologies* that can be used to change traveler behavior by providing real-time information about traffic congestion, transit options, and general system efficiency will also be vital to measuring the ability of the transportation system to achieve specific performance standards likely to be incorporated in the next round of transportation legislation. ITS America believes that deployment of multiple intelligent transportation technologies that are a part of an actively managed network will create an efficient, sustainable transportation system that can be objectively evaluated.

In addition to the immediate need to address our aging surface transportation system, we also face daunting environmental challenges such as global climate change and its potential impacts on sea levels, the number and severity of droughts in some areas, and the amount of precipitation and storm intensity in other areas. As we plan for and develop policies to address changes in global climate, we need to consider both mitigating activities that may adversely affect our climate as well as find solutions that will ensure that our transportation system can effectively adapt to climate change.

It is imperative that transportation decisions be evaluated in terms of their social, economic, and environmental impact. Transportation technologies designed to maximize the efficiency of current transportation resources are sustainable because they can accommodate current economic growth and provide long-term transportation services to future generations while mitigating the impact on the environment. ITS technologies will also help us adapt to the

¹ "Freight Facts and Figures, 2007, Office of Freight Management and Operations (2007) at 9.



changing climate. Current research indicates that over the next fifty years, we will likely experience rising sea levels, an increase in the number of very hot days, more precipitation events, and greater intensity of hurricanes. These changes will result in multiple impacts on the transportation infrastructure including, but not limited to, flooding of tunnels and low lying infrastructure, erosion of bridge supports, and inundation of roads, rail lines, pipelines and runways. ITS technologies will help us adapt to these conditions by alerting drivers to adverse weather conditions, guiding people away from areas affected by increases in the number of and intensity of hurricanes, and integrating emergency response services into transportation operations.

Key industry sectors and all levels of the United States government are debating climate change. Members from both the U.S. House of Representatives and the U.S. Senate have introduced climate change legislation. In response to the Supreme Court's decision in Massachusetts v. EPA that the United States Environmental Protection Agency ("U.S. EPA") has authority under the Clean Air Act to regulate greenhouse gas ("GHG") emissions, the U.S. EPA issued an Advanced Notice of Proposed Rulemaking seeking comment on the possible regulation of GHG emissions. The next Administration will face the daunting task of developing a single regulatory scheme to address GHG emissions, and reconciling the Supreme Court's decision giving the U.S. EPA regulatory authority to regulate GHG emissions under the Clean Air Act, with the National Highway Traffic Safety Administration's responsibility for establishing fuel efficiency standards. In addition to any federal program that is created, several states, such as California, Oregon, and Washington, enacted their own climate change legislation and promulgated regulations. A coalition of major corporations and environmental organizations, known as the United States Climate Action Partnership, is calling for national climate change legislation. As consensus grows among federal and state governments, industry, environmental groups, and the public that climate change should be addressed, lawmakers, industry, and the public must determine how to most efficiently, cost-effectively and quickly achieve the necessary reductions.

The U.S. transportation sector contributes an estimated 28 percent to our nation's carbon dioxide emissions. Strategies for reducing GHG emissions from the transportation sector are often thought of as a "three-legged stool": (1) improve fuel economy of vehicles, such as the Corporate Average Fuel Economy standards; (2) reduce the carbon content in fuels, *e.g.*, the reformulated fuel standards and alternative fuels; and (3) improving the efficiency of the transportation system, which includes maximizing system operations, facilitating mode shifts (*i.e.*, increase transit options), changing driver behavior, land use policy, and system planning. *Transportation technologies*, which are part of the third leg of the stool, can play a significant role in reducing emissions in the near term because they can be deployed more quickly, and they help improve the efficiency and mobility of the transportation system, thereby reducing fuel consumption and GHG emissions. Deployment of transportation technologies may also strengthen the second leg of the stool by supporting creation of the infrastructure for alternative energy sources, such as plug-in hybrids or hydrogen fuels. Regardless of actions taken to mitigate the impacts of climate change, we will need to adapt to



changing weather patterns and ITS technologies may help facilitate our ability to respond to our changing climate by tracking road conditions, warning of potential system failures, re-routing traffic as necessary, and providing drivers with real-time traffic and weather information.

With a large and diverse membership, ITS America is in a unique position to help develop and implement a strategy for broad deployment of travel measures that increase energy independence and system efficiency and reduce fuel consumption and related GHG emissions. This Strategic Plan for Sustainable Transportation discusses the potential for transportation technology to create a more sustainable transportation system that helps reduce GHG emissions from the transportation sector and adapt to the changing climate as part of the global effort to address climate change.

To implement the objectives of this Strategic Plan, ITS America created an Environmental Task Force and four subcommittees (Science and Technology, Environmental Policy and Regulation, Transportation Policy and Regulation, and Legislative). The Environmental Task Force and its subcommittees are responsible for developing and implementing a program that identifies and promotes sustainable transportation measures. Specifically, ITS America will:

- (1) identify and, if possible, quantify the environmental benefits of developing and deploying broadly a suite of transportation technologies that help reduce GHG emissions through efficiency gains in system operations, reduction of vehicle miles traveled, and/or use of alternative, cleaner fuels;
- (2) support investment in technical innovation to help our members create and deploy the next generation of transportation technology that will help reduce GHG emissions and adapt our transportation system to the changing climate; and
- (3) educate members about eco-friendly measures for their own operations that minimize their carbon footprint.

As developers and users of transportation technology, ITS America members are accustomed to rapid change. Consequently, ITS America members are able to develop or adopt a wide range of solutions that will help achieve more immediate reductions of GHG emissions from the transportation sector that will be protective of our environment, while increasing the mobility of goods and people for the economic well-being of our nation. The following statement explains how ITS America intends to realize its vision of sustainable transportation.



I. WHAT IS SUSTAINABILITY?

A. Definition of Sustainable Development

Sustainable development requires consideration of three core impacts: environmental, social and economic.² One of the most frequently cited definitions of sustainable development is the one created by the Brundtland Commission, which defines it as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.”³ In the United States, sustainability policy seeks to balance the desire for economic expansion with the need to help preserve our natural resources.

B. What Is Sustainable Transportation?

Sustainability is an increasingly important goal for transportation because the demand for transportation infrastructure and desire for economic expansion is increasing, while natural resources are diminished and harmed with each passing year. Applying the principles of sustainable development, “sustainable transportation” can be defined as meeting, and sometimes re-defining, the mobility needs of the present without compromising the ability of future generations to meet their needs. Transportation technologies that facilitate mode shifts and increase the efficiency of the transportation system will help mitigate certain negative environmental consequences associated with increasing mobility. ITS America’s Environmental Task Force will collect data and disseminate information on the ability of specific transportation technologies working individually as well as collectively to (1) reduce fuel consumption; (2) increase mode shifts to reduce vehicle miles traveled and congestion; and/or (3) reduce emissions.

II. ITS AMERICA’S COMMITMENT TO SUSTAINABLE TRANSPORTATION

A. Environmental Stewardship Begins at Home

In order to encourage others to develop a sustainable transportation system, ITS America will foster leadership in sustainable transportation by helping members further reduce the impact of their operations on the environment. ITS America will inform members about international, federal, and state environmental programs, such as U.S. EPA’s Climate Leaders program, that help organizations reduce their carbon footprint. ITS America will provide general information to members about the International Organization for Standardization

² International Association of Public Transport, “Sustainability Charter” (April 2008) at 2.

³ United Nations, “Report of the World Commission on Environment and Development.” General Assembly Resolution 42/187 (December 11, 1987) (Retrieved: 2007-04-12).



("ISO") 14000 and 14001, which specify requirements for an environmental management system that enables an organization to systematically reduce the impact of its operations on the environment. ITS America will also provide members with information about increasing the efficiency of their own operations by using recycled materials, switching to clean energy, and purchasing more efficient equipment. As transportation technology requires more computing power, ITS America members may also consider participating in programs such as the Green Grid or the Climate Savers Computing Initiative, which are dedicated to advancing energy efficiency in data centers and purchasing energy efficient personal computers and servers. These efforts will facilitate continued economic prosperity while reducing use of natural resources and waste byproducts.

ITS America hopes that its environmental program ultimately will help members become "carbon neutral," meaning that members' net carbon emissions would be zero. Members may achieve carbon neutrality by: (1) limiting energy use and emissions in their own operations (transportation, building, and operations); (2) obtaining energy from renewable sources by either generating their own renewable energy or purchasing green power; and (3) offsetting any remaining emissions that cannot be avoided by undertaking carbon projects or purchasing emissions credits. ITS America members able to achieve permanent, quantifiable, and additional reductions of carbon emissions may be able to monetize their emissions reductions by participating in emissions trading programs such as the Chicago Climate Exchange.

B. Promote Technology that Improves Mode Shifts and Increases System Efficiency

Entities that deployed transportation technologies are experiencing environmental benefits. Cities that have congestion pricing of their central business districts report reductions in GHG emissions. Similarly, electronic toll collection and electronic weigh-in motion facilities are increasing traffic flow and reducing GHG emissions, but these emissions reductions have yet to be quantified. While additional studies are needed to determine the extent to which all transportation technologies have played a positive role, either individually or in combination with several measures, initial reports demonstrate that transportation technologies are having a positive impact on the environment.

1. Identify the Environmental Benefits of Transportation Technology

As transportation technology is developed and deployed, government agencies, legislators, and the public may ask "what does this do for sustainability?" Congestion pricing, electronic toll collection, traffic light synchronization, and electronic weigh-in motion facilities keep traffic moving and reduce idling time, thereby reducing GHG emissions. London and Stockholm adopted congestion pricing in their central business districts and both cities report a



14 to 16% reduction in GHG emissions.⁴ Similarly, the Advanced Regional Traffic Interactive Management and Information System (ARTIMIS) and the Arterial Street Signal Interconnect, funded by the U.S. DOT's Congestion Mitigation and Air Quality (CMAQ) Improvement Program, are intended to improve traffic flow and reduce emissions of certain pollutants. Despite such anecdotal evidence, there is not yet a comprehensive analysis of the environmental benefits of several transportation measures, deployed alone or in concert with other measures. In a data-driven world, ITS America must obtain data documenting the generally accepted conclusion that transportation technology can help reduce GHG emissions.

The Environmental Task Force is performing a comprehensive review of ITS services in the National ITS Architecture to determine the extent to which each transportation measure reduces congestion, increases average vehicle speed, or reduces vehicles miles traveled, and is comparing those benefits with the cost of deploying the technology. The following categories of transportation technology may help reduce GHG emissions:

1. **Traffic Signal Synchronization**: This simple and well-established technology for congested urban areas adjusts in real-time the timing patterns of traffic signals to allow for the least delay and the best possible flow of vehicles.
2. **Transit Signal Priority**: Transit signal priority reduces competition between transit vehicles and cars for use of traffic signals. Using a wireless network, a transit vehicle communicates with the traffic signal so that the transit vehicle will have a green light to proceed through the intersection.
3. **Traffic Management Centers**: Traffic management centers use "Automated Transportation Management Systems" to synthesize -- in one location -- data from a variety of sensors, closed circuit televisions, weather stations, and other sources to determine speed along the roads, detect incidents and accidents, and dispatch emergency services to help vehicles cope with and ease congestion.
4. **Electronic Toll Collection**: Rather than stop to pay tolls, electronic toll collection allows vehicles to travel at highway speed while paying a toll. Recent applications of electronic toll collection are "High Occupancy Toll" lanes and congestion pricing.
5. **iPark**: Intelligent parking management eliminates the need to cruise for a space by using technology to either allow a driver to make a reservation for a parking space or provide real-time information about the location of available parking spaces.

⁴ Transport for London, "Central London Congestion Charging: Impacts Monitoring", (July 2007) at 56 (it was estimated that congestion pricing in London reduced carbon dioxide emissions by 16 percent); Stockholmsforsöket, "Facts and Results of the Stockholm Trials, Final Version – December 2006 at 10 (congestion pricing in Stockholm reduced emissions of carbon dioxide by about 14 percent).



6. **Speed Management**: Vehicle emissions are highest at low speeds, but for some class of vehicles, increase again at higher speeds. Speed management systems can help enforce speed laws.
7. **Road Weather Information**: Weather information systems remotely detect weather and road surface conditions and communicate that information to drivers so they can make alternative plans or drive appropriately for the conditions.
8. **Demand Responsive Transit Service**: Demand responsive transit service avoids the use of large transit vehicles by using technology to dispatch small, more efficient transit vehicles to serve specific client groups.
9. **511 Traveler Information**: The phone number “511” has been designated by the FCC for traveler information. Using voice response, travelers can use mobile or land-line telephones to obtain real-time information about traffic and transit conditions, accidents and construction, transit schedules and a variety of useful traveler information.
10. **Dynamic Route Guidance**: Using in-vehicle route guidance systems equipped with GPS and digital maps, drivers can obtain real-time traffic conditions to plan the least congested route.
11. **Freight and Fleet Administration**: Freight and fleet technologies, such as the PrePass® systems, use electronic toll tags on trucks to allow them to bypass truck weigh stations saving gas, time and GHG emissions.
12. **Crash Avoidance**: Technologies, such as cooperative intersection collision avoidance systems, provide automatic communication between vehicles and the roadside and between vehicles that inform drivers of the state of activities at an intersection or on the open road so they can avoid crashes and help reduce congestion caused by accidents.
13. **Historical Traffic Data**: ITS technology collects aggregated data regarding the use of the transportation network. Transportation planners can use this data to make decisions that maximize the efficiency of the transportation network.

While there are some data regarding the environmental benefits of traffic signal synchronization or electronic toll collection, ITS America believes that deploying a mix of these technologies will enable the transportation operator to more actively manage the surface transportation network and achieve even greater benefits. We call this approach the “Actively Managed Network,” which uses a combination of technologies to reduce congestion on the roads, provide information to travelers about road conditions and transit options, and promulgate public policies to help reduce vehicle emissions.



The Environmental Task Force will ask ITS America's technical forums, which comprise ITS America members, to identify technologies within these categories that may help reduce (1) fuel consumption, (2) vehicle miles traveled, (3) congestion, or (4) GHG emissions, collect and review available data, and compare those benefits with the cost of deploying the technology. Based on the ratio of environmental benefits to the cost of deployment, the Environmental Task Force, with input from the Forums, will rank technologies according to their ability to help deliver environmental benefits at the lowest cost. The rankings will be re-evaluated as new transportation technologies emerge and as the Environmental Task Force collects relevant data from members, government agencies, international organizations, and non-governmental organizations. Data found to be robust will be incorporated into a database library as a resource for transportation planners and decision makers. Any data gaps will be identified and the Environmental Task Force will propose actions to fill such deficiencies.

In parallel with its efforts, ITS America will co-sponsor with the Natural Resources Defense Council, the Environmental Defense Fund, the American Public Transit Association, the American Association of State Highway Transportation Officials, the Rockefeller Foundation, Urban Land Institute and possibly, the U.S. Department of Transportation ("U.S. DOT") a study (the "Joint Study") that will evaluate and quantify the environmental benefits of transportation measures. The Joint Study will assume aggressive national implementation of approximately 25 travel activity measures, a number of which fall within the ITS category. To the extent ITS America obtains data from its members, government agencies, domestic corporations, non-governmental organizations, academic institutions and research labs, and international organizations regarding the ability of transportation technologies to benefit the environment, ITS America will forward that information to the investigator.

2. Educate and Disseminate Information to Lawmakers, Government Agencies, Non-Governmental Organizations, and the Public About the Environmental Benefits of Transportation Technology

The existence of innovative transportation technology and any resulting benefits will remain unknown unless ITS America informs the public about the impact of transportation technology on the environment. To the extent permitted by the source of data, ITS America will make relevant data available to its members, the general public, the U.S. DOT, the U.S. EPA, the state DOTs, and Congressional Committees like the Senate Committee on Environment and Public Works, the House Committee on Transportation and Infrastructure, and the House Committee on Science and Technology, so that lawmakers and federal agencies can develop transportation policy that balances environmental, social, and economic interests. Lawmakers and domestic and international government officials eagerly await the results of the Joint Study, which is expected to be complete in early 2009, as Congress begins to consider climate change and transportation legislation. ITS America will work with its co-sponsors to educate members of Capitol Hill and interested federal agencies about the results of the Joint Study.



Nearly one half of ITS America members are public agencies that can provide the U.S. U.S. Department of Transportation (“U.S. DOT”) and the U.S. EPA with information regarding the deployment and benefits of transportation technologies, regulatory policies and requirements, and voluntary programs regarding emissions reductions. ITS America’s private sector members may be able to inform these same regulatory agencies about emerging technologies, barriers to deployment, and estimated costs. The Environmental Task Force can facilitate the exchange of relevant information from nearly every sector of the transportation industry, providing federal agencies with valuable insights about the ability and time to deploy transportation technologies and the resulting environmental benefits of each measure.

ITS America is also reaching out to non-governmental organizations (NGOs), like the transportation programs at the Environmental Defense Fund, the Natural Resources Defense Council, and the World Resources Institute, and sharing information about the environmental impacts of transportation technology and coordinating efforts to quantify any benefits.

Finally, the Environmental Task Force and ITS America’s Communications Director will work with ITS America’s association partners, such as AASHTO and APTA, its 24 regional and state chapters, media contacts, non-governmental organizations, and international organizations, such as the World Bank, to advise the public at large about environmental benefits resulting from broad, systematic deployment of ITS.

3. Monetize Permanent, Quantifiable, and Voluntary Emissions Reductions

Despite the lack of a U.S. federal program to cap GHG emissions, Europe and regions within the United States have trading programs to reduce GHG emissions. By placing constraints, or a “cap,” on certain business sectors to reduce GHG emissions to specified levels, a market for GHG emissions trading has been created because some covered entities are able to achieve greater emissions reductions than required, while others fall short. A “cap-and-trade” program allows those who achieve greater emissions reductions to sell their unused emissions to those entities that cannot meet their cap. Currently, proposed climate change legislation for the U.S. does not specifically identify transportation systems as entities required to achieve emissions reductions. However, transportation technology projects may qualify as emission “offsets” in federal, regional, or state schemes to reduce emissions of GHG.

An offset, which is a financial instrument representing one metric ton of carbon dioxide or its equivalent in other greenhouse gases, is generated from the reduction or avoidance of GHG emissions from a specific project. The project can be used to counteract or “offset” emissions from other activities, such as generating electricity. The entity undertaking the offset project must demonstrate that the offset project is not required to occur and that any emissions reductions are quantifiable, permanent, and enforceable. A third party with no financial interest in the project must verify the calculation of emissions before the project (the baseline) and the projected emissions following the project in order to determine the GHG benefit, which is expressed as the difference between baseline and projected emissions.



Offsets are critical to effective climate change policy because they can achieve additional emissions reductions using existing technology.

If the Joint Study, data collected by ITS America, or other analyses confirm that transportation technologies help reduce GHG emissions, then ITS America staff will work with U.S. EPA, association partners, and existing carbon offset programs, such as the Chicago Climate Exchange and the California Climate Action Registry, to develop a verification procedure to certify transportation technology projects as offsets that can be traded on carbon markets. The Environmental Task Force will also work with ITS America association partners, ITS America members, and non-governmental organizations to help ensure that climate change legislation and regulations do not preclude transportation technology projects from qualifying as offset projects.

4. Support Investment in Technological Innovations

Technology can play an important role in making our transportation system more eco-friendly by improving the capacity to move goods and people necessary for economic prosperity and by assuring safe transportation. Technological advancement is dynamic, however, and ITS America recognizes that its commitment to sustainable transportation systems needs to be ongoing and open-ended. Therefore, it is essential that we continue to invest in the development and deployment of transportation technologies. ITS America will seek funding for technological innovation by proposing legislative provisions that could include tax credits, tax incentives, and/or government grants for the development of innovative transportation technologies. ITS America may also support legislation or regulations requiring deployment of transportation technology because such requirements may expand the demand for transportation technology and, as a result, will encourage public and private investment.

III. MOVING FORWARD

Transportation technologies provide an immediate tool to help reduce the transportation sector's contribution to GHG emissions in the near term, while simultaneously helping to improve the mobility, safety, and efficiency of the transportation system. ITS America is committed to devoting its resources to one of the most important challenges currently facing transportation planners and policymakers.

To ensure that transportation planners consider environmental and climate change consequences of their decisions, the Environmental Task Force recommends that ITS America develop a comprehensive decision-tree that helps transportation decision-makers assess how transportation planning decisions affect climate change and our ability to adapt to it.

To assure that ITS America's vision for sustainable transportation endures, it is vital that we continue to research new transportation technologies. The Environmental Task Force recommends that ITS America propose the creation of the "Sustainable Transportation Institute" to be housed at an existing transportation research center and funded by the federal



government, major universities, and the private sector. The Institute could be devoted to research and development and data collection regarding how transportation technologies improve system efficiency and play a role in reducing GHG emissions.

Climate change is a global issue. As ITS America collects and analyzes data regarding the environmental impact of transportation technology, it should discuss with the international community the role of transportation technology projects in climate change policy and how transportation projects can satisfy the offset requirements. Such efforts may facilitate the connection between U.S. and European carbon trading programs designed to reduce GHG emissions.

