

ITS Technology and Sustainable Transportation

What are the Elements of Sustainable Transportation and how can ITS Technology be a Part of it?

ITS America has defined sustainable transportation as “*meeting, and sometimes re-defining, the mobility needs of the present without compromising the ability of future generations to meet their needs*”. There are several attributes associated with these mobility needs – a “triple bottom line” consisting of economic, social, and environmental impacts. Moreover, the decision making process must carefully consider and balance these potential impacts.

Since its founding, ITS America has been a leading advocate for operational strategies and the supporting technologies that improve the efficiency of the nation's surface transportation system (thereby promoting economic sustainability) as well as its safety and security (thereby promoting social sustainability). These same technologies and strategies can also be applied to promote environmental sustainability by reducing Greenhouse Gas (GHG) emissions, a major cause of climate change.

Sustainable transportation – from an environmental perspective – is generally thought of as consisting of four key elements:

- Fuel Efficiency
- Alternative Fuels
- Travel Activity
- Transportation System Improvements

When the environmental concept of sustainable transportation was first articulated, only the first three elements above were included, but there is a growing recognition that system improvements in terms of operational efficiency and reliability are an important part of the solution.

Fuel efficiency essentially translates as miles per gallon and is addressed by CAFE (corporate average fuel economy) standards that are mandated by the federal government. The Obama Administration recently approved higher CAFE standards for the next generation of gasoline vehicles. There is also corporate research seeking much greater fuel efficiency than is required by the government.

Alternative fueled vehicles are generating significant interest and include gas/electric hybrids and will soon be joined by plug-in electric vehicles and battery-electric vehicles. This category also includes E-85 Ethanol as well as the potential for hydrogen-powered vehicles.

The third leg is travel activity. In this leg travel patterns are altered and multimodal transportation alternatives are encouraged to reduce travel in cars. This may be accomplished via pricing measures, improvements in transit service alternatives, and (in the long term) changes in land use.

The fourth leg includes the operational improvements that can be achieved through the use of ITS technologies. These include synchronized and adaptive signal timing at intersections; Active Traffic Management systems providing variable speed limits and speed harmonization; traffic incident and emergency management systems; transit signal priority systems; real-time traffic and multimodal travel information; dynamic routing; integrated corridor management; smart transit and parking systems; electronic and open road toll collection and more; and the ITS technologies that make these strategies possible.

Why This Matters

In the US, nearly a third of human produced carbon is emitted by the transportation sector – the second largest contributor to GHG emissions. Of that amount, 80% comes from light and heavy duty gasoline burning vehicles. That is fully 25% of the problem caused by cars and trucks, and is the fastest growing source of GHG in the US.

Recent legislative solutions to climate change – specifically, Kerry / Lieberman in the U.S. Senate – would invest \$6.25 billion annually to fund energy-efficient transportation projects, including \$2.5 billion for the Highway Trust Fund to be used “to promote the safety, effectiveness and transportation in the U.S. through measures that are consistent with transportation efficiency planning.” Moreover, “system operation improvements, including intelligent transportation systems” are specifically included in the bill’s language as one of the potential transportation investment and management strategies that reduce greenhouse gas emissions from the transportation sector.

The solutions that ITS technology provides reduce congestion and improve the operational efficiency and reliability of the transportation network. There are also some (e.g., transit signal priority) that improve transit operations and help provide commuters with more efficient, accessible multimodal travel alternatives. ITS can also help promote eco-driving. In the recent past our metrics for this have focused on traffic flow, time savings and incidents, but now we need to measure GHG reductions as well.

One problem that has emerged is that a significant part of the environmental community, including the EPA, believes that as much as 80% of the improvements that ITS technology offers will be wiped out over time by induced demand. That is, additional traffic will start to use the roadway as a result of our good efforts to improve travel times and overall reliability. In the past this was not seen as an obstacle because traffic and VMT is highly correlated with economic growth, but if GHG reduction is the goal we need to address this concern. Moreover, the research and assumptions regarding induced demand (resulting from travel time improvements) have been based on capacity additions; something much different from improved efficiency of the existing infrastructure provided by transportation technology.

What ITS America Believes

We believe that we have technology and solutions that can ease traffic flow and reduce GHG emissions, but to date we have neither articulated that message nor delivered it effectively. It is unfortunate but we are largely seen as a part of the climate change problem; not part of the climate change solution.

However, ITS America believes that transportation technology can have a significant impact on a GHG reduction strategy.

ITS America believes that a research effort to determine which ITS technologies and associated operational strategies will have the greatest value in a GHG reduction strategy will produce valuable results. This effort should include both publicly funded research as well as tax credits for private firms.

ITS America believes that working with state and local governments to help them develop effective GHG reduction plans utilizing the best transportation technology and operational strategies will demonstrate the value of ITS in the next few years.

What We All Can Do

Articulate a clear message that ITS technology is an important part of a climate change agenda, both as a means to reduce GHG emissions and to help transportation agencies adapt to the impacts of climate change.

Urge Congress to ensure that any climate change or energy legislation recognize the current and potential contributions to be made by transportation technology, and fund research into and deployment of these technologies and associated strategies.

Promote the development and use of performance measures that address all aspects of a sustainable transportation network.

Encourage the EPA and DOT to sponsor research (e.g., induced demand resulting from improved operations and reliability) and the EPA to certify transportation technology to reduce GHG emissions.

Encourage state and local governments to incorporate transportation technology in their GHG reduction plans.

Advocate for the widespread and uniform deployment of transportation technology.