

A TIME FOR ACTION...

Experts from across North America convened at the University of Massachusetts' Amherst campus to address climate change and transportation and explored transport's impact on the environment and climate change's impact on transportation. AMY ZUCKERMAN reports

For two days at the end of May global experts from academia, government and industry explored one of the most urgent issues of our time - climate change and transportation - as part of H3B Media's Climate Change Think Tank: Transportation's Impacts & Solutions, held on May 29 and 30 at the University of Massachusetts at Amherst.

Speakers focused on both the impact of transport-related emissions on climate change and ways that severe weather - the by-product of climate change - could severely affect traffic infrastructure. Also presented were an array of solutions to reduce traffic congestion and idling, which create greenhouse gases. These range from deploying traffic management technology to developing alternative fuels, and promoting public policy changes to address everything from driving habits, to congestion pricing, smart growth and urban planning.

Given that climate experts estimate that all forms of transportation contribute roughly 28 per cent of the greenhouse gas emissions that are responsible for climate change, *Thinking Highways* plans ongoing coverage of this topic and expects to tap the think tank speakers and others for their knowledge and insights. The following is a synthesis of their warnings and recommendations.

Ray of hope?

Raymond S. Bradley, a professor in the Department of Geosciences at UMass Amherst and director of the Climate System Research Center, a campus-based facility that focuses on the climate system, climatic variability

and global change issues, is one of the Intergovernmental Panel on Climate Change (IPCC) scientists who recently shared the Nobel Prize with former vice president Al Gore for collected work on global warming.

Bradley works hard to make the science behind climate change (or global warming to give its more populist name) intelligible to lay people and to point out the



RITA director Paul Brubaker



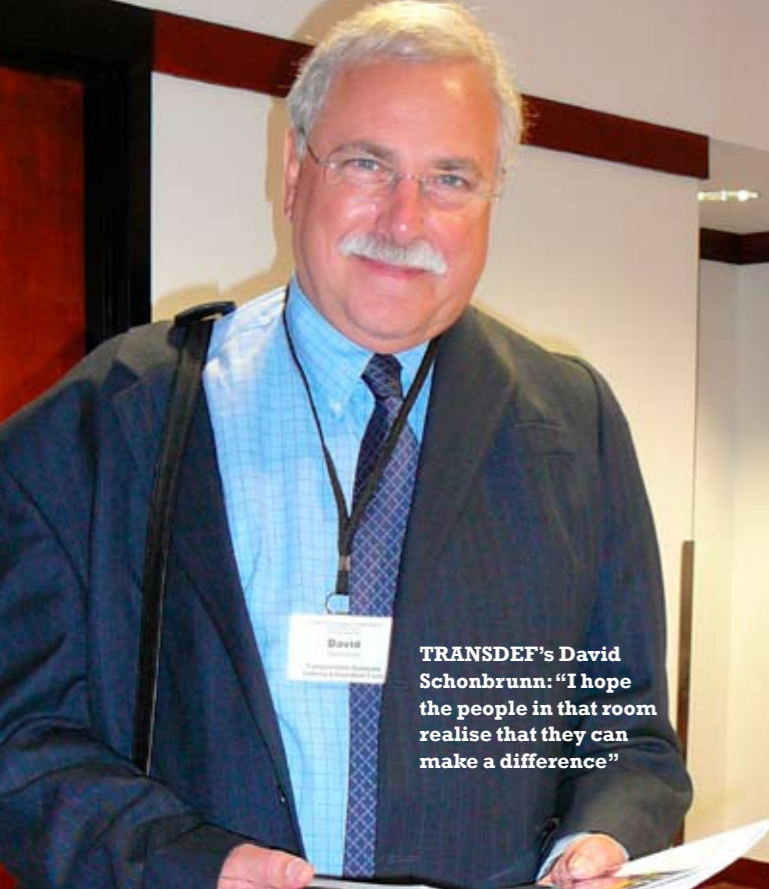
Nobel Prize-winning Prof Ray Bradley holds court via video



Quixote Corp's Tim O'Leary (above)
Resource System Group's Peter Plumeau (below)



Joyce Wenger (Booz Allen Hamilton) and Mike Replogle (Environmental Defense)



TRANSDEF's David Schonbrunn: "I hope the people in that room realise that they can make a difference"

potential for its disastrous impact on the world's transportation infrastructure as he says the world experiences more "extreme weather resulting from the heating of the tropical oceans."

Bradley predicts the rise in global temperature to continue "for the foreseeable future, even if carbon dioxide levels were to be dramatically stabilized. Transportation is closely involved in this matter, through the contributions that transportation makes to the 'excess' greenhouse gases and because more unusual climatic conditions in the future will affect transportation infrastructure. In particular," he explained via a video recorded especially for the event, "episodes of heavier rainfall, more severe weather events, and increased coastal flooding (due to sea-level rise and more intense storms) will require long-term planning. In addition, strategic transportation investments can help to reduce the demand for fossil fuels, lower greenhouse gas emissions, and thus be a part of the overall solution to the problem of global warming."

"The program could not be more timely," said John Collura, a key developer of the think tank program, and director of the University of Massachusetts Transportation Center. Nationally known for his work in transportation engineering and traffic management, as well as a UMass Amherst Professor of Environmental and Civil Engineering, Collura says that transportation planners, engineers and operators are "rethinking, and in some instances changing the methods they use to provide safe and efficient transportation services" in reaction to the serious information scientists are reporting on the impact of greenhouse gas emissions on the world's climate.

However, despite the recent release of two key federal reports pointing to a "looming disaster" for highway



Congressman John Olver gave the thought-provoking keynote speech

and transportation infrastructures in the wake of new findings about climate change, Collura says there is a huge need to build awareness of climate change so that state departments of transportation, local departments of public works and civil engineers start factoring changing weather patterns into their maintenance programs. Echoing report findings, Collura is not currently finding many practitioners making the connection between climate change and their current missions to build and maintain infrastructure.

A hard rain's going to fall...

Like Collura, David Ahlfeld, Ph.D, PE Professor of Civil and Environmental Engineering at UMass, Amherst, is concerned to raise awareness with practitioners about transportation infrastructure's vulnerability to extreme weather events.

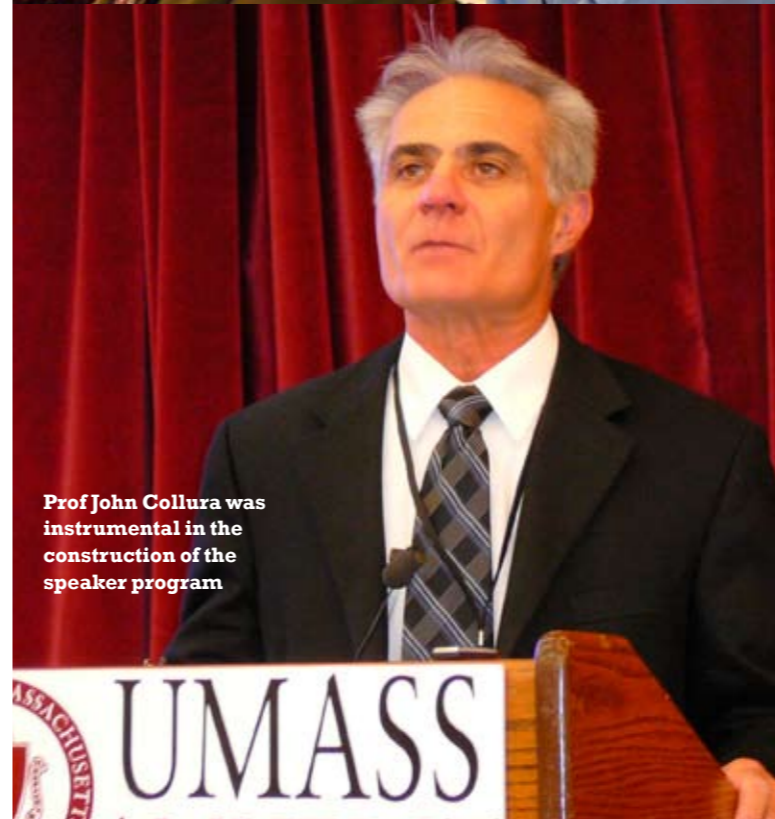
"From flooded road surfaces to collapsed bridges, transportation facilities can be interrupted and destroyed by extremes in precipitation intensity and depth," he said. He warned that a changing climate "is altering the means and extremes of hydrologic flows,



Mike Replegle in full flow



Speakers and delegates listened intently



Prof John Collura was instrumental in the construction of the speaker program

bringing into question the validity of the stationarity (25-year storm) assumption. More frequent extreme events will lead to more frequent failure of transportation systems."

Suggesting that these changes "may require innovative design procedures for new construction," he said "in addition, substantial retrofitting of existing drainage infrastructure may be required." Ahlfeld is concerned with the "vulnerability of transportation infrastructure to extreme events; recent trends and forecasts for future changes in the frequency of extreme events, and current thinking on how to incorporate these trends into infrastructure design."

Overselling the idea

Michael Replegle, Transportation Director for the Environmental Defense Fund in Washington, D.C. is concerned to reduce greenhouse gas emissions through traffic management that's coupled with smart growth and envisions a wide array of solutions. These range from building "greener, less polluting, more fuel efficient cars, trucks, locomotives, and ships" to the "promise for new technologies to cut the carbon content of fuels."

However, he warns that in the "near-term, such technology fixes will not deliver large reductions in greenhouse pollution. The auto industry faces financial challenges retooling and adapting to changing markets. Vehicles and fueling infrastructure, once sold, stay in use, often for decades. In many cases, the least expensive and most readily available way to reduce greenhouse gas emissions is to find ways to grow the world's communities and economies while reducing the amount of driving" as "over-sold techno fixes like biofuels, electric vehicles, and hydrogen-fueled transportation, are at least a decade or two away from delivering major greenhouse gas reductions."

"Smarter traffic management," said Replegle, "has potential to reduce the amount of driving and to boost the greenhouse gas efficiency of the remaining travel, curbing CO₂ emissions. In addition, it can make cities and economies more economically efficient, healthy, and livable."

State of the (sm)art

Another smart growth proponent, Joyce Wenger, principal at Booz Allen Hamilton, based in McLean, Va. often offers insights into linking traffic congestion solutions to climate change. Responsible for Booz Allen's federal transportation business, Wenger considers congestion mitigation and transportation funding "two of the big issues being addressed today. This is generating numerous ideas for solutions that include new policies, processes, and technologies. I suggest that climate change (and other environmental issues that relate to climate change) should be addressed at the same time so that solutions can be balanced across all needs."

Among the policies she advocates are congestion pricing to reduce urban traffic congestion; PPP (public private partnership) agreements on the environment a climate change, and the technologies that support them.

Climate Change

She is concerned to bring together multiple sectors to address these issues.

Another advocate of reducing driving while promoting alternative transportation is David Schonbrunn, president of Transportation Solutions Defense and Education Funds (TRANSDEF) in San Rafael, Calif. Like Wenger, he would employ congestion pricing in urban areas as a means of reducing traffic congestion. Schonbrunn argues that reducing emissions from vehicles “will require multiple strategies: increasing the fuel efficiency of vehicles; transitioning to electric and plug-in hybrid vehicles; and building renewable energy power generating facilities to power those vehicles.”

He recognizes that his proposals would amount to a “giant U-turn for transportation policy” and force Americans to re-assess auto ownership as a sign of wealth. “Reducing emissions requires an entirely different set of values and expectations,” Schonbrunn said. Calling for a convergence of transportation and land-use planning to create more walkable communities in the future, Schonbrunn also supports locating a stable new source of transportation funding (to replace shrinking gas tax revenues).“

The best laid plans....

Peter Plumeau, director of Policy & Strategy Practice at Resource Systems Group, Inc. in Burlington, Vermont, says for a myriad of reasons climate change is posing “a daunting challenge” for metropolitan planning organizations (MPOs). Even urban areas where there is “strong awareness of climate change” are conflicted about how to address climate change most effectively he said. Plumeau notes that over 30 states have developed statewide climate action plans with specific targets for transportation and other sectors to reduce greenhouse gas emissions, many of which “assume very aggressive land use and transportation strategies.”

But questions remain about how MPOS and partner agencies will be able to plan for the future while protecting current transport infrastructure, particularly in a mood of budget cuts that force agencies “to do more with less ...” He advocates rethinking the role of MPOs in regional growth management and land use, and creating “options for how a more integrated regional planning approach might be achieved in various geographic and political settings.”

Curbing idling, which reduces emissions, is at the core of Lee Armstrong’s work developing the WAVE (wireless access in vehicular environments) standard. Principal of Armstrong consulting in Southamptn, Mass., Armstrong has been a driving force in developing WAVE, which is expected to pave the way for embedded transponders in vehicles that will allow for even more efficient pass-through toll collection and less highway congestion, along with alternative means for drivers to receive traffic information while en route.

Tim O’Leary, president of the Intersection Control Group at event sponsor Quixote Corporation, based in Palmetto, Fla., believes that “solving the global climate change crisis requires industry to work on two critical fronts: reducing the green house gases and preparing

the traveling public for severe weather conditions. . . In order to reduce our dependency on the automobile, efficient methods of mass transportation must be made available.”

But he also advocates the use of the “many creative and innovative approaches [that] have been developed to reduce green house gas emissions, including transit signal priority, offering buses and mass transit vehicles priority through crowded urban areas – a proven way of producing more rapid commuting and less idling. O’Leary is also concerned with the need to protect current traffic management infrastructure under severe weather conditions, as well as providing alternate power supplies during outages so traffic technology can function and keep traffic flowing.

Strah poll

With trucks contributing about 8 per cent of that 28 per cent of emissions from vehicles - cars, light trucks and SUVs contributing about 20 per cent - Thomas M Strah, Editor of TT Magazines, publications affiliated with the American Trucking Association (ATA) in Arlington, Va., notes that today’s “new diesel truck engines produce 90 per cent less smog-inducing nitrogen oxides and health-threatening soot than the models of just five years ago.” However, Strah says “this extraordinary clean-air achievement has come at a price . . . a worrisome loss of fuel efficiency. As a result, modern trucks cost more to buy and operate, and they consume as much as 10 per cent more diesel to deliver the same amount of freight.”

As public attention is focused on reducing greenhouse

gases, Strah predicts governments will start addressing regulation of carbon dioxide from diesel truck engines.

In fact, he says leaders of the U.S. trucking industry, including top executives of the largest, most influential fleets, recently “decided they would join in, rather than oppose, developing regulations that address CO₂ emissions. Further, many are embracing ‘green’ trucking, spurred by customer demands (such as Wal-Mart and Procter & Gamble),” Strah explained.

But with oil prices surging and alternative fuels and “other power sources for heavy vehicles are barely in their infancy,” Strah noted that shorter-term solutions are needed “that address both oil dependency and greenhouse emissions.”

Hard at work developing alternative fuels, John Faber,

co-founder of SunEthanol Inc. based in Hadley, Mass., is commercializing “an exciting new technology for converting a wide array of waste biomass directly into ethanol. This fuel, known as cellulosic ethanol, can be substituted for gasoline, gallon for gallon. But it burns much cleaner than gasoline, which helps to reduce air pollution. It can also be produced domestically from cheap and readily available waste biomass, which ... reduces emissions and helping to combat global warming,” he explained.

Joining Faber in discussing the potential for alternative fuels, Al Gullon, principal, Automobiles+Concepts +Environments based in Ottawa, Canada, argues that it’s possible to both save fuel, save lives and crops. “To understand how saving lives can save fuel you must understand that a fairly consistent empirical relationship has been established between the numbers of (accidents) ... and energy-wasting, braking applications by drivers not involved in the original incident ... I am proposing inexpensive solutions which would cut the fatality rate dramatically and thus hugely reduce the fuel consumption of the motor vehicle fleet.”

At the same time, Gullon is promoting awareness of Iogen Corporation in Ottawa, Ontario, which is building a commercial-scale plant to create cellulose-based ethanol fuel. This process utilizes agricultural waste to create both transportation fuel and electric power, he explained.

Really virtual, not virtually real

And this author, along with Collura and John Mullin, UMass Graduate Dean and an economic development expert, explored how the rise of the virtual work force – where people work from homes or rental offices near their residences – could have a major impact on both traffic patterns and fuel consumption as the Internet and communication technology make it possible to work anywhere.

“If I was a transportation planner I’d make sure that officials in my agency recognized that people are changing how they travel. Fixed routes and fixed schedule like bus services won’t meet their needs like they did 50 years ago, because what’s inherent in the virtual world is there are no predictable schedules,” Collura said. **TH**

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‘Virtual colleagues’, H3B Media’s Kevin Borrás and Amy Zuckerman with TT Magazines’ Tom Strah actually meet

(Photo by Lewis Randolph, all other photos by Amy Zuckerman and Kevin Borrás)



Mike Replogle, Congressman Olver and Diane Doherty of the Western Massachusetts Small Business Development Center