

# Committee on Ecology and Transportation Newsletter

Transportation Research Board Committee ADC30

September 2014



## View from the Chair

*Alex Levy, Chair Ecology and Transportation Committee*

### Preaching to the Choir... as Well as the Uninitiated

*By Alex Levy, Senior Ecologist, Arcadis, US*

The following – paraphrased – is the crux of our committee’s mission and what’s been with us since our founding:

The TRB Committee on Ecology and Transportation’s mission is to stimulate research in transportation ecology and communicate the results of recent and ongoing research to and throughout the transportation community. We engage in identifying existing and needed research, as well as plan, evaluate, educate and provide outreach associated with sound ecological principles and designs, while striving to integrate ecologically-sound principles into transportation planning, decision-making, maintenance and design.

In the life of an organization or institution, there are times when introspection and the challenges of an ever-changing reality compel us to find meaning in circumstances and – at times – a reminder of our purpose. Recently, there’s been some constructive dialogue within our Committee, trying to understand why, in preparing for the 2015 annual meeting, we received no submittals of papers for peer review just one year after receiving an all-time record number. Fact is, our committee is not alone in this phenomenon; there are times when paper submissions are lean for other committees for reasons that have little to do with a committee’s success or popularity.

As with most Environment and Energy Section committees, ours forms an exquisite nexus between research pro-

fessionals and practitioners in the allied transportation and environmental fields. In fact, we were initially founded as a bridge between the biennial International Conference on Ecology and Transportation (ICOET) and the transportation researchers and practitioners who rally under the TRB banner of the National Academies. As with time-tested TRB committees, we are methodically and carefully growing to meet the needs of our respective communities of practice as well as those outside the natural sciences, who come to us for ideas and understanding that contribute to their own practices.

When there are numerous external conferences and forums, it is natural to feel the importance of a massive, multidisciplinary forum like TRB might not represent the greatest investment of one’s time and scarce resources in the furtherance of ecosystem science and sustainability. However, it bears reminding that TRB (the organization, not just the annual meeting) is the best forum for people within the ecological community to interact with transportation professionals who do not have an ecological focus (or education), but who have responsibilities in their respective spheres that overlap with natural resource management and stewardship. Yes, the TRB annual meeting is oft-times an overwhelming forum that may not seem the best place to serve the needs of the broader ecological community, but our committee can and does serve as a liaison to both the greater transportation AND ecological communities. As such, the TRB forum is the most direct and expeditious way for the voice of our community to reach beyond the pews where the choir is seated. With the 2015 annual meeting bringing - for the first time – virtually the entire TRB gathering under

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one roof, the opportunity to increase the visibility of ecology within the larger forum will be unprecedented.

It's understandable that many in the ecological community would see more value from other meeting venues, including the very summer meetings our own committee attends in an official capacity. Compounded with the scarce sources for travel funding being stretched perilously-thin, we each will have times when some tough decisions must be made about whether or not to attend the TRB Annual Meeting. That said, getting to Washington DC to attend the Annual Meeting is only one way to participate. Helping to foster the submission of papers, provide peer reviews, developing sessions, promoting and reviewing invited poster proposals are other ways of directly participating. These are all vitally important functions of a committee. In fact, TRB does not judge a committee's success by the number of papers it receives nor the number of its constituents that attend the Annual Meeting. Success is gauged by our level of participation – within TRB (and interaction with other committees). External to TRB, we are evaluated on how many organizations/perspectives are represented within our membership and work for the achievement of the committee's objectives. There is always room for improvement and we should be ever-vigilant to embrace and to try new directions, such as our first invited poster session. However, in both our internal and external engagement, the committee is doing well.

Beyond papers and posters, each year our committee supports a volume of the Transportation Research Record (TRR).

Papers reviewed and accepted by the committees within the Environment & Energy Section – including ADC30 – are grouped into an environment-specific TRR edition. How the volume is organized depends on the type and number of papers contributed. To host an ecology-specific TRR would require an enormous number of papers be submitted. How we reach out to the academic community that typically contributes these papers is an important discussion. TRB has a limited universe in which it pushes announcements about our Call for Papers, so it becomes incumbent on each committee and its members to reach out with our annual Call for Papers. Therefore, it is a function of our committee to facilitate outreach to people not already engaged in TRB.

As a stand-alone committee, it bears reminding that Ecology and Transportation is still a relatively young enterprise within TRB. Our founding chair poured his energy into successfully getting our committee up and running and we – all of us – are serving in the role of moving the ball forward to get more people engaged, but this is an evolutionary process. Our only compensation for driving the success of this committee is our passion for and dedication to success. As with every organization, there is a nucleus of committed committee folk who are working to take the next steps forward.

In conclusion, it is clear from recent dialogues that it is natural to focus on what value TRB participation brings to each of us and our respective professions. However, as with the vast majority of roads, even this one is a two-way street – so it's vitally important to recognize that – as a TRB committee- we are helping to bring the ecology community to TRB.

## SAVE THE DATE FOR ICOET 2015!

**September 20-24, 2015**  
**Raleigh Convention Center**  
**Raleigh, North Carolina**  
[www.icoet.net](http://www.icoet.net)

Plan now to participate in the eight biennial International Conference on Ecology and Transportation (ICOET) in September 2015, co-hosted by the North Carolina Department of Transportation with support from the US DOT Federal Highway Administration.

ICOET is the foremost multi-disciplinary, inter-agency supported conference addressing the broad range of ecological issues related to transportation systems. Experts in transportation development, related scientific study, policy issues, and administrative processes gather at ICOET to share the most current research information, quality applications, and best practices that can enhance both the project development process and the ecological sustainability of transportation systems.

The ICOET program includes topics of interest for practitioners in all transportation modes – researchers, biologists, engineers, planners, project managers, administrators, and policy makers representing government, Tribal, academic, non-governmental, and private industry organizations. The conference brings together hundreds of professionals from across the United States and over 20 countries. Information on registration, the Call for Abstracts, and related conference details will be available soon at [www.icoet.net](http://www.icoet.net).

We'll see you in Raleigh!



## Research in Progress at VTTI

*By Andrew S. (Andy) Alden, M.S., P.E., Senior Research Associate Leader – Eco-Transportation Group, Virginia Tech Transportation Institute*

The Virginia Tech Transportation Institute has two exciting projects that examine different types of data collection to better understand roadside animal movements and driving behaviors.

### ***Roadside Evaluation of a Buried Cable Animal Detection System***

In the United States this year, it is expected that the number of animal-to-vehicle collisions will exceed 1 million and that trend is projected to continue. Of these crashes that are likely to happen during 2014, up to 100,000 people are expected to be injured (State Farm, 2012). Damages to vehicles and property cost nearly \$4 billion each year and an additional \$4 billion is spent on medical care, emergency response and crash management, and animal carcass removal and disposal (Donaldson and Moruza, 2010; State Farm, 2012).

An NSTSCE project is currently testing a new system that may reduce the number of animal-vehicle collisions, and potentially save lives. This new animal detection system depends on a roadside cable that is buried nine inches underground that senses larger animals by their size, speed, and electrical conductivity. The buried cable can detect animals in either direction and up to four feet above ground. Once an animal is sensed, the system will relay that information to a data acquisition system onsite, including where along the road the animal was located.

Current testing is being conducted on the Virginia Smart Road at VTTI. The Smart Road provides a great location for this testing as numerous wildlife can be found on and around the facilities. Video surveillance at the Smart Road will help to monitor animal movement to evaluate how well the system is working. The surveillance system is running continuously, in all weather conditions and even through the night, when animal vehicle crashes could be the most dangerous. There have been numerous sightings of deer, coyotes, and even bears on the Smart Road. Parts of the Smart Road have wooded areas on either side of the road, so animals will often be found moving across the roadway. Because of this, the Smart Road is a prime location for this project.

The installation of the animal detection system was completed during the last quarter of 2013, with data collection scheduled to continue until November 2014. The entire Smart Road phase of the project is scheduled to end in March 2015. After all the data have been col-

lected and analyzed, the system's performance will be evaluated to determine its efficacy. If the system is deemed to be effective, the next step will be to apply the system to Virginia public roads. The cables could be implemented in major animal-vehicle conflict areas in Virginia. Using data about animal-vehicle crashes and Virginia Department of Transportation (VDOT) carcass pick-ups, high-risk roads would be identified. In addition, traffic speed data would be collected so that the system can alert drivers with enough time to slow down and avoid the crash.

This project falls under the NSTSCE focus area of: Evaluation of the Built Roadway Environment and Infrastructure-Based Safety Systems, and the lead researcher is Andy Alden.

### ***Evaluation of Onboard Vehicle Sensors for Animal Detection***

VTTI, in collaboration with Toyota Collaborative Safety Research Center and Western Transportation Institute, is collecting and analyzing driving data that characterizes animal behavior prior to, and during, an animal-vehicle conflict (AVC). In addition, multiple technologies are being used to determine the ability to detect animals in the roadway. To ensure that an adequate number of recorded AVC incidents are obtained for analysis, two different types of driving data collection are being collected using different equipment.

In the first "naturalistic" collection, participant-owned vehicles are equipped with unobtrusive data acquisition systems (DAS) to record continuous driving data including forward-looking video. The participants were recruited from rural areas of Southwestern Virginia and nearby West Virginia, a region with the nation's highest incidence of AVCs. VTTI has targeted participants whose normal daily travels expose them to an elevated likelihood of AVC occurrence. The equipment was installed on 48 cars for 5 months. The first group of participants is just now completing their study. The last group of participants will be finished in January.

A second experimental mode of data collection is performed whereby VTTI employees intentionally drive in high exposure areas at times of increased exposure (e.g., dusk and dawn) with the primary intent of encountering and recording large animal interactions. The vehicle has a DAS that records continuous driving data that includes video that records both in front and on both sides of the vehicle, as well as short and long-range forward-looking radar.

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## URBAN WILDLIFE CORRIDORS COULD SAVE AFRICA'S FREE-ROAMING ELEPHANTS

By Claire Patterson-Abrolat, Manager, and Wendy Collinson Field Officer, Wildlife & Transport Programme, Endangered Wildlife Trust

Botswana has some of the last remaining free-roaming populations of wild animals on the planet. Massive breeding herds of elephants are known to move thousands of kilometres across the country's wild lands, through private farms, national parks, towns and deep into neighbouring countries too. It's a picture of Africa that one reads about in the history books.

The town of Kasane borders the Chobe National Park in the North of Botswana, and regularly sees all kinds of wildlife pass through, including lion, buffalo, hyena and even the rare sable antelope. This is one of the few places where human infrastructure still grows within these functioning ancient wildlife home ranges.

As human populations develop and pressure grows on the environment, it's natural to presume that wildlife will get squeezed into closed-off parks and reserves such as has happened all around the world over the last century. Right? Not necessarily.

The team at Elephants Without Borders are researching the use of wildlife corridors to reduce human/wildlife conflict in Northern Botswana, where one of the largest populations of elephants in Africa still remains. Using Kasane as the base for these studies, the organisation has set up 'urban corridors' and are now monitoring the movement of animals through the town and neighbouring farms.

"When you think of wildlife corridors, everyone thinks the big trans-boundary movements," says Tempe Adams, a lead researcher on the team, "I'm trying to re-define the idea of a wildlife corridor."

"It's amazing when I take people to see the corridors – they can't imagine that the elephants actually use them. But I assure them that they absolutely do. I use detection cameras to monitor the movement. A lot of the corridors I'm looking at, people would not class them as a corridor, but when I actually show them the photos of usage they say: 'that's incredible.' I'm yet to show someone who is not surprised by the amount of wildlife that comes into town. And they don't even know about it. A lot of these corridors are not even known to local people."

It seems corridors could be important to the movement of wildlife on a much broader scale in Africa.

The Chobe National Park is at the centre of what could be the world's largest conservation area. The Kavango Zambezi Transfrontier Conservation Area, or KAZA TFCA an ambitious project to link five southern African countries; Angola, Botswana, Namibia, Zambia and Zimbabwe into



A breeding herd of elephants cross the road near the town of Kasane, Botswana. (Photo by Tempe Adams of Elephants without Borders)



Elephants cross at a corridor outside Kasane. (Photo by Tempe Adams of Elephants Without Borders)



Elephants face up to a herd of buffalo while passing through the urban corridor (Photo by Tempe Adams, Elephants Without Borders)

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one massive space, and ensuring the safe movement of millions of animals over an area of 287,132 square kilometres – about the size of Italy.

Kasane is fast becoming the capital of this mega-wildlife zone, welcoming more and more tourism to the area and surrounds, in particular, the famous Victoria Falls just over the border in Zimbabwe.

With all this growing interest, it's fitting that this important research is taking place here, in Kasane, where the vision is now slowly taking shape and setting the example for other towns in Africa. The Elephants Without Borders team are working closely with the KAZA initiative (Also based in Kasane), providing essential data to support KAZA projects from a scientific a research perspective.

“The overall plan is to have wildlife corridors as a legislative land designation,” Tempe concludes. “At the moment there is no legislation attached to wildlife corridors. So when towns are expanding, they actually have a designation for a wildlife corridor. If you don't block off key areas for them, you will reduce the conflict. It's such a simple concept.” Paul Steyn in A Voice for Elephants (December 12, 2013). Link: <http://tinyurl.com/lv7tczu>

(Article originally published in the July issue of The Green Mile, Wildlife and Transport Programme, Endangered Wildlife Trust (South Africa), with permission of author and ADC30 member Wendy Collinson. The newsletter can be viewed at (<http://tinyurl.com/mardu6u>))

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This study is being performed both in southwest Virginia and in Maine, where moose are prevalent. Data mining of three existing naturalistic driving study (NDS) data sets is proposed to identify and analyze AVCs that may have occurred during vehicle-based data collection. These



Figure 1. MiniDAS installed on a vehicle for real-time data collection. The MiniDAS collects forward video (75 degrees) (color) (10 FPS), GPS, linear & angular acceleration, magnetometer and limited vehicle network data.

data sets include those for the 100-Car NDS, the 40-Teen NDS, and the SHRP2 NDS.

Data analysis has primarily focused on animal behavior and vehicle kinematics. Data analysis will reveal AVC characteristics including time of day, environment (light, weather and road conditions), number of deer, deer movement, vehicle speed, etc. In addition, photogrammetry will be used to analyze the deer movements and collect information such as location and distance from the vehicle. As a final metric, time to collision (TTC) will be calculated. All these data will pro-

vide researchers with more information about AVCs, which will identify vehicle and infrastructure technologies to help drivers avoid AVCs.



Figure 2. NextGen head unit (left), and Delphi ESR Radar mounted to license plate (right). The NextGen collects forward video from 3 cameras (180+ degrees) (color) (10 FPS), GPS, linear & angular acceleration, magnetometer and limited vehicle network data. The Delphi ESR Radar collects raw signature data on the 76.5 GHz range 1 minute before and 1 minute after a triggered event.

# New Web Tools Provide a One-Stop-Shop for National, Ecological Data and Environmental Decision Making

By Paige Colton, U.S. DOT Volpe Center

Transportation and resource agencies across the United States have frequently asked for better tools to access and map ecological data when planning for future transportation improvements. The Strategic Highway Research Program 2 (SHRP2) responded to this need by developing two new research products. Eco-Plan and Eco-Plan Advanced are geospatial, “one-stop-shop” web tools for national and local data sets that can be used to identify potential conflicts between ecological assets and transportation plans at the beginning of the planning process. The two tools can be used by both novice and advanced transportation and environmental practitioners, including staff at Federal, State and local transportation and resource agencies, and conservation organizations.

screening was a major challenge for planners. Furthermore, participants observed that Federal, State, and local agencies varied widely in their capacity to develop and use ecological screening and data-sharing tools. The stakeholders therefore recommended the development of a centralized repository for important ecological data.

TRB, AASHTO, and FHWA decided to use SHRP2 funds to develop tools to address this challenge under the project name C40. The development of C40 began in January 2013, and beta testing is expected to be complete in fall 2014. Through C40, TRB is also funding proof-of-concept pilot projects at three recipient agencies: the California Department of Transportation/ University of California, Davis; East-West Gateway Council of Governments (Missouri); and Contra Costa Transportation Authority (California). The pilots were intended to test the effectiveness of existing geospatial data tools and inform the development of Eco-Plan and Eco-Plan Advanced.



Figure 1: Screenshot from Eco-Plan.

## Background

Eco-Plan and Eco-Plan Advanced grew out of a need to improve access to and use of integrated data identified through the SHRP2 research product known as C06: Implementing Eco-Logical. Implementing Eco-Logical is a set of tools, steps and activities that practitioners can use to bring the Eco-Logical approach into practice; incorporating an advanced, integrated, and ecosystem-scale approach into standard business practices for transportation planning and development. Through SHRP2, the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the Transportation Research Board (TRB) jointly developed activities to advance Implementing Eco-Logical tools and activities across the U.S.

In 2011, TRB convened a workshop with Eco-Logical stakeholders to discuss barriers to implementing the Eco-Logical approach. Participants noted that accessing and using clear and consistent data within and across agencies during pre-National Environmental Policy Act (NEPA)

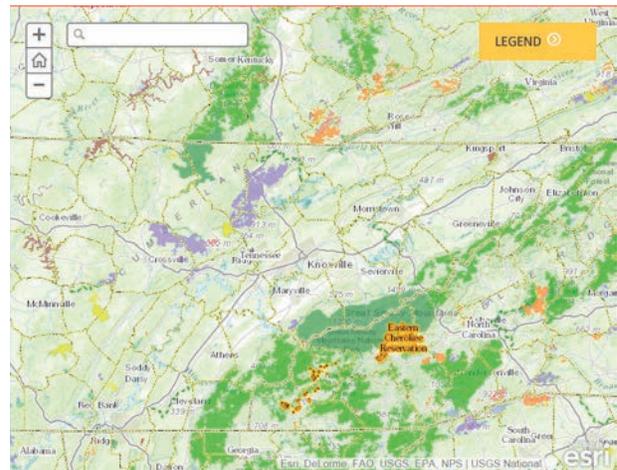


Figure 2: Eco-Plan walks novice GIS users step-by-step through ecological theme maps to help transportation professionals identify and avoid potential impacts of their transportation plans.

## Capabilities: Eco-Plan

Eco-Plan will allow novice GIS users and those without access to specialized geospatial technologies to review maps of authoritative national ecological data sets and upload or draw a planning area or transportation network on top of existing maps. Eco-Plan contains a few tools to assist the user, including:

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  - A step-by-step introduction and corresponding map to assessing a proposed project's proximity to resources such as protected areas and critical habitat;
  - Individual theme maps, which allow users to explore datasets grouped by topic, such as watersheds and wetlands; and
  - An Ecological Screening tool, which can calculate the acreage of critical habitat, national wetland, and protected areas that may be impacted by a drawn project area.

Eco-Plan also describes each data set used in the tool in a Data Catalog, and provides information on other GIS tools that support integrated transportation and ecological planning. A beta version of the tool is available at <http://c40-stage.icfwebservices.com/>.

### Capabilities: Eco-Plan Advanced

Eco-Plan Advanced contains the same theme maps available in Eco-Plan, but is intended to serve those with more advanced GIS skills using Esri's ArcGIS Online<sup>1</sup>. Users can:

- Add their own local and regional data sets to the theme maps of national ecological data;
- Set up groups to save, share and comment on maps;
- Create reports;
- Perform detailed data analyses; and
- Search the ArcGIS Online platform for any other data made publically available by a growing number of State and local agencies who use ArcGIS Online.

Users or their organizations must subscribe to ArcGIS Online to access more advanced functions of the tool, such as to perform spatial analyses. A working version of the tool is available at <http://eco-plan.maps.arcgis.com/home/index.html>.

### Benefits

Eco-Plan and Eco-Plan Advanced are intended to help transportation planners and decisionmakers to identify mitigation sites and avoid priority conservation areas before

<sup>1</sup> Esri's ArcGIS Online is a cloud-based data-sharing, visualization, and analysis tool. For more information, see <http://www.esri.com/software/arcgis/arcgisonline>.



Figure 3: Eco-Plan Advanced contains the same ecological theme maps as Eco-Plan, but gives users a more interactive experience.

the NEPA process begins. “The tools are easy to access and simple to use, making it very feasible for planners to take an initial look at ecological data in their planning areas – and potentially alert them to the need to coordinate with resource agency partners early on,” says Shannon Cox, Planning Communities, LCC, and a member of the C40 planning team. The tools can help facilitate interagency analysis, negotiations and discussions by providing a common visual and analytic interface for the agencies involved.

### Next Steps

Eco-Plan and Eco-Plan Advanced are currently in beta testing and are expected to be finalized in fall 2014. FHWA is soliciting feedback from State DOTs, MPOs, and other practitioners on the utility and ease of use of both the tools, as well as how the tools might be used. FHWA, AASHTO, and TRB recently featured the two tools at the 2014 AASHTO GIS for Transportation Symposium, the 2014 AASHTO Standing Committee on Environment annual meeting, and at a TRB SHRP 2 Tuesdays Webinar. FHWA will be holding a webinar this fall on the tools as part of its Eco-Logical webinar series.<sup>2</sup> FHWA is also working with the U.S. Geological Survey and Environmental Protection Agency and their data portals to assess opportunities for collaboration.

Please contact Mike Ruth ([mike.ruth@dot.gov](mailto:mike.ruth@dot.gov)) for more information and to provide feedback on the tools.

<sup>2</sup> For more information on this webinar, sign up for email updates on the webinar series here.

## One Picture Is Worth a Thousand Models! Game Camera Studies Ground Truth Wildlife Connectivity in Vermont

*By Glenn Scherer on behalf of the Staying Connected Initiative*

*Provided by Jens Hawkins-Hilke, Conservation Planning Biologist, Community Wildlife Program, VT Fish & Wildlife Department.*

People love seeing wildlife, except when it's a half-ton moose standing in the middle of a highway, caught in the glare of headlights. Deer-related automotive collisions alone resulted in \$3.8 billion dollars in insurance damage claims nationally last year.

“When wildlife ventures onto roads and highways, the results can be devastating for people and animals,” notes Vermont Fish and Wildlife Department conservation planning biologist Jens Hawkins-Hilke. “In addition to creating roadkill, highways act as barriers that can halt animal migration, isolating wildlife and promoting inbreeding among disconnected populations.”

Now two groundbreaking Vermont studies are seeking ways to decrease collisions, while increasing wildlife connectivity. The research is being conducted through a unique Staying Connected partnership between the Vermont Agency of Transportation (VTrans) and the state's Fish and Wildlife Department, along with private engineering firm McFarland Johnson as well as the Vermont chapter of the Nature Conservancy and the University of Vermont's Transportation Research Center.

“We're studying ways to evaluate and improve wildlife migration corridors where they cross busy highways by taking pictures of animals,” says Hawkins-Hilke. The two Vermont studies are deploying game cameras equipped with infrared triggers to determine the abundance of wildlife species near roadways, and

to see if, and how often, animals are using various-sized stream culverts and bridges to cross under roads. The hope is that, over time, as culverts and bridges need to be replaced, that they can be minimally and economically redesigned to be more inviting to migrating animals.

### I-89/RTE. 2 GAME CAMERA STUDY, NORTH AND CENTRAL GREEN MOUNTAINS LINKAGE

The first game camera study began in June 2013 and is slated to run for two years. The study is located along a busy stretch of I-89 and U.S. Rte. 2 between Waterbury and Bolton Village—a section of highway that is among the most frequented by moose, according to State Police statistics. “The Green Mountains represent one of the largest unfragmented forest habitats in the Northeast, and the I-89 corridor is easily the biggest break in that habitat,” explains Jed Mellow, Environmental Project Manager for McFarland Johnson. “This to a wildlife rich area, with mammals such as bobcats, bear and moose moving through it. But no one knows to what extent they can cross the corridor. If they can't cross, that has negative implications for population health and genetic mixing. Our purpose is to find out if and where they are crossing. We want to know what kind of transportation structures they're currently using, and what kind of improvements we can make in the future to enhance movement.”

Since 2011's Tropical Storm Irene, Vermont has made a dedicated effort to enlarge undersized bridges and culverts—increasing stormwater capacity, and hopefully, animal movement as well.

The study's forty game cameras are stationed in stream culverts and beneath bridges along I-89 and Rte. 2, with others placed at either end of 1,600-foot long transects to see if wildlife is moving parallel and close to roadways. Still others were placed in transects a mile or more distant, as a control to compare population density far from the highways.

The project, still in its early phase, has already yielded remarkable candid images. “We've got hundreds of pictures of deer, bear, moose, bobcat, coyote, fisher, flying squirrel, white-footed mice, and turkey,” says Hawkins-Hilke. “But there is very little evidence so far of movement across Rt. 2 and I-89.”

Knowing exactly where wildlife is plentiful on either side of the highways is important to planners. It



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means that the next time highway infrastructure nears the end of its design life or becomes compromised during a major storm, VTrans will know where the highest animal concentrations are located, and where the state can get the most bang for its infrastructure buck when designing replacement culverts and bridges. “We have beautiful computer models and layered maps to show habitat and where we think animals will cross,” says VTrans Environmental Specialist James Brady. “But that doesn’t necessarily tell us where they are really moving. This study is designed to convince decision makers who are approving expensive infrastructure projects of exactly what is happening on the ground. It helps ensure that if we invest in infrastructure for connectivity in an area, that it will enhance wildlife movement and reduce collisions.”

“Our preliminary data shows very little connectivity in the I-89 corridor now,” reports Merrow. “Once we find wildlife hotspots on either side of the road, we can see if there are bridges and box culverts in proximity that might be enhanced, maybe with fencing that channels animals to those structures and away from the highway or perhaps by adding a dry shelf to a culvert or bridge’s stream channel which would allow easier passage.”

VTrans is already experimenting with just such a connectivity enhancement. They’ve used leftover soil from recent highway projects to create a sandy wildlife shelf under I-89’s Little River Bridge. “Hoofed animals such as deer and moose don’t like to walk on rocks,” relates Hawkins-Hilke. “So this should entice them, though we’ll have to wait and see what the cameras show.”

### ROADWAY GAME CAMERA STUDY, WORCESTER RANGE TO NORTHEAST KINGDOM LINKAGE

A second important Vermont game camera study, this one in the Worcester Range to Northeast Kingdom wildlife linkage, got underway in 2014. The two to three year project involves sixty game cameras, also called “critter cams,” installed at select culverts and bridges along highways. It will be the biggest study of this kind in the Northeast to date.

“We’re using computer models to determine where wide-ranging mammals are most likely to cross roads between two habitats, and where those crossings coincide with culverts and bridges,” says Paul Marangelo, Conservation Ecologist for the Vermont Chapter of The Nature Conservancy. Streams, he notes, can be popular travel corridors for animals, since they offer cover, food, and a hidden route for crossing under roads. “The question this study is asking is, ‘How do a wide variety of wildlife respond to different sized bridges and



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culverts?” says Marangelo. “Scientists will be systematically comparing wildlife use of 1 to 5 foot diameter structures, with 6 to 8 foot structures, versus 10 foot structures, versus large extended bridges. There have been studies done out West which categorized wildlife use of transportation structures by the size of the structures and the willingness of various species to use them. We’re using those studies as a guide to see if the results hold up in our neck of the woods,” says Marangelo. “Eventually we’d like to be able to look at a road segment and be able to suggest focal areas for creating the best opportunities for wildlife to cross under highways, reducing vehicle collisions.”

Vermont’s two game camera projects represent cutting edge science. The data collected at Waterbury-Bolton and in the Northeast Kingdom could one day help reduce roadkill and animal collisions, and enhance wildlife connectivity across New England.

Hawkins-Hilke views the projects as a new model for conservation: “What we’re seeing here in Vermont is one agency working closely with another to plan years ahead,” he says. “The long-term proactive partnership between state wildlife officials and transportation planners around wildlife connectivity is fiscally responsible and the envy of other states.”

“What’s exciting about these projects is that everyone is on the same page,” agrees Brady. “Everybody wants to have a healthy ecosystem in our state, and safe roads too. Everybody also realizes how expensive it is to replace infrastructure and these studies assure us that we have everything figured out in advance so when it comes time to spend highway money, we do it right. If these structures can handle the next Tropical Storm Irene and a moose can walk through them too, all the better!”

*(Shared with permission from Staying Connected Initiative, original article located at [http://stayingconnectedinitiative.org/our-work/transportation-and-wildlife/vt\\_photo\\_monitoring/](http://stayingconnectedinitiative.org/our-work/transportation-and-wildlife/vt_photo_monitoring/))*

# Call for Poster Displays

*TRB Committee, Ecology and Transportation (ADC30) Poster Submission*

The Transportation Research Board (TRB) Committee on Ecology and Transportation (ADC30) invites submissions of your work as part of an environmental poster session at TRB's 2014 annual meeting in Washington, DC this coming **January**. Please submit your abstract for consideration for presentation at the TRB Annual Meeting, Ecology and Transportation (ADC30) poster session, that will emphasize procedural and technological best practices, streamlined regulatory applications, impact assessment and documentation methods, technical approaches employed during resource assessment and impact analysis or similar environmental processes, technical approaches used for integrating natural resource and transportation planning, novel regulatory compliance and permitting approaches, successful mitigation and enhancement applications, environmental stewardship, lessons learned and any other ecological aspects of project development. This poster session and the process used to apply for participation is separate from the traditional peer-reviewed paper process utilized by TRB, and is designed to promote more project-specific examples of innovative and/or successful environmental practices in transportation. Posters celebrating program-level ecological and academic accomplishments and ongoing activities will also be considered. Please note that the top 20 posters meeting these general criteria will be considered by the committee.

Our committee is now accepting abstracts for presentation at poster sessions. **Abstracts must be no more than 500 words**, and should contain the following: (1) full title; (2) primary/secondary presenter name(s) with complete contact information (mailing address, phone, fax, e-mail); (3) a concise statement of the project or study objective; (4) notable practices, approaches or lessons learned; (5) current or anticipated results or outcomes; (6) significance and implications of the results or outcomes; and, if applicable, (7) recommendations for future research. Abstracts must be submitted electronically no later than **Thursday, September 18, 2014**. Draft Mock-ups in PDF-format are encouraged but not required with abstract submittals.

Following review of all abstracts, the committee will notify primary authors of their selection status on or about **Wednesday, October 1, 2014**. Applicants whose abstracts are accepted for presentation during a poster session must provide a draft mock-up of the

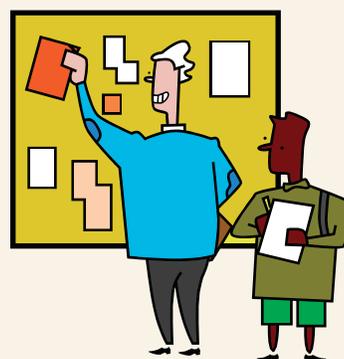
poster for general comment by no later than **Friday, December 5, 2014**; although a **final submittal is not necessary until**

**the actual date of the poster session.** Please follow the Suggestions from Poster Authors, Viewers, and Other Conferences section of the "Meet the Author Poster Session Guidelines" available on the TRB website for full details and instructions. Note: Abstracts received after the September 18 deadline and/or draft mock-ups received after the December 5 deadline will not be included in the proceedings and will not be scheduled for poster presentation at the annual meeting.

Historically, our committee hasn't focused on the poster session(s), but we are finding these sessions offer an exquisite opportunity for interaction and a showcase for innovative ideas, projects, and programs that feature ecological analysis and stewardship. Don't miss this opportunity to share your work to thousands of other transportation professionals! If you are selected to present a poster at the meeting in January, please make yourself or a colleague available to register for the conference in Washington, D.C and accompany your display to interact with conference attendees.

Please submit your abstracts and mock-ups to alex.levy@arcadis-us.com. Please be sure to include the words "TRB ADC30 Poster Session Application" in the subject line of all emails.

For more information, please contact: Alex Levy at (770) 384-6595.



## Environmental Risks of an Expanded Arctic Shipping

By Marcia Bowen, Senior Marine Ecologist, Normandeau Associates Inc. and Communications Subcommittee Chair

Climate change creates both crisis and opportunity for marine transportation in the Arctic Circle. The Arctic is warming more quickly than other regions, resulting in decreasing amounts and thickness of sea ice, rising sea levels and a longer ice-free season. Projections suggest that the Arctic Ocean may be almost ice free in 15-25 years. Reductions in the amount of sea ice create the opportunity for an expanded season for marine transportation. But what environmental risk does this pose?

Marine transportation takes several forms in the Arctic. There is what could be termed “local” traffic, tugs and barges delivering essential supplies to communities. Water-borne transport is often the only way to deliver these goods. Fishing is an important industry as well as providing subsistence to indigenous communities. Resource extraction, such as under-sea oil, gas and minerals, has become increasingly important.



The USGS estimates that 22% of the undiscovered oil and gas resources are in the Arctic. Exploration and recovery requires a variety of marine vessels to the sites and then to markets. Tourism in the form of cruise ships is also rising. Finally, an ice-free Arctic ocean creates new routes for trans-continental shipping. A trans-Arctic route between Europe and Asia can be as much as 5,200 miles shorter, cutting transit time by an estimated 30%. There are two routes that link the Pacific and Atlantic Oceans. The Northern Sea Route (NSR) extends from the Russian Arctic coast through the Barents and Kara Seas to the Bering Strait. The Northwest Passage passes through the Arctic Ocean along the northern coast of North America via Canadian Arctic Archipelago waterways. Both routes are only open during summer for a period of weeks, but potentially

offer a commercially-viable alternative to the Suez and Panama Canals. The number of vessels passing through the Bering Strait, the entry or exit point for both passages, increased from 220 vessels in 2008 to 480 vessels in 2012 a year, a more than 100 percent increase. The growth rate was particularly high for tank vessels; tugs and other cargo vessels were the second and third largest categories of movements. While passage through the Northern Sea Route is fairly limited, it is increasing. Only 4 ships passed in 2010, but 34 ships passed in 2012 and 71 in 2013.

There is considerable debate about whether an Arctic sea route offers the safety and reliability necessary for commercial shipping. However, there is no question that commercial interests and thus associated marine traffic will be increasing. Even with the diminishing sea ice, the Arctic is still a challenging environment. Weather as well as sea ice conditions are highly unpredictable. There is a strong need for accurate charts and navigational support. There are no harbors of refuge and emergency response capabilities are limited. Communications infrastructure is inadequate for many of the remote areas. There are multiple governing bodies in the Region. All of these contribute to the environmental risks of Arctic marine transportation.

Environmental risks range from nominal to catastrophic. An oil spill resulting from a shipping accident is probably presents the most damaging environmental risk, although perhaps lowest in probability. However, that probability is increased by the communication, navigation, and meteorological challenges mentioned above. The threat to the marine ecosystem is exacerbated by the lack of safety infrastructure to contain an oil release. The vulnerability and lack of resilience of these ecosystems further increases the harm. For example, federally-listed endangered species such as polar bears are already threatened by climate change because of diminished habitat (sea ice) and would therefore be more vulnerable to other impacts. Another important environmental risk is ship collision with large mammals. Several species migrate through the Arctic such as bowhead whales; migratory paths are changing and becoming more unpredictable, decreasing the ability for ships to avoid these species. Finally, increased shipping traffic increases the impacts such as increased underwater noise, waterborne contaminants from small spills, and marine debris.

These complex issues are going to be discussed in a cross-cutting session at the Annual Meeting. Our committee is co-sponsoring this session, entitled ‘Emerging Environmental Issues from Increasing Arctic Marine Transport’. Helen Brohl, Executive Director of the US Committee on Marine Transportation, will enlighten us on how marine transport is expanding in the Arctic and her perspective on the risks. The session will also include representatives from a federal agency and environmental advocacy group. Stay tuned for further information.



**Northeastern Transportation and Wildlife Conference**  
**September 21-24, 2014**  
**Sheraton Hotel & Conference Center, Burlington, Vermont**  
*“Climate Ready? Wildlife and transportation in a changing world.”*

### About the Conference

In an increasingly interconnected world, the array of issues confronting transportation and wildlife officials have increased dramatically both in terms of frequency and complexity. Maintaining road infrastructure and wildlife populations cannot occur in isolation. Every time a stream flows through a culvert or a moose crosses the median, we see another example of how these networks converge in complex ways and with significant implications to the public's interests in fish and wildlife conservation as well as a safe, reliable transportation system.

The Northeast Wildlife & Transportation Conference is an opportunity to learn from and network with experts from all disciplines related to wildlife and transportation. The conference began in 2004 and focused on wildlife & transportation officials from the northeastern U.S.. Since that time, the range of participants has grown to include representatives from Canadian provinces and other U.S. states.

Today, climate change is yet another stressor that affects wildlife and transportation. Transportation officials are being forced to reevaluate and reprioritize transportation infrastructure in a world of increasingly dramatic and unpredictable weather events. Wildlife officials are facing the reality of populations shifting their ranges and changes in ecosystem composition that were previously unimaginable. These are challenging times, and only through interdisciplinary dialogue will we truly become, Climate Ready.

The TRB Committee on Transportation and Ecology will be meeting on Sunday September 20.

#### Hosts:



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*The views expressed in this newsletter are those of the authors and do not reflect the policies or opinions of TRB or the National Academy of Science*

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