

Committee on Ecology and Transportation Newsletter

January 2020



Transportation Research Board Committee ADC30



THE CHAIR'S MESSAGE

*Daniel J. Smith, PhD, AICP
University of Central Florida*

REVITALIZE, RENEW, REINVENT: EMBRACING THE OPPORTUNITY FOR POSITIVE CHANGE

Greetings ADC30 committee members, friends, and colleagues! As we return from the holiday break, there is much to discuss and do to prepare for the year ahead. The upcoming TRB Annual Meeting, as expected, will offer many interesting talks, opportunities to network, and to connect with friends. Nevertheless, given the recent passing of our dear friend Joe Burns, this meeting will be somewhat different, one with a somber tone. Joe was a founding member of ADC30, and a staunch advocate for ecologically compatible transportation systems. He was beloved by many in our community for his intelligence, sense of humor and optimism, and he will be sorely missed. It's my hope that we as a committee can propagate Joe's enduring enthusiasm in striving to make the world a better place.

We certainly can make use of his indomitable spirit to tackle the substantial changes coming to TRB, and our committee. As everyone has heard by now, TRB is implementing substantial organizational changes that are impacting many committees. There's been varied discussion of proposed changes involving our committee over the past year, including an early proposal less than ideal. Ultimately, it was through input from you, the ADC30 committee members and friends, directly to TRB that I believe helped us achieve the most desirable outcome possible under the circumstances. Specifically, **our committee (ADC30) will merge with ADC10 (Environmental Analysis in Transportation) to form a new committee, namely the Committee on Environmental Analysis and Ecology (AEP70)**. Both ADC10 Committee Chair, Martin Palmer, and I are committed to working collaboratively and with all of you to make it as smooth a transition as possible without diminishing the core missions of each separate committee. The merging process and details of what that means to all of us will be discussed extensively at both the ADC10

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and ADC30 Committee business meetings in DC next week. I urge everyone interested to attend and participate. Reorganization into a single committee will not happen overnight so stay tuned, and feel free to contact me if you have any questions. For anyone seeking general information regarding the new organizational structure of TRB, please visit TRB's webpage <http://www.trb.org/AboutTRB/TADStrategicAlignment.aspx>.

While I think we all recognize that change can be difficult, it can also be a tremendous opportunity to improve and become more efficient in our efforts. Many members and friends of ADC10 are already familiar with us and have a good understanding of the importance of ecological systems and the need to develop infrastructure

that is harmoniously integrated with the natural world. I anticipate that our combined expertise, resources, and communication capabilities will improve our effectiveness and provide us with a stronger, more unified voice within the transportation community, and a larger platform for disseminating the latest scientific research findings and other information derived from the work we do.

Please take the time to check out the interesting articles and important announcements in this newsletter and visit our website (<https://ecologyandtransportation.weebly.com/>) and twitter feed (@Ecology_Trans) for additional content. I hope you all enjoy the Annual Meeting this year and all it has to offer!



Transportation, Environment, and Energy: An Integrated Research Symposium

July 12-15, 2020 | Denver, CO

Embassy Suites by Hilton Denver Downtown Convention Center
1420 Stout St, Denver, CO 80202

This Symposium is a joint meeting sponsored by the TRB Environment and Energy Section and includes the following committees: Environmental Analysis in Transportation, Transportation and Air Quality, Ecology and Transportation, Transportation-Related Noise and Vibration, Resource Conservation and Recovery, Transportation Energy, and Alternative Transportation Fuels and Technologies.

Call for Abstracts

<http://onlinepubs.trb.org/onlinepubs/dva/CG/2020DenverCFP.pdf>

Call for Sponsors

Please refer to the following website for more information:

<https://trb.secure-platform.com/a/page/2020EnvironmentEnergy>



REMEMBERING JOE BURNS

SUBMITTED BY:

Alex Levy, former Chair of ADC30 and Joe's friend and ally in transportation ecology



Remembering What Matters

Whether as a scientist, planner, or engineer, public servant, consultant, or non-government conservationist; if you are reading this, there's a Joe Burns inside you.

That inner voice looking forward to the day that transportation systems for humans coexist, maybe even harmoniously, with the natural systems that are vital to the quality and diversity of life on this planet; that's the Joe Burns in you.

The belief in you that, with enough good information and conviction, we can solve even very big problems with a little collaboration; that's the Joe Burns in you.

When you contribute your time and resources to the ecology and transportation community-of-practice, not simply because doing so fulfills a performance metric, but because you believe that – in so doing – the resulting relationships and achievements are worthy of sacrificed time and energy; that's the Joe Burns in you.

And if you ever have big ideas that you feverishly communicate in so-many, maybe too-many words, but your audience listens intently anyway, because your enthusiasm for working together on innovative ideas is simply infectious; that's the Joe Burns in you.

Only weeks ago, we lost Joseph A. Burns: a friend to many, a founding member of this committee, and a ferocious advocate for collaborative conservation. So, at the 99th TRB annual meeting, and at many annual meetings to-come, those of us who knew or worked with Joe find ourselves solemnly mourning the loss of a friend and tenacious advocate for measurable and meaningful change. Going forward, it will be in what we achieve – together – that the legacy for Joe's loving and indefatigable passion and selfless accomplishments will endure.

So, whether or not you are someone fortunate-enough to have known or worked with Joe, chances are – if you are reading this – there's a Joe Burns in you, too.



\$250 MILLION WILDLIFE CROSSING SAFETY PILOT PROGRAM INCLUDED IN BIPARTISAN EPW HIGHWAY BILL

SUBMITTED BY:

Renee Callahan and Maggie Ernest Johnson, Association of Fish & Wildlife Agencies, mjohnson@fishwildlife.org

On July 30, 2019, the Senate Environment and Public Works (EPW) Committee unanimously voted (21-0) to advance a bipartisan surface transportation reauthorization bill, S. 2302, America's Transportation Infrastructure Act (ATIA). Weighing in at \$287 billion, ATIA is not only the largest surface transportation bill in U.S. history, it also creates – for the first-time ever – a \$250 million wildlife crossing pilot program aimed at reducing wildlife-vehicle collisions while improving habitat connectivity.

If enacted, section 1125 of ATIA would establish a 5-year, \$250 million competitive Wildlife Crossing Pilot Program to provide grants for wildlife infrastructure, including crossing structures and associated fencing that funnel wildlife over and under our highways. In selecting grant recipients, the pilot would primarily consider the project's ability to reduce wildlife-vehicle collisions (WVCs) and improve habitat connectivity for terrestrial and aquatic species, with 60% of funding going to projects located in rural states. Additional selection considerations include:

- Ability to leverage Federal funds with non-Federal and private funding,
- Support for local economies and improved visitation opportunities,
- Inclusion of innovative technologies,
- Provision of educational and outreach opportunities, and
- Inclusion of monitoring and research elements.

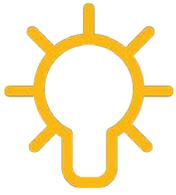
Eligible recipients include: State Departments of Transportation (DOTs), metropolitan planning organizations, local governments, regional transportation authorities and special purpose districts (including port authorities), Tribes, Federal land management agencies, and any combination of

eligible entities. Eligible partners include all eligible recipients plus foundations, non-governmental organizations, universities and other Federal, Tribal, regional or State government entities.

In addition to the wildlife crossing pilot, ATIA also includes a new section entitled "Wildlife Reduction and Habitat Connectivity Improvement." This section provides for the items listed below.

1. Update and expand the 'Wildlife Vehicle Collision Reduction Study: 2008 Report to Congress' and accompanying 'Best Practices Manual' including, among other things, assessing the causes of and recommending solutions for reducing WVCs.
2. Develop guidance for voluntary joint statewide transportation and wildlife action plans aimed at addressing WVCs and improving aquatic and terrestrial habitat connectivity.
3. Develop a series of in-person and online workforce development and technical training courses aimed at reducing WVCs and improving habitat connectivity, which would be made available to transportation and fish and wildlife professionals.
4. Standardize the methodology for collecting and reporting spatially accurate crash and carcass data, as practicable given technology and cost. The goal will be to develop a standardized data template that can be voluntarily implemented by states.
5. Establish voluntary guidance that includes a threshold for determining whether a highway should be evaluated for potential mitigation measures to reduce WVCs and improve aquatic and terrestrial habitat connectivity.

Despite EPW's bipartisan support for ATIA, much work remains, including resolving the perennial challenge of how to pay for our nation's deteriorating infrastructure. In the meantime, if you're interested in learning more about the wildlife-related provisions included in ATIA, please contact: Maggie Ernest Johnson, Association of Fish and Wildlife Agencies, mjohnson@fishwildlife.org, or Renee Callahan, Center for Large Landscape Conservation, renee@largelandscapes.org.



BIRTHING AN IDEA

At ICOET 2019, a gathering of ADC30 members and friends discuss the notion of creating a southeast regional conference on ecology and transportation.





TRB

ANNUAL MEETING

2020

2020 TRB Annual Meeting

99th Annual Meeting

January 12-16, 2020

Washington, D.C.

The Transportation Research Board (TRB) 99th Annual Meeting will be held January 12–16, 2020, at the Walter E. Washington Convention Center, in Washington, D.C. The information-packed program is expected to attract more than 13,000 transportation professionals from around the world.

The meeting program will cover all transportation modes, with more than 5,000 presentations in nearly 800 sessions and workshops, addressing topics of interest

to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. A number of sessions and workshops will focus on the spotlight theme for the 2020 meeting: A Century of Progress: Foundation for the Future.

Workshops Announced: Details regarding the more than 100 specialty workshops are available online now. These workshops take place on the first and last day of the meeting. The full 2020 program, including information on all 800+ sessions, will be posted to this website in November, 2019.



The 99th Annual Meeting marks the beginning of the year-long TRB Centennial celebration. All full-meeting registrants onsite will be eligible to pick up a complimentary copy the TRB history book, *Transportation Research Board 1920–2020: Everyone Interested Is Invited*.

WILDLIFE, TRANSPORT, ROADKILL: Join the Coalition to Reduce Collisions

SUBMITTED BY:

Wendy Collinson, Wildlife and Transport Programme Manager, Endangered Wildlife Trust, wendyc@ewt.org.za

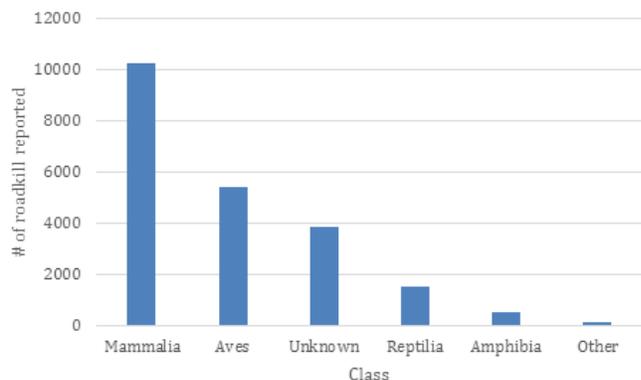
We have all accidentally collided with an animal at some point in our lives, be it a small butterfly, a bird or something larger like a kudu. Ironically, many of these deaths occur near conservation areas where animals flourish, but find themselves in harms way. While smaller species may not result in a human injury or damage to a vehicle, collisions with larger species can cause significant damage, and may be fatal to vehicle occupants. An average of 45 people are killed each day in vehicle collisions on South African roads, with many of these collisions involving animals. Insurance claims suggest that approximately R82.5 million is paid each year against vehicle collisions with wild animals, though the costs of these accidents on ecosystems are hard to calculate.

What are the consequences for animals and what can we do about it? The EWT’s Wildlife and Transport Programme (WTP) is tackling this question and working hard to find solutions to the problems associated with wildlife and transport infrastructure.

I currently lead the WTP and coordinate numerous research projects that examine the impacts of roads in South Africa, and ultimately, finding solutions to reduce roadkill. Many of my projects involve collaborations with stakeholders in the transport sector, as well as academia, regarding the design of future projects to reverse the negative impact of transport infrastructure on wildlife. This body of knowledge will inform the development and planning decisions of future road design, which will lessen the impact of roads on South African fauna and flora.

While roadkill is not the most pleasant subject matter, we need public support to help us protect our wildlife. If we know more about where particular species are being killed on our roads, we can put plans in place to lessen this impact. The importance of roadkill data collection and monitoring is therefore important and one way that members of the public can get involved. Their contribution is twofold: firstly, it will greatly expand our understanding of where roadkill occurs most in the country and what species are most at risk from roads; and secondly, it will improve

Roadkill in South Africa, 2014-2018



How it all began

Wendy began her work in conservation with the EWT’s Carnivore Conservation Programme in 2006 in northern Limpopo. During that time, she observed many animal road deaths, and in her own time, began to conduct pilot studies to ascertain the extent of roadkill. Some alarming statistics came to light, showing how roads can detrimentally impact biodiversity. The research resulted in scientific papers that were published in peer-reviewed journals as well as an MSc in Zoology from Rhodes University in 2013.

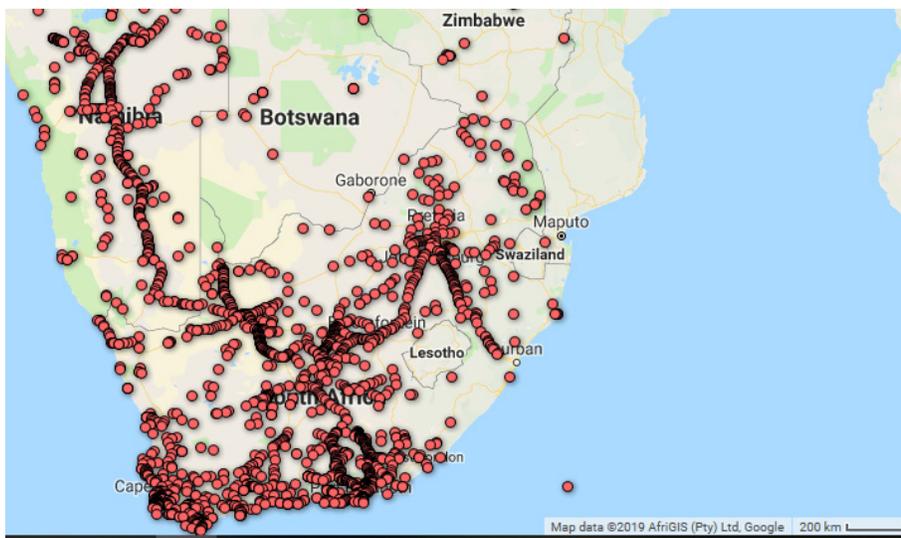
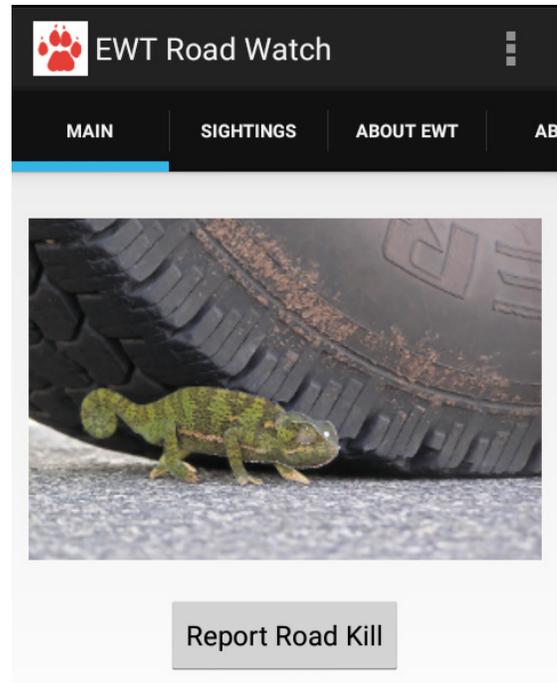
From there, Wendy expanded the research to the rest of the country and so was born the EWT’s Wildlife and Transport Programme. “It’s not about preventing new roads – we need efficient infrastructure for the country to function – it’s about finding a balance between wildlife and transportation” says Wendy, “and the Programme has already expanded to other modes of transportation and linear infrastructure, like fencing and shipping.”

■ WILDLIFE continued from page 6

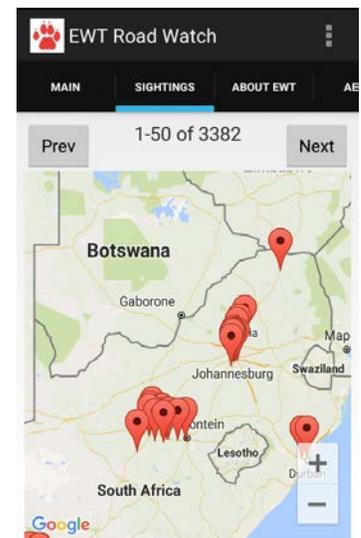
our knowledge of the impacts of roads so that effective mitigation measures can be applied.

In 2013, I launched several national campaigns, which included the development of social media sites, Roadkill Awareness Days, promotional materials as well as the development of a cellphone app—“RoadWatch”—to allow the public to get involved in a citizen science programme and submit their roadkill sightings. To date, almost 25,000 roadkill data points for the country have since been reported from over 200 ‘citizen scientists’ resulting in the identification of species and habitats most at risk.

Data gathered over time allows for the identification of patterns and trends. The impacts of roads will only be understood over time, since the ecological process (such as rainfall and drought) influence animal movement patterns and feeding behaviour, which in turn affects their exposure to roads and ultimately the possibility of becoming a roadkill statistic.



Fusion Table Map showing the roadkill reports for RSA (2014-2018). NB: reported data does not equate to true data as there will be underreporting in roads that are less travelled.



Roads in Parks Project

I initiated the Roads in Parks Project in 2014 to reduce the impact of road users on wildlife in protected areas. The five-year project will ground-truth data collected via expert surveys and social media platforms in order to establish cost-effective, long-term roadkill monitoring and mitigation in our parks.

Social media discussions highlight public concern for wildlife-vehicle collisions (WVCs) inside protected areas.

Using a quasi-experimental field trial, we investigated factors affecting the likelihood of WVCs within Pilanesberg National Park, South Africa, and assessed the comparative effectiveness of wildlife-warning signage (WWS) for altering driver behaviour. We laid a dummy snake crosswise on roads across four combinations of habitat and road shape and recorded 10 driver-related variables for 1454 vehicles that passed the dummy snake, including whether there was a collision. An interaction

■ WILDLIFE continued on page 8

■ WILDLIFE continued from page 7

between speeding and driver occupation (staff/visitor) was the best indicator for WVC. When driving below the speed limit, visitors were almost three times more likely than staff to hit the dummy snake. Collision probabilities increased when speeding and became more similar between visitors and staff, although still significantly higher for visitors. We then investigated the effectiveness of roadside signage in modifying driver behaviour by erecting four variations of WWS, depicting a snake or a cheetah, and in photographic or silhouette form. We positioned the dummy snake 100 m or 1 km after the

signage and recorded our 10 variables (n = 6400 vehicles). Sixty-one percent of drivers who passed a WWS changed their behaviour when they saw the dummy snake, compared to 37% with no sign present. Further, this behaviour change significantly reduced collisions, where 98% of drivers who changed their behaviour avoided a collision.

Finally, an interaction between the animal depicted and distance before the dummy snake affected collisions. A WWS depicting a snake, and placed 100 m before the dummy snake, was most effective at reducing collisions. Our results suggest that drivers adapt their behaviour to signage that portrays smaller animals and awareness retention is low. Ultimately, to reduce WVCs within protected areas, we suggest steeper penalties for speeding and WWS placed in WVC hotspot areas.

The next stage of the project has commenced in the Kruger National Park in 2019.

Wendy Collinson leads EWT’s Wildlife and Transport Programme and lives in Makhado. WTP is works to reduce the negative impacts of transport infrastructure on wildlife, and ultimately improve driver safety through a reduction in WVCs. The Wildlife and Transport Programme is supported by Bridgestone SA, De Beers Group, Ford Wildlife Foundation, N3 Toll Concession (RF) Proprietary Limited, Bakwena Platinum Corridor Concession, and Trans African Concessions (Pty) Limited (TRAC N4). Visit ewt.org.za for more information about their conservation work.



SAVE THE DATE!

TRB Workshop: Co-Developing Wildlife-Vehicle Collision Data Standards

The Transportation Research Board's (TRB) Ecology and Transportation Committee (ADC30) invites members and friends to an important TRB Workshop.

Sunday, January 12, 2020

1:30 – 4:30 pm EST

Walter E. Washington Convention Center
Room 140 A
Washington D.C.

Currently, there are no national data standards for wildlife-vehicle collision (WVC) data collection. Without standards, it is difficult for us to adequately analyze and share WVC data, develop priorities, and implement the most effective mitigation solutions that resolve WVC issues and their adverse effects on both motorist safety and natural resource protection.

This Workshop will engage a diverse group of entities to begin co-developing national WVC data standards. It will start with a panel discussion where key stakeholders and professionals will present issues and criteria relevant to their agency or organization to be considered for national WVC data system standards. Round-table discussions will follow in which Workshop attendees will discuss strategies to co-develop and implement national standards for WVC data collection systems to facilitate more efficient and effective collection and sharing of data by federal, state, tribal, and local agencies and non-governmental organizations.

Developing national data standards is the next step in advancing WVC research, and is pivotal to effectively applying limited resources to mitigate these incidents. A widely-adopted WVC data standard will improve the way in which we collect, interpret, analyze, and apply data to better manage and sustain safe roadway transportation systems for both people and wildlife. Please join us in this TRB Workshop to take part in moving applied research surrounding ecology and transportation forward.

For more information, please contact Rob Ament at rament@montana.edu or Dan Smith at daniel.smith@ucf.edu

WE ARE LOOKING FORWARD
TO YOUR ATTENDANCE!

STANDARDIZING AND AUTOMATING WILDLIFE DATA COLLECTION AND ANALYSIS

SUBMITTED BY:

Fraser Shilling, Co-Director, Road Ecology Center, University of California, Davis; roadecology.ucdavis.edu; fmshilling@ucdavis.edu

Wildlife-vehicle conflict

Wildlife-vehicle conflict (WVC) on state highways and local roads represents both economic and ecological impacts and is a consistent source of concern among Departments of Transportation (DOTs), conservation organizations and agencies, and the driving public. State DOTs have a consistent need to understand rates and locations of WVC, but inconsistent access to tools to collect and manage data and to measure statistical significance of clusters of WVC which could need mitigation. At the same time, as mitigation for WVC expands across road networks, there is an increasing need to collect data about safe wildlife passage through mitigation or other structures.

This article describes several approaches that the Road Ecology Center is using to address these needs. Thanks to the Federal Highway Administration (FHWA), the Pacific Southwest Region University Transportation Center & US Department of Transportation for their partnership and support. Thanks also to David Waetjen, Cameron Denney, Christian John, Kathryn Harrold, Michelle Cowardin, Julia Kintsch, Bridget Donaldson, Kelly McAllister, Jeff Gagnon, and the hundreds of contributors and users of our web-systems.

We have developed approaches to address 1) the standardized collection, management and automated analysis of WVC data, and 2) the automated collection, management and analysis of safe wildlife passage data. These approaches lay the foundation for these two types of data collection and analysis for people studying and managing wildlife-roads interactions to keep up with rapidly changing world of transportation engineering and data use. For

road ecology to stay relevant in transportation, it is necessary to not only translate our concerns and conclusions into engineering speak, but also to perform in a way that makes sense to engineers. This includes developing and conforming to standard practices for data management, rapidly adapting practices to incorporate new methods, and producing analytical outputs at a frame rate that suits decisions.

Standard Wildlife-Vehicle Conflict Assessment System

Current approaches for recording WVC varies widely among states, and often within states, which reduces opportunities for sharing tools and software and creates barriers to effective analysis and mitigation planning. To record WVC, state DOTs and their partners variously use paper forms, spreadsheets, online forms, and in a few instances smartphones. Until our and FHWA's efforts recently, there has been little effort to standardize these approaches, though the types of data collected and the uses of the data in planning are similar. In conversations with the Road Ecology Center, state DOT staff have expressed the need for new, or updated approaches and tools for collecting, managing, and querying WVC data. The lack of standard specifications for data and metadata is a serious barrier to providing affordable and easy-to-use software approaches for collecting data. It may be the most significant barrier to cost-effective mitigation that also improves driver safety and is ecologically-effective.

We have developed and are continuing to develop standards methods and formats for WVC data, which have been described in previous newsletters and Waetjen and Shilling (2017; journal.frontiersin.org/article/10.3389/fevo.2017.00089/full). We collaborate with global partners, many listed here: globalroadkill.net, to continuously update our approaches to support reliable and consistent data management and analysis protocols. The California Roadkill Observation System (<https://wildlifecrossing.net/California>, CROS, Figure 1) is our signature system and since 2009 has been used to collect ~100,000 records and support dozens of analyses of WVC and mitigation projects in California. The data model used in CROS (which you can find in Waetjen and Shilling, 2017) is similar to models underlying more recent systems around the US and world and collectively these data models represent a standard approach.

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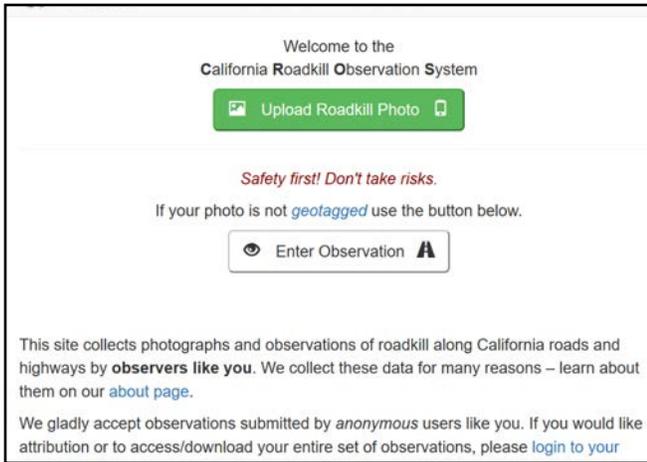


FIGURE 1. The California Roadkill Observation System web-app.

There are new and evolving software-development approaches based on international standards that can be used to standardize WVC data collection, management, sharing, querying, and quality control. There are specifications needed to bring WVC data collection and management systems into line with conventional standards for similar “Big Data” systems. Types of specifications for WVC reporting systems include: data formats, data tracking and verification, data management, security and sharing, image management, long-term archiving (decades), and data transfers among evolving platforms. These are all important specifications for analyzing WVC datasets and to support mitigation decisions, from the level of analysis to combining with other types of data and supporting specific mitigation decisions.

The CROS system provides several semi-automated, standardized services for the range of non-expert to

expert users: 1) The first is in data collection. We use an automated approach to collect traffic incident data from the California Highway Patrol, and store them in a local relational database. Periodically, stored queries extract records involving animals, and we report those incidents in real-time through a web-map tool (<https://roadecology.ucdavis.edu/hotspots/maps>). 2) The second method we employ for collecting WVC incidents data is by volunteer observers, who can now use a “one-click” web-app to contribute carcass data to a reporting website (<https://wildlifecrossing.net/california>, Figure 1). A user can use a smartphone to upload a geotagged picture to the data portal, which automatically reads the location and timestamp from the image file and creates an observation record which then becomes available for automated WVC hotspots analysis. This method is being used by the public and by state DOT maintenance workers.

More recently and with support from the US Department of Transportation and the Pacific Southwest Region UTC, we developed a web-based automated WVC hotspots analysis tool (<https://roadecology.ucdavis.edu/hotspots>) that anyone in the US can use (and we are working on other countries). Staff from 9 states participated in initial conversations to develop requirements for the system. User-supplied data from CA, ID, ME, and NV were used to develop and test the desktop version of the tool. Once the tool was working in the desktop environment, it was moved to an online location and opened to an invited group of beta testers. Users from CO and MN joined the initial group and the entire group repeatedly used the tool and reported any issues they encountered.

This tool allows a user to upload a database/spreadsheet of WVC events on any highway(s) in the US (e.g., Figure

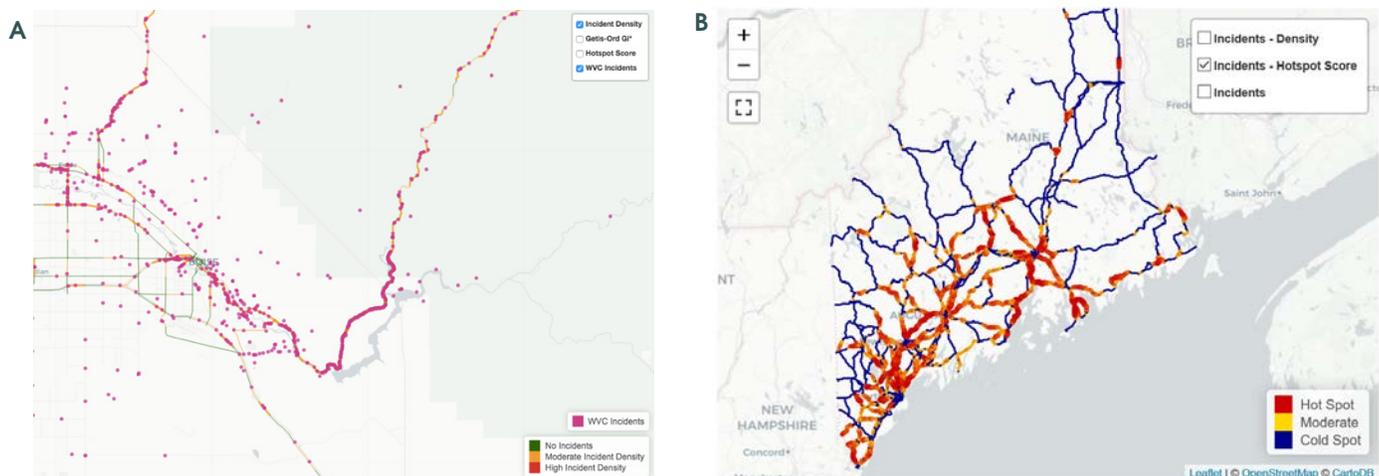
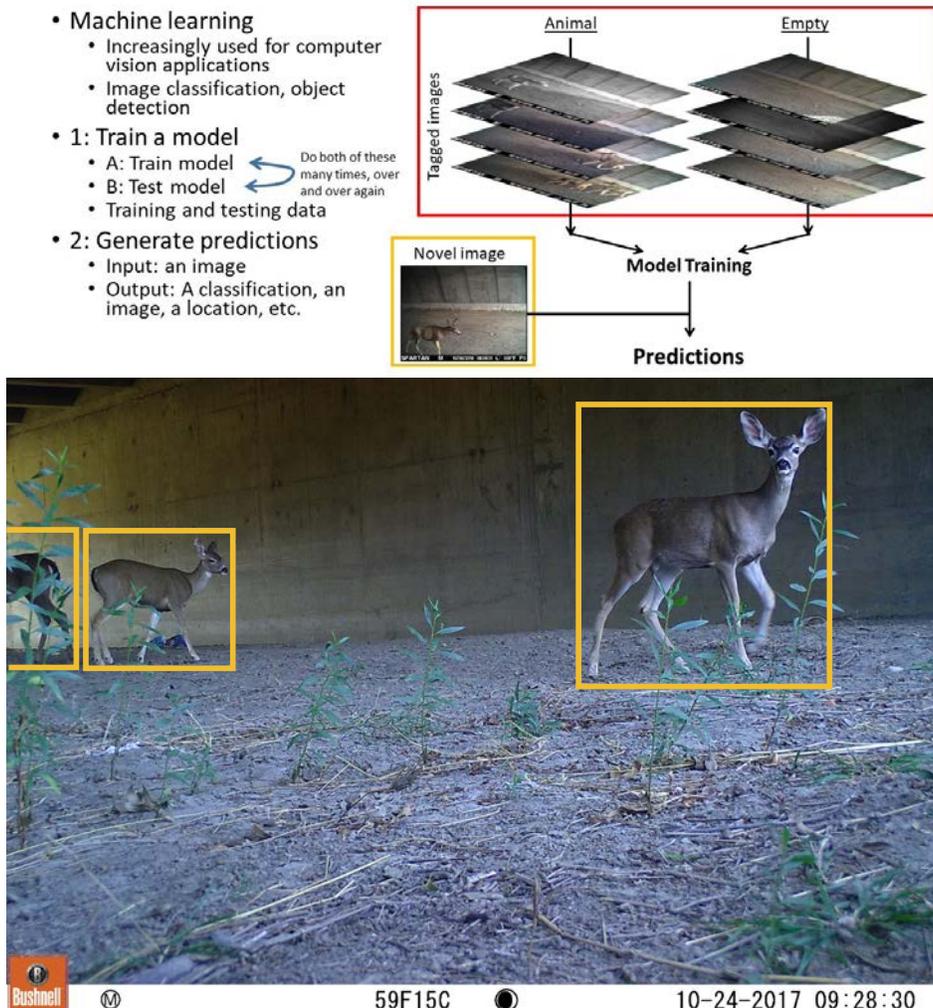


FIGURE 2. A) WVC Incidents around Boise, ID. B) Image file output for WVC incident hotspots in ME. Darker red indicates greater degree of clustering.

■ **STANDARDIZING** continued from page 11

2A) and get back a couple of different kinds of analyses. One is calculation of the density of WVC for every highway segment (currently, 1-mile segments), which is the raw material for many statistical analyses. Another is the calculation of clustering of WVC using two statistical tests: Getis-Ord and local Morans I (e.g., Figure 2B). These pieces of information can be used by the analyst, planner, and project engineer to make rational decisions about placement and types of mitigation for WVC. As of December 1, 2019, over 60 staff from 41 local, state, federal, and private organizations from 15 states had registered in the system and used the analysis tool to carry out >100 local and state-scale hotspot analyses. Given that getting up to speed and running individual analyses like those described here would cost tens of thousands of dollars in staff or consultant time, this tool represents a considerable savings to state DOTs and their partners.

FIGURE 3. A) Overview of training process for machine-learning approaches, B) Animal-counting mechanism.



Next Steps with WVC Data

In the next phase of this program, we propose to work collaboratively with state DOT partners, FHWA and others to use these standard WVC data approaches to develop free tools for states and others to download and use, or use through web-systems. Although there is no need or requirement for all states to use the same approach or web-system, there are enough standard components that we can develop methods that anyone can incorporate into their state-specific system.

Automated Wildlife Safe Passage Assessment

Mitigation actions to reduce WVC include providing wildlife with safe passage across highways through built crossing structures and by warning drivers of the presence of wildlife near or on roadways. Understanding the cost and ecological-effectiveness of safe passage mitigation is important in decisions to continue investing in this technology to protect drivers and to limit impacts to the environment, including to wildlife. Rapidly detecting and identifying wildlife near

roadways is important in developing driver warning systems, both in roadside and vehicle warning systems.

In the first 3 phases of this FHWA-supported project: 1) we developed a web-based informatics system to improve the efficiency of image file management originating from wildlife camera traps (wildlifeobserver.net); 2) we deployed various types of wifi/cell-communicating cameras in the field in 7 states (CA, WA, UT, MT, CO, SD, & ME) to both test the camera systems for their utility and to test the data input methods into the web-informatics system; and 3) we developed web-tools for automated image analysis to further speed up the process of data processing.

We created two animal-classification systems that are

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currently being beta-tested by users in AZ, CA, CO, WA, and VA. The system begins with a user uploading a zip file with images from a camera trap. The tool uses a previously-trained machine-learning/artificial intelligence (AI) program to automatically determine if an animal is present or absent in each image (Figure 3A), a step which can have accuracy up to 99%, but has some issues with animals mixed in vegetation at night. The tool also counts the number of animals (Figure 3B). The system then uses a second AI-based classification method for mule deer, trained using ~40,000 images of mule deer across 20 camera positions and views in AZ, CA, and NM (special thanks to Jeff Gagnon and Haley Nelson from Arizona Game and Fish Department for help with this). We achieved >95% accuracy using this tool, but only for images from the same camera positions; we had accuracy as low as 67% for deer classification for images from other states. Although there is no current answer to this dilemma in the literature, we suspect that this variation in accuracy is because of the same problem that haunts developers of object classification systems for driver-assistance programs in vehicles: as backgrounds change, AI systems have to constantly re-learn how to classify objects in the new background.

The web-tool produces two outputs: 1) a zip file containing only the animal-containing images, and 2) a .csv file summarizing findings. We think this tool will be very useful for culling through the many false-trigger images and returning just animal-containing pictures to the user. We think the mule deer-classification tool needs more work, but we think we know what the problems and solutions are (stay tuned!).

Next Steps with Safe Passage Data

In the next phase of this project, we propose to work with staff from multiple state DOTs and FHWA to further standardize and develop web-services for collecting and analyzing wildlife imagery. We are experimenting with a range of sensing technologies, AI-based image processing tools, and automated work-flows from sensor to analytical outputs.

For more information on the systems, for special analysis requests, or for other information, contact Fraser Shilling (Co-Director, Road Ecology Center, University of California, Davis); fmshillling@ucdavis.edu; roadecology.ucdavis.edu.



IENE 2020
INTERNATIONAL CONFERENCE

LIFE LINES
Linear Infrastructure Networks
with Ecological Solutions

CONFERENCE HIGHLIGHTS

- Thematic sessions and workshops
- Training Sessions
- Final Seminar of the LIFE LINES project (free admission)
- Field trips

REGISTRATION*	FEE
Early Bird	350€
Regular	450€
Late	550€

* Conference dinner, field trips and training sessions are not included

Assessment, Mitigation and Monitoring • Infrastructure-related Habitats • Citizen Science • Linear Infrastructure Ecology • Financing Linear Infrastructures • Legislation and Policy • Replicating Ecological Solutions

Contact
iene2020@uevora.pt

Visit our website
www.iene2020.info

Organisers



SAVE THE DATE
New abstract submission deadline:
15 September 2019
Early bird registration closes:
30 November 2019
Conference:
6-9 April 2020

The University of Évora and the Infrastructure and Ecology Network Europe, have the pleasure to invite you to the **IENE 2020 International Conference**, which will take place in **Évora, Portugal**, between **6 and 9 of April 2020**.



Now Accepting Presentation Proposals

The 9th biennial Northeastern Transportation & Wildlife Conference will be co-hosted by the South Jersey Transportation Authority (SJTA) and the New Jersey Division of Fish and Wildlife (NJDFW).



Make plans now to join us!

September 20-23, 2020
Sheraton Atlantic City Convention Center
Atlantic City, New Jersey

Call for Presentations

Deadline to Submit: March 11, 2020

The Program Committee is now seeking proposals that focus on topics that are important to transportation and wildlife professionals across the Northeast. This conference includes a variety of formats for presentations to promote lively discussions and learning opportunities.

Below are the formats that will be accepted:

- **Podium Presentation**—lecture style format of technical papers. Presentation time is 30 minutes: 20 minutes speaking plus 10 minutes of questions and answers. Presenters use PowerPoint slides and other audiovisual media to support their remarks.
- **Panel Session** (3 or more presenters)—podium lecture(s), panel discussion, or breakout groups with facilitated discussion. Presentation/discussion time will be 1.5 hours total.
- **Workshop**— format involves group interaction and hands on demonstrations. Workshop length may vary based on topic and format; preferred length should be noted in proposal. For instance, there may be a classroom portion of a workshop that complements a field component held on Tuesday afternoon.

- **Lightning Talk**—format is a quick 10-minute “lightning talk” presentation. Up to six back-to-back lightning talks (with short breaks in between) will be scheduled to fill a 1.5-hour session. This format focuses on the results of work and not the methodology.
- **Poster Session**—format is a visual representation of your recent research or ongoing projects. A dedicated Poster Session will be held during the main conference, when poster presenters will be required to remain with their poster to encourage interaction and discussion with the conference attendees. Poster presenters should also consider doing a Lightning Talk on their topic.

[LEARN MORE AND SUBMIT A PROPOSAL ONLINE](#)

TIMELINE FOR SUBMISSION AND NOTIFICATION:

- Presentation proposals will be accepted until Wednesday, March 11, 2020 at 11:59 PM, EST.
- Submitters will be notified by the end of May, and accepted presenters will receive a detailed confirmation packet.
- Speakers will have a discounted registration fee to attend the conference. Registration fees and details will be announced in June 2020.

2020 VISION: Creating a Roadmap to Help Wildlife Navigate Our Mobile World

We recognize the great challenge of sustaining wildlife mobility in a fragmented and changing landscape. NETWC 2020 will bring together a community of transportation and ecology professionals from across our region to explore advancements in wildlife ecology and roadway planning, and collaboratively put science, technology, and solutions into practice.

Sponsor & Exhibitor Opportunities Available

The NETWC offers you the opportunity to make face-to-face CONNECTIONS with industry leaders and state officials in the fields of transportation and wildlife. You will have ACCESS to people who need your products and services, and the EXPOSURE will reinforce your brand awareness and maximize visibility.

A wide range of participating levels and prices are available. Sponsor opportunities range from \$1,000 to \$5,000, and an exhibitor-only option is available at \$675.

[Download the sponsor and exhibitor registration brochure](#) to learn more, then click the button below to sign up online.

[REGISTER ONLINE NOW](#)

To learn more about the upcoming Northeastern Transportation & Wildlife Conference, visit www.netwc.org. Updates will be posted there as the conference nears.

SCDOT Project Delivery Innovation

The South Carolina Department of Transportation (SCDOT) has recently invested over \$1 Billion in new gas tax funding to the upgrade the infrastructure of the Palmetto state.

In an effort to streamline delivery of these projects, the Environmental Services Office (ESO) at SCDOT is working closely with research faculty at the University of South Carolina (USC) to develop three new environmental applications: Project Screening Tool 2.0, e-Permitting and e-Jurisdictional Determination (e-JD).

These applications will use geospatial data assisted by artificial intelligence (AI) in order to help streamline the environmental decision making process. The web based applications will assist in standardizing 404/NEPA

deliverables in order to bolster interagency coordination at the state and federal level. The Project Screening Tool 2.0 application will be built upon the latest ArcGIS technology and will allow SCDOT staff to more easily quantify environmental impacts at the onset of a project. The e-Permitting and e-JD applications will automate the production of USACE 404 permit applications and JDs by driving the end user through a logic question analysis.

The applications are just now entering the Beta Testing window and SCDOT's environmental office would love to have DOTs assist them in evaluating any of the products. If interested in helping, please contact Vince McCarron, Mitigation Analyst with SCDOT's Environmental Service Office (ESO) at McCarronVJ@scdot.org or via telephone at (803)-737-1967.



The SECRET is out: A New Ecology and Transportation Conference is Coming to the Southeast!

Derived from discussions between a number of attendees at the International Conference on Ecology and Transportation (ICOET) this past September, an organizing committee has been formed and is in the initial stages of planning a new conference based in the southeast US and focusing on regionally-applicable ecological issues associated with transportation infrastructure. The new conference organization, tentatively named the Southeast Conference on [Regional] Ecology and Transportation (aka "SECRET"), proposes to hold its initial meeting in Savannah, GA sometime in late 2020 or

early 2021. The concept for the conference is to provide a forum similar to the Northeast Transportation and Wildlife Conference (NETWC) and enhance regional engagement with the larger ICOET organization. Conference planning is still in the early stages, and more detailed information is anticipated in early 2020. Stay tuned for updates, and feel free to contact Daniel Smith, Chair of ADC30 (Committee on Ecology and Transportation) daniel.smith@ucf.edu for more information or if you would like to get involved in making this conference happen!

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