



# Committee on Ecology and Transportation Newsletter

Transportation Research Board Committee ADC30

January 2018



## View from the Chair

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

### EMBRACING NEW CHALLENGES AND OPPORTUNITIES

It's been seven months now since I assumed the role as Chair of the Committee on Ecology and Transportation. While the administrative tasks have presented new challenges, it's been great to have so many dedicated members and friends of the committee step forward to ease the transition. Thanks to you all.

In my inaugural statement, perhaps it's appropriate to tell you a little about myself. First, I'm an academic researcher, not an administrator or manager. I've been working on the front lines alongside colleagues, students, and field technicians collecting and analyzing data on the effects of roads on wildlife. The vast majority of my time has been spent in the Southeastern Coastal Plain, in particular investigating the effects of roads on habitat connectivity and movements of predators, both large and small, with fur and without.

The general premise of my approach has involved using applied science to inform decisions that support and promote safer, more efficient roadways while improving the function and integrity of native ecosystems and the species that inhabit them. All my professional successes have shared a common element—teamwork. Every project has involved many people working together, as partners for a common goal. As my predecessor, Alex Levy, also encouraged, I will strive to emphasize partnerships in the work of the committee. Together, we can elevate our influence on improving transportation systems and lessening their impact on the environment.

### Partnerships: Strengthening Existing Ones and Developing New Ones

In 2017, TRB adopted a new policy disallowing individual committee's ability to finance and manage their own mid-year workshops/meetings. While this may reduce our flexibility in planning mid-year events, it also presents an opportunity to explore potentially beneficial partnerships with other organizations. There are many professional associations and groups out there that share common goals and pursuits with our committee. First there's our long-running partnership with ICOET, for which we're already working to increase collaborative efforts. Second, there is the Northeast Wildlife and Transportation Conference that we've partnered with in past years. Another professional organization that we're pursuing a working relationship with is the National Association of Environmental Professionals. Many others should also be considered like the Society for Conservation Biology, The Wildlife Society, and Ecological Society of America. Besides these outside groups, partnerships with other TRB committees, many of which we've only collaborated with previously at annual meetings, is something we should to continue to cultivate and reinforce.

### Taking Advantage of Networking Opportunities

While the theme of the TRB 2018 meeting, Transportation: Moving the Economy of the Future, doesn't directly speak to ecological or environmental issues, the annual meeting does bring together over 13,000 individuals involved in this industry and provides us with the unique opportunity to communicate the importance of addressing ecological issues in transportation planning, design, construction, and management. At this year's annual meeting, and beyond, we should, each of us, resolve to connect with someone new,

preferably from outside the environmental community, so we can—together—move ecology and transportation into the economy of the future.

Lastly, I remind everyone to periodically explore our website: [www.ecologyandtransportation.weebly.com](http://www.ecologyandtransportation.weebly.com) and encourage you to read the articles in this issue of our newsletter. They include a diverse representation of programs/projects from three different continents. On behalf of TRB, I offer my sincere appreciation to those that submitted articles and to the dedicated members and friends of the Committee for their continued service in furtherance of our mission.



## INTERNATIONAL CONFERENCE ON ECOLOGY AND TRANSPORTATION California 2019

We are proud to announce that the next **International Conference on Ecology and Transportation (ICOET)** will take place in **Sacramento, California** in late September 2019.

The Road Ecology Center (REC) and the ICOET Steering Committee selected downtown Sacramento as providing the most amenities, convenience, and affordability among a range of options in Northern Central California. Working with Caltrans, we will design a program that cuts across many areas of road ecology, matched by field trips to montane, urban, and coastal project areas. The REC is joined by other UC Davis research entities in welcoming you to California in 2019: the Institute of Transportation Studies, National Center for Sustainable Transportation, and the John Muir Institute of the Environment. We look forward to your participation.

For more information, contact Fraser Shilling, REC Co-Director ([fmshilling@ucdavis.edu](mailto:fmshilling@ucdavis.edu)).



## Save the Date!

SEPTEMBER 8-12, 2018

UMASS AMHERST, AMHERST, MA

## Partnering for Resilient Infrastructure and Ecosystems

The 2018 Northeastern Transportation & Wildlife Conference will be co-hosted by the Massachusetts Department of Transportation and the Massachusetts Department of Fish & Game. This year's theme is "Partnering for Resilient Infrastructure and Ecosystems." Make plans now to join us September 8-12, 2018 at UMass Amherst in Amherst, Massachusetts.

### Who You'll See There

Up to 250 experts from all areas of wildlife and transportation from Northeastern U.S., Canadian Provinces and other U.S. states.

### Conference Highlights

Highlights of the event include keynote speakers, informative and relevant concurrent sessions, problem solving workshops, full afternoon field trip, and numerous opportunities for networking.

Preliminary event information including a schedule at-a-glance, lodging details, and sponsor opportunities will be posted to the conference website mid-December 2017. Please check back for updates!

Northeastern Transportation and  
Wildlife Conference  
[www.netwc.org](http://www.netwc.org)

# NYS Department of Transportation Recognized for Pollinator Conservation Effort

Submitted by: Sarah Piecuch, Environmental Specialist, NYSDOT Rochester, NY, Sarah.Piecuch@dot.ny.gov

MaryEllen Papin, Maintenance Environmental Coordinator, NYSDOT Rochester, NY, MaryEllen.Papin@dot.ny.gov

The New York State Department of Transportation’s (NYSDOT) Rochester Region and the Seneca Park Zoo Society (Zoo Society) recently received the New York State Department of Environmental Conservation’s (NYSDEC) Environmental Excellence Award for their pollinator protection efforts. The Awards are given annually in recognition of outstanding, innovative, and sustainable projects, programs and partnerships that contribute to a healthier environment and economy and serve as models of excellence. Award winners are a select group of committed organizations leading by example, serving as models of excellence within their industry and community. NYSDOT’s Rochester Region is proud to be recognized by NYSDEC for their pollinator conservation efforts and partnership.

Within a six-mile section of Interstate 390 (I-390), south of Rochester, NYSDOT has modified its mowing practices to protect approximately 93 acres of naturally regenerating wildflower habitat for pollinators. Within this section are two rest areas (Figure 1). These rest areas provide the opportunity for NYSDOT and the Zoo Society to explain the importance of pollinators in general and why the mowing has changed. The NYSDOT and Zoo Society have planted, and together with—Green Thumb Environmental Beautification, Inc., maintain a 20’x 20’ interpretative garden (Figure 2) at each rest area and erected signage to highlight ways to conserve milkweed and encourage others to enroll in the Butterfly Beltway program.



Figure 2: Seneca Park Zoo Society Butterfly garden at the I-390 Southbound Rest Area.

The mowing modification consists of mowing later in the season and mowing wider (see Figure 3) to delay succession along I-390. This area was exhibiting a natural recolonization of wildflowers, such as milkweed (*Asclepias sp.*), goldenrod (*Solidago sp.*) and asters (*Aster sp.*) (Figure 4). The area is also free of invasive species, specifically black & pale swallow-worts (*Cynanchum spp.*).

Despite ideal habitat being present along I-390, portions of the right-of-way (ROW) were being mowed in August or early September when the last monarch generation of the summer was emerging or before more northern born individuals were passing through during migration, thus breaking the monarch’s developmental cycle.

To improve habitat for the monarchs, mowing was delayed in this section until late September/early October, to protect emerging butterflies and provide habitat and food sources until the monarch migration has passed through New York State. In addition to mowing later, the changed mowing limits cover a wider area than the width defined in NYSDOT’s statewide mowing policy. NYSDOT did not



Figure 1

### Modified Roadside Mowing Strategies to Protect Pollinators

NYSDOT— Interstate 390 in Livingston County

#### TRADITIONAL ROADSIDE MOWING STRATEGY:

- Mow a single pass (~15' wide) twice a year on both sides of the road for highway safety; (thin yellow strip)
- Mow (~35' wide) once a year on both sides of the road (blue & yellow strips)
  - Mow in July/August

#### MODIFIED ROADSIDE MOWING STRATEGY:

- Mow a single pass (~15' wide) twice a year on both sides of the road for highway safety; (thin yellow strip)
- Mow a wider area alternating each side of the road every other year (NB odd years, SB even years) (thick gold strip)
  - Mow in late-Sept/Oct



Figure 3



Figure 4: Milkweed plants naturally recolonizing I-390 ROW.



Figure 5: Successional old field state

make any changes to the single pass mowing, also known as the safety strip. The safety strip is mowed twice a year during the growing season. Mowing a wider area on a two-year cycle keeps shrubs from crowding out milkweed and prevents the establishment of future hazard trees. By mowing wider, we are reclaiming an area that was passing from wildflowers and meadow into scrub/shrub habitat. Mowing beyond the safety strip on a biennial basis maintains the ROW in a successional old field state (see Figure 5). Traveler safety is not compromised by the change in mowing practice.

The organization and culture of NYSDOT and its Rochester region are important to the success of this work. NYSDOT is, to our knowledge, the only state transportation agency in the nation that has environmental professionals, Maintenance Environmental Coordinators (MEC), in its maintenance program and the Rochester region has a long-standing history of organizational teamwork. When the opportunity arose to partner with the Zoo Society, NYSDOT's Regional Environmental Group and the MEC were ready to capture the moment. The MEC then worked with the Livingston County Residency, the front-line maintenance organization, to coordinate the logistics of modifying mowing in the six-mile section. Staff used their collective knowledge of ROWs to make the project work for both the highway users and pollinators.

To reverse pollinator declines, large sections of pollinator habitat must be protected or restored. This can be accomplished by a combination of efforts, where everyone helps with whatever habitat they have available. Every bit

helps. If several miles of right of way with two rest areas are not available, even a few hundred or thousand feet would help. If this ROW is next to a safety parking area, park and ride lot, historic marker or park, it may be possible to use one of these places to provide interpretive signs or plantings to explain what is happening on the adjoining ROW.

Here is a checklist of the questions that NYSDOT considered in planning its changes to mowing on I-390:

- Can the changes to mowing limits and frequencies be made without affecting highway safety, such as sight distance and visibility?
- Are there direct and indirect conservation values, such as helping migratory pollinator species and pollinators that do not migrate, in making the mowing changes?
- If mowing is changed, will plants suitable for pollinators regrow?
- Are invasive or noxious plants in the ROW that would affect pollinators or people monitoring the mowing changes? For example, swallow-worts are toxic to monarch butterflies and many people are allergic to poison ivy and wild parsnip.
- Does the agency's mowing equipment have the horsepower and configuration to accomplish mowing of vegetation at different heights and thicknesses?
- Are there agency lines of communication between environmental staff, maintenance managers and mowing operators? This ensures that safety and pollinator concerns are balanced and that all understand where the changes will occur so that desirable vegetation is not accidentally mowed.
- Is there a safe location, either on the transportation agency's ROW or on adjoining land where interpretive activities such as signs and pollinator gardens can be placed?
- Are adjoining landowners aware of the planned changes and the reasons for them?

The conversations you have in addressing these concerns will ensure that, once the changes occur, they are workable and supported by the community and the people who plan and undertake the mowing.

We encourage everyone to scout their ROWs to see if areas can be mowed less frequently and later in the year. By adjusting mowing frequency and timing you too can foster the natural regeneration of wildflowers. If a transportation agency can help pollinators on the ROW, it may inspire neighboring landowners to look at their property and see where they can change their vegetation management practices to help too.

## ADC30 Well-Represented at 2017 FHWA Environmental Excellence Awards

*Submitted by: Chris K. Slesar, Project Delivery Bureau, Environmental Section, Vermont Agency of Transportation*

Two TRB ADC30 Members crossed paths in Des Moines, Iowa at the 2017 FHWA Environmental Excellence Awards (EEA) ceremony at the AASHTO Standing Committee on Environment (SCOE) meeting this past July. Dr. Bethany K. Kunz, Biologist with the USGS, and Chris Slesar, Environmental Resources Coordinator at the Vermont Agency of Transportation and Chair of the Monkton, Vermont Conservation Commission, were both on hand to represent two projects receiving EEA recognition. The biennial FHWA Environmental Excellence Awards program, which began in 1995, recognizes “partners, projects, and processes that protect and enhance the environment, while meeting the transportation needs of expanding and evolving communities.”



Figure 1: Dust at Squaw Creek. (Credit: B. Kunz, USGS)

Dr. Kunz represented the Road Dust Management in Sensitive Environments project, which received the EEA for Environmental Research. Dr. Kunz accepted the award along with Steve Suder (NPS), Tom Bell (USFWS), and Ed Little (USGS). The Road Dust Management project is an 8-year collaboration between the U.S. Fish and Wildlife Service and the U.S. Geological Survey designed to provide better environmental information for managers of unpaved roads.

Unpaved roads make up nearly 50 percent of the Nation’s road network, and more than 80 percent of the roads managed by federal agencies. Controlling dust from these roads reduces safety hazards for drivers, reduces sedimentation in roadside streams and wetlands, and lengthens road lifespans (Figure 1). Although tens of millions of gallons of dust control products are applied to roads in the

United States annually (with product compositions ranging from salts to hydrocarbons to agricultural byproducts), very little research has addressed the possible environmental consequences of dust control treatment. This knowledge gap is problematic for road managers attempting to choose effective and safe products.

The Road Dust Management Project used a combination of laboratory studies and large-scale field tests to investigate both the benefits of dust control strategies and the potential effects of applications on roadside organisms, soil chemistry, and water quality. Importantly, the project is a success story of bringing together federal, state, and industry partners to address practical road management problems.

Overall, this project contributes quantitative environmental data where little existed before. This information supports road managers as they decide if, and how, to incorporate dust control into management plans. Research results are also being shared with the U.S. Forest Service and other



Figure 2: Wildlife crossing. (Credit: C. Slesar, VTrans)

federal lands agencies charged with managing large unpaved road networks in sensitive environments.

Chris Slesar was present to receive an award for the Monkton Road Amphibian and Wildlife Crossing Project, which received the EEA for excellence in Ecosystems, Habitat, and Wildlife category (Figure 2). The Monkton Amphibian and Wildlife Crossing is the result of nearly two decades of planning and a decade of fundraising to provide wildlife safe passage to and from their breeding and overwintering habitats.

The town of Monkton, Vermont, is home to one of the largest and most diverse amphibian populations in the northeastern United States, a population that must cross the Monkton-Vergennes Road each spring to breed in the Champlain Valley wetlands. It is estimated that cars kill more than 50 percent of the amphibians attempting this perilous



Figure 3: Amphibian crossing project. (Credit: C. Slesar, VTrans.)



Figure 4: Cat. (Credit: C. Slesar, VTrans.)

migration. Many of the amphibian species that make the crossing are Species of Greatest Conservation Need according to the Vermont Wildlife Plan. At that rate, biologists feared this regionally significant population would not survive without an infrastructure solution.

This project designed and constructed two wildlife crossing structures, targeting primarily amphibians, on a rural town highway. Perhaps one of the most distinctive aspects of the Monkton project is that it was a grassroots volunteer effort. Typically, communities rely on state and federal government to resolve conflicts between transportation infrastructure and wildlife. In this case, a small rural community refused to sit back and watch an ecological resource blink out as traffic volumes increased beyond the amphibians' reproduction rate.

The results are extraordinarily encouraging. In the first year of post-construction monitoring, over 2,000 successful amphibian crossings have been photo-documented using the wildlife crossing culverts. In addition to amphibians, small and medium-sized mammals (including bobcat, porcupine, and opossum) have been photo-documented using these crossing structures. It is the hope of the Monkton Road project's many partners and collaborators, that similar transportation projects will begin to include similar infrastructure accommodations where cars and amphibians collide.



**NAEP 2018  
CONFERENCE  
TACOMA  
WASHINGTON**

**MARCH 11-14, 2018**

Registration is Now OPEN!  
Visit [www.naep.org/2018-conference](http://www.naep.org/2018-conference)  
to register online!

If you have any questions or would like to register via check, please contact Tatiana Veres at [tveres@ahint.com](mailto:tveres@ahint.com).

## Mid-Year ADC30 Meeting

We will be holding a mid-year business meeting in 2018 in partnership with ADC10 (Committee on Environmental Analysis in Transportation).

We will be co-hosts of the Florida Association of Environmental Professionals' Annual Conference that will be held in Orlando in September 2018. Further details as they become available will be announced at the Annual Meeting, via email from the chair, on the FAEP website ([www.faep-fl.org](http://www.faep-fl.org)), and in the Summer Newsletter.



# Current Roadway Culvert Issues in Washington State—Design Implications

*Submitted by: Wayne S. Wright, FP-C, PWS Stantec Consulting Services Inc., Bellevue, WA*

In 2013, U.S. District Judge Ricardo Martinez made a landmark ruling that has changed transportation planning and design in Washington State forever. With his ruling, Judge Martinez ended a 16-year dispute between the State of Washington and several Native American Tribes in western Washington over roadway culverts that pose migration barriers to Pacific salmon. The Tribes asserted these culverts, by their disruptive nature, pose a risk of extinction to Pacific salmon and hinder recovery efforts required by the Endangered Species Act. This violates established Treaty Rights by reducing productivity of fisheries depended upon by Native Americans. Judge Martinez agreed with the Tribes and went on to prescribe the design method to be used in correcting culverts acting as migratory barriers. Judge Martinez laid out a strict schedule for the State to comply with corrective actions for over 900 known migratory barriers prepared and a preliminary budget of what the State needed to do to meet his requirements.

Over the past four years, the State of Washington (Departments of Transportation, Natural Resources, Fish & Wildlife, and Parks & Recreation) has made substantial progress. The Department of Transportation is currently spending an average of \$80M per biennium on culvert replacements in the Puget Sound vicinity. In June 2016, the State appealed the ruling in the Ninth Circuit Court of Appeals and lost in a ruling filed in October 2016. In August 2017, the State Attorney General's Office filed a petition to the U.S. Supreme Court to review Judge Martinez's decision. The basis of the appeal keys on three key points: 1) many WSDOT blockages are upstream of equal to or more



*Figure 1: Unnamed Tributary After – 72” Diameter Open-Bottom Arch Culvert*



*Figure 2: Unnamed Tributary Before – 24” Diameter Buried Culvert*

severe blockages; 2) it is the Federal Government's fault since Federal agencies specify the use of design standards for roadway design; and, 3) Judge Martinez misinterpreted the Treaty and contradicted previous U.S. Supreme Court's interpretation of the state's obligations under the treaty.

As the dispute and appeals play out, roadway design in Washington has taken on new dimensions. Based on Judge Martinez's finding, all new roadways are incorporating stream crossing design parameters that will accommodate the 100-year flow rates and maintain natural stream channel dimensions. Commonly called the "Stream-Sim Method," designers set culvert width dimensions based on scientific information gathered in the field. The bankfull

width of the stream channel in an undisturbed portion of the stream to be crossed is determined by a qualified professional. The bankfull width is then multiplied by 1.2 then an additional 2 feet are added to that product to derive the minimum culvert width for the crossing.

The equation is:

$$(BFW \times 1.2) + 2 = \text{minimum culvert diameter}$$

The impacts of this method for sizing culverts are striking. Many older culverts in the 3 to 4 foot diameter range must be replaced with bottomless arch culverts, box culverts, or three-sided bridges with openings of 12 to 20+ feet to meet the required width (Figures 1 - 4). These extra wide openings pose design challenges with roadway grades, utility maintenance/relocation, drainage, safety features and overall construction cost to accommodate these larger openings.

In the past, some culverts were sized and designed based on hydraulic calculations with accommodations for sediment and debris flow through the conduit. Use of hydraulic methods now are supplemental to the basic stream simulation method noted above. Of course, there are many additional culvert design elements that must be included. Stream sediment stability, scour protection, streambed elevation control, instream habitat improvement (use of large woody material), and floodplain maintenance are common design features.

Regardless of the ongoing legal dispute, significant advancement has been made and is continuing in Washington State for new roadway construction and retrofits to prevent future and correct existing fish passage blockages. The integration of biology, geomorphology, hydrology, and engineering has never been stronger to complete transportation design projects in western Washington State.



Figure 3: East Fork Union River Before – 48” Hung Culvert



Figure 4: East Fork Union River After – 20’ Diameter Tunnel

# Improving Animal-Vehicle Collision Data for the Strategic Application of Mitigation



*Submitted by: Bridget Donaldson, Senior Research Scientist, Virginia Transportation Research Council (the research division of VDOT)*

Deer are responsible for the highest number of animal-related human deaths in the U.S., and more than 1.3 million collisions with deer occurred in the U.S. for the year ending June 30, 2016. Virginia has more than 61,000 deer crashes in recent years, representing 1 in 6 of the insurance claims in Virginia.

The increase in collisions with deer and other wildlife and the success of certain countermeasures have led to an increase in the implementation of mitigation to decrease animal-vehicle collisions (AVCs) in the last 20 years. Any mitigation decision is dependent on a preliminary step: the identification of the problem and its severity. This can only be done with a reliable source of AVC data.

In most states, police crash reports are the only available statewide data source for deer-vehicle collisions (DVCs). It is known that AVCs are not sufficiently documented in most states, but more detailed analyses are needed to understand the scale of animal crash underreporting.

Quality and cost evaluations of DVC data in Virginia were conducted that illustrate an AVC underreporting phenomenon that is a problem nationwide. Deer carcass removal records were collected along a major interstate in Virginia and compared with police report data of DVCs.

Figure 1 uses deer carcass removal data to illustrate an example of the underrepresentation of DVC data from police reports.

DVCs represent a considerable safety hazard, but the magnitude of the problem is not apparent from the police report data. In some of the evaluated road segments, deer carcass removals were up to 8.5 times higher than what was indicated by police reports. Deer were the most frequent cause of collisions in the evaluated areas in Virginia, causing 3 to 5 times more crashes than the next two most frequent collision types. This was not apparent from police crash reports of DVCs.

From a cost estimate that was developed to calculate statewide costs of DVCs, deer crashes were the fourth costliest collision type (Figure 2), averaging more than \$533 million per year.

The increasing use of handheld devices among transportation maintenance staff to track road activities provides an ideal opportunity to implement the systematic collection of carcass removal data. The Virginia Department of Transportation is considering the addition of a carcass removal element to its new digital maintenance tracking software.

Implementing reliable data collection and reporting practices may encourage public discourse and bring the matter the attention that is consistent with the magnitude of the problem. Using reliable data to target mitigation strategically will benefit motorists and wildlife.

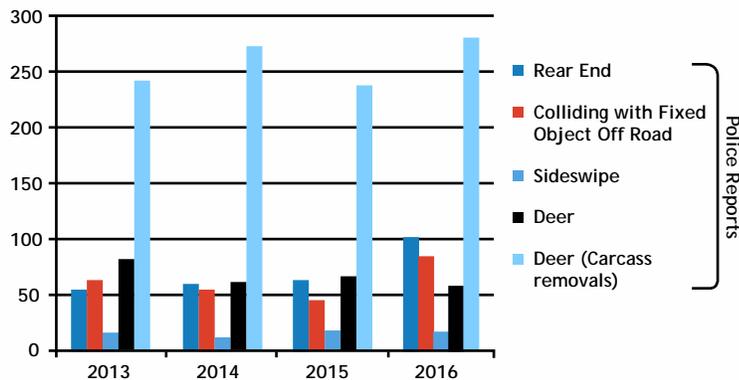


Figure 1: Most frequent types of collisions in police crash reports from a 30 mile segment of I-64 in Albemarle County, Virginia.

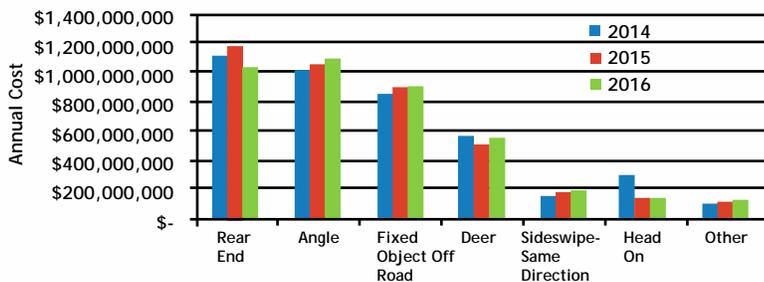


Figure 2: Comparison of DVC cost estimates with estimates of other collision types in Virginia.

# Study on Design Parameters of Wildlife Crossing Structures for Golmud-Lhasa Section of Qinghai-Tibet Expressway

Submitted by: Yun Wang\*, Lei Guan, Xinjun Wang, Jiding Chen, Yaping Kong, China Academy of Transportation Sciences, 240 Huixinli, Chaoyang District, Beijing, wangyun80314@163.com (Y. Wang)

Understanding the use of bridges and culverts of the Qinghai-Tibet railway by wildlife will provide valuable references in the design of wildlife crossing structures for similar transportation infrastructure, such as the Qinghai-Tibet Expressway, which will be built in the future. The middle and small bridges and culverts in Golmud-Lhasa Section of Qinghai-Tibet railway, and Tibetan antelope underpass of Qinghai-Tibet highway are selected as the study objects. The infrared camera trapping technology was used to monitor the structures continuously from August, 2014 to October, 2016. The design parameters of wildlife crossing structures for 4 typical ungulates (Tibetan-antelope [*Pantholops hodgsonii*]; Tibetan-gazelle [*Procapra picticaudata*, *Kiang-Equus kiang*]; and Wild yak [*Bos mutus*]) were analyzed, and the suggestion on design of auxiliary facilities is put forward (Table 1). The result indicates that (1) for the migration of Tibetan antelope groups through underpasses, the open rate (Figure 1) should be higher than 129, the height should be equal to or greater than 5 m, with the underpasses within the migration route of Tibetan antelope (Figure 2); (2) while for the scattered crossing of Tibetan antelope along non-migration route, the height should be higher than 3.5 m, the length should be longer than 6 m and the open rate should be higher than 4.2 (Figure 3); for Tibetan gazelle underpasses, the open rate should be higher than 4.2, the length should be higher than 6 m and the height should be higher than 4 m (Figure 4); concerning Kiang underpasses, the open rate should be higher than 4.2, the length should be longer than 3 m and the height should no less than 2.5 m (Figure 5). Some suggestions on auxiliary facilities

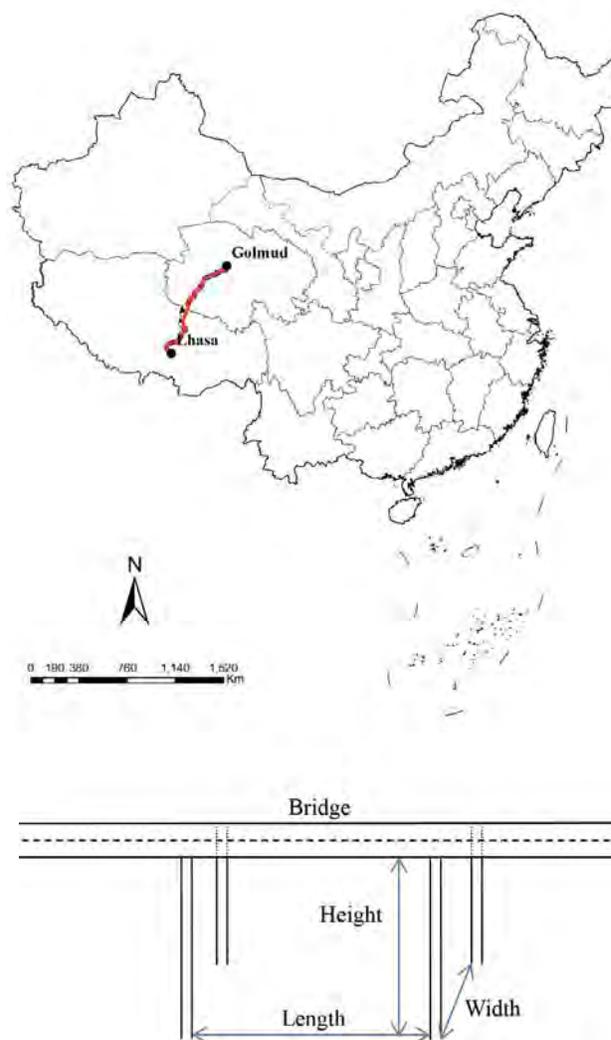


Figure 1: Sketch map of indicators of Open rate (Open rate=Length×Height/Width)

Species	Open rate	Length/m	Height/m	Remark
Tibetan antelope	≥129	--	≥5	For the migration of Tibetan antelope groups through underpasses, the underpasses should be within the migration route of Tibetan antelope
	≥4.2	≥6	≥3.5	For the scattered crossing of Tibetan antelope along non-migration route
Tibetan gazelle	≥4.2	≥6	≥4	
Kiang	≥4.2	≥3	≥2.5	
Wild yak	--	--	--	Unknown, more data are required

Table 1: Recommended parameters of underpass along Qinghai-Tibet Expressway for ungulates

of wildlife crossing structures are provided, such as alert signs, limit speed device, noise barrier, landform design, vegetation restoration, artificial water pool and monitoring design. It is suggested to minimize the barrier effect of Qinghai-Tibet expressway on Tibetan antelope and other species, both wildlife overpasses and underpasses should be located along the expressway, and landform should be designed to avoid the visual disturbance of vehicles; and decrease the noise impact near the structures of Tibetan antelope in the future. Furthermore, water pools should be built and vegetation should be restored to maintain the connectivity of habitats at both sides of the structures, which will attract wildlife to approach and cross using the structures. Moreover, it is important to strictly limit the human activities around the structures for maintaining the efficiency of wildlife crossing structures.



Figure 3: Tibetan antelope using a culvert located under the railway



Figure 2: Tibetan antelope groups using a bridge located along the highway during migration season



Figure 4: Tibetan gazelles using a bridge located under the railway



Figure 5: Kiangs using a small bridge located under the railway

## News from Africa

*Submitted by: Wendy Collinson-Jonker, Wildlife and Roads Project, Endangered Wildlife Trust.*

*More information is available at <https://www.ewt.org.za/>*

### ROAD TO RUIN?

Roads are a critical element of human economic development and society, and global rates of road construction will likely continue to rise for the foreseeable future. Roads and road users have numerous, diverse, and mostly negative consequences for biodiversity by, among other things, destroying and degrading habitats, fragmenting wildlife populations and their dynamics, direct impacts through collisions, and secondary impacts through increased access to previously unattainable natural resources. The science of road ecology (our understanding of such impacts and how these can be minimised) is fairly well developed in North America, Europe, and Australia, but is only in its infancy in regions such as Africa, which are likely to experience rapid infrastructure development in the upcoming decades.

To address the threat to biodiversity from roads and road users, the EWT launched the Wildlife and Roads Project (WRP) in 2010, the only large-scale initiative of its kind in South Africa. Working in partnership with several of South Africa's road agencies, the WRP aims to reduce wildlife fatalities and improve driver safety on regional and national roads, through:

- Undertaking risk assessments (including research projects to inform the identification, quantification and prioritisation of risks);
- Policy and best practice research and development;
- Assisting and guiding the identification, development and implementation of mitigation strategies relevant to the African context;
- Training and capacity building;
- Awareness raising; and,
- Performance assessment.

The WRP works in collaboration with relevant stakeholders throughout the transport industry, in both the public and private sectors. It also uses its existing network of international experts in this area to guide interventions and provide expertise and support. In addition, the programme facilitates the establishment of relevant forums and networks of stakeholders in this area to ensure their effective engagement and involvement in the solutions.

Our work contributes to the EWT's Conservation Strategy, by reducing the harmful impacts of transport

infrastructure (Strategic Imperative 3) and increasing awareness of these impacts among people and decision makers to effect positive changes in behaviour and practice (Strategic Imperative 4). The project aligns closely with four of the Aichi Biodiversity Targets of the Convention on Biological Diversity (CBD), namely, targets 1, 11, 17 and 19; and it also supports articles 6(b), 13(a) and 13(b). We contribute to four of the 17 United Nations Sustainable Development Goals (SDGs): Goal 9 (industry, innovation and infrastructure), Goal 11 (sustainable cities and communities), Goal 15 (life on land) and Goal 17 (partnerships for the goals). On a national level, the WRP supports the National Framework for Sustainable Development Strategic Focus Area 5, by "responding appropriately to emerging human development, economic and environmental challenges."

### DRIVING AWARENESS

Studying the complex relationships between roadways and the natural systems they bisect is the focus of road ecology of which the WRP has been at the forefront in South Africa since



*Photo credit: Wendy Collinson*

2011. The WRP has raised public awareness of its projects through media campaigns and engagement with South African road management agencies. An increase in public awareness of roadkill has led to an increase in the reporting of roadkill incidences contributing to the development of a national database of roadkill occurrences. Data collected by the WRP and the public has enabled the WRP to identify gaps in our current understanding of the impacts of roads and road users on wildlife.

Since the launch of the public awareness campaign in 2013, where members of the public have been encouraged to submit roadkill data from across the country through various reporting platforms, there are now over 16,000 roadkill data points for the country – an increase of almost 7,000 since last year. This has enabled us to identify priority species and habitats most at risk from roads and initiate research projects to investigate possible solutions.

To encourage members of the public to assist with data collection as well as raise awareness of our work, two roadkill

awareness days were held in Pilanesberg National Park. Members of the public were invited to chat to the researchers and find out what is being done to reduce roadkill in the country.

We presented some of our research at two national and three international conferences; the former being the Symposium of Contemporary Conservation Practice in Howick and the Southern African Wildlife Management Association in Tzaneen, and the latter being the ninth biennial International Conference on Ecology & Transportation (ICOET) conference, in Utah, USA, the Infra Eco Network Europe (IENE) in Lyon, France, and the Life Strade International Congress in Perugia, Italy.

There were over 400 delegates represented at ICOET from 24 different countries; we were the sole representatives from the African continent.



Photo credit: Wendy Collinson

## STEERING NEW PROJECTS

The WRP is recognised as leaders in the road ecology field for the continent, and hence collaborate and offer support on a number of national and international projects.

### NATIONAL

#### Protecting the Protected

South Africa's protected areas are the prime custodians of biodiversity, intended for the conservation of biodiversity. The more popular parks receive high volumes of vehicular traffic, which impacts negatively on wildlife through wildlife-vehicle collisions. The WRP initiated its 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 parks.



Photo credit: Wendy Collinson

The past year has seen the use of pre- and post-roadkill-reduction-surveys that examine ways to improve driver vigilance by assessing drivers' responses to various driver-alert-signage, measured through their response to fake animals placed on paved roads in Pilanesberg National Park. Early results suggest that, before signage 50% (n=1,715) of observed drivers were looking at the road, rather than scanning the bush for wildlife. Of this 50%, 40% adapted their behaviour to 'miss' the fake animal. Our prediction is that effective signage will increase driver vigilance. The next stage of the project will commence in the Kruger National Park.

This project is supported by Bridgestone SA, North West Parks Tourism Board, SANParks and Copenhagen Zoo.

#### Why did the Chicken Cross the Road?

A joint project between the University of Limpopo and the WRP is using bird road-mortality data from Limpopo province to better understand the diversity of bird-roadkill and the resulting roadkill hotspots. The outcomes of this research will assist related agencies, such as



Photo credit: Thabang Teffo

Department of Roads and Transport (Limpopo), Roads Agency Limpopo (RAL), the EWT and other conservation bodies, to motivate for a greater understand of the threats posed by roads for bird species as well as guide measures, which will act to reduce the rate of bird-roadkill.

#### Toads on Roads

The WRP is proud of their partnership with Toad NUTS (Noordhoek's Unpaid Toad Savers), a group of volunteers working to save the Endangered



Photo credit: Alison Faraday

Western Leopard Toad from extinction. Every wet, windy, and unpleasant winter night, volunteers from the communities in the Western Cape southern peninsula, South Africa patrol the roads in an effort to prevent the Western Leopard Toad (*Schlerophrys pantherinus*) from being killed as they cross roads in their annual migration to mating ponds. Since 2007, this dedicated group of residents has responded to the threats to the Western

Leopard Toad – primarily migration hazards and man-made changes to their habitat. This year marks the 11th winter breeding migration, which will be monitored by Toad NUTs. A range of initiatives are used in an attempt to reduce road mortality. Signage directed at motorists, awareness and education drives, road patrols using trained volunteers and toad barriers have all contributed towards a significant reduction in toads killed on the roads.

### African Grass Owls and Roads

WRP has partnered with the EWT's Birds of Prey Programme (BOPP) to collaborate on an in-house project to address the threat to the African Grass Owl. The Grass Owl is undergoing significant habitat degradation and fragmentation, particularly in the highveld region of South Africa, primarily as a result of increasing agricultural, mining activity, and road development. Linear infrastructure, in particular power lines and roads, impact birds negatively, although the true impact on the Grass Owl from these two threats is, as yet, unknown in South Africa

Identifying high-risk key areas of where roadkill fatalities will occur for the Grass Owl will assist in prioritising conservation actions for this species. With over 15 years of owl and Grass Owl roadkill data (EWT Road Mortality Database, 2017), high-risk areas can be baselined in South Africa. A further aim of this study is to identify high-risk roadkill mortality areas for the Grass Owl in South Africa and generate sensitivity maps highlighting hotspot areas. These maps will be valuable tools in the future planning of expanding infrastructure with consideration for Grass Owl habitat.

### How to get the Monkey Across the Road

The Samango Monkey Roadkill Mitigation Project began in April 2015 at the Lajuma Research Centre in response to regular road fatalities of Samango Monkeys on a particular stretch of road along the eastern Soutpansberg in northern Limpopo Province. The Samango Monkey is listed as Vulnerable in South Africa and is considered a rare species as it inhabits South Africa's smallest and most fragmented biome, indigenous high canopy forest. The aim of the project is to design and install permanent canopy bridges suited specifically for Samango Monkeys to mitigate road fatalities.

The WRP is proud to be associated with this PhD project (through the University of Venda). Finding a solution to ensuring the safe crossing of the Samango Monkey is almost complete. With the camera trap survey completed and almost a year's worth of behavioural data of Samango Monkeys crossing the specially designed canopy-bridges, guidelines for "primate canopy overpass" are being prepared for conservation and management use.

## INTERNATIONAL

### Roadkill Project in Florida

This international project saw the implementation of a roadkill detection protocol designed by Collinson et al. in 2014 (a collaboration between the EWT, Rhodes University and Tswane University of Technology), which was first trialled in the Greater Mapungubwe Transfrontier Conservation Area, Limpopo. Mark Spicer (a BSc student from the University of Kent, UK) trialled the protocol



*Photo credit: Mark Spicer*  
Southwest Florida. A 100-kilometre stretch of State Road 29 between the State Road 80 junction in the north (26.76163°N -81.43849°W) and US 41 to the south (25.91093°N -81.36445°W).

for a month in Florida, where an assessment of temporal and spatial patterns of summer roadkill were undertaken on a 100 km stretch of road in southwest Florida, USA – the first time that the protocol has been trialled overseas.

Over a 30-day period, nearly 550 bird, mammal and reptile roadkill were recorded, representing 60 species. This particular stretch of road is set to see increased traffic volumes in coming years and is scheduled for widening from two lanes to four. This research will consequently be extremely valuable in alerting the Florida Department of Transport to potential roadkill hotspots to be considered during their road expansion plans.

Mark received a first class for his BSc degree and was also awarded the Gerald Durrell Prize for the best research thesis.

### Ethiopian Highways

A collaboration between the WRP and the Ethiopian Biodiversity Institute (Mekelle Biodiversity Center, Ethiopia) is undertaking an assessment of roadkill rates for all wild vertebrates in the region of the Ethio-Djibouti highway. This highway passes through five spatially isolated protected areas in eastern Ethiopia and is home to several species of conservation significance, such as the Endangered Grévy's Zebra (*Equus grevyi*), Near Threatened Striped Hyena (*Hyaena hyaena*) and the East African Oryx (*Oryx beisa*). Outcomes of this research are expected in 2018.



*Photo Credit:*  
Getachew Mulalem

### Long-term Monitoring of Roadkill In Northern Tanzania

An additional collaboration is with the School for Field Studies in Tanzania, in the Tarangire Ecosystem of Northern Tanzania. Students have been looking at patterns of roadkill and elephant crossing on the major highways in Northern Tanzania. The study found a host of animals killed representing most of the large animal taxa. The work is priceless in better understanding the impacts of roads on wildlife in East Africa, and is one of the few long-term monitoring programmes going on.



## IENE 2018 International Conference

### Crossing borders for a greener and sustainable transport infrastructure

September 11-14, 2018 | Evoluon | Eindhoven, Netherlands

### CALL FOR ABSTRACTS

IENE invites professionals and students to submit abstracts for oral presentations, poster presentations, and workshops at its 2018 conference, which will take place in the Netherlands.

IENE 2018 will address the following topics:

- Crossing borders in policy and regulations for greener transport infrastructure
- Crossing borders in strategic planning for greener transport infrastructure
- Crossing borders in impact assessments for greener transport infrastructure
- Crossing borders in constructing greener transport infrastructure
- Crossing borders in maintenance and management of greener transport infrastructure
- Crossing borders in evaluating the performance of greener transport infrastructure
- Crossing borders in education and knowledge exchange for greener transport infrastructure
- New directions in transportation ecology



### The submission period is open now through January 15, 2018

For full details on abstract submission, please [download here](#) the Guidelines for Abstract Submission or find enclosed the pdf attachment. For submission of your abstract, [navigate](#) to the Abstract Submission Tool on the conference website.

Join the event and share your experiences, best practices and research that reflect the need for crossing borders for greener transport infrastructure.

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