



Committee on Ecology and Transportation Newsletter

Transportation Research Board Committee ADC30

August 2018



The Chair's Message

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

SPOTLIGHT ON FLORIDA

This newsletter comes about a month in advance of our mid-year gathering this September 19-21, in Orlando, Florida. To prepare everyone planning to attend I'm taking this opportunity to provide a little background on past and current practices of road ecology in the State of Florida.

The Emerging Practice of Road Ecology in Florida

Though there are a few examples of isolated efforts predating it, the planning, design and construction of I-75 "Alligator Alley" across The Everglades and Big Cypress in the late 1980s was the first large-scale effort to address the ecological impacts (e.g., habitat fragmentation, barriers to wildlife movement/migration, impaired ecological flows and processes) of roads in Florida. The intent of the project was to improve mobility of goods and services between the east and west coasts and to offer an alternative high-speed emergency evacuation route from southern Florida. To minimize impacts to the ecological integrity of Everglades National Park and Big Cypress National Preserve, home to the Florida panther and numerous other species, 36 wildlife crossings and another 30 flow-way bridges were constructed along a 75 mi stretch.

Today there are over 100 wildlife crossing structures of various sizes and designs in place across the state. At least 90 more are included in future road improvement plans. Most of these existing and future crossings are located at critical interfaces with the Florida Ecological Greenways Network, a system of core conservation areas and connecting linkages designed to preserve Florida's diverse ecosystems, native fauna and flora, and provide for adaptation to climate change across three distinct climactic zones. Since 1990, approximately 2.5 million acres of conservation lands have been added to the system that now totals over 10 million acres. Despite these

laudable accomplishments, significant gaps in the ecological network remain unprotected and many roadways still jeopardize the integrity of the system. The State now boasts the third highest population behind only California and Texas so the pressure to convert open areas to urban/suburban uses is ever increasing. As such, many challenges remain in establishing an ecologically sustainable transportation network.

Local Origins of ICOET and ADC30

Of historical note, much of the beginnings of ICOET and ADC30 can be traced back to June of 1996 when Gary Evink (FDOT), Paul Garrett (FHWA), and others hosted the first organized symposium in Orlando entitled "The Transportation-related Wildlife Mortality Seminar." It included 27 presentations from 13 different states and provinces in the US and Canada. It was a modest start with only about 60-70 attendees, but it generated enough interest and synergy to spawn a 2nd and 3rd meeting in 1998 and 1999 in Florida and Montana, respectively. These latter meetings were entitled "The International Conference on Wildlife Ecology and Transportation". A group of participants from these first 3 meetings were key players in developing what we now recognize as ICOET with several hundred people from around the world attending biennially. Another outgrowth conceived by many of these same individuals was the original TRB Task Force on Ecology and Transportation, the precursor to ADC30. It's with the founding spirit of these evolving and influential organizations that I enthusiastically invite you once again to Florida to attend this year's mid-year meeting to expand our minds, generate new ideas and re-energize our efforts to tackle the new challenges ahead.

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Networking Opportunities at the Joint Meeting with ADC10 and the Florida Association of Environmental Professionals

This year's meeting has four parallel tracks to choose from: 1) assessment and remediation, 2) natural resources, 3) NEPA, regulations and policy, and 4) environmental consulting practice. In addition, three field trips are offered—NASA and the Spaceport, Econ River Kayaking, and the Sea World VIP tour. The FAEP annual conference is typically attended by more than 300 environmental and transportation

professionals. This is a great opportunity to network with your colleagues, learn about projects and practices in the southeast region, and explore central Florida. The program is posted and online registration available at <https://www.cfaep.org/faep-conference>.

Lastly, I remind everyone to check our website www.ecologyandtransportation.weebly.com for periodic updates and announcements. On behalf of TRB, many thanks to those that submitted articles and to the steadfast members and friends of the Committee for their valued service.

Seasonal Deer Advisories on Changeable Message Signs Appear to be an Effective Form of Mitigation

Submitted by: Bridget M. Donaldson, Associate Principal Research Scientist, Virginia Transportation Research Council/VDOT

The effectiveness of deer advisory messages on Changeable Message Signs (CMSs) with regard to deer-vehicle collision (DVC) reduction is largely unknown. While one study found a 50% reduction in DVCs when temporary enhanced animal crossing signs were posted during mule deer migration periods, research has typically focused on driver speed differences in response to animal advisories rather than DVC reductions. Several studies have shown a reduction in driver speed in response to the animal advisories.

Using deer carcass removal (CR) records, the Virginia Transportation Research Council recently investigated the effectiveness of seasonal deer advisory messages as a DVC mitigation option for the Virginia Department of Transportation. Vehicle speed evaluations were also conducted to determine whether drivers reduced speed in response to the advisories.

Deer advisories were posted on 5 CMSs stationed within a 17-mile segment of a major interstate (I-64) in 2015. The advisories were posted from 5 P.M. to 9 A.M. in October through November, and were scheduled to be posted every two days rather than daily to minimize driver habituation (Figure 1).

Researchers found that DVCs were 51% lower when the deer advisories were posted than when they were not posted, and this difference was statistically significant. No significant differences in DVCs were found along a control segment with no deer advisories.

There were also statistically significant reductions in speeds of up to 2.8 MPH during the advisories. Speed reductions were greater when the advisories were posted during lower traffic volumes.

Given the findings in the study area, seasonal deer advisory messages on an interstate appear to be an effective form of DVC mitigation. They may be a cost effective option in areas where habitat connectivity measures (such as wildlife

crossings with fencing) are unfeasible. Posting seasonal deer advisories every other day on the five existing CMSs in this study's project area is expected to save approximately \$595,500 to \$1.2 million over the service life of the CMSs.

Additional information will be included in the VTRC research report, which will be available on vtrc.virginia.gov by the end of this year.



Figure 1. Text of the deer advisories (each sign alternates between 2 frames of text).

Monarch Butterfly Candidate Conservation Agreement with Assurances (CCAA) for Transportation and Energy Rights-of-Way (ROW)

Submitted by: Kris Gade, Roadside Resources Specialist, Arizona DOT, kgade@azdot.gov

With reports of declining pollinator populations in recent years, enhancement of resources to support pollinating insects has been widely embraced. Organizations that manage rights-of ways (ROW) face challenges to implementation of pollinator habitat programs on the lands they own or manage. These include (1) additional cost and effort to manage for habitat, (2) lack of training or expertise on beneficial practices for pollinators, (3) concern over landowner cooperation on adjacent or easement lands, and (4) regulatory uncertainty surrounding potential endangered species listings and the impacts these would have on maintenance and management practices and overall business operations.

In August 2014 the U.S. Fish & Wildlife Service (the Service) was petitioned to list the monarch butterfly under the Endangered Species Act. The Service is expected to make a listing determination by June 2019. In the meantime, concerted conservation efforts to protect the monarch butterfly—including developing conservation plans and demonstrating commitments to habitat creation, enhancement, and protection—are informing the Service's species status assessment (SSA) and helping to address the widespread declines in other pollinator populations.

Organizations in the transportation and energy sectors are partnering through the Rights-of-Way as Habitat Working Group (Working Group) to develop a voluntary agreement outlining conservation actions that will benefit the monarch butterfly and serve as a model for other pollinators as well. The agreement, known as a Candidate Conservation Agreement with Assurances (CCAA), is a regulatory mechanism that encourages non-federal landowners and managers to adopt measures that create net conservation benefits to the species prior to listing. In turn, landowners and managers are provided assurances (in the form of a permit) that no additional requirements beyond the activities identified in the CCAA will be mandated if the monarch butterfly is listed.

In January 2018, the University of Illinois-Chicago (UIC), which leads the Working Group, created a joint fund to pool resources from the Working Group and support the development of a collaborative CCAA prior to the Service's listing decision. To date 26 organizations have formally joined the CCAA effort.

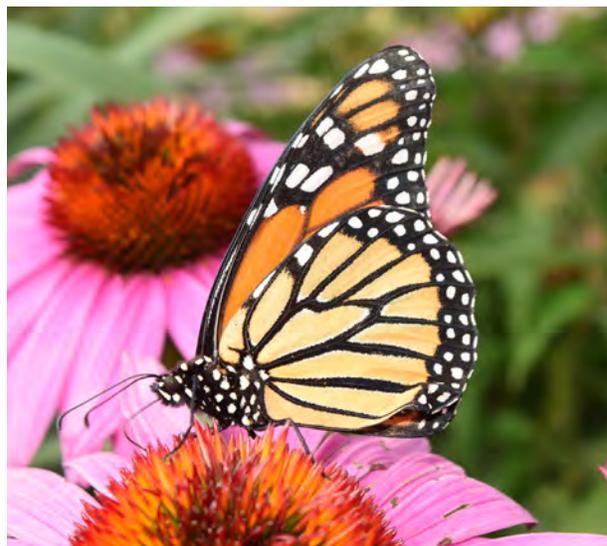


Figure 1: Monarch butterfly. Photo courtesy of Christopher Smith, Minnesota DOT.



Figure 4: Monarch butterfly caterpillar on common milkweed (*Asclepias syriaca*). Photo courtesy of Christopher Smith, Minnesota DOT.



Figure 3: A map showing the states where CCAA partners are located

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Figure 4: Common Milkweed along a Minnesota roadside, Photo courtesy of Christopher Smith, Minnesota DOT.



Figure 5: Sullivant's Milkweed (*Asclepias sullivantii*) growing on a Minnesota roadside. Photo courtesy of Christopher Smith, Minnesota DOT.



Figure 6: Roadside habitat with nectar resources supports monarch butterflies and other pollinators. Photo by Luis Colon, courtesy of Arizona DOT.

The CCAA demonstrates the significant interest and investment in habitat conservation by the transportation and energy sectors across the United States. In doing so, the effort builds upon several existing initiatives, including the Mid-America Monarch Conservation Strategy developed under the leadership of the Midwest Association of Fish and Wildlife Agencies (MAFWA). MAFWA's strategy identifies monarch habitat conservation actions across core geographies and multiple landscape types, including ROW.

The CCAA represents an unprecedented opportunity in terms of scale and scope for collaborative conservation. The 26 initial partner organizations collectively manage more than 1.8 million acres of ROW and other land. This presents valuable opportunities to connect available habitats, provide more diverse breeding and feeding habitat compared to surrounding landscapes (e.g., intensively-managed agricultural lands), and offer areas that are generally safe from major disturbances or future development.

The partner organizations are working with UIC, the Service, and Cardno to develop the draft CCAA and associated NEPA and ESA Section 7 documents. With partners from across the country and a wide range of ecosystems involved, the team is working to develop an agreement that will be broadly applicable across the lower 48 states to encourage wide participation.

Once the CCAA is finalized, landowners and managers can apply for coverage up until the effective listing date for the monarch butterfly, regardless of their prior involvement in the project or on the Advisory Team. If the Service determines that the monarch butterfly listing is warranted in June 2019, the effective listing date is anticipated by July 2020. If the determination is made not to list the monarch butterfly in June 2019, the CCAA application period will remain open as long as the species is not listed.

If your organization is interested learn more about participating in the development of the documents and providing input on the requirements of the CCAA, please contact Kris Gade at kgade@azdot.gov or Chris Smith at christopher.e.smith@state.mn.us (co-chairs of the DOT Sector Team) or Iris Caldwell at iriscald@uic.edu (lead at UIC).



Figure 7: ROWs connect habitat graphic

Population Trends for an Urban Wildlife Tunnel in Concord, Massachusetts

Submitted by: P. Chase Bernier, CWB, Project Manager/ Wildlife Biologist, BSC Group, Inc.; Jessica Kenny, Director of Environmental Compliance for Construction, Massachusetts Department of Transportation-Highway Division; and Tim Dexter, Fish and Wildlife Program Coordinator, Massachusetts Department of Transportation-Highway Division.

Introduction

In 2015, the Massachusetts Department of Transportation (MassDOT) completed their fifth wildlife tunnel beneath Route 2 in Concord, Massachusetts. Construction of the tunnel was completed as part of MassDOT's commitment to increasing the safe passage of wildlife across transportation corridors to reduce vehicular strikes and maintain habitat connectivity. Monitoring of wildlife populations utilizing the tunnel began in 2016. Having completed two full consecutive years of monitoring, distinct wildlife population trends have been observed.

Study Area

The tunnel was constructed beneath Route 2 east of Sandy Pond Road. Route 2 is a heavily-travelled urban highway with a 2010 Average Daily Traffic (ADT) rate of 48,000 and an ADT of 59,500 by 2030. Valuable wildlife habitats occur north and south of Route 2 and construction of the tunnel provides contiguous access to those areas.

Habitats to the north and south consist of residential housing, constructed stormwater management basins, successional upland forest, and a wetland mosaic with an associated perennial stream. The adjacent forest is comprised of a combination of deciduous and coniferous species. Wetlands associated Mill Brook, a perennial watercourse, are located to the south of the tunnel.

The study area was limited to the data collected from track beds, camera traps, and snow tracking within and in the immediate vicinity of the tunnel. The tunnel consists of a natural substrate to a depth of approximately 1-foot with the walls and ceiling constructed of concrete. The tunnel is 8-feet wide by 5-feet tall with a length of 130-feet.

Methods

Three track beds were installed at the tunnel. Track beds were monitored twice weekly for a period of 8 weeks in the spring. Each track path captured was photographed, identified to species whenever possible or to similar group (e.g., bird, canine, etc.), and the direction and location noted.

Each track path was given a degree of certainty ranging from 1 (uncertain) to 4 (very certain).

Camera traps were installed at each track bed. In 2017, additional camera traps were installed at each end of the tunnel to better capture wildlife attempts at crossing in addition to individuals who passed the tunnel. Cameras were deployed from March to October. Captured images were organized by individual crossing including date and direction of travel.

Evaluation of population trends focused on the diversity of wildlife species groupings observed at the tunnel in addition to the number of individuals that utilized the tunnel and adjacent habitats. Total number of track paths and individuals captured on camera traps were compared between survey years and species assemblages. Species were categorized into individual classifications including reptiles/amphibians, birds, small mammal herbivores (SMHs), other small mammals (OSMs), large mammals, and predators.

Results

In 2016, 21 species were identified including two reptile/amphibians, two birds, seven SMHs, two OSMs, two large mammals, and six predators (see Figure 1). A total of 37 species were identified in 2017 consisting of 12 birds, nine SMHs, two OSMs, two large mammals, and nine predators. There was a total of 901 individuals recorded in 2016 and 1,098 in 2017, a 1.9% decrease in individuals. Figure 1 depicts the frequency of each group during both years.

In both years, predators were most common and experienced a 117 percent increase in frequency from 2016 (n=303) to 2017 (n=657). SMHs closely followed predators with 256 in 2016 but decreased by 9 percent to 234 in 2017. Reptiles/amphibians and large mammals had similar occurrences in 2016 (n=192 and n=106, respectively). However, reptiles/amphibians experienced a dramatic 98 percent decrease 2017 (n=3) while large mammals experienced an 8 percent decrease (n=98). Both birds and OSMs showed an increase in occurrence. Birds experienced a 204 percent increase (n=70) while OSMs experienced a 71 percent increase (n=36).

In regard to diversity, from 2016 to 2017, only reptiles/amphibians experienced a decline (100 percent). OSMs and large mammal diversity remained constant (n=2). Birds experienced the greatest increase in diversity with a 600 percent increase from 2016 (n=2) to 2017. SMHs increased from seven species to nine (29 percent) and predators experienced a 50 percent from 2016 (n=6).

POPULATION continued from page 5

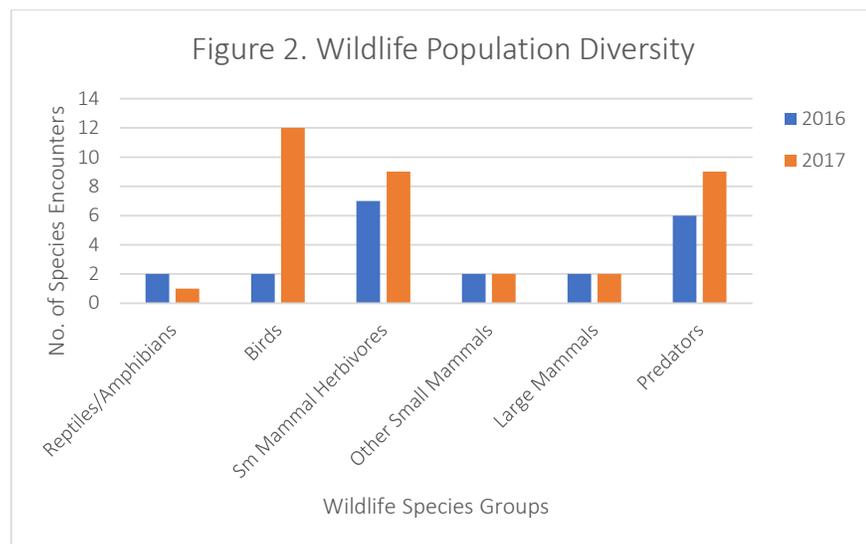
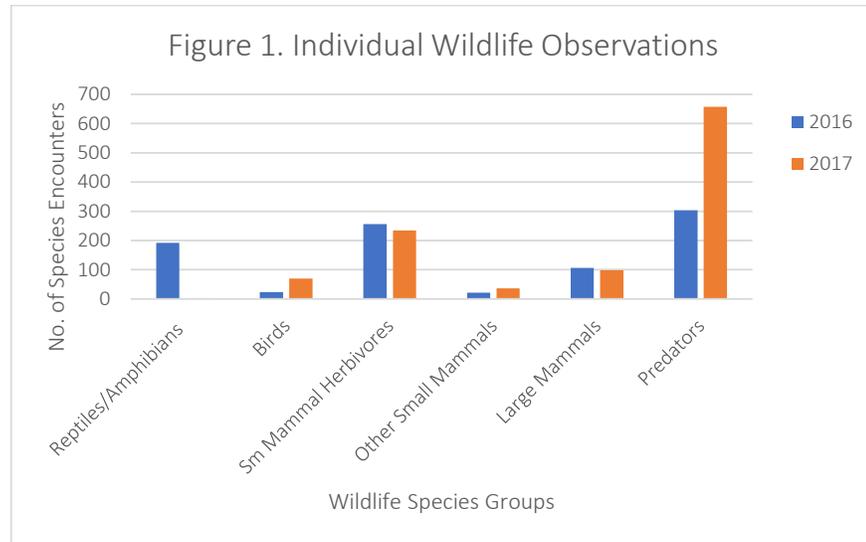
Discussion

Distinct changes in wildlife populations utilizing the tunnel and adjacent habitats over time are observable. Most notably, changes in the occurrences of reptiles/amphibians, SMHs, and predators as well as the increase in avian occurrence and diversity.

2016 was the second year of a severe drought resulting in unusually low water levels in regional aquatic systems. A mass migration of eastern painted turtles (*Chrysemys picta*) was recorded across the region resulting in atypical occurrences at the tunnel. In 2017, few turtles have been encountered.

SMHs experienced a 9 percent decrease from 2016. The cause is hypothesized to be the increase in predator populations (50 percent). Frequently, predators such as red fox (*Vulpes vulpes*) would be observed with SMH prey in their mouths. Predator diversity also included species that were surprising to find in such an urban setting including long-tailed weasel (*Mustela frenata*), river otter (*Lontra canadensis*), and bobcat (*Lynx rufus*). Further evidence of the importance the tunnel plays in linking habitats of high wildlife value. The increase in predator occurrence and decrease in SMHs following the first year of tunnel operation is in line with previous wildlife utilization studies for other tunnels along Route 2 in Concord.

The increase in avian occurrence and biodiversity at the tunnel is hypothesized to be resultant from maturing and maintained meadow habitat at either tunnel entrance. The tall grass of mature meadow promotes increased populations of insects which in turn results in greater populations of species that prey on those insects (i.e., birds). On multiple occasions, different avian species have been observed foraging on insects found on the surface of track beds and in the adjacent habitat.



Recommendations

Understanding wildlife populations utilizing the tunnel and adjacent habitats is critical. As wildlife populations change over time, potential management strategies and future improvements may also change. The increase in species diversity from 2016 to 2017 indicates positive growth as the adjacent habitats mature despite fewer individual occurrences throughout the study period. Further studies investigating wildlife utilization of the tunnel would provide additional valuable information on populations trends. Additional data yielded from camera traps at the entrances of the tunnel capturing wildlife attempts and passes will be useful in understanding what species are avoiding the tunnel and/or attempting to use the tunnel, but fail to successfully pass.

Endangered Wildlife Trust wins prestigious 'Science Oscar'

Submitted by: Wendy Collinson-Jonker, Wildlife and Roads Project, Endangered Wildlife Trust, wendyc@ewt.org.za

The Endangered Wildlife Trust (EWT), champion of conservation in Africa, is extremely proud to announce that team member, Wendy Collinson, was the recipient of the TW Kambule-NSTF Award: Emerging Researcher at last night's National Science and Technology (NSTF) awards.



The NSTF-South32 Awards gala dinner took place in Gauteng on 28 June 2018, to celebrate the most outstanding contributions to science, engineering and technology (SET), and innovation. This is the 20th anniversary celebration of the awards, which are the largest SET and innovation awards in South Africa, and were the first of their kind in the country. They are known as the 'Science Oscars' and this year were presented by the Honourable Minister of Science and Technology, Ms Mmamoloko Kubayi-Ngubane, who is the event's patron.

Wendy scooped the prestigious award for her work in establishing and running the EWT's Wildlife and Roads Project, which aims to reduce the negative impacts of transport infrastructure on wildlife, and ultimately improve driver safety through a reduction in wildlife-vehicle-collisions (WVCs). Wendy is overseeing numerous research projects that examine the impacts of roads in South Africa, in order to develop solutions to reduce roadkill. Most of her projects involve collaborations with stakeholders in the transport sector, as well as academia, regarding the design of future developments. This body of knowledge is inform-

ing the development and planning decisions around future road design, which will lessen the impact of roads on South African fauna and flora. "It is an honour to be nominated, it is an outstanding achievement to reach the finals, and an exceptional milestone and celebration of excellence to win one of these awards", said Wendy.

The EWT was also recognised as a finalist in the NSTF-GreenMatter Award category, for its outstanding contribution to the Groen Sebenza Initiative, an innovative project aimed at developing skills and bridging the gap between education and job opportunities in the biodiversity sector which was initiated by the Department of Environmental Affairs in 2013.

With numerous research projects across the African continent, the EWT strives to undertake high-quality scientific studies and frequently publishes scientific papers in international peer-reviewed journals. "Through our partnerships with academic institutions, we ensure that our scientific understanding is innovative and contributes towards finding solutions to some of the challenges we face in conservation. Through initiatives like Groen Sebenza, we safeguard our conservation champions of the future and provide opportunities to expand their knowledge, and learn from the best", concluded Wendy.

The core supporters of the EWT's Wildlife and Roads Project are Bridgestone SA, Bakwena Platinum Corridor Concessionaire, De Beers Group of Companies, Ford Wildlife Foundation, N3 Toll Concession, GreenMatter, and TRAC N4, dedicated to minimising the negative interactions between wildlife and transport infrastructure.

About the Endangered Wildlife Trust

The Endangered Wildlife Trust (EWT), champion of conservation in Africa, has worked tirelessly for over 45 years to save wildlife and habitats, with our vision being a world in which both humans and wildlife prosper in harmony with nature. From the smallest frog, to the majestic rhino; from sweeping grasslands to arid drylands; from our shorelines to winding rivers: the EWT is working with you, to protect our world.

The EWT's team of field-based specialists is spread across southern and East Africa, where committed conservation action is needed the most. Working with our partners, including businesses and governments, the EWT is at the forefront of conducting applied research, supporting community conservation and livelihoods, training and building capacity, addressing human wildlife conflict, monitoring threatened species and establishing safe spaces for wildlife range expansion.

A beacon of hope for Africa's wildlife, landscapes and communities, the EWT is protecting forever, together. Find out more at www.ewt.org.za.

NCHRP 25-25, Task 102:

Artificial Bat Roost Mitigation Designs and Standardized Monitoring Criteria

Submitted by: Edward Samanns, ADC 30 Committee Member, Senior Program Manager, Natural Resource Management, Louis Berger US, Inc., ESamanns@louisberger.com

Transportation structures, including bridges, culverts, and some retaining walls, are an important resource for roosting habitat as bats face increasing pressure from habitat loss, wildfire, and the spread of White-Nose Syndrome (WNS). Two bat species that are known to roost in these types of structures, the Indiana bat (*Myotis sodalis*) and the northern long-eared bat (*M. septentrionalis*), are listed as federally endangered and federally threatened, respectively, under the Endangered Species Act (ESA). Such listing requires consultation with the U.S. Fish and Wildlife Service (USFWS) on the means to avoid and mitigate potential impacts. One means of mitigating disturbance to bats roosting in transportation structures is artificial roosts. Both onsite (mounted to or installed within a structure) and offsite (stand-alone bat houses) roost types have been developed and implemented, with varying success. However, a thorough analysis of bat roost mitigation success and of transportation structures and site-specific environmental factors that influence success has not been performed. A research study of existing artificial bat roost designs, performance, and factors that influence performance will help transportation practitioners to define the most appropriate designs for a project site, proper roost siting, long-term maintenance, and criteria for monitoring success, ultimately serving to inform and streamline mitigation decisions by both transportation professionals and regulatory staff.

The main objectives of this research include gathering sufficient information on both proven effective offsite and onsite artificial bat roost structure designs, as well as related information on long-term maintenance needs, monitoring requirements, performance standards and success criteria, roost siting and microhabitat concerns, construction and maintenance costs, and other factors that will guide mitigation decisions.

Ultimately, a best design practices manual will be prepared to efficiently convey information assisting transportation professionals and regulatory staff in determining appropriate bat roost mitigation measures, especially as concerns with ESA compliance continue to grow in light of the effects of habitat loss, wildfire, and WNS on bat populations. The manual will be robust enough to proactively assist west-



*Figure 1: A biologist checks a bridge in Oklahoma for bats
©Environmental Solutions & Innovations*



*Figure 2: Bats in a freestanding bat box
©Environmental Solutions & Innovations*

ern state DOTs and their partners when these states experience dramatic reductions in bat populations anticipated with arrival of WNS.

To-date, a comprehensive literature review and an on-line stakeholder survey questionnaire have been conducted by the project team. The on-line questionnaire generated forty-one responses representing 33 states. Most Departments of Transportation (DOTs) attempt to identify those bridges and culverts used by bats and this is often incorporated into

■ ARTIFICIAL BAT ROOST continued from page 8

structural inspections. The vast majority of bats observed are found in bridge structures. When bats are detected, DOTs typically take steps to avoid or reduce impacts to the bats, although this process is far less formal in areas where bats are not protected by state or federal laws. Efforts are underway to develop a master dataset based on data obtained through both the literature and the survey effort that can be used to evaluate the effectiveness of bridges, culverts, and stand-alone artificial roosts. A technical report summarizing these data and the results of the analysis is underway and is due for completion in Mid-May of 2019.

The principle investigator for the research is Dale Sparks, PhD. from Environmental Solutions & Innovations, Inc. (ESI) and supported by ESI scientists Kory Armstrong and Patrick Moore. Ms. Robin Maycock from Louis Berger US, Inc. (Louis Berger) is managing the overall research project.



Figure 3: Big brown bats under a bridge in Kentucky
©Environmental Solutions & Innovations



Figure 4: Free-standing bat box at a mitigation site
©Environmental Solutions & Innovations



SEPTEMBER 9-12, 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.

[Review the schedule details](#), including poster abstracts.

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

- [View registration pricing and options](#)
- [Register online](#)

Conference participants are eligible to receive a discounted group rate of \$139/night at [Hotel UMass](#). Call the hotel at 877-822-2110 and reference the group code NTW18C. Deadline to make lodging reservations is August 17, 2018.

This conference brings together a diverse and unique mix of planners, engineers, natural resource specialists, and technical experts in transportation, wildlife, ecology, hydraulics and hydrology, as well as regulators and policy makers from state and provincial governments in the Northeastern U.S. and southern Canada.

Northeastern Transportation and Wildlife Conference
www.netwc.org

NCHRP 25-25, Task 113

Highway Passages for Small Terrestrial Wildlife - Summary And Repository Of Design Examples

Submitted by: Edward Samanns, ADC 30 Committee Member, Senior Program Manager, Natural Resource Management, Louis Berger US, Inc., ESamanns@louisberger.com

The National Cooperative Highway Research Program (NCHRP) has initiated this project to create a repository of existing information on how to reduce the impacts of roads on small animal species, including terrestrial mammals smaller than a coyote, amphibians, and reptiles. The research team is led by Dr. Marcel Huijser of the Western Transportation Institute (WTI) and Kari Gunson of Eco-Kare International (EKI). Ms. Laura Totten from Louis Berger US, Inc. (Louis Berger) is managing the overall research project.

The most successful mitigation for larger animals has been the inclusion of wildlife crossing structures with exclusion fencing as part of the road infrastructure. This has also been the case for smaller animals, however there are numerous considerations in design and planning that are often overlooked. This project will explore the design detail of successful mitigation projects for smaller animals and the potential to 'retro-fit' existing infrastructure to improve habitat connectivity and reduce small animal-vehicle-collisions.

The state of knowledge and practice will be assessed with a literature review as well as an on-line survey sent out to practitioners who work with wildlife fencing and associated mitigation measures for small animals in the United States and Canada. The survey will be available through Survey Monkey by the end of August and an email announcement with a link to the survey will be sent out on multiple platforms. If you have knowledge to share or know someone with knowledge on this topic we encourage you to fill out the survey and share the information with your colleagues. Alternatively, you may contact the research lead: Dr. Marcel Huijser at mhuijser@montana.edu to provide information. The team is compiling materials such as photos, drawings, and reports for compilation into a user friendly searchable repository that will be available approximately October 2019.



Figure 1: Snapping Turtle using a reptile tunnel (twinned concrete box culverts 3.4 m wide x 2.4 m high x 16 m long) in Ontario, Canada. Photo copyright: Kari E. Gunson



Figure 2: Open-grate box culvert built for Massasauga Rattlesnakes (Sistrurus catenatus) in Ontario, Canada. Photo copyright: Kari E. Gunson

IENE 2018 International Conference

Crossing borders for a greener and sustainable transport infrastructure

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

The Organisation Committee is excited to announce that the registration for the IENE 2018 conference is open. We are happy to welcome you at the iconic Evluon building in Eindhoven, September 11-14. In this conference venue an interactive and lively five-day program is being offered to you. Poster and parallel sessions are being alternated by inspiring lightning talks and workshops with plenty of time for one-on-one interactions between presenters and audience.



We look forward to seeing you at IENE 2018! www.iene2018.info

TRB "SNAP SEARCH" SERIES:

Environmental Process and Natural Resources

TRB has released two new Snap Searches exploring the **environmental process** and **natural resources**. A Snap Search provides a summary of TRB research reports that are underway and published, upcoming events, and ongoing committees that cover these specific topics. Produced by TRB's Library, Snap Searches are designed for the busy researcher or professional who would like to quickly get up to speed on complex research topics.

Also take note that the Transportation Environmental Research Ideas database has new ideas that were submitted for the 2018 Research Cycle. This cycle is now closed. If you wish to review the most current set of ideas you can review them at the link below. For the most current round of reviews, ideas were received through June 8, 2018. Feel free to search the database to see the current proposals submitted.

Transportation and Environmental Research Ideas: research proposals were accepted through June 8, 2018 for the **Transportation and Environmental Research Ideas (TERI) Database**; 26 submittals were received and are being reviewed by the subcommittees. TERI is a central storehouse for tracking and sharing new transportation and environmental research ideas.

If any of you have ideas on research or questions on the procedures to prepare ideas please reach out to me at todd.williams@mbakerintl.com or Kris Gade at kgade@azdot.gov.

The National Academies of
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TRANSPORTATION RESEARCH BOARD



SAVE THE DATE

March 10-15, 2019
Skukuza Rest Camp
Kruger National Park
South Africa

The inaugural African Conference for Linear Infrastructure and Ecology (ACLIE) will co-hosted by the Endangered Wildlife Trust and Eskom.

Centered around the theme Building Partnerships: the linear way, the conference will focus on the intersection of people and linear infrastructure, specifically how both people and nature are connected along, across and between different types of infrastructure.

Linear infrastructure (which includes roads, railways, pipelines, fencing and powerlines) has numerous, diverse, and mostly negative consequences for biodiversity by, among other things, destroying and degrading, fragmenting ecological connectivity and wildlife populations and their dynamics, direct impacts through collisions and secondary impacts through increased access to previously unattainable natural resources.

This first of its kind conference seeks to move away from a siloed approach, and bring various modes of linear infrastructure together, namely: Roads and Rail, Energy, Canals, Pipelines and Fences.

Experts in transportation development, related scientific study, policy issues, and administrative processes are encouraged to attend ACLIE to share current research, quality applications, and best practices that can enhance both the project development process and the ecological sustainability of all linear infrastructure modes.

Registration opens soon. Visit the conference website: <https://www.eiseverywhere.com/ehome/321729/>

A range of sponsorship packages are available – please contact Wendy Collinson if you would like more details: wendyc@ewt.org.za

Photovoltaics + Pollinators

Submitted by: Anna Cullen, Director of External Relations, The Ray, anna@theray.org

The transportation sector contributes an outsized portion of global carbon pollution and our human transportation needs disrupt the preexisting ecosystem. Technology is rapidly changing our infrastructure landscape, and while that poses its own set of unique challenges, it also opens the door to new opportunities to mitigate some of the historical negative impacts. Tackling these types of challenges and opportunities is at the heart of The Ray.

The Ray is a nonprofit foundation that works to advance technology, innovation and best practices which will enable safer transportation and smarter, more efficient infrastructure to produce more value and better outcomes for our communities, our economy, and the environment. The Ray is also a physical place – an 18-mile stretch of Interstate 85 in Georgia. Through a strong partnership with the Georgia Department of Transportation (Georgia DOT), we have established the corridor as a living laboratory for demonstrating, testing, and raising the public’s awareness of technologies and innovations that exist today and that can transform transportation infrastructure.

The Ray was founded in 2014 in honor of green industrialist and Interface founder and CEO, Ray Anderson. After he passed away in 2011, the Georgia state legislature and Governor Deal approved the memorial highway designation on I-85 between Ray’s hometown of West Point and LaGrange, where he founded Interface. Very quickly, Ray’s youngest daughter, Harriet Anderson Langford, realized that she had helped put her father’s name - the pioneer of corporate sustainability and the greenest industrialist of the 20th century - on a “dirty highway.” Thus, The Ray was born.

The Ray’s ambitious mission is a zero death, zero carbon and zero waste highway. In pursuit of this goal, The Ray scours the world to find emerging transportation and infrastructure technologies and innovations to demonstrate on



Figure 1: Pollinator meadow



Figure 2: Solar array



Figure 3: Solar array

The Ray, where they can be tested in real-world scenarios and socialized with the millions of travelers who ride The Ray.

We have piloted the United States’ first solar road, a first-in-the-world tire safety station, and a free solar-powered electric vehicle charger that will give your EV a full charge in under 30 minutes.

Those innovations are all exciting, but one of the things The Ray is most excited about is pollinator meadows. These pollinator meadows are a beautiful alternative to the turfgrass that drivers are accustomed to seeing on our roadways. Turfgrass is expensive to maintain and requires a great deal of costly mowing. Additionally, turfgrass has shallow roots that do a poor job of securing and nurturing the degraded soil on the rights-of-way.

Instead, choosing native flowering plants and native grasses for our roadsides benefits all stakeholders: the Georgia DOT, our neighboring farmers, drivers, and the at-risk pollinator species that are responsible for pollinating 70 of the 100 crop species that feed 90 percent of the world.

On The Ray, you can see our beautiful highway pollinator meadows in several places. In 2016, Kia Motors Manufacturing Georgia employees partnered with The Ray and the Chattahoochee Nature Center to plant a pollinator meadow at the Georgia Visitor Information Center off Exit

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1. This was the first pollinator meadow planted on Georgia DOT land. In 2018, Troup County High School Junior ROTC students started another garden on the backslope of Exit 14.

By the end of October, The Ray and Georgia Power will complete the installation of a one-megawatt solar farm in the right-of-way of The Ray, and it will be a first for the southeast and the third in the nation. What will set this project apart from those preceding it is the use of low-growing native flowering plants and native grasses as the groundcover management strategy.

The Ray's seed mix includes several species of verbena and phlox, partridge pea, clover and others, and was specified through a partnership with the Chattahoochee Nature Center, Fresh Energy, University of Georgia, and Georgia DOT. These pollinator-friendly plants will not grow beyond a two-foot maximum height identified by Georgia Power to prevent shading over the solar panel.

By choosing pollinator-friendly plants, The Ray and Georgia Power have unlocked new benefits for the solar farm. First, these plants are low-maintenance. Unlike turfgrass that requires regular mowing, pollinator meadows are mowed once annually. In addition to the lower cost for a maintenance team and equipment (not to mention the fuel used to power the machinery), risk of panel damage is reduced. Operating heavy machinery in and around rows of solar panels is almost guaranteed to cause some damage to the panels. By reducing the number of times the vegetation needs to be mowed, it reduces the risk of damage to the solar infrastructure. Moreover, research has demonstrated that groundcover plants in a solar farm can have a cooling impact on the panels, increasing their power-generation potential.

The native plants and grasses selected for this project also have a deeper, more complex root structure than turfgrass. Consequently, they are better able to prevent erosion and actually renourish and hold moisture in the soil. This becomes especially important in a high-speed interstate location that must efficiently deal with storm-water runoff.

For those focused on growing the population of pollinating spe-

cies, the most important benefit is simply securing the land for pollinator habitat for 35 years, the length of the land lease agreement between Georgia DOT and Georgia Power.

We believe that solar production and transportation corridors are natural partners and we want all states to take advantage of the opportunities of right-of-way solar. In partnership with the Webber Energy Group at the University of Texas, Austin (UT), we will analyze the grassy shoulders of all U.S. interstates, mile by mile, for solar energy generation potential. Through an interactive web-based tool and report, each state will have access to individualized solar energy generation projections for their rights-of-way.

While it is not part of the study, it is not difficult to draw a connection between the results of our study and potential locations for acres of pollinator habitats. Each state's environment and soil conditions are different, but if The Ray's model of pollinator-friendly right-of-way solar is adopted across the country, those acres of land could have a positive impact on the bees, butterflies, and birds that are a crucial component of their ecosystems and our food production, which is in serious jeopardy of disruption.



Figure 4: The Ray



Figure 5: Map of The Ray



Save the date!

TRB Annual Meeting

January 13-17, 2019
Washington, D.C.

Online registration will open in early September.



ADC30 MID YEAR MEETING

The ADC30 meeting will be held jointly with ADC10 at the 2018 Florida Association of Environmental Professionals Annual Conference.

September 19 - 21, 2018
The Doubletree by Hilton
at Universal Studios
Orlando, Florida



For more info, visit:
<https://www.faep-fl.org/faep-conference>



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).

Ohio DOT Improves and Protects Historic Railroad Tunnels as Artificial Bat Hibernacula

Submitted by: Matt Perlik, Chris Staron, Affiliation: Ohio Department of Transportation, Office of Environmental Services

In 2017 Ohio Department of Transportation (ODOT) ecologists conducted a routine ecological check for a small transportation maintenance project to install pillars or to grout an underground void. The void presented a potential safety hazard under a rural state route in hilly southeast Ohio. Fast forward 18 months and ODOT is partnered with the Ohio Rail Development Commission, USFWS, Ohio Department of Natural Resources (ODNR), Ohio University, and the tenant rail company to permanently gate several abandoned rail tunnels that are the largest previously unknown bat hibernacula in the state.

During the Appalachian coal boom of the late 1800s, the railroads tunneled through the hills of southeast Ohio to get coal to outside markets. The countless hand-cut and hand-laid stones that make up these tunnels, some as long as 1,500 feet, were later bypassed in mid 1900s, sealed with brick or dirt, and left. Over the decades that followed the bricks were broken into and the dirt eroded or was dug away in small areas. Nearby human residents accessed the tunnels as hang outs, canvas for graffiti, camp fires, and apparently target practice. At some point bats also found these tunnels useful.

The ecological investigation of the tunnel discovered flowing water throughout the tunnel and live bats in several places on the ceiling. Loose grout between stones and the long length of the tunnels created a variety of temperatures useful to hibernating bats. Dead bats also littered the ground and were collected to confirm another white nose syndrome (WNS) disaster. However to the ODOT wildlife biologist's surprise the necropsies indicated tiny white pellets



Figure 2. Spring 2018 existing interior facing the entrance to abandoned railway tunnel 9 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT).

in the bodies of the bats. The bats had been shot off the ceiling by Airsoft pellet guns.

Through discussions with Ohio University Assistant Professor Joe Johnson and Ohio Department of Natural Resources wildlife biologists, ODOT Senior Ecologist Chris Staron developed a conceptual plan to build bat gates on the tunnel. Chris worked with John Barnhouse ODOT District 11 Planning & Engineering Administrator to develop tunnel-specific bat gate plans based on designs from ODNR Division of Mineral Resource Management and Division of Forestry. ODNR Division of forestry has a team of staff who design and install bat gates on abandoned coal mine openings throughout southeastern Ohio and offered to assist with the design and installation of the gates. Chris worked with

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Figure 1. Spring 2018 existing external entrance to abandoned railway tunnel 9 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT).



Figure 3. Tricolor bats (Perimyotis subflavus) observed roosting along the ceiling of abandoned railway tunnel 9 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT).

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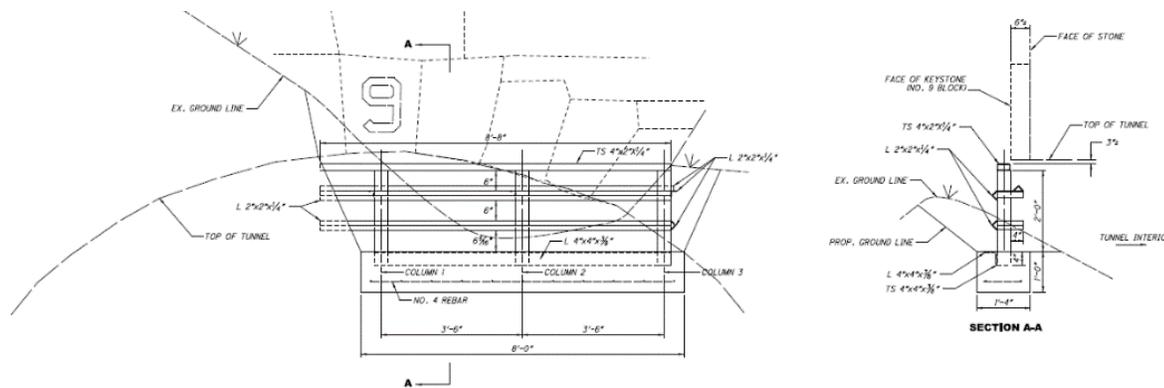


Figure 4. Early conceptual drawing of the east end bat gate design for abandoned railway tunnel 9 in Harrison County Ohio, USA.

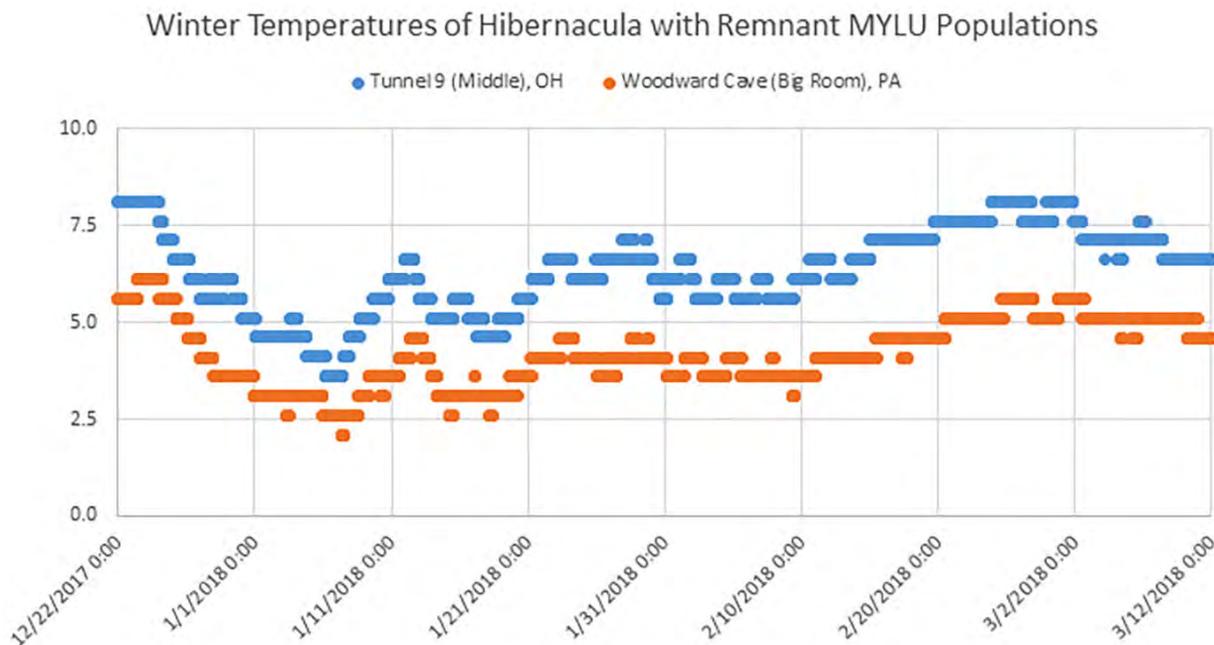


Figure 5: Tunnel 9 temperature trends as compared to a natural cave hibernacula in Pennsylvania (credit: Joe Johnson Ohio University. Used with permission)

Jim Bishop Administrator of the ODNR Mineral Resource Management to purchase the steel and other materials needed for the gates using ODOT funds provided to ODNR.

During meetings about the gates within ODOT, the question arose regarding project funding and the return on investment for the DOT. After a discussion with the ODOT USFWS liaison Dr. Karen Hallberg and USFWS Ohio Ecological Services Field Office Supervisor Dan Everson the Service offered to allow ODOT to achieve bat conservation credits as return on the DOT investment in the gate installation and conservation easements. Existing funding provided to ODNR as well as funds from a canceled research project were leveraged to pay for the materials for the gates.

For ODOT the goal is simple: install bat gates to eliminate the risk to human safety and preserve bat hibernacula. Protecting hibernacula protects the most sensitive and per-

haps most critical component of bat life history. Conservation easements will be placed on the forested property immediately above and adjacent to the tunnels and the ownership transferred to a long-term conservation steward. Additional forested property near the openings will also be researched and pursued for long term preservation furthering the benefits of the tunnels for bat conservation.

The team of partners is also beginning research on how to manipulate nearby tunnel 10 to achieve a colder winter temperature making it more suitable for bats. A similar natural cave in Pennsylvania maintains a cooler temperature and while WNS is present, is potentially not nearly as fatal compared to warmer hibernacula. Minor modifications to the entrance to tunnel 10 and the installation of a simple temperature and more resistant to the full deadly force of WNS.

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Figure 6. Spring 2018 abandoned railway tunnel 10 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT).



Figure 7. July 2018 during construction of the east end bat gate for abandoned railway tunnel 9 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT). The west end gate will be completed in July 2018 prior to fall swarming and include a locking human access door for future research.



Figure 8. July 2018 completed east end bat gate for abandoned railway tunnel 9 in Harrison County Ohio, USA (photo credit Chris Staron Ohio DOT).

As of now there are five known tunnels slated to be gated and protected as bat hibernacula. However historic mapping indicates there may be more tunnels on the landscape that could be harboring bats. Final installation of the first gate on tunnel 9 is expected in the summer of 2018 with successive gates and easements installed over the next few years.



The Transportation Resilience Innovations Summit and Exchange (RISE) 2018

October 9-10, 2018
Sheraton Denver Downtown Hotel
Denver, CO

TRB and AASHTO are convening all 50 State DOTs for a unique conference to implement risk and resilience practices within daily and emergency operations.

The Summit and Exchange will provide a forum for sharing state-of-the-practice information about how to include resilience practices within transportation system performance activities. Participants will share effective strategies for incorporating resilience into all aspects of their infrastructure management programs; hear real-life-examples of community collaboration, equity and cooperation initiatives; expand their professional peer network; and help create new linkages between national, statewide, local, community, and tribal organizations. It will also provide participants an opportunity to shape the national transportation resilience research agenda for 2020-2025.

Links:

Information

Register

Conference Program

Committee on Ecology and Transportation (ADC30)

CALL FOR POSTERSfor the **TRB 2019 Annual Meeting**

The Transportation Research Board (TRB) Committee on Ecology and Transportation (ADC30) invites submissions for a poster session at TRB's 2019 Annual Meeting in Washington, DC this coming January.

Please submit your abstract for consideration at the Ecology and Transportation (ADC30) poster session emphasizing environmental/ecological topics such as:

- procedural and technical best practices,
- 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 management and transportation planning,
- geospatial modeling and decision-making tools,
- novel regulatory compliance and permitting approaches,
- successful mitigation and enhancement applications,
- environmental stewardship,
- climate change adaptation and resiliency,
- lessons learned or 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 for inclusion in the meeting program.

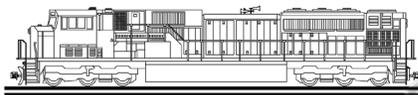
Abstracts should be about 350 words and should contain the following: (1) full title; (2) primary/secondary presenter name(s) with current contact information (organization, address, title, phone, e-mail); (3) a concise statement of the project or study objective; (4) notable practices, approaches or 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 September 15, 2018.

Following review of all abstracts, the committee will notify primary authors of their selection status on or about October 1, 2018. 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 December 1, 2018, 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 2010 "Meet the Author Poster Session Guidelines" available on the TRB website. Note: Abstracts received after the September 15 deadline will not be included in the proceedings and will not be scheduled for poster presentation at the annual meeting.

Our committee has found these poster sessions offer a superb opportunity to interact and showcase innovative ideas, projects, and programs that feature ecological analysis and stewardship. Don't miss this opportunity to share your work with 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 and accompany your display to interact with conference attendees.

Please submit your abstracts and mock-ups to daniel.smith@ucf.edu. Please be sure to include the words "TRB ADC30 Poster Session" in the subject line of all related emails. For more information, please contact committee Chair, Daniel Smith at daniel.smith@ucf.edu.

20th RAILROAD ENVIRONMENTAL CONFERENCE



October 23-24

University of Illinois at
Urbana-Champaign

Champaign, IL

RREC-2018 will feature presentations by railroaders, consulting engineers, academics and others involved in all aspects of railroad environmental topics. Presentation topics will include: Compliance & Permitting; Ecological Conservation; Energy, Emissions & Air Quality; Environmental Analytical Data Applications; Environmental Management; Environmental Response; Noise & Vibration; Passenger Rail & Transit; Remediation; Risk & Liability Management; Stormwater & Wastewater; and Sustainability.

The annual railroad environmental conference enables you to meet with your peers throughout the railroad environmental community to exchange views, learn about new techniques and technologies, and generally stay in touch with the direction of the railroad industry's environmental programs. It is also an excellent opportunity to renew old acquaintances and make new contacts in the ever-changing railroad environmental arena.

500 people attended RREC last year with representation from the railroad industry, environmental consulting engineers, environmental control equipment suppliers and regulators from both the US and Canada. We expect RREC-2018 to be the largest gathering of the railroad environmental community this year.

All individuals interested in the topics to be presented are encouraged to attend. We expect representatives from all of the Class 1 railroads, as well as short line, passenger, commuter, and rail transit organizations to be in attendance. In addition, most of the major environmental engineering consulting firms serving the railroad industry will be represented. Environmental researchers from academia and representatives from environmental regulatory agencies are also expected.

The conference is co-sponsored by The Association of American Railroads (AAR), the American Railway Engineering & Maintenance of Way Association (AREMA), the American Short Line and Regional Railroad Association (ASLRA), the American Railway Development Association (ARDA), and the Railway Association of Canada (RAC).

AREMA Committee 13 and the AAR Environmental Affairs Committee are expected to hold their fall meeting in conjunction with the conference.

Contact us at rrec-conf@illinois.edu or (217) 300-1340.

Subscribe to RREC announcements [here](#).

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