NORTHEAST TRANSPORTATION WORKFORCE CENTER

Environmental Work in the Transportation Sector

CAREER PROFILE

NAME: James Brady

DEGREE: Ecology

TITLE: Senior Environmental Biologist

COMPANY: Vermont Agency of Transportation (VTrans)

Vermont has an extensive multimodal transportation system. With oversight from the Vermont Legislature, the Vermont Agency of Transportation (VTrans) is responsible for planning, development, implementation, and maintenance of a variety of transportation infrastructure including, but not limited to, roads, bridges, state-owned railroads, airports, park and ride facilities, bicycle facilities, pedestrian paths, public transportation facilities and services, and Department of Motor Vehicles operations and motor carrier enforcement. VTrans serves the entire population of the State of Vermont.

Source: vtrans.vermont.gov/about

Q. What is your current role at the organization?

A. I am at the Vermont Agency of Transportation and I am a Senior Environmental Biologist-- there are two of us that cover all of Vermont. I cover the southern half of the state. We review basically every single transportation project for natural resources-related concerns. And that can range from doing resource identification during the scoping process all the way through environmental permitting with the Army Corps of Engineers, the VT Wetlands Office, VT Fish and Wildlife. We've been recently starting to get plugged into corridor planning—which means that we are getting looped in early into more long-term processes.

When we are thinking about issues like wildlife connectivity on a regional scale, it requires a lot of information gathering and a lot of evidence showing that a project might be eligible for upgrading, due to wildlife concern not just transportation concerns. So I've been here about eight years and in that time frame, we've been really integrated into the entire life of a project, which is pretty neat. There are very few positions within this agency where somebody might be involved from scoping all the way to post-construction, so it's kind of a unique part of my job, which I really enjoy. NEPA (National Environmental Policy Act) review and environmental permitting are the bread and butter, that's why the job exists.

And then, beyond that, I am involved heavily with wildlife connectivity issues related to the transportation network and research-related work. We have several on-going wildlife-related studies specific to the Vermont transportation network. We are using that information to integrate into our design reviews. Going above and beyond what most states do—it's becoming the norm to think about wildlife in the transportation network, but it's still not everywhere yet. It's definitely still an emerging science even though it has a lot of public support, at least in the Northeast.

Q. How did you get to this point in your career? Any key points along that pathway?

A. So, starting back in my undergrad at UVM (The University of Vermont), I had a unique transition that fits well into my current role. I

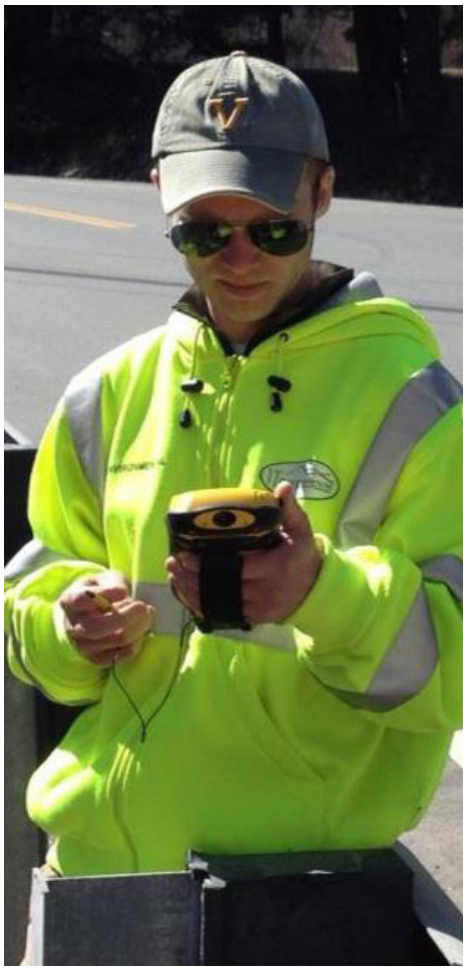
actually started out studying civil engineering. Half way through I just realized that it wasn't for me. I switched into the Rubenstein School and I graduated with a degree in ecology. So after graduating, I landed an internship with the U.S. Fish and Wildlife Service in New Jersey. I did that to kind of spring board into additional seasonal jobs which took me up to the north shore of Massachusetts, in Ipswich, working for a land trust (The Trustees of Reservations) doing similar but new and additional work related to coastal birds and their nesting—and protecting their habitats. It was a lot of fun—basically hiking the beach and inventorying bird colonies and doing nest counts, counting chicks and keeping an eye on them. These were all threatened and endangered species so they had reporting requirements for properties that had endangered birds on them. I did that for three field seasons. Basically, for four years after college, I was bouncing around from seasonal position to seasonal position. And these were pretty low-paying jobs. They often would provide housing, which made them viable positions. The field of natural resources historically, doesn't pay a ton. And you're basically competing with people who are willing to do the work for free as a volunteer. So, you find yourself wanting to start a career path but there is so much interest from folks all over, they can almost justify having these low paying jobs to get the people they need. So, you're basically getting the experience and then you are able to use that experience to finally get a job—like I did—at a place like VTrans. I got a job here at VTrans as an environmental specialist. Which is more general, but definitely related to the natural resources background that I had. But it also kind of got me into the world of cultural resources, which I did not really have any experience in. I thought that this was very interesting and something that people don't often think about.

Luckily, I got that job. That was in 2011 and then my day-to-day was doing NEPA review and making sure permitting was checked off for each of the places it needed to be. There were a lot of administrative tasks involved with that but also a lot of ability to dig deeper into the environmental world related to transportation. I was able to start my career path in wildlife connectivity, at that point, as a focus. That job let you have a focus as a specialty and I kind of used my wildlife background to do a lot more research into wildlife connectivity and transportation.

Using my wildlife background over the years, I was able to leverage that and continue an education in wetlands and GIS to get the biologist position when that opened up about three years ago. It was just a lot of patient waiting and taking opportunities as they came up that got me to where I am now. Three years into the biologist position and there is a great deal that I can do internally for that—but I've been in the position long enough where I feel comfortable.

Q. Were there any experiences that helped to best prepare you for the work that you do?

A. During my job at the Trustees of Reservations in Massachusetts, I was able to run a field crew that included folks from college-graduates down to high school students. I



feel like the level of experience and level of commitment from those staff members varied quite a bit and it kind of started the beginning of my experience with dealing with different personalities, different work ethics, and different work methods that I think is transferable forever—in and out of the professional career. When you are dealing with so many different types of personalities, it is critical to figure out how best to work with each person. There's only so much you can do to get somebody to follow a prescription for a job, or a method. But, you need to allow them to be themselves too. So that experience really early on helped me in my career. During that same job, I was kind of starting public speaking—in the environmental specialist job there was an opportunity to speak at a conference or an engagement or anywhere really. I tried to take each one as they came along. Now, I have a lot of confidence going into meetings or conferences where I am invited to speak. Not only is it a skill, but it gets your name out there in a way that you couldn't do without putting yourself out there in that public eye. So that's the huge one, for me. Those opportunities and the skill sets that I gained from them have really broadened my horizons. It's been tremendous fun—though at first, terrifying.

Q: What does a day in the life of your position look like?

A: In winter, I wouldn't want somebody shadowing me. We are still in the thick of winter and there is snow everywhere. There's not much to do in the field. It's pretty boring. It's a lot of big-picture thinking—kind of like prepping for the field season. But throughout the year, it varies.

But a typical day would kind of be going to our database of projects that come through and sorting by due date to see what reviews or permits are required—and setting up the next couple of weeks or months in terms of scheduling site visits as needed and coordinating with regulators and then hopefully, on a good day, we are out in the field delineating a wetland or walking up and down a stream. During the summer, we are driving around a lot—which is great because we are living in Vermont. I don't know if this would necessarily be as great if we lived somewhere else. We are pretty lucky to be where we are. But then, we have to take that data that we collect in the field and produce results. That is the desk part of the job. Depending on the season, it can be pretty varied. There can be weeks where we are in the field almost every day. And this time of year, we are stuck behind a computer pretty exclusively. There is no normal day but I think that they variety helps because it keeps things interesting and fresh.

Q: What skills have you gained in the work? Are these unique or transferable to other disciplines?

A: This position has allowed me to coordinate, on a professional level, almost every type of job that I can think of related to the transportation

industry and natural resources field; and they all speak different languages. So being able to interpret a transportation project from an engineer and provide that information to coordinate with regulators in the natural resources world is a skill-set that I've developed over this job. It's unique experience because there are not a lot of people in that role that have to funnel natural resources-related information to all kinds of different agencies. This also falls the other way in terms of understanding wildlife terms and relaying impacts to transportation agencies to mitigate impacts to natural resources. Being able to do this is a clear skill-set needed to be successful in this job.

Q. What do you enjoy most about your job?

A. There are a lot of great things. Obviously, going out in the field is wonderful. I get to see all parts of Vermont that you don't really get to. It forces us to get all over the state. A lot of this wildlife work gets us interacting with professionals from all over North America, and even other parts of the world, to do this research related to transportation and wildlife connectivity. It's been really exciting because there are so many incredible people that I have been able to interact with and collaborate with. This is one of the things that goes above and beyond our typical day-to-day tasks.

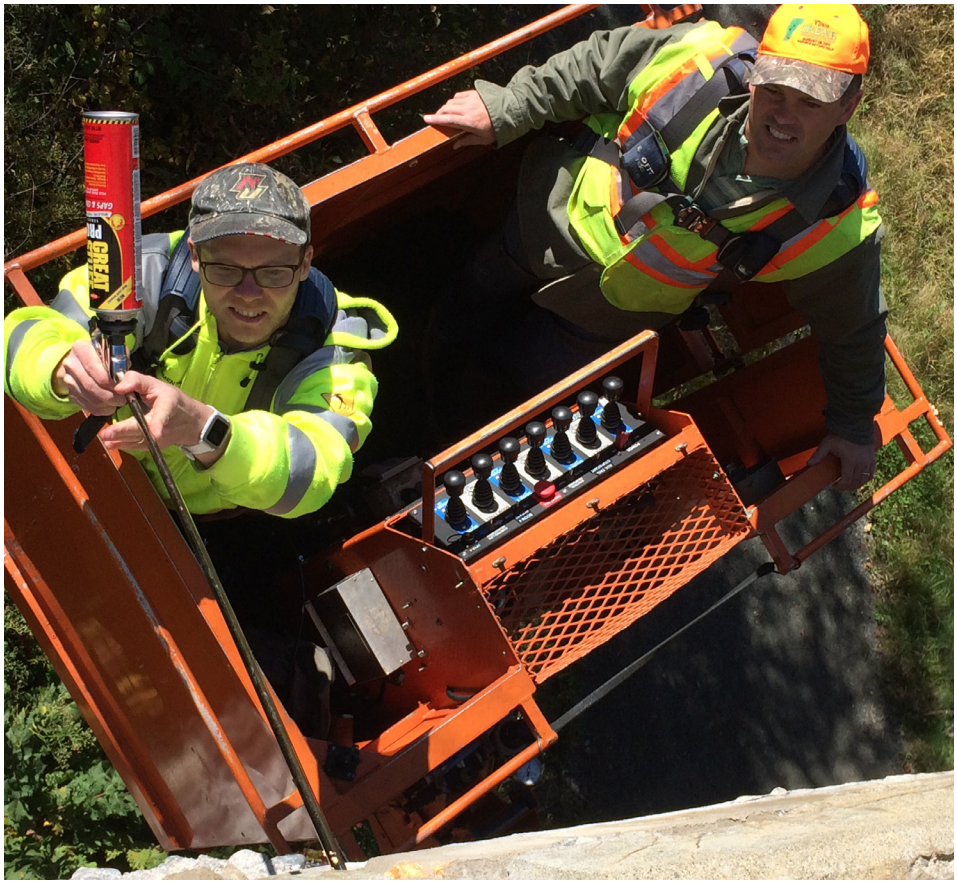
Q. What are some of the challenges you have faced in the work? How did you overcome them?

A. One of the challenging parts of this job is that we operate under a project schedule that is set up years in advance. It is our agency's goal to meet that schedule by delivering a project in a set period of time. We are under constraints that way and we often have variables in our review, like permitting, that can be pretty time consuming and take up to six months to get. But not every project needs that and so we have to figure this out in order to keep projects on track. This can be a tricky needle to thread without jeopardizing a resource or requiring changes at the end. It's pretty difficult and at times, it can be really stressful trying to get our piece of the puzzle to fit. And then of course, it is a transportation and engineering-heavy agency. So, natural resources are considered and included in design but making the most with the state's limited budget in terms of repairing and maintaining our transportation network is hard to do. And then, if there are issues related to natural resources, it can often times increase the cost of a project. So its challenging to figure out when this needs to be integrated and it can be kind of stressful because we need to make sure that we are really confident that a project might be worth an extra investment, in terms of natural resources, when the budget is so limited. But this can also be really rewarding. Once we have that trust from the designers and project managers, it feels really good.

Q. What are some of your own personal characteristics and values that make you a good fit for this type of work?

A. I come from a natural resources degree in ecology, this is a passion of mine. But, I have a strong and very legitimate interest in the transportation world. I've always been interested in it. I love driving around, and this is the background that initially got me into civil engineering. I totally understand the value in the work that is being done that is directly related to transportation and how important a role that plays into our economy and a Vermonter's day-to-day life where you basically have to drive in a rural state. It's pretty much the reality as public transportation is really difficult in a rural setting. So, totally understanding the need and the value and also the constraints of having a small population to support with tax money and the large amount of infrastructure that we have; and understanding how difficult it is to maintain that infrastructure with the small amount of financial resources and tax payers that we have (relative to other states) in particular.

But then also, understanding that as climate change continues to march seemingly out of control right now—there is more of a need than ever to provide a permeable transportation network for terrestrial wildlife in particular. So, allowing our wildlife to move into different parts of our region without getting blocked by the interstate or state roads is critical for the genetic exchange and long-term survival of a lot of species that cannot adapt as easily to the changing environment. Being able to understand the constraints of the transportation network and the costs, but also understanding that there is critical value in a lot of these natural resource concerns that people understand and buy into, and commit to while understanding that our roads could actually be in better shape. It's a hard needle to thread and I try my hardest to do that and be successful in lobbying for those resources to our engineers and our natural resources communities wherever it makes the most sense to place our interests and money. Being able to not just think project-by-project, but being able to think regionally. I think that this is a skill set that has allowed me to be successful in these contexts that not everybody would be completely comfortable with, especially with our financial constraint.



Q. What is something that you want people to know about the work that you do?

A. I would say be willing to travel for work and be very open to the type of work. If you have some interest in the work, consider it. So for me, I lived in New Jersey and then I moved to the north shore of Massachusetts. I took a job before I even visited the site—I knew it was a good job, so I took a leap of faith and it worked out pretty tremendously. I use the experiences that I gained there, to this day. I think, if you can make it work, seasonal positions are an excellent way to build experience much faster than potentially an entry-level job at a bigger firm or agency.

Obviously, there are a lot of constraints with paying for college loans and health insurance, but if you can make it work, it's definitely worth it. It gets incredibly frustrating to essentially be laid off every season; and then every season, was like having to find a whole new job. It was extremely stressful, but it was temporary and it was really important to think of it as temporary. It was worth it in the long run. It's stressful, it's frustrating, but also, those jobs can be a lot of fun. You're in the field a lot, doing the hands on work, getting dirty, riding around in ATVs, and all that cool stuff. It was huge to power through those trying times when you weren't sure where your next job would come from. It was tough, but worth it.

Overview of Position as it Relates to Transportation

Transportation-related impacts to wildlife, plants, and endangered species typically may occur because of road construction, tree clearing, wetland impacts, or other impacts to plant and animal habitat.

Impacts to fish, wildlife, plants, and rare species are regulated at the state level through the Vermont Fish and Wildlife Department, and at the federal level through the US Fish and Wildlife Service and other federal agencies. Laws and regulatory programs pertaining to fish, wildlife and plants are created in partnership with transportation agencies. Some examples of these laws and regulations are: impacts to state-listed rare species, impacts to federally listed rare species, impacts to wildlife from federally funded projects, and impacts to migratory birds.

Source: vtrans.vermont.gov/environmental-manual/permitting/fish-and-wildlife

Fish, Wildlife & Rare Species

"As climate change continues to march seemingly out of control right now—there is more of a need than ever to provide a permeable transportation network for terrestrial wildlife in particular. So, allowing our wildlife to move into different parts of our region without getting blocked by the interstate or state roads is critical for the genetic exchange and long-term survival of a lot of species that cannot adapt as easily to the changing environment."

—James Brady

Environmental Biologists

Biologists with a specialty in transportation are typically are responsible for coordination with the state transportation department on transportation-related projects and programs: 1) help complete DOT environmental assessment and permits 2) Development of evidence-based information, strategies, management practices, communication and coordination addressing collisions and wildlife crossings. They also provide technical and site-specific consultation and training to staff and contractors to develop and implement connectivity priorities, mitigation, and improvement projects on state highways. Additionally, they assist in the design of road projects to restore and improve wildlife while determining the impacts of roads and highways while creating criteria for wildlife crossing desig.

James is responsible for natural resource review and clearances on all transportation projects in Southern Vermont; and the agency lead on wildlife and transportation connectivity initiatives. Additionally, James is the primary contact for all ecology related resources associated with the VT transportation network; serves on development and implementation teams for three major photo monitoring studies for wildlife throughout Vermont; serves as agency representative; and is the in-house GIS specialist for the agency's Environmental Section.

About the Vermont Agency of Transportation

VTrans works to provide safe and efficient movement of people and goods with the vision of a safe, reliable, and multimodal transportation system that promotes Vermont's quality of life and economic well-being. This includes providing a safe and resilient transportation system that supports the Vermont economy to preserve, maintain, and operate the transportation system in a cost effective and environmentally responsible manner; and to provide Vermonters with efficient travel options.

Source: vtrans.vermont.gov/about/mission-and-vision

Overview of General Skills and Requirements for an Environmental Biologist

Environmental biologists are required to have skills regarding communication, critical-thinking, emotional stamina and stability, interpersonal skills, observation skills, outdoor skills, and problem-solving skills. These skills are important for disseminating knowledge to the public, academics, and policymakers. Biologists also need reasoning and judgment to draw conclusions from their own experimental results and observations. It is also important for biologists to have the ability to work, problem-solve and communicate on teams that often operate in the outdoors.

Biologists require certain credentials. For the field of wildlife conservation/environmental biology, an entry-level position requires a bachelor's degree. For higher-level investigative or scientific work, a master's degree is needed. Additionally, to lead independent research or to occupy a university research position, a Ph.D. is necessary.

Looking to the future, employment of biologists is expected to grow 8 percent from 2016 to 2026—this is average for the majority of occupations. Biologists will be needed to study human wildlife interactions as the human population continues to grow. Human development and growth will impact wildlife and their natural habitats. It is predicted that because most funding for this work comes from government agencies, demand for biologists will be limited by budget, although this is the expectation for most occupations funded by the government.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Zoologists and Wildlife Biologists, www.bls.gov/ooh/life-physical-and-social-science/zoologists-and-wildlife-biologists.htm

GLOSSARY

- **Wildlife Corridor** – an area of habitat connecting wildlife populations separated by human activities or structures.
- **Resilient Transportation System** – the ability of a transportation system to move people around in the face of one or more major obstacles to normal function (e.g. natural disaster or crash).
- **NEPA** – National Environmental Policy Act, environmental law that promotes the enhancement of the environment and established the President's Council on Environmental Quality (CEQ).

Type of Projects Carried Out at the Vermont Agency of Transportation

ROAD ECOLOGY & CLIMATE CHANGE ADAPTATION

Two presentations were made at the 2017 Conference on Road Ecology & Climate Change Adaptation: "Successes in Road Ecology: Partnerships and Training in Vermont" and "Lessons Learned in Vermont Following Tropical Storm Irene."

ECO-LOGICAL

VTrans contributed to a Federal Highway Administration 2015 Eco-Logical Webinar Series with the presentation, "Vermont's Staying Connected Initiative: A Partnership to Advance Landscape-Scale Conservation."

ANIMAL CROSSINGS

James was interviewed in 2015 by journalist Jane Lindholm on Vermont Public Radio's Vermont Edition which was titled, "Animal Crossings: Sharing Roads with Vermont Wildlife."

WILDLIFE MOBILITY

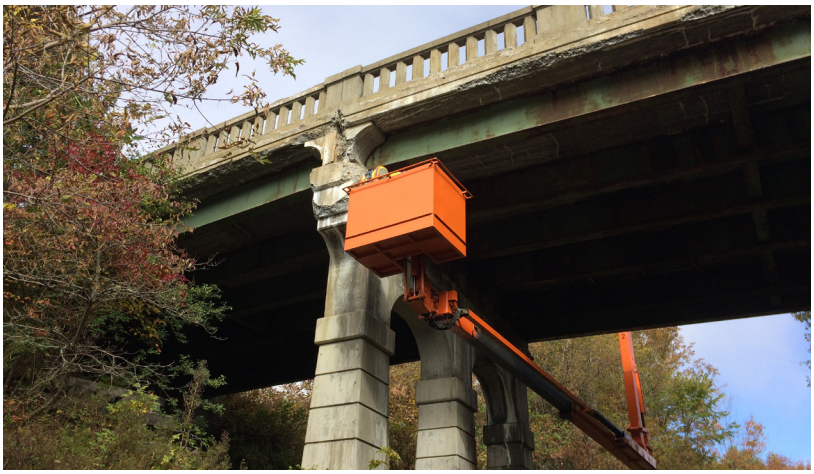
James was interviewed in 2013 by journalist Joel Banner Baird with the Burlington Free Press for an article title, "A study shoots for improved wildlife mobility across our roads."

Key Skills

- **Reading Comprehension** – Reading work-related information.
- **Complex Problem Solving** – Noticing a problem and figuring out the best way to solve it.
- **Critical Thinking** – Thinking about the pros and cons of different ways to solve a problem.
- **Active Listening** – Listening to others, not interrupting, and asking good questions.
- **Judgment and Decision Making** – Thinking about the pros and cons of different options and picking the best one.
- **Coordination** – Changing what is done based on other people's actions.
- **Active Learning** – Figuring out how to use new ideas or things.
- **Systems Evaluation** – Measuring how well a system is working and how to improve it.
- **Systems Analysis** – Figuring out how a system should work and how changes in the future will affect it.
- **Time Management** – Managing your time and the time of other people.
- **Monitoring** – Keeping track of how well people and/or groups are doing in order to make improvements.

Abilities Needed for Success

- **Written Comprehension** – Reading and understanding what is written.
- **Oral Expression** – Effective spoken communication.
- **Written Expression** – Effective communication in written form.
- **Deductive Reasoning** – Using rules to solve problems.
- **Inductive Reasoning**– Making general rules or coming up with answers from lots of detailed information.
- **Oral Comprehension** – Listening and understanding what people say.
- **Problem Sensitivity** – Noticing when problems happen.
- **Fluency of Ideas** – Coming up with lots of ideas.
- **Near Vision** – Seeing details up close.
- **Originality** – Creating new and original ideas.
- **Information Ordering** – Ordering or arranging things.
- **Visualization** – Imagining how something will look after it is moved around or changed.



This material is based upon work supported by the Federal Highway Administration under Agreement No. DTFH6114H00025 & DTFH6116H00030. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the view of the Federal Highway Administration.