

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Lead Agency (FHWA or State DOT): Nevada Department of Transportation

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

| | | | |
|--|---|---|--|
| Transportation Pooled Fund Program Project # <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i> TPF-5(358) | | Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) 2020 <input checked="" type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31) | |
| Project Title: <i>The Wildlife Vehicle Collision (WVC) Reduction and Habitat Connectivity Transportation Pooled-Fund Project Strategic Integration of Wildlife Mitigation into Transportation Procedures</i> | | | |
| Name of Project Manager(s): Nova Simpson for Nevada DOT Patricia Cramer, PI | Phone Number: Nova Simpson: 775-888-7035 Patricia Cramer: 435-764-1995 | E-Mail nsimpson@dot.nv.gov cramerwildlife@gmail.com | |
| Lead Agency Project ID: Nevada Dept. of Transportation | Other Project ID (i.e., contract #): Agreement #: P700-18-803 | Project Start Date: 12/13/2018 | |
| Original Project End Date: 12/31/2021 | Current Project End Date: 12/31/2021 | Number of Extensions: 0 | |

Project schedule status:

On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

| Total Project Budget | Total Cost to Date for Project | Percentage of Work Completed to Date |
|----------------------|--------------------------------|--------------------------------------|
| \$146,000.00 | \$78,628.23 | 50% |

Quarterly Project Statistics:

| Total Project Expenses and Percentage This Quarter | Total Amount of Funds Expended This Quarter | Total Percentage of Time Used to Date |
|--|---|---------------------------------------|
| 8.0% | 8.0% | 50% |

Project Description:

The *Wildlife Vehicle Collision (WVC) Reduction and Habitat Connectivity* pooled fund study is a collaborative research project through the Transportation Pooled Fund Program. Partners from both the United States and Canada have come together with a common interest in reducing WVC's for the safety of humans and wildlife, as well as restoring habitat connectivity in landscapes fragmented by roadways. Contributing partners currently include Alaska DOT, Arizona DOT, California DOT, Iowa DOT, Minnesota DOT, Nevada DOT, Ontario Ministry of Transportation, Oregon DOT, and Washington DOT.

This pooled fund study (PFS) will seek to identify solutions that integrate highway safety and mobility with wildlife conservation and habitat connectivity. The Project: Strategic Integration of Wildlife Mitigation into Transportation Procedures is conducted under Principal Investigator Patricia Cramer and is reported on in this progress report.

Within U.S. states and Canadian provinces, there are few standardized planning processes for considering wildlife in transportation planning, or Best Management Practices (BMP) manuals to instruct personnel at every level how to consider, plan, design, construct, and maintain transportation infrastructure that permits connectivity for wild and domestic animals that could become involved in WVC. This study investigates and makes recommendations on successful procedures that consider and create mitigation solutions to reduce WVC and provide connectivity for wildlife to assist transportation agencies in developing standards at every level.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

Team members authored case study stories of how progressive actions have been taken by various states, counties, and cities to include consideration of wildlife in transportation processes. They also edited previous case history stories with guidance from panel members' reviews from the previous quarter. There are now case studies titled: Colorado's Western Slope Wildlife Prioritization Study Benefit Cost Analysis; Texas Department of Transportation Manuals, The MPO Connection; Highway & Habitats Training for Vermont Transportation Agency Staff; New Mexico's Legislators Integrate Wildlife Concerns into Agency Actions; Building Partnerships to Advance Wildlife-Highway Mitigation in Colorado; A Personal Federal Agency Perspective; Gaining Support for Including Wildlife Crossings in Transportation Projects: Securing Funding for Wildlife Connectivity – A Golden Moment in Pima County, Arizona; Montana Working Partnerships; The Wildlife Program of the Environmental Management Branch of the British Columbia Ministry of Transportation and Infrastructure: A Model for Institutional Cohesion; and, Construction Project Impacts and the Seven Dwarfs of Implementation. The survey of all state traffic safety engineers to report crash data into a templated Excel spreadsheet that calculated the annual average number of total crashes, crashes with animals, and crashes with wildlife, using the state's crash costs, and FHWA's 2018 crash costs continued. As of June 30, approximately 45 states had responded and provided data. The total cost of animal (all animals, not only wildlife) vehicle collisions was calculated with FHWA 2018 cost for crashes, and the value exceeded 9 billion dollars annually in the U.S.

Anticipated work next quarter:

The team will work to complete Task 1 and its sub-tasks. This includes list and compare methods (A.i.d), Identify pros and cons of efforts (A.i.e), Identify Gaps in the science and practice (A.i.f), and Identify how others can be brought into practices (A.i.g) . It is expected that the crash costs for all states will be calculated. It is also expected that Task 1 will be completed and a report will be submitted.

Significant Results:

The US-Canadian on-line survey is completed (Aia.) Twelve case studies on how states, provinces, MPO's, and counties entities create considerations for wildlife in transportation planning have been written about (Aib). The main literature search is complete, with additions to be made throughout the duration of the project (Aic). Work continues on data needs and other aspects of Task 1.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

The budget is very constrained for the tasks in this work. The team will strive to complete all deliverables within the budget and time frame set forth in the contract. The Covid-19 pandemic will continue to affect this project. Dr. Cramer submitted an abstract to present some of the study results and learn from northeastern states and provinces at the September 2020 Northeastern Conference on Wildlife and Transportation. The conference will be held over the internet with audience participation over three consecutive Wednesdays in September and October. It is not known yet if Dr. Cramer will be presenting at this conference. All activities that entailed meeting with people in 2020 are curtailed, including the annual meeting for this pooled fund study. It may be prudent to extend the project for an additional year to accommodate opportunities to present at conferences that will be canceled or pushed back, such as the Transportation Research Board meeting in Washington DC, the Northeastern Wildlife Conference, and possibly ICOET.

Potential Implementation:

The information generated from this work will be available for U.S. DOT's and Canadian MoT's for assistance in incorporating wildlife concerns into transportation processes.

It may also be used in the development of the forthcoming U.S. Transportation Act.

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|---|---|---|--|
| Transportation Pooled Fund Program Project # <i>Wildlife Vehicle Collision (WVC) Reduction and Habitat Connectivity</i> Task 1 – Cost Effective Solutions Transportation Pooled-Fund Project TPF-5(358) | | Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) 2020 <input checked="" type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input type="checkbox"/> Quarter 4 (October 1 – December 31) | |
| Project Title: WVC Reduction & Habitat Connectivity NVDOT | | | |
| Name of Project Manager(s): Dr. Marcel Huijser | Phone Number: 406-543-2377 | E-Mail mhuijser@montana.edu | |
| Lead Agency Project ID: 4W7576 | Other Project ID (i.e., contract #): 4W7576 | Project Start Date: 18 Dec 2018 | |
| Original Project End Date: 30 Sep 2022 | Current Project End Date: 30 Sep 2022 | Number of Extensions: 0 | |

Project schedule status:

- On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

| Total Project Budget | Total Cost to Date for Project | Percentage of Work Completed to Date |
|----------------------|--------------------------------|--------------------------------------|
| \$354,001.00 | \$129,877.5 | 35% |

Quarterly Project Statistics:

| Total Project Expenses and Percentage This Quarter | Total Amount of Funds Expended This Quarter | Total Percentage of Time Used to Date |
|--|---|---------------------------------------|
| \$547.34 0.0015% | \$547.34 | 33% |

Project Description:

All but one research modules have been submitted, have been processed, and are active.
 1 remains under development:

| Topic | Title | Proposed Budget | PI | Submitted? | Approved by NV? | Active account? |
|-------|---|-----------------|---|--------------------|-----------------|--|
| C | Design of Fiber-Reinforced Polymer (FRP) Wildlife Overpass Structures | \$70,000 | Rob Ament and Matt Bell | yes | yes | yes |
| F | Identification of the patterns and processes that result in highway accidents involving elk: Informing the design of effective mitigation strategies in areas where elk is a dominant species | \$20,000 | Tony Clevenger | yes | yes | yes |
| G | Wildlife community and species factors affecting crossing structure use: A continental meta-analysis and a 16-year perspective | \$65,000 | Tony Clevenger, Marcel Huijser | no, in preparation | no | no |
| H | Jump-out design and measures at fence ends and at access roads | \$115,000 | Marcel Huijser | yes | yes | yes |
| I | Efficacy and cost-savings of fencing and wildlife crossings to reduce wildlife-vehicle collisions in the Bow River Valley, Alberta | \$30,000 | Tony Clevenger | yes | yes | yes |
| | Economic value select species based on biological conservation | \$90,181.20 | Chris Neher and John Duffield (as subcontractors from Bioeconomics) | yes | yes | Yes But subcontract (WTI-Bioeconomics) not active yet |

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

General:

1. Worked on rewriting literature review.
2. Worked on the update for the costs and benefits of mitigation measures

Research modules:

| Topic | Title | Activities |
|-------|---|--|
| C | Design of Fiber-Reinforced Polymer (FRP) Wildlife Overpass Structures | Road section selected; field review conducted 9 July 2020 (see below for more details). |
| F | Identification of the patterns and processes that result in highway accidents involving elk: Informing the design of effective mitigation strategies in areas where elk is a dominant species | Research initiated |
| G | Wildlife community and species factors affecting crossing structure use: A continental meta-analysis and a 16-year perspective | N/A |
| H | Jump-out design and measures at fence ends and at access roads | <p>Three student volunteers have been recruited: Samantha Getty, Gina Kuebelbeck, Alexa Morris.</p> <p>Gates and cameras were installed at 4 sites at Dixon Melon Farm (24 June 2020). In addition, 2 cameras were installed along the electric fence at the Dixon Melon Farm (was not planned) (6 July 2020). (see below for more details). Work at this location is in close collaboration with the farmer and the NGO People and Carnivores (Bryce Andrews and Stephanie Barron).</p> <p>Cameras and associated equipment for the Thompson Falls site and the 4 sites in Canada have arrived at the respective field offices (on 10 and 13 July 2020). Plans are now being made to install these cameras.</p> |

| | | |
|---|--|---|
| I | Efficacy and cost-savings of fencing and wildlife crossings to reduce wildlife-vehicle collisions in the Bow River Valley, Alberta | Research initiated |
| | Economic value select species based on biological conservation | Waiting for the subcontract between WTI and Bioeconomics to be activated. |

Additional information

1. Design of Fiber-Reinforced Polymer (FRP) Wildlife Overpass Structures

The use of fiber-reinforced polymers (FRPs) to shore up, or replace, old and deteriorating concrete, steel and wood bridges is becoming much more common in North America and Europe. Over the past 20 years there has been increasing acceptance and innovation with FRP bridge designs, as engineers face the time-honored challenges of corrosion, construction efficiency, and life cycle costs. We now have embarked on building North America’s first FRP wildlife overpass.

As part of this project, the WTI Team is currently putting the finishing touches on the task report for the literature review and FRP manufacturer evaluation. This report will be finalized and delivered to the TAC in July. The literature review and manufacturing contacts are an essential step in creating an FRP wildlife structure. Along with understanding what these composite materials are capable of, we have started to establish connections with manufacturers and their engineers about material properties and their ability to work with the WTI Team during this research project. In addition to this, the WTI Team has presented the information to state Departments of Transportation, the Bozeman Area Bicycle Association, and at the 2020 Transportation Research Board annual meeting in Washington D.C.

The Pooled Fund Technical Advisory Committee reviewed six different locations for the FRP wildlife overpass and selected the US Highway 97 in Siskiyou County, California site. As a result, the WTI research team has been working with Caltrans staff on moving the design forward.

You may recall that US Highway 97 is a two-lane road running from Weed, CA, north to the Oregon border. It is an alternate route when I-5 is forced to close during winter storms. In the 54-mile long project area there is an estimated 9,000 AADT in southern part and 3,600 AADT in northern portion of the highway. Focal species include elk, deer and pronghorn; Caltrans removes 6-7 animal carcasses a month.

The WTI Team and Caltrans have scheduled a field trip for July 9th to finalize the design location, picking between two to three different locations along the route that have been tentatively chosen for further investigation. The map below shows radio collared elk movement in the project area and their incidents on US97 are the red dots.

Due to COVID, the scheduled ARC design co-laboratory slated for September in Redding has been cancelled. Instead, the WTI Team is working with ARC Solutions to develop a virtual working group of experts to inform the FRP wildlife crossing design. It will be launched in August and work with Caltrans and the WTI Team until the spring of 2021.

Other Good News

As a result of the selection of US97, another of the six projects that wasn’t selected by the PFS TAC was Caltrans’ State Road 20 project in Colusa County, CA. However, a Caltrans project team met with the WTI Team to explore an FRP structure for this site as well.

This project is a two-lane road between post miles 9.8 and 12.35 that is to include the realignment of curves, widening of shoulders, and the addition of rumble strips. CalTrans proposed to include wildlife crossing structures within this project and it, too, is a good candidate for an FRP crossing structure. This area has been prioritized by CDFW as an area of

great concern for migratory and resident elk populations. Collaring data shows that SR-20 has become a barrier for the resident elk herd.



Field review along US Hwy 97 near Grass Lake (north of Mt Shasta) on 9 July 2020.



Field review along US Hwy 97 near Grass Lake (north of Mt Shasta) on 9 July 2020.

2. Jump-out design and measures at fence ends and at access roads



Car loaded up with equipment to install wildlife cameras at the Dixon Melon Farm.



Bryce Andrews and Stephanie Barron Install the electric fence around the melon patch.



Samantha and Gina install a camera at one of the four gates at the melon patch.



The installed electrified bump gate at the melon patch. There are three other gates at the melon patch. There is one other bump gate, one standard gate that is electrified, and a “drive” over set of electrified wires.

Anticipated work next quarter:

General:

1. Finish literature review.
2. Finish the update for the costs and benefits of mitigation measures

Research modules:

- Submit the last remaining research module: Meta analyses Banff and Hwy 93 MT
- Activate the subcontract between WTI and Bioeconomics.
- Electrified barriers and jump-outs:
 - Install cameras at electrified barriers Parks Canada (close collaboration with Parks Canada).
 - Install cameras at electrified barriers Thompson Falls (close collaboration with MDT).
 - Select and modify jump-outs, install cameras along US93 N (close collaboration with MDT).

Significant Results:

None yet

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

Positive:

Funding from MDT for 5 electrified barriers along Hwy 93N has been approved. Contracting process has not been initiated yet by MDT. This will supplement the effort of the pooled fund study related to electrified barriers.

Negative:

- Covid-19 increased expenses related to transportation. For the jump-out and electrified barrier project the 3 students Marcel travel in separate cars.
- Covid-19 also led to some increased costs for travel to the site near Mt Shasta in California.

Potential Implementation:

None