

NHDOT SPR2 PROGRAM

RESEARCH PROGRESS REPORT

Project # SPR 42372I		Report Period: Year 2021 <input type="checkbox"/> Q1 (Jan-Mar) <input type="checkbox"/> Q2 (Apr-Jun) <input checked="" type="checkbox"/> Q3 (Jul-Sep) <input type="checkbox"/> Q4 (Oct-Dec)	
Project Title: Wildlife Vehicle Collisions Data Gathering and Best Management Practices			
Project Investigator: Amy Villamagna		E-mail: amvillamagna@plymouth.edu	
Phone:			
Project Start Date: 5/19/2021	Project End Date: 12/31/2022	Project schedule status: <input checked="" type="checkbox"/> On schedule <input type="checkbox"/> Ahead of schedule <input type="checkbox"/> Behind schedule	

Brief Project Description:

Currently we do not understand the scope or the cost of wildlife vehicle collisions (WVCs) in New Hampshire. Citizens die every year in New Hampshire in collisions with wildlife. There is also a cost in terms of emergency response and property damage from the collisions. Records of collisions with wildlife are not held in one easy to access central location. A better understanding of where these collisions are happening and how often could allow future projects to incorporate more wildlife crossing structures during project development and design to reduce wildlife vehicle conflict.

The proposed project will include a review of the sources of information available about WVCs in NH including the Department of Safety data that is shared with the Highway Design Bureau, the roadkill and accident data collected by the various NHDOT Districts and the NH Fish and Game roadkill data. Data from the NH Fish and Game wildlife sightings database may also be pertinent.

Based on the results of this review process, the project deliverables will include a mapping interface that would identify hot spots of WVCs, a review of WVC mitigation measures, and a summary of best management practices that have been found to effectively reduce WVCs in the Northeast. Development of educational material for NHDOT staff about the cost and prevention of WVCs is also planned.

Progress this Quarter (include meetings, installations, equipment purchases, significant progress, etc.):

During this first period of the project we:

- engaged in a Kick-off Project meeting with the TAG on June 30, 2021.
- reviewed a substantial amount of literature regarding wildlife vehicular conflict and summarized this into a working outline from which we plan to write the final report (in time). Associated with this is an online library of resources via Mendeley.com, which I am happy to share with you and others at any point, and the outline itself is stored in a Google doc available at:
https://docs.google.com/document/d/1Wjd8hwlnaFa6kZU_v3KBy-27Wc8c_dI07OJRjUOeH4c/edit?usp=sharing
- met via Zoom with Pete Steckler (TNC) regarding this history of wildlife ~ transportation efforts in the state, the Staying Connected Initiative, Connecting the Coast, and more.
- met via Zoom with Rebecca Martin (NHDOT) for a broader perspective of how wildlife collisions have been integrated into DOT decision-making and planning (thanks again for your time)
- communicated via email and phone with several representatives from DOT and wildlife agencies in ME, MA, and VT regarding wildlife corridor efforts, planning processes, data collection.
- developed an outline with supporting text and images for a StoryMap (through ESRI) that can used to inform NHDOT and others regarding the problem of wildlife vehicular collisions and the many approaches for minimizing wildlife collisions. The outline of relevant information for the StoryMap can be viewed (without imagery) at:
<https://docs.google.com/document/d/1BDHEIBEXJtAv2ZOGBoVloDFylxxEaUhtY3vEV3zixOOQ/edit?usp=sharing>

NHDOT SPR2 PROGRAM

RESEARCH PROGRESS REPORT

- conducted some preliminary analysis of the GIS data to assess how it can be used and identify challenges. I list some of the challenges and our current thoughts on the matter below and, again, welcome your feedback and direction.
 - There are two datasets 2002-2017 IDMS and 2017-2019 Vision. The attributes (columns) do not directly align between the two. We have asked for the metadata and/or a crosswalk so that we can stack the data into one dataset for analysis. Mike Dugas contacted Jim Irwin and his staff but we have not received a response, so we are moving forward best we can.
 - We have identified records from 2017 that are in both datasets and plan to remove duplicate records during consolidation (mainly removing the 2017 IDMS records since VISION is the more contemporary dataset). It seems only 16 records were in IDMS but not VISION so those will be maintained during consolidation.
 - The information that is shared regarding the nature of the collision (CrashType) varies by year. For example, it is only in 2017 that crashes are listed with species specificity [*Black Bear(Animal); Deer(Animal)*]. In all other years, we are limited to "Animal" or "Animal (Other)", which unfortunately could include domestic animals. If there is information recorded to denote that we will remove domestic animal records where possible.
 - Spatial precision is a major limitation of the Crash data. After connecting with a GIS planner at Strafford RPC we learned that many records plot to the centroid (i.e., geographic center) of a municipality. For analyses that require spatial explicit locations (i.e., (coordinates), these records will need to be removed. For analyses that rely on the attributes/information in the crash dataset itself, we will be able to use all records. A summary of centroid locations is provided below. We plan to make these out statewide to identify if/where this is a reoccurring issue. Hopefully that information will inform changes in the data recording or processing step at DMV or DOT.
 - Field names and the data stored is not consistent across datasets. We have reviewed the available data fields in both datasets (IDMS and VISION) and constructed a new schema for the combined data set. This will be the dataset we use to map and analyze spatial and statistical patterns in WVC from 2002-2019. We will share this schema at our TAG meeting in November.

Items needed from NHDOT (i.e., Concurrence, Sub-contract, Assignments, Samples, Testing, etc...):

At this point, we welcome feedback from the project champion and TAG regarding the literature review and full synthesis which is available for review via Google docs at:

https://docs.google.com/document/d/1Wjd8hwlnaFa6kZU_v3KBy-27Wc8c_dI07OJRjUOeH4c/edit?usp=sharing

AND feedback on the content for the StoryMap. We plan to have a functional draft of the StoryMap to share by the end of the fourth quarter (Dec 2021)

Anticipated research next three (3) months:

Over the next quarter we will be focusing our efforts on GIS mapping and spatial analysis of the collision data. Our intention is to provide a summary of maps illustrating spatial and temporal patterns in wildlife vehicular collisions since 2002. This will include visualizations of records for which data collection was less precise (mapping to town centroids rather than accident location) as well as seasonal and annual patterns. We also hope to overlay the combined dataset (IDMS and VISION) with the NHFG Wildlife Action Habitat Maps (and or the Habitat Blocks and Corridors layer produced for the seacoast region and in production for the rest of the state) to evaluate habitat conditions nearest collision hotspots.

Circumstances affecting project:

At this point in time, we feel like we are on track to complete the project within the previously defined period; however, we shifted focus from spatial analysis in the first quarter to literature review while we waited to receive the GIS data and then review and revise it as needed to combine datasets. This is reflected in a decrease in completion % below for GIS related tasks and increase for other tasks.

**NHDOT SPR2 PROGRAM
RESEARCH PROGRESS REPORT**

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
<i>Collect WVC data for NH (2021 Q3)</i>	100%	100%
<i>Create series of static maps (2021 Q3 -Q4)</i>	50%	10%
<i>Conduct literature review and synthesis (2021 Q3-Q4)</i>	50%	85%
<i>Collect ancillary data (2021 Q4 – 2022 Q1)</i>	10%	10%
<i>Creation of ArcGIS Online viewer for WVC data (2021 Q3-Q4)</i>	25%	0%
<i>Statistical analysis of WVC data (2022 Q1-Q2)</i>	0%	0)%
<i>Development of ArcGIS StoryMap (2022 Q1)</i>	0%	20%
<i>Write technical report (2022 Q1-Q4)</i>	0%	15%
<i>Develop short videos (2022 Q2)</i>	0%	0%
<i>Present results (2022 Q4)</i>	0%	0%

Barriers or constraints to implementing research results

As described briefly in progress review, there are inconsistencies in how WVC are reported since 2002. Some inconsistencies relate the specificity of the animal involved and others to the spatial precision of the collision location record. We plan to summarize these concerns so that revisions could be made to initial data collection that would ultimately enhance confidence in the results.