IENE 2016

Integrating Transport Infrastructure with Living Landscapes

Organisers

Cerema

FRB Fondation pour la Recherche sur la Biodiversité

Co-organisers

Ministère de l'Environnement, de l'Énergie et de la Mer

Ministère des Affaires Étrangères

Université Lyon III Jean Moulin

ADEME

IENE 1996 - 2016

20th anniversary

2016 Lyon

August 30th September 2nd, 2016

Lyon - France

IENE 2016

5th IENE International Conference on Ecology and Transportation

August 30th - September 2nd, 2016
Lyon, France

Talk- 1.9

New prevention technologies

The reliability and effectiveness of a radar based animal detection system and road crossing behaviour of large ungulates

Author(s): Marcel Huijser, Brice Sloan

Contact: Marcel Huijser, Western Transportation Institute - Montana State University

E-mail: mhuijser@montana.edu

In many parts of the world the number of collisions with large ungulates is high and increasing. These collisions not only lead to substantial property damage, but also cause human fatalities, human injuries, the death of individual animals and the loss of associated economic values. In addition, some species are also affected on the population level. Over 40 different mitigation measures have been implemented or described to reduce animal-vehicle collisions. However, only wildlife fencing, with or without safe crossing opportunities for wildlife, and animal detection systems have shown that they can substantially reduce collisions with large mammals. Animal detection systems are designed to detect large animals (e.g., deer (Odocoileus sp.), elk (Cervus canadensis) and moose (Alces spp.)) as they approach the road. When an animal is detected, signs are activated to warn drivers that large animals may be on or near the road at that time. Drivers may then reduce vehicle speed, become more attentive, or both, which puts them in a better position to avoid hitting the animals. Starting in 1993, animal detection systems have been installed at dozens of locations throughout Europe and North America. Some of these systems were found to be reliable in detecting large mammals and effective in reducing collisions. However, animal detection systems should still be considered experimental and more research and development is needed before they can be considered reliable and effective without requiring much attention or maintenance. In late 2013 a radar based animal detection system (Sloan Security Technologies, Inc.) was installed along US Hwy 95 in Boundary County, Idaho, USA. In this paper we report on the reliability and effectiveness of this animal detection system as well as the behaviour of large mammals on and near the road. We conducted reliability and effectiveness tests in each season (autumn, winter, spring, and summer in 2015-2016). Each test lasted 10 consecutive days. We investigated the detection logs and matched the detections with images of a thermal camera. This allowed for the identification of correct detections (i.e. a detection occurred and a large mammal was present) and false positives (i.e. a detection occurred but no large mammal was present). In addition, we continuously recorded video images with a thermal camera for 3 randomly selected hours for each test day. We investigated these video images and matched them with the detection log to identify correct detections, false positives and false negatives (i.e. a large mammal was present but it was not detected). Furthermore, we investigated the effectiveness of the system in reducing vehicle speed by forcing the warning signs on for 1 randomly selected hour for each test day. We then investigated whether vehicle speed was lower than during periods when no detections occurred and when the warning signs were not activated. Finally, we used the video images from the thermal camera to investigate road crossing behaviour of large ungulates. The latter is important as it shows how long the warning signs should be activated for after a detection has occurred.