WILDLIFE & ROADWAYS
Examining factors that lead to the successful implementation of wildlife management strategies into Ontario’s road infrastructure

Kristin Elton, M.E.S Candidate
Michael Drescher, Assistant Professor
School of Planning, University of Waterloo, Waterloo, Ont. N2L 3G1

Background/Context
Road Ecology
- Defined as: the study of the interactions between road networks and the natural environment particularly the effects of roads on ecological processes and wildlife populations.
- Southern Ontario’s road network has grown drastically over the past century.
- Increase from 7,133km in 1935 to 35,637km in 1995 and growing.
- No single point in Southern Ontario is more than 1.5km away from a road.
- Has the highest density of roads and people in Canada.

Southern Ontario is home to the highest level of biodiversity in the province.
- 203 species are identified as ‘Species at Risk’ (SAR) as of 2010.
- A large portion of these have been identified as being affected by roads, such as the Jefferson Salamander, Blanding’s Turtle, Eastern Foxsnake, & American Badger.
- Extensive research into the effect of roads on wildlife. These include:
  - Species displacement
  - Habitat destruction & reduced quality
  - Behavioral changes in wildlife
  - Invasive species dispersal
  - Habitat fragmentation & barrier effects
  - Direct wildlife mortality from wildlife-vehicle collisions (WVCs)

Extensive research into the effect of roads on wildlife. These include:
- Southern Ontario is home to the highest level of biodiversity in the province.
- 203 species are identified as ‘Species at Risk’ (SAR) as of 2010.
- A large portion of these have been identified as being affected by roads, such as the Jefferson Salamander, Blanding’s Turtle, Eastern Foxsnake, & American Badger.
- Extensive research into the effect of roads on wildlife. These include:
  - Species displacement
  - Habitat destruction & reduced quality
  - Behavioral changes in wildlife
  - Invasive species dispersal
  - Habitat fragmentation & barrier effects
  - Direct wildlife mortality from wildlife-vehicle collisions (WVCs)

Current Mitigation
Legal Requirements
- Endangered Species Act, 2007, in conjunction with Ontario’s Provincial Policy Statement (PPS) form the legal basis for the protection of Species at Risk in Ontario and their habitats.
- Therefore, any road development threatening these are required by law to provide mitigation.
- No legal requirement for species NOT at risk, but common problems. i.e. deer, moose, raccoons, black bears

Example Management Strategies
- Wildlife Exclusion Fencing
- Caution Signs
- Wildlife crossing structures
- Wildlife Detection System
- Road Closures

Decision-Making Tools
- Mostly scientific based, catering to the ecological side of the issue
- Useful in determining optimal design and location characteristics for various management strategies
- Global Positioning System (GPS) has emerged as a useful tool for predicting problem areas.

E.g. Overlapping wildlife population, road map, and wildlife-vehicle collision data sets to identify the most beneficial location for management.
- Frameworks such as the National Wildlife Crossing Decision Guide Protocol.
- Very little evidence of the consideration of socio-political/ economic factors beyond cost-benefit analyses

Policy Realities
- "Rational analysis, carried on in an ignorance of political reality, may well end up so divorced from social reality as to be of little use to anyone," (Rosenbaum, 1998)
- Barkenbus (1998) discusses how the role of scientific expertise within the policy-making cycle is often overshadowed, and in some cases insignificant, compared to other factors.
  - These include:
    - Inadequate funding & resources
    - Short time frames
    - Special-interest pleading
    - Bureaucratic constraints & priorities
    - Political forces
  - The notion of a ‘rational man’ context- in which environmental decision-makers weigh and decide on policies and technical solutions that best maximize public welfare- rarely exists due to the constraints of political decision-making.

Analysis & Conclusions
- There is a disconnect between the scientific tools available for decision-makers and the political realities of policy-making
- This can be described as a problem of ‘fit’ explained as:
  - “The interplay between the human and ecosystem dimensions in socio-ecological systems that are not just linked by truly integrated,” (Folke et al., 2007)
- Ability of social institutions to make effective decisions is a direct measure of how integrated and connected the biophysical and social informative bodies are.

Therefore, an understanding of the socio-political and economic influences must be combined with the current scientific decision-making tools if road ecology decisions are to be optimized.

Future Work
- The conclusions from this review act as the basis of the ongoing thesis project being conducted.
- The following research question is currently being investigated:

  What are the socio-political and economic determinants for successful incorporation of wildlife management strategies into Ontario road infrastructure projects?

- Will be answered by investigating the development and implementation experiences of decision-makers.
- Goal: use a content analysis approach to develop a model for comprehensive socio-political decision-making for future projects.

National Wildlife Crossing Decision Guide