PhD Advert Template

Project title: Alignment consistency, forward visibility and road safety on undesigned roads

Project ID *(optional)*: *Please leave blank*

Accept all year-round applications

Funding information: Self-funded students only

Project description:

Road traffic crashes are a major cause of injury and premature death in many countries of the world. This problem has received much attention over recent years with actions such as the UN Decade for Road Safety, the development of a safe systems approach to designing safer roads and other initiatives to improve road safety.

Roads that have been designed to modern standards will take into account factors such as dynamic stability of vehicles on curves, safe braking distances and other geometric or physical parameters. However large proportions of the highway network remain undesigned, following historic alignments with no rationale based on modern design parameters. Busier roads tend to attract more funding for improvement, meaning that the minor road network remains unimproved, presenting a higher risk to road users, per mile travelled, than designed or realigned roads.

It has been hypothesised that consistency of alignment parameters could be a method of predicting risky locations where local small-scale improvements could reduce accident risks at a fraction of the cost of realigning whole

sections of highway. An operating speed model is necessary for this type of analysis, to predict drivers’ choice of speed. Input parameters for these studies have, in the past, been geometric factors related to the road layout an dimensions. This study’s hypothesis is that forward visibility could provide a better speed operating model for predicting drivers’ speed choice than current geometry-based models.

Measurement of forward visibility has not been practical in the past, but can now be achieved using new mobile laser scanning and manipulation of the resulting point data. The study could yield an improved speed operating model for use by highway designers and road safety practitioners.

This PhD project will initially investigate the current state of knowledge in highway design consistency analysis. It will also assess the potential use and application of the latest mobile laser scanning techniques to survey the properties of lengths of highway including forward visibility. Through trial surveys, these parameters can then be applied to update current speed operating models, investigate whether forward visibility can be linked to drivers’ choice of speed and to the location of accidents, and devise more reliable consistency criteria to guide investment in road safety.

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References (optional):

Application enquires: Mr Roger Bird, roger.bird@ncl.ac.uk

*https://www.ncl.ac.uk/engineering/staff/profile/rogerbird.html*

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Geography

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