

An Indian-Australian research partnership

Project Title:	Driver Performance Based Safety Evaluation of Highway Geometry	
Project Number	IMURA0760	
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Research Clusters:

Research Themes:

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8 HSS, Design, Management	8 Design

The research problem

Understanding driver performance is important for safety evaluation of highway geometry. In rural highways, driver performance depends on their perception of the driving environment and can be assessed using various performance measures related to vehicle dynamics such as speed, acceleration/deceleration rate, steering effort, brake application rate and vehicle off tracking. However, the use of these performance measures to evaluate highway geometric design and highway safety remains unexplored. This project aims to fill the gap by conducting a comprehensive study of vehicle dynamics in four-lane median divided highway facilities and correlate it with highway geometric features using advanced analytics such as machine learning, artificial intelligence or deep learning. Required data would be obtained from field as well as available driving simulators at IIT Bombay and Monash University.

Project aims

- The primary aims of this project are:
1. Understand the effect of highway geometry on various performance measures related to vehicle dynamics.
 2. Develop correlation between performance measures related to vehicle dynamics and highway geometry.
 3. Develop proactive highway geometric design evaluation criteria for safety.

Expected outcomes

The expected outcomes are as follows:

1. A comprehensive highway safety evaluation model based on vehicle dynamics.
2. Highway geometric design guideline based on driver performance.

How will the project address the Goals of the above Themes?

- The highway safety model and the highway geometric design guideline would help in developing safer highway infrastructure. It can provide proactive safety evaluation of newly designed highway infrastructure and reduce post construction cost.
- Application of advanced analytics in the project would help in initiating advanced computational method in the field of performance based highway infrastructure design.

Capabilities and Degrees Required

The ideal set of capabilities of a student for this project are:

- Knowledge of highway geometric design
- Understanding of vehicle dynamics
- Experience in computer programming and software
- Exposure in advanced analytics

Potential Collaborators

Potential collaborators are already identified as follows:

Monash University: Prof. Hai L. Vu
IIT Bombay: Prof. Avijit Maji

Select up to **(4)** keywords from the Academy's approved keyword list (**available at <http://www.iitbmonash.org/becoming-a-research-supervisor/>**) relating to this project to make it easier for the students to apply.

Transportation; Next Generation Infrastructure; Data Science; Modelling