



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : **Ph.D.**

Thesis Title: **Analysis and Modeling of Vehicular Movement in no-lane-disciplined Heterogeneous Traffic Stream**

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SHORT ABSTRACT

Solutions to prevailing traffic conditions in the cities of developing countries can be either in terms of efficient traffic management and operational strategies or by expanding the existing infrastructure according to the growing requirements. Both strategies cannot be implemented without using suitable traffic flow models. Based on the empirical observations it has been found that one of the important characteristics of no-lane-disciplined heterogeneous traffic is the variable lateral gap maintaining behavior of different types of vehicles. Logistic regression model has been used to model this behavior.

Modified cellular automata (CA) based microscopic traffic simulation model incorporating the variable lateral gap maintaining behavior of the vehicle has been developed. Updating procedures and the corresponding parameters of the current CA model is modified in accordance with the modified cell structure. The movement of vehicles is characterized by the finer lateral movements. To represent this behavior the road section was divided into multiple sub-lanes in terms of finer cells. With the help of finer cell structure, gradual lateral shifting has been introduced in the present model.

The developed model has been validated at macroscopic and microscopic levels. Model has also been validated by comparing the observed and simulated queue formation and dissipation characteristics. The developed model has been used to analyze the effect of two-lane road width being used in urban regions. It has been observed that slight changes in the road width, between 6.9 to 8.4 m, significantly influence the traffic stream behavior.