



## Methodology for finding optimum cell size for a grid based cellular automata traffic flow model

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### Abstract

A methodology for determining optimum cell size for a grid based traffic flow model for heterogeneous traffic is proposed in this paper. The cell size is an important factor to determine as it affects the computational efficiency and model accuracy. The objective function minimizes three aspects namely the difference of distance headway in case of cellular automata and grid based traffic flow model, the total number of cells to represent different types of vehicles and multiple of cell width that gives closer representation of the different road widths. The presented method is found better than the previous attempt which tries to find the cell size by trial and error.

*Keywords:* Heterogeneous traffic flow; Simulation; Grid based approach; Cellular Automata.

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### Introduction

Deciding a cell size is crucial for the cell-based simulation approach. In the present study, a systematic approach is given to decide the cell size in cellular automata based modelling for heterogeneous traffic flow. In this model, size of the cell is carefully decided according to the types of vehicle. It is decided in such a way that it represents the actual size of vehicles and the total width of the road as close as possible. The physical representation of the vehicle should be kept slightly more than the actual size of vehicle to provide some clearance. The cell length also depends upon the dynamic characteristics of the vehicular movement, as in the cellular automata, distance-headway and speed is considered in terms of number of cells. The cellular automata (CA) traffic flow model developed by Nagel and Schreckenberg (1992) is used for comparison of

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