

# Mixed Traffic Flow Management Condensing the Impact of the Air Pollution

## Project Leader

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## Faculty Members Involved in this Project

None

### 1. Objective

#### **This project is aimed at:**

investigation of road traffic management schemes, considering their impact on air pollution under mixed traffic conditions in which passenger cars, trucks and motorcycle all use a given section of road. In particular, this project focusses on the evaluation of road network performance of whole cities, from a macroscopic point of view, in eastern Asian countries in which the population and economy are both expanding. Therefore, a macroscopic mixed traffic flow model will be formulated, and a scheme to improve traffic conditions and reduce air pollution will be proposed by evaluation of road network performance based on the model developed in this project.

### 2. Project Outline

#### **To that end, the project will consist of the following phases:**

- (a) Development of a macroscopic mixed traffic flow model
- (b) Estimation of road traffic network performance considering both traffic congestion and air pollution
- (c) Propose a road network management scheme for mixed traffic conditions, such as motorcycle lane network design, and traffic signal control planning
- (d) Evaluation of the impact of air pollution issues when implementing the proposed road network management scheme

### 3. Expected Performance

#### **In this project, the successful candidate would be expected to:**

- (a) Work independently to establish a hypothesis, develop the model, and evaluate road network management
- (b) Provide supervision for mixed traffic road management

### 4. Required Skills and Knowledge

#### **The successful candidate for this project will have the following knowledge and skills:**

- (a) Knowledge on Traffic engineering, infrastructure planning and statistics
- (b) Programming skills and knowledge of relevant computer technologies, including Python, R, and SPSS

## References

- 1) Hiroaki Nishiuchi, Yasuhiro Shiomi, Kazushi Sano and Tomoki Watanabe : Revisiting Fundamental Characteristics of Mixed Traffic Flow; Focusing on Interactions between Passenger Cars and Motorcycles, Internet Journal of Society of Social Management Systems, Vol.1, pp.79-85, 2016.
- 2) Yasuhiro Shiomi, Hiroaki Nishiuchi and Toshio Yoshii: Mode Classification for Mixed Traffic Flow Based on Smart Phone Data, Journal of the Eastern Asia Society for Transportation Studies, Vol. 11, pp.1970-

- 1981, 2015.
- 3) Hiroaki Nishiuchi, Yasuhiro Shiomi and Hiroshi Warita : A new concept to evaluate road traffic capacity based on number of passengers in vehicle: Case application of Tokyo Metropolitan Expressway, Proceedings of the Eastern Asia Society for Transportation Studies, online, Vol.10, 2015.
  - 4) Yasuhiro Shiomi and Hiroaki Nishiuchi : Evaluation of Spatial Motorcycle Segregation at Isolated Signalized Intersections Considering Traffic Flow Conditions, Journal of the Eastern Asia Society for Transportation Studies, Vol.8, pp1644-1659, 2011.

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**Contact**

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