Oguchi & Tanaka Lab

[Research on Road Traffic and Traffic Simulation]

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Study field ●Traffic Engineering
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Our laboratory studies on road traffic phenomena and problems including traffic congestion as well as environmental problems. We approach and analyze those issues from various aspects based on fundamental theories of traffic engineering and traffic data collected by various sensors, propose new traffic management methods or policies, and evaluate their effects by traffic simulation.

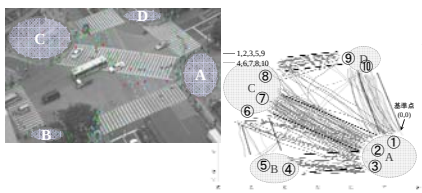
1. Development of Policy-Assessment Tools

We develop various traffic simulation models to analyze temporally-dynamic traffic phenomena, such as congestion, with high accuracy.

Application of AVENUE &

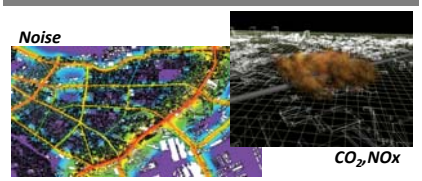
Using two simulation models of different scales, traffic simulations for both local and wide-area are available.

Developing pedestrian flow



For design and assessment of pedestrian space, microscopic simulation and route choice model of pedestrians are developed.

Developing environment assessment tool

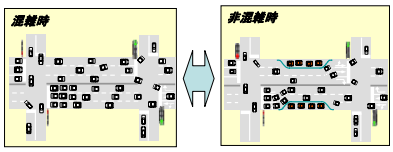


With integration of traffic simulation, CO_2 and NO_x emission model, and street noise model, a comprehensive road-environment assessment tool is developed.

2. Traffic Management for Sustainable Urban Environment

We investigate various traffic management methods for efficient and safe traffic flow.

Efficient road-space utilization

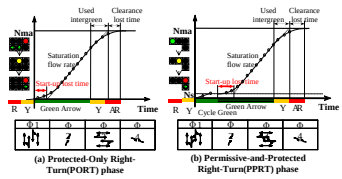


To enhance road facilities' social utility, we propose efficient road-space design and operation methods satisfying both traffic safety and smooth traffic flow.

Temporal and spatial dispersion of road traffic demand

We propose and evaluate mobility management method which temporally and spatially disperses road traffic demand by driver's spontaneous participation.

Signal control



We propose signal control algorithms using ITS sensing technology, carry out its validation, and evaluate its lost time.

3. Research and Data Development for Better Road Traffic Society

We study on road design methods and travel time prediction to improve road service quality.

Performance-based road design

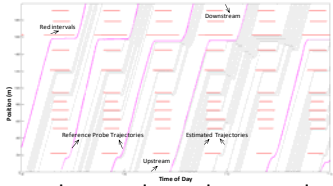
Performance-based design is a road design concept to check whether the expected traffic performance under the given road-geometric and traffic conditions is satisfied with the desired performance determined by the objective and the function of the road and to reflect that on the design.

We propose a new concept toward Performance-based road design and planning.

International traffic database

We develop and maintain an international traffic data warehouse to gather and share traffic data collected around the world.

Developing data fusion



Using probe-car data, detector data, and signal control data together (data fusion) based on a traffic flow theory, we estimate trajectories of all vehicles on a corridor.