Transport Research at Monash (TR@M) Workshop

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Table of contents

1. Previous researches
2. Current researches
3. Future research areas
Previous Researches

- Development of a micro-simulation program to study traffic operation
- Utilizing driving simulator to study traffic operation at merging areas
- Intelligent transport systems
- Application of GPS and intelligent probe vehicle to traffic monitoring and managements
Development of a micro-simulation program to study traffic operation at merging sections
Continued…

1. Macroscopic study
2. Microscopic study
3. Simulation model
4. Experimental car
5. Developing strategy

Validation and calibration

Driving simulator
Applications

- Operational strategy developments
- Lane changing restriction
- Freight operation
- ITS applications
Applications: Operational strategy developments
Utilizing driving simulator to study traffic operation at merging areas

Objective: To make a link between a micro-simulation and a driving simulator to examine the differences between simulator’s driving behavior and one in the real world at the time of merging.
Continued…

FMCSP Control Unit

Start of FMCSP

Initialization of FMCSP

FMCSP generation of vehicles

Substituting one vehicle with DS and passing its control to DS driver

Getting the coordination (x,y), speed and acceleration of each vehicle in FMCSP

$t = t + \Delta t$

Adjusting the speed of vehicles affected by the motion of DS in FMCSP based on FMCSP car-following model

DS unit

Image of all vehicles in DS screen

DS driver’s station

DS driver adjusts his speed according to the surrounding FMCSP vehicles shown in DS screen

Getting the coordination (x,y), speed and acceleration of DS

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Driving simulator configuration

120-inch screen

Video projector

Onyx Reality System

Driver's seat

Flow of data
Some images of driving simulator
Intelligent transport systems

- Effect of AHC on sag bottlenecks utilizing micro-simulations
- ETC studies
- AHS car-following algorithm study
Continued…
Application of GPS and intelligent probe vehicle to traffic monitoring and managements

- Developing a methodology for data cleansing of probe car to determine trip OD
- To establish a general methodology to identify different traffic conditions in network using intelligent probe vehicles
Table of contents

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Current Researches

- Driving behavior at weaving section under congested condition
- Development of an instrumented vehicle to study driving behavior during complicated maneuvers
- Travel time prediction utilizing AVI (automatic vehicle identification) data
- Comparing analytical and micro-simulation models for roundabout capacity and performance estimation
Future researches (with high potential of collaboration)

- Development of an image processing technique
- Vehicle identification and tracking system
Application:

- Freeway lead vehicle
- Freeway lag vehicle
- Ramp merging vehicle
Tracking system