

Can traffic stability be the pivot in enhancing the efficiency and safety of mixed environment ?



Problem description

Road safety and efficiency are critical components in traffic engineering. Given this, current traffic studies proved that both safety and efficiency depend on each other. With an increase in stream speed, traffic efficiency can be improved, and safety gets deteriorated and vice versa. However, at the same time, traffic string stability is a pivot in balancing safety and efficiency, where improved traffic stability brings ordered traffic movements, thus enhancing the safety and efficiency of the traffic stream. Sensing this, researchers in the past have worked on numerous concepts to gauge and model traffic stability. Researchers heavily focused on autonomous vehicles and their impacts on the traffic stream in the present context. As a result, various surrogate safety measures are employed to assess the safety and tracing the traffic efficiencies over the study sections. However, on the other hand, given the combination of autonomous vehicles and human-driven vehicles, string stability plays a balancing force in regulating safety and efficiency. Given this, grading the stability would certainly help in identifying the enhancements of the safety and efficiency of the road spaces.

Assignment

- Review of the state-of-the-art on car following and stability concepts and highlight the limitations of traffic stream stability
- Modeling the mixed traffic with the present traffic microsimulation tools (VISSIM, SUMO etc.) with some externalities
- Perform trajectory level analysis and assess the stability criteria in mixed traffic scenario
- Writing a thesis report (and optionally a scientific paper for international journal).

Research group

Transport & Planning

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Information

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