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<div align="center">論 文 内 容 要 旨</div>

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学位論文題目	Safety Performance Assessment of Car Following Behavior using Integrated Weigh-In-Motion System 統合型車両重量自動計測システムを用いた追従交通流の安全性評価

内容要旨

This study attempts to propose a safety performance assessment using empirical-simulation technique. What is meant by empirical-simulation technique is empirical data will be compared with a safety indicator which is determined using simulated data. More specifically, empirical data such as time gap together with vehicle characteristics will be compared with a new proposed safety indicator named Minimum Safe Time Gap (MSTG) to investigate the behavior of drivers in a car following situation on a specific road segment.

The new safety indicator, MSTG incorporates vehicle and driver capabilities in calculating critical safe car following time gap for various leader-follower compositions. A critical safe following time gap is the time required by the following vehicle (FV) to safely stop without hitting the leading vehicle (LV) in an emergency stop situation. This new indicator is derived as a function of vehicle braking time and driver perception-reaction time. The braking time for vehicles for various gross vehicle weight, vehicle type and speed is determined using well-known and established vehicle dynamics simulation software.

The success of the proposed method is dependent not only on a realistic safety indicator, but also on the availability of the data-collection system to provide necessary traffic and vehicle data continuously and automatically in real-time.

As such, empirical data from an integrated weigh-in-motion (WIM) system is used in this study. The integrated WIM system is a comprehensive and continuous traffic data-collection system based on weigh-in-motion technology. This system is capable of simultaneously and continuously measuring large amount of all essential traffic data and vehicle parameters in real-time.

Through this empirical-simulation technique, the concept of safe vehicle-following behavior where actual time gap is more than MSTG, and unsafe vehicle-following behavior where actual time gap is less than MSTG can be explained through the sketch of the empirical-simulation plot. From this plot, the frequency of unsafe behavior and the degree of unsafe behavior referred to as "unsafe occurrence" and "unsafe deviation" indices on specific road segments can be assessed.

In summary, the close car following behavior at any particular road segment that need to be examined can be characterized through the proposed safety performance assessment and more importantly it may provide a realistic approach for various agencies to identify and mitigate problems related to rear-end crashes.