講演番号	203

A study of ADS safety assessment methodology using near-miss data on logistics trucks

Shoji Ito[1)] **Hideo Inoue**[1)]

1) Kanagawa Institute of Technology Vehicle Resarch Institute Promotion Organization of Technological Education and Research
1030 Shimoogino, Atugishi, Kanagawa, 243-0329, Japan

KEY WORDS: **Safety、Intelligent vehicle、** Near-miss analysis (C1)

Active international discussions are underway regarding effective safety assessment methods for Level 3 and higher automated driving systems (L3+ADS) , including the development of ISO standards and international regulations. While functional safety (ISO 26262) covers specific product development processes and the implementation of safety assessment methods, SOTIF (ISO/PAS 21448:2022), which addresses risks arising from unintended behavior, complements areas not covered by ISO 26262; however, it lacks the methodology necessary to establish quantitative safety verification.

Against this Background, as part of the FY2025 Digital Lifeline Development Project, we utilized near-miss data from approximately 400,000 km of dashcam videos collected from logistics trucks traveling on highways. Based on this data, we formulated a draft of an "Framework for Generating Micro/Macro Risk Scenarios and Safety Assessment Methods Using Simulation."

In this paper, to enable quantitative analysis of driving risks, we introduced Safety Cushion Time (SCT) as an indicator for evaluating Dynamic Driving Tasks (DDT). We used SCT to analyze near-miss data and reproduced risks in complex traffic flows as scenarios to verify the effectiveness of statistical safety evaluation methods.

Figure 1 shows the pipeline of the "Framework for Generating Micro/Macro Risk Scenarios and Safety Assessment Methods Using Simulation". Risk scenarios used for safety assessments addressing "known hazards" in SOTIF are extracted and generated using two methods. The first is the micro-evaluation method, which analyzes a large volume of near-miss driving data and utilizes the quantitative SCT (Safety Cushion Time) metric to extract data with high quantitative risk, thereby creating risk scenarios. The second is the macro-evaluation method, which simulates natural traffic flow in a simulation environment. It is assumed that this simulation will yield edge cases and corner cases that are statistically unlikely to occur under normal conditions, and these are extracted as risk scenarios.
The risk scenarios extracted using these two methods are loaded into the simulation to evaluate the driving behavior of the autonomous vehicle.

This paper describes a method for creating specific risk scenarios for micro- and macro-level assessments based on near-miss data.

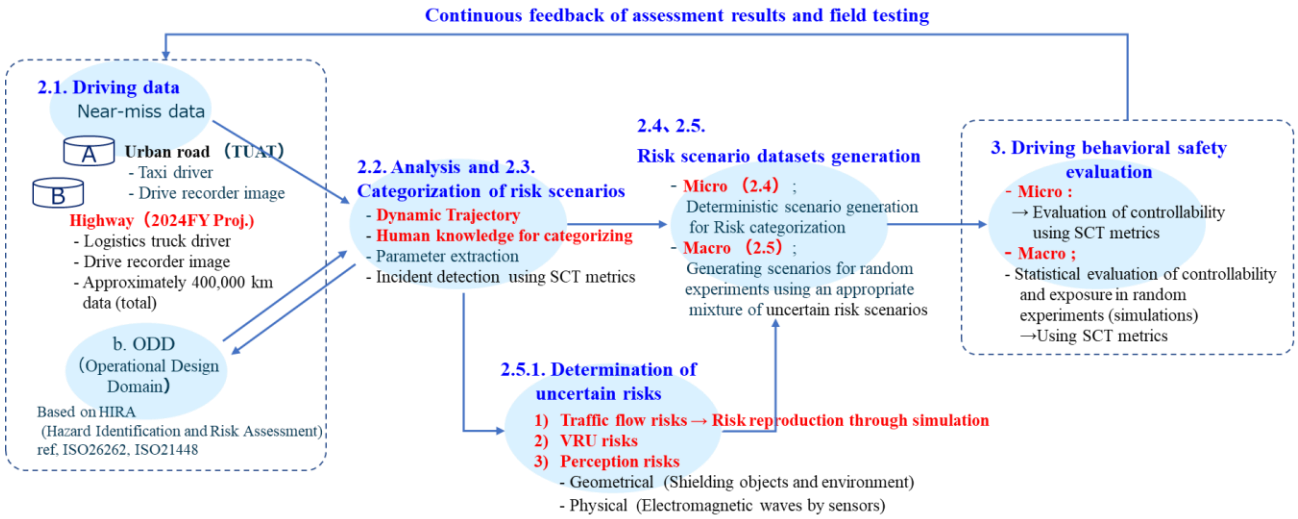

Fig.1 Framework for Generating Micro/Macro Risk Scenarios and Safety Assessment Methods Using Simulation