

**AN EVALUATION OF ROAD ACCIDENT FACTORS USING  
FERMATEAN FUZZY STEPWISE WEIGHT ASSESMENT RATIO  
ANALYSIS (SWARA)**

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## **ABSTRACT**

This study investigates the factors contributing to road accidents in the Melaka Tengah district, utilizing the Fermatean Fuzzy Stepwise Weight Assessment Ratio Analysis (SWARA) methodology. The focus is on factors influenced by human behavior, including over-speeding, fatigue, drunk driving, use of mobile phones, disobeying traffic lights, changing lanes without signaling, and failure to maintain a safe gap. Data were collected from six experts, comprising police officers from the traffic department, through interviews and questionnaires to evaluate and rank the seven critical road accident factors.

The findings reveal that drunk driving and disobeying traffic lights were identified as the most critical factors contributing to road accidents, each carrying the highest weight of 0.144507. Otherwise, the use of mobile phone was determined to be the least significant factor, with a weight of 0.142889. This study demonstrates the effectiveness of the Fermatean Fuzzy SWARA methodology in managing decision-making under uncertainty. By addressing these road accident factors, it may raise awareness among drivers about road safety and help reduce the occurrence of road accidents.

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