The field of car safety has recently received a lot of scientific attention. The increased integration of technology into our automobiles is the cause of this increased interest. Numerous techniques for characterizing driver behavior have surfaced within the research community. These procedures frequently begin by assembling a number of elements from the vehicle. These approaches heavily rely on machine learning as their main strategy. However, as is well documented in the body of research already in existence, these solutions face a number of challenges, partially as a result of the diversity of situations and also because they are unable to transparently justify the precise predictions they make. To overcome these limitations, in this thesis explores the identification of driver behavior through the application of formal methods. The research utilizes a data set collected from a driver simulator, encompassing various driving parameters such as accelerator pedal input, brake pedal input, environmental impact metrics, and fuel efficiency data. The study focuses on the development and validation of formal models, particularly Linear Temporal Logic (LTL), to capture and analyze driver behavior patterns. Furthermore, the research assesses the implications of identified driver behaviors on factors such as CO_2 emissions, fuel consumption, and cost-effectiveness. The findings contribute to the enhancement of road safety, environmental sustainability, and transportation efficiency.