Traffic control systems play a critical role in maintaining the safety and efficiency of modern transportation networks. This thesis proposes the formal verification of traffic control systems using the SafeCap tool and the Computational Tree Logic (CTL) language. Formal verification is a systematic methodology for mathematically proving that a system meets its specified requirements. SafeCap is a powerful tool for formal verification, enabling engineers to model and analyze complex systems. CTL, a temporal logic, provides a framework for expressing and checking temporal properties of systems. The primary objective of this research is to develop a formal model of a traffic control system, representing its components, behavior, and operational constraints. We will then use SafeCap to perform formal verification on the model, checking it against safety and liveness properties specified using CTL. This process will ensure that the traffic control system behaves correctly, adhering to traffic laws, minimizing congestion, and responding appropriately to various traffic scenarios. The expected outcomes of this research include the identification and elimination of potential safety hazards within traffic control systems, as well as the verification of system correctness, leading to increased public safety and improved traffic flow.