

Traffic Signal Management & Control System Based on Density of Vehicles and Emergency Vehicles

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Objective

- To monitor the number of vehicles at an intersection in real time.
- To adjust traffic light timings dynamically.
- To manually override the automated system in case of emergencies or special events
- To allow a smoother flow of vehicles through multiple intersections, especially during peak traffic hours.

Contributions

- Reduce traffic congestion and emissions.
- Improve emergency response times.
- Enhance safety and efficiency in transportation.
- Positively impact society as a whole.

Complex Eng. Characteristics

- P1: Depth of Knowledge
- P2: Range of Conflicting Requirements
- P3: Depth of Analysis
- P4: Familiarity of Issues
- P5: Interdependence

Complex Eng. Activities

- A1: Range of resources
- A2: Level of Interaction
- A4: Consequences for society and the environment
- A5: Familiarity

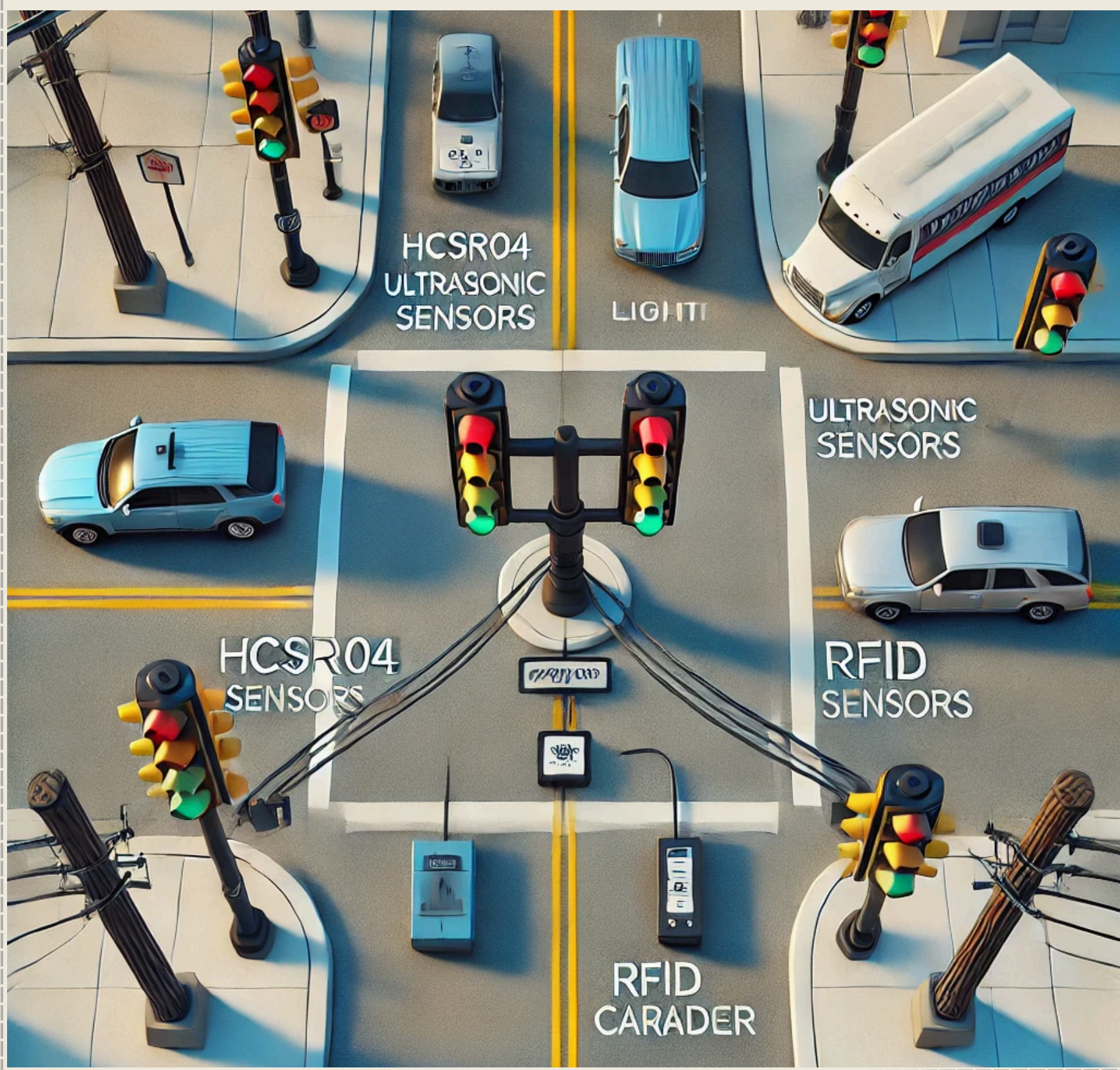
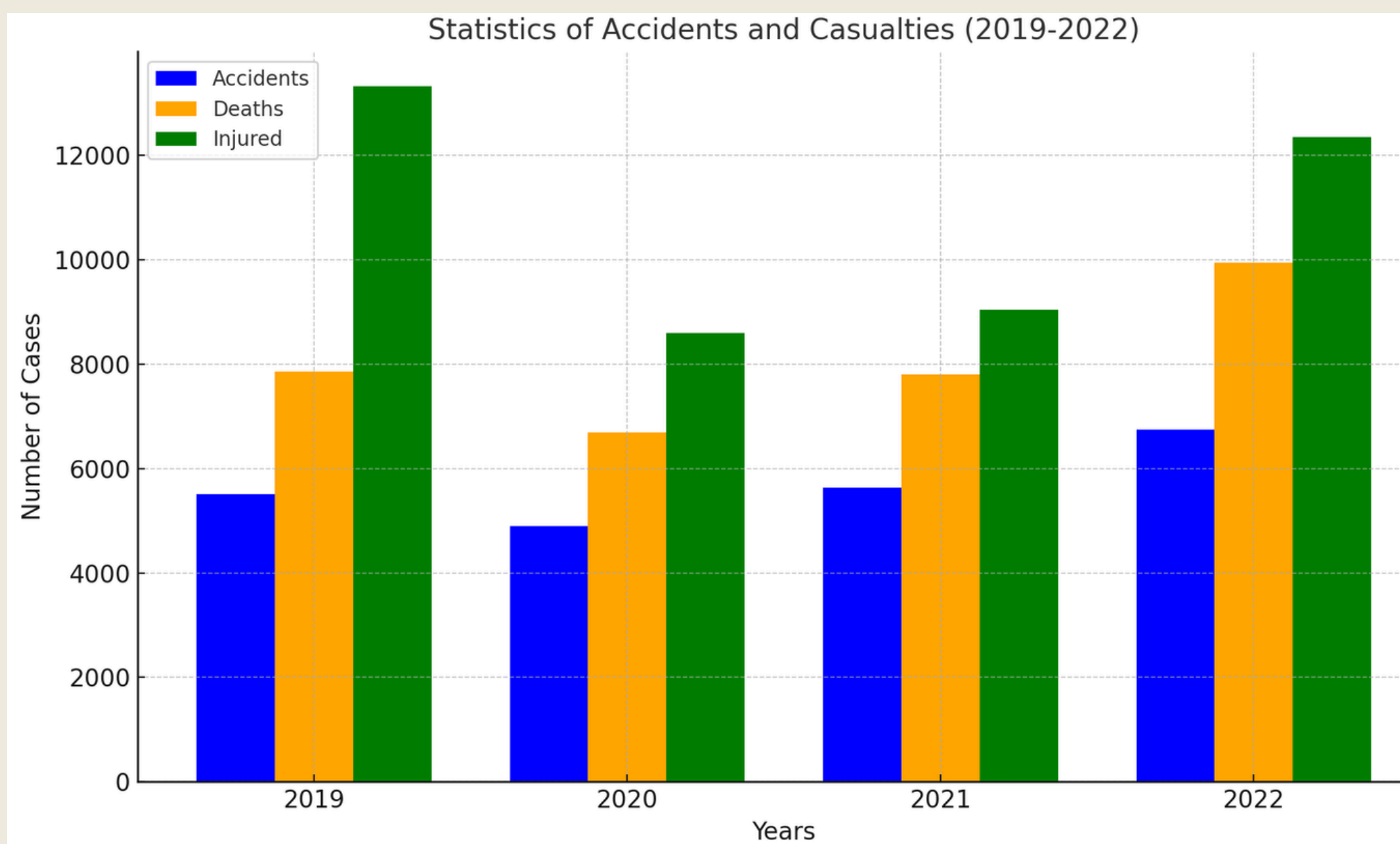
Background and Motivation

Adjusts signals based on real-time traffic density.

Reduces congestion, delays, and emissions

Prioritizes emergency vehicles for swift passage.

Enhances road safety and aligns with smart city goals.



Apparatus

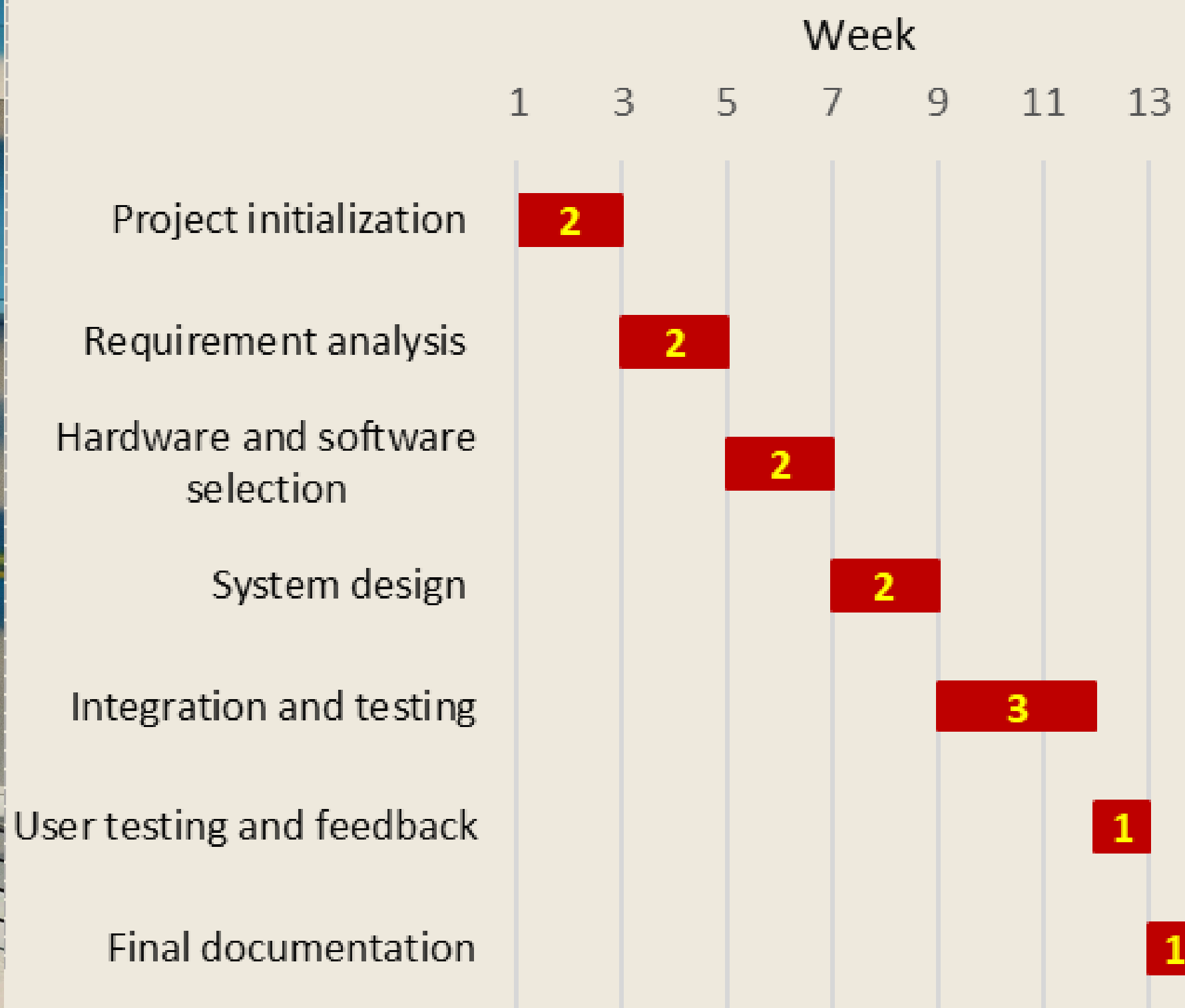
- Arduino mega 2560
- Arduino nano
- HC SR04 Ultrasonic sensor
- RFID RC-522 module
- RFID Tags
- Signal light Module PCB
- 74HC595

Software Environment: Arduino IDE
Estimated Cost: 4000 BDT(nearly)

Future Aspects

- Smart City Integration: Centralized traffic management.
- Enhanced Detection: Improved sensors and cameras.

Work Timeline



Methodology

