PROJECT SCOPE

Smart Traffic Light

The Arduino-based smart traffic light project consists of a system that operates based on the volume of vehicles on the road. It comprises a 60x60 cm model representing a city intersection. The streets will be one-way, with a traffic light assigned to each. The city will be represented by buildings, a grassy area, and houses. A support structure will be created at the base of the model to provide space for housing the Arduino and breadboard. Wiring will be routed through poles, buildings, or other decorative elements to keep it concealed.

The traffic lights will use standard red, yellow, and green LEDs. The detection system will rely on an IR obstacle sensor, soldered and connected to the Arduino. This sensor will be mounted on the pole next to the traffic light, tilted slightly upwards to avoid detection at the pedestrian crossing. Consequently, it will detect vehicles and trigger the corresponding traffic light function; if no vehicles are present, the light will remain red. If vehicles are present on both streets, the traffic lights will operate in the conventional manner.

The model's base will be made of Styrofoam, featuring synthetic grass and buildings constructed from recycled materials. The streets will feature decorative lamp posts, and the asphalt will be represented by gray EVA foam. For simulation, testing, and presentation purposes, toy cars (such as Hot Wheels) will be used to demonstrate the traffic light's operation.