

Aavishkar

Inter-Collegiate/Institute/Department Research Convention

Category:5

Level: UG

Life Under Wheels: Smart Animal Safety System

Slot No:

Life Under Wheels:

Smart Animal

Safety System



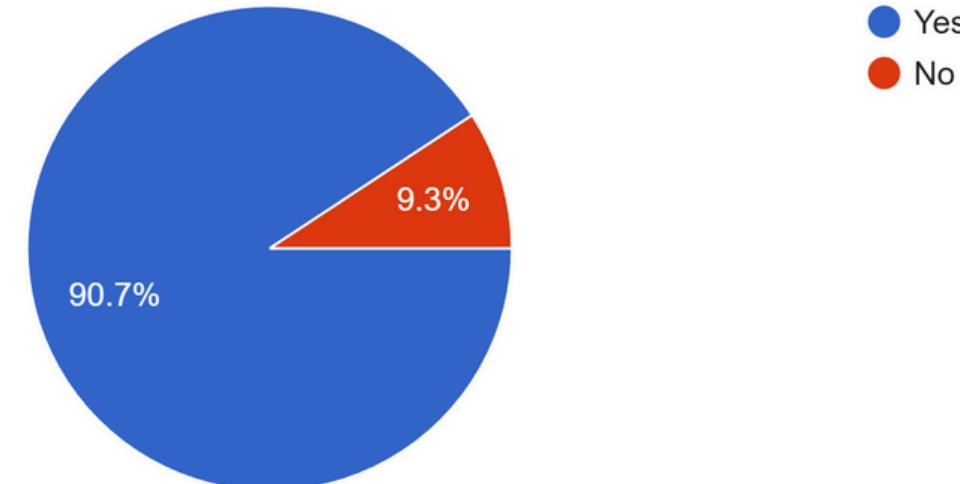
Gap Analysis:

- *The current methods (manual checking, horns, and phone flashlights) are reactive and unreliable.*
- *Road vs. Parking: Current detection systems focus almost entirely on animals above ground or crossing highways.*
- *Under-Vehicle Blind Spot: These roadside devices fail to handle the significant issue of small animals hiding inside a parked vehicle's undercarriage.*



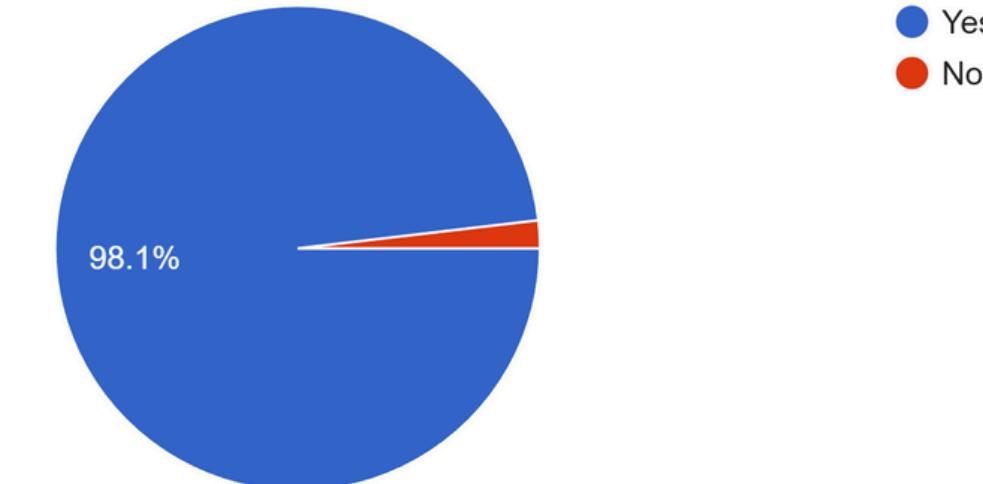
Have you ever seen or heard of animals hiding under parked vehicles?

54 responses



Would You support a system that alerts if an animal is under your vehicle?

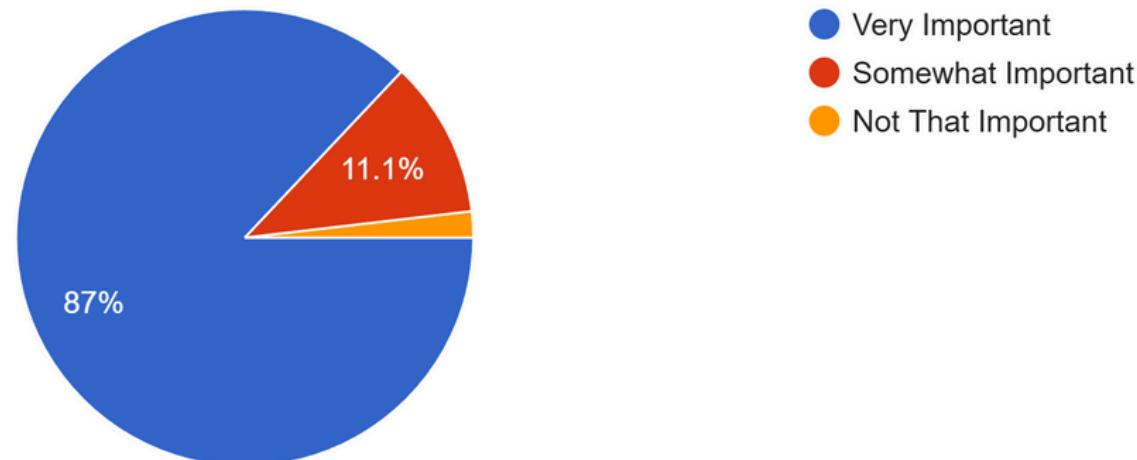
54 responses



Survey

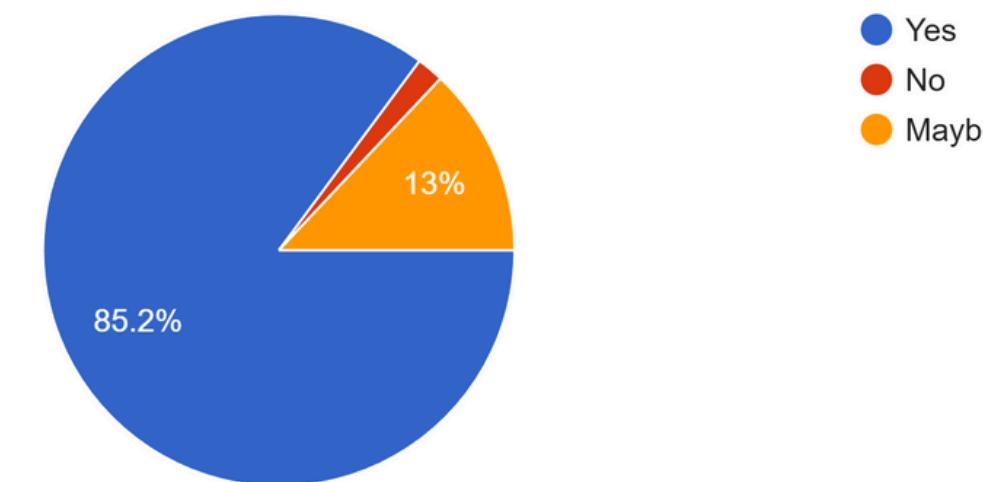
How important is it for the system to work on both two-wheelers and four-wheelers?

54 responses

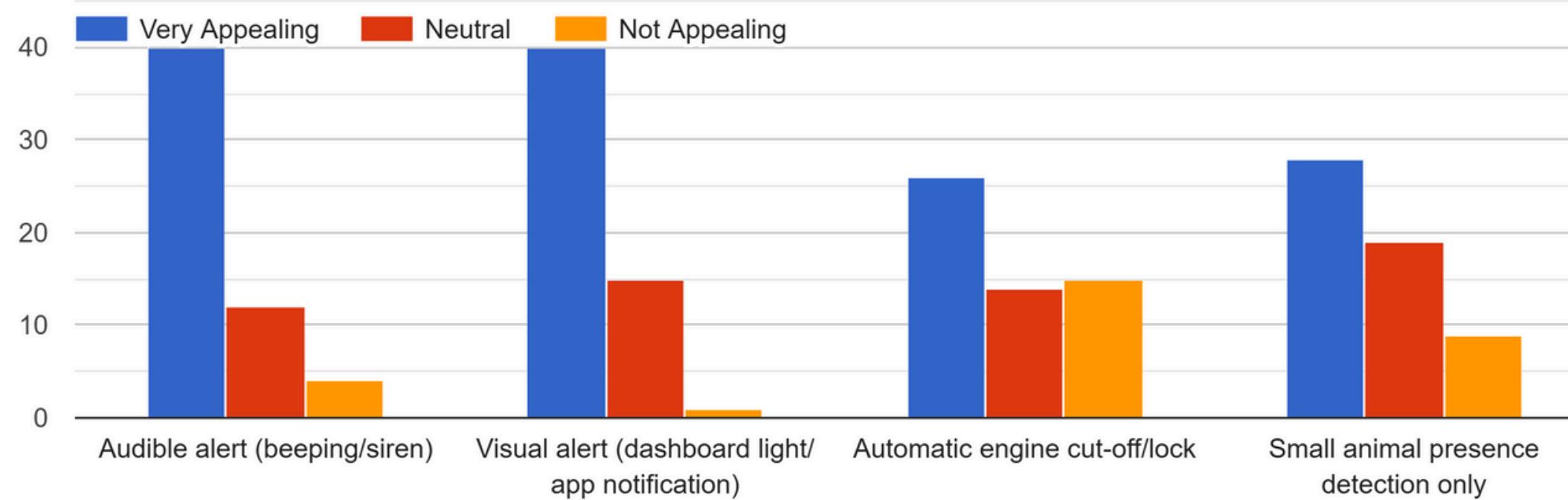


Do you think implementing such a system can reduce animal accidents significantly?

54 responses

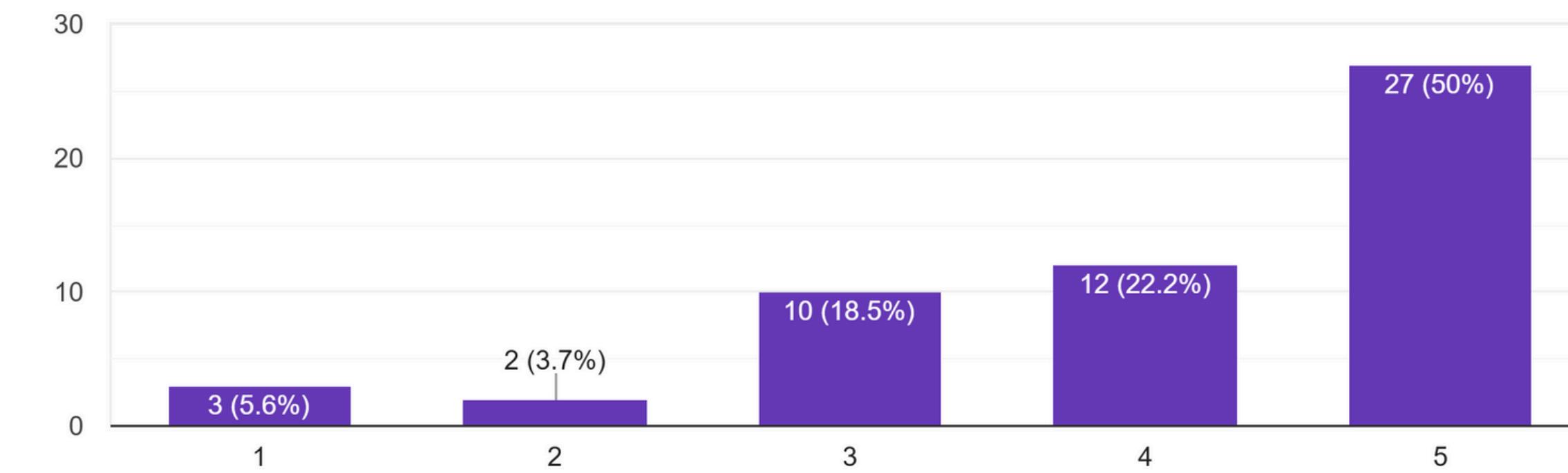


Which potential features of a safety system are most appealing to you?



How concerned are you about the safety of animals near vehicles?

54 responses



Objective:

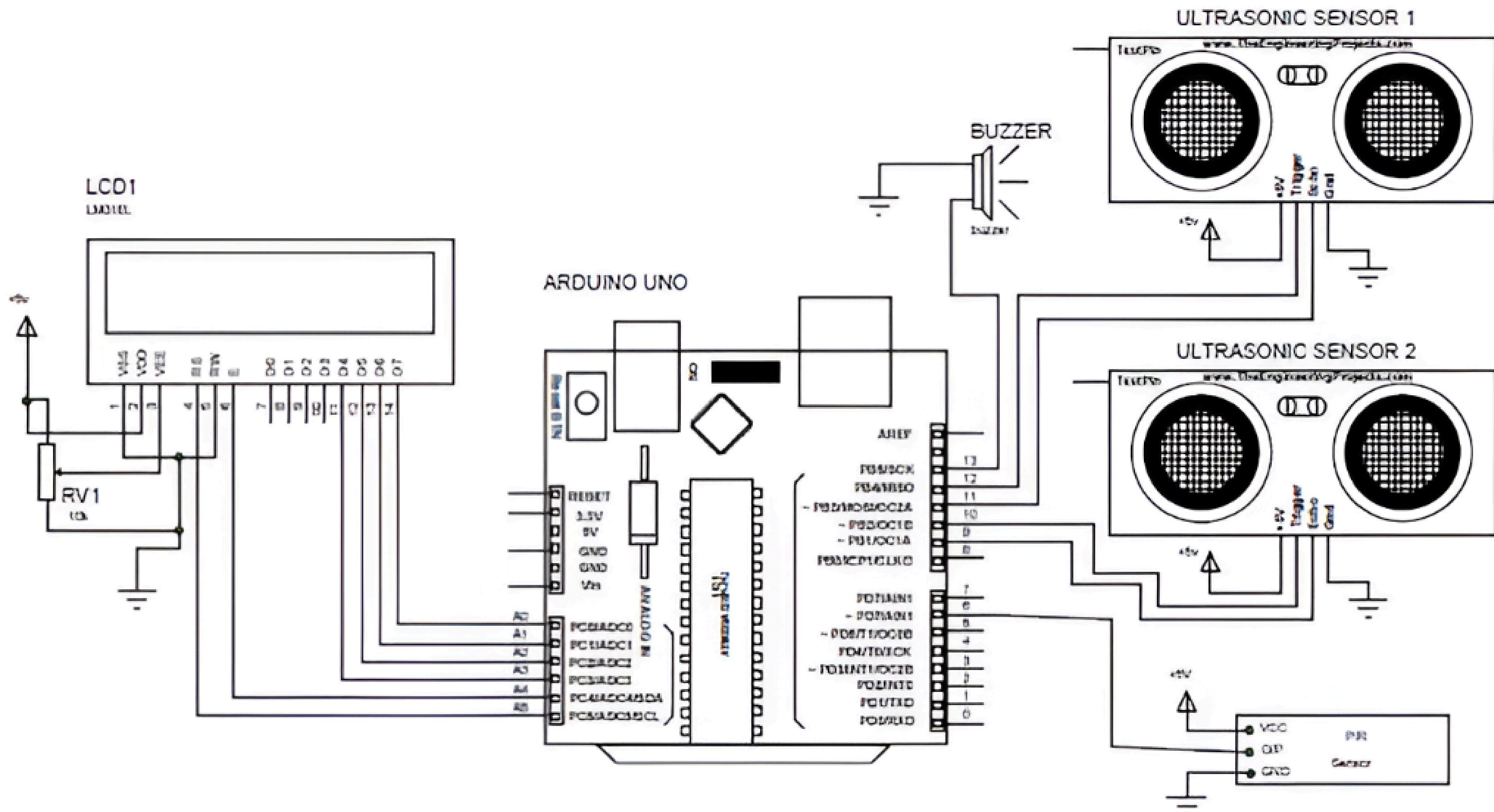
- *To address the issue of animals hiding under vehicles.*
- *To reduce the risk of unnoticed animal-related accidents.*
- *To add a sensor-based system that detects animals and alerts the driver.*

Components:

- PIR Sensor – Detects movement
- UltraSonic Sensors - Distance Measurement
- Arduino Uno – Processes data
- Thermal Sensor – Detects body heat
- Buzzer – Audible alert
- LED - Light Alert
- LCD – Displays status
- Battery – Powers system
- Housing/Brackets – Protection & mounting

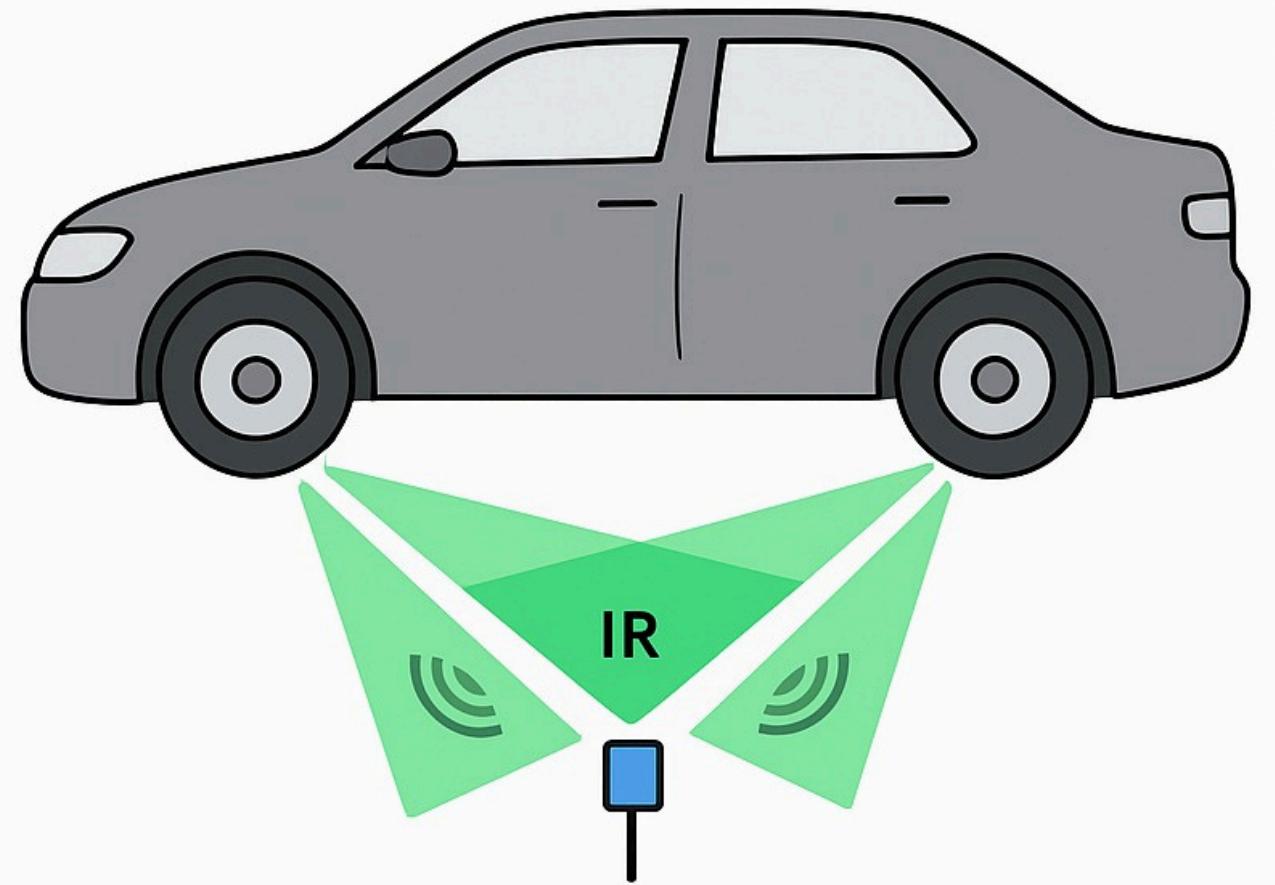


Working/Circuit diagram



Positioning

Vehicle Animal Detection & Safety System



Four-wheeler



Two-wheeler

Positioning



Future Scope:

- *Full vehicle integration with ignition interlock (OEM collaboration).*
- *Thermal imaging with AI-based detection and classification.*
- *Community-level fixed sensor units in parking areas.*
- *Wireless alerts via mobile app (IoT/Bluetooth).*



Costing

Component	Estimated Quantity (Car)	Unit Cost (₹ INR)	Total Cost (₹ INR)	Notes
Microcontroller	1	₹450	₹450	Arduino Uno R3 or compatible module (e.g., clone).
PIR Sensor (HC-SR501)	2	₹80	₹160	Standard module for motion/heat detection.
IR Proximity Sensor	1	₹50	₹50	Close-range presence confirmation.
Thermal Sensor (MLX90614)	1	₹500	₹500	High-accuracy non-contact temperature sensor.
Buzzer/Speaker	1	₹40	₹40	For audible alert.
LCD Display (16x2 I2C)	1	₹250	₹250	For visual status display.
LEDs (Status)	2	₹5	₹10	Small indicator lights.
Voltage Regulator	1	₹70	₹70	Module to safely convert vehicle's 12V to 5V.
Housing/PCB/Brackets	1 set	₹800	₹800	Waterproof casing, custom PCB for connections, and mounting
Wiring & Connectors	1 lot	₹200	₹200	Wires, small passive components, and automobile connectors.
Total Estimated Material Cost			₹2,530	

Conclusion:

The Vehicle Animal Detection & Safety System is a safe, usable prototype that tackles a real-world problem. It accurately identifies animals beneath cars while preventing engine-heat problems thanks to clever sensor fusion and strategic positioning. It is suitable for both 2- and 4-wheelers and has great potential for future advancements like IoT, AI, and thermal imaging, which will encourage ethical engineering and animal safety.