

“SAMVED” HACKATHON 2026



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- Problem Statement ID – 05
- Problem Statement Title – SMART IOT-BASED AMBULANCE ROUTING WITH GREEN CORRIDOR CONTROL
- Theme- Smart Cities / Healthcare / IoT
- Team ID – 3023076D
- Team Name (Registered on portal)- Rakshak



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SMART IOT-BASED AMBULANCE ROUTING WITH GREEN CORRIDOR CONTROL

Proposed Solution

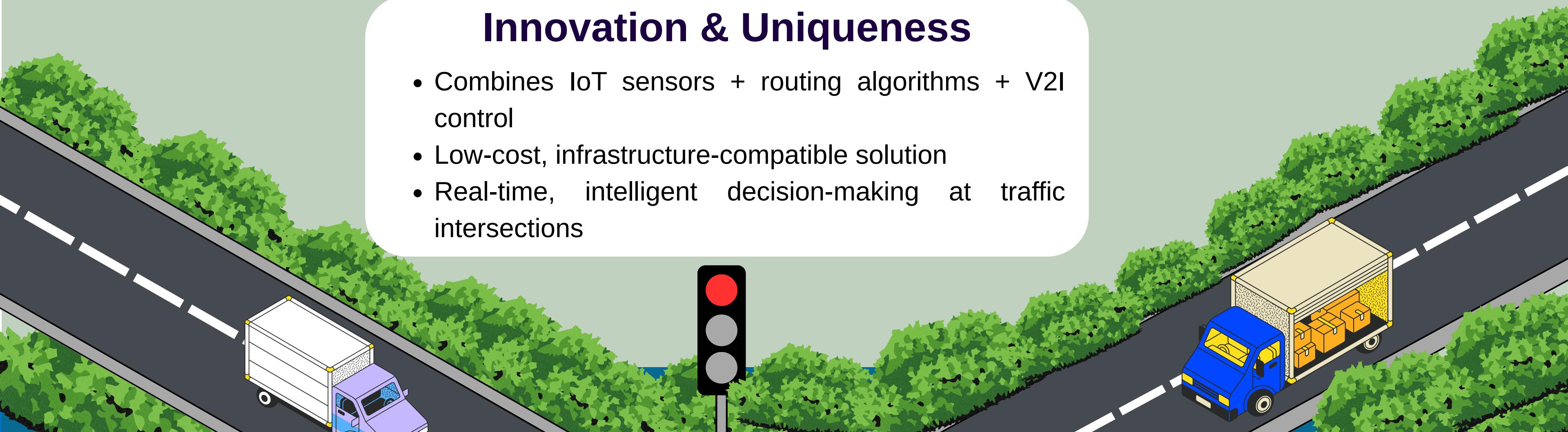
- IoT-based system to prioritize ambulances dynamically
- Shortest-route computation to hospitals using real-time data
- Automatic green corridor creation along the optimized route
- Live monitoring via dashboards and alerts

How It Addresses the Problem

- Eliminates ambulance waiting at red signals
- Reduces travel time using route optimization
- Avoids unnecessary signal overrides on non-critical roads

Innovation & Uniqueness

- Combines IoT sensors + routing algorithms + V2I control
- Low-cost, infrastructure-compatible solution
- Real-time, intelligent decision-making at traffic intersections



TECHNICAL APPROACH



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Technologies Used

Hardware

ESP32, Ultrasonic Sensor, Hall Sensor, Traffic LEDs

Cloud and UI

MQTT

Processing & Control

Firebase, Web/Mobile Dashboard

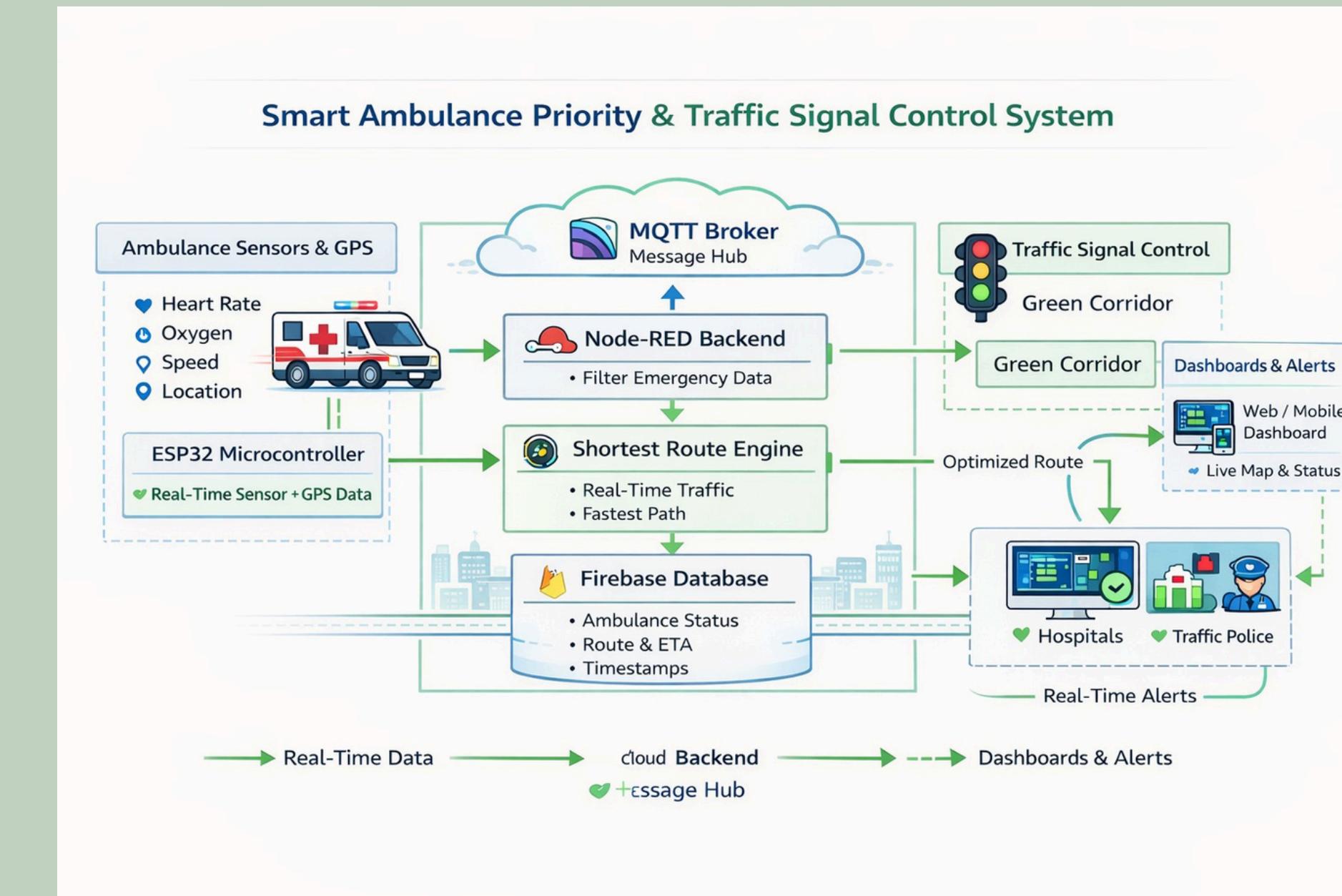
Routing Algorithm

Dijkstra's Shortest Path Algorithm

Communication

Node-RED

System Workflow





Existing Systems	Our System	Potential Challenge	Mitigation Strategy
Static signal timers	Dynamic real-time control	Sensor noise or false detection	Sensor fusion using Hall-effect + Ultrasonic sensors to improve detection accuracy
GPS-only tracking	Sensor + GPS hybrid		
Single-intersection focus	Route-level optimization	Network delays in dense traffic	Use MQTT with appropriate QoS levels to ensure reliable and timely message delivery
Manual or rule-based	Algorithm-driven		
Expensive camera infra	Low-cost IoT	Dynamic traffic variations	Apply dynamic edge weights using real-time traffic density and signal delay data

Feasibility

- Uses proven algorithms (Dijkstra)
- Low hardware cost and modular design
- Scalable across multiple intersections

IMPACT AND BENEFITS



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Impact



Faster Ambulance
Arrival Times



Improved
Survival Rates



Smarter
Traffic Management



Enhanced Public
Safety Confidence



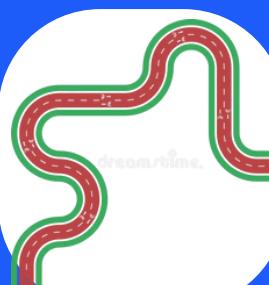
Benefits



Saves Lives
in the Golden Hour



Smart City
Emergency Systems



Efficient
Green-Wave Routing

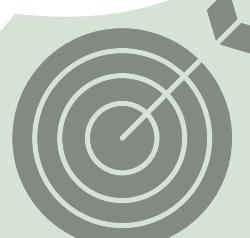


Low-cost,
scalable deployment



Demo video for the model:
[Rakshak.mp4](#)

Prioritizing
Emergencies.
Optimizing
Everyday Traffic



RESEARCH AND REFERENCES



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5. "Shortest Path Problem," *Wikipedia, The Free Encyclopedia*, 2024. https://en.wikipedia.org/wiki/Shortest_path_problem