AI AGENT TRAFFIC LIGHT SIMULATION FOR AMBULANCES

IN IOT

Problem statement

Ambulances face critical delays in congested cities due to fixed traffic signals and lack of automation.
Manual intervention is slow and inefficient, leading tolife-threatening delays.
Emergency vehicles often struggle in 4-way intersections where no priority is given.

Proposed solution

AI agent predicts ambulance route using GPS data and switches nearby signals to green in advance. At 4-way intersections, all other signals turn red to ensure a clear path. This is visualized in real-time through a dashboard and is IoT-ready for integration with smart signals.

Key features

Predictive Green Corridor: Lights turn green before ambulance arrival.

- Interactive Map Dashboard with live ambulance tracking.
- Transparent AI Reasoning Panel explaining every signal change.
- 4-Way Safety Control: Other roads switch to red automatically.
- IoT-ready integration with smart traffic signals.
- Distance-based AI decision-making.

Technological stack

- Frontend: Streamlit, Folium • Backend: Python
- AI Logic:Geopy distance calculation, custom AI rules
- Cloud: Streamlit Cloud
- IoT Layer: Smart Signal Controllers

System Architecture GPS tracking → AI Agent Pro

System architecture

GPS tracking → AI Agent Processing → Decision Engine → IoT Signal Controllers → Real-time

Target users

- Emergency Services (Ambulance, Fire, Police)
- Hospitals & Healthcare Networks
- Smart City Administrators
- Traffic Control Authorities
- Municipal Corporations

Use cases

- Ambulance emergency response in metro cities.
- IoT-based traffic light automation.
- Smart event and VIP convoy management.
- Real-time integration with live traffic feeds

Impact and benefits

- Reduce ambulance delays by up to 60%.
- Fully automated, reducing dependency on manual control.
- Scalable for Smart Cities with IoT integration.
- Improves patient survival rates through faster emergency response.

Roadmap and future scope

1. Build a working simulation with AI agents.
2. Implement predictive green-light logic.
3. Add ETA calculation and real-time congestion prediction.
4. Integrate IoT-enabled signal controllers.
5. Support multi-vehicle emergency prioritisation.

CONTACT INFORMATION

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GitHub repository

https://github.com/sahanashree-26/Code-Veda-Project.git

Alone we can do so little; together we can do so much.” – Helen Keller

I'm ready to answer you questions; Go ahead!