

# Theme : Innovation Beyond Boundaries

## Abstract : RescueRoute

### AI-Powered Smart Traffic Signal System for Ambulances

#### Introduction

Urban traffic congestion often delays ambulances, leading to **critical time loss** in medical emergencies. Every second counts in saving a patient's life, yet ambulances often face delays at traffic signals. A major issue is that **drivers at traffic signals may not realize an ambulance is behind them**, while those at the back honk, creating confusion. However, due to red signals, vehicles remain stuck, and even if some drivers notice the ambulance, they hesitate to break traffic rules, causing further delays. When the opposite lane has a green signal, vehicles continue moving, increasing **accident risks**. Current systems **lack real-time automated solutions**, causing further delays in emergency response.

#### Objectives

This project aims to develop **RescueRoute**, an **AI-driven smart traffic system** that:

- **Automatically detects ambulances** using siren and honking intensity analysis.
- **Dynamically switches signals** to create a clear path.
- **Reduces intersection accidents** by controlling opposite-lane traffic.
- **Enhances emergency response times** with minimal infrastructure modifications.

#### Proposed Solution

**RescueRoute** integrates **AI, IoT, and sound recognition** to enable an automated traffic control system. The system analyzes ambulance sirens and honking patterns, confirming an emergency. It then **switches the traffic signal to green** for the ambulance's lane while stopping traffic in conflicting directions, ensuring safe passage.

By leveraging **real-time AI processing and IoT sensors**, RescueRoute establishes seamless ambulance-to-signal communication, eliminating manual intervention. The system enhances urban emergency response efficiency, reduces travel time, and prevents **traffic congestion-related fatalities**.

#### Conclusion & Impact

This AI-powered solution will revolutionize emergency traffic management, ensuring ambulances reach their destinations without delays or accidents. Implementing RescueRoute in smart cities can optimize urban traffic flow, improve emergency response times, and save more lives.