Who We Are

A Team of Young Innovators Addressing Urban Traffic Challenges

We are a team of senior high school STEM students developing a low-cost intelligent traffic management system for crowded urban areas. Our solution detects congestion indirectly using environmental sensors and applies scientific principles to predict traffic buildup, improve air quality, enhance road safety, and enable adaptive, automated traffic control.

Our values

- We focus on sustainable, low-cost, and energy-efficient solutions that reduce traffic emissions while enhancing road safety through reliable, data-driven congestion detection and timely traffic diversion.

Our goal

- To develop an intelligent, sensor-based traffic management system that detects and predicts congestion indirectly through environmental indicators, enabling automated road control and real-time driver notification to improve traffic flow, air quality, and urban mobility.

Choose Us

Why Traffic Relief !?

1. **Data-Driven & Scientific Approach**
   - **Uses CO concentration, dust density, light intensity, and temperature trends as indirect indicators of congestion**
   - **Applies time-averaging, threshold modeling, and trend analysis**
   - **Decisions are based on validated environmental behavior, not random readings**

2. **Predictive & Preventive Traffic Control**
   - Detects early congestion buildup before full blockage
   - Uses predefined peak-hour prediction to open the green road in advance
   - Reduces stop-and-go traffic and minimizes emission accumulation

3. **Cost-Efficient & Scalable**
   - Relies on low-cost sensors suitable for local availability
   - Easily scalable to other road segments
   - Requires minimal infrastructure modification

Traffic Relief

A Smart Environmental-Based Traffic Management System

TrafficRelief

TEAM 10343

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conclusions & acknowledgment

• Conclusions

Traffic congestion can be effectively detected using indirect environmental indicators such as carbon monoxide, dust, light intensity, and temperature trends. Data-driven thresholds enable accurate classification of traffic states and support predictive control strategies. Automated road diversion and real-time mobile notifications reduce congestion duration, emissions, and driver uncertainty, demonstrating a scalable, low-cost, and energy-efficient solution for urban traffic management.

• Acknowledgment

We gratefully acknowledge our supervisors, teachers, and school administration for their guidance, resources, and technical support. We also thank mentors, advisors, and peers for their contributions to sensor calibration, data analysis, testing, and mobile application development, which were essential to completing this project.
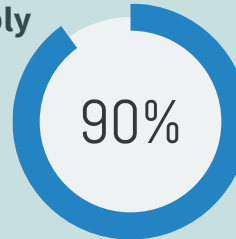
Efficiency

How Environmental Indicators Enable Smart Traffic Control

• CO concentration respons

CO levels increase sharply during prolonged idling and low vehicle speed. Field testing showed a clear transition CO levels increase sharply during prolonged idling and low vehicle speed. Field testing showed a clear transition

90%

• Predictive timing efficiency

Predefined peak-hour activation (7:30 AM, 2:00 PM, 8:30 PM) improves response time and reduces congestion buildup by opening the green road in advance.

• Control accuracy

Averaging sensor readings over 30-second intervals stabilizes system decisions and minimizes noise-driven fluctuations.

Visit us

Scan the QR code or visit **[https://qrco.de/bfzIzK]** to:

- View live traffic state demonstrations
- Explore real-time sensor data and graphs
- Learn about congestion prediction logic

Be part of Egypt's Traffic revolution!

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