TRAFFIX

AI-Optimized Traffic Management System

-OVERVIEW

- The objective is to alleviate pollution caused by vehicular traffic and idling at crossroads by implementing **TRAFFIX**, a comprehensive strategy.
- By employing **TRAFFIX**, the aim is to significantly lower pollution levels resulting from these activities while concurrently addressing other significant issues related to traffic congestion and environmental degradation.

Why Crossroads?

It takes approximately 7 minutes for one traffic cycle to complete. During this time, almost 70% of vehicles keep their engines running.

The idling of these 70% of vehicles contributes to approximately 30% of air pollution. This indicates a significant impact on air quality stemming from the unnecessary idling of engines during traffic cycles. Idling vehicles emit pollutants such as carbon monoxide, nitrogen oxides, and particulate matter, which degrade air quality and pose health risks to both humans and the environment. Therefore, addressing this issue by reducing idling time can substantially mitigate air pollution levels and improve overall air quality.

IMPACTS ON LIFE

30%

Air Pollution

25%

Physical Health Risks

20%

Noise Pollution

10%

Road Safety Concerns

Solution

is

TRAFFIX

AI-Optimized Traffic Management System

What TRAFFIX DO?

Utilizes computer vision to analyze live video streams from intersection cameras. Detects and tracks vehicles, pedestrians, and other relevant objects

Segments the intersection into paths and calculates the time spent by vehicles in each path. Identifies maximum time durations, aiding in congestion analysis.

Adapts traffic signal timings in real-time based on current traffic conditions. Optimizes signal control to reduce congestion and improve overall traffic flow

Incorporates machine learning models to predict traffic patterns based on historical and real-time data. Enhances the system's ability to adapt to changing traffic conditions

How does TRAFFIX work?

Data Collection

- Real-time video capture using static cameras.

Data Preprocessing

- Colour image to grayscale.
- Applying blurring techniques on grayscale images.
- Depth-based foreground-background separation performed using morphological techniques to improve the overall quality of separation.

Algorithm Building

- Calculated a maximum traffic signal time for each path of the intersection.
- Uses AIMD (Additive Increase and Multiplicative Decrease) for optimizing the green light signal timing.

Integration

- Seamless integration with either existing cameras or installing new ones, using microcomputers like Raspberry Pi, leveraging their computational simplicity.

TRAFFIX's Efficiency

Air Pollution will be reduced from

30%

15%

The average Traffic light scheduling Cycle is reduced from

7 Min

2-3min

Cost will be reduced up to

70%