

Final Report

Project Name: : Traffictelligence:Advanced Traffic Volume Estimation With Machine

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1. INTRODUCTION

1.1 Project Overview

Traffictelligence is a smart traffic monitoring system that uses machine learning to estimate traffic volume and help manage roads better. The main goal of this project is to collect real-time traffic data from sources like CCTV cameras, road sensors, and drones. This data is then processed using machine learning models to understand traffic patterns, predict congestion, and suggest solutions..

1.2 The system provides live updates to traffic officers, city planners, and commuters through a user-friendly dashboard or app. It helps authorities make better decisions, reduce traffic jams, and improve road safety. By using technology, Traffictelligence makes traffic control faster, smarter, and more efficient.

2. IDEATION PHASE

2.1 2.1 Problem Statement

In many busy cities, traffic is a big problem. Roads are often full, and people waste a lot of time in traffic jams. This happens because there is no smart system to watch and understand how traffic moves. Traffic officers and city planners do not get real-time data, so it is hard for them to manage traffic properly.

The main problem is that current systems cannot predict how much traffic will be on the road at a certain time. They also cannot give fast updates or help in taking quick actions.

2.2 Empathy Map Canvas

Focuses on workers, citizens, and factory managers dealing with waste. Key concerns include hygiene, efficiency, and compliance.

2.3 Brainstorming Ideas explored:

Using CCTV cameras and sensors,applying machine learning to predict traffic jams,build a live traffic dashboard,sending alerts for high traffic alerts,creating a mobile apps.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

Faces Traffic Problems -> Looks for Help -> Finds Traffic Intelligence -> Starts Using the System -> Takes Action -> Checks Results -> Shares Feedback -> Gets Better System .

3.2 Solution Requirement

Includes functional and non-functional requirements (see solution requirements document).

3.3 Data Flow Diagram

Input (Image) → Preprocessing → Classification → Categorization → Storage/Action

3.4 Technology Stack

Refer to Technology Stack document for details on architecture and technologies used.

4. PROJECT DESIGN

4.1 Problem Solution Fit

The solution matches the problem perfectly. It gives traffic officers what they need real-time updates, smart predictions, and easy tools to manage traffic better. It also helps city planners make smart long-term decisions.

4.2 Proposed Solution

An intelligent vision-based system that classifies and traffic intelligence is a smart, fast, and easy solution to help manage traffic better and keep roads safer using cameras and AI models.

4.3 Solution Architecture

The solution architecture of traffic intelligence shows how different parts of the system work together to collect, process, and show traffic data using machine learning. Modular, scalable architecture combining edge devices and cloud services.

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Weeks 1-2: Research and dataset prep

Weeks 3-4: Model training and testing

Weeks 5-6: Integration

Weeks 7-8: Testing & documentation

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

FPS: 30+, Accuracy: ~92%, Latency: ~200ms/image on edge devices.

7. RESULTS

7.1 Output Screenshots

Screenshot examples of classified waste categories, real-time dashboard, and reports (to be attached).

8. ADVANTAGES & DISADVANTAGES-

Advantages: Real time traffic updates, Traffic prediction, Useful for planning, Smart alerts and reports, Saves time and fuel.

Disadvantage: Needs training, Data privacy issues, Needs good internet and devices.

9. CONCLUSION

Traffic intelligence is a smart system that helps us understand and manage traffic better using cameras, sensors, and machine learning. It collects real-time traffic data, processes it using AI, and gives useful information like how many vehicles are on the road, how fast they are moving, and where traffic is heavy. This helps city planners, traffic police, and even apps to reduce traffic jams, improve road safety, and make better travel decisions. In short, Traffic intelligence makes traffic smarter and roads smoother using the power of technology.

10. FUTURE SCOPE

In the future, Traffic intelligence can become even smarter and more helpful. It can be used in more cities to control traffic lights automatically based on real-time traffic. It can also help emergency vehicles like ambulances get a clear path by managing traffic signals with better AI models.

11. APPENDIX

Source Code: Available upon request

Dataset Link: Custom & public datasets

GitHub & Project Demo Link: To be update