Title: Smart Traffic Light System (STLS)

Team members on this Semester Project:

- Bhaskara Yashwant Bitra
- Courtney Moane
- Liam Murphy
- Thomas Bonagura

Objective:

What is the aim of this proposed product?

The objective of the Smart Traffic Light System project is to revolutionize urban traffic management using advanced AI and camera technology. This system will employ city-wide cameras to monitor traffic flow, using AI algorithms to assign weights and make informed decisions that minimize wait times for the majority of commuters. Additionally, the system includes a user interface that allows residents to report traffic incidents and excessive waiting times, enhancing the AI's decision-making process. The project aims not only to reduce congestion and improve travel efficiency but also to increase public engagement in traffic management. By leveraging real-time data and community input, the system will adapt to changing traffic conditions, ultimately creating a more dynamic, responsive, and efficient urban traffic environment.

Scope:

What are the broad boundaries of the proposed product (technical and business)?

The scope of this project lies in the technical feasibility and effectiveness of using AI and camera networks to manage traffic light systems across a city. The core technical challenge is developing robust AI algorithms that can accurately analyze real-time traffic data from these cameras and make intelligent decisions to minimize congestion. Additionally, the project involves creating a user-friendly interface for public interaction, allowing residents to report traffic issues. Success in these areas depends on the system's ability to adapt to diverse urban traffic patterns and user engagement. The business aspect involves integrating this technology within existing city infrastructures and ensuring its scalability and sustainability as a smart traffic solution.

Reason:

Provide a brief explanation as to why the business area has identified the project as a priority.

The prioritization of the Smart Traffic Light System is underscored by compelling statistics. Globally, urban traffic congestion costs economies billions annually in lost productivity. In the United States alone, urban commuters spend an average of 51 extra hours a year in traffic which costs $869 (2021), leading to excess fuel consumption of about 1.7 billion gallons annually (2020). By addressing these issues, the Smart Traffic Light System taps into a significant market need, where efficient traffic management is not just a convenience, but a

necessity for sustainable urban living and economic productivity.

Deliverable(s):
What will be delivered at the end of the proposed project? List some of the customers functions and capabilities.

The deliverable at the end of the Smart Traffic Light System project will be an advanced traffic management system, incorporating city-wide AI-driven traffic light control. This system will feature a network of IoT devices (cameras, sensors, etc) feeding real-time data to the AI, which will then optimize traffic light timings to reduce congestion. The project also includes an interface where the community can report traffic issues, contributing to the AI's decision-making process. This interface will enable direct community involvement in traffic management, enhancing the system's responsiveness to real-time urban traffic conditions.

How to Measure Success of the Proposed Project:
Describe the measure(s) that will indicate that the proposed product/project has been successfully completed.

The success of the Smart Traffic Light System project will be measured by several key indicators. Firstly, a reduction in average traffic wait times at major intersections, aiming for a specific percentage decrease. Secondly, the system's impact on overall traffic flow, measured by reduced congestion during peak hours. Thirdly, user engagement and feedback on the public reporting interface, assessed through user activity and satisfaction ratings. These measures will provide a comprehensive assessment of the project's effectiveness in achieving its goals.

Resources:
What human resources, and other resources (if applicable) will be required for the product?

Human Resources:
- Software developers specialized in AI and traffic system integration.
- Project managers for coordination and oversight.
- AI/ML experts for algorithm development.
- UI/UX designers for the public interface.
- A testing team for system validation.
- Marketing and community engagement personnel.

Other Resources:
- Traffic simulation software for testing.
- Hardware like cameras, sensors, and computing infrastructure for data analysis and system operation.
- Software development tools for AI, user interface, and system integration.