**Case Study**

**Traffic Light System with SDLC**

**Requirements :**

* Understanding traffic patterns, accident data, pedestrian needs, and integration with existing infrastructure was crucial. Public surveys, meetings with traffic officials, and data analysis were conducted.

**Design :**

* Designing a modular system with central control, communication protocols between lights, and user interface for monitoring was essential. System architecture diagrams, user interfaces, and data flow charts were created.
* A scalable and user-friendly design ensured efficient system operation and easy data analysis.

**Implementation:**

* Developing software to manage traffic light timing based on real-time data, hardware integration with existing lights, and a user interface for monitoring required skilled programmers and engineers.
* A functional system with real-time traffic light control and data collection capabilities was built.

**Testing:**

* Through testing of the system's functionality, communication between lights, and integration with existing infrastructure was crucial. Unit testing, integration testing, and system testing were conducted in simulated and real-world environments.
* Bugs were identified and fixed, ensuring reliable system operation before deployment.

**Deployment:**

* Careful installation of the system at the intersection, configuration of software, and user training for traffic officials were required.
* A smooth and successful deployment minimized disruption to traffic flow.

**Maintenance:**

* Ongoing monitoring, bug fixes, software updates, and system adjustments based on real-world data are essential.
* Continuous improvement ensures the system remains efficient and adapts to changing traffic patterns.

**Evaluation of Contribution to Project Outcomes:**

* Requirements: to analyse and require the traffic condition around the city.
* Design: A well-defined designed that is user friendly and easy to understand and debug.
* Implementation: Bringing together the software and hardware components to complete the process.
* Testing: Identifying and fixing bugs and looking for errors that may arise.
* Deployment: Careful installation and training minimized disruption and ensured successful system launch.
* Maintenance: Ongoing monitoring and adjustments maintain optimal traffic flow