**Project Design Phase-II**

**Solution Requirements (Functional & Non-functional)**

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| --- | --- |
| Date | 21 JUNE 2025 |
| Team ID | LTVIP2025TMID33800 |
| Project Name | TrafficTelligence: Advanced Traffic Volume Estimation with Machine Learning |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

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| --- | --- | --- |
| **FR No.** | **Functional Requirement (Epic)** | **Sub Requirement (Story / Sub-Task)** |
| FR-1 | Data Acquisition | |  | | --- | | - Collect traffic data from sensors and APIs |  |  |  |  | | --- | --- | --- | |  |  | - Collect weather and public event data | |
| FR-2 | Data Preprocessing | |  | | --- | | Clean and normalize data |  |  |  |  | | --- | --- | --- | |  |  | - Encode categorical and numerical features | |
| FR-3 | Traffic Volume Prediction | |  | | --- | | - Train ML model with historical and real-time data |  |  |  |  | | --- | --- | --- | |  |  | - Evaluate and validate model performance | |
| FR-4 | Real-Time Prediction Service | |  | | --- | | Expose prediction via API |  |  |  |  | | --- | --- | --- | |  |  | - Display data on admin/user dashboard | |
| FR-5 | Commuter Routing and Navigation Support | Generate trend reports for planners |
| FR-6 | System Access and Monitoring | Suggest alternative routes to users via traffic predictions |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | User-friendly UI for authorities, planners, and commuters |
| NFR-2 | **Security** | Encrypted data transmission, role-based access, secure APIs |
| NFR-3 | **Reliability** | Accurate model results and stable deployment |
| NFR-4 | **Performance** | Real-time API responses within 2 seconds |
| NFR-5 | **Availability** | System available 24/7 with automatic failover |
| NFR-6 | **Scalability** | Easily handles increased data volume and user traffic |