**Project Design Phase-II**

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

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| Date | 16 june 2025 |
| Team ID | LTVIP2025TMID41921 |
| Project Name | Traffic Telligence :Advanced Traffic volume estimation with machine learning |
| Maximum Marks | 4 Marks |

**Functional Requirements**

**These describe what the system should do:**

**Data Collection**

* **Collect real-time and historical traffic data from sensors, GPS, APIs, or cameras.**
* **Integrate weather, event, and road condition data.**

**Data Preprocessing**

* **Clean and normalize traffic data.**
* **Handle missing, noisy, or duplicate data**

**Traffic Volume Prediction**

* **Apply machine learning models to predict future traffic trends.**
* **Provide congestion forecasts for specific locations and time intervals.**

**Non-functional Requirements :**

**Performance**

* System should respond to user requests within 2 seconds.
* ML predictions must be generated within 5–10 seconds after receiving data.

**Scalability**

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | Interface should be intuitive, with a clean UI, accessible to users of all ages and backgrounds |
| NFR-2 | **Security** | Implement end-to-end encryption, secure authentication (OAuth 2.0), and role-based access controls. Ensure HIPAA compliance. |
| NFR-3 | **Reliability** | The system should consistently provide correct and up-to-date health responses with high accuracy. |
| NFR-4 | **Performance** | System must respond to queries within 2 seconds for 95% of requests |
| NFR-5 | **Availability** | 99.9% uptime with auto-recovery and failover strategies. |
| NFR-6 | **Scalability** | Able to support growing user base and queries using scalable cloud infrastructure (e.g., IBM Cloud with Kubernetes). |

* System should handle increased data from more cities or traffic sources.
* Support for scaling cloud infrastructure (if deployed).

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