REPORT MILESTONE 1

I. Overview :

The document presents the initial planning, design decisions, and early implementation progress of our group as we begin developing a Java-based application that connects to the SUMO traffic simulator using the libtraci API.

To remind, the primary goal of the project the creation of a real-time traffic simulation platform using the SUMO mobility engine, controlled via the Java API. It features a GUI that visualizes the road network, vehicles, and traffic lights, while enabling user interaction and adaptive control. The system connects to a running SUMO instance and steps through the simulation in real time. Vehicles are rendered on a 2D map or optionally 3D views using JavaFX's 3D capabilities. Traffic lights are displayed with current phase indicators and can be manually adjusted or tuned via the GUI. Simulation data can be exported as CSV or PDF reports for analysis.

In this milestone, we outline our conceptual design by initializing class structure, drawing architectural diagram, designing the Graphical User Interface (GUI), discussing the way for the interaction between the user, application and SUMO. We also describe our early progress in setting up the development environment, experimenting with libtraci, and drafting the object-oriented wrapper that encapsulates SUMO's procedural API. Furthermore, we summarize our team's work distribution, collaboration strategy, and the tasks planned for the next development phase.

Milestone 1 marks the transition from planning to implementation, providing a clear roadmap for realizing the required features while ensuring maintainability, extensibility, and adherence to the project guidelines.

II. Introduction to my team in the milestone 1 :

Team member	Responsibility
Marko Jandric - 1529337	SUMO connection demo and libtraci wrapper
Lazar Milosevic - 1584538	GUI Mockups
Minh Phu Do - 16555190	Sumo network creating and testing
Dinh Hoang Bach Nguyen - 1647312	Sumo network creating and testing
Duc Thien Nguyen - 1651777	Report and Architecture Diagram

III. Technology Stack Summary : Here are the technologies, we applied in the milestone 1 :

Layer	Technology / Tool	Purpose
Programming Language	Java 17+	Core language for all application logic
IDE	IntelliJ, VS code	Development environment
GUI Framework	Java Swing (or JavaFX)	Map rendering, control panels, and dashboards
Traffic Simulator	SUMO	Real-world traffic simulation engine
SUMO Java API	Libtraci	Interface to communicate with SUMO
Diagram	Dia	Architecture Diagram for the system