Software Requirements Specification (SRS)
Tunis Track: Metro Management System

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1 Introduction

1.1 Purpose

The purpose of this document is to define the software requirements for *Tunis Track*, a **Tunis Metro Management System**, designed to track metro operations in real time, manage schedules, passengers, reports, and system maintenance. The system aims to fix the organizational chaos in Tunisia's metro transport.

1.2 Scope

The system will:

- Track metro movement in real-time (speed, location, status).
- Allow passengers to book a trip using a smart metro card or NFC.
- Allow users to report incidents anonymously.
- Provide admin tools for schedules, logs, and user reports.
- Handle technician assignments and technical logs.

2 Overall Description

2.1 Product Perspective

Standalone system with a backend database, admin dashboard, and user interface for real-time info and reporting. Replaces the currently non-existent digital system.

2.2 Product Functions

- Passenger registration and authentication.
- Smart metro card management.
- Booking a metro trip.
- Real-time metro monitoring: location (latitude/longitude), speed, and status (idle, moving, maintenance).
- Logging ETA vs actual arrival time to compute delays.
- Technicians' technical log entries for assigned metros.
- Incident reporting system.

2.3 User Classes and Characteristics

- **Passengers**: Can book trips, report incidents, and track metro status.
- **Technicians**: Can view and update technical logs.
- **Administrators**: Have full control of the system including schedules, stations, metros, and technician assignments.

3 Specific Requirements

3.1 Functional Requirements

- **FR1**: The system shall allow passengers to register and log in.
- **FR2**: The system shall associate every passenger with a unique metro card.
- **FR3**: The system shall allow passengers to book trips and validate access based on booking.
- **FR4**: The system shall track each metro's real-time status including location and speed.
- **FR5**: The system shall allow admins to create/edit/delete schedules.
- **FR6**: The system shall store schedule data including departure and arrival stations times.
- **FR7**: The system shall allow passengers to issue incident reports.
- **FR8**: The system shall allow technicians to view and update technical logs related to their assigned metros.

3.2 Non-Functional Requirements

- **NFR1**: The system shall provide secure authentication and data encryption.
- **NFR2**: The system shall provide a responsive interface across desktop and mobile devices.
- **NFR3**: The system shall allow for scalability to support increasing metro lines or users.
- **NFR4**: The system shall ensure availability with regular backups and fault tolerance.

4 Constraints

- Internet access is required for real-time data updates.
- GPS hardware may be needed for live location tracking.
- Only authenticated users may perform advanced operations.

5 Future Improvements

- AI-based delay prediction.
- Mobile app version for real-time passenger updates.
- Automated maintenance suggestions using historical logs.

6 Glossary

- **ETA**: Estimated Time of Arrival.
- **Metro Card**: A digital or physical card used by passengers (logged-in users) for access and payments.