High Level Design Document

Introduction

This High Level Design (HLD) document outlines the architecture and core components for the **MoveFlow - Transportation Fleet Dashboard** project. The purpose of this project is to deliver a Tableau dashboard that visualizes fleet utilization, trip frequency, maintenance schedules, and provides cost analysis for a transportation company.

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1. System Architecture Overview

Architecture Description:
The system ingests transportation fleet data, processes and transforms it for analytics, and presents interactive dashboards via Tableau. Data sources may include CSV files, databases, or APIs. The Tableau dashboard is the primary user interface.

Component	Role
Data Source	Stores raw fleet, trip, and maintenance data
Data Integration Layer	Extracts, transforms, and loads (ETL) data for analysis
Tableau Data Model	Defines calculated fields and data relationships for visualization
Tableau Dashboard	Visualizes metrics and provides interactive analytics to users

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2. Component Interactions

Step	Interaction Description
1	Data Source provides raw data to the Data Integration Layer
2	Data Integration Layer processes and loads cleaned data into Tableau
3	Tableau Data Model applies calculated fields and prepares data for visualization
4	Tableau Dashboard queries the data model and presents visualizations to end users

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3. Data Flow Overview

Source Component	Destination Component	Data Transferred
Data Source	Data Integration Layer	Raw fleet, trip, maintenance data
Data Integration Layer	Tableau Data Model	Cleaned, transformed analytics data
Tableau Data Model	Tableau Dashboard	Aggregated metrics, calculated fields
Tableau Dashboard	End Users	Visualizations, reports, interactive views

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4. Technology Stack

Layer/Function	Technology/Framework
Data Storage	CSV, SQL Database, or API
Data Integration/ETL	Tableau Prep, Python (optional)
Analytics & Visualization	Tableau Desktop/Server
Deployment	Tableau Server/Public

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5. Scalability & Reliability

- **Scalability:**
  The solution supports scaling by connecting Tableau to larger or multiple data sources as needed. Tableau Server enables multi-user access and concurrent dashboard usage.
- **Reliability:**
  Data refresh schedules and Tableau's built-in data integrity features ensure up-to-date and accurate analytics.
- **Security:**
  Access controls can be managed via Tableau Server to restrict sensitive data and dashboard access.

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