



# *FleetFlow: Modular Fleet & Logistics Management System*

**Objective:** To replace inefficient, manual logbooks with a centralized, rule-based digital hub that optimizes the lifecycle of a delivery fleet, monitors driver safety, and tracks financial performance.

## 1. Target Users

- **Fleet Managers:** Oversee vehicle health, asset lifecycle, and scheduling.
- **Dispatchers:** Create trips, assign drivers, and validate cargo loads.
- **Safety Officers:** Monitor driver compliance, license expirations, and safety scores.
- **Financial Analysts:** Audit fuel spend, maintenance ROI, and operational costs.

## 2. Core System Pages

### Page 1: Login & Authentication

- **Purpose:** Secure access for different user roles (Manager vs. Dispatcher).
- **Features:** Email/Password fields, "Forgot Password," and Role-Based Access Control (RBAC).

### Page 2: Command Center (Main Dashboard)

- **Purpose:** High-level "at-a-glance" fleet oversight.
- **KPIs:**
  - **Active Fleet:** Count of vehicles currently "On Trip."
  - **Maintenance Alerts:** Number of vehicles marked "In Shop."
  - **Utilization Rate:** % of fleet assigned vs. idle.
  - **Pending Cargo:** Shipments waiting for assignment.
- **Filters:** By Vehicle Type (Truck, Van, Bike), Status, or Region.

### Page 3: Vehicle Registry (Asset Management)

- **Purpose:** CRUD operations for physical assets.
- **Data Points:** Name/Model, License Plate (Unique ID), Max Load Capacity (kg/tons), and Odometer.
- **Logic:** Manual toggle for "Out of Service" (Retired).

### Page 4: Trip Dispatcher & Management

- **Purpose:** Workflow for moving goods from Point A to Point B.
- **Features:**
  - \* **Creation Form:** Select Available Vehicle + Available Driver.
  - **Validation Rule:** Prevent trip creation if  $\text{CargoWeight} > \text{MaxCapacity}$
  - **Lifecycle:** Draft → Dispatched → Completed → Cancelled.

## Page 5: Maintenance & Service Logs

- **Purpose:** Preventative and reactive health tracking.
- **Logic Link:** Adding a vehicle to a "Service Log" automatically switches its status to **"In Shop"**, removing it from the Dispatcher's selection pool.

## Page 6: Completed Trip, Expense & Fuel Logging

- **Purpose:** Financial tracking per asset.
- **Features:** Record Liters, Cost, and Date.
- **Calculation:** Automated "Total Operational Cost" (Fuel + Maintenance) per Vehicle ID.

## Page 7: Driver Performance & Safety Profiles

- **Purpose:** Human resource and compliance management.
- **Features:**
  - **\* Compliance:** License expiry tracking (Blocks assignment if expired).
  - **Performance:** Trip completion rates and "Safety Scores."
  - **Status:** Toggle between On Duty, Off Duty, or Suspended.

## Page 8: Operational Analytics & Financial Reports

- **Purpose:** Data-driven decision making.
  - **Metrics:**
    - **\* Fuel Efficiency:** km / L.
    - **Vehicle ROI:**  $\frac{\text{Revenue} - (\text{Maintenance} + \text{Fuel})}{\text{Acquisition Cost}}$ .
    - **Exports:** One-click CSV/PDF for monthly payroll and health audits.
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## 3. Logic & Workflow Summary

1. **Vehicle Intake:** Add "Van-05" (500kg capacity) ->Status: **Available**.
2. **Compliance:** Add Driver "Alex." System verifies license validity for "Van" category.
3. **Dispatching:** Assign "Alex" to "Van-05" for 450kg load.
  - **Check:** 450 < 500 (Pass).
  - **Status Update:** Vehicle & Driver -> **On Trip**.
4. **Completion:** Driver marks trip "Done," enters final Odometer.
  - **Status Update:** Vehicle & Driver -> **Available**.
5. **Maintenance:** Manager logs "Oil Change."
  - **Auto-Logic:** Status -> **In Shop**. Vehicle hidden from Dispatcher.
6. **Analytics:** System updates "Cost-per-km" based on fuel logs from the last trip.

## 4. Technical Requirements

- **Frontend:** Modular UI with scannable data tables and status pills.
- **Backend:** Real-time state management for vehicle/driver availability.
- **Database:** Relational structure to link Expenses/Trips to a specific Vehicle ID.