

# **TRANSPORTATION MANAGEMENT DATABASE DESIGN & WEB APP**

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## **Introduction:**

The Transportation Management Database Design and Web Application project aims to create a robust and efficient system to streamline delivery service operations. In today's fast-paced logistics environment, timely and accurate delivery of goods is crucial for maintaining customer satisfaction and operational efficiency. By integrating various functional components such as customer management, order tracking, delivery performance monitoring, route optimization, fleet management, scheduling, and notification services, this project offers a comprehensive solution for managing transportation logistics.

The database design involves creating a structured, normalized relational database that covers all aspects of the delivery process. Key entities include customers, orders, delivery performance metrics, routes, vehicles, drivers, schedules, maintenance records, fuel consumption, and user notifications. The Entity Relationship Diagram (ERD) illustrates the relationships and dependencies between these entities, ensuring data integrity and facilitating efficient data retrieval.

The system addresses transportation logistics complexities by providing real-time data and analytics. Modules such as delivery performance tracking, route optimization, and fleet management help identify bottlenecks, reduce fuel consumption, and ensure regular vehicle maintenance. The user-friendly web application interface allows dispatchers, drivers, and managers to interact seamlessly with the system, access and update relevant information, receive critical notifications, and generate decision-making reports. This project highlights the importance of effective database design and the value of integrating such a system with a user-friendly web application to enhance efficiency, reduce costs, and improve customer satisfaction.

## **System Requirements:**

- System with Operating System with Windows or MacOS
- Python 3.12.0 or equivalent
- MySQL 8.4.0 or equivalent must be installed in the system
- MySQL Workbench 8.0.36 or equivalent for accessing the database
- Python specific packages that are needed are:
  1. Flask 2.3.2 or equivalent
  2. Flask-WTF 1.0.1 or equivalent

3. Flask-SQLAlchemy 3.0.2 or equivalent
4. Flask-Migrate 3.1.0 or equivalent
5. Flask-Bcrypt 1.0.1 or equivalent
6. Flask-Login 0.6.2 or equivalent
7. PyMySQL 1.0.2 or equivalent
8. email-validator 1.1.3 or equivalent
9. WTForms 3.0.1 or equivalent
10. Werkzeug 2.3.3 or equivalent

### **Database Business Rules and Assumptions:**

The business rules and assumptions for the Transportation Management System (TMS) are

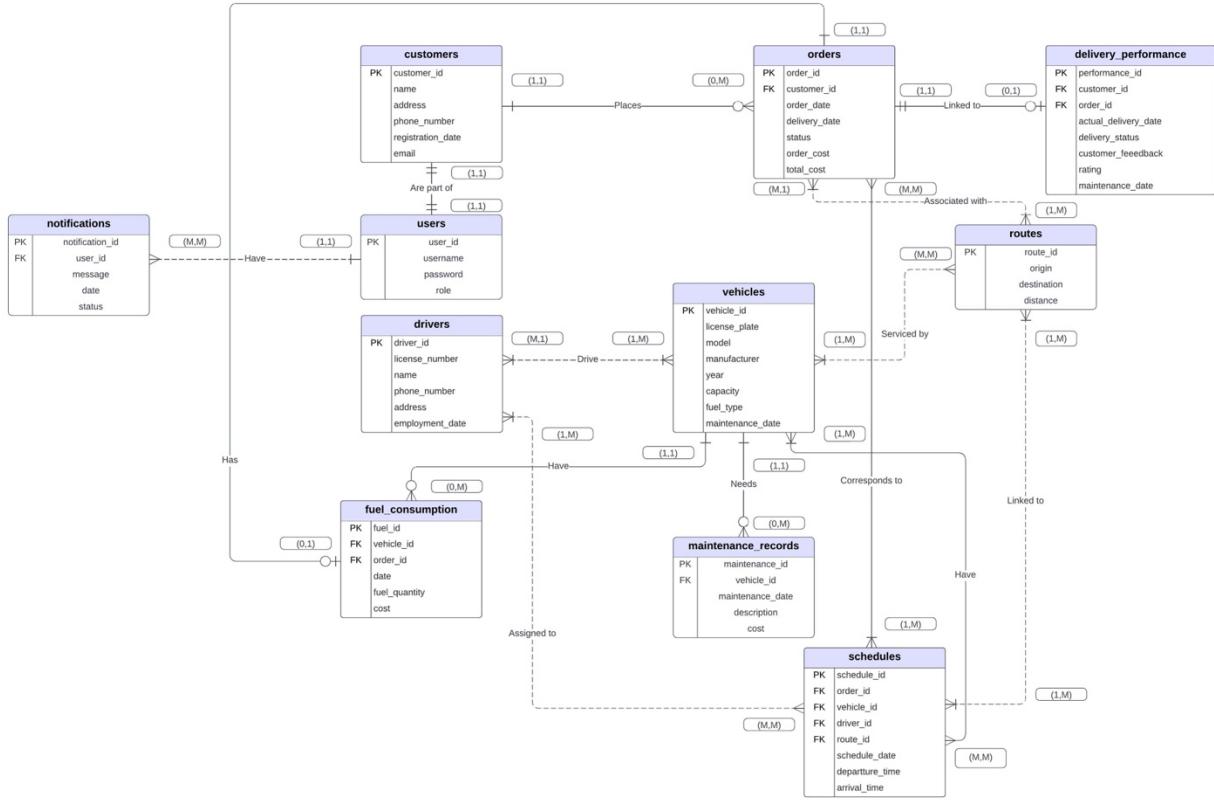
#### **Business Rules:**

1. Each customer can place multiple orders.
2. Each order is linked to one customer.
3. Delivery performance is tracked for each order.
4. Each route can be used by multiple schedules.
5. Vehicles are assigned to specific routes and schedules.
6. Drivers are assigned to specific schedules.
7. Vehicles require regular maintenance, and records are kept for each maintenance activity.
8. Fuel consumption is tracked for each vehicle and linked to orders.
9. Notifications are sent to users regarding important activities or issues.

#### **Assumptions:**

1. Each customer has unique contact information.
2. Orders are processed sequentially and linked to specific schedules.
3. Delivery performance metrics are updated post-delivery.
4. Vehicle maintenance is scheduled based on predefined intervals.
5. Fuel logs are updated daily or per trip.
6. User roles define access to specific functionalities in the system.

## Entity- Relationship Diagram:



## Relationship with entities:

Based on the provided Entity-Relationship Diagram (ERD), the relationships between the entities in the Transportation Management System (TMS) are as follows:

### 1. Customers and Orders

- **Relationship:** One-to-Many
- **Description:** Each customer can place multiple orders. An order is associated with exactly one customer.
- **Cardinality:** A customer (1) to orders (many)

### 2. Orders and Delivery Performance

- **Relationship:** One-to-Many
- **Description:** Each order can have multiple delivery performance records. Each delivery performance record is associated with exactly one order.
- **Cardinality:** An order (1) to delivery performance records (many)

### **3. Customers and Delivery Performance**

- **Relationship:** One-to-Many
- **Description:** Each customer can have multiple delivery performance records associated with their orders. Each delivery performance record is linked to one customer.
- **Cardinality:** A customer (1) to delivery performance records (many)

### **4. Routes and Schedules**

- **Relationship:** One-to-Many
- **Description:** Each route can be assigned to multiple schedules. Each schedule is associated with one route.
- **Cardinality:** A route (1) to schedules (many)

### **5. Vehicles and Schedules**

- **Relationship:** One-to-Many
- **Description:** Each vehicle can be assigned to multiple schedules. Each schedule is associated with one vehicle.
- **Cardinality:** A vehicle (1) to schedules (many)

### **6. Drivers and Schedules**

- **Relationship:** One-to-Many
- **Description:** Each driver can be assigned to multiple schedules. Each schedule is associated with one driver.
- **Cardinality:** A driver (1) to schedules (many)

### **7. Orders and Schedules**

- **Relationship:** One-to-One
- **Description:** Each order is associated with one schedule. Each schedule corresponds to one order.
- **Cardinality:** An order (1) to a schedule (1)

### **8. Vehicles and Maintenance Records**

- **Relationship:** One-to-Many
- **Description:** Each vehicle can have multiple maintenance records. Each maintenance record is associated with one vehicle.
- **Cardinality:** A vehicle (1) to maintenance records (many)

### **9. Vehicles and Fuel Consumption**

- **Relationship:** One-to-Many
- **Description:** Each vehicle can have multiple fuel consumption records. Each fuel consumption record is associated with one vehicle.
- **Cardinality:** A vehicle (1) to fuel consumption records (many)

### **10. Orders and Fuel Consumption**

- **Relationship:** One-to-Many

- **Description:** Each order can have multiple fuel consumption records linked to it. Each fuel consumption record is associated with one order.
- **Cardinality:** An order (1) to fuel consumption records (many)

## 11. Users and Notifications

- **Relationship:** One-to-Many
- **Description:** Each user can receive multiple notifications. Each notification is associated with one user.
- **Cardinality:** A user (1) to notifications (many)

## Normalization

The database design satisfies the Third Normal Form (3NF) by ensuring:

1. All attributes are atomic and dependent on the primary key.
2. There are no partial dependencies; each non-key attribute is fully functionally dependent on the primary key.
3. There are no transitive dependencies; non-key attributes are not dependent on other non-key attributes.

## Data Dictionary

ENTITY	ATTRIBUTE	DESCRIPTION
<b>CUSTOMERS</b>	customer_id	Unique identifier for each customer
	name	Name of the customer
	address	Address of the customer
	phone_number	Contact number of the customer
	registration_date	Date when the customer registered
	email	Email address of the customer
<b>ORDERS</b>	order_id	Unique identifier for each order
	customer_id	Identifier linking the order to a customer
	order_date	Date when the order was placed
	delivery_date	Scheduled delivery date
	status	Current status of the order
	order_cost	Cost of the order
<b>DELIVERY PERFORMANCE</b>	total_cost	Total cost including any additional charges
	performance_id	Unique identifier for performance record
	customer_id	Identifier linking to the customer
	order_id	Identifier linking to the order
	actual_delivery_date	Actual delivery date
	delivery_status	Status of the delivery

	customer_feedback	Feedback from the customer
	rating	Rating given by the customer
	maintenance_date	Date of last maintenance
<b>ROUTES</b>	route_id	Unique identifier for each route
	origin	Starting point of the route
	destination	Ending point of the route
	distance	Distance of the route
<b>VEHICLES</b>	vehicle_id	Unique identifier for each vehicle
	license_plate	License plate number
	model	Model of the vehicle
	manufacturer	Manufacturer of the vehicle
	year	Manufacturing year of the vehicle
	capacity	Maximum capacity of the vehicle
	fuel_type	Type of fuel used by the vehicle
	maintenance_date	Date of the last maintenance
<b>DRIVERS</b>	driver_id	Unique identifier for each driver
	license_number	Driver's license number
	name	Name of the driver
	phone_number	Contact number of the driver
	address	Address of the driver
<b>SCHEDULES</b>	employment_date	Date of employment
	schedule_id	Unique identifier for each schedule
	order_id	Identifier linking to the order
	vehicle_id	Identifier linking to the vehicle
	driver_id	Identifier linking to the driver
	route_id	Identifier linking to the route
	schedule_date	Date of the schedule
	departure_time	Departure time
<b>MAINTENANCE RECORDS</b>	arrival_time	Arrival time
	maintenance_id	Unique identifier for vehicle maintenance
	vehicle_id	Identifier linking to the vehicle
	maintenance_date	Date of maintenance
	description	Description of the maintenance activity
<b>FUEL CONSUMPTION</b>	cost	Cost of the maintenance
	fuel_id	Unique identifier for each fuel log
	vehicle_id	Identifier linking to the vehicle
	order_id	Identifier linking to the order
	date	Date of the fuel log
	fuel_quantity	Quantity of fuel consumed
<b>NOTIFICATIONS</b>	cost	Cost of the fuel
	notification_id	Unique identifier for each notification
	user_id	Identifier linking to the user
	message	Notification message
	date	Date of the notification
<b>USERS</b>	status	Status of the notification
	user_id	Unique identifier for each user
	username	Username of the user
	password	Password of the user
	role	Role of the user (e.g., admin, customer)

## **Implementation of TMS database:**

### **Creating the Advanced Transportation Management System Database Schema:**

First, we create the TMS database if it does not already exist and switch to using this database:

```
sql
CREATE DATABASE IF NOT EXISTS tms;
USE tms;
```

### **Tables Definition and Creation:**

We then proceed to create the necessary tables, ensuring all relevant relationships and constraints are defined.

#### **1. Customers Table**

The `customers` table stores customer information:

```
sql
CREATE TABLE IF NOT EXISTS customers (
    customer_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(255) NOT NULL,
    address VARCHAR(255) NOT NULL,
    phone_number VARCHAR(15),
    email VARCHAR(255),
    registration_date DATE
);
```

#### **2. Orders Table**

The `orders` table records details of customer's orders and references the `customers` table:

```
sql
CREATE TABLE IF NOT EXISTS orders (
    order_id INT AUTO_INCREMENT PRIMARY KEY,
    customer_id INT,
    order_date DATE,
    delivery_date DATE,
    status VARCHAR(50),
    order_cost DECIMAL(10, 2),
    total_cost DECIMAL(10, 2),
    FOREIGN KEY (customer_id) REFERENCES customers(customer_id)
);
```

### **3. Vehicles Table**

The vehicles table contains information about the delivery vehicles:

```
sql
CREATE TABLE IF NOT EXISTS vehicles (
    vehicle_id INT AUTO_INCREMENT PRIMARY KEY,
    license_plate VARCHAR(15) NOT NULL UNIQUE,
    model VARCHAR(50),
    manufacturer VARCHAR(50),
    year INT,
    capacity INT,
    fuel_type VARCHAR(20),
    maintenance_date DATE
);
```

### **4. Drivers Table**

The drivers table stores driver information:

```
sql
CREATE TABLE IF NOT EXISTS drivers (
    driver_id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(255) NOT NULL,
    license_number VARCHAR(20) NOT NULL UNIQUE,
    phone_number VARCHAR(15) NOT NULL,
    address VARCHAR(255) NOT NULL,
    employment_date DATE
);
```

### **5. Routes Table**

The routes table defines delivery routes:

```
sql
CREATE TABLE IF NOT EXISTS routes (
    route_id INT AUTO_INCREMENT PRIMARY KEY,
    origin VARCHAR(255) NOT NULL,
    destination VARCHAR(255) NOT NULL,
    distance INT NOT NULL
);
```

### **6. Schedules Table**

The schedules table is for managing delivery schedule and links orders, vehicles, drivers, routes:

```
sql
CREATE TABLE IF NOT EXISTS schedules (
    schedule_id INT AUTO_INCREMENT PRIMARY KEY,
```

```

order_id INT,
vehicle_id INT,
driver_id INT,
route_id INT,
scheduled_date DATE,
departure_time TIME,
arrival_time TIME,
FOREIGN KEY (order_id) REFERENCES orders(order_id),
FOREIGN KEY (vehicle_id) REFERENCES vehicles(vehicle_id),
FOREIGN KEY (driver_id) REFERENCES drivers(driver_id),
FOREIGN KEY (route_id) REFERENCES routes(route_id)
);

```

## 7. Maintenance Records Table

The `maintenance_records` table keeps track of the prospective vehicle maintenance schedule:

```

sql
CREATE TABLE IF NOT EXISTS maintenance_records (
    maintenance_id INT AUTO_INCREMENT PRIMARY KEY,
    vehicle_id INT,
    maintenance_date DATE,
    description TEXT,
    cost DECIMAL(10, 2),
    FOREIGN KEY (vehicle_id) REFERENCES vehicles(vehicle_id)
);

```

## 8. Fuel Consumption Table

The `fuel_consumption` table records the fuel usage of vehicles for a specific order:

```

sql
CREATE TABLE IF NOT EXISTS fuel_consumption (
    fuel_id INT AUTO_INCREMENT PRIMARY KEY,
    vehicle_id INT,
    order_id INT,
    date DATE,
    fuel_quantity DECIMAL(10, 2),
    cost DECIMAL(10, 2),
    FOREIGN KEY (vehicle_id) REFERENCES vehicles(vehicle_id),
    FOREIGN KEY (order_id) REFERENCES orders(order_id)
);

```

## 9. Users Table

The `users` table stores system user information:

```

sql
CREATE TABLE IF NOT EXISTS users (
    user_id INT AUTO_INCREMENT PRIMARY KEY,
    username VARCHAR(50) NOT NULL UNIQUE,
    password VARCHAR(255) NOT NULL,

```

```
    role VARCHAR(20) NOT NULL
);
```

## 10. Delivery Performance Table

The delivery\_performance table tracks delivery performance metrics and feedback:

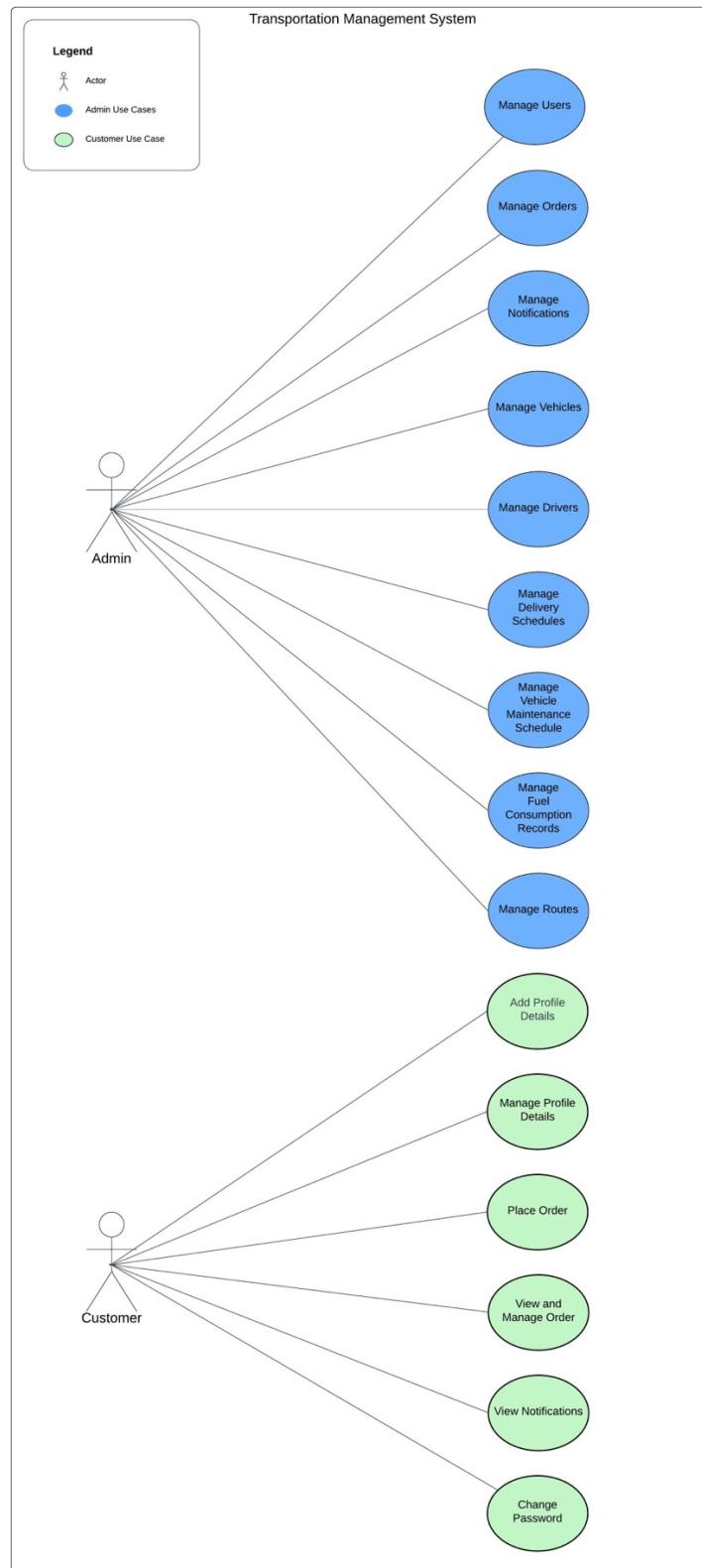
```
sql
CREATE TABLE IF NOT EXISTS delivery_performance (
    performance_id INT AUTO_INCREMENT PRIMARY KEY,
    customer_id INT,
    order_id INT,
    actual_delivery_date DATE,
    delivery_status VARCHAR(50),
    customer_feedback TEXT,
    rating INT CHECK (rating >= 1 AND rating <= 5),
    FOREIGN KEY (customer_id) REFERENCES customers(customer_id),
    FOREIGN KEY (order_id) REFERENCES orders(order_id)
);
```

## 11. Notifications Table

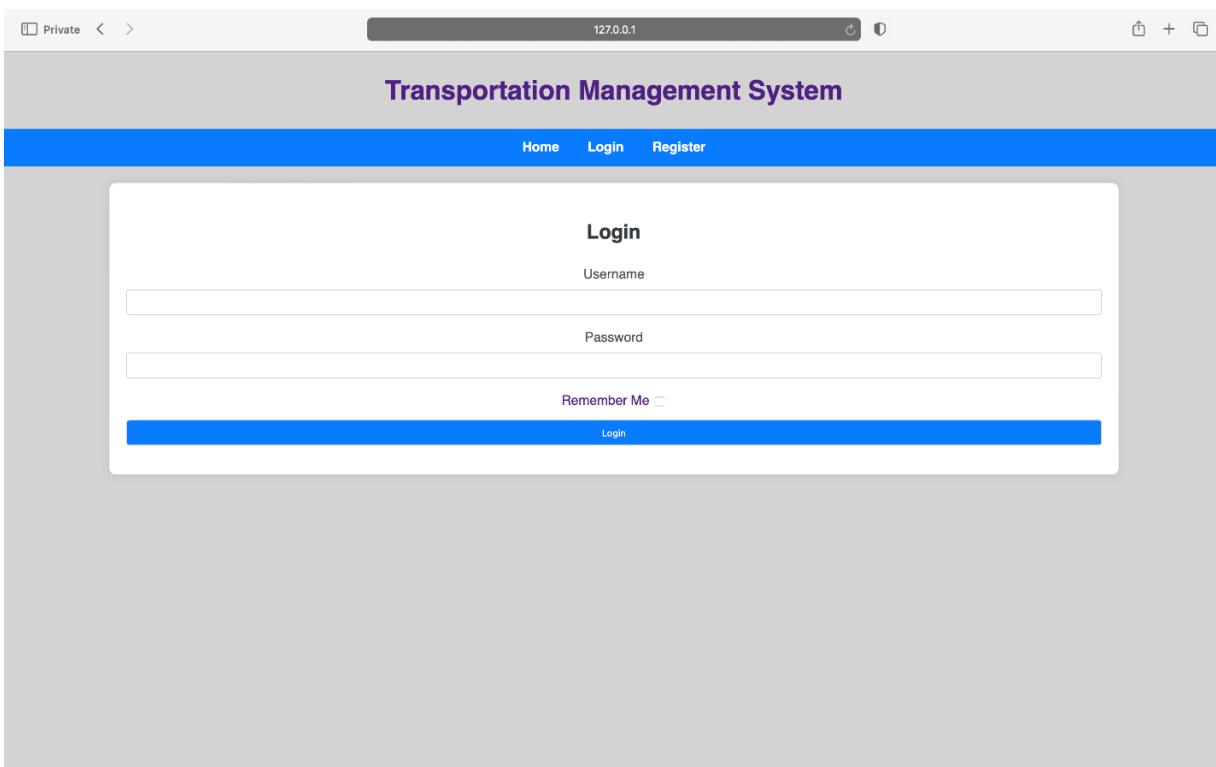
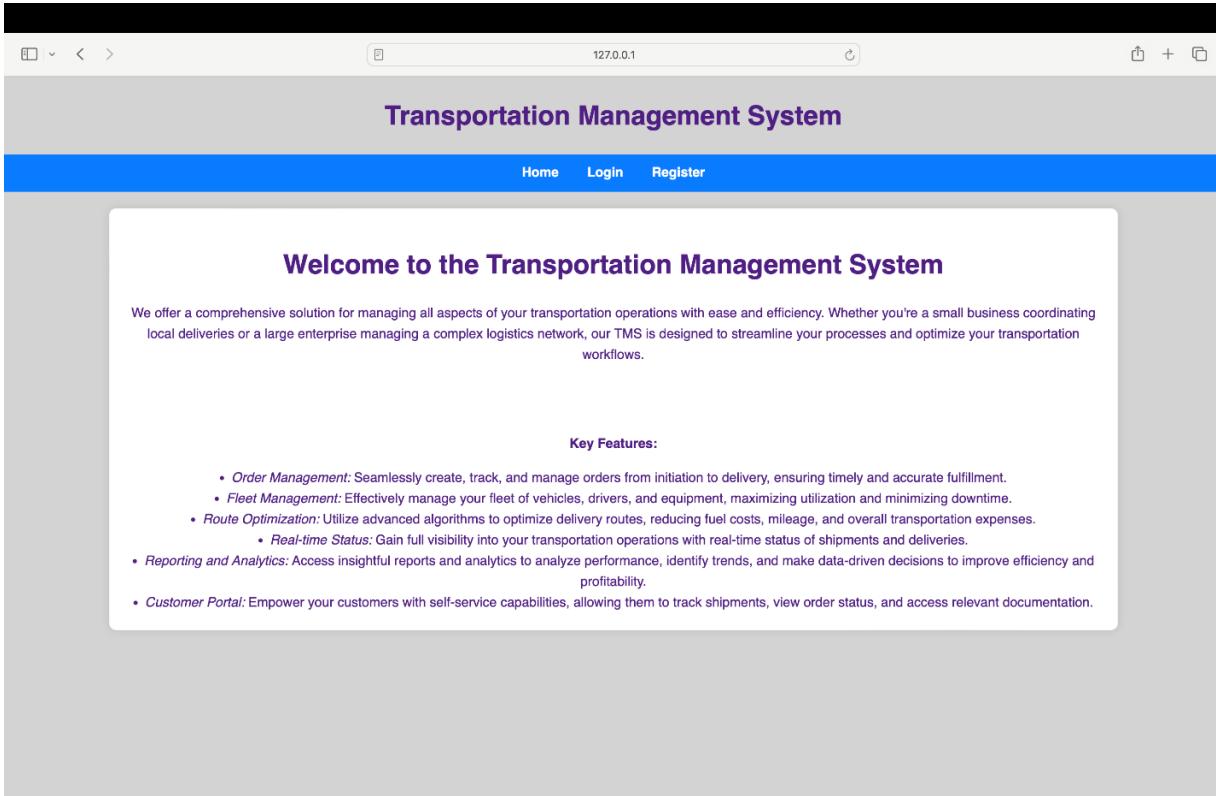
The notifications table manages user notifications:

```
sql
CREATE TABLE IF NOT EXISTS notifications (
    notification_id INT AUTO_INCREMENT PRIMARY KEY,
    user_id INT,
    message TEXT,
    date DATETIME,
    status VARCHAR(20),
    FOREIGN KEY (user_id) REFERENCES users(user_id)
);
```

## Use Case Diagram:



## Screenshots of TMS Web Application Screens:



A screenshot of a web browser showing the 'Transportation Management System' Register page. The URL in the address bar is 127.0.0.1. The page has a blue header with 'Home', 'Login', and 'Register' buttons. The main content area is titled 'Register' and contains fields for 'Username', 'Password', and 'Confirm Password'. Below these is a 'Role' section with radio buttons for 'Admin' (selected) and 'Customer'. A 'Submit' button is at the bottom of the form.

## Transportation Management System

Home Login Register

### Register

Username

Password

Confirm Password

Role

✓ Admin Customer

Submit

A screenshot of a web browser showing the 'Transportation Management System' Login page. The URL in the address bar is 127.0.0.1. The page has a blue header with 'Home', 'Login', and 'Register' buttons. The main content area is titled 'Login' and contains fields for 'Username' (with value 'admin@tms.com') and 'Password' (with value '\*\*\*\*\*'). There is a 'Remember Me' checkbox checked. A 'Login' button is at the bottom of the form.

## Transportation Management System

Home Login Register

### Login

Username

admin@tms.com

Password

\*\*\*\*\*

Remember Me

Login

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main title is "Transportation Management System". Below it is a blue navigation bar with "Home" and "Logout" links. The central content area is titled "Admin Dashboard" and contains a horizontal menu bar with the following items: Manage Users, Manage Orders, Manage Notifications, Manage Vehicles, Manage Drivers, Manage Delivery Schedule, Manage Maintenance, Manage Fuel Consumption Records, and Manage Routes.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main title is "Transportation Management System". Below it is a blue navigation bar with "Home" and "Logout" links. The central content area is titled "Manage Users" and includes a "Add New User" link. A table lists user information:

ID	Username	Email	Role	Actions
1	admin@tms.com		Admin	<a href="#">Edit</a>   <a href="#">Delete</a>
2	aaron@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
3	barton@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
5	daniel@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
6	elen@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>

A "Back" button is located at the bottom of the page.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". A blue header bar contains "Home" and "Logout" links. Below this is a white form titled "Add User". The form has four input fields: "Username" (frank@tms.com), "Password" (\*\*\*\*\*), "Confirm Password" (\*\*\*\*\*), and "Role" (Customer). A "Submit" button is at the bottom left, and a "Back" button is at the bottom right.

Transportation Management System

Home Logout

Add User

Username  
frank@tms.com

Password  
\*\*\*\*\*

Confirm Password  
\*\*\*\*\*

Role  
Customer

Submit Back

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". A blue header bar contains "Home" and "Logout" links. A green banner at the top states "Your account has been created! You are now able to log in". Below this is a table titled "Manage Users" with the heading "Add New User". The table lists user information:

ID	Username	Email	Role	Actions
1	admin@tms.com		Admin	<a href="#">Edit</a>   <a href="#">Delete</a>
2	aaron@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
3	barton@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
5	daniel@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
6	elen@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
7	frank@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>

Your account has been created! You are now able to log in

Manage Users

Add New User

ID	Username	Email	Role	Actions
1	admin@tms.com		Admin	<a href="#">Edit</a>   <a href="#">Delete</a>
2	aaron@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
3	barton@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
5	daniel@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
6	elen@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
7	frank@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>

Back

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. A central modal dialog titled "Edit User" contains fields for "Username" (with value "barton@tms.com"), "Password" (with value "\*\*\*\*\*"), and "Role" (set to "Customer"). A "Submit" button is at the bottom of the modal, and a "Back" button is located below it.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. A green notification bar at the top states "User has been updated successfully!". Below it is a table titled "Manage Users" with the following data:

ID	Username	Email	Role	Actions
1	admin@tms.com		Admin	<a href="#">Edit</a>   <a href="#">Delete</a>
2	aaron@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
3	barton@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
5	daniel@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
6	elen@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
7	frank@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
9	georgie@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>

A "Back" button is located at the bottom of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The title bar reads "Transportation Management System". The top navigation bar includes "Home" and "Logout" links. A green success message box contains the text "User has been deleted successfully!". Below it, the "Manage Users" section features a table with columns: ID, Username, Email, Role, and Actions. The table data is as follows:

ID	Username	Email	Role	Actions
1	admin@tms.com		Admin	<a href="#">Edit</a>   <a href="#">Delete</a>
2	aaron@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
3	barton@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
5	daniel@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
6	elen@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>
7	frank@tms.com		Customer	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The title bar reads "Transportation Management System". The top navigation bar includes "Home" and "Logout" links. The "Manage Orders" section features a table with columns: ID, Customer ID, Order Date, Delivery Date, Status, Order Cost, Total Cost, and Actions. The table data is as follows:

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
3	2	2024-06-06	2024-06-20	In Progress	35000.0	52500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	1	2024-06-06	2024-06-21	New	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
5	1	2024-06-05	2024-06-12	Delivered	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
6	4	2024-06-13	2024-06-28	New	34750.0	52125.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

Transportation Management System

Home Logout

### Add New Order

Customer ID

- Aaron James
- Barton Clint
- Daniel David
- Elen Parr

Delivery Date

Order Cost (\$)

Submit Back

06/13/2024

06/13/2024

Transportation Management System

Home Logout

### Add New Order

Customer ID

- Daniel David

Order Date

Delivery Date

Order Cost (\$)

Submit Back

06/13/2024

06/25/2024

44500

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## Transportation Management System

Home Logout

Order has been added successfully!

### Manage Orders

• [Add New Order](#)

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
3	2	2024-06-06	2024-06-20	In Progress	35000.0	52500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	1	2024-06-06	2024-06-21	New	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
5	1	2024-06-05	2024-06-12	Delivered	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
6	4	2024-06-13	2024-06-28	New	34750.0	52125.0	<a href="#">Edit</a>   <a href="#">Delete</a>
7	3	2024-06-13	2024-06-25	New	44500.0	66750.0	<a href="#">Edit</a>   <a href="#">Delete</a>

[Back](#)

Private < > 127.0.0.1 ⌂ ⌃ ⌄

## Transportation Management System

Home Logout

### Edit Order

Customer ID  
Aaron James

Order Date

Delivery Date

Status

Order Cost (\$)

[Submit](#)

[Back](#)

Private < > 127.0.0.1 ⌂ ⌃ ⌄

## Transportation Management System

Home Logout

### Edit Order

Customer ID  
Aaron James 

Order Date  
06/06/2024

Delivery Date  
06/21/2024

Status  
In Progress

Order Cost (\$)  
25000.0

Private < > 127.0.0.1 ⌂ ⌃ ⌄

## Transportation Management System

Home Logout

Order has been updated successfully!

### Manage Orders

• [Add New Order](#)

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
3	2	2024-06-06	2024-06-20	In Progress	35000.0	52500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	1	2024-06-06	2024-06-21	In Progress	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
5	1	2024-06-05	2024-06-12	Delivered	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
6	4	2024-06-13	2024-06-28	New	34750.0	52125.0	<a href="#">Edit</a>   <a href="#">Delete</a>
7	3	2024-06-13	2024-06-25	New	44500.0	66750.0	<a href="#">Edit</a>   <a href="#">Delete</a>

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title is a blue navigation bar with "Home" and "Logout" links. A green success message box at the top states "Order has been deleted successfully!". The main content area is titled "Manage Orders" and contains a table of order data. The table has columns: ID, Customer ID, Order Date, Delivery Date, Status, Order Cost, Total Cost, and Actions. The data in the table is as follows:

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
3	2	2024-06-06	2024-06-20	In Progress	35000.0	52500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	1	2024-06-06	2024-06-21	In Progress	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
5	1	2024-06-05	2024-06-12	Delivered	25000.0	37500.0	<a href="#">Edit</a>   <a href="#">Delete</a>
6	4	2024-06-13	2024-06-28	New	34750.0	52125.0	<a href="#">Edit</a>   <a href="#">Delete</a>
7	3	2024-06-13	2024-06-25	New	44500.0	66750.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title is a blue navigation bar with "Home" and "Logout" links. The main content area is titled "Manage Notifications" and contains a table of notification data. The table has columns: ID, User ID, Message, Date, Status, and Actions. The data in the table is as follows:

ID	User ID	Message	Date	Status	Actions
1	3	Your order is in progress	2024-06-12 00:00:00	In Progress	<a href="#">Edit</a>   <a href="#">Delete</a>
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Add New Notification for Users

User ID  
aaron@tms.com

Message

Notification Date  
06/13/2024

Current Status

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Add New Notification for Users

User ID  
aaron@tms.com

Message  
Thanks for the feedback

Notification Date  
06/13/2024

Current Status  
Delivered

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. Below the header is a green success message box containing the text "New Notification has been added successfully!". The main content area is titled "Manage Notifications" and contains a table of notifications. The table has columns: ID, User ID, Message, Date, Status, and Actions. There are three rows of data:

ID	User ID	Message	Date	Status	Actions
1	3	Your order is in progress	2024-06-12 00:00:00	In Progress	<a href="#">Edit</a>   <a href="#">Delete</a>
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>
3	2	Thanks for the feedback	2024-06-13 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. Below the header is a form titled "Edit Notification". The form fields are as follows:

- User ID: barton@tms.com
- Message: Your order is in progress
- Notification Date: 06/13/2024
- Current Status: In Progress

A blue "Submit" button is located at the bottom of the form, and a blue "Back" button is located at the bottom right.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title, there is a blue navigation bar with "Home" and "Logout" links. The main content area has a green header bar with the message "Notification has been updated successfully!". Below this, the title "Manage Notifications" is centered. Underneath the title, there is a link "• Add New Notification". A table lists three notifications:

ID	User ID	Message	Date	Status	Actions
1	3	Your order is in progress	2024-06-13 00:00:00	In Progress	<a href="#">Edit</a>   <a href="#">Delete</a>
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>
3	2	Thanks for the feedback	2024-06-13 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title, there is a blue navigation bar with "Home" and "Logout" links. The main content area has a form titled "Add New Notification for Users". The form fields are:

- User ID: daniel@tms.com
- Message: Thank you for placing the order.
- Notification Date: 06/13/2024
- Current Status: New

A blue "Submit" button is located at the bottom of the form, and a blue "Back" button is located at the bottom right.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout" links. A green success message box at the top states "New Notification has been added successfully!". Below it, a table titled "Manage Notifications" lists four notifications. The table columns are ID, User ID, Message, Date, Status, and Actions. The notifications are:

ID	User ID	Message	Date	Status	Actions
1	3	Your order is in progress	2024-06-13 00:00:00	In Progress	<a href="#">Edit</a>   <a href="#">Delete</a>
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>
3	2	Thanks for the feedback	2024-06-13 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>
4	5	Thank you for placing the order.	2024-06-13 00:00:00	New	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout" links. A green success message box at the top states "Notification has been deleted successfully!". Below it, a table titled "Manage Notifications" lists three notifications. The table columns are ID, User ID, Message, Date, Status, and Actions. The notifications are:

ID	User ID	Message	Date	Status	Actions
1	3	Your order is in progress	2024-06-13 00:00:00	In Progress	<a href="#">Edit</a>   <a href="#">Delete</a>
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>
3	2	Thanks for the feedback	2024-06-13 00:00:00	Delivered	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below this is a white card titled "Manage Vehicles" with a sub-header "Add New Vehicle". A table lists two vehicles:

ID	License Plate	Model	Manufacturer	Year	Capacity	Fuel Type	Maintenance Date	Actions
3	ABC453	VC860	Volvo	2021	35000	Diesel	2024-10-01	<a href="#">Edit</a>   <a href="#">Delete</a>
4	ABC129	VCX65	Volvo	2024	51500	Diesel	2025-02-07	<a href="#">Edit</a>   <a href="#">Delete</a>

A "Back" button is located at the bottom right of the card.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below this is a white card titled "Add New Vehicle". The form fields are as follows:

- License Plate: XYZ616
- Model: RS668LS
- Manufacturer: Mack
- Year: 2020
- Capacity (kgs): 60000
- Fuel Type: Diesel
- Upcoming Maintenance Date: 10/04/2024

A "Submit" button is located at the bottom left of the card, and a "Back" button is located at the bottom right.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title, there is a blue navigation bar with "Home" and "Logout" buttons. The main content area has a green header bar with the message "Vehicle has been added successfully!". Below this, the title "Manage Vehicles" is centered. Underneath the title is a table with the following columns: ID, License Plate, Model, Manufacturer, Year, Capacity, Fuel Type, Maintenance Date, and Actions. The table contains three rows of vehicle data:

ID	License Plate	Model	Manufacturer	Year	Capacity	Fuel Type	Maintenance Date	Actions
3	ABC453	VC860	Volvo	2021	35000	Diesel	2024-10-01	<a href="#">Edit</a>   <a href="#">Delete</a>
4	ABC129	VCX65	Volvo	2024	51500	Diesel	2025-02-07	<a href="#">Edit</a>   <a href="#">Delete</a>
5	XYZ616	RS686LS	Mack	2020	60000	Diesel	2024-10-04	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". Below the title, there is a blue navigation bar with "Home" and "Logout" buttons. The main content area is titled "Edit Vehicle". It contains several input fields for editing vehicle details:

- License Plate: XYZ616
- Model: RS686LS
- Manufacturer: Mack
- Year: 2024
- Capacity (kgs): 60000
- Fuel Type: Electric (highlighted with a blue border)
- Upcoming Maintenance Date: 10/04/2024

A blue "Submit" button is located at the bottom of the form, and a blue "Back" button is located at the bottom right.

A screenshot of a web browser displaying the Transportation Management System. The title bar shows the URL as 127.0.0.1. The main content area has a header "Transportation Management System". Below it is a blue navigation bar with "Home" and "Logout" buttons. A green success message box contains the text "Vehicle has been updated successfully!". The main content area is titled "Manage Vehicles" and features a table with the following data:

ID	License Plate	Model	Manufacturer	Year	Capacity	Fuel Type	Maintenance Date	Actions
3	ABC453	VC860	Volvo	2021	35000	Diesel	2024-10-01	<a href="#">Edit</a>   <a href="#">Delete</a>
4	ABC129	VCX65	Volvo	2024	51500	Diesel	2025-02-07	<a href="#">Edit</a>   <a href="#">Delete</a>
5	XYZ616	RS686LS	Mack	2024	60000	Electric	2024-10-04	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

A screenshot of a web browser displaying the Transportation Management System. The title bar shows the URL as 127.0.0.1. The main content area has a header "Transportation Management System". Below it is a blue navigation bar with "Home" and "Logout" buttons. A green success message box contains the text "Vehicle has been deleted successfully!". The main content area is titled "Manage Vehicles" and features a table with the following data:

ID	License Plate	Model	Manufacturer	Year	Capacity	Fuel Type	Maintenance Date	Actions
3	ABC453	VC860	Volvo	2021	35000	Diesel	2024-10-01	<a href="#">Edit</a>   <a href="#">Delete</a>
4	ABC129	VCX65	Volvo	2024	51500	Diesel	2025-02-07	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below the header is a white card titled "Manage Drivers" with a sub-link "• Add New Driver". A table lists two drivers:

ID	Name	License Number	Phone Number	Address	Employment Date	Actions
1	Chris Columbus	AVCF56154326713746	8178348272	123 Main Street, Tampa, FL - 33624	2022-06-01	<a href="#">Edit</a>   <a href="#">Delete</a>
2	Steve Rogers	AB54256FCF456	8008108198	651 Main Street, Orlando, FL - 32801	2021-01-01	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the card.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below the header is a white card titled "Add Driver". The form fields are as follows:

- Name: Tony Stark
- License Number: NMH762353261GF6414A
- Phone Number: 8765675430
- Address: 567 N Central Street, Lakeland, FL - 33801
- Employment Date: 01/02/2023

A blue "Submit" button is at the bottom left, and a blue "Back" button is at the bottom right of the card.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout" links. A green success message box at the top states "Driver has been added successfully!". Below it is a table titled "Manage Drivers" with columns: ID, Name, License Number, Phone Number, Address, Employment Date, and Actions. The table contains three rows of driver data:

ID	Name	License Number	Phone Number	Address	Employment Date	Actions
1	Chris Columbus	AVCF56154326713746	8178348272	123 Main Street, Tampa, FL - 33624	2022-06-01	<a href="#">Edit   Delete</a>
2	Steve Rogers	AB54256FCF456	8008108198	651 Main Street, Orlando, FL - 32801	2021-01-01	<a href="#">Edit   Delete</a>
3	Tony Stark	NMH762353261GF6414A	8765675430	567 N Central Street, Lakeland, FL - 33801	2023-01-02	<a href="#">Edit   Delete</a>

A blue "Back" button is located at the bottom of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout" links. A form titled "Edit Driver" is displayed with fields for Name, License Number, Phone Number, Address, and Employment Date. The "Name" field contains "Tony Stark", the "License Number" field contains "ABGF65176326568" (which is highlighted with a blue border), the "Phone Number" field contains "8765675430", the "Address" field contains "567 N Central Street, Lakeland, FL - 33801", and the "Employment Date" field contains "01/02/2023". A blue "Submit" button is at the bottom of the form, and a blue "Back" button is located below it.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout". A green success message box at the top states "Driver has been updated successfully!". Below it, a table titled "Manage Drivers" lists three drivers with columns: ID, Name, License Number, Phone Number, Address, Employment Date, and Actions. The first driver is Chris Columbus (ID 1). The second driver is Steve Rogers (ID 2). The third driver is Tony Stark (ID 3). Each row includes an "Edit | Delete" link under the Actions column. A blue "Back" button is located at the bottom of the table.

ID	Name	License Number	Phone Number	Address	Employment Date	Actions
1	Chris Columbus	AVCF56154326713746	8178348272	123 Main Street, Tampa, FL - 33624	2022-06-01	<a href="#">Edit   Delete</a>
2	Steve Rogers	AB54256FCF456	8008108198	651 Main Street, Orlando, FL - 32801	2021-01-01	<a href="#">Edit   Delete</a>
3	Tony Stark	ABGF65176326568	8765675430	567 N Central Street, Lakeland, FL - 33801	2023-01-02	<a href="#">Edit   Delete</a>

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a navigation bar with "Home" and "Logout". A green success message box at the top states "Driver has been deleted successfully!". Below it, a table titled "Manage Drivers" lists two drivers with columns: ID, Name, License Number, Phone Number, Address, Employment Date, and Actions. The first driver is Chris Columbus (ID 1). The second driver is Steve Rogers (ID 2). Each row includes an "Edit | Delete" link under the Actions column. A blue "Back" button is located at the bottom of the table.

ID	Name	License Number	Phone Number	Address	Employment Date	Actions
1	Chris Columbus	AVCF56154326713746	8178348272	123 Main Street, Tampa, FL - 33624	2022-06-01	<a href="#">Edit   Delete</a>
2	Steve Rogers	AB54256FCF456	8008108198	651 Main Street, Orlando, FL - 32801	2021-01-01	<a href="#">Edit   Delete</a>

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## Transportation Management System

Home Logout

### Manage Delivery Schedule

• Add New Delivery Schedule

ID	Order ID	Vehicle ID	Driver ID	Scheduled Date	Departure Time	Arrival Time	Actions
2	3	3	1	2024-06-19	11:00:00	14:30:00	<a href="#">Edit   Delete</a>
3	4	3	2	2024-06-12	10:00:00	13:00:00	<a href="#">Edit   Delete</a>

[Back](#)

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Add Schedule

Order ID

Vehicle ID

Driver ID

Route ID

Scheduled Date

Departure Time

Arrival Time

[Submit](#)

[Back](#)

The screenshot shows a web browser window for the Transportation Management System at address 127.0.0.1. The title bar reads "Transportation Management System". The main content area has a blue header bar with "Home" and "Logout" links. Below this is a green success message box containing the text "Delivery Schedule has been added successfully!". The main content area is titled "Manage Delivery Schedule" and contains a table with the following data:

ID	Order ID	Vehicle ID	Driver ID	Scheduled Date	Departure Time	Arrival Time	Actions
2	3	3	1	2024-06-19	11:00:00	14:30:00	<a href="#">Edit   Delete</a>
3	4	3	2	2024-06-12	10:00:00	13:00:00	<a href="#">Edit   Delete</a>
4	7	4	2	2024-06-25	8:00:00	12:00:00	<a href="#">Edit   Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window for the Transportation Management System at address 127.0.0.1. The title bar reads "Transportation Management System". The main content area has a blue header bar with "Home" and "Logout" links. The main content area is titled "Edit Schedule" and contains the following form fields:

Order ID	<input type="text" value="7"/>
Vehicle ID	<input type="text" value="ABC129"/>
Driver ID	<input type="text" value="Steve Rogers"/>
Route ID	<input type="text" value="3"/>
Scheduled Date	<input type="text" value="06/27/2024"/>
Departure Time	<input type="text" value="8:00:00"/>
Arrival Time	<input type="text" value="12:00:00"/>

A blue "Submit" button is at the bottom of the form, and a blue "Back" button is at the bottom right.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". A blue header bar contains "Home" and "Logout" links. Below the header, a green success message box displays "Delivery Schedule has been updated successfully!". The main content area is titled "Manage Delivery Schedule" and includes a table with the following data:

ID	Order ID	Vehicle ID	Driver ID	Scheduled Date	Departure Time	Arrival Time	Actions
2	3	3	1	2024-06-19	11:00:00	14:30:00	<a href="#">Edit</a>   <a href="#">Delete</a>
3	4	3	2	2024-06-12	10:00:00	13:00:00	<a href="#">Edit</a>   <a href="#">Delete</a>
4	7	4	2	2024-06-27	8:00:00	12:00:00	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System". A blue header bar contains "Home" and "Logout" links. Below the header, a green success message box displays "Delivery Schedule has been deleted successfully!". The main content area is titled "Manage Delivery Schedule" and includes a table with the following data:

ID	Order ID	Vehicle ID	Driver ID	Scheduled Date	Departure Time	Arrival Time	Actions
2	3	3	1	2024-06-19	11:00:00	14:30:00	<a href="#">Edit</a>   <a href="#">Delete</a>
3	4	3	2	2024-06-12	10:00:00	13:00:00	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a sub-section titled "Manage Vehicle Maintenance Schedule". A link "Add New Maintenance Schedule" is visible. Below it is a table with one row of data:

ID	Vehicle ID	Maintenance Date	Description	Cost	Actions
1	3	2024-10-17	100k mile service	20000.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the table.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a sub-section titled "Add Vehicle Maintenance Record". The form fields include:

- Vehicle ID: A dropdown menu with options "ABC453" (selected) and "ABC129".
- Maintenance Date: A date input field containing "06/13/2024".
- Description: A text input field.
- Maintenance Cost (\$): A text input field.

A blue "Submit" button is at the bottom of the form, and a blue "Back" button is at the bottom right.

Private < > 127.0.0.1 Home Logout

## Transportation Management System

### Add Vehicle Maintenance Record

Vehicle ID  
ABC129

Maintenance Date  
08/30/2024

Description  
90k mile service

Maintenance Cost (\$)  
15000

Submit Back

Private < > 127.0.0.1 Home Logout

## Transportation Management System

### Manage Vehicle Maintenance Schedule

Vehicle Maintenance record has been added successfully!

• Add New Maintenance Schedule

ID	Vehicle ID	Maintenance Date	Description	Cost	Actions
1	3	2024-10-17	100k mile service	20000.0	Edit   Delete
2	4	2024-08-30	90k mile service	15000.0	Edit   Delete
3	4	2024-08-30	90k mile service	15000.0	Edit   Delete

Back

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Edit Maintenance Record

Vehicle ID  
ABC129

Maintenance Date  
11/30/2024

Description  
100k mile service

Maintenance Cost (\$)  
16000

Submit Back

Private < > 127.0.0.1

## Transportation Management System

Home Logout

Vehicle Maintenance record has been updated successfully!

### Manage Vehicle Maintenance Schedule

• Add New Maintenance Schedule

ID	Vehicle ID	Maintenance Date	Description	Cost	Actions
1	3	2024-10-17	100k mile service	20000.0	Edit   Delete
2	4	2024-08-30	90k mile service	15000.0	Edit   Delete
3	4	2024-11-30	100k mile service	16000.0	Edit   Delete

Back

Transportation Management System

Home Logout

Vehicle Maintenance record has been deleted successfully!

### Manage Vehicle Maintenance Schedule

• Add New Maintenance Schedule

ID	Vehicle ID	Maintenance Date	Description	Cost	Actions
1	3	2024-10-17	100k mile service	20000.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	4	2024-08-30	90k mile service	15000.0	<a href="#">Edit</a>   <a href="#">Delete</a>

[Back](#)

Transportation Management System

Home Logout

### Manage Fuel Consumption Records

• Add New Fuel Consumption Record

ID	Vehicle ID	Order ID	Date	Fuel Quantity	Cost	Actions
1	4	4	2024-06-21	400.0	1350.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	3	5	2024-06-12	300.0	1200.0	<a href="#">Edit</a>   <a href="#">Delete</a>

[Back](#)

Private < > 127.0.0.1 ⌂ + ⌂

## Transportation Management System

Home Logout

### Add Fuel Consumption Record

Vehicle ID  
 ABC453  ABC129  
Order ID  
 3

Delivery Date  
06/13/2024

Fuel Quantity (gallons)

Fuel Cost (\$)

Private < > 127.0.0.1 ⌂ + ⌂

## Transportation Management System

Home Logout

### Add Fuel Consumption Record

Vehicle ID  
 ABC129

Order ID  
 6

Delivery Date  
06/25/2024

Fuel Quantity (gallons)  
450

Fuel Cost (\$)  
2000

Private < > 127.0.0.1

## Transportation Management System

Home Logout

Fuel Consumption Record has been added successfully!

### Manage Fuel Consumption Records

• Add New Fuel Consumption Record

ID	Vehicle ID	Order ID	Date	Fuel Quantity	Cost	Actions
1	4	4	2024-06-21	400.0	1350.0	Edit   Delete
2	3	5	2024-06-12	300.0	1200.0	Edit   Delete
3	4	6	2024-06-25	450.0	2000.0	Edit   Delete

Back

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Edit Fuel Consumption Record

Vehicle ID  
ABC129

Order ID  
6

Delivery Date

Fuel Quantity (gallons)

Fuel Cost (\$)

Submit

Back

The screenshot shows a web browser window with the title "Transportation Management System". The URL bar displays "127.0.0.1". The main content area has a blue header bar with "Home" and "Logout" links. Below this, a green success message box contains the text "Fuel Consumption Record has been updated successfully!". The main content area is titled "Manage Fuel Consumption Records" and includes a table with the following data:

ID	Vehicle ID	Order ID	Date	Fuel Quantity	Cost	Actions
1	4	4	2024-06-21	400.0	1350.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	3	5	2024-06-12	300.0	1200.0	<a href="#">Edit</a>   <a href="#">Delete</a>
3	4	6	2024-06-26	450.0	2000.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the title "Transportation Management System". The URL bar displays "127.0.0.1". The main content area has a blue header bar with "Home" and "Logout" links. Below this, a green success message box contains the text "Fuel Consumption Record has been deleted successfully!". The main content area is titled "Manage Fuel Consumption Records" and includes a table with the following data:

ID	Vehicle ID	Order ID	Date	Fuel Quantity	Cost	Actions
1	4	4	2024-06-21	400.0	1350.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	3	5	2024-06-12	300.0	1200.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A blue "Back" button is located at the bottom right of the content area.

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below the header is a white card titled "Manage Routes" containing a table of routes and a "Back" button.

ID	Origin	Destination	Distance	Actions
1	Lakeland, FL	Orlando, FL	65.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	Lakeland, FL	Tampa, FL	55.0	<a href="#">Edit</a>   <a href="#">Delete</a>
3	Lakeland, FL	Clearwater, FL	68.0	<a href="#">Edit</a>   <a href="#">Delete</a>

[Back](#)

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below the header is a white card titled "Add New Route" with fields for Origin, Destination, and Distance (miles), and a "Submit" button.

Origin: Lakeland, FL

Destination: Daytona Beach, FL

Distance (miles): 110

[Submit](#)

[Back](#)

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. A green success message box at the top states "New Route has been added successfully!". Below it is a table titled "Manage Routes" with columns: ID, Origin, Destination, Distance, and Actions. The table contains four rows of route data. At the bottom is a "Back" button.

ID	Origin	Destination	Distance	Actions
1	Lakeland, FL	Orlando, FL	65.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	Lakeland, FL	Tampa, FL	55.0	<a href="#">Edit</a>   <a href="#">Delete</a>
3	Lakeland, FL	Clearwater, FL	68.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	Lakeland, FL	Daytona Beach, FL	110.0	<a href="#">Edit</a>   <a href="#">Delete</a>

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area has a title "Transportation Management System" and a blue header bar with "Home" and "Logout" links. A form titled "Edit Route" is displayed, containing fields for "Origin" (Lakeland, FL), "Destination" (Daytona Beach, FL), and "Distance (miles)" (112.0). A "Submit" button is at the bottom of the form, and a "Back" button is located below it.

A screenshot of a web browser window titled "Transportation Management System". The URL in the address bar is 127.0.0.1. The page has a blue header bar with "Home" and "Logout" links. Below the header is a green success message box containing the text "Route has been updated successfully!". The main content area is titled "Manage Routes" and contains a table with four rows of route data. Each row includes columns for ID, Origin, Destination, Distance, and Actions (Edit | Delete). A blue "Back" button is located at the bottom right of the table area.

ID	Origin	Destination	Distance	Actions
1	Lakeland, FL	Orlando, FL	65.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	Lakeland, FL	Tampa, FL	55.0	<a href="#">Edit</a>   <a href="#">Delete</a>
3	Lakeland, FL	Clearwater, FL	68.0	<a href="#">Edit</a>   <a href="#">Delete</a>
4	Lakeland, FL	Daytona Beach, FL	112.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A screenshot of a web browser window titled "Transportation Management System". The URL in the address bar is 127.0.0.1. The page has a blue header bar with "Home" and "Logout" links. Below the header is a green success message box containing the text "Route has been deleted successfully!". The main content area is titled "Manage Routes" and contains a table with three rows of route data. Each row includes columns for ID, Origin, Destination, Distance, and Actions (Edit | Delete). A blue "Back" button is located at the bottom right of the table area.

ID	Origin	Destination	Distance	Actions
1	Lakeland, FL	Orlando, FL	65.0	<a href="#">Edit</a>   <a href="#">Delete</a>
2	Lakeland, FL	Tampa, FL	55.0	<a href="#">Edit</a>   <a href="#">Delete</a>
3	Lakeland, FL	Clearwater, FL	68.0	<a href="#">Edit</a>   <a href="#">Delete</a>

A screenshot of a web browser showing the 'Transportation Management System' registration page. The URL in the address bar is 127.0.0.1. The page has a blue header bar with 'Home', 'Login', and 'Register' buttons. Below the header is a white registration form titled 'Register'. The form fields are: 'Username' (george@tms.com), 'Password' (\*\*\*\*\*), 'Confirm Password' (\*\*\*\*\*), 'Role' (Customer), and a 'Submit' button.

Transportation Management System

Home Login Register

Register

Username

george@tms.com

Password

\*\*\*\*\*

Confirm Password

\*\*\*\*\*

Role

Customer

Submit

A screenshot of a web browser showing the 'Transportation Management System' login page. The URL in the address bar is 127.0.0.1. The page has a blue header bar with 'Home', 'Login', and 'Register' buttons. A green success message at the top states: 'Your account has been created! You are now able to log in'. Below the message is a login form titled 'Login'. The form fields are: 'Username' (empty), 'Password' (empty), and a 'Remember Me' checkbox. At the bottom is a 'Login' button.

Transportation Management System

Home Login Register

Your account has been created! You are now able to log in

Login

Username

Password

Remember Me

Login

A screenshot of a web browser showing the Transportation Management System login page. The title bar indicates the page is at 127.0.0.1. The main header reads "Transportation Management System". Below it is a blue navigation bar with "Home", "Login", and "Register" buttons. A green success message box contains the text "Your account has been created! You are now able to log in". The main content area is titled "Login" and contains fields for "Username" (georgie@tms.com) and "Password" (\*\*\*\*\*). There is also a "Remember Me" checkbox and a blue "Login" button.

A screenshot of a web browser showing the Transportation Management System customer dashboard. The title bar indicates the page is at 127.0.0.1. The main header reads "Transportation Management System". Below it is a blue navigation bar with "Home" and "Logout" buttons. The main content area is titled "Customer Dashboard" and features a horizontal menu bar with links: "Add Profile Details", "Manage Profile Details", "Place Order", "View and Manage Order", "View My Notifications", and "Change Password".

The screenshot shows a web browser window with the address bar displaying "127.0.0.1". The main content area is titled "Transportation Management System" and features a blue header bar with "Home" and "Logout" links. Below the header is a white form titled "Add Profile Details". The form contains four input fields: "Name" (empty), "Address" (empty), "Phone Number" (empty), and "Email" (empty). At the bottom of the form are two buttons: a large blue "Submit" button and a smaller white "Back" button.

## Add Profile Details

Name

Address

Phone Number

Email

This screenshot is identical to the one above, but the "Name" field now contains the value "Georgie Cooper". All other fields (Address, Phone Number, Email) and the buttons remain the same.

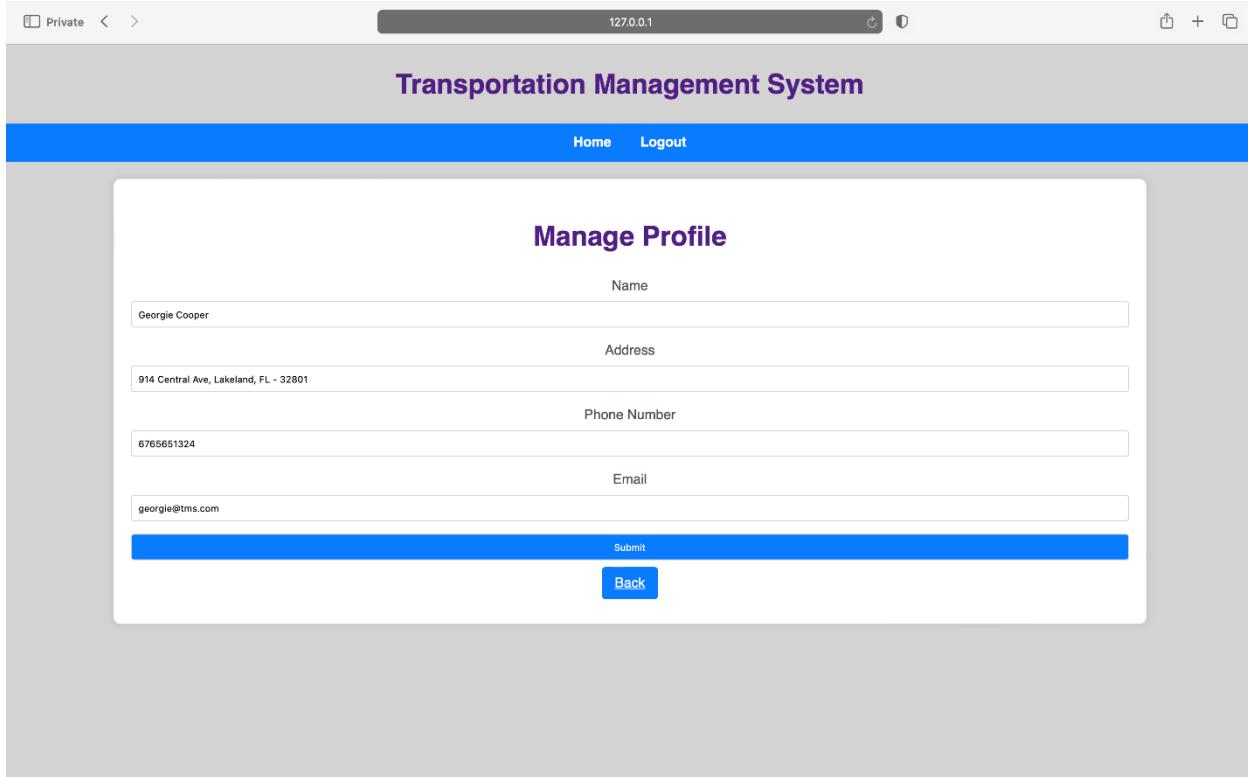
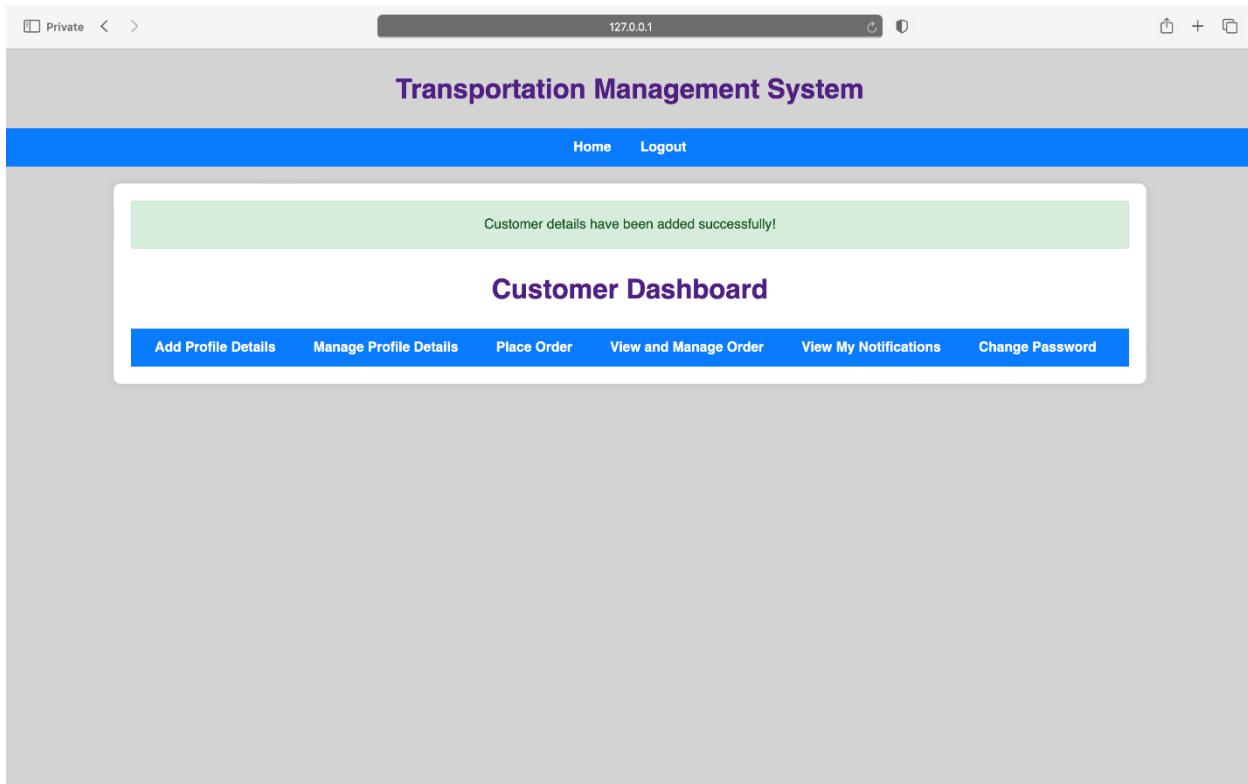
## Add Profile Details

Name

Address

Phone Number

Email



Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Manage Profile

Name  
Georgie Cooper

Address  
914 Central Ave, Lakeland, FL - 32801

Phone Number  
8912341542

Email  
georgie@tms.com

[Submit](#)

[Back](#)

Private < > 127.0.0.1

## Transportation Management System

Home Logout

Your profile has been updated!

### Customer Dashboard

[Add Profile Details](#) [Manage Profile Details](#) [Place Order](#) [View and Manage Order](#) [View My Notifications](#) [Change Password](#)

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Place Order

Order Date

Delivery Date

Order Cost (\$)

Submit

Back

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Place Order

Order Date

Delivery Date

Order Cost (\$)

Submit

Back

This screenshot shows the Customer Dashboard of the Transportation Management System. At the top, there is a blue header bar with 'Home' and 'Logout' buttons. Below the header, a green notification bar displays the message 'Your order has been placed!'. The main content area is titled 'Customer Dashboard' and contains several navigation links: 'Add Profile Details', 'Manage Profile Details', 'Place Order', 'View and Manage Order', 'View My Notifications', and 'Change Password'. The background of the dashboard is light gray.

This screenshot shows the 'View Placed Orders' page of the Transportation Management System. At the top, there is a blue header bar with 'Home' and 'Logout' buttons. The main content area is titled 'View Placed Orders' and displays a table of placed orders. The table has columns for ID, Customer ID, Order Date, Delivery Date, Status, Order Cost, Total Cost, and Actions. One row is visible, showing ID 9, Customer ID 5, Order Date 2024-06-13, Delivery Date 2024-07-04, Status New, Order Cost 90000.0, Total Cost 135000.0, and Actions with a link 'Edit | Rate Delivery'. A 'Back' button is located at the bottom of the table. The background of the page is light gray.

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## Transportation Management System

Home Logout

### Update Order

Order Date  
06/13/2024

Delivery Date  
07/04/2024

Status  
New

Order Cost (\$)  
85000.0

Total Cost (\$)  
135000.0

Submit

Back

Private < > 127.0.0.1 ⌂ + ⌂

## Transportation Management System

Home Logout

Your order has been updated!

### Customer Dashboard

Add Profile Details Manage Profile Details Place Order View and Manage Order View My Notifications Change Password

## Transportation Management System

Home Logout

### View Placed Orders

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
9	5	2024-06-13	2024-07-04	New	85000.0	127500.0	<a href="#">Edit   Rate Delivery</a>

[Back](#)

## Transportation Management System

Home Logout

### View Placed Orders

ID	Customer ID	Order Date	Delivery Date	Status	Order Cost	Total Cost	Actions
4	1	2024-06-06	2024-06-13	Delivered	25000.0	37500.0	<a href="#">Edit   Rate Delivery</a>
5	1	2024-06-05	2024-06-12	Delivered	25000.0	37500.0	<a href="#">Edit   Rate Delivery</a>

[Back](#)

A screenshot of a web browser window titled "Transportation Management System". The address bar shows "127.0.0.1". The main content area has a blue header bar with "Home" and "Logout" links. Below this is a white form box with a title "Provide Order & Delivery Feedback". The form contains a "Feedback" input field containing "Great delivery!", a "Rating" input field set to "1", and a "Submit" button. A "Back" button is located at the bottom left of the form.

Private < > 127.0.0.1 Home Logout

## Transportation Management System

Provide Order & Delivery Feedback

Feedback

Rating

Submit

Back

A screenshot of a web browser window titled "Transportation Management System". The address bar shows "127.0.0.1". The main content area has a blue header bar with "Home" and "Logout" links. Below this is a white form box with a title "Provide Order & Delivery Feedback". The form contains a "Feedback" input field containing "Great delivery!", a "Rating" input field set to "5", and a "Submit" button. A "Back" button is located at the bottom left of the form.

Private < > 127.0.0.1 Home Logout

## Transportation Management System

Provide Order & Delivery Feedback

Feedback

Rating

Submit

Back

This screenshot shows the Customer Dashboard of the Transportation Management System. At the top, there is a blue header bar with 'Home' and 'Logout' buttons. Below the header, a green notification bar displays the message 'Your feedback has been submitted!'. The main content area is titled 'Customer Dashboard' and contains a horizontal navigation bar with links: 'Add Profile Details', 'Manage Profile Details', 'Place Order', 'View and Manage Order', 'View My Notifications', and 'Change Password'. The background of the dashboard is light gray.

This screenshot shows the 'View Notifications' page of the Transportation Management System. At the top, there is a blue header bar with 'Home' and 'Logout' buttons. The main content area is titled 'View Notifications' and features a table with four columns: 'ID', 'Message', 'Date', and 'Status'. Two notifications are listed:

ID	Message	Date	Status
2	Your order has been delivered	2024-06-12 00:00:00	Delivered
3	Thanks for the feedback	2024-06-13 00:00:00	Delivered

A blue 'Back' button is located at the bottom of the notification list.

Private < > 127.0.0.1

## Transportation Management System

Home Logout

### Change Profile Password

Username  
aaron@tms.com

Password  
\*\*\*\*\*

Confirm Password  
\*\*\*\*\*

Submit

Back

Private < > 127.0.0.1

## Transportation Management System

Home Logout

Your password has been updated!

### Customer Dashboard

Add Profile Details Manage Profile Details Place Order View and Manage Order View My Notifications Change Password

## Screenshots of the Database tables:

3 • SELECT \* FROM CUSTOMERS;

Result Grid Filter Rows: Search Edit: Export/Import:

customer_id	name	address	phone_number	email	registration_d...
1	Aaron James	123 Main Street, Orlando, FL - 32789	8128987654	aaron@tms.com	2006-01-22
2	Barton Clint	456 N Central Ave, Lakeland, FL - 33801	8155453434	barton@tms.com	2024-06-04
3	Daniel David	453 N Central Ave, Tampa, FL - 33613	8165674532	daniel@tms.com	2024-06-05
4	Elen Parr	125, N Central Blvd, Sanford, FL - 32771	8123456543	elen@tms.com	2024-06-05
5	Georgie Cooper	914 Central Ave, Lakeland, FL - 32801	8912341542	georgie@tms.com	2024-06-13

3 • SELECT \* FROM USERS;

Result Grid Filter Rows: Search

user_id	username	password	role
1	admin@tms.com	Admin@1234	Admin
2	aaron@tms.com	Test@1234	Customer
3	barton@tms.com	Test@1234	Customer
5	daniel@tms.com	Test@1234	Customer
6	elen@tms.com	Test@1234	Customer
7	frank@tms.com	Frank@1234	Customer
9	georgie@tms.com	Test@1234	Customer

3 • SELECT \* FROM ORDERS;

Result Grid Filter Rows: Search Edit:

order_id	customer_id	order_date	delivery_date	status	order_cost
3	2	2024-06-06	2024-06-20	In Progress	35000.00
4	1	2024-06-06	2024-06-13	Delivered	25000.00
5	1	2024-06-05	2024-06-12	Delivered	25000.00
6	4	2024-06-13	2024-06-28	New	34750.00
7	3	2024-06-13	2024-06-25	New	44500.00
9	5	2024-06-13	2024-07-04	New	85000.00

3 • SELECT \* FROM NOTIFICATIONS;

Result Grid Filter Rows: Search Edit: Export/Import:

notification_id	user_id	message	date	status
1	3	Your order is in progress	2024-06-13 00:00:00	In Progress
2	2	Your order has been delivered	2024-06-12 00:00:00	Delivered
3	2	Thanks for the feedback	2024-06-13 00:00:00	Delivered

3 • SELECT \* FROM DRIVERS;

Result Grid Filter Rows: Search Edit: Export/Import:

driver_id	name	license_number	phone_number	address	employment_da...
1	Chris Columbus	AVCF56154326713746	8178348272	123 Main Street, Tampa, FL - 33624	2022-06-01
2	Steve Rogers	AB54256FCF456	8008108198	651 Main Street, Orlando, FL - 32801	2021-01-01

3 • SELECT \* FROM ROUTES;

Result Grid Filter Rows: Search

route_id	origin	destination	distance
1	Lakeland, FL	Orlando, FL	65
2	Lakeland, FL	Tampa, FL	55
3	Lakeland, FL	Clearwater, FL	68

3 • SELECT \* FROM SCHEDULES;

Result Grid Filter Rows: Search Edit: Export/Import:

schedule_id	order_id	vehicle_id	driver_id	route_id	scheduled_da...	departure_t...	arrival_time
2	3	3	1	1	2024-06-19	11:00:00	14:30:00
3	4	3	2	2	2024-06-12	10:00:00	13:00:00

3 • SELECT \* FROM FUEL\_CONSUMPTION;

Result Grid Filter Rows: Search Edit:

fuel_id	vehicle_id	order_id	date	fuel_quant...	cost
1	4	4	2024-06-21	400.00	1350.00
2	3	5	2024-06-12	300.00	1200.00

3 • SELECT \* FROM VEHICLES;

Result Grid Filter Rows: Search Edit: Export/Import:

vehicle_id	license_plate	model	manufactur...	year	capacity	fuel_type	maintenance_da...
3	ABC453	VC860	Volvo	2021	35000	Diesel	2024-10-01
4	ABC129	VCX65	Volvo	2024	51500	Diesel	2025-02-07

3 • SELECT \* FROM MAINTENANCE\_RECORDS;

Result Grid Filter Rows: Search Edit:

maintenance_id	vehicle_id	maintenance_da...	description	cost
1	3	2024-10-17	100k mile service	20000.00
2	4	2024-08-30	90k mile service	15000.00

3 • SELECT \* FROM DELIVERY\_PERFORMANCE;

Result Grid Filter Rows: Search Edit: Export/Import:

performance_id	customer_id	order_id	actual_delivery_date	delivery_status	customer_feedback	rating
1	1	5	2024-06-12	Delivered	Great on-time quick d...	5
2	1	4	2024-06-13	Delivered	Great delivery!	5

## **Web Application:**

The Transportation Management System (TMS) web application was developed using Python and the Flask framework, which is a popular choice for building web applications due to its simplicity and flexibility. Flask allows developers to create web applications quickly and efficiently by providing a lightweight and modular approach to web development.

The application follows the Model-View-Controller (MVC) architectural pattern, where the model represents the data, the view handles the presentation layer, and the controller manages the application logic. This separation of concerns allows for easier maintenance and scalability of the application.

For data storage and manipulation, SQL Alchemy, an Object-Relational Mapping (ORM) tool, was used. SQL Alchemy simplifies database interactions by allowing developers to work with database entities as Python objects, abstracting away the complexities of SQL queries.

Authentication and authorization were implemented using Flask's built-in mechanisms along with login required decorators to ensure that only authenticated users can access certain parts of the application. Role-based access control was employed to differentiate between administrators and customers, allowing for secure access to relevant functionalities.

The frontend of the application was developed using HTML templates with the Jinja2 templating engine, which allows for dynamic content generation based on data retrieved from the backend. This combination of Flask and Jinja2 facilitates the creation of dynamic and interactive web pages.

Various features were implemented to facilitate the management of transportation-related entities. Customers can add, view, and edit their profile details, while administrators have access to functionalities such as order management, driver and vehicle management, schedule management, and notification management.

Order management allows administrators to add, edit, and delete orders, while customers can view their order history and provide feedback on deliveries. Driver and vehicle management functionalities enable administrators to manage the fleet efficiently by adding, editing, and deleting driver and vehicle records.

The schedule management feature assigns vehicles and drivers to orders based on predefined routes and dates, ensuring efficient allocation of resources. A notification system alerts customers about order status updates, enhancing transparency and communication.

Fuel consumption tracking allows administrators to monitor fuel usage for vehicles, facilitating cost management and monitoring fuel efficiency. These features combined provide a comprehensive solution for managing various aspects of a transportation service.

Overall, the TMS web application was created using a combination of Python, Flask, SQLAlchemy, HTML, and Jinja2, leveraging their respective strengths to develop a robust and user-friendly transportation management system.

## **Conclusion:**

The database design lays the foundation for storing and organizing data in a structured manner, while the web application facilitates user interaction and streamlines operations. The implementation of the Transportation Management System database involves creating a comprehensive relational schema that covers all aspects of the delivery process. The SQL DDL statements ensure the structure and integrity of the database, while the DML statements performed through the Python pre-existing libraries provide mechanisms for data insertion, querying, updating and deletion. This robust schema supports efficient data management, enabling the system to optimize transportation logistics effectively.

In conclusion, the database design encompasses several key entities, including customers, orders, drivers, vehicles, routes, delivery schedules, fuel consumption records, maintenance records, customer feedback on delivery, users and customers notifications. These entities are interconnected through relationships that capture the dependencies and associations between them. For example, an order is associated with a customer, a vehicle, and a driver, while a schedule assigns vehicles and drivers to specific orders based on predefined routes and dates.

The web application built on top of this database design provides a user-friendly interface for interacting with the underlying data. Customers can easily add, view, and update their profile details, as well as track the status of their orders and provide feedback on deliveries. Administrators, on the other hand, have access to additional functionalities for managing orders, drivers, vehicles, schedules, fuel consumption records, and notifications. Where the entire transportation management system can allow users to perform various operations and actions based on their role to optimize the process.

The application leverages Flask, SQL Alchemy, HTML, and Jinja2 to create a dynamic and responsive user experience. Authentication and authorization mechanisms ensure secure access to functionalities based on user roles, while the MVC architectural pattern promotes code maintainability and scalability.

Overall, the TMS database design and web application provide an efficient and scalable solution for managing transportation operations. By centralizing data storage and streamlining workflows, the system helps organizations optimize resource allocation, improve communication, and enhance customer satisfaction. As transportation continues to play a vital role in various industries, the TMS serves as a valuable tool for addressing logistical challenges and achieving operational excellence.

**References:**

- [1]<https://www.geeksforgeeks.org/how-to-design-database-for-logistics-and-transportation/>
- [2]<https://www.moontecholabs.com/blog/transportation-management-system-development/>
- [3]<https://acropolium.com/blog/transportation-management-software-development-a-detailed-overview/>
- [4]<https://ijisrt.com/wp-content/uploads/2017/05/THE-TRANSPORT-MANAGEMENT-SYSTEM.pdf>