

Appendix 1 : Database Schema

Service: RFID Card Management Service

RFID_Cards Table:

Column Name	Data Type	Constraints
Card_ID (PK)	VARCHAR(16)	Primary Key, Not Null
User_ID	INT	Foreign Key (Users), Nullable
Balance	DECIMAL(10,2)	Not Null
IsActive	BOOLEAN	Not Null, Default True
Created_At	TIMESTAMP	Default Current Timestamp
Updated_At	TIMESTAMP	Default Current Timestamp

Service: Fare Deduction Service

Fare_Deductions Table:

Column Name	Data Type	Constraints
Deduction_ID (PK)	INT	Primary Key, Not Null
Card_ID (FK)	VARCHAR(16)	Foreign Key (RFID_Cards), Not Null
Journey_ID (FK)	INT	Foreign Key (Journeys), Not Null
Amount	DECIMAL(10,2)	Not Null
Tagged_On_Timestamp	TIMESTAMP	Not Null
Expiration_Time	TIMESTAMP	Not Null
Created_At	TIMESTAMP	Default Current Timestamp
Updated_At	TIMESTAMP	Default Current Timestamp

Fares Table:

Column Name	Data Type	Constraints
Fare_ID (PK)	INT	Primary Key, Not Null
Mode_of_Transport	VARCHAR(50)	Not Null
Zone	INT	Not Null
Amount	DECIMAL(10,2)	Not Null

Fare_Capping Table:

Column Name	Data Type	Constraints
Fare_Capping_ID (PK)	INT	Primary Key, Not Null
Mode_of_Transport	VARCHAR(50)	Not Null
Zone	INT	Not Null
Time_Period	INT	Not Null
Max_Amount	DECIMAL(10,2)	Not Null

Service: Journey Audit Service

Journeys Table:

Column Name	Data Type	Constraints
Journey_ID (PK)	INT	Primary Key, Not Null
Card_ID (FK)	VARCHAR(16)	Foreign Key (RFID_Cards), Not Null
Mode_of_Transport	VARCHAR(50)	Not Null
Start_Time	TIMESTAMP	Not Null
End_Time	TIMESTAMP	Nullable
Fare_Deducted	DECIMAL(10,2)	Not Null, Default 0.00
Tagging_Status	VARCHAR(10)	Not Null
Created_At	TIMESTAMP	Default Current Timestamp
Updated_At	TIMESTAMP	Default Current Timestamp

Service: Transaction Record Service

Transactions Table:

Column Name	Data Type	Constraints
Transaction_ID (PK)	INT	Primary Key, Not Null
Card_ID (FK)	VARCHAR(16)	Foreign Key (RFID_Cards), Not Null
Amount	DECIMAL(10,2)	Not Null
Transaction_Type	VARCHAR(50)	Not Null
Timestamp	TIMESTAMP	Not Null
Created_At	TIMESTAMP	Default Current Timestamp
Updated_At	TIMESTAMP	Default Current Timestamp

Service: Payment Service

Payments Table:

Column Name	Data Type	Constraints
Payment_ID (PK)	INT	Primary Key, Not Null
Card_ID (FK)	VARCHAR(16)	Foreign Key (RFID_Cards), Not Null
Amount	DECIMAL(10,2)	Not Null
Payment_Method	VARCHAR(50)	Not Null
Status	VARCHAR(20)	Not Null
Created_At	TIMESTAMP	Default Current Timestamp
Updated_At	TIMESTAMP	Default Current Timestamp