

PROJECT DEVELOPMENT PHASE

Date	18th June 2025
Team ID	LTVIP2025TMID28953
Project Name	CRM Application for Public Transport Management System
Maximum Marks	

1. OVERVIEW

This document captures the technical deliverables implemented for the CRM-based Public Transport Management System in Salesforce. It includes configurations of custom objects, automation logic, sample datasets, and screenshots of functional outcomes. The aim is to demonstrate fully executable components aligned with the problem statement, solution design, and project objectives.

2. REQUIRED PROJECT FILES

A. Custom Objects and Their Roles

1. Bus_Station__c

- **Purpose:** Stores details of each bus station.
- **Key Fields:**
 - Name
 - Bus_Stop_Category__c (Picklist: Managed/Unmanaged)
 - City__c, State__c, Amenities__c (Multi-select), Shelter_Available__c (Checkbox), Last_Updated__c (Formula)
 - Bench__c (Checkbox)
- **Usage:** Referenced by Bus and Employee for location information.

Setup Home Object Manager

SETUP > OBJECT MANAGER

Bus Station

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters

Details

Edit
Delete

Description

API Name
Bus_Station__c
Custom
✓

Singular Label
Bus Station
Plural Label
Bus Stations

Enable Reports
✓
Track Activities
Track Field History
Deployment Status
Deployed
Help Settings
Standard salesforce.com Help Window

2. Bus__c

- **Purpose:** Records information about buses.
- **Key Fields:**
 - Name (Registration No)
 - Bus_Station__c (Lookup to Bus Station)
 - Capacity__c (Number)
 - Category__c (Picklist: Local, Intercity, Interstate)
 - Model__c (Dependent picklist)
- **Usage:** Linked to Trip and Ticket Fare to define bus deployments.

Setup Home Object Manager

SETUP > OBJECT MANAGER

Bus

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types

Details

Edit
Delete

Description

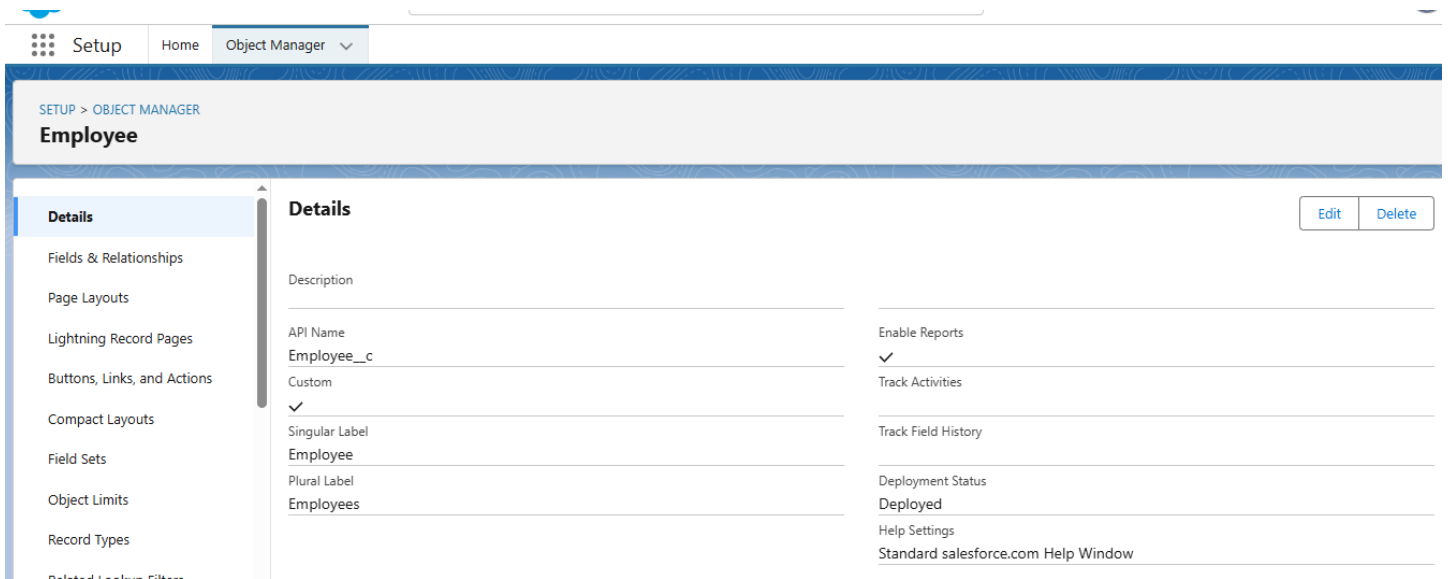
API Name
Bus__c
Custom
✓

Singular Label
Bus
Plural Label
Buses

Enable Reports
✓
Track Activities
Track Field History
Deployment Status
Deployed
Help Settings
Standard salesforce.com Help Window

3. Employee__c

- **Purpose:** Contains staff records (drivers, conductors, etc.).
- **Key Fields:**
 - Name, Employee_Id__c, Role__c (Picklist), Phone__c, Date_of_Birth__c, Date_of_Joining__c
 - Age__c, Experience__c, Date_of_Retirement__c (Formula)
 - Bus_Station__c (Lookup)
- **Usage:** Used in Trip assignment and validation.



4. Ticket_Fare__c

- **Purpose:** Maintains fare information per route and bus model.
- **Key Fields:**
 - Route_Name__c
 - Bus_Model__c (Global picklist)
 - Ticket_Fare__c (Currency)
- **Usage:** Retrieved via Flow to assign fare in Trip.

Setup Home Object Manager

SETUP > OBJECT MANAGER

Ticket Fare

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters

Details

Description

API Name
Ticket_Fare__c

Custom
✓

Singular Label
Ticket Fare

Plural Label
Ticket Fares

Enable Reports
✓

Track Activities

Track Field History

Deployment Status
Deployed

Help Settings
Standard salesforce.com Help Window

EditDelete

5. Trip__c

- **Purpose:** Captures each daily bus trip.
- **Key Fields:**
 - Trip_No__c, Trip_Date__c, Bus_No__c (Lookup), Route_Name__c (Lookup Ticket_Fare)
 - Arrival_Time__c, Departure_Time__c (Global picklists)
 - Driver_Id__c, Conductor_Id__c (Lookups), Driver__c, Conductor__c (Formula)
 - Passenger_Count__c, Ticket_Fare__c, Total_Amount__c (Formula)
- **Usage:** Core operational record linking bus, fare, employees, earnings.

SETUP > OBJECT MANAGER

Trip

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters

Details

Description

API Name
Trip__c

Custom
✓

Singular Label
Trip

Plural Label
Trips

Enable Reports
✓

Track Activities

Track Field History

Deployment Status
Deployed


Help Settings
Standard salesforce.com Help Window

EditDelete

B. AUTOMATION ELEMENTS

1. Apex Trigger – Validate Driver/Conductor Roles

- **Name:** TripTriggerHandlerClass & TripTrigger
- **Trigger Type:** before insert, before update on Trip__c
- **Logic:** Prevent improper role assignments (e.g., an employee not assigned as “Driver” cannot be Trip.Driver).
- **Impact:** Ensures role integrity and prevents misuse.
- **Testing:** Cases tested with valid/invalid IDs for Driver and Conductor


SETUP

Apex Triggers

Apex Trigger

TripTrigger

[Help for this P](#)

Apex Trigger Detail

[Edit](#)
[Delete](#)
[Download](#)
[Show Dependencies](#)

Name	TripTrigger	sObject Type	Trip
Code Coverage	0% (0/4)	Status	Active
Created By	AKASH PRATTI TEAM, 6/19/2025, 12:00 AM	Last Modified By	AKASH PRATTI TEAM, 6/19/2025, 12:00 AM
Namespace Prefix			

Apex Trigger

Version Settings Trace Flags

```

1 trigger TripTrigger on Trip__c (before insert, before update) {
2   if (Trigger.isBefore) {
3     if (Trigger.isInsert || Trigger.isUpdate) {
4       TripTriggerHandlerClass.driverValidation(Trigger.new);
5       TripTriggerHandlerClass.conductorValidation(Trigger.new);
6     }
7   }
8 }

```

2. Record-Triggered Flow – Fetch Ticket Fare

- **Name:** Fetching Ticket Fare For Bus
- **Trigger Event:** on insert or update of Trip__c
- **Flow Steps:**
 1. Get Ticket_Fare__c record matching route and bus model
 2. If found, update Trip.Ticket_Fare__c; otherwise, show error
- **Impact:** Automates fare assignment based on input conditions
- **Testing:** Valid and missing fare scenarios tested.

Flow Fetching Ticket Fare For Bus

Help for this Page

« Back to List: Flows

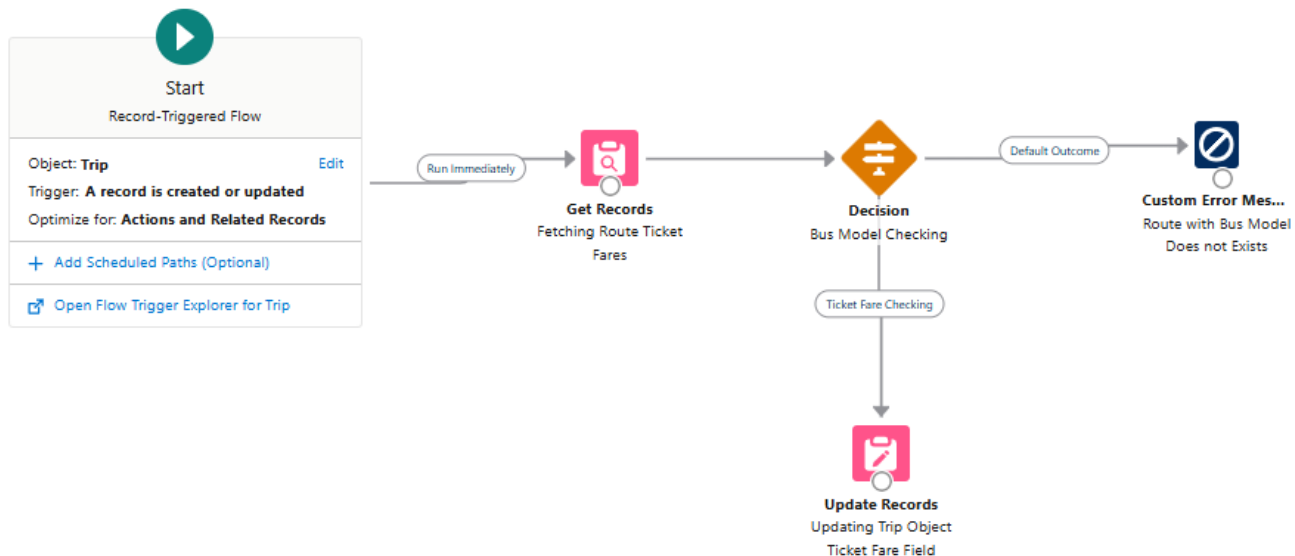
Flow Detail

Edit Open Run Details

Flow Label	Fetching Ticket Fare For Bus	Flow API Name	Fetching_Ticket_Fare_For_Bus
Description		Namespace Prefix	
Environments	Default	Type	Autolaunched Flow
Active Version	2	URL	/flow/Fetching_Ticket_Fare_For_Bus
Trigger	Record—Run After Save	Activated/Deactivated By	AKASH PRATTI TEAM, 6/18/2025, 11:43 PM
Modified By	AKASH PRATTI TEAM, 6/18/2025, 11:43 PM	Created By	AKASH PRATTI TEAM, 6/18/2025, 10:51 PM

Flow Versions

Action	Flow Label	Version	Description	Built with	Created Date	Type	Status	Progress Status	Run In Mode	API Version for Running the Flow	Log Metrics to Data Cloud
Open Run Deactivate	Fetching Ticket Fare For Bus	2		Flow Builder	6/18/2025, 11:43 PM	Autolaunched Flow	Active	Activated	Default Mode	64.0	<input type="checkbox"/>
Open Run Del Activate	Fetching Ticket Fare For Bus	1		Flow Builder	6/18/2025, 11:41 PM	Autolaunched Flow	Inactive	Canceled	Default Mode	64.0	<input type="checkbox"/>



C. VALIDATION RULES

1. Employees_only_for_Managed_Bus_stops

- **Object:** Employee__c
- **Logic:** Prevent employee assignment for unmanaged bus stops
- **Error Message:** “Employees must work for Managed Bus Stops”

Employee Validation Rule

[Back to Employee](#)

Validation Rule Detail

[Edit](#) [Clone](#)

Rule Name	Employees_only_for_Managed_Bus_stops	Active	✓
Error Condition Formula	IF(ISPICKVAL(Bus_Station_Name__r.Bus_Stop_Category__c , "UnManaged Bus Stop") , true, false)		
Error Message	The Employees must work for Managed Bus stops	Error Location	Bus Station Name
Description			
Created By	AKASH PRATTI TEAM, 6/18/2025, 7:32 AM	Modified By	AKASH PRATTI TEAM, 6/18/2025, 7:32 AM

[Edit](#) [Clone](#)

2. Phone_Number_Validation

- **Object:** Employee__c
- **Logic:** Ensures valid phone starting with 6/7/8/9 and 10 digits
- **Error Message:** “Phone no must be 10 digits and start with 6,7,8 or 9”

Employee Validation Rule

[Back to Employee](#)

Validation Rule Detail

[Edit](#) [Clone](#)

Rule Name	Phone_Number_Validation	Active	✓
Error Condition Formula	IF(NOT(REGEX(Phone_No__c , "[6-9]\d{9}\$")) , true, false)		
Error Message	Phone no must be 10 digits and starts with 6 or 7 or 8 or 9	Error Location	Top of Page
Description			
Created By	AKASH PRATTI TEAM, 6/18/2025, 7:39 AM	Modified By	AKASH PRATTI TEAM, 6/18/2025, 7:39 AM

[Edit](#) [Clone](#)

3. Departure_and_Arrival_Time_Checking

- **Object:** Trip__c
- **Logic:** Disallows same value in departure and arrival fields
- **Error Message:** “Departure Time and Arrival Time should not be the same”

Trip

- Details
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits

Trip Validation Rule

[Back to Trip](#)

Validation Rule Detail

[Edit](#) [Clone](#)

Rule Name	Departure_and_Arrival_Time_Checking	Active	✓
Error Condition Formula	TEXT(Departure_Time__c) = TEXT(Arrival_Time__c)		
Error Message	The Departure Time and Arrival Time Should not be the same	Error Location	Top of Page
Description			
Created By	AKASH PRATTI TEAM, 6/18/2025, 7:50 AM	Modified By	AKASH PRATTI TEAM, 6/18/2025, 7:50 AM

[Edit](#) [Clone](#)

4. Passenger_Count_Checking_for_Few_Buses

- **Object:** Trip__c
- **Logic:** Prevents passenger_count > capacity for specified bus types
- **Error Message:** “For ... Buses, passenger count must not exceed capacity”

Trip Validation Rule

[Back to Trip](#)

Validation Rule Detail

[Edit](#) [Clone](#)

Rule Name	Passenger_Count_Checking_for_Few_Buses	Active	✓
Error Condition Formula	IF(ISPICKVAL(Bus_No__r.Model__c , "Super Deluxe") , IF(Passenger_Count__c > Bus_No__r.Capacity__c , true, false) , IF(ISPICKVAL(Bus_No__r.Model__c , "Semi Sleeper") , IF(Passenger_Count__c > Bus_No__r.Capacity__c , true, false) , IF(ISPICKVAL(Bus_No__r.Model__c , "Sleeper") , IF(Passenger_Count__c > Bus_No__r.Capacity__c , true, false) , false)))		
Error Message	For Super Deluxe, Semi Sleeper and Sleeper Buses ,the Passenger Count must be less than or equal to the Capacity of the Bus	Error Location	Passenger Count
Description			
Created By	AKASH PRATTI TEAM, 6/18/2025, 7:57 AM	Modified By	AKASH PRATTI TEAM, 6/18/2025, 7:57 AM

[Edit](#) [Clone](#)

5. Bus_Registration_Number_Validation

- **Object:** Bus__c
- **Logic:** Enforces registration number format (e.g., “KA 01 AB 1234”)
- **Error Message:** “Bus Registration Number must follow format ...”

D. UI COMPONENTS

Custom Page Layouts

- **Bus Station:** Ensured Last_Updated is read-only

SETUP > OBJECT MANAGER

Bus Station

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Search Layouts

List View Button Layout

Restriction Rules

Scoping Rules

Save Quick Save Preview As... Cancel Undo Redo Layout Properties

Quick Find Field Name

Section	Bus Station Name	Last Modified By	State/Province
Blank Space	Bus Stop Category	Last Updated	Street
Amenities	City	Owner	Zip/PostalCode
Bench	Created By	Shelter Available	

Bus Station Detail

Edit Delete Clone Change Owner Change Record Type Printable View Sharing Sharing Hierarchy Edit Labels

Address Information

Information (Header visible on edit only)

Bus Station Name

Sample Text

Amenities

Sample Text

Bus Stop Category

Sample Text

Last Updated

8/28/2025

Shelter Available

☒

Bench

☒

Owner

Sample Text

System Information (Header visible on edit only)

street

Sample Text

City

Sample Text

Last Modified By

Sample Text

State/Province

Sample Text

Zip/PostalCode

Sample Text

Custom Links (Header visible on edit only)

- **Bus:** Arranged fields for intuitive entry

SETUP > OBJECT MANAGER

Bus

Details

Fields & Relationships

Page Layouts

Lightning Record Pages

Buttons, Links, and Actions

Compact Layouts

Field Sets

Object Limits

Record Types

Related Lookup Filters

Search Layouts

List View Button Layout

Restriction Rules

Save Quick Save Preview As... Cancel Undo Redo Layout Properties

Quick Find Field Name

Section	Bus Station Name	Last Modified By
Blank Space	Capacity	Model
Bus Name	Category	Owner
Bus Registration No	Created By	

Bus Detail

Edit Delete Clone Change Owner Change Record Type Printable View Sharing Sharing Hierarchy Edit Labels

Information (Header visible on edit only)

Bus Name

Sample Text

Bus Registration No

Sample Text

Bus Station Name

Sample Text

Category

Sample Text

Model

Sample Text

Capacity

2,316

Owner

Sample Text

System Information (Header visible on edit only)

Created By

Sample Text

Last Modified By

Sample Text

Custom Links (Header visible on edit only)

9

- **Employee:** Custom layout for key attributes

SETUP > OBJECT MANAGER

Employee

Details
Fields & Relationships
Page Layouts
Lightning Record Pages
Buttons, Links, and Actions
Compact Layouts
Field Sets
Object Limits
Record Types
Related Lookup Filters
Search Layouts
List View Button Layout
Restriction Rules
Scoping Rules

Save Quick Save Preview As... Cancel Undo Redo Layout Properties
Quick Find Field Name

Section	City	Date of Joining	Last Modified By	Salary	Work Place
Blank Space	Country	Date of Retirement	Owner	State	Zip/Postal Code
Age	Created By	Employee Name	Phone No	Street	
Bus Station Name	Date of Birth	Experience	Role	Ticket Fare	

Information (Header visible on edit only)

Employee Name Sample Text
Role Sample Text
Bus Station Name Sample Text
Ticket Fare Sample Text
Work Place Sample Text
Salary \$123.45
Date of Joining 6/28/2025
Date of Retirement 6/28/2025
Experience 45.77

Owner Sample Text

Personal Details

Phone No 1-415-555-1212
Date of Birth 6/28/2025
Age 553.39

System Information (Header visible on edit only)

Street Sample Text
City Sample Text
Created By Sample Text
Last Modified By Sample Text
State Sample Text
Country Sample Text
Zip/Postal Code Sample Text

- **Trip:** Read-only for fare field

UP > OBJECT MANAGER

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compact Layouts
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st View Button Layout
striction Rules
coping Rules
bject Access

Save Quick Save Preview As... Cancel Undo Redo Layout Properties
Quick Find Field Name

Section	Bus Starting Term...	Departure Time	Estimated Travel ...	Owner	Total Amount
Blank Space	Conductor	Destination Terminal	Frequency Per Day	Passenger Count	Trip Date
Arrival Time	Conductor Id	Driver	Last Modified By	Route Name	Trip Name
Bus No	Created By	Driver Id	No. of Stops	Ticket Fare	Trip No

Trip Detail

Edit Delete Clone Change Owner Change Record Type Printable View Sharing Sharing Hierarchy Edit Labels

Information (Header visible on edit only)

Trip Name Sample Text
Trip No Sample Text
Trip Date 6/28/2025
Bus No Sample Text
Driver Id Sample Text
Driver Sample Text

Conductor Sample Text
Conductor Id Sample Text
Owner Sample Text

Bus Schedule

Route Name Sample Text
Bus Starting Terminal Sample Text
Departure Time Sample Text
No. of Stops 37
Estimated Travel Time 46,885
Destination Terminal Sample Text
Arrival Time Sample Text
Frequency Per Day 92

Passenger Information

Passenger Count 7,100
Ticket Fare \$123.45
Total Amount \$123.45

- **Ticket Fare:** Clean layout with essential fields

1. Employees by Bus Station – Grouped by station

Report: Employees Employees By Bus Station			
Total Records 1			
<input type="checkbox"/> Bus Station Name ↑ ▾	<input type="checkbox"/> Employee: ID ▾	<input type="checkbox"/> Employee: Employee Name ▾	<input type="checkbox"/> Role ▾
<input type="checkbox"/> Gajuwaka (1)	a04gL000005KSy9	AKASH	Administrative Assistant
Subtotal			
Total (1)			

2. Drivers and Conductors Info – Staff listing by station

Report: Employees Drivers And Conductors Information			
Total Records 1			
<input type="checkbox"/> Bus Station Name ↑ ▾	<input type="checkbox"/> Employee: Employee Name ▾	<input type="checkbox"/> Employee: ID ▾	<input type="checkbox"/> Role ▾
<input type="checkbox"/> Gajuwaka (1)	AKASH	a04gL000005KSy9	Administrative Assistant
Subtotal			
Total (1)			

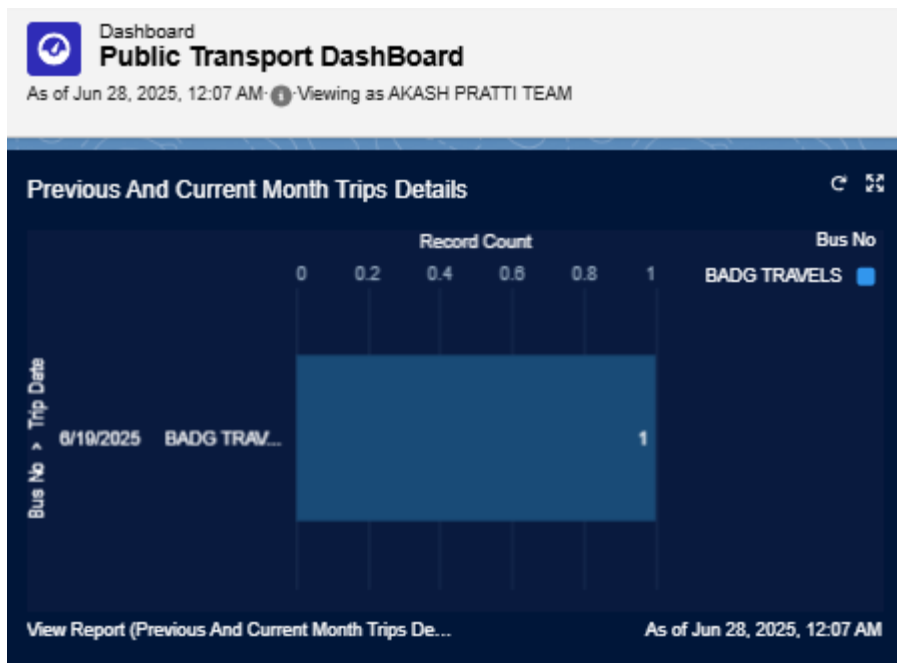
3. Previous and Current Month Trip Details – Aggregated by date and bus

Report: Trips Previous And Current Month Trips Details			
Total Records 1			
<input type="checkbox"/> Trip Date ↑ ▾	<input type="checkbox"/> Bus No ↑ ▾	<input type="checkbox"/> Route Name ▾	<input type="checkbox"/> Trip No ▾
<input type="checkbox"/> 6/19/2025 (1)	BADG TRAVELS (1)	Beach Road	01
	Subtotal		
Subtotal			
Total (1)			

Dashboard Components:

- **Public Transport Dashboard**

- Trip details report charts
- Drivers/Conductors distribution visual



F. OBJECT RELATIONSHIP DIAGRAM (ERD)

Parent Object	Child Object	Relationship Type	Field Name
Bus_Station__c	Bus__c	Lookup	Bus_Station__c
Bus_Station__c	Employee__c	Lookup	Bus_Station__c
Bus__c	Trip__c	Lookup	Bus_No__c
Ticket_Fare__c	Trip__c	Lookup	Route_Name__c
Employee__c	Trip__c	Lookup	Driver_Id__c, Conductor_Id__c

(Relationships reflect station → buses/employees → trips with embedded fare references)

G. PROFILES & PERMISSION SETS

Custom Profiles

1. **System Administrator** – Full access
2. **Transport Manager** – Full CRUD on all core objects
3. **Driver/Conductor** – View/edit only Trip records

Permission Sets

- Assigned to Driver/Conductor users to allow:
 - View and manage Trip__c
 - Access related lookup data (Bus, Station, Fare)

H. ROLE HIERARCHY & USER ACCESS CONTROL

Roles

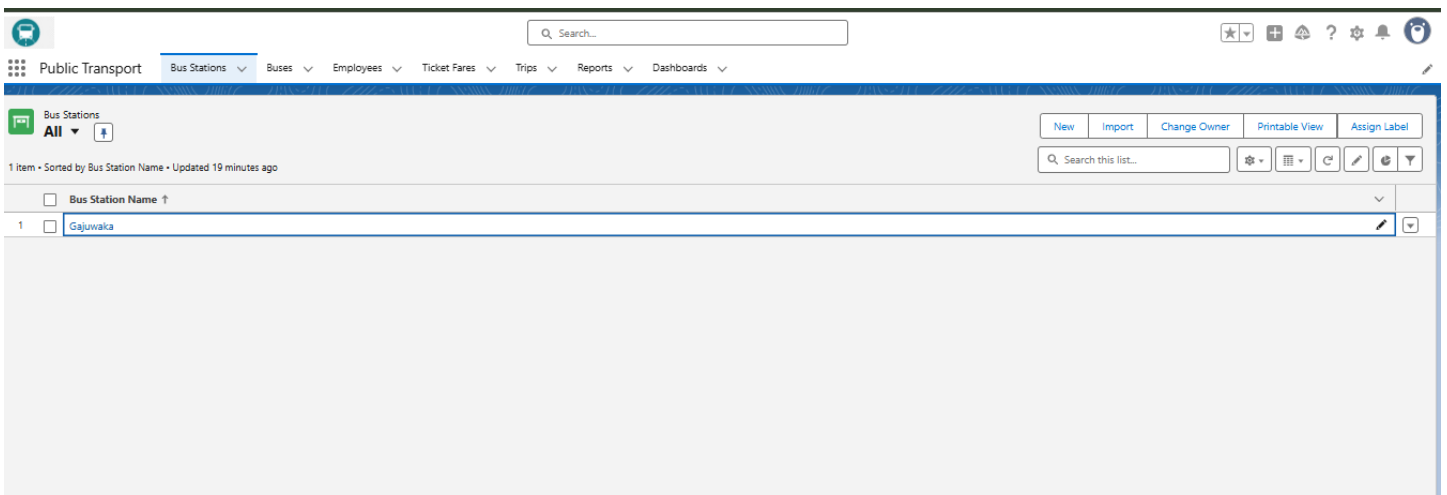
- **Transport Manager** (top level)
- **Driver** (reports to Manager)
- **Conductor** (reports to Manager)

User access restricted to records they own or are shared upwards via hierarchy.

I. LIGHTNING APP SETUP

App Name: Public Transport CRM

- **Navigation Tabs:** Bus Stations, Buses, Employees, Ticket Fares, Trips, Reports, Dashboards
- **Profiles Included:** System Administrator, Transport Manager, Driver, Conductor



3. DEPLOYMENT PROCESS

- Developed & tested in Salesforce Sandbox
- Deployment via change set containing objects, fields, validation rules, flows, triggers
- Post-deployment testing included trip creation, fare fetching, role validation, and dashboards

4. DATASETS

Sample Records

- **Bus Stations:** Hyderabad Central (Managed), Warangal Stop (Managed)
- **Buses:** KA 01 AB 1000 (Local, Regular, capacity: 40), TS 02 BC 2000 (Intercity, Express, capacity: 50)
- **Employees:**
 - Driver: Ravi Kumar (Role=Driver)
 - Conductor: Sindhu Reddy (Role=Conductor)
- **Ticket Fares:** Hyderabad–Warangal (Express) = ₹125; Hyderabad–Warangal (Deluxe) = ₹200
- **Trips:**
 - Trip 101, Date = 25-June-2025, Bus = KA...1000, Driver/Conductor assigned, Fare auto-fetched