## **🧠 1. locations Table – Master Table for All Places**

### **Purpose:**

This table **defines every possible geographic location** involved in the bus system: bus stands, stops, terminals, boarding/drop points.

### **Key Columns:**

* name: Could be a bus stand, a more local landmark, or specific boarding point like "Near Domino’s, Andheri".
* city, state: Organize locations by geography.
* latitude, longitude: Enable **map integrations**, real-time tracking, distance calculations.
* is\_active: Lets you soft-disable a location if it's no longer used.

### **Real-Life Use Case:**

When a user selects:

* **Source: “Gopalganj More, Siwan”**
* **Destination: “Kashmiri Gate, New Delhi”** The system will internally map those **to location\_ids** in this table.

## **🚌 2. bus\_trips Table – Core Schedule: When & Where a Bus Runs**

### **Purpose:**

Represents **one scheduled journey** of a bus from a source to a destination — with a fixed date/time (or recurring days).

Think of this table as defining a **calendar of runs** for each bus.

### **Key Columns:**

* bus\_id: Link to which **physical bus** is used.
* source\_location\_id, destination\_location\_id: Where this trip **starts and ends**.
* departure\_time, arrival\_time: Specific times the bus **departs and arrives**.
* travel\_date: Useful for **one-time** trips (e.g. a holiday special).
* is\_recurring, days\_of\_week: If true, allows repeating trips like:  
  + “Every Mon, Wed, Fri at 6PM”
* is\_active: Let you disable a trip (maintenance, cancellation, etc.)

### **Real-Life Use Case:**

Let’s say a bus runs:

Daily from **Siwan (source)** to **Delhi (destination)** at **6:00 PM**.

This would be:

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INSERT INTO bus\_trips (bus\_id, source\_location\_id, destination\_location\_id, departure\_time, travel\_date, is\_recurring, days\_of\_week)

VALUES (7, 3, 10, '18:00', '2025-07-31', TRUE, 'Mon,Tue,Wed,Thu,Fri,Sat,Sun');

## **📍 3. pickup\_points Table – Where Can You Board?**

### **Purpose:**

Defines **all intermediate locations** where **passengers can board** for a specific trip.

Each pickup point is:

* Attached to a trip\_id
* Linked to a location\_id
* Given a pickup\_time and sort\_order

### **Why this is powerful:**

* Supports multiple boarding locations for the **same trip**
* Passengers can choose **"Where to board"** during booking

sort\_order enables **sequential display** like:  
  
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🕕 6:00 PM – Gopalganj More

🕡 6:30 PM – Siwan Bus Stand

🕖 7:00 PM – Chhapra Bypass

### **Real-Life Use Case:**

When a user searches for a bus from **Siwan to Delhi**, they see:

“Boarding Points near you:

* Siwan Kachahari (6:00 PM)
* Gopalganj Bus Stand (6:45 PM)”

These come from this table.

## **📥 4. drop\_points Table – Where Can You Get Off?**

### **Purpose:**

Defines **where passengers can get off** during a trip — typically within or near the destination city.

Exactly like pickup\_points, but for **end-of-journey** locations.

### **Use Case:**

When user searches for a bus to **Delhi**, they might see:

“Dropping Points:

* Anand Vihar Terminal (6:30 AM)
* Kashmiri Gate (7:00 AM)
* Majnu Ka Tila (7:30 AM)”

This table handles that.

## **🔄 How It All Works Together (System Flow):**

### **As a developer:**

When a user searches for buses from **Siwan to Delhi**, your backend will:

1. **Map city names** to location\_id from locations.
2. **Query bus\_trips** where:  
   * source\_location\_id = Siwan
   * destination\_location\_id = Delhi
   * travel\_date = 'selected date'
   * Or match recurring days (e.g., Mon, Tue)
3. For each matched trip\_id, fetch:  
   * Pickup points → Show boarding options
   * Drop points → Show dropping options
4. Join with buses to show the bus name/type/seats etc.

## **🧩 In Summary (User POV):**

| **Table** | **What It Represents** | **User Experience** |
| --- | --- | --- |
| locations | All possible stops and points | Autocomplete/dropdowns for location search |
| bus\_trips | Scheduled bus journeys | What buses are available on a date |
| pickup\_points | Where to board that trip | Select boarding location |
| drop\_points | Where to get down from the bus | Select dropping point |