**Step-by-Step Guide to Build the Data Model in Power BI**

**1. Load the Data**

Open Power BI Desktop:

* Go to **Home → Get Data → Text/CSV**
* Load each of the 4 files:
  + houses\_for\_sale\_kenya.csv
  + owners\_details.csv
  + property\_tax.csv
  + house\_utilities.csv

After loading, rename the tables appropriately for clarity (e.g., Houses, Owners, Taxes, Utilities).

**2. Clean the Data (Optional but Recommended)**

Use **Power Query Editor** (Transform Data) to:

* Ensure PropertyID is clean and consistent across all tables.
* Convert fields like Price, Size, and TaxRate to proper numeric formats.
* Remove "KSh", "m²", and commas using **Replace Values** and **Data Type Conversion**.

**3. Set Relationships**

Go to the **Model View** (icon with three tables on the left panel):

Now define relationships using **PropertyID** as the **primary key** in Houses and **foreign key** in others:

| **From Table** | **Column** | **To Table** | **Column** | **Relationship** | **Cardinality** | **Direction** |
| --- | --- | --- | --- | --- | --- | --- |
| Owners | PropertyID | Houses | PropertyID | Many-to-One | Single → 🔄 |  |
| Taxes | PropertyID | Houses | PropertyID | Many-to-One | Single → 🔄 |  |
| Utilities | PropertyID | Houses | PropertyID | Many-to-One | Single → 🔄 |  |

Power BI may auto-detect these, but confirm them manually.

**4. Build the Data Model Diagram (Optional)**

Here's a quick **ERD**-like structure:

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| Owners |

|--------------|

| OwnerID |

| PropertyID FK|

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| Houses |◄────────+

|--------------| |

| PropertyID PK| |

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| Taxes | | Utilities |

|-----------------| |-------------|

| PropertyID FK | | PropertyID FK|

+-----------------+ +--------------+

**5. Create Measures & Calculations**

Examples:

* **Average House Price**:
* Average Price = AVERAGE(Houses[Price])
* **Total Annual Tax**:
* Total Tax = SUM(Taxes[AnnualTaxAmount])
* **Monthly Total Utility Cost**:
* Total Utilities = SUM(Utilities[MonthlyElectricityCost]) +
* SUM(Utilities[MonthlyWaterCost]) +
* SUM(Utilities[MonthlyInternetCost])

**6. Create Visuals**

In **Report View**:

* Pie chart for **Houses per County**
* Bar chart for **Average Tax per County**
* Table of **Owner Info + Property Location**
* Card for **Total Properties**
* KPI card for **Average Utility Cost per Property**

**7. Save and Publish**

Once the model and visuals are done:

* Save your .pbix file
* Optionally publish to **Power BI Service**

**Summary**

You now have a **star-schema-like data model** with:

* Houses as the central **fact-like table**
* Owners, Taxes, Utilities as **dimension-like tables**

This approach supports rich interactive visuals and scalable analytics.