



# Smart City Analytics – Traffic, Energy & Pollution Dashboard



## Project Objective

Students will create an **interactive Power BI Dashboard** to analyze **urban traffic patterns, energy consumption, and pollution levels**. This will help city administrators make **data-driven decisions** to improve urban living conditions.



## Dataset Overview – "Smart\_City\_Data.xlsx"



This dataset contains **real-world-inspired** data covering multiple aspects of a smart city.

---



## Session Breakdown



### Session 1: Understanding the Dataset & Project Goals

- ◆ **Explain project scope** – Why Smart City Analytics is important?
  - ◆ **Introduce dataset structure** (Traffic, Energy, and Pollution data).
  - ◆ **Discuss key insights** expected from the dashboard.
  - ◆ **Task:** Students explore the dataset in **Excel** before importing it into Power BI.
- 



### Session 2: Importing & Preparing Data in Power BI

- ◆ **Load the dataset** into Power BI.
  - ◆ **Check for missing values** and correct data types.
  - ◆ **Create calculated columns** where necessary.
  - ◆ **Task:** Perform data cleaning and transformations.
- 



### Session 3: Traffic Insights Visualization

- ◆ **Create a heatmap** of **Traffic\_Congestion\_Level** by **Time** and **City\_Zone**.
  - ◆ **Build a line chart** to track **Avg\_Speed\_Kmph** over time.
  - ◆ **Task:** Add interactivity by using slicers (e.g., Filter by Time or City Zone).
-

## Session 4: Energy Consumption Analysis

- ♦ Visualize **Energy\_Consumed\_MWh** in a bar chart.
  - ♦ Compare **Household\_Consumption\_%** vs **Industrial\_Consumption\_%** in a stacked column chart.
  - ♦ **Create KPI cards** to highlight key metrics (Total Energy, Renewable %).
  - ♦ **Task:** Add filters and slicers for dynamic data views.
- 

## Session 5: Pollution & Air Quality Dashboard

- ♦ Use a map visualization to display **AQI** values by City Zone.
  - ♦ Track **PM2.5\_Level** and **PM10\_Level** trends in a line chart.
  - ♦ Create a gauge chart to display **CO2\_Emissions\_Tons** with warning levels.
  - ♦ **Task:** Format visuals for clarity and impact.
- 

## Session 6: Dashboard Finalization & Presentation

- ♦ **Optimize visuals & layout** for a professional look.
  - ♦ **Ensure all filters, slicers, and interactions work smoothly.**
  - ♦ **Task:** Students present their dashboards, explaining key insights.
- 

 Keep exploring, keep learning, and keep building amazing dashboards! 