# Hyderabad Air Pollution Analysis (2015–2017)

## 1. Problem Framing & Hypothesis

This project investigates air pollution levels in Hyderabad from 2015 to 2017. The objective is to understand trends in AQI and identify key pollutant contributors, particularly in the context of urban infrastructure developments like public transport. The hypothesis is that AQI levels may have improved post-2016 due to improved metro services or stricter pollution control measures.

## 2. Descriptive Analysis

The dataset was cleaned by removing rows with excessive null values (more than 9), and remaining nulls were filled with column averages. AQI and AQI Bucket columns were engineered based on pollutant concentrations (PM2.5, SO2, NO2, etc.). Visualizations such as KPIs, time series, scatter plots, and donut charts were created to explore average AQI, its correlation with PM2.5, and bucket-wise air quality distribution.

## 3. Diagnostic Analysis

Further analysis using Trends over time indicate potential changes in pollution behavior, with a slight improvement visible after 2016. The correlation scatter plot of PM2.5 and AQI validates that PM2.5 is a major AQI driver.

## 4. Inferential Reasoning

Without applying statistical models, visual and trend-based analysis indicates strong influence of PM2.5 on AQI. No machine learning model was used as the dashboard insights themselves were sufficiently conclusive.

## 5. Prescriptive Insights

• To reduce AQI levels, target PM2.5 emissions through construction dust control and vehicle emission norms.  
• Strengthen green buffer zones around high-AQI areas.  
• Promote use of electric public transport.  
These steps could further help reduce pollution and improve air quality in the city.

## 6. Storytelling & Delivery

The Power BI dashboard presents key metrics, correlations, and filters to help users interactively explore air quality trends. With KPIs, time-series charts, scatter plots, and AQI bucket visualizations, the dashboard effectively communicates Hyderabad’s pollution scenario from 2015 to 2017.