**Slide 15: Spatial Analysis of Emissions**

**The purpose of this analysis is to identify neighborhoods that consistently experience elevated levels of boiler emissions, specifically focusing on nitrogen oxides (NOx), particulate matter (PM 2.5), and sulfur dioxide (SO2).  As you can see from the pie chart, the neighborhoods with the highest boiler emissions are all relatively close, there are no significant outliers.**

**Slide 16: Spatial Analysis of Emissions**

* **Introduction:**
  + This slide focuses on the spatial analysis of boiler emissions across various neighborhoods in New York City. Our goal was to identify areas that consistently experience elevated levels of emissions, specifically looking at nitrogen oxides (NOx), particulate matter (PM 2.5), and sulfur dioxide (SO2).
* **Key Findings:**
  + We identified **Gramercy Park - Murray Hill**, **Upper East Side**, and **Upper West Side** as the neighborhoods with the highest composite scores for boiler emissions. These areas are characterized by a high density of older buildings and significant commercial activity, both of which contribute to higher emissions.
  + Moderate emission areas include **Chelsea - Clinton**, **Manhattan**, and **Greenwich Village - SoHo**, where emissions are present but not as concentrated as in the highest emission neighborhoods.
  + On the lower end of the emission spectrum, neighborhoods like **Lower Manhattan** and **Central Harlem - Morningside Heights** have relatively lower emissions, likely due to a mix of newer infrastructure and less reliance on traditional heating systems.

**Slide 17: Spatial Analysis of Emissions (Heatmap)**

* **Introduction:**
  + The heatmap on this slide visually represents the intensity of boiler emissions across New York City. This geographical analysis helps us understand where emissions are most concentrated and what factors contribute to these patterns.
* **Key Observations:**
  + As shown, the highest concentrations of boiler emissions are found in the core commercial and densely populated residential areas of Manhattan, particularly in **Midtown Manhattan**, **Upper East Side**, and **Upper West Side**."
  + This pattern suggests that urban density, building age, and the concentration of commercial activity are significant contributors to boiler emissions in these areas.

**Slide 18: Limitations and Assumptions**

* **Introduction:**
  + While our analysis provides valuable insights, it’s important to acknowledge the limitations and assumptions that may affect the accuracy and generalizability of our findings.
* **Limitations:**
  + First, the model may not capture all external factors affecting health outcomes, such as socioeconomic status or access to healthcare.
  + Second, the dataset may contain missing or incomplete data, which could impact the accuracy of our analyses and visualizations.
  + Finally, the geographic granularity may vary, with some regions having more detailed data than others, potentially leading to incomplete spatial analysis.
* **Assumptions:**
  + We’ve assumed that the data provided is accurate and reflects real-world conditions, and that the relationship between air quality and health outcomes is stable over time.
  + Additionally, we assume that geographic boundaries and names are consistent and accurately represent the areas analyzed.
* **Conclusion:**
  + Understanding these limitations and assumptions helps us interpret the results more critically and highlights areas where future work could improve the robustness and applicability of our findings.