**George Bronleewe Capstone**

**Executive Summary**

*This project investigates how Nashville’s rapid population growth and housing development have impacted transportation and commute times since 2010. With significant increases in residents and infrastructure strain, traffic congestion has become a pressing issue for city planners and commuters alike. The analysis will combine population, housing, and transportation datasets to identify trends, highlight problem areas, and provide visual insights that could help guide urban planning decisions. Assumptions include that publicly available data is representative and covers a sufficiently broad timeline. Potential challenges involve data consistency across years and aligning geographic boundaries between datasets.*

**Motivation**

*Over the last ten years of living in Nashville, traffic has gotten worse almost every year (with the exception of during COVID when fewer people were on the road). I want to analyze traffic and commute-time data alongside population and housing growth figures to show how these factors correlate. The goal is to provide evidence-based insights on how population growth is impacting traffic, which areas are most affected, and how such information could be leveraged for planning solutions.*

**Data Question**

*How has population growth and housing development in Nashville impacted transportation and commute times since 2010?  
Additional sub-questions may include:*

*1. Which neighborhoods or corridors have seen the largest increases in congestion?*

*2.* *How have commute times shifted in relation to major housing developments?*

*3. Are certain times of day disproportionately affected by growth?*

**Minimum Viable Product (MVP)**

*The final deliverable will be an interactive dashboard in Tableau or Power BI, supported by a detailed Jupyter Notebook analysis. The MVP will include:*

* *Visualizations showing changes in commute times across Nashville neighborhoods since 2010*
* *Heatmaps of high-traffic corridors over time*
* *Side-by-side plots of population growth, housing development, and transportation performance metrics*
* *Insights and recommendations for city planners and transportation officials*

*The intended audience is local government officials, urban planners, and Nashville residents interested in understanding and addressing congestion.*

**Schedule (through <date of demo day>)**

1. Get the Data (finish date)
2. Clean & Explore the Data (finish date)
3. Create Presentation of your Analysis (finish date)

* Should be a presentation, but could include a Jupyter Notebook or dashboard in Excel, Tableau, or PowerBI

1. Internal demos (<date of internal demos)
2. Demo Day!! (<date of demo day>)

**Data Sources**

* *U.S. Census Bureau (population data)*
* *Nashville Open Data Portal (housing permits, transportation datasets)*
* *Tennessee Department of Transportation (traffic and commute-time data)*
* *Google Maps API or HERE API (optional, for current traffic patterns)*

**Known Issues and Challenges**

*1.Historical commute-time data may be incomplete or inconsistent, especially before 2015.*

*2.API usage for live traffic data may require obtaining keys and handling rate limits.*

*3.Cleaning housing permit and traffic datasets will require reconciling different formats, handling missing values, and ensuring time periods align.*