Link to GitHub showcasing project (Includes mission statement, app characteristics, discussion on transit equity and sustainability, data retrieval and processing methodology, conclusions, references, and readme file):

[GitHub - haoruizhou/VITRAA-GitHub: We have created VITRAA: an interactive dashboard that visualizes the accessibility of different neighbourhoods to rapid transit stations within the city of Toronto.](https://github.com/haoruizhou/VITRAA-GitHub)

Link to Arc Dashboard: [Visualized Interactive Toronto Rapid-Transit Accessibility Analysis](https://www.arcgis.com/apps/dashboards/7c71115a8d254fdeb8cba3ec8d42732d)

Mission Statement

Toronto offers a diverse array of rapid transit options that empower residents to travel efficiently across the city. This project seeks to rigorously examine the relationship between the walking distance to rapid transit stations and the frequency of transit use in Toronto. Drawing on the methodologies and insights of El‑Geneidy et al. (2014), which emphasize the importance of accurately delineating walking catchment areas to identify gaps and redundancies in transit service, as well as Hao and Peng (2023), who document nonlinear and threshold effects of bus stop proximity on transit use and carbon emissions in developing cities, our study will extend these frameworks to the Toronto context (El-Geneidy et al., 2014; Hao & Peng, 2022).

As the cost of living escalates, a growing number of individuals and families are increasingly dependent on public transit to mitigate transportation expenses. By analyzing how the proximity of transit stations influences ridership patterns, our research aims to provide critical insights into improving transit accessibility—thereby alleviating financial burdens for transit-dependent households—and contribute to the sustainable urban mobility agenda.

App Characteristics

1. **User-Centric Analysis:** The app provides insights into how transit accessibility impacts commuting behavior, emphasizing equitable access for diverse socioeconomic groups.
2. **Data-Driven Insights:** By leveraging detailed Census data, the analysis quantifies the relationship between transit proximity and mode choice.
3. **Sustainability Focus:** The study connects to the greater idea of how improved transit accessibility can reduce dependency on private vehicles, lower greenhouse gas emissions, and promote sustainable urban mobility. This focus aligns with Canada’s sustainability goal of achieving net-zero emissions by 2050 and fostering environmentally responsible urban development.
4. **Reproducible Research:** The organized R code and data retrieval process ensure that the methodology is transparent and reproducible for future studies or policy development.

**Discussion on Transit Equity and Sustainability**

Transit equity is a fundamental aspect of sustainable urban planning. Ensuring equitable access to transit not only addresses social justice by offering mobility options to all community segments but also enhances environmental sustainability. By facilitating the use of public transit, cities can reduce traffic congestion, lower carbon emissions, and promote healthier lifestyles. This project specifically investigates how distance to transit influences commuting choices, a key determinant of urban mobility patterns and overall sustainability.

References

El-Geneidy, A., Grimsrud, M., Wasfi, R., Tétreault, P., & Surprenant-Legault, J. (2014). New evidence on walking distances to transit stops: Identifying redundancies and gaps using variable service areas. *Transportation*, *41*(1), 193–210. <https://doi.org/10.1007/s11116-013-9508-z>

Hao, Z., & Peng, Y. (2022). Comparing Nonlinear and Threshold Effects of Bus Stop Proximity on Transit Use and Carbon Emissions in Developing Cities. *Land*, *12*(1), 28. <https://doi.org/10.3390/land12010028>