GGR322 Final Project

Mapping Inequity: Housing Affordability, Ethical GIS,

and Community Health in Vernon

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[Dashboard Link](#)

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Vernon, British Columbia, located in the Okanagan Valley, is a growing city facing

significant challenges, most significantly regarding housing affordability. This problem directly

impacts community well-being and health equity, forcing data-driven approaches for effective

solutions. This project introduces an ArcGIS Dashboard designed as a health profile for Vernon.

This profile helps visualize key spatial data related to demographics, services, the environment,

and social factors. The dashboard specifically focuses on the correlation between the housing

crisis and health access, aiming to provide an evidence-based tool for decision-makers.

This project uses the 2021 Statistics Canada Census Data at the Dissemination Area (DA)

level to understand Vernon's socio-demographic patterns relevant to housing and health. Key

variables visualized include shelter-cost-to-income ratios, median household income, age

distribution, education levels, and the count of single-parent families. These metrics identify

spatial variations in potential vulnerabilities across the city.

The dashboard displays data from diverse sources such as Statistics Canada

(demographics), BC Open Data (municipal boundaries), the City of Vernon website (local

features, eg., parks, community centers), BC Housing (subsidized housing locations), and the BC

Health Service Provider locations map. These data sets allowed for the multi-layered analysis

connecting population characteristics, housing, services, and environmental features. The

availability of these federal, provincial, and local datasets indicates sufficient digital

infrastructure and data practices in the region to support this geospatial analysis, enabling the

project's focus on Vernon's housing and health landscape.

Analysis using the dashboard reveals distinct spatial concentrations of demographic

groups and socio-economic conditions across Vernon. Hot spot analysis confirms a significant

clustering of elderly residents (aged 65+) within Central Vernon, where multiple DAs show this demographic comprising 51% - 70% of their population. This aligns geographically with higher averages of residents lacking a high school degree (45-80 people or 6.4% - 15% per DA). Central Vernon also hosts the majority of the city's healthcare facilities, contributing to a relatively low city-wide average drive time of 5.2 minutes to reach care, although accessibility may vary locally. Notably, this central area exhibits lower average monthly rents ($870 - $1210) compared to outlying regions.

On the other hand, Vernon's Northern outskirts show a different socio-economic profile despite featuring higher average monthly rents ($1210 - 1820). These areas contain higher average numbers of single-parent families (45 - 115 per DA versus 30 - 45 in central Vernon) and larger counts of people classified as low-income (430 - 1475 per DA versus 315 - 430 centrally). Furthermore, mapping indicators of poverty show significantly higher concentrations in the Northern outskirts compared to Central Vernon, highlighting a stark wealth inequality between these parts of the city.

Central Vernon's challenges appear linked to an aging population needing accessible services within a lower-rent context, while the Northern outskirts face housing affordability pressures impacting larger low-income populations, single-parent households, and those experiencing significant economic hardship. This spatial analysis provides concrete evidence supporting broader reports of housing stress (Castanet, 2023).

The spatial analysis reveals distinct patterns of vulnerability interventions targeted to address health and housing needs in Vernon. Firstly, there must be an enhancement made for health access and support. Given the concentration of seniors in Central Vernon, leverage the

proximity of healthcare facilities by implementing target outreach programs focused on health navigation, chronic disease management, and aging in place support for this population. One must also investigate transportation barriers for residents in peripheral areas, specifically the Northern outskirts. Assess the routes taken by the residents of Northern Vernon to healthcare facilities and consider adjustments or supplementary options such as shuttles or targeted subsidies. Furthermore, evaluate the need for mobile health services, especially for basic needs. Implementing these changes will improve access to central health services without needing to create new facilities or allocate health resources away from the aging population.

Secondly, one must also implement target housing policies and programs. One must address the affordability pressures in the Northern outskirts by exploring rent relief programs or housing allowances, prioritizing single-parent families and those who experience deep poverty identified in the analysis. They must also ensure that there are new housing developments, contributing to goals such as reaching 1,000 affordable units (Vernon Matters, 2025), including units with deep affordability suitable for the low-income households concentrated on the outskirts.

Handling sensitive community data requires careful ethical consideration in balancing transparency with privacy. This project aggregated data at the Dissemination Area (DA) level for all variables relating to Indigenous identity or income to ensure privacy and reduce the risk of re-identification. Although deductive disclosure remains a possibility in sparsely populated DAs, steps were taken to ensure that framing disparities as stigmatizing would be avoided by presenting them as phenomena related to systemic rather than neighborhood deficits. Data bias—such as undercounting transient populations in Vernon (Castanet, 2023)—was acknowledged in the responsible interpretation of findings. Accessibility was built into the

dashboard through colorblind-safe color palettes, plain-language descriptions, intuitive navigation tools, and a logical layout for usability by a wide range of audiences, from policymakers to community advocates.

This dashboard delivers actionable insights to Vernon's stakeholders. City planners may now prioritize housing investments based on the identified affordability hot spots, and health authorities can optimize clinic placements based on elderly access gaps. Social service agencies could program their services, such as food security, in those high-need DAs. In turn, disparities that can be vividly seen may be used by others to advocate for changed policies. Future versions might embrace AI tools for predictive modeling, such as forecasting housing stress or scenario planning tools capable of simulating policy impacts. With real-time data and advanced analytics, this dashboard would become a dynamic instrument for continuous long-term data-driven decision-making in alignment with the Housing Needs Report for Vernon and provincial health strategies.

Works Cited

BC Health Service Provider Locations. Map Viewer. (n.d.).

https://www.arcgis.com/apps/mapviewer/index.html?webmap=3d39e4e409594ec0a66bd5e39b90f8ba

City of Vernon. City of Vernon | Regional District of North Okanagan. (n.d.).

https://www.rdno.ca/our-communities/your-neighbourhood/city-vernon

City of Vernon. City of Vernon. (2023, May 11). https://www.vernon.ca/#gsc.tab=0

Government of Canada, Statistics Canada. (2021, November 17). *List of 2021 census boundary files depicting boundaries of 2021 census standard geographic areas for which census data are available.* 2021 Census Boundary files.

https://www12.statcan.gc.ca/census-recensement/2021/geo/sip-pis/boundary-limites/index2021-eng.cfm?year=21

Government of Canada, Statistics Canada. (2022, February 9). *Census Profile, 2021 Census of Population*. Census Profile Downloads, 2021.

https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/details/download-telecharger.cfm?Lang=E

Vernon City Boundary. COV. (n.d.).

https://cov-open-data-vernon.hub.arcgis.com/datasets/5eb883dbbc8e4b5c88728d075885b577_22/explore

Verster, L. (2025, March 26). *Vernon's affordable housing stock to hit 1,000 units*. Vernon

Matters.

https://vernonmatters.ca/2025/03/24/vernons-affordable-housing-stock-to-hit-1000-units/

City of Vernon. (2024, November). *Vernon*. City of Vernon Housing Needs Report.

https://www.vernon.ca/sites/default/files/docs/241120-Vernon-HNR-final.pdf

Mutter, C. (n.d.). *Housing crisis affecting more in Vernon, driving homeless numbers -*

Vernon News. Castanet.

https://www.castanet.net/news/Vernon/431650/Housing-crisis-affecting-more-in-Vernon-driving-homeless-numbers