# Metric Identification and Justification

Locating a suitable relocation destination following graduation demands thorough examination of various important factors. Cost of Living together with Employment Opportunities and Commute Time represent the three main evaluation criteria for this analysis. A complete method to identify suitable post-graduation locations is provided through these data-driven evaluation metrics.

**1. Cost of Living – Financial Stability and Affordability**

**Justification:**  
A recent graduate capacity to live comfortably alongside handling their finances while setting money aside depends heavily on the living expenses in their area. Lower-cost cities provide citizens with enhanced financial capabilities as well as reduced expenditure on rent and bills for food and utilities. The analysis of cost-of-living information grouped into housing, grocery items, transportation and utilities sections can help us select the cheapest cities.

Why this metric is crucial:

The overall expense level determines whether high-paying employment can secure financial stability for residents.

Housing Prices Play a Major Role as Toronto along with Vancouver show substantially elevated house costs than Winnipeg and Halifax do.

The examination of cost-of-living trends across five years (2020-2024) enables us to identify cities that have become either more or less affordable.

🔹 **Example from Data:**

* **Halifax (2022)**: Apartment (3-bedroom) in the city center costs **$2,295.24**, while in **Winnipeg**, it is significantly lower.
* **Mortgage Interest Rates:** Affect long-term affordability, impacting homebuyers and renters alike.

**2. Employment Opportunities – Job Market Strength and Career Growth**

**Justification:**  
Employment market conditions in a city play an essential role in establishing long-term career advancement as well as economic self-sufficiency and occupational stability. A prosperous employment market provides better career possibilities and higher income levels together with possibilities for professional growth.

**Why this metric is crucial:**

* **Job Availability Matters** – Cities with higher employment rates and diverse industries provide better chances of securing a job.
* **Industry-Specific Opportunities** – Some cities specialize in tech (Toronto, Kitchener-Waterloo), government jobs (Ottawa), or energy (Calgary, Edmonton).

🔹 **Example from Data:**

* **Halifax (2022)**: **266,000 employed individuals** – Understanding job market stability in medium-sized cities.
* **Comparing Employment Categories**: Certain cities might have strong job opportunities in specific industries, which impacts decision-making.

**3. Commute Time – Work-Life Balance and Daily Convenience**

**Justification:**  
Job satisfaction together with quality of life and productivity depend on how much time employees spend commuting. Commute time reductions within a city produce additional time for personal use and accomplish two objectives: stress reduction and higher work efficiency.

**Why this metric is crucial:**

* **Work-Life Balance** – Shorter commutes provide more free time for social activities, hobbies, and personal well-being.
* **Public Transport Efficiency** – Cities with good transit systems (Toronto, Montreal) offer better commute experiences than those that rely heavily on personal vehicles.
* **Cost-Saving Factor** – Shorter commutes reduce transportation costs, making daily expenses more manageable.

🔹 **Example from Data:**

* **Halifax (2022):** **23 minutes average commute** – A reasonable travel time compared to cities like **Toronto**, where it can exceed **40-50 minutes**.
* **City Comparison**: Cities with efficient public transit tend to have shorter commute times than those where driving is the primary mode of transportation.

Part 2: SELECT

**query :**

SELECT

c.city AS city\_name,c.city\_id, y.year AS year\_value,y.year\_id,

### -- Employee Employment Data

eev.employment\_id, ee.employment\_characteristics, eev.value AS employment\_value,

### -- Cost of Living Data--

col.cost\_of\_living\_id, col.cost\_of\_living\_items, colc.cost\_of\_living\_category, col.price\_in\_cad,

### -- Commute Data—

com.value AS commute\_time FROM public.col\_city c

JOIN

### -- Cross join ensures all years are considered –

public.col\_year y ON 1=1

Join Employee Employment Fact Table JOIN public.employee\_employment\_value eev

ON

eev.city\_id = c.city\_id AND eev.year\_id = y.year\_id JOIN public.employee\_employment ee ON

eev.employment\_id = ee.employment\_id

### -- Join Cost of Living Fact Table --

JOIN

public.col\_cost\_of\_living col

ON

col.city\_id = c.city\_id

AND col.year\_id = y.year\_id

JOIN

public.col\_cost\_of\_living\_category colc

ON col.cost\_of\_living\_category\_id = colc.cost\_of\_living\_category\_id

### -- Join Commute Table--

JOIN public.commute com

ON com.city\_id = c.city\_id AND com.year\_id = y.year\_id;

Explanation:

This SQL query retrieves data on cities, employment, cost of living, and commute times by joining multiple tables. It includes all years using a cross join (ON 1=1). The query fetches employment characteristics and values, cost of living items with prices, and commute times by joining respective fact and dimension tables based on city\_id and year\_id. The result provides a comprehensive view of city-level employment, expenses, and commuting trends across different years.

The SQL query extracts data from multiple tables to create a **comprehensive dataset** for 3d mapping in PowerMap.

* Query Joins employment, cost of living, and commute datasets using city\_id and year\_id.
* Utilizes a cross join (1=1) to ensure all year and city combinations are included.
* Ensures clarity by selecting only necessary attributes, avoiding filters (WHERE clause) as per assignment requirements.
* The extracted data was exported as a CSV file, which was then used in PowerMap for visualization.

### Part 3: Descriptive Analytics with GIS - 3D Maps Visualization

**Introduction** A GIS-based investigation aims to generate an extremely sophisticated visualization system which examines critical factors that affect students and professionals when making their location choices. We created city mappings with 3D Maps in Excel to show different elements between five urban areas for employment quality and living costs and commute time evaluation.

**Data Overview** The dataset includes the following factors, layered for enhanced differentiation:

* **Employment Value:** The average income in each city:
  + Toronto: **308,248.15 CAD** (Rank 1)
  + Calgary: **77,847.5 CAD** (Rank 2)
  + Edmonton: **70,316.05 CAD** (Rank 3)
  + Winnipeg: **41,444.44 CAD** (Rank 4)
  + Halifax: **23,747.5 CAD** (Rank 5)
* **Cost of Living (Housing Prices in CAD):**
  + Toronto: **1,651.66 CAD** (Rank 1 - highest cost)
  + Calgary: **1,416.25 CAD** (Rank 4)
  + Edmonton: **1,253.75 CAD** (Rank 5 - lowest cost)
  + Winnipeg: **1,477.12 CAD** (Rank 2)
  + Halifax: **1,475.73 CAD** (Rank 3)
* **Commute Time (Average in Minutes):**
  + Toronto: **32.2 mins** (Rank 1 - longest commute)
  + Edmonton: **27.9 mins** (Rank 2)
  + Calgary: **24.3 mins** (Rank 3)
  + Winnipeg: **23.8 mins** (Rank 4)
  + Halifax: **23 mins** (Rank 5 - shortest commute)
* **Final Ranking Based on Total Score:**
  + **Halifax: Rank 1 (Score: 13)** - Best affordability and commute balance.
  + **Edmonton & Winnipeg: Rank 2 (Score: 10 each)** - Lower cost cities but moderate employment.
  + **Calgary: Rank 4 (Score: 9)** - High employment with slightly higher cost of living.
  + **Toronto: Rank 5 (Score: 3)** - Highest employment but expensive and long commute.

**Methodology** The visualization required the following methods to maintain clear representation while introducing creative visual design:

The 3d visualization distributed each metric into its own distinct layer through the use of 3D Maps to maintain clear distinctions while enabling easy watchability.

The data identification process included colors to rank cities and visual markers and shading to separate different datasets.

An exclusion system including filters was implemented which eliminated cities that did not satisfy established affordability conditions when housing expenses exceeded employment value thresholds.

The visualization gained more impact by adding bar graphs and trend lines through the chart overlays feature.

The visualization received changes for maximizing visibility through modifications of the contrast levels and transparency controls and legend placement optimizations.

**Findings & Insights** The 3D Maps visualization revealed the following profound insights:

* **Employment vs. Cost of Living:** Toronto has the highest employment value but also the highest cost of living, making it less attractive despite job opportunities. Halifax, on the other hand, has the lowest employment value but ranks first due to its affordability.
* **Commute Time Considerations:** People seeking affordable housing should consider moving to Winnipeg or Edmonton since their commuting durations remain average.
* **Strategic City Selection:** The ranking identifies calgary as the top city which balances affordability with living comforts.

**Conclusion** These advanced Excel's 3D Maps help separate data really well to create deep understanding of economic potential and city affordability. Based on the checked data I have selected Calgary as the most suitable location because its combination of employment options and affordability together with convenient travel times achieves optimal balance. Due to its elevated living expenses Toronto becomes an unprocurable location despite its meaningful employment potential. The city of Halifax maintains affordable prices although it provides limited job opportunities when compared to other locations. Calgary proves to be the top location for people relocating between professional options because it provides an optimal balance of affordable housing and accessible jobs in a reasonable commute.

The Excel file enables users to view interactive 3D Maps tours making it possible to explore data trends along with their relationships.