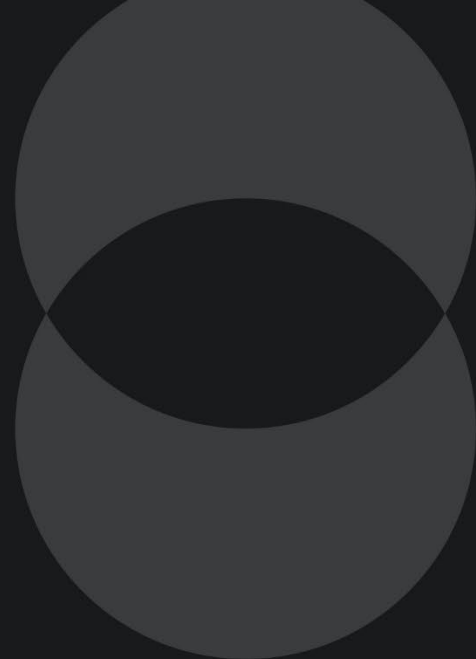




The Absorptive Capacity Index

Methodology and Bibliography



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How we calculated the Absorptive Capacity Index

The Absorptive Capacity Index (ACI) provides a place-based snapshot of absorptive capacity, indicating where immigration is generally associated with positive changes, challenges to local conditions, or a mixture of both. The index is built using long-term data that tracks how municipalities across Canada have changed over time. The analysis uses census data from eight points between 1981 and 2021 along with national facilities data on the locations of schools and hospitals.

We looked at data for 236 Census Subdivisions (municipalities) in Canada, where boundaries were based on 2021 census demographics. The 236 municipalities consist of 3,343 Census Tracts. Since some Census Tracts overlap more than one municipality boundary, to avoid duplication, we assigned it a Census Tract to the larger municipality based on municipality type. For example, if a Census Tract overlapped a town and a city, it was assigned to the city.

Census Tracts are small geographic areas that can be split into new parts over time as populations grow, which can make long-term comparisons misleading if the same place is no longer being measured in the same way. We harmonized all data to a consistent geographic base by aggregating later Census Tract splits back to their original 1981 aggregation. Since the tracts were only aggregated, boundaries were not changed, and none are duplicated across municipalities, the municipalities boundaries are still the most up to date. Changes shown in the results therefore reflect real changes in population and local conditions, not changes in how administrative boundaries were defined.

To build the ACI, we estimated a statistical model to examine how immigration is associated with changes in local outcomes. All variables were placed on a common scale so the results could be compared across different indicators. The resulting estimates can be read as effect sizes, showing whether immigration is associated with substantial negative, neutral, or positive effects on the outcomes. Due to missing data in some of the indicators, 222 municipalities out of the initial 236 were used.

Estimated effect sizes from these models are used to construct the index. The direction of the effects is harmonized so that higher values indicate more capacity and lower values indicate more strain. Because the regression coefficients are standardized, they can be combined. The standardized indicator effects are first averaged into five-dimension scores and then averaged into an overall Absorptive Capacity Index. To support interpretation and visualization, the dimension scores and overall index are then optionally rescaled to a 0–100 range using a winsorized, centred transformation that preserves the meaning of the midpoint 50.

Municipalities were categorized into three capacity groups using the sign of the overall index before rescaling. Negative index values indicate that immigration is more often associated with strained outcomes, positive values indicate that immigration is more often associated with manageable or favourable outcomes, and values close to zero indicate a balanced relationship between immigration and local capacity. A small neutral band of 0.01 around zero is used to distinguish municipalities whose overall scores are substantively close to balanced. For presentation purposes, the signed index is then rescaled to a 0 to 1 range, where scores near 0.5 correspond to balance, lower values indicate more strain, and higher values indicate more capacity.

The values were rescaled for readability to be between 0 and 100 and centred around 50. Values of 49 and less now indicate that immigration is more often associated with strained outcomes, values of 51 and greater indicate that immigration is more often associated with manageable or favourable outcomes, and a value of 50 indicates a balanced relationship between immigration and local capacity. This approach shows which municipalities are facing pressure, and which ones may have more room to adapt.

The immigration rate and municipality outcomes: Key indicators

The ACI is the main output of this study. It is a comparative score that shows how well a municipality appears able to accommodate immigration-driven population growth across five dimensions. A higher score means immigration is generally associated with more manageable or positive outcomes across these areas, while a lower score means immigration is more often associated with pressure on local systems.

One of the key inputs used to calculate the index is the immigration rate. This is measured as the number of recent immigrants (those who arrived in the past five years) relative to the size of the local population in the previous census. In other words, the immigration rate helps us measure the scale of immigration-driven population growth, while the index shows how that growth appears to interact with local capacity.

For users, the value of the index is practical. It helps municipalities identify whether immigration appears to be broadly aligned with local capacity, where pressures may be emerging, and which dimensions—such as housing or transit—may require planning attention or investment.

Immigration is associated with changes in municipalities' outcomes. The municipality outcomes are grouped into five areas that are central to everyday life:

- the economy
- housing
- health and community well-being
- education
- public transit

Each area is represented using familiar indicators, such as unemployment rates, housing affordability, access to hospitals, students per school, and public transit use. These indicators were selected because they capture systems that are commonly affected by population growth and are frequently identified in the absorptive capacity literature as important to successful integration. The index does not measure every aspect of municipal capacity, but it provides a consistent way to compare how immigration is associated with changes in key local outcomes across municipalities.

The indicators used in each dimension are:

Dimension	Measures used	What the score captures
Economy	Labour force participation rate, unemployment rate, average employment income	Whether immigration is associated with stronger or weaker local labour market outcomes
Housing	Share of households that rent; share of households spending 30 per cent or more of income on shelter costs	Whether immigration is associated with rental market pressure and housing affordability strain
Health and community well-being	Hospital access proxy based on hospitals within a defined distance of Census Tracts, relative to population	Whether immigration is associated with greater or weaker access to nearby hospital infrastructure
Education	School access/capacity proxy based on schools within a defined distance of Census Tracts, relative to the child or student population	Whether immigration is associated with greater or weaker pressure on local education infrastructure
Transit	Public transit users as a share of employed residents with a usual place of work	Whether immigration is associated with more manageable or more strained public transit use

All measures are placed on a common scale before being combined. The direction of the indicators is also aligned so that higher scores always indicate more capacity or more manageable outcomes, while lower scores indicate more strain or weaker outcomes. This allows the five dimensions to be compared and combined into the overall Absorptive Capacity Index.

To understand how immigration is associated with changes in these outcomes, the analysis compares changes within the same municipalities over time using a fixed-effects panel regression framework. This approach helps separate the effects associated with immigration from other factors, such as long-standing local characteristics or national economic trends that affect all municipalities at once. Census Tract fixed effects control for unobserved, time-invariant local characteristics, while Census Year fixed effects account for broader macroeconomic and policy shifts.

The analysis also allows the relationship between immigration and outcomes to differ across municipalities, recognizing that each municipality has its own conditions and capacity. The analysis allows the relationship between immigration and outcomes to vary from one municipality to another, recognizing that local conditions differ across places. This approach captures whether observed

levels of immigration are associated with improvements or deterioration in local conditions, conditional on each municipality's existing capacity.

Limitations

- We show associations, not causal links: The index shows how immigration is associated with changes in local outcomes, but it does not establish that immigration directly causes those changes.
- Data constraints: Some dimensions rely on proxy indicators (e.g., hospitals or schools per person), which may not fully capture service quality, access, or operational capacity. For example, the health ("The Open Database of Healthcare Facilities") and education ("The Open Database of Educational Facilities") facility datasets are time-invariant. These datasets provide facility names/types/locations but do not include consistent "operational since" (opening) dates, so facility access measures are effectively static over time and may misrepresent historical access when applied to earlier census years.
- Recent changes not fully captured: Census data is collected at multi-year intervals, meaning recent shifts in infrastructure investment, service expansion, or population change will not yet be captured in the analysis.
- Some dimensions use proxy measures: The health, education, and transit dimensions rely on available indicators rather than complete measures of system capacity. For example, hospital and school measures reflect proximity to facilities, but not staffing, wait times, facility size, or service quality. Transit measures reflect commuting by public transit, but not route frequency, reliability, fleet size, or budgets. These scores should therefore be interpreted as signals of possible capacity pressure, not as full assessments of service adequacy.

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