CANDEV 2020: Smart Cities

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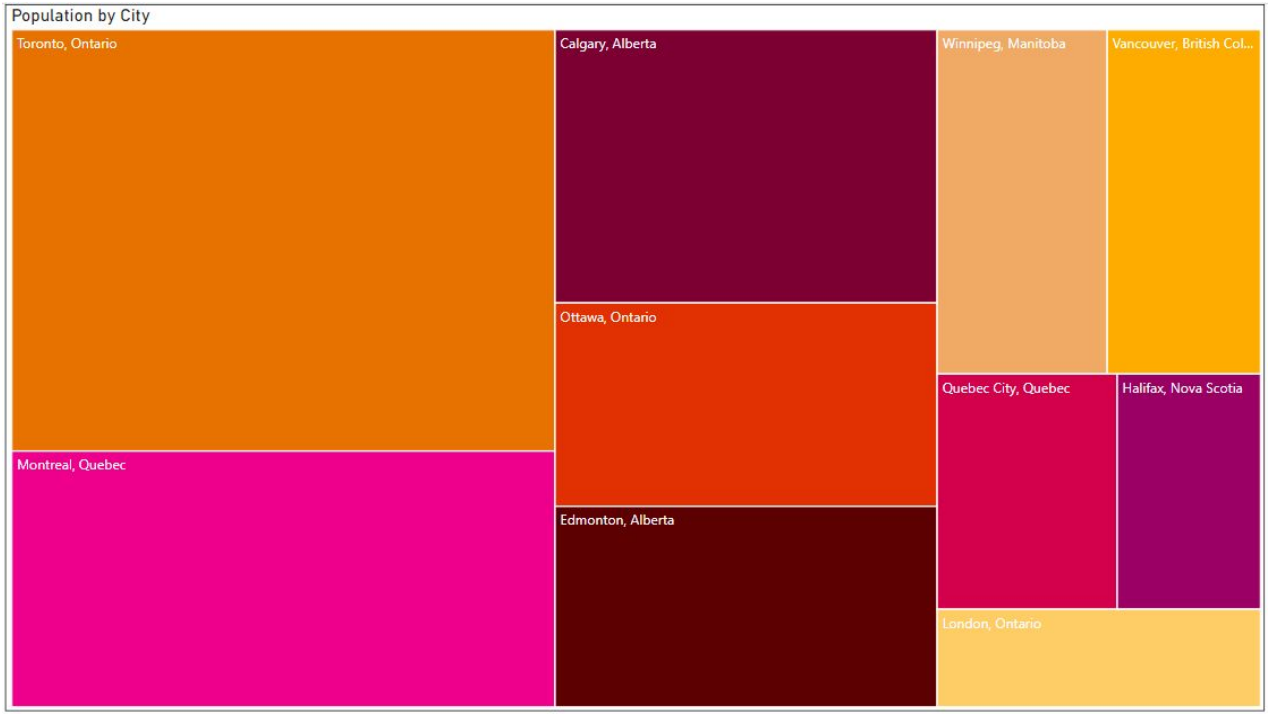
Overview


Population and Smart-score by City
Athabasca
CANADA
Edmonton
Calgary
Vancouver
Seattle
Lake Superior
Montreal
Toronto
Chicago
Detroit
Boston
New York
Philadelphia
Washington
UNITED STATES
Denver
St Louis
San Francisco
Province of Ontario, Esri, Garmin, FAO, NOAA, EPA, NRCan, Parks Canada | Pr...
esri

Overview: Smart Cities Assessed



*We only collected data for Canadian cities. Populations 400k-2.9M

Smart Scores: Selecting Key Factors

Factor	Importance
(1) Percentage of population that takes public transit to work	High
(2) Internet speed in city	High
(3) Electric car charging stations per capita	Low
(4) City-wide transit score from Walk Score ®	Med
(5) Percentage of population with door to door solid waste removal	Low
(6) Percentage of municipal budget spent on parks and recreation	Med
(7) Cities with Lyft/Uber	Low

Key Criteria for Smart Cities:

- Environmental Impact
- Accessibility
- Access to Technology
- Ease of Transit
- Quality of Life
- Openness to Technological Change

ISO 37122: 2019 (Sustainable cities and communities—Indicators for smart cities)

Smart Scores: Scoring Methodology

1. Each factor was given a weight which designated its significance.
2. The metrics for each city were normalized from 0 to 1 (fractional score)
3. The fractional score for each city was multiplied by 4.5, such that each city would receive a score between 0 and 4.5 for each metric.
4. The scores were then multiplied by the weight designated to each metric and were summed up for each city, producing an overall “city score” for each city.

Smart Scores: Results

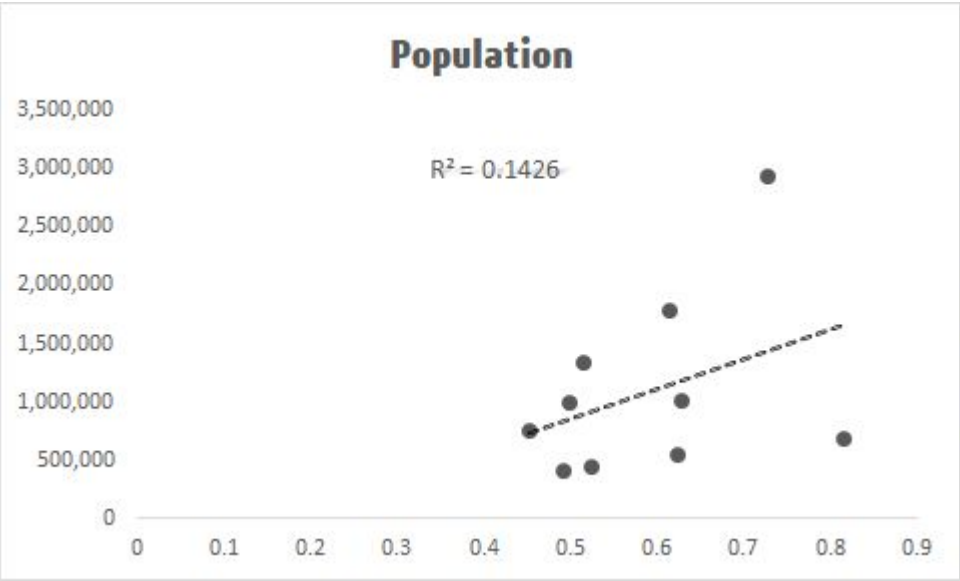
	Category							
Score	Transit to work	Internet speed	Electric cars	Transit score	Park budget	Uber	TOTAL SCORE	CITY SCORE
London, Ontario	1.1	4.5	0.8	2.6	0.4	5	90	49.34%
Toronto, Ontario	4.5	4.4	0.9	4.5	1.1	5	90	72.98%
Calgary, Alberta	1.9	4.2	0.4	2.9	0.4	5	90	51.56%
Ottawa, Ontario	2.5	4.2	0.9	2.9	N/A	5	75	63.04%
Québec City, Québec	1.8	4.1	2.9	2.7	N/A	5	75	62.51%
Edmonton, Alberta	1.8	3.9	0.3	2.8	0.7	5	90	49.96%
Halifax, Nova Scotia	1.4	3.8	0.4	3.5	2.5	0	90	52.47%
Vancouver, British Columbia	3.6	3.6	4.5	4.3	4.5	5	90	81.63%
Winnipeg, Manitoba	1.8	3.1	0.2	2.9	0.4	5	90	45.30%
Montreal, Québec	4.4	2.7	3.2	3.9	0.2	5	90	61.56%
Weight	15	23	7	25	15	5	-	

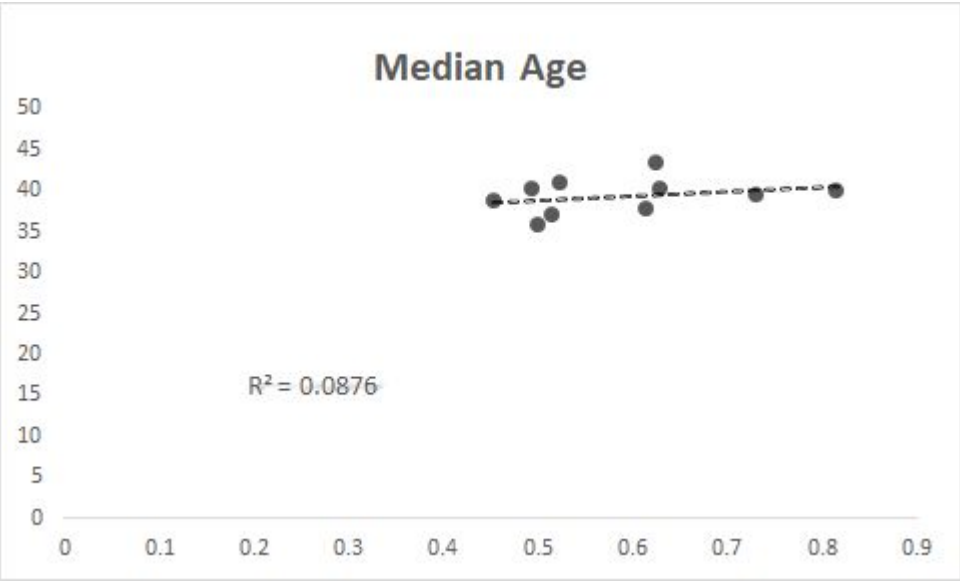
Predictor Factors: Definition

Factors that are present in smart cities that can be used to predict a city's potential to become a smart city.

- Median age
- Number of public libraries per 100,000
- Median family income after-tax
- Average number of City's monthly tweets
- Municipal election turnout
- Number of DLI in city

Predictor Factors: Assessing Correlations





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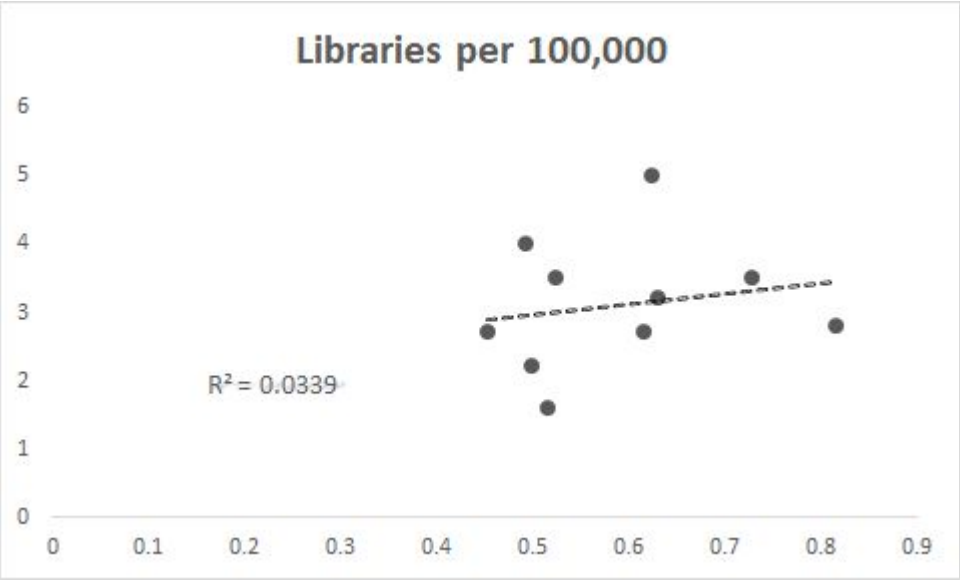

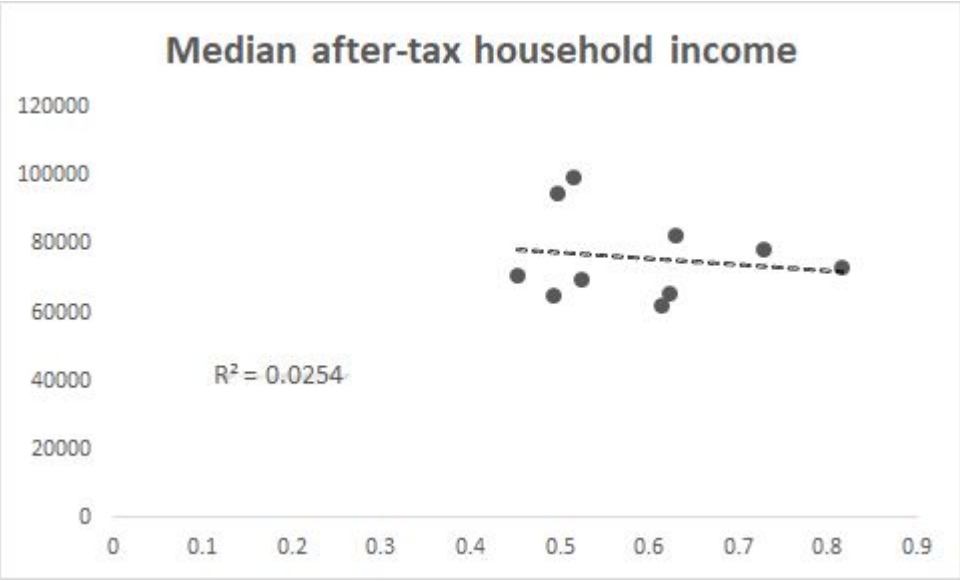

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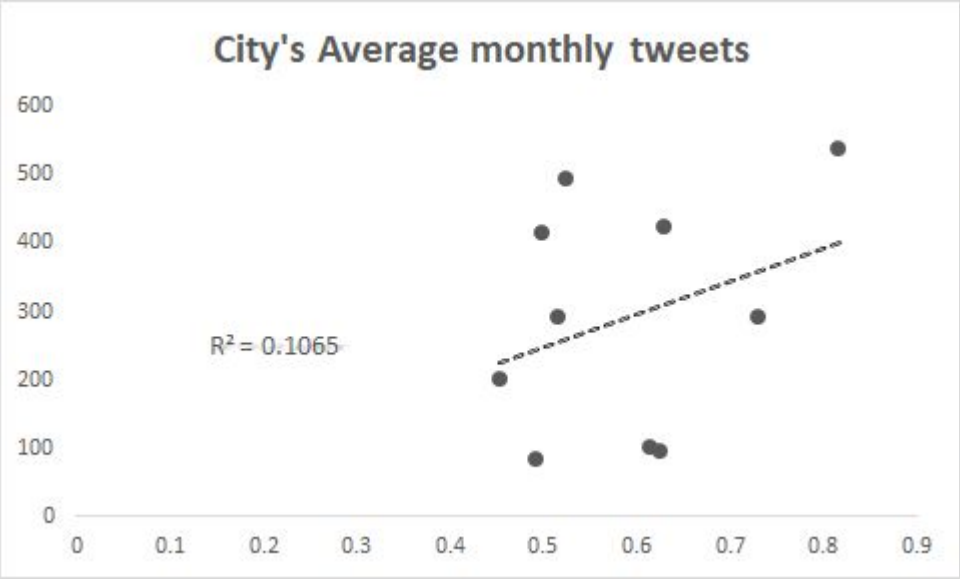
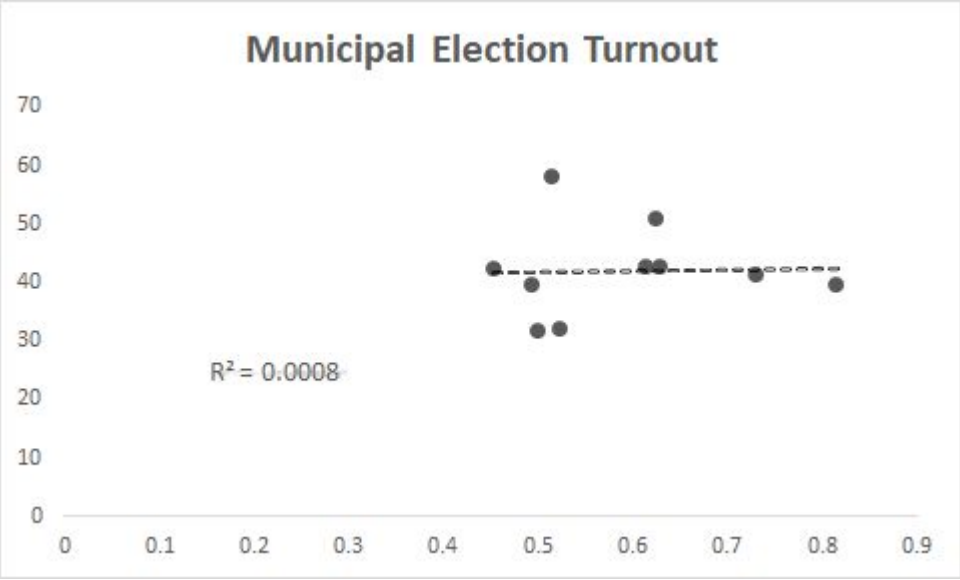
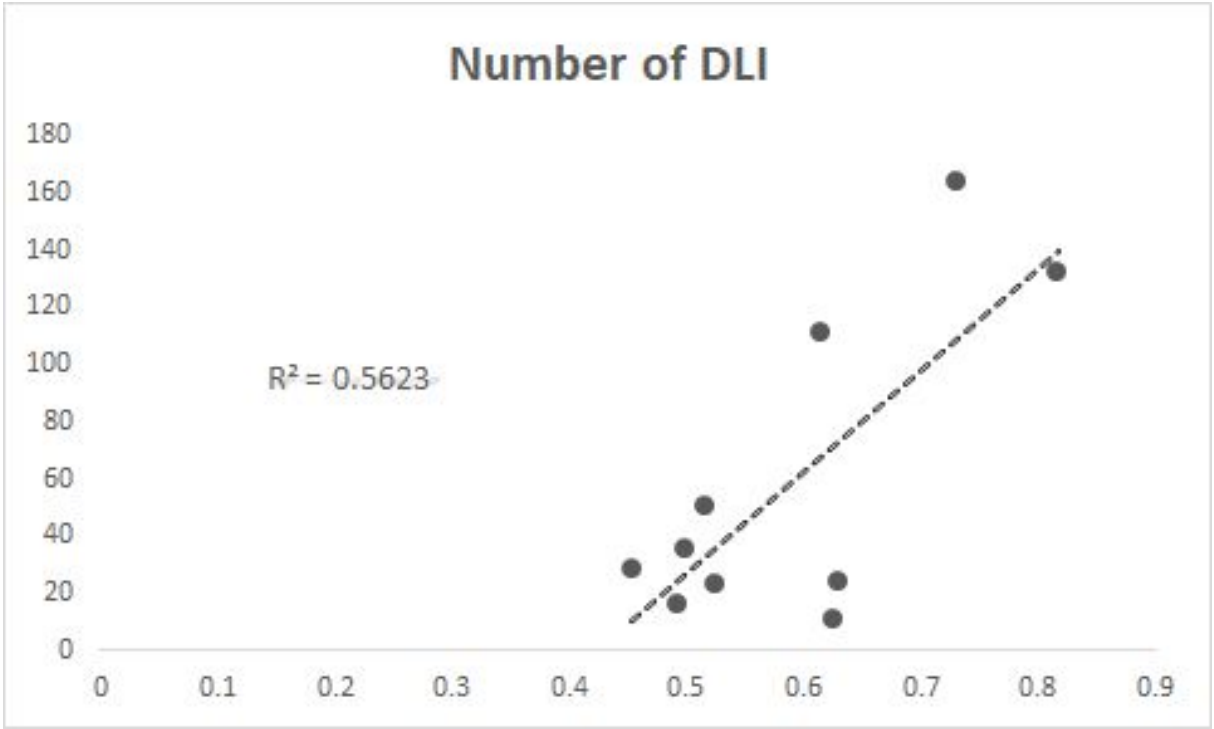




Predictor Factors: Assessing Correlations



Further Research

Smart Factors

Factor	Importance
(1) Percentage of population living in high density area	High
(2) Percentage of population in education, R&D, or IT	Med
(3) Percentage of population with door-to-door waste pickup	Med

Predictor Factors

Factor	Importance
(1) Diversity of origin	Med
(2) Percentage of population with post-secondary education	Med
(3) Percentage of population who has retired	Med

- Assess the time based impact of the change in predictor factors on smart score
- Potential second order correlations