The Census as a Framework for Business Analytics

UNECE – Census Week – September 2022

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The Census as a framework for Business Analytics

You can’t improve what you can’t measure

You can’t measure without a framework

You can’t reference or compare without standardization

You can’t divide without a denominator

A wealth of data exists that can be put to greater use, and value, when projected into a framework established by the Census.

Extending the Census to new products

In this presentation I will talk about the following products at Environics Analytics (EA) that leverage the Census Framework to create new value:

- Updates to population and income estimates
- Extending the household basket of goods to new products
- Commercial off-the-shelf segmentation system
- Extending the use of survey data collected for media measurement
- Applying attribution and analog techniques to other survey data
- Passively collected network-based tracking data and Big Data
- Extending to the Adtech eco-system

The Framework

- Socio-economic concepts – Population, Households, Dwellings, Labour Force
- Dwelling and settlement pattern – Housing type, migration, urban density
- Geographic Reporting Framework – geo-unit of reporting

Building new Small Area Data using the Census framework

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Fundamental Ideas

The geodemographic approach is based on **3 ideas**:

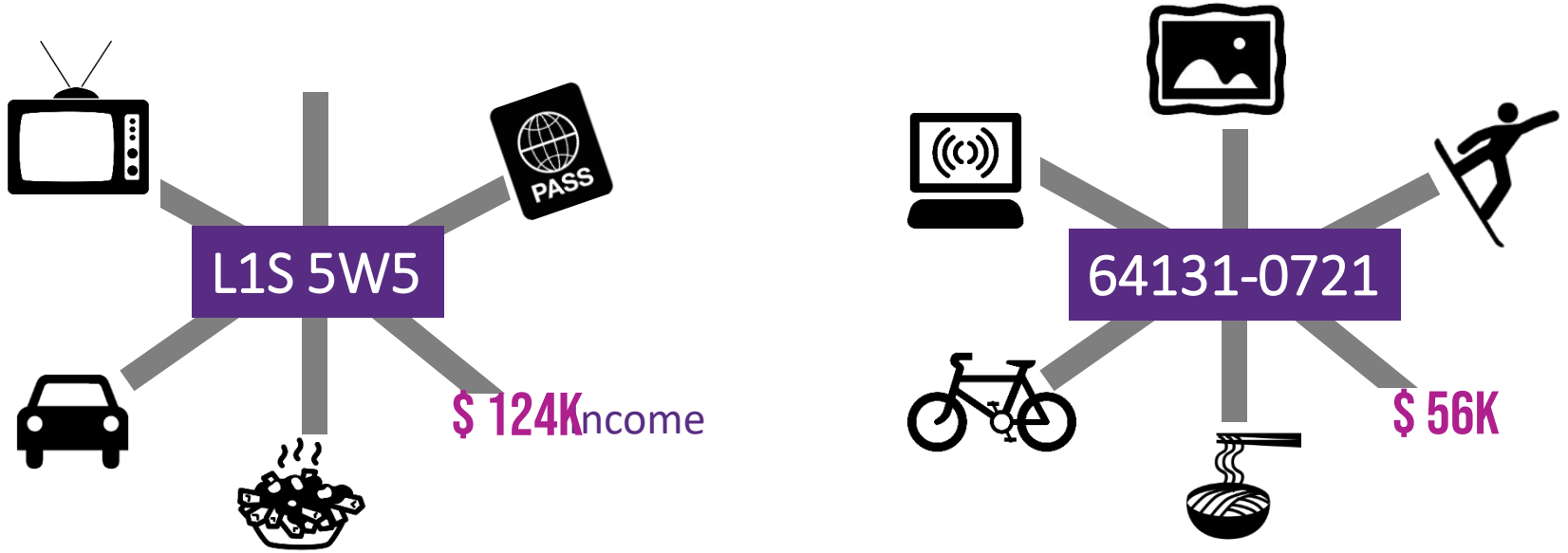
1. The attributes of persons/households that are close together are more similar that those that are far away (*positive spatial autocorrelation*)

2. Knowing a person's neighborhood (at a small spatial scale) helps make good inferences about that person

3. When privacy is critical one can make use of small-area attributes as reasonable estimates of the attributes of residents of these small areas

Built on Foundation of Geodemography

- Combines geography and demography
- Uses geographic codes (such as postal codes or ZIP+4) as a unique indicator to combine and summarize large amounts of data



From Many Sources, Using Best Methods

Geodemography
KNN
Microsimulation
Predictive Analytics
Typological projection
Machine Learning
Benchmarking
Control total calibration
Clustering
Normalization
Bootstrapping

50,000 data variables available at the 6-digit Postal Code Level

- Demographic
- Segmentation
- Psychographic
- Behavioural
- Financial
- Mobile Analytics

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Built to a Census-based Geographic Framework

DATA PROVIDERS
(85+ SOURCES)

TomTom · Environics Research · cleanlist.ca · nielsen · askingcanadians™ a Delvinia company · vividata · Numeris · UberMedia · mastercard · nlogic · Equifax · Oxford Economics · Baron Lists · Canada Post / Postes Canada · Experian A world of insight · EnsembleIQ · CAP Index · Ipsos · Statistics Canada · Bell Media · Kalibrate · Epsilon · CSCA · dun & bradstreet · House Price Index, Teranet and National Bank of Canada

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Make rich survey data actionable at the neighbourhood

Coefficient-based

- Assign survey respondents to a segment code (PRIZM) based on their postal code
- Tabulate the number of people or households that purchase the product at the national segment level. So, if in segment 5, 672,931 people out of 2,301,764 purchase the product, then 29.2% of people are projected to purchase.
- Therefore, all segment 5 postal codes have the same propensity to make the purchase regardless of geography

Modeled

- Data are modeled directly to the postal code level using the demographics of the respondent and the demographic characteristics of the neighbourhood
- Models can be constrained by region
- There is no direct relationship to PRIZM
- In theory, each postal code obtains a unique set of propensities

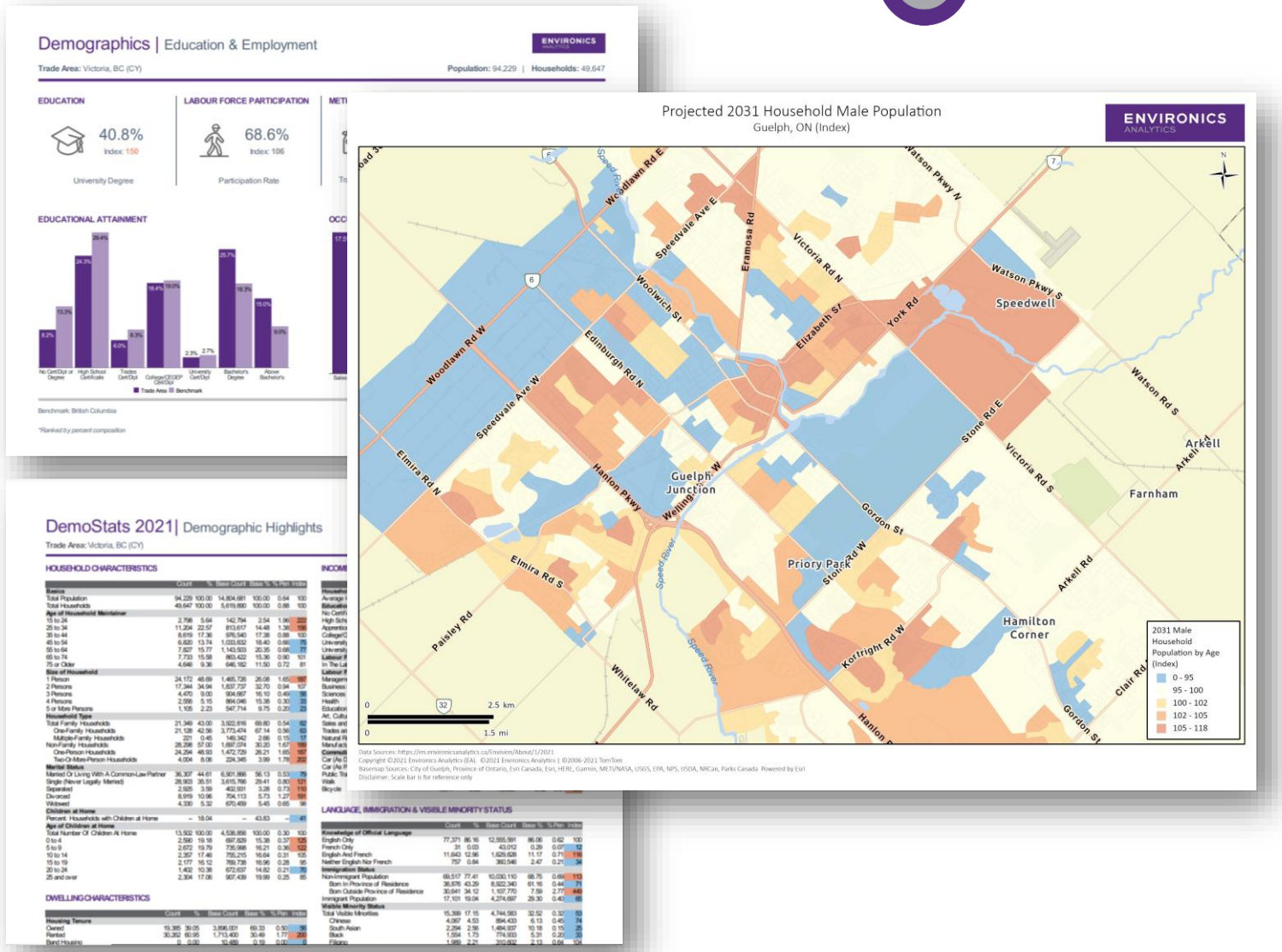
Geodemography – Why it Still Works

- Uses census data so it can be used in many jurisdictions
- Tied to the ground, not the individual
- Privacy friendly
- Easy to name, describe, and use
- Segments make sense to most people as a way to describe reality
- Designed for granularity so can be aggregated to larger custom groups
- Ability to join disparate databases – big advantage
- Provides market sizing at small geographic level – big advantage
- Harnesses new types of data

Start with Small Area Demographics

DemoStats

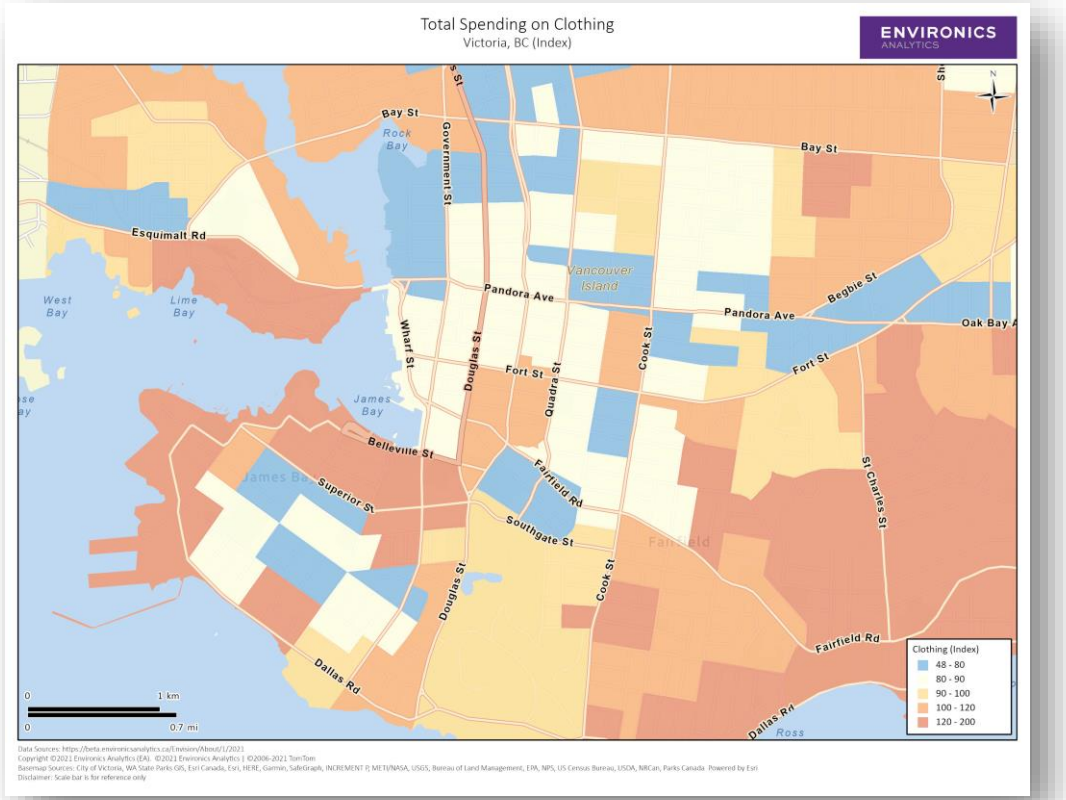
- Current-year estimates for more than 750 population, education, cultural diversity and income variable
- Created with data from Environics Analytics, Statistics Canada, Oxford Economics, Equifax, CMHC and Canada Post and a combination of econometric, demographic and geographic models
- Available at postal code leve



Add the consumer basket of goods

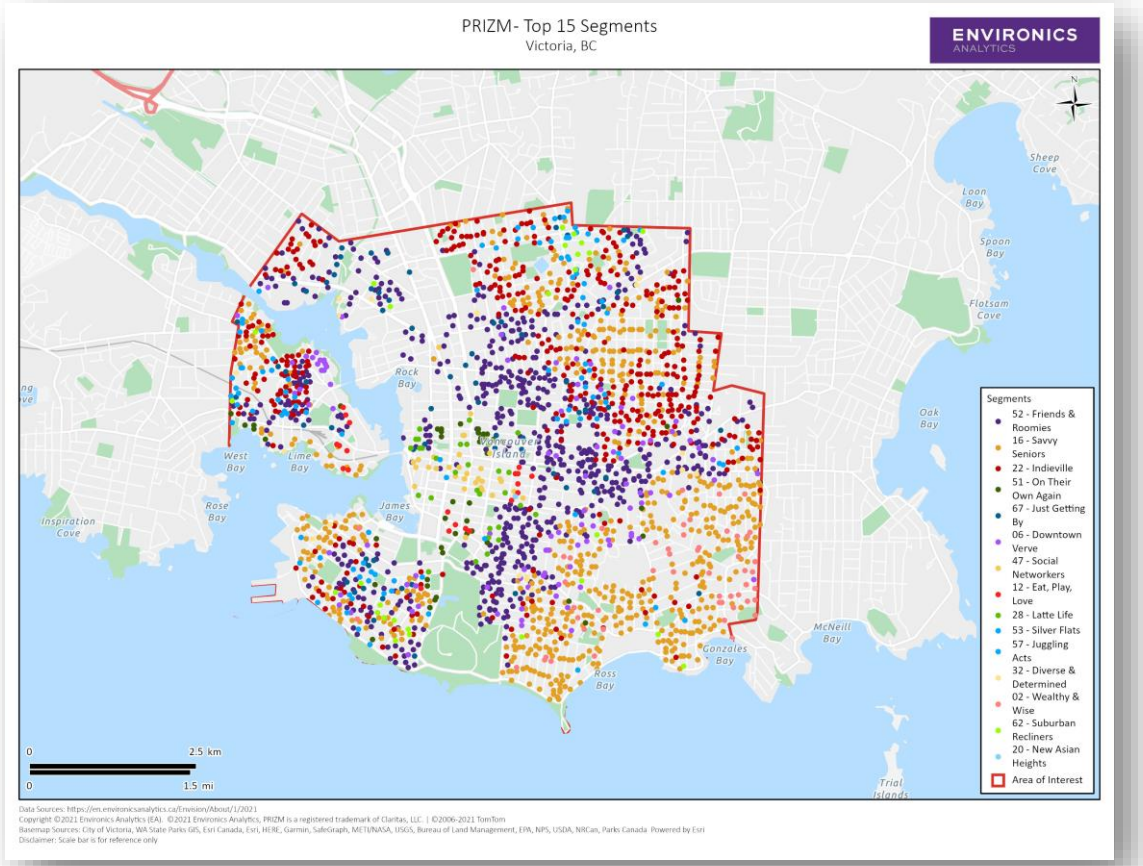
HouseholdSpend

- HouseholdSpend provides estimates of annual expenditures for almost 500 variables, across 18 categories of goods and services used by Canadian households
- Commonly used to identify trade area purchase trends, spot cross promotional opportunities and identify category spending potential
- Estimates expenditures by both average dollars per household and total dollars spent for any geographic level
- Produced using data from DemoStats, PRIZM™ and Statistics Canada's Survey of Household Spending
- Aligned to control totals from the Canadian System of National Accounts and Statistics Canada



Group neighbourhoods into homogeneous segments

- PRIZM® is our pioneering segmentation system that classifies Canada's neighbourhoods into 67 unique lifestyle types
- Integrates data from nearly a dozen geographic, demographic, media and psychographic sources
- Provides the foundation for building custom segments for different client needs
- Ability to link to over 30,000 behavioural variables to help you better analyze, understand, and find customers and markets
- Unique assignment at 6-digit postal code level or at Census dissemination area level



PRIZM

PRIZM® is our pioneering segmentation system that classifies Canada's neighbourhoods into **67 unique lifestyle types**

PRIZM Segments

Socio Economic Status Indicator (SESI)

Segment Name

Segment Picture

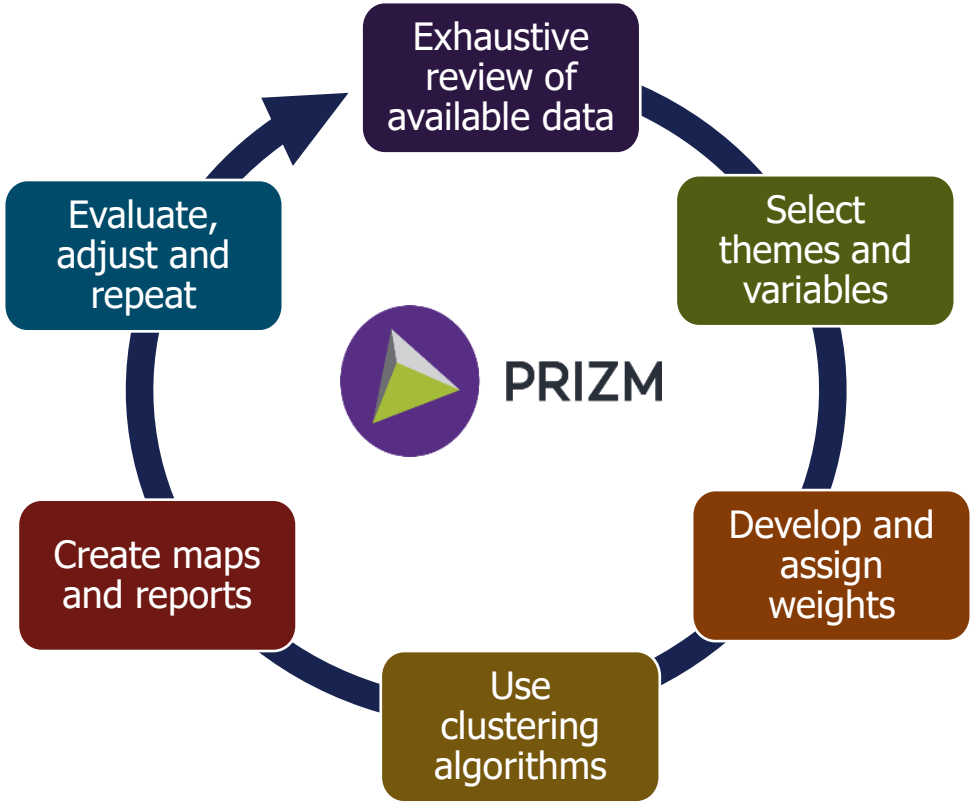
Social Group

Lifestage Group

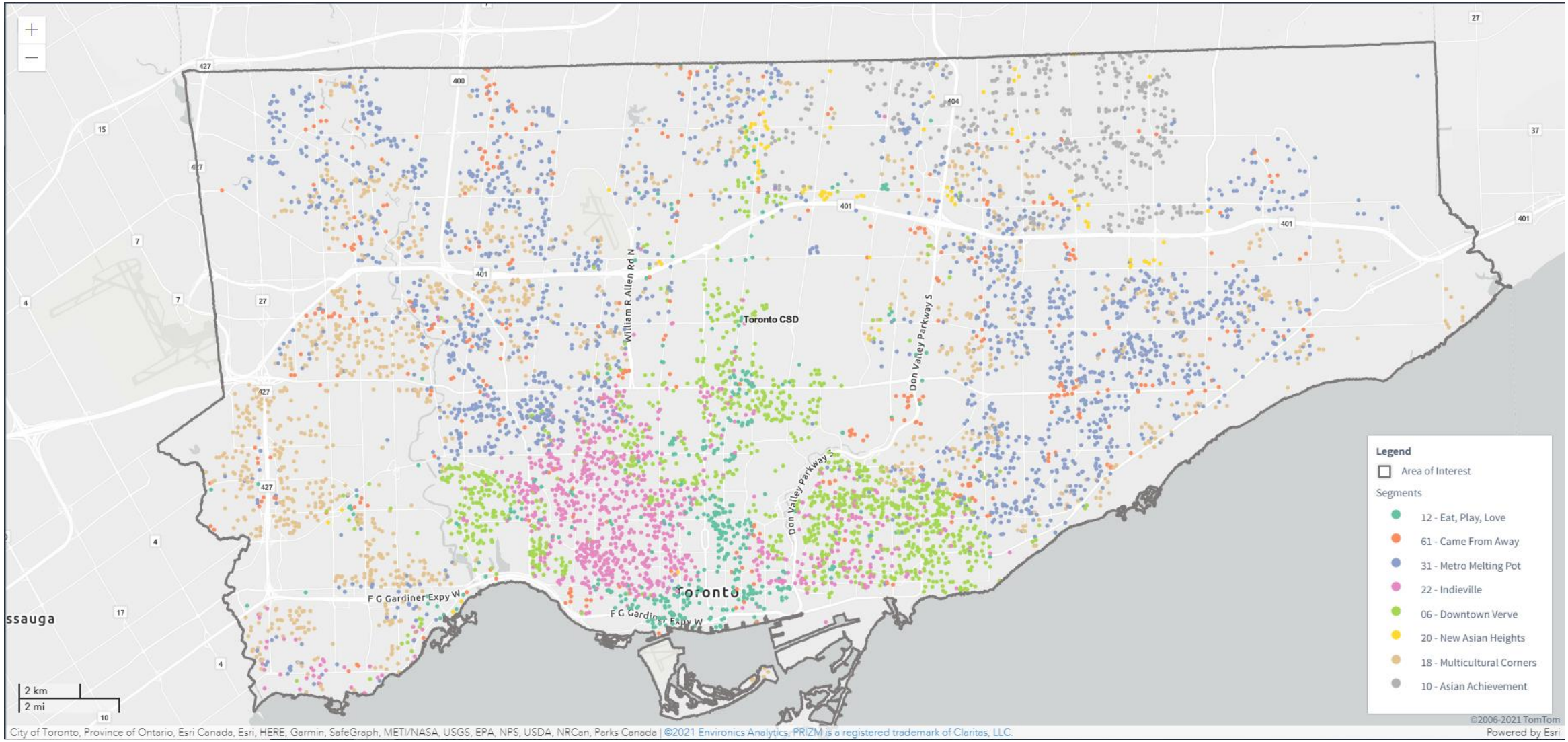
Data Inputs

- Demographic
- Psychographic
- Financial
- Geographic
- Shopping
- Leisure
- Media
- Motivators

How is it Built?



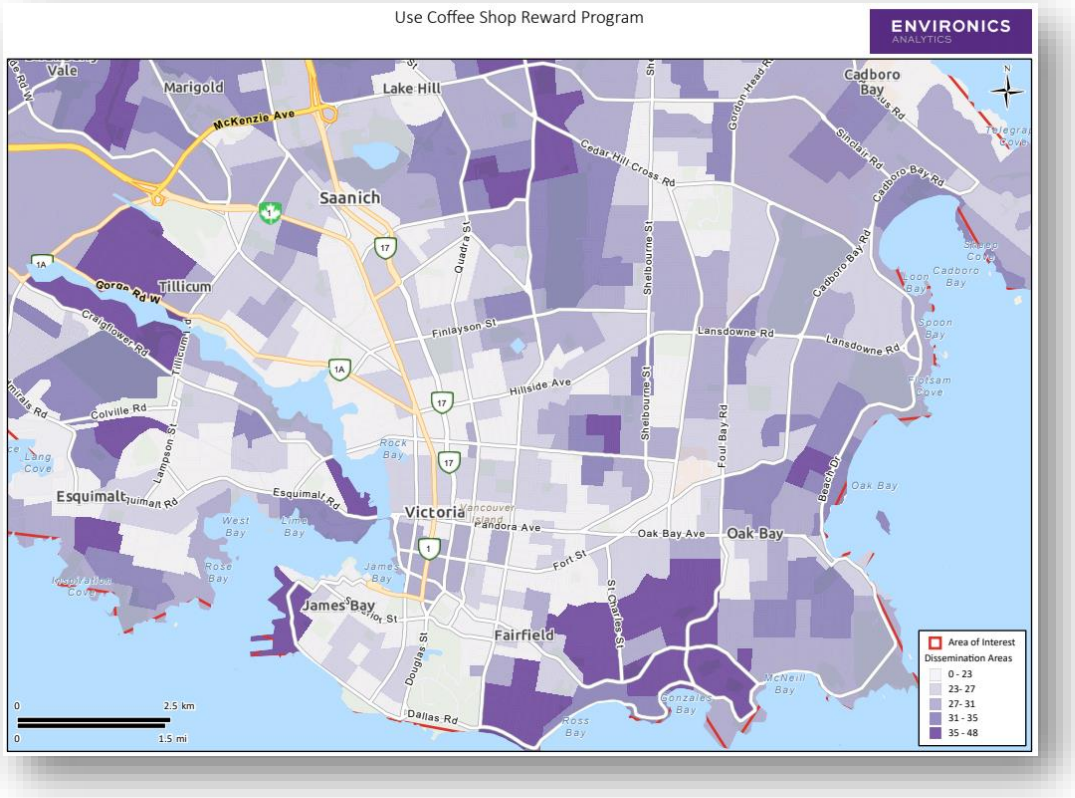
PRIZM: Segment Dot Map



Extend to widely used media measurement surveys

Opticks
powered by Vividata

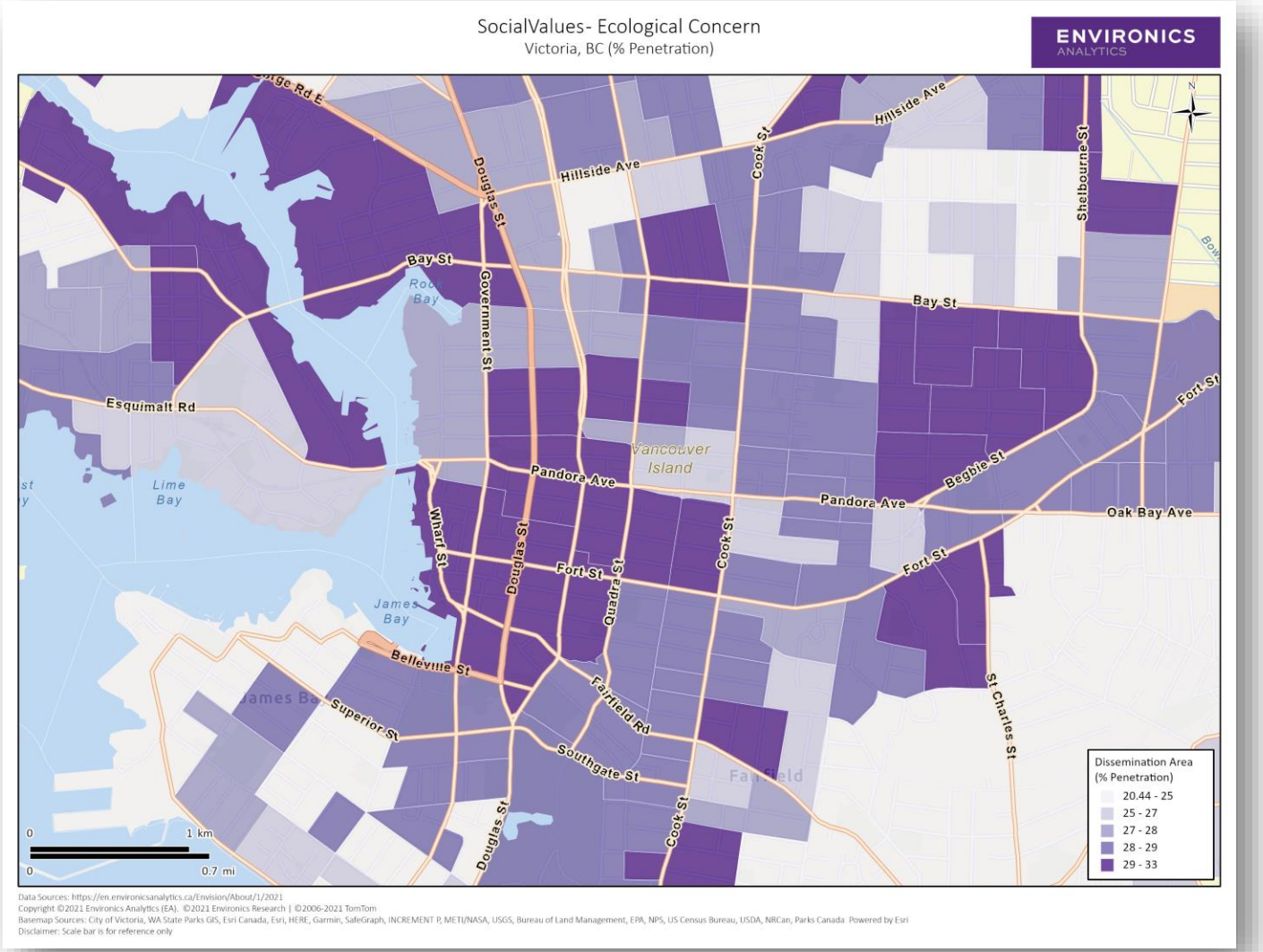
- Includes more than 5,000 behavioural profiles across a broad range of products, activities, services and media choices
- Based on Canada's leading syndicated study on cross-media audiences, consumer behaviour, product usage and lifestyles
- Derived from a rolling 52-week online survey sample of more than 34,000 respondents
- Available at the postal code level



Geodemographics to Psychographics?

SocialValues

- Describes the mindset of Canadians to determine the best message to engage them
- Derived from the Social Values survey by Environics Research,
- 10,000 respondents measuring 250 indicators of human motivation and social relations
- Behaviour is often used as a surrogate but mindset is key – especially in digital



Applying to Big Data sources

- Volume, Variety, Velocity… Usually with spatial and temporal attributes
- Typically collected on daily cadence or in real-time, with billions or trillions of observations per year with some form of a location association
- Data sources include:
  - Public Infrastructure
  - Cellular Devices
  - Network Infrastructure
  - Connected X (vehicles, IOT, checkout terminals, sensors, etc.)

MobileScapes - Mobile movement data, updated daily

- Combines three sources of permission-based and anonymized data collected from location-enabled mobile devices and employs the best spatial data processing and analysis practices
- Mobile analytics help businesses and organizations enhance what they know about movement patterns using privacy-compliant mobile movement data collected from location-enabled mobile devices
- Most accurate, comprehensive and up-to-date mobile movement database available for marketing and business applications
- Can describe who's visiting your locations or competitor locations, how often, and where they live and work to inform decisions around products, program development, marketing, messaging, recovery planning and staffing levels
- Acts as a surrogate for customer data to link to Environics Analytics PRIZM

Emergence of Mobile Movement Data

Advantages

- Timeliness
- Lower cost of collection
- Low respondent burden

Disadvantages of Raw Data

- Bias in ping universe
- Diminishing acceptance of location-based apps
- Risk of improper use
- Risk of incorrect inferences

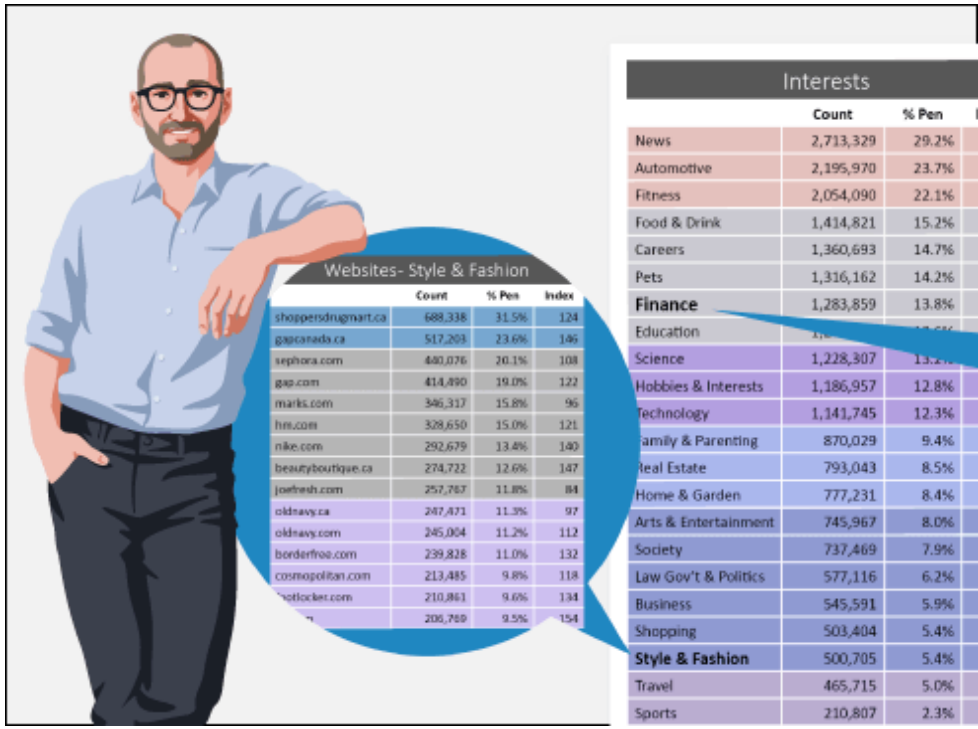
Converting BIG Data to Insights

- Anonymized cellular devices can be treated as a spatiotemporal sample of the population
- Do not confuse "Big Data" with "Insights“
- Spatial analysis can harness Big Data to turn it into actionable insights
- Smoothing, interpolation, aggregation and synthesis techniques
    - protect privacy
    - project to General Population
- Weighted to reference population to correct for behavioural and reporting biases
- Results are reported as an estimated neighbourhood population
- Traditional geodemographic techniques can then be used to describe the visitors' demographics, behaviours and psychographics

Big Data – IoT – Clicks

ClickScapes

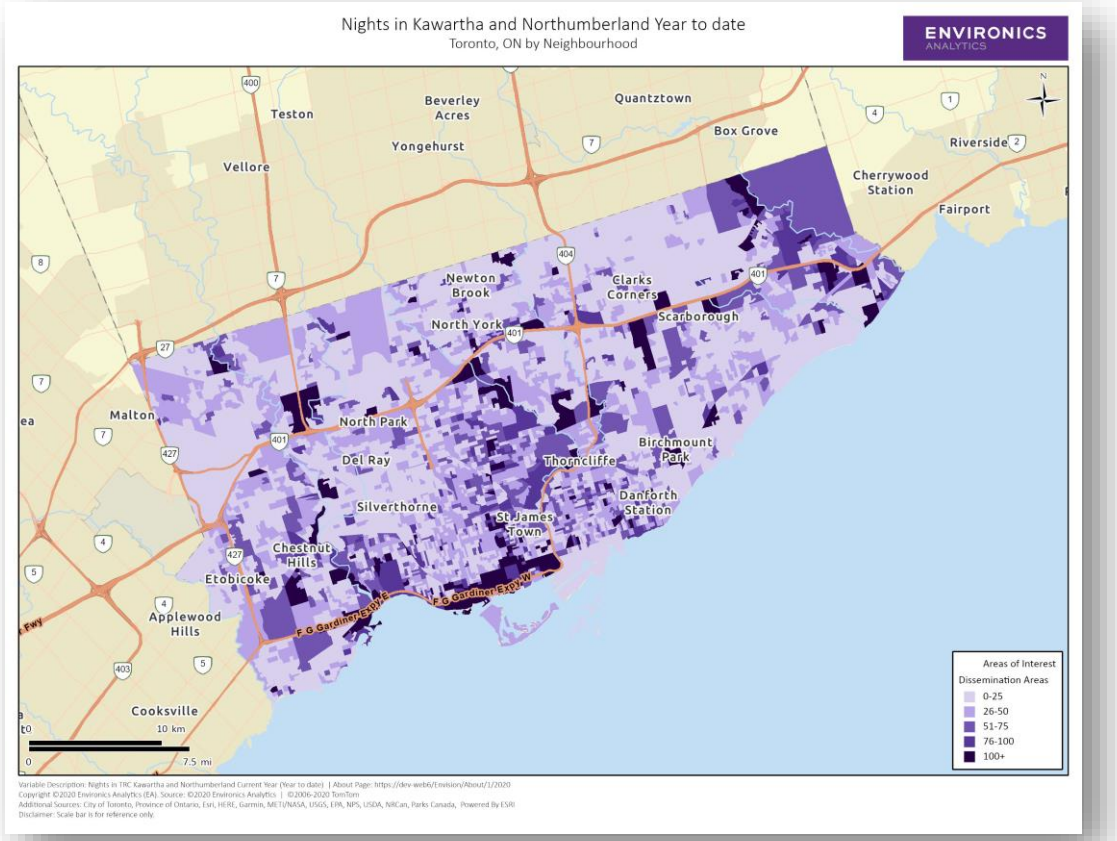
- Visitor metrics for thousands of apps and websites with Company and Interest aggregations
- Data for mobile or home internet networks
- Access via the audited, secure and privacy-compliant Environics Analytics (EA) ecosystem
- Annual or monthly updates with weekly detail
- Link ClickScapes to customer data or other EA data for unparalleled visitor and geographic insight



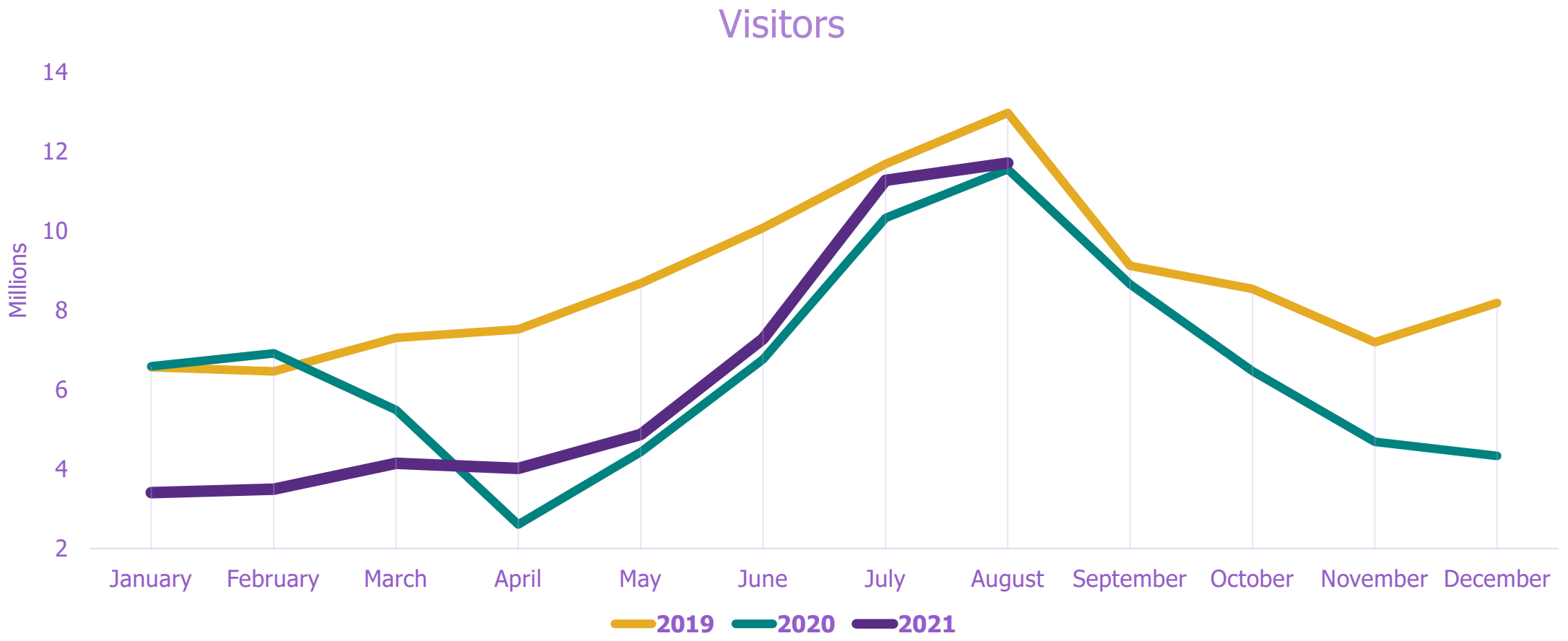
Big Data – IoT – Pings

VisitorView

- VisitorView presents neighbourhood-level estimates of overnight Canadian travellers within Canada, its provinces and territories, or one of Canada's 85 tourism regions as defined by Destination Canada
- Estimates are provided for the total number of visitors, the number of trips and the number of nights spent in each province or tourism region
- Updated monthly so you can develop and execute marketing campaigns quickly and effectively
- Linked to our PRIZM neighbourhood classification system featuring 67 segments that capture current demographics, lifestyles and values of Canadians



2019 thru 2021 Visitor Trends



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Some Questions It Helps Answer

- Which Toronto neighbourhoods generate the greatest number of visitors to the Niagara Falls and Wine Country tourism region?
- Which Ontario segments and markets produce the most visitors to the Canadian Rockies during ski season?
- What is the total number of nights spent by visitors in the in the Kootenay Rockies tourism region?
- Where do we find more off-season travellers?
- Which postal codes should I target for a direct marketing campaign?
- … all answered in a framework that comes from the Census.

60 Data Products for the Canadian Market

Demographic

DemoStats
CensusPlus
DaytimePop
CrimeStats
AccultuRates

Segmentation

PRIZM
PRIZM QC
DELTA

Financial

HouseholdSpend
FoodSpend
WealthScapes
WealthScapes Lite
WealthScapes Daytime
WealthScapes Fundraiser
AgeByIncome
LiquidAssets
MoneyMatters *Powered by Canadian Financial Monitor*
Neighbourhood View™
ClickSpend™ *Powered by J.C. Williams Group*
WealthCare
WealthTransfer
Financial Vulnerability Index

Behavioural

Opticks *Powered by Vividata*
Opticks *Powered by Numeris*
Opticks Social *Powered by AskingCanadians™*
Opticks Mobile *Powered by AskingCanadians™*
Opticks eShopper *Powered by AskingCanadians™*
Opticks Automotive *Powered by IHS Markit™*
CannabisInsights *Powered by Vividata*
GreenLiving
CommunityLife
GivingBack
Homescan® Profiles
AutoRank™
DonorRank™
FireScapes
ShopperChoice

Health

Social Vulnerability Index
Frailty Index
CommunityHealth
VaccineInsights

Psychographic

SocialValues

Mobile Movement

MobileScapes Out & About
MobileScapes ENVISION
VisitorView
ClickScapes

Geographic

Enhanced PCCF
Streets & Boundaries
Postal Code Boundaries

Location

Businesses
Financial Institutions
Spectra Trade Areas
ShoppingCentres
TrafficCounts
Points of Interest

Business

BusinessProfiles
BusinessProfiles Lite
ResponseCanada™ Business

Contact

ResponseCanada™ Consumer
ResponseCanada™ Movers
ResponseCanada™ Pre-Movers

Using small area estimates as a denominator to customer data

Small area data can be used to:

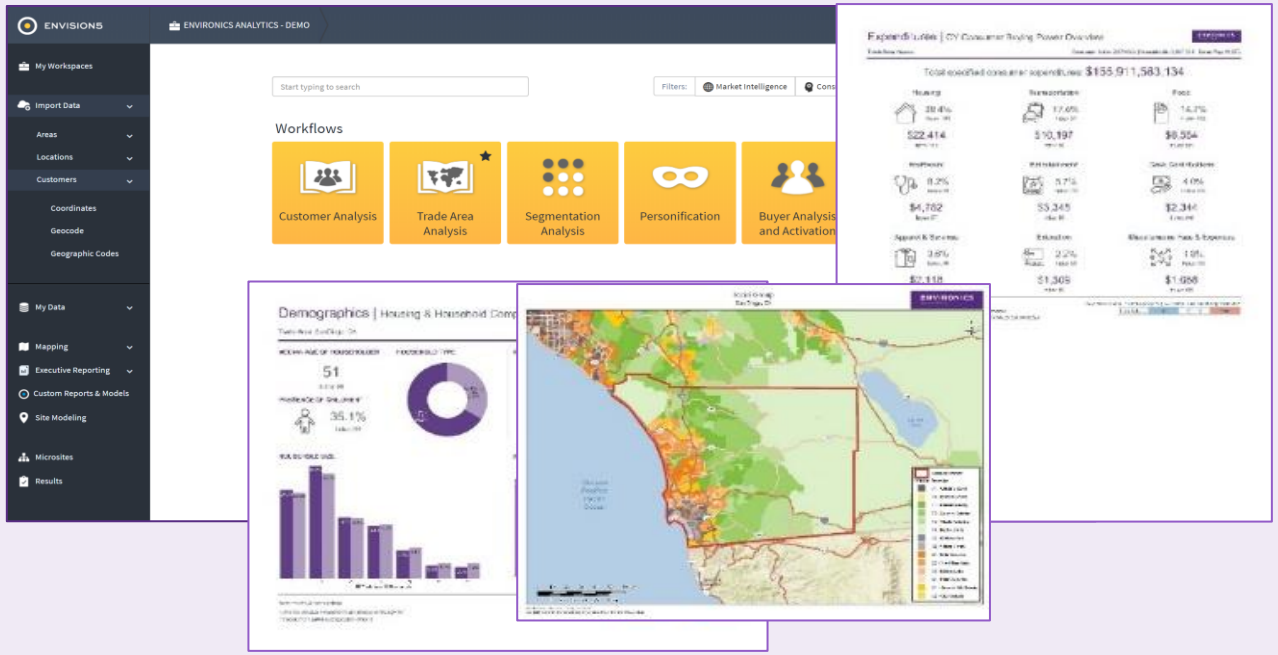
- Describe
- Understand
- Focus and target

- Using the Framework as the Denominator

Putting it together - ENVISION

- Cloud-based, secure platform with more than 30,000 variables including demographics, consumer behaviour, lifestyles and values
- Allows clients to connect first- and third-party data to derive insights
- Intuitive user interface and interactive dashboard for sharing reports and maps, ENVISION is easy-to-use
- Not for the data scientist or the GIS professional
- All analyzed within a framework formed by the Census

Our Purpose-Built Platform



Segments & Personas

Target Marketing

Cross Selling

Product Assortment

Media Planning

Message Targeting

Site Selection

Omni-Channel

ENVISION Samples

VisitorView

VisitorView British Columbia | Visitors 2020

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Trade Area: Toronto, ON (C)

Households: 1,217,308

VISITORS TO BRITISH COLUMBIA

This Yr*:39,371
Last Yr:154,899
2 Yrs Ago:153,889

TRIPS TO BRITISH COLUMBIA

This Yr*:62,695
Last Yr:308,789
2 Yrs Ago:306,536

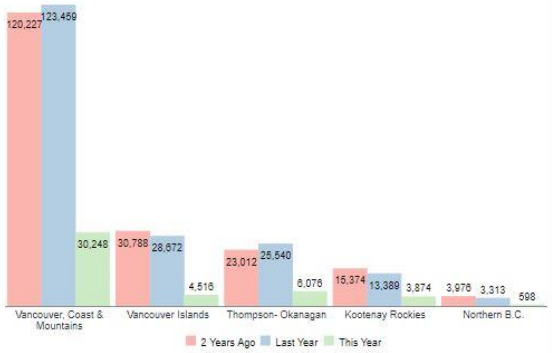
NIGHTS IN BRITISH COLUMBIA

This Yr*:232,622
Last Yr:1,109,219
2 Yrs Ago:1,075,508

NGTS/VIS. IN BRITISH COLUMBIA

This Yr*:5.9
Last Yr:7.2
2 Yrs Ago:7.0

TOP 5 MOST VISITED REGIONS IN BRITISH COLUMBIA



*"This Year" values are YTD.

PRIZM Profile | Top Segments - Most Visitors to New Brunswick CY

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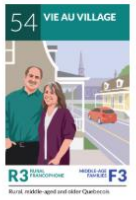
Variable: Visitors to New Brunswick Current Year (Year to date)

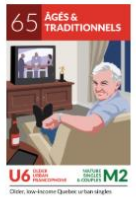
Top 10 segments represent **78.4%** of households in Quebecwith most visitors to NB

This Yr (YTD): 4,650
% of All Visitors: 15.1
Segment Rank: 1



This Yr (YTD): 4,172
% of All Visitors: 13.6
Segment Rank: 2

This Yr (YTD): 2,956
% of All Visitors: 9.6
Segment Rank: 3

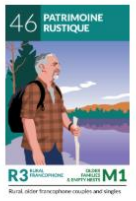


This Yr (YTD): 2,143
% of All Visitors: 7.0
Segment Rank: 4

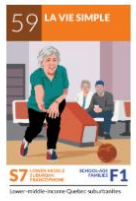
This Yr (YTD): 2,066
% of All Visitors: 6.7
Segment Rank: 5

This Yr (YTD): 1,951
% of All Visitors: 6.3
Segment Rank: 6

This Yr (YTD): 1,878
% of All Visitors: 6.1
Segment Rank: 7



This Yr (YTD): 1,720
% of All Visitors: 5.6
Segment Rank: 8



This Yr (YTD): 1,339
% of All Visitors: 4.4
Segment Rank: 9

This Yr (YTD): 1,228
% of All Visitors: 4.0
Segment Rank: 10

Benchmark: Quebec

Index of Visitors to Acadian Coastal Drive July Previous Year

New Brunswick

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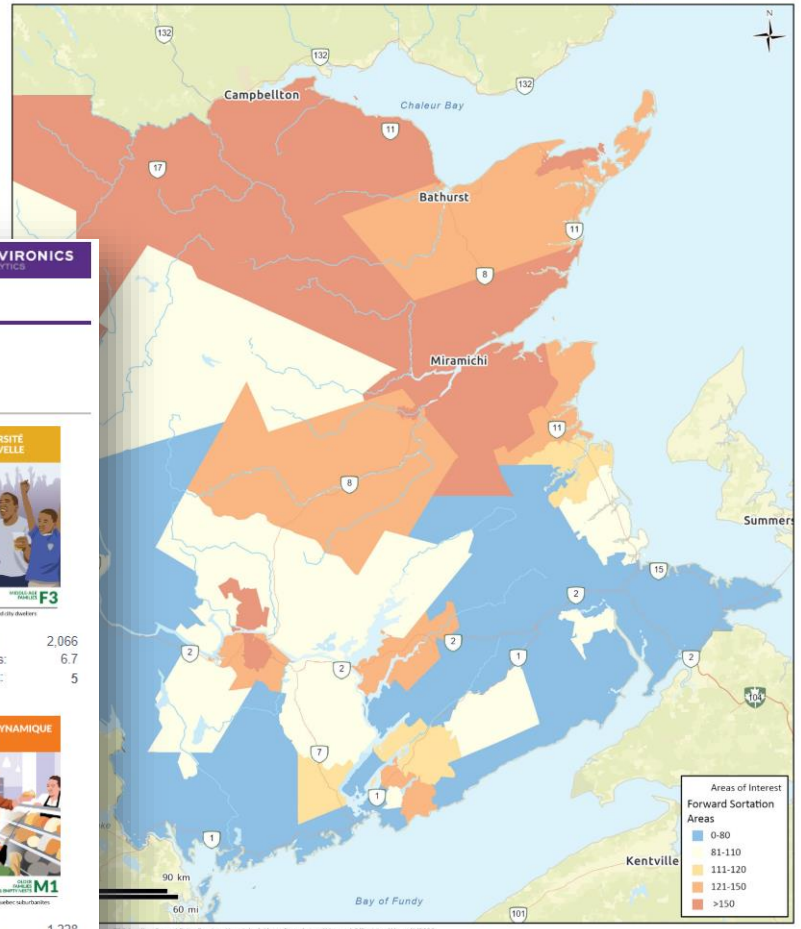

The next step:
Execution and Attribution

Applying the framework and data to AdTech

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Tailoring to Industries

We Work Across Many Industries

- Automotive
- Banking
- Consumer Goods
- Credit Unions
- Education
- Energy
- Government
- Healthcare
- Insurance
- Not-For-Profit
- Retail
- Real Estate
- Sports and Entertainment
- Travel and Leisure
- Telecommunications
- Media

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