



**RPS House Price Index (HPI)  
Product & Methodology Information**

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## Introduction

The RPS House Price Index (HPI) provides the most comprehensive national view of house price trends in Canada. The RPS HPI leverages RPS' extensive, unique residential property database comprising millions of transactions that are updated continuously from sources across Canada. RPS employs a stratified central tendency approach<sup>1</sup> that enables the delivery of robust house price trend information down to the neighbourhood level, across multiple property types including the high, median and low ends of these real estate markets. The HPI dataset delivered to clients is highly structured and includes detailed, supplemental information for efficient utility and enhanced insights.

The RPS HPI is available as:

1. A complimentary **Public Release** for download [here](#) and includes:
  - **Geographies:** 13 Census Metropolitan Areas (CMAs, metros) <sup>2</sup>
  - **Property types:** Aggregate (all property styles combined, treated as an aggregate)
  - **HPI Data:** Median index (base period January 2005) and dollar value (\$)
2. A comprehensive subscription-based **Enterprise Solution** that includes:
  - **Geographies:** National, 10 provinces, 33 metros, 1,000 cities/towns and 1,500 neighbourhoods
  - **Property types:** Aggregate, single family detached, semi-detached, row / townhouse, condominium apartment and plex house, where available
  - **HPI Data:** Market stratification as high, median and low index values and dollar values
  - **Supplemental Data:** Additional geographic identifiers (like geographic level and parent geography), confidence scores, national and regional rankings, urban / rural indicators, neighbourhood names and census population information

The Enterprise Solution can be configured to individual client requirements based on the geographic coverage.

The comprehensive RPS HPI information enables mortgage lenders, mortgage insurers and other real estate related industry organizations to:

- Gain extensive visibility into real estate markets and the related impacts to their property portfolios
- Provide improved reporting to stakeholders (executives, investors, regulators and more)
- Make smarter, more informed decisions related to risk management and identification of new business opportunities
- Perform analysis at more localized and precise geographic segmentation to distinguish differential behaviours between smaller markets and larger urban centres
- Perform analysis across property types and value segments in the same geographies to uncover trends that could impact the way they do business

The RPS HPI provides enterprises, regardless of size or national footprint, with the insights needed to evaluate markets and better manage their business.

RPS Real Property Solutions Inc. (RPS) is a Brookfield company and a leading Canadian provider of outsourced appraisal management, mortgage-related services and real estate business intelligence to financial institutions, real estate professionals and consumers. The company's expertise in real estate valuation, together with its proprietary property database and innovative technologies and services, has established RPS as the trusted source for Canadian residential real estate intelligence and analytics.

The RPS House Price Index is part of a complete suite of risk and valuation solutions, including portfolio analytics services, automated valuation models (AVMs), supplementary market reports like our homogeneity reports and house price forecasts and more.

For more information on RPS' solutions, visit [here](#).

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<sup>1</sup> A stratified central tendency approach is one of four main approaches to constructing a house price index, per the [Handbook on Residential Property Price Indices \(RPPIs\)](#), which outlines best practices and was developed in coordination by the Statistical Office of the European Union (Eurostat) under the joint responsibility of six organizations, including the International Monetary Fund (IMF).

<sup>2</sup> The boundaries used in the datasets are based on Statistics Canada and Canada Post boundaries. Census Metropolitan Areas (CMAs) are formed by one or more adjacent municipalities centred on a population centre (known as the core). Towns and cities are Census Subdivisions (CSDs) and neighbourhoods are Forward Sortation Areas (FSAs). Geographies and property styles provided as available. More [here](#).

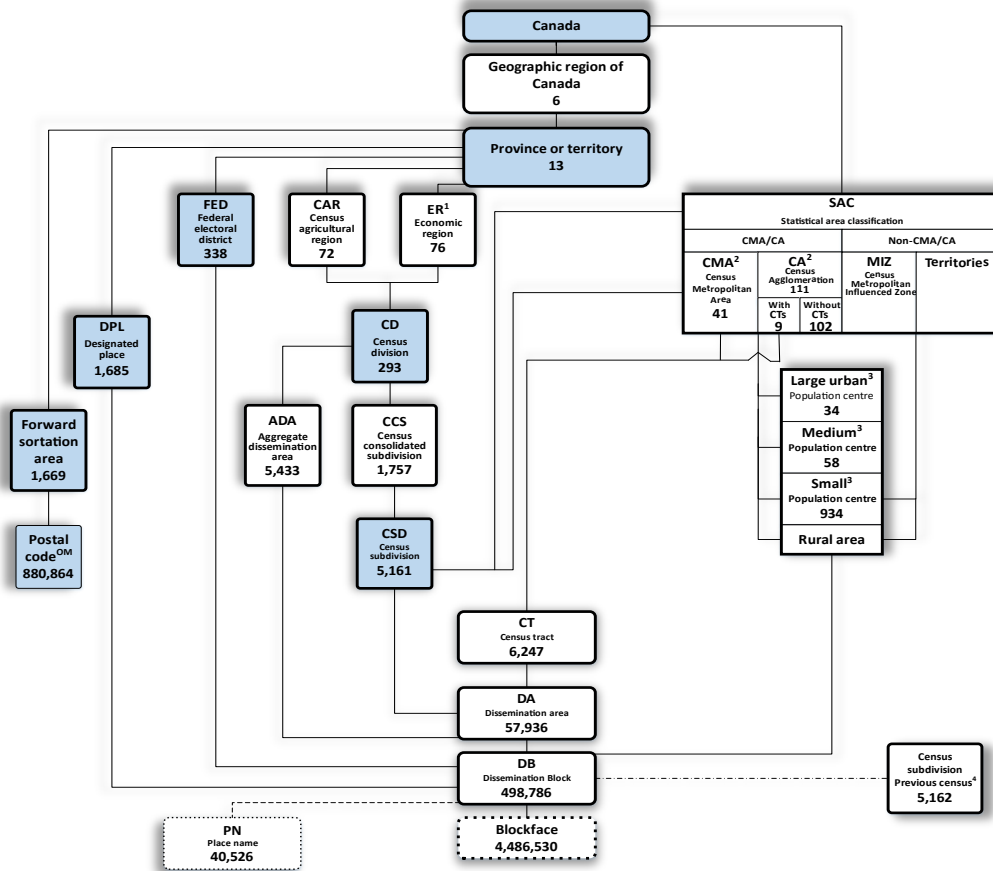
## Geographic Levels and Coverage

### Overview

The RPS HPI uses Statistics Canada and Canada Post geographic boundary standards to stratify indices into five geographic levels:

1. National
2. Provincial
3. Metropolitan (CMA)
4. City / town (CSD)
5. Neighbourhood (FSA)

This illustration shows the geographic hierarchy per Statistics Canada and is followed by a description of each geographic level contained in the RPS HPI.



1. Economic regions (ER) are composed of complete census divisions (CD) except for one CD in Ontario.  
 2. Some census metropolitan areas (CMA) and census agglomerations (CA) cross provincial boundaries.  
 3. Previous census population centres are used in the delineation of the current census CMAs and CAs; some population centres (POPCTR) cross provincial boundaries.  
 4. A best fit linkage is created between the census subdivisions (CSD) - previous census and the current census dissemination blocks (DB) to facilitate historical data retrieval.

Source: Statistics Canada, 2021 Census of Population.

## National

The RPS HPI provides two composite indices:

1. The 13 Metro Composite, which is the weighted median of 13 CMAs.
2. The National Composite, which is the weighted median of all markets across Canada, including all towns and cities. This is a robust method of assessing and measuring house prices in Canada and provides an accurate representation of house prices broadly across Canada.

## Provincial

Province and territory refer to the second tier political geographies in Canada. When used for statistical purposes they are the third highest level geographies for which data is tabulated by Statistics Canada. Canada is divided into 10 provinces and three territories. According to Statistics Canada, the occupied private dwelling counts by province, territory, and structural dwelling type as of 2021 are:

Statistics Canada 2021 Census - Occupied Private Dwellings							
	Total Dwellings		By Property Structure <sup>i</sup>				
	Number	Percent	Single Family Detached	Semi-Detached House	Row House	Apartment <sup>ii</sup>	Other <sup>iii</sup>
<b>British Columbia</b>	2,041,835	13.6%	866,340	62,885	168,585	889,165	54,855
<b>Alberta</b>	1,633,220	10.9%	994,560	98,740	127,735	365,645	46,540
<b>Saskatchewan</b>	449,580	3.0%	322,070	13,675	19,865	84,130	9,840
<b>Manitoba</b>	518,055	3.5%	343,990	18,185	19,720	125,975	10,185
<b>Ontario</b>	5,491,200	36.7%	2,942,995	303,255	505,270	1,714,480	25,205
<b>Quebec</b>	3,749,035	25.0%	1,671,925	199,085	98,625	1,739,895	39,500
<b>Newfoundland</b>	223,250	1.5%	161,410	8,695	10,770	40,670	1,705
<b>Prince Edward Island</b>	64,570	0.4%	43,855	3,640	2,680	11,625	2,770
<b>Nova Scotia</b>	428,225	2.9%	272,980	21,605	11,220	106,390	16,040
<b>New Brunswick</b>	337,650	2.3%	228,945	13,490	9,735	70,130	15,330
<b>Yukon</b>	17,180	0.1%	10,355	1,270	1,255	2,735	1,570
<b>Northwest Territories</b>	15,210	0.1%	8,600	1,070	1,630	3,180	730
<b>Nunavut</b>	9,925	0.1%	4,280	960	3,020	1,655	15
<b>Canada</b>	<b>14,978,940</b>	<b>100.0%</b>	<b>7,872,305</b>	<b>746,560</b>	<b>980,110</b>	<b>5,155,670</b>	<b>224,300</b>
			52.6%	5.0%	6.5%	34.4%	1.5%

Source: [Statistics Canada, Census 2021](#). i) Structural type refers to the structural characteristics and/or dwelling configuration, that is, whether the dwelling is a single-detached house, an apartment in a high-rise building, a row house, a mobile home, etc. ii) Apartment includes all stories, purpose-built rental and condominium / strata, as well as flats in duplex. iii) Other includes mobile homes and other single attached homes. More about each kind of dwelling per Statistics Canada [here](#).

## Metropolitan

“Metropolitan” refers to a Census Metropolitan Area (CMA). CMAs consist of one or more neighbouring municipalities, known as Census Subdivisions (CSDs, described below), situated around a core. Examples of CMAs are the Greater Vancouver Area (GVA), Greater Montreal Area (GMA) and Greater Toronto Area (GTA).

The Toronto CMA (GTA) for example, includes the municipality of Toronto (its core CSD), as well as the CSDs of Mississauga, Brampton, Markham, Richmond Hill, Oakville, Ajax, Pickering, Milton, Newmarket, Orangeville and others (see map at right). Per the 2021 Census, the Toronto CSD had 1.16 million private dwellings and a population of 2.79 million, while the Toronto CMA had 2.26 million private dwellings and a population of 6.20 million, with the adjacent municipalities / CSDs making up the difference.



## Cities and Towns

A city or town is referred to as a Census Subdivision (CSD). A CSD is a municipality as determined by provincial / territorial legislation, or an area deemed to be equivalent to a municipality for statistical reporting purposes (such as a First Nations reserve).

CSDs can be grouped by type as cities, cantons, townships, municipalities, parishes, towns or villages. Here are examples of cities and towns in a few provinces:

- **British Columbia:** Burnaby, Richmond, Coquitlam, Victoria, West Vancouver, Port Moody, West Kelowna and Oak Bay
- **Alberta:** St. Albert, Medicine Hat and Wood Buffalo (also known as Fort McMurray)
- **Ontario:** Vaughan, Richmond Hill, Caledon, Aurora and King City

There are 5,161 CSDs in Canada. Many are sparsely populated, however, and the top 1,000 CSDs by population account for 91.95% of the overall population of Canada, based on the 2021 Census.

## Neighbourhoods

A neighbourhood refers to a Forward Sortation Area (FSA). FSAs are the Canada Post delivery areas denoted by the first three characters of a postal code<sup>3</sup>. In total, there are about 1,620 FSAs in Canada. The majority of FSAs are populated (about 1,500), with only a small minority being sparsely populated (as they house mostly commercial properties within their boundaries, such as industrial parks, etc.). The RPS HPI Enterprise Solution provides coverage for the 1,500 most populous FSAs across Canada, in which >90% of the population resides.



In urban areas, FSAs tend to be drawn along major roads. As a result, they tend to encompass common neighbourhoods in a city. Within the City of Toronto, for example, there are about 100 FSAs. The green lines on this map illustrate the City of Toronto's FSAs.

FSAs are large enough that there are sufficient sales volumes to drive reliable house price trend information for the index. They are still small enough, however, that they represent areas that are homogenous, provide information about localized home

<sup>3</sup> Canadian postal codes are six-character alphanumeric code in the format A1B 2C3. As of 2019 there were 876,445 postal codes in use.

value changes and enable meaningful, precise and in-depth analyses at the sub-city level. Neighbourhoods do not always follow higher-level trends. Thus, house price information that reflects the realities of distinct local markets is critical, allowing local markets to be analyzed independently.

In rural areas where FSA areas are larger, the city-level index is a more fitting tool for analyses. RPS denotes these areas within our index (see the previous section, Cities and Towns).

The major advantage to using FSAs as the lowest disseminate unit is that any data record with a postal code can be easily attributed to its respective FSA (i.e. the first three digits of the postal code are the FSA). This eliminates the need for specialized geo-coders or lookup tables to determine the geography that would best represent a data point.

## Property Types

### Overview

RPS categorizes house price trends into six residential property types: Condominium Apartment, Single Family Detached, Semi-Detached, Row / Townhouse, Plex and Aggregate. Some property types are typically found only in certain markets, such as Semi-Detached properties are usually found in larger cities and Plex properties in Quebec; data is only provided where these property types are located. If a property is multi-purpose, it is not included in the index.

### Category Descriptions

The following are descriptions of each category type:



Condominium Apartments are buildings in which units of property are owned by individuals. Common parts of the property, know as common elements, such as the grounds and amenities) are owned jointly by all unit owners.



Single Family Detached are houses that are not attached to another house. They may be one level or multi-level. Property types that fit into this category include those labelled bungalow, back split, bi-level, two-storey split, three-level split, hillside bungalow and hillside split.



Semi-Detached consists of pairs of houses built side by side, as units sharing a party wall, and usually in such a way that each house's layout is a mirror image of its next-door neighbour.



Row / Townhouse consists of houses built side by side as units sharing one or more common walls, usually in such a way that each house's layout is very similar. In some cases, they can be stacked up to five storeys. Tenure of these properties can be either condo or freehold.



Plex consists of buildings with apartments that have separate entrances for multiple households, and includes properties labelled duplex, triplex and maisonette. It is a property type found mainly in Quebec.



Aggregate is a combination of the property types listed above, including condominium apartment, single family detached, semi-detached, row / townhouse and plex.



## Methodology and Data

### Model Methodology

The RPS HPI uses a Bayesian-filtered stratified central tendency approach to derive property price trends over time. This framework is closely related to Autoregressive Integrated Moving Average (ARIMA) models, as well as other structured time series models. RPS uses Bayesian filtering models as they tend to be more robust, given their ability to handle non-normal distributions and leverage all prior information to identify trends and remove noise.

A stratified central tendency addresses the issues surrounding sampling bias in the creation of property price indices by stratifying the national market into a larger number of small geographic and property type-based strata or building blocks. The properties within these strata tend to be relatively homogeneous in form and, therefore, limit the variance in the sample set over time. Median sales prices from monthly transactions within each strata form the basis of the index.

Bayesian filtering, which has its roots in time series analysis, allows for the removal of noise from the median time series. By having a good estimate of the current state and the dynamics of a system, it is possible to derive assumptions about their evolution. Bayesian theory is a branch of mathematical probability theory that uses prior knowledge and observational evidence to allow for the modelling of trends based on data that may exhibit uncertainty and volatility. The objective of Bayesian inference is to use prior information and new measurements to determine volatility and infer current estimates.

Forming an observation using prior information and knowledge of how a system works allows for noise to be filtered from the trend. Bayesian filtering is being used to analyze stock prices and trends from temperature sensors, as well as other high volume and high velocity datasets. Consequently, filter models can be used in any instance where there is the need to obtain the best estimate of the unknown state, considering the set of available observations at a given point in time.

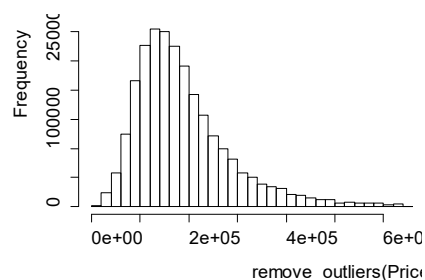
### Data and Eligibility Criteria

Only valid and representative residential sale transactions are included in the RPS HPI model processing. Transaction data goes through five rigorous stages of record filtering and cleaning:

1. Data standardization, geo-coding and cleansing
2. Outlier detection
3. Stratification and median value aggregations
4. Bayesian filtering, and
5. Weighting and aggregation

All data (residential sales, property characteristics, geo-spatial, property addresses) used in the RPS HPI go through a series of validations. These validations ensure standardized formatting, removal of duplicate records, and testing to ensure records meet minimum informational requirements. Property addresses are geocoded to street-level accuracy in order to assign respective geographies.

In all major Canadian markets the mix of property types, dwelling styles, sizes, and conditions fluctuates. Consequently, RPS employs proprietary machine learning<sup>4</sup> techniques that use metrics such as price per square foot, square foot index per property type, and price per local geographic average, to filter out properties that are deemed outliers in their local market. Any record that is not within the minimum and maximum thresholds of 0.5% and 95.5% of the local normal distribution of these metrics is removed.



With outliers removed from the data, RPS stratifies the data by neighbourhood geography and property type, for each month being reported. A median value is then derived for each stratum, such that for each month, style

<sup>4</sup> Machine learning is an application of artificial intelligence (AI) that enables systems to learn and improve from experience without being explicitly programmed. Machine learning focuses on computer programs that can access data and use it to learn for themselves.



and geography, aggregations are made using one, two, three, four, five and six months of historical data, depending on the activity within the strata. This adaptive moving window aggregation is used in order to ensure that a statistically valid sample for each stratum is being used in the median calculation.

### **Weighting and Aggregation**

Once the Bayesian filtered time series trend is calculated for each cell in the stratified set, it is stock weighted and aggregated to create an overall trend for the neighbourhood geography. It is then weighted and aggregated up to produce trends at the city, metropolitan, provincial and national levels. Housing stock weights are based on the historical transactions and most recent Statistics Canada Census data available.

### **Base Period and Periodicity**

The base period for the RPS House Price Index is January 2005. It is updated and released monthly on or about the 15<sup>th</sup> of the month.

### **Testing and Maintenance**

To ensure model robustness, RPS continually runs a blind back test on its files to gauge the accuracy of the index values. The company uses an original point of value (v1), applies the RPS House Price Index to calculate a current value (v2), then compares this calculated value against the actual price at which the property sold. Results have shown reliable commercial-grade accuracy that is in line with other automated valuation methodologies. Additionally, the RPS House Price Index model is continually reviewed and maintained in order to ensure the product is of the highest quality.

## Available Datasets – Complimentary Public Release

### Overview

This is a complimentary dataset that RPS makes available to the public.

### Geographic Coverage

The RPS HPI Public Release provides house price trends for the following 13 CMAs / metros:

- |              |              |                 |             |
|--------------|--------------|-----------------|-------------|
| 1. Victoria  | 5. Saskatoon | 9. Hamilton     | 13. Halifax |
| 2. Vancouver | 6. Regina    | 10. Ottawa      |             |
| 3. Edmonton  | 7. Winnipeg  | 11. Montreal    |             |
| 4. Calgary   | 8. Toronto   | 12. Quebec City |             |

Additionally, RPS includes two composites, the 13 Metro and National Composites.

### Property Types Included

These house price trends are for aggregated properties, meaning all property styles combined, treated as an aggregate.

### Download the Dataset

The Public Release is published on a monthly basis on or about the 15<sup>th</sup> of the month. Please visit the RPS website at [www.rpsrealsolutions.com/House-Price-Index](http://www.rpsrealsolutions.com/House-Price-Index) to review in either table or chart form, or to download in Excel file format. The public also has the option to subscribe to the RPS monthly email release on the RPS website.



## Available Datasets – Enterprise Solution

### Overview

The RPS HPI Enterprise Solution is a comprehensive, subscription-based service available to enterprise users. The extensive house price trend information provided in the Enterprise Solution enables mortgage lenders, mortgage insurers, and other industry participants extended visibility into the Canadian housing markets, processes to effectively mark-to-market portfolios, better reporting to stakeholders (such as senior executives, regulators, investors) and more informed decision-making.

By leveraging the local market insights in the RPS HPI Enterprise Solution subscribers can detect emerging risks, uncover imbalances in portfolios and discover opportunities for growth.

The Enterprise Solution delivers house price information that is:

Broad	In Depth	Detailed
HPI trends across all Canadian markets	HPI trends for thousands of discreet local markets and property types	Supplemental information and consulting support to help subscribers fully leverage the HPI and make better, more informed decisions

### Geographic Coverage

The Enterprise Solution provides house price information for over 2,500 geographies, including:

- 2 National (the RPS 13 Metro and National Composites)
- 10 Provincial
- 33 Metropolitan areas (CMAs)
- 1,000 Cities and towns (CSDs)
- 1,500 Neighbourhoods (FSAs)



The following are the cities / towns provided by province:

Cities and Towns											
Province	BC	AB	SK	MB	ON	QC	NB	NS	NL	PE	Total
Cities, towns	164	121	24	32	289	293	21	27	19	9	999

### Property Type Categories



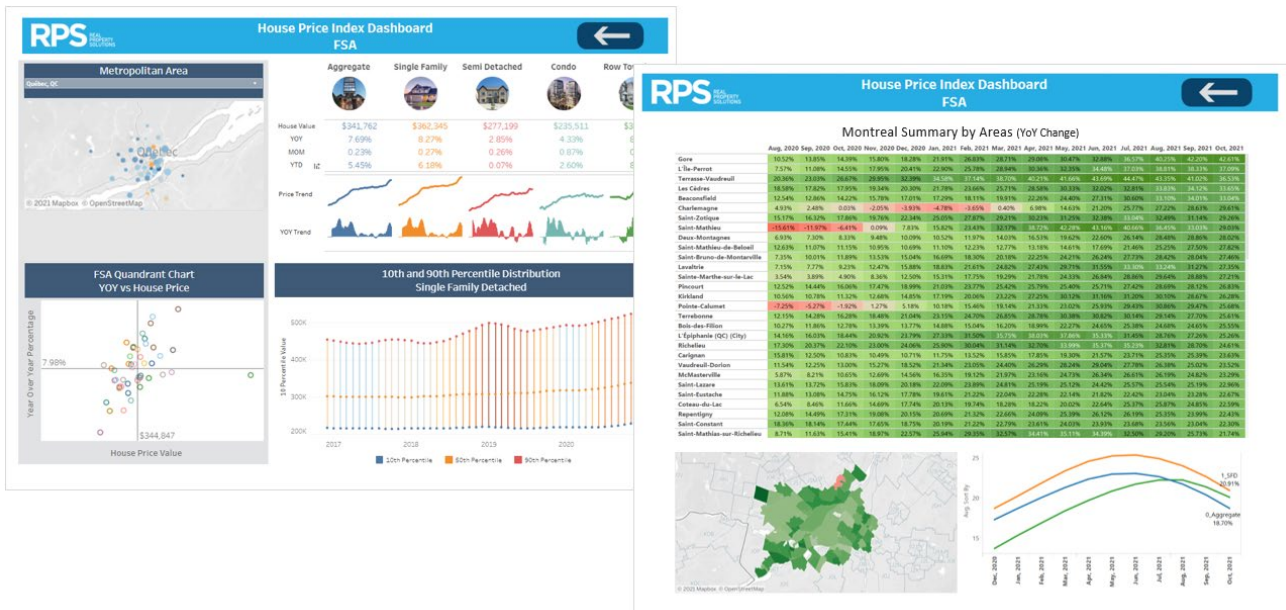
The additional stratification of the HPI data by property type enables subscribers to better understand even more nuances in and across local markets, and to fine-tune analysis to better determine strategy.

**Added Information**

Subscribers are provided with supplementary information needed to enable and enhance analyses, risk management decisions and portfolio valuation.

In addition to index values and median house price dollar values, Enterprise Solution subscribers receive:

1. Lower and upper house price values
2. Year-over-year percentage pre-calculations
3. Confidence scores
4. Performance indicators based on a proprietary ranking system <sup>5</sup>
5. Geographical hierarchies including provincial identifiers and parent geographies
6. Urban / rural indicators <sup>6</sup>
7. Neighbourhood names <sup>7</sup>
8. Population information



**Delivery**

Delivery is provided via a CSV file through secure SFTP.

<sup>5</sup> RPS proprietary ranking system for each geographic location enables users to easily see how each geographic location has performed in terms of price increases over time, relative to related geographic areas.

<sup>6</sup> Urban / rural indicators can help assess property liquidity risk. This assists Federally Regulated Financial Institutions (FRFIs) to meet regulatory requirements, such as the Office of the Superintendent of Financial Institutions' (OSFI) B20 guideline "Residential Mortgage Underwriting Practices and Procedures". FRFIs must identify and manage "non-conforming" mortgages in portfolios differently, as outlined in the guideline. Non-conforming mortgages include those where the attributes of the underlying property used as collateral cause the loan to carry elevated credit risk (e.g. illiquid properties).

<sup>7</sup> The addition of neighbourhood labels facilitate research and analyses by correlating postal FSA identifiers to locally referred to geographies - for example, M5S is locally known as "Davisville Village" in Toronto, and V6K as "Kitsilano" in Vancouver.

**File Format**

<b>Geographic</b>	<b>RowID</b>	Unique ID for each record
	<b>HPI_Level</b>	Geographic level identifier (National, Province, Metropolitan Market, City, FSA)
	<b>HPI_GeoID</b>	Unique ID of the geography being reported on
	<b>HPI_GeoName</b>	Neighbourhood / City name of the geography relative to the Parent_GeoName based on FSA
	<b>Parent_GeoName</b>	Parent geography of the HPI_GeoName, typically the CSD name
	<b>Parent_GeoID</b>	Parent geography ID, typically the CSD number
	<b>Province</b>	Province name
	<b>ProvinceID</b>	Census province ID number
	<b>Geo_Type</b>	Geographic type identifier (urban, rural, provincial, national)
<b>Property</b>	<b>Type</b>	Property type identifier, (0_Aggregate, 1_SFD, 2_SD, 3_CondoApt, 4_Row)
<b>HPI Data</b>	<b>Date</b>	Year and month of HPI Data as YYYYMM
	<b>HPI_Value</b>	Market value of a neighbourhood’s median property
	<b>HPI_Index</b>	Index value of property value relative to January 2005
	<b>HPI_Value_Low</b>	Lower estimated value of median property value based on 80% confidence
	<b>HPI_Value_High</b>	Upper estimated value of median property value based on 80% confidence
	<b>ConfScore</b>	Confidence score for the last 60 months (1 = high confidence, 0 = low confidence)
<b>Performance Metrics</b>	<b>Year_over_YearPctChange</b>	Year-over-year percentage change
	<b>National_Rank_1YR</b>	Proprietary ranking identifying the percentile of price appreciation related to national price appreciation
	<b>Regional_Rank_1YR</b>	Proprietary ranking identifying the percentile of price appreciation related to parent geography price appreciation
	<b>POP2011</b>	The 2011 population count
	<b>POP2016</b>	The 2016 population count
	<b>POPPctChange_2011_2016</b>	The 2011 - 2016 population change as a percent

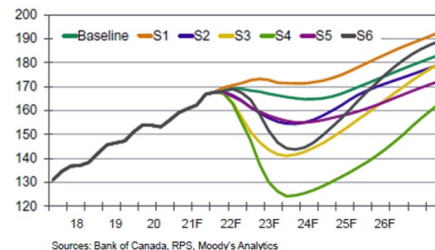
RPS HPI Enterprise Solution subscribers also receive consulting support from our analytics team to assist with maximizing the utility of the HPI data for their organization.

## Supplementary Dataset - House Price Forecasts

### Overview

While the RPS House Price Index Enterprise Solution provides enhanced market visibility of historical and current house prices and trends, the RPS – Moody's Analytics House Price Forecasts are a great complementary dataset that provides enterprises with a comprehensive forward-looking view of house prices.

The Forecasts are based on fully specified regional econometric models that account for both housing supply-demand dynamics and long-term influences on house prices, such as unemployment and changes in mortgage rates. This enables enterprises to more accurately conduct 'what if' analyses and stress-test the impact of shocks and differing assumptions on their portfolios, and better assess the risks and opportunities facing their businesses and investments.



### Coverage

- **Geographies:** Nation, 10 provinces, 33 metros, 1,000 cities / towns and 1,500 neighbourhoods
- **Property types:** Aggregate, single family detached and condominium apartments
- **Time horizon:** A 10-year forward-looking time horizon
- **Scenarios:** A baseline and six alternative scenarios
- **Updates:** Forecasts and alternative scenarios are updated monthly to reflect the latest data, conditions and expectations
- **Added features:** Comprehensive forecasts link house prices and activity with a wide range of economic variables

Moody's Analytics is recognized for its industry-leading solutions comprising of research, data and professional services. Thousands of organizations worldwide have made the company their trusted partner because of its commitment to quality, client service and integrity.

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO), which reported revenue of \$6.2 billion in 2021, employs more than 13,000 people worldwide and maintains a presence in more than 40 countries. For more information, please visit [www.moodyanalytics.com](http://www.moodyanalytics.com).

## About RPS and Our Solutions

### The RPS Advantage

RPS is a leading provider of real estate insights due to its:

- Proprietary, national property database – a single source of national residential real estate data, including information on over 10 million residential properties collated from over 50 unique data sources and counting. The RPS suite of solutions powered by this data delivers extensive insights at all geographic levels across Canada.
- Home valuation experts comprising both on-staff appraisers and over 96% of residential fee-based appraisers in Canada provide national coverage. Adding to that vast experience are the RPS team of data scientists and analysts who have an extensive understanding of housing markets and the data that influences it.
- Innovative property and market modeling solutions leveraging industry-leading technologies, advanced machine learning (ML) techniques, visualization software and geographic information systems (GIS) best practices.
- Client collaboration is fundamental to RPS as our objective is to always ensure wins for our clients and continuously support their success.



## Industry-Leading Solutions

RPS' advantages enable the development and delivery of unique real estate solutions to meet our clients' needs. Over the last twenty years, RPS has developed market-first, sector-leading solutions including:

- RPS House Price Index (HPI) – Developed through extensive collaboration with industry experts, it is the most comprehensive, highly structured and detailed enterprise-grade HPI solution available.
- RPS Automated Valuation Model (AVM) – RPS was the first in Canada to leverage ML technologies in its AVM, producing one of the most accurate AVM models in Canada.
- RPS AVM Cascade - RPS is the only provider in Canada that is integrated with all commercial-grade third-party AVMs available in the market, including five external property value providers as well as the RPS proprietary AVM valuation models that are our ML, Index and Local Market Average (LMA) models. In addition to market value AVMs, RPS' AVM Cascade includes alternative AVM models like Retrospective AVMs, Market Rent AVMs and Agricultural AVMs. The RPS AVM Cascade provides the broadest coverage, highest accuracy and most efficient AVM solution available in the Canadian marketplace.
- RPS Property Risk Score® – The only purpose-built solution in the market that quantifies a property's risk into a single score for easy operationalization in the selection of the optimal valuation product type.
- RPS Homogeneity Score Dataset - Measures the variability and diversity of housing stock in a neighbourhood, to better understand how distinct a property is relative to its local market.
- RPS Liquidity Score Dataset - Shows whether a real estate housing market is a buyer's, seller's or balanced market, quantifying the relationship between supply and demand.
- RPS Local Market Average Dataset (LMA) - Provides the average feature information by property type at the micro-neighbourhood level (Dissemination Area/ DA), such as average lot size, living space, number of bedrooms and bathrooms and more.
- RPS-Moody's Analytics House Price Forecasts (Forecasts) – Developed in partnership with Moody's Analytics, the Forecasts provide the most comprehensive and only commercially available macro-economic house price forecast solution. The solution enables the modelling of multiple scenarios (baseline / alternative) at varying levels of geography, from national to neighbourhood, across multi-decade time horizons. More information in the next section.

## About RPS

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