

ZIPList Canada Geocode User's Guide

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OVERVIEW

ZIPList Canada Geocode lists the more than 850,000 Postal Codes to which the Canada Post Corporation (CPC) delivers mail. The database contains the city name, province (state) abbreviation, telephone area code, time zone, daylight saving time flag, and latitude/longitude for each of the active Postal Codes defined by CPC. We license the Postal Code data directly from CPC.

The 6-character Postal Codes used by Canada Post Corporation are the equivalent of the 9-digit ZIP+4 codes used by the US Postal Service. That is the reason there are so many records in this file. Note, however, that this database DOES NOT contain street address information, street names, nor the names of individuals or businesses.

The database is formatted as a comma delimited ASCII text file, making it easy to import the file into most database programs. The file is also available in several native database formats, including MS Access, Corel Paradox, and dBase/Visual FoxPro.

The database is available with either French or English city name spellings.

Because this database is available as a simple text file, it can be used on almost every type of computer, including PCs, Macs, Linux/Unix, and mainframes.

END-USER LICENSE

Please read the accompanying license document, ZCGLIC.TXT, which defines your rights and restrictions for using ZIPList Canada Geocode. Your license level is indicated on the invoice for ZIPList Canada Geocode issued to you by CD Light, LLC.

Please be aware of the following restrictions on the use of this data imposed on all licensees by Canada Post:

1. Postal Code[®] is an official mark of Canada Post Corporation.
2. No public access through the Internet to Canada Post Data Files or to Postal Code look-up or addressing tools is permitted.
3. Use of this data after the end-date shown in the release notes file for this version of the database, for the purpose of addressing mail to be delivered by Canada Post, is expressly prohibited. See support file ReleaseNotes.txt for details.

INSTALLATION

ZIPList Canada Geocode is available on CDROM or can be downloaded from our secure database server. The data content is the same in either case. You should select the proper installation notes below depending upon the the distribution medium you have chosen.

ZIPList Canada Geocode is available with city names spelled in either the French spelling (standard) or the English spelling. The French spelling uses the ISO-8859-1 character set for accented characters, such as the 'é' in Montréal. The English spelling uses the US-ASCII (ISO 646) character set, with the French accented characters converted to their US-ASCII equivalent, as in Montreal.

INSTALLATION from CDROM

ZIPList Canada Geocode is available on the CDROM in a variety of different formats. Each file contains the exact same data, but the data has been formatted for a specific desktop database program. This means that all you need to do is select the proper format for your database program and simply copy the file containing that format from the CDROM to the proper folder on your computer. The files on the CDROM are not compressed.

To install this database from a CDROM, follow these steps:

1. Identify the file which has the data in the format you wish to use. The following table identifies the various formats available on the CDROM for this database:

File Name	Format
zcg.txt	French version in Comma-delimited ASCII (also known as CSV)
zcgA2K.mdb	MS Access 2000
zcgA03.mdb	MS Access 2003
zcgA07.accdb	MS Access 2007
zcgX07.xlsx	MS Excel 2007
zcg.dbf	dBase/Visual FoxPro
zcg.db	Paradox
zcggoem.txt	English version in Comma-delimited ASCII (CSV)

2. Using Windows Explorer, copy the file in the format of your choice from the CDROM to the desired folder on your computer.
3. Open the file using the database program of your choice.

INSTALLATION AFTER DOWNLOADING OVER THE INTERNET

ZIPList Canada Geocode is available to download from our secure database server in a variety of different formats. Each file contains the exact same data, but the data has been formatted for a specific desktop database program.

You should download the proper format for your database program. You can download more than one format, if you wish, and you can download the data as often as you need to. There is no charge for downloading the data more than once.

Most files on our database server have been compressed for faster downloading. These files must be decompressed before you can use them with your database program. To make the decompression easier, most of the files have been made "self-extracting", which means that you do not need to use a specific program to decompress the files - they decompress themselves!

To install ZIPList Canada Geocode after downloading, follow these steps:

1. Download the format of your choice from the secure database server. Be sure to save the file to your hard drive, and note the name of the file and the folder where it has been saved.
2. If the file name ends in ".exe", such as zcg.exe, the file is a "self-extracting" compressed file. To decompress the file you must "run" the file as a program so that it can decompress itself. Just double-click on the file name using Windows Explorer. The file will extract itself from the compressed form to its original format and name. Hint: Windows Explorer may not show the file extensions, depending upon settings in the View | Options menu.
3. The actual database file name depends upon the format of the data:

File Name	Format
zcg.txt	French version in Comma-delimited ASCII (also known as CSV)
zcgA2K.mdb	MS Access 2000
zcgA03.mdb	MS Access 2003
zcgA07.accdb	MS Access 2007
zcgX07.xlsx	MS Excel 2007
zcg.dbf	dBase/FoxPro
zcg.db	Paradox
zcggeom.txt	English version in Comma-delimited ASCII (CSV)

4. Open the file using the database program of your choice.

SUPPORT FILES

ZIPList Canada Geocode contains several additional support files which you may find useful. These files can be found on the CDROM or in the folder where the compressed archive was decompressed. Here are the files you should find:

FILE	CONTENT
ac.txt	List of area codes for North America, including overlays
zcgdoc.pdf	ZIPList Canada Geocode documentation file (this file)
zcglic.txt	ZIPList Canada Geocode license file
ReleaseNotes.txt	Lists recent changes and usage dates

SEARCHING ZCG.TXT USING A TEXT EDITOR

Many text editors can work directly with ZCG.TXT. Just open the file and use the normal search commands to find a particular city, county, area code, or Postal Code. However, some text editors cannot process a file as large as ZIPList Canada Geocode.

IMPORTING INTO A DATABASE PROGRAM

You may wish to import the ZCG.TXT data file into a database program where you will be able to search the data more efficiently and sort the data into an order which better suites your needs. ZCG.TXT can be used with almost any commercial database program, such as Microsoft ACCESS, Paradox, dBase, Visual FoxPro, or a spreadsheet program such as Excel, etc.

To import ZIPList Canada into a database program:

1. Start your database program in the usual way.
2. Select "IMPORT" from one of the menus.
3. Select the file to import: ZCG.TXT
4. If necessary, specify the import data format. Any of the following terms may be used to describe the text format of the ZCG.TXT file:

- delimited text
- delimited ASCII
- comma delimited ASCII
- ASCII (DOS) text

After importing the data, save the converted data in the native format of the database program. You should be able to sort and search the data using the normal sort and search functions of your database program.

You may wish to build an index for the database. Using an index may shorten searches of the data by your database program. Note, however, that some database programs cannot create an index for a data field which is not unique. The data fields of ZCG.TXT are not unique. A given Postal Code can appear in more than one record of the file.

Postal Codes ARE NOT UNIQUE

The ZIPList Canada Geocode Postal Code field is not unique (duplicates exist within the database). This happens when a Postal Code crosses city boundaries. Although this is rare, it does occur.

SORTED ORDER

ZIPList Canada Geocode data records are sorted in ascending order by Postal Code. If you prefer to order the data by some other order, we suggest that you import the data into your own database program where you can sort the data into the order you prefer.

RECORD LAYOUT

The data records of the ZIPList Canada Geocode file consist of nine data fields, arranged as follows:

FIELD	TYPE	LENGTH
City Name	Variable length ASCII	30 maximum
Province Code	Fixed length ASCII	2
Postal Code	Fixed length ASCII	7 alphanumeric characters (ANA NAN)
Preferred?	Fixed length ASCII	1 ("P", or "A")
Area code	Fixed length ASCII	3 numeric characters
Time zone	Variable length ASCII	5 maximum (see below)
DST?	Fixed length ASCII	1 character: "Y" or "N"
Latitude	Fixed length ASCII	7 chars: nn.nnnn
Longitude	Variable length ASCII	8 or 9 chars: nnn.nnnn

DATA FIELD DESCRIPTIONS

City Name

The City Name field identifies a city name associated with the Postal Code by the CPC. There may be several different city names associated with a particular Postal Code. If so, the Postal Code may appear in several different records, each with a different city name. Note that city names are available with either French or English spellings.

Province code

The Province code is the two-character abbreviation defined by Canada Post Corporation for the thirteen Canadian provinces:

AB	Alberta
BC	British Columbia
MB	Manitoba
NB	New Brunswick
NL	New Foundland and Labrador
NT	Northwest Territories
NS	Nova Scotia
NU	Nunavut
ON	Ontario
PE	Prince Edward Island
QC	Quebec
SK	Saskatchewan
YT	Yukon Territory

Postal Code

The Postal Code field lists only valid 6-character (plus an embedded space) Postal Codes currently defined by the CPC. Obsolete Postal Codes which have been "retired" from service by the CPC are not included in this database.

A particular Postal Code may appear in more than one record if the CPC has defined more than one city name for that Postal Code. If you wish to eliminate the "duplicate" Postal Code records, you can use the Preferred? field (described below) to isolate those records which contain the "primary" city name for every Postal Code.

Preferred?

The Preferred? flag can have one of two values, which indicate how that name can be used for delivery of mail to the associated Postal Code. The two values are:

- P This is the preferred city name for this Postal Code
- A This city name is approved (but NOT preferred) for this Postal Code

Most Postal Codes exist entirely within the boundaries of a single city. If the Postal Code crosses city boundaries (as some do), the Preferred? flag can be used to determine which of the various city names is the best to use with that one Postal Code. In such "multi-city" cases only a single record has the Preferred? flag set to "P". All other records for that same Postal Code have the Preferred? flag set to "A", meaning "approved".

Area code

The Area code field identifies the telephone area code which applies to that one Postal Code.

When a new area code is announced by the telephone companies, we update this database only ON or AFTER the effective date when dialing with the new area code is permissible. That way you are assured that all area codes in the database are valid and active on the date the database was created.

Time zone

The Time zone field always contains the standard time zone designation for a particular Postal Code. The following codes may be found in the time zone field:

Zone Code	GMT Offset	Geographic Area
NST	GMT-3.5	Newfoundland Standard Time (offset by 1/2 hour)
EST+1	GMT-4	Atlantic standard time
EST	GMT-5	Eastern standard time
CST	GMT-6	Central standard time
MST	GMT-7	Mountain standard time
PST	GMT-8	Pacific standard time

DST?

If the Postal Code falls within a political entity which participates in Daylight Saving Time (DST) during the summer months, the DST? field is set to "Y". Otherwise the DST? field is set to "N".

Latitude and Longitude

The latitude and longitude fields contain the geographic coordinates of the Postal Code in degrees.

For larger Canadian cities, we resolve the latitude and longitude based on the first three characters of the Postal Code (known as the "Forward Sortation Area", or FSA), which corresponds to the 5-digit ZIP code level in the US. The larger Canadian cities often have more than 50 FSAs. This keeps the cost of the product within reason, yet provides a level of resolution perfect for dealer locator or store locator applications.

For rural areas, in most cases, the database contains the latitude and longitude of the center of the city or town. For villages and very small towns in close proximity the database contains the latitude and longitude of the general geographic area. In general, the latitude and longitude values relate to the geographic centroid of the area, not the population centroid.

The latitude/longitude resolution of ZIPList Canada Geocode is equivalent to that of our sister product ZIPList5 Geocode. The two products can readily be combined, since they provide equivalent levels of resolution.

The ZIPList Canada Geocode latitude and longitude values are based on the "North American Datum 1983" (NAD-83). Please note that this is a different geodetic "datum" from that used by GPS. GPS works in "World Geodetic System 1984". However, most GPS units can be programmed to display latitude and longitude in NAD-83 coordinates.

CALCULATING DISTANCE

In this database, the location of a Postal Code is defined in terms of degrees of north latitude and degrees of west longitude. Because of the spherical shape of the Earth, calculating the exact distance between two Postal Codes requires the use of spherical geometry and trigonometric math functions.

However, you can calculate an approximate distance using much simpler math functions. For many applications the approximate distance calculation provides sufficient accuracy with much less complexity.

The following approximate distance calculations are relatively simple, but can produce distance errors of 10 percent or more. These approximate calculations are performed using latitude and longitude values in degrees, as defined in this database. The first approximation requires only simple math functions:

$$\text{Approximate distance in miles} = \sqrt{x * x + y * y}$$

where

$$x = 69.1 * (\text{lat2} - \text{lat1})$$

and

$$y = 53 * (\text{lon2} - \text{lon1})$$

You can improve the accuracy of this approximate distance calculation by adding the cosine math function:

$$\text{Approximate distance in miles} = \sqrt{x * x + y * y}$$

where

$$x = 69.1 * (\text{lat2} - \text{lat1})$$

and

$$y = 69.1 * (\text{lon2} - \text{lon1}) * \cos(\text{lat1}/57.3)$$

If you need greater accuracy, you must use the exact distance calculation. The exact distance calculation requires use of spherical geometry, since the Earth is a sphere. The exact distance calculation also requires a high level of floating point mathematical accuracy - about 15 digits of accuracy (sometimes called "double-precision"). Many computer languages do not provide sufficient accuracy for this calculation. In addition, the trig math functions used in the exact calculation require conversion of the latitude and longitude values from degrees to radians. To convert latitude or longitude from degrees to radians, divide the latitude and longitude values in this database by 180/pi, or 57.2958. The radius of the Earth is assumed to be 6,371 kilometers, or 3,958.75 miles.

If you convert all latitude and longitude values in the database to radians before the calculation, use this equation:

$$\text{Exact distance in miles} = 3958.75 * \arccos[\sin(\text{lat1}) * \sin(\text{lat2}) + \cos(\text{lat1}) * \cos(\text{lat2}) * \cos(\text{lon2} - \text{lon1})]$$

If you do NOT first convert the latitude and longitude values in the database to radians, you must include the degrees-to-radians conversion in the calculation. Substituting degrees for radians, the calculation becomes:

$$\text{Exact distance in miles} = 3958.75 * \arccos[\sin(\text{lat1}/57.2958) * \sin(\text{lat2}/57.2958) + \cos(\text{lat1}/57.2958) * \cos(\text{lat2}/57.2958) * \cos(\text{lon2}/57.2958 - \text{lon1}/57.2958)]$$

If the computer language you are using has no arccosine function, you can calculate the same result using the arctangent function, which most computer languages do support. Use the following equation:

$$\text{Exact distance in miles} = 3958.75 * \arctan[\sqrt{1-x^2}/x]$$

$$\text{where } x = [\sin(\text{lat1}/57.2958) * \sin(\text{lat2}/57.2958)] + [\cos(\text{lat1}/57.2958) * \cos(\text{lat2}/57.2958) * \cos(\text{lon2}/57.2958 - \text{lon1}/57.2958)]$$

Using the latitude and longitude values provided by this database, you should be able to obtain distance accuracy of approximately +/- 36 feet.

If your distance calculations produce wildly incorrect results, check for these possible problems:

1. Did you convert the latitude and longitude values from degrees to radians? Trigonometric math functions such as sine and cosine normally require conversion of degrees to radians, as described above.
2. Are the equations implemented correctly with necessary parentheses? Remember the math precedence rule: MDAS - multiply, divide, add, subtract.
3. Does your computer language provide sufficient mathematical accuracy? Many languages simply do not provide the required floating point precision. For best results, you need about 15 digits of accuracy. Older versions of Basic, for example, often provide much less accuracy than required for the exact distance calculation.

4. Did you retain decimal points in the latitude and longitude values? When you imported the data into your database program, you may have lost the decimal point during the importation of latitude and longitude values.

ERRORS and OMISSIONS

We created ZIPList Canada Geocode with care and considerable effort. The data is as accurate as we can reasonably make it. We recognize, of course, that errors are bound to exist, and that, over time, the data will become "out-of-date".

If you find errors, we would like to hear from you. Please send corrections to us via any of these methods:

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