Catalogue No. 92F0157GIE

Road Network Files
2001 Census

Reference Guide

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Statistics Canada

Road Network Files 2001 Census

Reference Guide

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Note of Appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

What's new?

- National coverage of road network information.
- Improved positional accuracy—much of the road network has been re-aligned to match that of the National Topographic Data Base.
- Unique identifiers for blocks (as well as other geographic areas) that allow for the referencing of those geographic areas in the Road Network Files.
- All the spatial information is now based on the North American Datum of 1983 (NAD83)
- The National Topographic Data Base digital topographic data are provided by Geomatics Canada, Natural Resources Canada.

- The roads in the Road Network Files can be used to reference all the boundaries in the Cartographic Boundary Files for all of Canada.
- Roads are ranked at five levels of detail, allowing for the selection of different subsets of roads for mapping at different levels of detail of the road network.
- Separate province / territory Cartographic Boundary File is included as a layer in the Road Network Files.
- This release of the Road Network Files contains road network updates made for the 2001 Census.

Table of Contents

1. About this guide

This reference guide is intended for users of any or all of the 2001 Road Network Files (RNFs). It provides general information about the products, including a description of the general methodology used to create the products.

Section 4, Data quality gives a detailed description of the various steps in the creation of the Road Network Files, including the new address imputation procedure. This section also provides information to evaluate the suitability of the data for a particular use.

Technical specifications in Section 5 include system requirements, installation guidelines, record layout and item descriptions, and file sizes (in mega bytes).

Geographic terms and concepts highlighted in **bold** in the text are described in the glossary. More details can be found in the 2001 Census Dictionary, Catalogue number 92-378-XIE. Supplementary information is provided in the appendices with a list of related products and services.

This reference guide does not provide details on specific software packages that are available for use with the 2001 Road Network File. Users are advised to contact the appropriate software vendor for information. Please contact your nearest Regional Reference Centre for further information.

This reference guide is based on the best information available at the time of its release. It in no way constitutes a warranty of the data in the event that users may observe characteristics that deviate from those stated in this document. Many **geographic codes** and numbers presented in this guide have been transcribed from computer screens and internal written reports and then key-entered. All efforts have been made to ensure a thorough verification of this product, however, there is no guaranty that the data are 100% accurate.

2. Overview

The **Road Network Files** (RNFs) are disseminated to provide geographic reference information for the 2001 Census data. They can be used to reference the boundaries of the geographic areas by which census data are tabulated or to request retrievals of census data by user-defined geographic areas.

Road Network Files contain a road layer for the entire country and a **province** / **territory** boundary layer. The road layer includes roads, with road names and address ranges (arc attributes), and geographic codes to identify **blocks**, **census subdivisions**, **census metropolitan areas** / **census agglomerations**, and provinces / territories (polygon attributes). Address ranges are mainly available in the large urban centres of Canada. The province / territory boundary layer incorporates hydrography (the shoreline around Canada and the inland lakes and waterways) with the boundaries and the geographic codes.

Roads in the Road Network Files are ranked at five levels of detail (four ranks). This allows the users to select different subsets of roads for mapping purposes.

Road Network Files provide full digital coverage for Canada. There are 60 standard Road Network Files:

- Canada
- 10 Provinces and 3 territories
- 27 census metropolitan areas
- 19 census agglomerations with **census tracts**

Subsets of the Road Network Files are available from the Regional Offices as a custom product. See Appendix E for a list of Road Network Files for urban centres.

The Road Network Files replace the Street Network Files and Street Network Feature Extension Files produced following the 1996 Census. For more information on how the new files compare with the 1996 files, consult section 3 of this document.

The 2001 Road Network Files' digital coordinates are in latitude / longitude and are based on the North American Datum of 1983 (NAD83). The Road Network Files standard products are available in ARC/INFO® interchange format or MapInfo® interchange format. Please see the Technical specifications (section 5) for more details on record layouts and file formats of the Files.

Reference Date

The **geographic reference date** is a date determined by Statistics Canada to finalize the geographic framework for which census data will be collected, tabulated and reported. The geographic reference date for the 2001 Census, and therefore for the geographic area boundaries in the Road Network Files, is **January 1, 2001**. The roads and road names on the Road Network Files were updated from a variety of sources, and considerable effort was made to ensure the information for the 2001 Census data collection was accurate as of the geographic reference date.

3. How to use this product

Purpose of the product

The Road Network Files are released as a geographic reference for the 2001 Census data. The Road Network Files, in conjunction with Statistics Canada data, can be used for applications such as site location analysis, planning of service delivery or various types of data analysis and mapping.

The boundaries by which census data is disseminated are released by Statistics Canada in a product called **Cartographic Boundary Files** (CBFs). The boundaries in the Cartographic Boundary Files are generally positionally consistent with the streets and roads in the Road Network Files. The Road Network Files can be used as a reference layer for mapping and analysis in conjunction with the Cartographic Boundary Files. The Cartographic Boundary Files contain the boundaries for census geographic areas. Please refer to section 4, Data quality, Consistency with other products, for more information on how the Cartographic Boundary Files and Road Network Files can be used together.

The Road Network Files can also be used as a basis for the retrieval of census data for user-defined areas. Users can define their areas in terms of the roads on the Road Network Files. **Block** identifiers on the Road Network Files polygons, new for the 2001 Road Network Files product, make data retrieval by block possible. The retrieval of Census data for user-defined geographic areas is available through Statistics Canada's **geocoding** service. Information on the geocoding service is available from the Regional Reference centres.

Limitations

Statistics Canada maintains the Road Network Files information to support the census and other Statistics Canada activities. The relative position of road network features is important in maps created for navigation and reference purposes therefore topological accuracy takes precedence over absolute positional accuracy. Road Network Files do not contain street information required for route optimisation. For example, data on one-way streets, dead-ends and other street obstacles are not included in the Road Network Files. Consequently, these files are not recommended for engineering applications, emergency dispatching services, surveying or legal applications.

The Road Network Files contain road arcs with either "true" address ranges, imputed address ranges, or no address ranges. Imputed address ranges are not meant to replace true address ranges for any purpose other than address geocoding. Thus, if the files are to be used for computer-aided dispatch or similar purposes (that require an address to be matched to a block or street) it may be necessary to supplement the file with local knowledge, by updating existing true addresses and replacing imputed addresses.

The limitations of the Road Network Files should be recognized for uses other than the mapping, analysis and retrieval of census data. Please read the data quality statement for information related to the effective use of these files.

General Methodology

The Road Network Files are based on road network and 2001 Census geographic area components extracted from the **National Geographic Base** (NGB). The National Geographic Base is a new database acquired by Statistics Canada for use in its various mapping applications. The National Geographic Base has been continuously improved as a result of Statistics Canada's partnership with Elections Canada, and with input from Natural Resources Canada's National Topographic Data Base. The National Geographic Base has been used for 2001 Census data collection, specifically in the delineation of **enumeration areas** and the automated production of census collection and **reference maps**. The arcs in the Road Network Files were generalized and edited to reduce file sizes and make the files easier to use.

Road Network Files and Cartographic Boundary Files are both derived from the National Geographic Base and are compatible, so the Road Network Files can be used with Cartographic Boundary Files to provide additional geographic reference information. Every Road Network File includes the appropriate province / territory Cartographic Boundary File as a layer. This layer includes shorelines and some water bodies. Please see section 4, Data quality, Consistency with other products, for more details.

The road arcs in the Road Network Files are ranked to allow for the mapping of different sets of roads at different scales, and at the level of detail determined by the user. Components of the Trans-Canada Highway road network were chosen to create rank 1. The ranks 2 to 3 were based on the length of roads, the number of intersections and the provincial naming conventions for these roads. Rank 4 was based on roads that formed census tract boundaries. The most detailed level of network consists of all roads in the Road Network Files including those that were not assigned a rank. The road arcs and attributes were edited to provide a continuous road network for ranking purposes. These ranks were only developed for mapping at different levels of detail and **do not** represent traffic volume or any other significance of the road network.

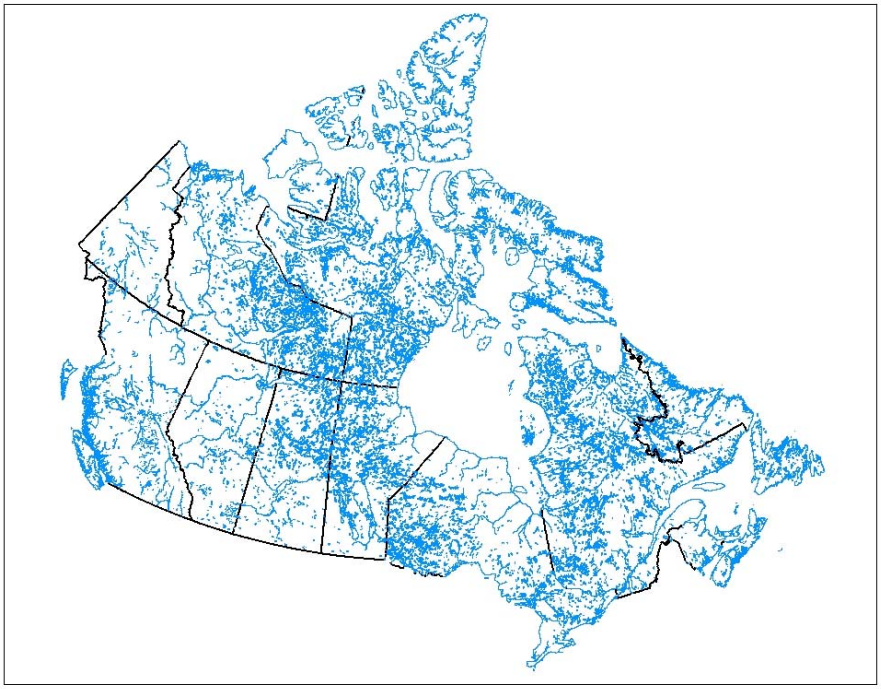
Content

The product contains two layers of geographic information. The first layer is the road and boundary layer which contains the following information:

- Road arcs with names and address information as well as rank;
- Boundary arcs (these arcs are not roads but are needed to define the polygons forming the 2001 blocks in the Road Network Files).
- Polygons with unique identifiers (uid) that designate them as belonging to particular blocks, census subdivisions and census metropolitan areas / census agglomerations.

The second layer is the province / territory cartographic boundary file layer. This layer contains polygons with unique identifiers designating them as belonging to a particular province or territory. The polygons also contain information identifying them as land or water polygons.
Figure 1 shows a map of the province/territory cartographic boundary file**.**

Figure 1. 2001 Province / territory Cartographic Boundary File



Please see Appendix F for more information on the Cartographic Boundary Files. Supplementary hydrography coverages are also available for use with the Cartographic Boundary Files. Please see Appendix G for more information.

All the geographic area codes for census metropolitan areas (CMAuid), census subdivisions (CSDuid) and blocks (BLOCKuid) are contained in the road and boundary layers. Unique identifiers for provinces / territories (PRuid) are contained in the province / territory CBF layer.

A large number of addresses are missing in the National Geographic Data Base (from which the RNF is derived). Some addresses have been imputed in order to increase the number of complete address ranges in the final product. Imputed addresses were specifically created to assist users who wish to geocode addresses. An address imputation field is included on the files for the identification of imputed addresses. Please see section 4, Data quality, for more information about the completeness of the information. This section describes where road names and address range information is present in the Road Network Files.

Please see section 5, Technical specifications, for more details on record layouts and file formats of the Road Network Files.

Comparisons to the 1996 Street Network File

The Road Network Files replace the 1996 Street Network Files, a similar product available only for the large urban centres of Canada. Other differences between the files are:

- Road Network Files contain more roads, road names and address ranges than Street Network Files.
- The 2001 Road Network Files include block identifiers in the polygons.

- The positional accuracy of the Road Network Files has been improved. Much of the network is re-aligned to match that of the National Topographic Data Base.
- Road Network Files are available in the North American Datum of 1983 (NAD83). SNFs are available in NAD27.
- 1996 Street Network Files included road network information collected during the 1996 Census. Road Network Files do not include road network information collected during the 2001 Census.
- Roads are ranked in the Road Network Files, allowing mapping at five levels of detail. Roads are assigned a rank ranging from 1 to 4. The fifth level of detail encompasses all of the roads including the unranked roads.
- A province / territory boundary layer with shoreline and inland lake information is included with the 2001 Road Network Files. The 1996 Street Network Files included a separate hydrography layer.

4. Data quality

Spatial data quality elements provide information on the fitness-for-use of a spatial database by describing why, when and how the data are created, and how accurate the data are. The elements include an overview describing the purpose and usage, as well as specific quality elements reporting on the lineage, positional accuracy, attribute accuracy, logical consistency and completeness. This information is provided to users for all spatial data products disseminated for the census.

Lineage

Describes the history of the spatial data, including descriptions of the source material from which the data were derived, and the methods of derivation. It also contains the dates of the source material, and all transformations involved in producing the final digital files or map products.

Road and boundary layer

The data in the road and boundary layer of the Road Network Files were derived from the National Geographic Base (NGB). The National Geographic Base is a nation-wide street network and boundary file containing attribute information such as road name, road type, and address ranges. The National Geographic Base also contains important linkages to other Statistics Canada data holdings, such as the Address Register and **Postal Code** file. The National Geographic Base was originally built from four main data sources:

- National Topographic Data Base (NTDB) 1:50,000 and 1:250,000 maps
- Digital Chart of the World (DCW) 1:1,000,000 maps
- Statistics Canada's Street Network Files (SNFs)
- Elections Canada road data

Additional road information has been incorporated from a variety of other sources including municipal maps and road data from private companies. However, the timeliness of the National Geographic Base varies from area to area depending on the source data available for use. Table 1 provides details on the distribution of features by source.

Table 1: Feature counts and summed length values by data source.

Source	Number of Features	Length of Features (kilometres)
DCW[1]	4,401	30,933.40
NTDB[2] 1:50,000	743,867	463,309.93
NTDB[2]1:250,000	317,706	615,667.34
Statistics Canada	682,741	510,770.90
Elections Canada	279,508	107,984.01
Municipal	15,271	6,072.43
Other	9,695	1,754.71
Totals	2,053,221	1,739,492.72

[1] Digital Chart of the World
[2] National Topographic Data Base (from Natural Resources Canada)

The steps taken to incorporate data from the various sources is briefly described below:

- National Topographic Data Base

The consistent positional accuracy of the National Topographic Data Base was adopted as the foundation of Statistics Canada's National Geographic Base. As such, the 1996 Street Network Files were reconciled to match the National Topographic Data Base. Outside areas covered by the 1996 Street Network Files, the National Topographic Data Base served as the source of the road network for most of southern Canada. In the most heavily populated parts of Canada, the scale used is 1:50,000, while in the more northern and sparsely populated areas the scale is 1:250,000. Unlike the 1996 Street Network Files, the National Topographic Data Base contains no civic address range or street name information.

- Digital Chart of the World

Much of the road network in the northern part of the provinces (but, not in the territories) is from the Digital Chart of the World (DCW). The DCW is a comprehensive 1:1,000,000 scale vector base map of the world. It consists of cartographic, attribute and textual data. The DCW was developed by agencies that produce the Operational Navigation Charts (ONC) maps series: the United States Defence Mapping Agency, the Australian Army Survey Directorate, the Canadian Directorate of Geographic Operations and the United Kingdom Military Survey.

- The 1996 Street Network File

In urban areas, the 1996 Street Network Files information was updated, enhanced, and incorporated into the National Geographic Base. Features that were not roads were removed. The streets were geometrically adjusted to match the superior accuracy of the National Topographic Data Base. The format of address information is unchanged. Updates were made to the road names. In most cases, names in all upper case letters were converted to names in upper and lower case. Both true and imputed civic address ranges are present in the National Geographic Base. By integrating the existing Street Network File coverage with the National Topographic Data Base, road coverage is greatly increased, from the less than 1% of Canada's **land area** covered by Statistics Canada's 1996 Street Network Files, to essentially complete coverage in the National Geographic Base.

- Elections Canada

Wherever more recent Elections Canada data would improve the quality and quantity of road information, it was added to the National Geographic Base. These were left in the format used by Elections Canada, with upper and lower case letters, accents, road type and direction, but no civic address ranges. The contribution of Elections Canada was especially critical in sparsely populated areas where National Topographic Data Base and Digital Chart of the World information is often of older vintage.

- Other Sources

In addition to federal, provincial, and municipal government sources, portions of the National Geographic Base may contain information obtained in part from maps and other materials prepared by private companies.

- Boundaries

Geographic area boundaries were created on the National Geographic Base based on the road network information. Polygon attributes for geographic areas were updated for the 2001 Census on the National Geographic Base road network layer. The geographic area boundaries

were based on maps and other information from the census data collection processes or were created automatically by a computer program called Geographic Area Delineation System (GArDS)[3]

The road and boundary data from the National Geographic Base was used to create the Road Network Files. Data derived form the National Geographic Base was further processed. Some attribute fields were re-named with user-friendly names and other attribute fields were removed.

The arcs were generalized in order to remove unwanted vertices. The only vertices removed were on straight line arcs between nodes. This process was performed with a weed tolerance of 0.1 metres. The generalization (based on the Douglas-Peucker algorithm and done with ARC/INFO® 8.0.2) removed about one third of the vertices from the original data that was extracted from the National Geographic Base.

All extraneous arcs and errors in classification were edited so only those arcs that designated roads or boundaries were maintained on the Road Network Files. Road arcs are those arcs that depict the road network. Boundary arcs are those arcs that are maintained in conjunction with road arcs to depict block polygons. Some errors found on the National Geographic Base were corrected on the Road Network Files.

Roads were ranked for mapping purposes. Ranks 1, 2 and 3 were derived in the creation of the Skeletal Road Network File.

Positional accuracy

Refers to the absolute and relative accuracy of the positions of geographic features. Absolute accuracy is the closeness of the coordinate values in a dataset to values accepted as or being true. Relative accuracy is the closeness of the relative positions of features to their respective relative positions accepted as or being true. Descriptions of positional accuracy include the quality of the final file or product after all transformations.

The road arcs on the Road Network File are derived from the National Geographic Base. Coordinates in the National Geographic Base files have six implied decimal places, but the positional accuracy of these coordinates is not as great as the six decimal places suggest. The six-decimal place precision is, however, useful when producing maps. The precision allows features that are next to each other on the ground to be placed in the correct position on the map, relative to each other, without overlap.

The National Geographic Base

The positional accuracy of roads on the National Geographic Base varies with the source materials used during creation of the base. An attempt was made to geometrically adjust all roads such that they were in the same position as roads on the National Topographic Data Base (1:50,000 and 1:250,000) or Digital Chart of the World (DCW), which were used for reference purposes. It is therefore expected that these geometrically matched arcs will have a positional accuracy similar to the corresponding reference data used during creation of the

[3] GArDS aggregates small geographic areas (in this case, blocks) according to a set of delineating or design criteria to produce a set of desired geographic areas. The design criteria are assigned penalty weights. The solution with the lowest total penalty weight is accepted, which is an aggregate of the penalty weights of all the combined criteria for all geographic areas.

database. It should be noted that the reference source selected for different geographic areas depended on a variety of factors such as population size, geographic location (urban or rural) and the availability of National Topographic Data Base / DCW data in Elections Canada / Statistics Canada holdings and was done on a NTS tile-by-tile basis. For example, in major urban centres 1:50,000 National Topographic Data Base data was generally used as the reference data. As a result, in these areas, roads that were geometrically matched will have a positional accuracy similar to roads on 1:50,000 National Topographic Data Base data. In areas that used 1:250,000 National Topographic Data Base and DCW reference data, the positional accuracy of roads are approximately that of the source data.

The positional accuracy of arcs that could not be matched because they were not present on the reference data is, however, completely unknown. These arcs were digitized from paper maps annotated by field staff. Although highly valuable and accurate in their attribute information and their relative position in relation to other features, the absolute positional accuracy of these roads is of unknown quality.

Other corrections have been made to the National Geographic Base from updated maps supplied by local participants for Census and Electoral programs. The positional accuracy of these updates is also of unknown quality. In addition to federal, provincial, and municipal government sources, portions of the National Geographic Base may contain information obtained in part from maps and other materials prepared by private companies. Thus, the National Geographic Base is not suitable for high-precision measurement applications such as engineering problems, property transfers, or other uses that might require highly accurate measurements of the earth's surface.

Quality controls were employed throughout the production process to ensure boundaries were in their correct position relative to the roads and boundaries on the National Geographic Base.

The positional accuracy of the Road Network File is similar to that of the National Geographic Base. Arcs in the Road Network Files may be shifted by about 2 metres as a result of editing. The Road Network Files were checked for topological errors including line-crossing, line-overlapping, and collapsed polygons. Any errors found were corrected.

The position of the blocks in the Road Network Files were compared against that of the National Geographic Base and found to be consistent. (Corrections applied to remove arcs less than 1 metre in length (only to the Road Network Files) result in very minor differences in the shape of blocks between the Road Network Files and the National Geographic Base.)

The position of the boundary information in the Province / Territory Cartographic Boundary File layer is generally consistent with the Road Network Files. The arcs representing the hydrography were generalized and adjusted to be consistent with the road network files. In a small number of instances, the relative position of the hydrography with respect to the road network could not be verified.

Attribute accuracy

Refers to the accuracy of the quantitative and qualitative information attached to each feature (such as population for an urban area, street name, census subdivision name and code).

The classification of features varies depending on the source of the information. No verification of these classifications against the ground truth or source / reference data set was conducted.

Limited testing was done to determine the attribute accuracy of features on the base. However, every effort was made during compilation of the National Geographic Base to ensure the proper association of a specific attribute (i.e. name, type, direction, code, etc.) to a specific geometric feature.

The CMAuid of 996, 997, 998 and 999 simply indicate that no CMA or CA is present in these areas. These values do not signify anything else and should be considered as representing a NULL value.

Logical consistency

Describes the fidelity of relationships encoded in the data structure of the digital spatial data.

The following tests were done on the Road Network File polygon attributes:

- All blocks were tested to have the same CSDuid and CMAuid as in the NGB.
- The numbers of blocks in each CSD were tested to be consistent with the number as specified in the Query Base. The Query Base is a database maintained within Statistics Canada.
- All POLY_ID were tested to be unique.
- All BLOCK_UID in the Road Network Files were compared with the BLOCK_UID in the Query Base and on the NGB.

The following tests were done on the Road Network File arc attributes:

- The ARC_ID was tested to be unique for every arc.

The following tests were conducted for the arcs:

- The TYPE and DIRECTION for the road arcs was tested to be within acceptable domain values (please see section 5, Technical specifications for the list of acceptable values for TYPE and DIRECTION).
- The ARC_GROUP was tested to be within acceptable domain values (of AD or NA for roads and BO for boundaries).
- All source codes for SOURCE, AL_SOURCE, AR_SOURCE, and NTD_SOURCE were checked to be within the acceptable codes.

Data from various sources was joined together in the National Geographic Base. During this joining process, less precise geometry was edgematched to the more precise geometry. For example, the Digital Chart of the World was edgematched to information from 1:250,000 or 1:50,000 mapsheets, and information from 1:250,000 mapsheets were edgematched to the 1:50,000 mapsheets. The 1996 Street Network was fitted to this new base geometry through a process of rubbersheeting and then attributes and missing features were added to the national base. Finally, road features and attributes from Elections Canada were introduced. As in any similar situation where geographic data at differing scales are brought together, some anomalies arise. An example is the situation where a multiple-lane highway suddenly switches to a single-lane highway at the point of change of data source. Feature name inconsistencies also exist as a result of using data from various sources.

Node-line-area relationships satisfy topological requirements as specified in the ARC/INFO® data model.

Consistency with other products

The positions of the arcs in the Road Network Files are generally consistent with those of the Cartographic Boundary Files and the Skeletal Road Network Files.

The CSDuid and BLOCKuid codes are consistent with those found in the Cartographic Boundary Files and GeoSuite. CMAuid codes are consistent with those found in the Cartographic Boundary Files.

Hydrography was specially created for the Cartographic Boundary Files to enable thematic mapping at small and medium scales. The hydrography used in the province / territory layer in the Cartographic Boundary Files differs from the hydrography used in the reference maps. For this reason, the boundaries of the geographic areas may be represented in a different fashion in the reference maps.

The hydrography used in the Cartographic Boundary Files was created to be consistent with the roads in the road network files. However, boundary arcs in the Road Network Files (designated by ARC_GROUP of "BO") are those present in the National Geographic Base. This very detailed information, including boundary arcs that for legal reasons are present in the water were left as they were depicted in the National Geographic Base. The detailed information was also considered preferable for geocoding with the BLOCKuid information in the Road Network Files. However, when mapping the Cartographic Boundary Files (or the Province / Territory Cartographic Boundary layer) with the road network files, users should consider not mapping the RNF boundary arcs (ARC_GROUP of "BO") if they do not want these to fall in the water.

Ranks 1, 2 and 3 are consistent with those found in the Skeletal Road Network File. Rank 4 in the RNF is derived from early work on the Skeletal Road Network File and is not consistent with the final Skeletal Road Network File product.

Completeness

Refers to the degree to which geographic features, their attributes and their relationships are included or omitted in a dataset. It also includes information on selection criteria, definitions used, and other relevant mapping rules.

Roads

Many features that were not found on the 1996 Street Network Files (SNFs) have been added to the Road Network Files in order to create a nation-wide road coverage. Table 2 shows the number of road features on the Road Network Files. Addressing is confined to major urban centres, with a few exceptions.

Table 2: Number of road features in the Road Network Files

Road group	Number of records	Percent of total roads (approximate)
Total roads	1,880,972	100%
Named roads	1,329,323	71%
Roads with at least 1 address range[4]	485,979	26%

This file does not contain names for roads in Nunavut.

Boundaries

Table 3 lists the total number of entities for the different kinds of geographic areas. The Road Network Files contain polygon attributes identifying all the blocks, census subdivisions, census metropolitan areas and census agglomerations in Canada.

Table 3

Geographic unit	Number of entities
CMA	27
CA	113
CSD	5,600
Blocks	478,707

The Road Network Files also contain all the sub-block boundaries. All BLOCKuid in the Query Base are also found in the Road Network Files. (The Query Base is a database maintained within Statistics Canada.)

[4] Address range is defined as an arc having at least one complete address range whether on the right or left side of the arc. The formula used to query the data is: [(add_fr_lf>0 and add_to_lf>0) or (add_fr_rt>0 and add_to_rt>0)].

5. Technical specifications

Software formats

All products are available on CD-ROM in the following formats:

- ARC/INFO® interchange format version 8.1
  ASCII interchange file
  File extension: .e00 (spatial and tabular data)
- MapInfo® interchange format version 6.0
  ASCII interchange files
  File extensions: .MIF (graphic data), .MID (tabular data)

Installation instructions

Both the ARC/INFO® and the MapInfo® files are compressed into self-executable WinZip® files (file extension .EXE). Users can unzip these files by executing them in DOS, or selecting them in Windows® and double clicking on the file icon, or executing them in the RUN dialog in Windows®.

The road names in the Road Network File contain accented characters. These characters can be seen in UNIX and Windows® versions of ARC/INFO® and MapInfo®. (They ware tested on desktop versions of ARC/INFO 8.1, MapInfo 6.0 and MapInfo 4.5. The accents were also visible in ARC/INFO 8.01 in UNIX.) To preserve accents, ArcToolbox® is recommended for importing files into the desktop version of ARC/INFO 8.1.

MapInfo files should be imported into MapInfo using the Import command. When uncompressed, MapInfo line files will have the suffix ml_E and MapInfo polygon files will have the suffix mp_E.

File naming conventions

Please see Appendix D for the file naming conventions.

Data descriptions and record layouts

Geographic representation

- All files distributed by the Geography Division are in the North American Datum of 1983 (NAD 83).
- The files are available in the geographic coordinate system (latitude / longitude).
- To make this file useful (i.e. to calculate distance) it must be projected.

Record layouts

ARC/INFO® .AAT Files:

Position	Item Name	Width	Output	Type	Decimals
1	FNODE#	4	5	B	
5	TNODE#	4	5	B	
9	LPOLY#	4	5	B	
13	RPOLY#	4	5	B	
17	LENGTH	8	18	F	5
25	<File name>#	4	5	B	
29	<File name>-ID	4	5	B	
33	ARC_ID	4	8	B	
37	SOURCE	4	5	B	
41	CLASS	4	4	C	
45	ARC_GROUP	2	2	C	
47	NAME	70	70	C	
117	TYPE	6	6	C	
123	DIRECTION	2	2	C	
125	ADDR_FM_LEFT	6	6	I	
131	ADDR_TO_LEFT	6	6	I	
137	ADDR_FM_RGHT	6	6	I	
143	ADDR_TO_RGHT	6	6	I	
149	ADDR_FL_TYPE	3	3	C	
152	ADDR_TL_TYPE	3	3	C	
155	ADDR_FR_TYPE	3	3	C	
158	ADDR_TR_TYPE	3	3	C	
161	GEO_SOURCE	4	5	C	
165	NTD_SOURCE	4	5	C	
169	AL_SOURCE	4	5	C	
173	AR_SOURCE	4	5	C	
177	LENGTH_KM	8	18	F	5
185	RANK1	1	1	I	
186	RANK2	1	1	I	
187	RANK3	1	1	I	
188	RANK4	1	1	I	

MapInfo® Line files:

Position	Field Name	Width	Output	Type	Decimals
1	arc_id	4	8	B	
5	source	4	5	B	
9	class	4	5	B	
13	arc_group	2	2	C	
15	name	70	70	C	
85	type	6	6	C	
91	direction	2	2	C	
93	street	78	78	C	
171	addr_fm_left	6	6	I	
177	addr_to_left	6	6	I	
183	addr_fm_rght	6	6	I	
189	addr_to_rght	6	6	I	
195	addr_fl_type	3	3	C	
198	addr_tl_type	3	3	C	
201	addr_fr_type	3	3	C	
204	addr_tr_type	3	3	C	
207	geo_source	4	5	C	
211	ntd_source	4	5	C	
215	al_Source	4	5	C	
219	ar_Source	4	5	C	
223	length_km	8	18	F	5
231	rank1	1	1	I	
232	rank2	1	1	I	
233	rank3	1	1	I	
234	rank4	1	1	I	

Item / field descriptions

Item Name ARC/INFO®	Field Name MapInfo®	Description
FNODE#		Maintained by ARC/INFO® (not included in the MapInfo files)
TNODE#		Maintained by ARC/INFO® (not included in the MapInfo files)
LPOLY#		Identifier for polygon on left side of the arc (not included in the MapInfo files)
RPOLY#		Identifier for polygon on right side of the arc (not included in the MapInfo files)
LENGTH		Maintained by ARC/INFO® (not included in the MapInfo files)
<File name>#		Maintained by ARC/INFO® (not included in the MapInfo files)
<File name>-ID		Maintained by ARC/INFO® (not included in the MapInfo files)
ARC_ID	arc_id	Identifies ARC
SOURCE	source	Origin of the arc : see source list
CLASS	class	NGB Classification system base on the NTDB Explicit Code
ARC_GROUP	arc_group	Data group : AD, BO, NA, SB
NAME	name	A seventy character field containing the given road name of the feature
TYPE	type	A six character code used for street identification when the feature is a single or multiple lane addressable street : see road type list

Item Name ARC/INFO®	Field Name MapInfo®	Description
DIRECTION	direction	A two character code identifying the direction of the arc when the feature is a single or multiple lane addressable street : see road direction list
	street	Road name, type and direction (not included in ARC/INFO®)
ADDR_FM_LEFT	addr_fm_left	The civic address found on the left-hand side of the arc at the FROM node
ADDR_TO_LEFT	addr_to_left	The civic address found on the left-hand side of the arc at the TO node
ADDR_FM_RGHT	addr_fm_rght	The civic address found on the right-hand side of the arc at the FROM node
ADDR_TO_RGHT	addr_to_rght	The civic address found on the right-hand side of the arc at the TO node
ADDR_FL_TYPE	addr_fl_type	Address type code associated to the left-hand side of the arc at the FROM node: see address type list for definition
ADDR_TL_TYPE	addr_tl_type	Address type code associated to the left-hand side of the arc at the TO node: see address type list for definition
ADDR_FR_TYPE	addr_fr_type	Address type code associated to the right-hand side of the arc at the FROM node: see address type list for definition
ADDR_TR_TYPE	addr_tr_type	Address type code associated to the right-hand side of the arc at the TO node: see address type list for definition
GEO_SOURCE	geo_source	Geometry of the arc last update origin : see source list
NTD_SOURCE	ntd_source	Name, type, direction of the arc last update origin : see source list
AL_SOURCE	al_source	Address left update origin : see source list : see source list
AR_SOURCE	ar_source	Address right update origin : see source list
LENGTH_KM	length_km	Approximate calculation of ARC length in kilometres
RANK1	rank1	Trans-Canadian network
RANK2	rank2	Major Road based on length
RANK3	rank3	Major road based on provincial naming and numbering schemes
RANK4	rank4	Roads that form Census Tract Boundaries

Record layouts

ARC/INFO® .PAT files:

Position	Item Name (ARC/INFO®)	Width	Output (ARC/INFO®)	Type	Decimals
1	AREA	8	18	F	5
9	PERIMETER	8	18	F	5
17	<File name>#	4	5	B	
21	<File name>-ID	4	5	B	
25	POLY_id	4	8	B	
29	CMAuid	3	3	C	
32	CSDuid	7	7	C	
35	BLOCKuid	10	10	C	

MapInfo® poly files:

Position	Field Name	Width	Output	Type	Decimals
25	POLY_id	4	8	B	
29	CMAuid	3	3	C	
32	CSDuid	7	7	C	
35	BLOCKuid	10	10	C	

Item / field description

Item Name ARC/INFO®	Field Name MapInfo®	Description
AREA		Maintained by ARC/INFO®
PEREMETER		Maintained by ARC/INFO®
<File name>#		Maintained by ARC/INFO®
<File name>-ID		Maintained by ARC/INFO®
POLYid	POLY_id	Polygon identifier
CMAuid	CMAuid	CMA / CA unique identifier
CSDuid	CSDuid	CSD unique identifier
BLOCKuid	BLOCKuid	BLOCK unique identifier

Domain

Representation of Unknown or No Value
The underscore "_" is used to represent values of the road's name, type and direction that are either missing or non-existent. The zero "0" is used when an address does not exist or is not known.

Road Type

Type	Description	Type	Description	Type	Description
_		ESPL	Esplanade	PINES	Pines
ABBEY	Abbey	ESTATE	Estates	PK	Park
ACCESS	Access	EXPY	Expressway	PKY	Parkway
ACRES	Acres	EXTEN	Extension	PL	Place (E)
ALLEY	Alley	FARM	Farm	PLACE	Place (F)
ALLÉE	Allée	FIELD	Field	PLAT	Plateau
AUT	Autoroute	FRONT	Front	PLAZA	Plaza
AV	Avenue (F)	FWY	Freeway	PROM	Promenade
AVE	Avenue (E)	GATE	Gate	PT	Point
BAY	Bay	GDNS	Grounds	PTWAY	Pathway
BEACH	Beach	GLADE	Glade	PVT	Private
BEND	Bend	GLEN	Glen	QUAY	Quay
BLVD	Boulevard (E)	GREEN	Green	RANG	Rang
BOUL	Boulevard (F)	GRNDS	Gardens	RD	Road
BRIDGE	Bridge	GROVE	Grove	REGRD	Regional Road

Type	Description	Type	Description	Type	Description
BROOK	Brook	HARBR	Harbour	RG	Range
BYPASS	By-pass	HAVEN	Haven	RIDGE	Ridge
BYWAY	Byway	HEATH	Heath	RISE	Rise
CAMPUS	Campus	HGHLDS	Highlands	RLE	Ruelle
CAPE	Cape	HILL	Hill	ROW	Row
CAR	Carré	HOLLOW	Hollow	RTE	Route
CERCLE	Cercle	HTS	Heights	RTOFWY	Right of way
CH	Chemin	HWY	Highway	RUE	Rue
CHASE	Chase	IMP	Impasse	RUN	Run
CIR	Circle	ISLAND	Island	SENT	Sent
CIRCT	Circuit	KEY	Key	SIDERD	Sideroad
CLOSE	Close	KNOLL	Knoll	SQ	Square
COMMON	Common	LANDNG	Landing	ST	Street
CONC	Concession	LANE	Lane	STROLL	Stroll
COUR	Cour	LINE	Line	SUBDIV	Subdivision
COVE	Cove	LINK	Link	TERR	Terrace
CRES	Crescent	LKOUT	Lookout	TLINE	Towline
CRNRS	Corners	LMTS	Limits	TRAIL	Trail
CROFT	Croft	LOOP	Loops	TRNABT	Turnabout
CROIS	Croissant	MALL	Mall	TSSE	Terrasse
CROSS	Crossing	MANOR	Manor	VALE	Vale
CRSSRD	Crossroads	MEADOW	Meadow	VIEW	View
CRT	Court	MEWS	Mews	VILLGE	Village
CTR	Centre	MONTÉE	Montée	VISTA	Vista
CÔTE	Côte	MOUNT	Mount	VOIE	Voie
DELL	Dell	MTN	Mountain	WALK	Walk
DIVERS	Diversion	ORCH	Orchard	WAY	Way
DOM	Domaine	PARADE	Parade	WHARF	Wharf
DOWNS	Downs	PARC	Parc	WOOD	Wood
DR	Drive	PASS	Passage	WYND	Wynd
END	End	PATH	Path		

Direction

The arc direction is not the geographic direction of the road feature, but a description used to identify it. A two character code is related to the arc when the feature is a single or multiple lane addressable street.

Code	Description
_	
E	East / Est
N	North / Nord
NE	North-east / Nord est
NO	Nord ouest
NW	North-west
O	Ouest
S	South / Sud

Code	Description
SE	South-east / Sud est
SO	Sud ouest
SW	South-west
W	West

Arc group:

Code	Description
AD	An addressable road arc
BO	An administrative or statistic boundary arc
NA	A non-addressable road arc
SB	A statistic boundary arc

Address Type:

Code	Description		
K	Known addresses		
Ixy	Imputed		
	X	R	Range Imputation
		E	Street end imputation
		C	Court yard imputation
		U	Unlinked arc imputation
	Y	1	One unknown range
		3	2 or 3 unknown ranges
		7	4 to 7 unknown ranges
		8	8 or more unknown ranges
ID	Imputed Duplicate		
NA	Non addressable arc		
U	Unknown addresses		

Class:

Code	Description
0	Unknown
1	Unknown from Elections Canada
92	Bridge :
94	Bridge :
201	Primary and secondary road functioning
202	Primary and secondary road under construction
301	Track, trail or footpath functioning
994	Road: less than 2 lanes, all season, undivided, depression, operational, hard
996	Road: less than 2 lanes, all season, undivided, n/a, under construction, hard
997	Road: less than 2 lanes, all season, undivided, n/a, under construction, loose
998	Road: less than 2 lanes, all season, undivided, other, operational, hard
999	Road: less than 2 lanes, all season, undivided, other, operational, loose
1000	Road: more than 2 lanes, all season, undivided, depression, operational, hard
1001	Road: more than 2 lanes, all season, undivided, elevation, operational, hard
1002	Road: more than 2 lanes, all season, undivided, n/a, under construction, hard
1003	Road: more than 2 lanes, all season, undivided, other, operational, hard

1004	Road: n/a, cart track, n/a other, operational, loose
1005	Road: n/a, dry weather, undivided, other, operational, loose
1006	Road: n/a, n/a, undivided, other, unclassified, n/a
1009	Road: n/a, rapid transit, n/a, other, operational, hard
1010	Road: n/a, rapid transit, n/a, n/a, under construction, hard
1011	Road: n/a, street, n/a, n/a, operational, hard
1012	Road: n/a, street, n/a, n/a, operational, loose
1014	Road: 2 lanes, all season, undivided, elevated, operational, hard
1015	Road: 2 lanes, all season, undivided, n/a, under construction, hard
1016	Road: 2 lanes, all season, undivided, other, operational, hard
1017	Road: 2 lines or more, all season, divided, depression, operational, hard
1018	Road: 2 lines or more, all season, divided, elevated, operational, hard
1019	Road: 2 lines or more, all season, divided, n/a, under construction, hard
1020	Road: 2 lines or more, all season, divided, other, operational, hard
1021	Road: 2 lines or more, all season, undivided, n/a, under construction, loose
1022	Road: 2 lines or more, all season, undivided, other, operational, loose
1027	Road: n/a, winter, n/a, other, operational, loose
1306	Trail: other
1307	Trail: portage
1536	Neatline
BO	Boundary arc
SB	Sub-Block boundary arc
U	Unknown

Source:

Code	Name	Description
1	GEO	Geography Division of Statistics Canada internal document
2	SES MAINTENANCE	Information generated by the Recognized Road Name List <Imputation> system
3	DCW ROAD_L	Digital Chart of the Word files
4	NTDB 50K ROAD_L	National Topographic Data Base scale of 1:50,000
5	NTDB 250K ROAD_L	National Topographic Data Base scale of 1:250,000
6	SNF	Street Network Files of 1996
7	SPLIT	Geography division of Statistics Canada internal document (boundary arcs outside SNF of 1996 boundary)
8	TILE	Created by an internal process by Geography division of Statistics Canada to support the Tile limit of the National Geographic Base library
9	SNF_SPLIT	Geography division of Statistics Canada internal document (boundary arcs outside SNF of 1996 boundary)
10	EC	Elections Canada internal document (new road update used for the first cycle of road update after the creation of the NGB)
615	Field Return	Document from field collection
616	CPC	Document from Canada Post Corporation
617	NGD	Document from NGD
618	MUN	Document from municipality
619	TELUS	Document from Telus
621	GC	Document from Geocom
622	LIO	Document from Land Information Ontario
9999	Not Applicable	-

6. Glossary

Adjusted Counts
Adjusted counts refer to previous census population and dwelling counts that have been adjusted (i.e., recompiled) to reflect current census boundaries (such as when a boundary change occurs between two censuses).

Block
A block is an area bounded on all sides by roads and/or boundaries of standard geographic areas. Blocks cover all the territory of Canada. The block is the smallest geographic area for which population and dwelling counts are disseminated.

Block-face
A block-face is one side of a street between two consecutive features intersecting that street. The features can be other streets, boundaries of standard geographic areas, or limits of map tiles.

Block-faces are used for generating block-face representative points, which in turn are used for geocoding and census data extraction when the street and address information is available.

Cartographic Boundary Files
Cartographic Boundary Files contain boundaries of standard geographic areas, along with shorelines and lakes, at a level of detail appropriate for small-scale mapping.

Census Agricultural Region
Census agricultural regions are composed of groups of adjacent census divisions. In Saskatchewan, census agricultural regions are made up of groups of adjacent census consolidated subdivisions, but these groups do not necessarily respect census division boundaries.

Census Consolidated Subdivision
A census consolidated subdivision is a grouping of adjacent census subdivisions. Generally, the smaller, more urban census subdivisions (towns, villages, etc.) are combined with the surrounding larger, more rural census subdivision, in order to create a geographic level between the census subdivision and the census division.

Census Division
Census division is the general term for provincially legislated areas (such as county, *municipalité régionale de comté* and regional district) or their equivalents. Census divisions are intermediate geographic areas between the province level and the municipality (census subdivision).

Census Metropolitan Area and Census Agglomeration
A census metropolitan area or a census agglomeration is formed by one or more adjacent municipalities centred on a large urban area (known as the **urban core**). The census population count of the urban core must be at least 10,000 to form a census agglomeration and at least 100,000 to form a census metropolitan area. To be included in the census metropolitan area or a census agglomeration, other adjacent municipalities must have a high degree of integration with the central urban area, as measured by commuting flows derived from census place of work data.

If the population of the urban core of a census agglomeration declines below 10,000, the census agglomeration is retired. However, once an area becomes a census metropolitan area, it is retained as a census metropolitan area even if the population of its urban core population declines

below 100,000. The urban areas that are located in the census metropolitan area or census agglomeration but are not contiguous to the urban core are called the **urban fringe**. Rural areas in the census metropolitan area or census agglomeration are called the **rural fringe**.

When a census agglomeration has an urban core of at least 50,000 based on census counts, it is subdivided into **census tracts**. Census tracts are maintained for the census agglomeration even if the population of the urban core subsequently falls below 50,000. All census metropolitan areas are subdivided into census tracts.

Census Metropolitan Area and Census Agglomeration Influenced Zone
The census **m**etropolitan area and census agglomeration **i**nfluenced **z**one (MIZ) is a concept that geographically differentiates the area of Canada outside census metropolitan areas and census agglomerations. Census subdivisions outside census metropolitan areas and CAs are assigned to one of four categories according to the degree of influence (strong, moderate, weak or no influence) that the census metropolitan areas and/or census agglomerations have on them.

Census subdivisions (CSDs) are assigned to a MIZ category based on the percentage of their resident employed labour force that has a place of work in the urban core(s) of census metropolitan areas or CAs. CSDs with the same degree of influence tend to be clustered. The zones they form around census metropolitan areas and census agglomerations progress through the categories from "strong" to "no" influence as distance from the census metropolitan areas and census agglomerations increases.

Census Subdivision
Census subdivision is the general term for municipalities (as determined by provincial legislation) or areas deemed to be their equivalents (for example, Indian reserves, Indian settlements and unorganized territories) used for statistical reporting purposes.

Census Tract
Census tracts are small, relatively stable geographic areas that usually have a population of 2,500 to 8,000. They are located in census metropolitan areas and in census agglomerations with an urban core population of 50,000 or more in the previous census.

A committee of local specialists (for example, planners, educators and health and social workers) initially delineates census tracts in conjunction with Statistics Canada. Once a census metropolitan area or census agglomerations has been subdivided into census tracts, the census tracts are maintained even if the urban core population subsequently declines below 50,000.

Coordinate System
A coordinate system is a reference system based on mathematical rules for specifying positions (locations) on the surface of the earth. The coordinate values can be spherical (latitude and longitude) or planar (such as the Universal Transverse Mercator).

The Cartographic Boundary Files, the Road Network Files and the representative points are disseminated in latitude/longitude coordinates.

Datum
A datum is a geodetic reference system that specifies the size and shape of the earth, and the base point from which the latitude and longitude of all other points on the earth's surface are referenced.

The spatial data disseminated for the 2001 Census are based on the North American Datum of 1983 (NAD83).

Designated Place
A designated place is normally a small community or settlement that does not meet the criteria established by Statistics Canada to be a census subdivision (an area with municipal status) or an urban area.

Designated places are created by provinces and territories, in cooperation with Statistics Canada, to provide data for submunicipal areas.

Dissemination Area
The dissemination area is a small, relatively stable geographic unit composed of one or more blocks. It is the smallest standard geographic area for which all census data are disseminated. dissemination areas cover all the territory of Canada.

Economic Region
An economic region is a grouping of complete **census divisions** (with one exception in Ontario) created as a standard geographic unit for analysis of regional economic activity.

Ecumene
Ecumene is a term used by geographers to mean inhabited land. It generally refers to land where people have made their permanent home, and to all work areas that are considered occupied and used for agricultural or any other economic purposes. Thus, there can be various types of ecumenes, each having its own unique characteristics (population ecumene, agricultural ecumene, industrial ecumene, etc.).

Enumeration Area
An enumeration area is the geographic area canvassed by one census representative. An enumeration area is composed of one or more adjacent blocks. Enumeration area s cover all the territory of Canada.

Enumeration areas are only used for census data collection. The dissemination area replaces the enumeration area as a basic unit for dissemination.

Federal Electoral District
A federal electoral district is an area represented by a member of the House of Commons. The federal electoral district boundaries used for the 2001 Census are based on the 1996 Representation Order.

Geocoding
Geocoding is the process of assigning geographic identifiers (codes) to map features and data records. The resulting geocodes permit data to be linked geographically.

Households and postal codes are linked to block-face representative points when the street and address information is available; otherwise, they are linked to block representative points.

Geographic Code
A geographic code is a unique number used to identify and access standard geographic areas for the purposes of data storage, retrieval and display.

Geographic Reference Date
The geographic reference date is a date determined by Statistics Canada for the purpose of finalizing the geographic framework for which census data will be collected, tabulated and reported. For the 2001 Census, the geographic reference date is January 1, 2001.

Land Area
Land area is the area in square kilometres of the land-based portions of standard geographic areas.

The land area measurements are unofficial and are provided for the sole purpose of calculating population density.

Locality
Locality refers to the historical place names of former census subdivisions (municipalities), former designated places and former urban areas, as well as to the names of other entities, such as neighbourhoods, post offices, communities and unincorporated places.

Map Projection
A map projection is the process of transforming and representing positions from the earth's three-dimensional curved surface to a two-dimensional (flat) surface. The process is accomplished by a direct geometric projection or by a mathematically derived transformation.

The Lambert Conformal Conic map projection is widely used for general maps of Canada at small scales and is the most common map projection used at Statistics Canada.

National Geographic Base
The National Geographic Base is a new database that contains roads and boundaries of standard geographic areas in one integrated layer with other physical and cultural features (such as hydrography, railroads and power transmission lines) stored as separate layers.

The National Geographic Base is an internal maintenance database that is not disseminated. It supports a wide range of census operations, such as geocoding, updating the road network and address ranges, supporting the block program and delineating the boundaries of standard geographic areas (including the automated delineation of enumeration areas, urban areas and dissemination areas). As well, the National Geographic Base is the source for generating many geography products for the 2001 Census, such as reference maps and Cartographic Boundary Files.

Place Name
Place name refers to the set of names that includes current census subdivisions (municipalities), current designated places and current urban areas, as well as the names of localities.

Population Density
Population density is the number of persons per square kilometre.

Postal Code
The postal code is a six-character code defined and maintained by Canada Post Corporation for the purpose of sorting and delivering mail.

Province or Territory
Province and territory refer to the major political units of Canada. From a statistical point of view, province and territory are basic areas for which data are tabulated. Canada is divided into ten provinces and three territories.

Reference Map
A reference map shows the location of the geographic areas for which census data are tabulated and disseminated. The maps display the boundaries, names and codes of standard geographic areas, as well as major cultural and physical features, such as roads, railroads, coastlines, rivers and lakes.

Representative Point
A representative point is a single point that represents a linear or areal feature. The point is centrally located along the linear feature or centrally within the areal feature. Representative points are generated for block-faces, blocks, enumeration areas, dissemination areas, census subdivisions and designated places. The block-face and block representative points support the geocoding of households and postal codes.

Road Network Files
The Road Network Files provide national coverage of roads, province / territory boundaries and other visible features such as hydrography, as well as attribute information (for example, street names and address ranges for streets with assigned addresses). The Road Network Files replace the Street Network Files, which were a similar product previously available only for the large urban centres of Canada.

Rural Area
Rural areas include all territory lying outside urban areas. Taken together, urban and rural areas cover all of Canada. Rural population includes all population living in the rural fringes of census metropolitan areas and census agglomerations,as well as population living in rural areas outside of census metropolitan areas and census agglomerations.

Spatial Data Quality Elements
Spatial data quality elements provide information on the fitness-for-use of a spatial database by describing why, when and how the data are created, and how accurate the data are. The elements include an overview describing the purpose and usage, as well as specific quality elements reporting on the lineage, positional accuracy, attribute accuracy, logical consistency and completeness. This information is provided to users for all spatial data products disseminated for the census.

Standard Geographical Classification
The Standard Geographical Classification is Statistics Canada's official classification for three types of geographic areas: **provinces** and **territories**, **census divisions** and **census subdivisions** . The Standard Geographical Classification provides unique numeric identification (codes) for these hierarchically related geographic areas.

Statistical Area Classification
The Statistical Area Classification groups census subdivisions according to whether they are a component of a census metropolitan area, a census agglomeration, a census metropolitan area and census agglomeration influenced zone (strong MIZ, moderate MIZ, weak MIZ or no MIZ), or the territories (Northwest Territories, Yukon Territory and Nunavut). The Standard Geographical Classification is used for data dissemination purposes.

Thematic Map
A thematic map shows the spatial distribution of one or more specific data themes for standard geographic areas. The map may be qualitative in nature (e.g., predominant farm types) or quantitative (e.g., percentage population change).

Urban Area
An urban area has a minimum population concentration of 1,000 persons and a population density of at least 400 persons per square kilometre, based on the current census population count. All territory outside urban areas is classified as rural. Taken together, urban and rural areas cover all of Canada.

Urban population includes all population living in the urban cores, secondary urban cores and urban fringes of census metropolitan areas and census agglomerations, as well as the population living in urban areas outside census metropolitan areas and census agglomerations.

Urban Core, Urban Fringe and Rural Fringe
Urban core, urban fringe and rural fringe distinguish between central and peripheral urban and rural areas within a census metropolitan area or census agglomeration.

Urban core is a large urban area around which a census metropolitan area or census agglomeration is delineated. The urban core must have a population (based on the previous census) of at least 100,000 persons in the case of a census metropolitan area, or between 10,000 and 99,999 persons in the case of a census agglomeration.

Urban fringe includes all small urban areas (with less than 10,000 population) that are located within a census metropolitan area or census agglomeration but are not contiguous with the urban core of the census metropolitan area or census agglomeration.

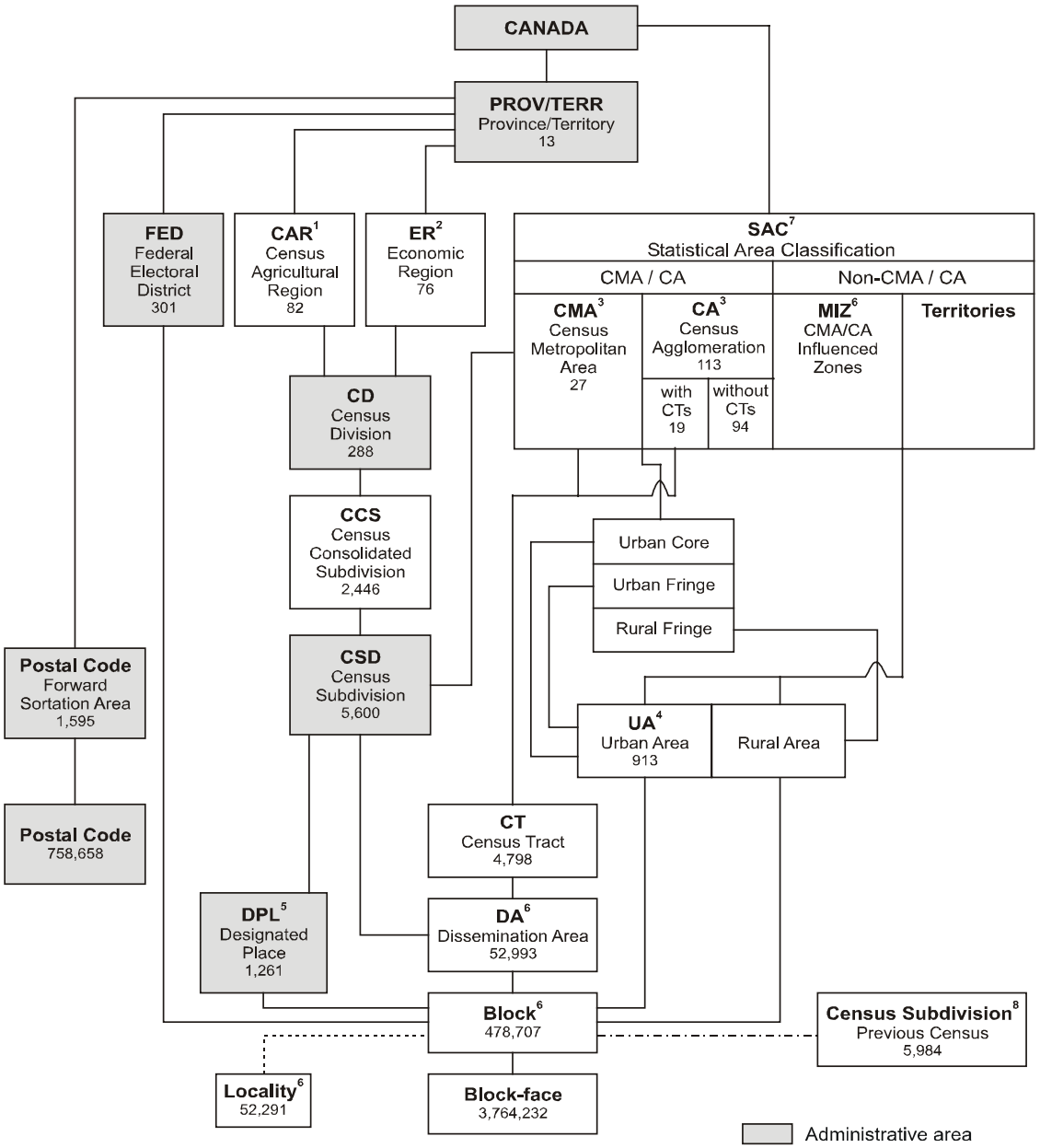
Rural fringe comprises all territory that is located within a census metropolitan area or census agglomeration but is not classified as an urban core or an urban fringe.

Urban Population Size Group
Urban population size group refers to the classification used in standard tabulations where **urban areas** are distributed according to the following predetermined size groups, based on the current census population.

1,000	–	2,499
2,500	–	4,999
5,000	–	9,999
10,000	–	24,999
25,000	–	49,999
50,000	–	99,999
100,000	–	249,999
250,000	–	499,999
500,000	–	999,999
1,000,000 and over		

Tabulations are not limited to these predetermined population size groups; the census database has the capability of tabulating data according to any user-defined population size group.

Appendix A: Hierarchy of standard geographic units for dissemination, 2001 Census



[1] Census agricultural regions in Saskatchewan are composed of census consolidated subdivisions.
[2] Economic regions in Ontario are composed of municipalities (census subdivisions).
[3] One CMA and four CAs cross provincial boundaries.
[4] Five UAs cross provincial boundaries.
[5] Designated places do not cover the total area of CSDs. Eighty-four DPLs cross CSD boundaries, of which 12 also cross CD boundaries.
[6] Census metropolitan area and census agglomeration influenced zones (MIZ), dissemination area, block, and locality are new concepts for the 2001 Census.
[7] The Statistical Area Classification (SAC) is a new geographic classification that allocates each CSD according to whether it is a component of a CMA, CA, a census metropolitan area and census agglomeration influenced zone (MIZ), or the territories outside the CAs of Whitehorse and Yellowknife.
[8] For the 2001 Census only, a best fit linkage is created between the 1996 CSDs and 2001 blocks to facilitate historical data retrieval. See the definition of Census Subdivision – Previous Census.

Appendix B: Geographic units by province and territory, 2001 Census

Geographic Unit	Canada		Nfld. Lab.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Y.T.	N.W.T.	Nvt.
	1996	2001													
Federal electoral district (1996 Representation Order)	295*	301	7	4	11	10	75	103	14	14	26	34	1	1	1
Economic region	74	76	4	1	5	5	17	11	8	6	8	8	1	1	1
Census agricultural region	78	82	3	3	5	4	14	5	12	20	8	8	–	–	–
Census division	288	288	10	3	18	15	99	49	23	18	19	28	1	2	3
Census consolidated subdivision	2,607	2,446	87	68	43	151	1,111	318	127	301	77	157	1	2	3
Census subdivision	–	5,600	381	113	98	275	1,476	586	298	1,002	452	816	35	37	31
1996 Census	5,984	–	381	113	110	283	1,599	947	298	970	467	713	35	68	N/A
Dissolutions (January 2, 1996 to January 1, 2001)	910	–	–	–	14	12	232	529	3	18	18	83	1	–	N/A
Incorporations (January 2, 1996 to January 1, 2001)	–	526	–	–	2	4	109	168	3	50	3	186	1	–	N/A
Designated place	828	1,261	182	–	59	172	78	81	51	158	260	219	1	–	–
Census metropolitan area	25	27	1	–	1	1	6	11	1	2	2	3	–	–	–
Census agglomeration	112	113	4	2	4	5	28	30	3	7	10	22	1	1	–
With census tracts	18	19	–	–	–	1	3	8	–	–	3	4	–	–	–
Without census tracts	94	94	4	2	4	4	25	22	3	7	7	18	1	1	–
Census tract	4,223	4,798	45	–	86	71	1,263	2,013	165	101	457	597	–	–	–
Urban area	929	913	36	7	39	34	229	258	42	65	108	93	1	3	3
Locality	N/A	52,291	2,428	964	3,920	3,445	12,448	10,889	2,339	3,868	3,466	7,699	362	173	290
Dissemination area	N/A	52,993	1,231	225	1,397	1,349	12,153	18,596	2,235	2,937	5,143	7,463	117	92	55
Enumeration area	49,361	42,851	1,204	225	1,337	1,216	9,133	14,753	1,805	2,697	4,129	6,088	117	92	55
Block	N/A	478,707	8,331	2,831	15,161	13,929	108,760	128,327	30,567	56,040	60,061	53,147	674	745	134
Block-face	817,734	3,764,232	80,162	19,854	168,840	136,311	865,600	955,847	200,569	377,776	435,604	499,365	10,644	12,304	1,356
Forward sortation area	1,477	1,595	33	7	74	110	398	518	64	47	147	188	3	3	3
Postal code	680,910	758,658	7,900	2,856	23,354	55,104	188,427	254,757	23,250	21,184	70,672	109,753	884	487	30

* Federal electoral districts (1987 Representation Order)

Note: Underlined numbers indicate that those census metropolitan areas, census agglomerations and urban areas crossing provincial boundaries are counted in both provinces.

Appendix C: Unique identifiers consistent with other Geography products

Unique identifiers are codes that uniquely identify a geographic area within Canada. Data from different files (for the same geographic area) can be joined or related based on the unique identifier. For example, the data in GeoSuite can be mapped on the Census Subdivision Cartographic Boundary File using the CSDuid as the field by which the two data sets can be related. Similarly, the BLOCKuid in the Road Network Files can be used to request data extractions as part of the **Geocoding**. The following are the unique identifiers for geographic areas:

Geographic Area	Unique Identifier Code	Code Composition
Province / Territory	PRuid	2 digit province code
Federal Electoral District	FEDuid	(2 digit province code) + (3 digit federal electoral district code)
Census Metropolitan Area / Census Agglomeration	CMAuid	3 digit CMA / CA code Where there are no CMA / CAs this code is NULL
Census Tract	CTuid	(3 digit CMA / CA code) + (4 digit, decimal point, 2 digit CT Name) Where there are Census Tract Residuals this code is NULL
Urban Area	UAuid	4 digit Urban Area code Where there are Rural Residuals this code is NULL
Economic Region	ERuid	(2 digit province code) + (2 digit economic region code)
Census Division	CDuid	(2 digit province code) + (2 digit census division code)
Census Subdivision	CSDuid	(2 digit province code) + (2 digit census division code) + (3 digit census subdivision code)
Census Agricultural Region	CARuid	(2 digit province code) + (2 digit census agricultural region code)
Census Consolidated Subdivision	CCSuid	(2 digit province code) + (2 digit census division code) + (3 digit Census consolidated subdivision code)
Designated Place	DPLuid	(2 digit province code) + (4 digit designated place code) Where there are no Designated Places this code is NULL
Designated Place Census Subdivision Parts	DPL_CSDuid	(2 digit province code) + (2 digit census division code) + (3 digit census subdivision code) + (4 digit designated place code) Where there are no Designated Places this code is NULL
Dissemination Area	DAuid	(2 digit province code) + (2 digit census division code) + (4 digit dissemination area code)
Block Unique Identifier (Dissemination)	BLOCKuid	(first 4 digits of the CSDuid) + (4 digit DACODE) + (last 2 digits of the CBCODE)
Arc Unique Identifier	ARC_ID	10 digit arc code
Polygon Unique Identifier	POLY_ID	10 digit polygon code

Appendix D: Spatial file naming conventions

For the 2001 Census, spatial products disseminated to clients will have file names harmonized to the Spatial File Naming Convention. The file geography, file type, language and software type and date stamp will be imbedded within the name. Standardizing the names of the files should facilitate the storage of compressed files, all having the extension *.exe.

These file-naming conventions are based primarily on the naming conventions used for 1996 DCF / DBF. The naming conventions were expanded to include Road Network Files, Skeletal Road Network Files, population **ecumene** and other boundary files. The naming conventions were also expanded to include the dissemination year of the file to allow for versioning, as well as indicate the file format.

Each file name is 13 characters in length, which meets the requirements of ARC/INFO®'s and MapInfo®'s limitations for file name sizes. All alphabetic characters are in lower case to maintain consistency.

First Character: geographic representation of file

g	if coordinate system is Latitude / Longitude
l	if projection is Lambert Conformal Conic

Next three characters: primary geographic area of file

Geographic Area (CBF) / Product	English	French
National / Provincial	pr_	pr_
Federal Electoral District	fed	cef
Economic Region	er_	re_
Census Division	cd_	dr_
Census Subdivision	csd	sdr
Census Agricultural Region	car	rar
Consolidated Census Subdivision	ccs	sru
Census Metropolitan Area / Census Agglomeration	cma	rmr
Census Tract	ct_	sr_
Urban Area	ua_	ru_
Designated Places	dpl	ld_
Designated Places with CSD parts	dpp	ldp
Dissemination Area	da_	ad_
Population Ecumene	ecu	ecu
Agriculture Ecumene	eca	eca
Road Network File	rnf	frr
Skeletal Road Network File	srn	fsr
International Boundary Files (part of U.S.A. mainland and Alaska as well as Greenland) and surrounding hydrography (Great Lakes, St. Lawrence River, oceans, etc.)	int	int
Supporting hydrography for Census Metropolitan Areas (CMAs) and tracted Census Agglomerations (CAs)	hy_	hy_

Next three numbers: **geographic code** of coverage

National	Provincial / territorial		CMA / CA	
000	010	Newfoundland and Labrador	001	St. John's
	011	Prince Edward Island	.	
	012	Nova Scotia	.	
	013	New Brunswick	.	
	024	Québec	505	Ottawa-Hull
	035	Ontario	(etc.)	
	046	Manitoba		
	047	Saskatchewan		
	048	Alberta		
	059	British Columbia		
	060	Yukon		
	061	Northwest Territories		
	062	Nunavut		

Next character: file type (based on 1996 codes)

a Digital Boundary File (for Dissemination Warehouse only) (DBF in 1996)
b Cartographic Boundary File, detailed coverage for large-scale mapping
c Detailed interior lakes hydrographic coverage
d Digital Boundary File without shoreline
e Ecumene
f Cartographic Boundary File, generalized for desktop mapping, based on the file in GeoGratis site
h Additional cartographic international boundary coverage and hydrographic coverage of Great Lakes, St. Lawrence River and surrounding oceans
r Road Network Files (RNF and SRNF)

Following two numbers: dissemination year (date stamp for versioning)

01 disseminated in 2001
02 disseminated in 2002
03 disseminated in 2003
etc.

Next character: file format

a ARC/INFO® ArcGIS interchange file (e00)
m MapInfo® interchange file (mid & mif)

Final two characters: language

_e English
_f French

Examples of the use of the Spatial File Naming Convention

Ex. 1	CSD Cartographic Boundary File for Ontario with English attributes in MapInfo® interchange format	gcsd035b02m_e.exe gint000h02m_e.exe	Boundary layer International boundary and water layer
Ex. 2:	CT Cartographic Boundary File for Ottawa-Hull with French attributes in ARC/INFO® interchange format	gsr_505b02a_f.exe ghy_505h02a_f.exe	Boundary layer CMA / CA water layer
Ex. 3:	Road Network File for St. John's with English attributes in MapInfo® interchange format	grnf001r02m_e.exe ghy_001h02m_e.exe	Road layer CMA / CA water layer

Appendix E: Road Network Files available as standard products

Geographic Area	File name ARC/INFO®	File size (MB)	File name MapInfo®	File size (MB)
Canada	grnf000r02a_e.exe	392.5	grnf000r02m_e.exe	246.4
Newfoundland and Labrador	grnf010r02a_e.exe	11.4	grnf010r02m_e.exe	9.8
St. John's (CMA)	grnf001r02a_e.exe	1.5	grnf001r02m_e.exe	1.0
Prince Edward Island	grnf011r02a_e.exe	1.8	grnf011r02m_e.exe	1.0
Nova Scotia	grnf012r02a_e.exe	18.4	grnf012r02m_e.exe	13.2
Halifax (CMA)	grnf205r02a_e.exe	4.0	grnf205r02m_e.exe	2.6
New Brunswick	grnf013r02a_e.exe	15.8	grnf013r02m_e.exe	12.0
Moncton (CA)	grnf305r02a_e.exe	1.1	grnf305r02m_e.exe	0.6
Saint John (CMA)	grnf310r02a_e.exe	1.9	grnf310r02m_e.exe	1.3
Quebec	grnf024r02a_e.exe	90.7	grnf024r02m_e.exe	57.9
Chicoutimi-Jonquière (CMA)	grnf408r02a_e.exe	1.4	grnf408r02m_e.exe	0.8
Drummondville (CA)	grnf447r02a_e.exe	0.8	grnf447r02m_e.exe	0.3
Granby (CA)	grnf450r02a_e.exe	0.6	grnf450r02m_e.exe	0.3
Montréal (CMA)	grnf462r02a_e.exe	17.7	grnf462r02m_e.exe	8.0
Québec (CMA)	grnf421r02a_e.exe	5.2	grnf421r02m_e.exe	2.7
Saint-Jean-sur-Richelieu (CA)	grnf459r02a_e.exe	0.8	grnf459r02m_e.exe	0.3
Sherbrooke (CMA)	grnf433r02a_e.exe	1.5	grnf433r02m_e.exe	0.8
Trois-Rivières (CMA)	grnf442r02a_e.exe	1.3	grnf442r02m_e.exe	0.6
Ontario	grnf035r02a_e.exe	92.8	grnf035r02m_e.exe	55.6
Barrie (CA)	grnf568r02a_e.exe	1.1	grnf568r02m_e.exe	0.6
Belleville (CA)	grnf522r02a_e.exe	1.0	grnf522r02m_e.exe	0.5
Brantford (CA)	grnf543r02a_e.exe	0.5	grnf543r02m_e.exe	0.2
Greater Sudbury (CMA)	grnf580r02a_e.exe	1.5	grnf580r02m_e.exe	0.8
Guelph (CA)	grnf550r02a_e.exe	0.6	grnf550r02m_e.exe	0.3
Hamilton (CMA)	grnf537r02a_e.exe	3.1	grnf537r02m_e.exe	1.5
Kingston (CMA)	grnf521r02a_e.exe	1.5	grnf521r02m_e.exe	1.0
Kitchener (CMA)	grnf541r02a_e.exe	1.9	grnf541r02m_e.exe	0.9
London (CMA)	grnf555r02a_e.exe	2.3	grnf555r02m_e.exe	1.1
North Bay (CA)	grnf575r02a_e.exe	0.7	grnf575r02m_e.exe	0.4
Oshawa (CMA)	grnf532r02a_e.exe	1.4	grnf532r02m_e.exe	0.6
Ottawa (CMA)	grnf505r02a_e.exe	6.2	grnf505r02m_e.exe	3.0
Peterborough (CA)	grnf529r02a_e.exe	1.1	grnf529r02m_e.exe	0.6
Sarnia (CA)	grnf562r02a_e.exe	0.7	grnf562r02m_e.exe	0.3
Sault Ste. Marie (CA)	grnf590r02a_e.exe	0.6	grnf590r02m_e.exe	0.3
St. Catharines-Niagara (CMA)	grnf539r02a_e.exe	3.1	grnf539r02m_e.exe	1.4
Thunder Bay (CMA)	grnf595r02a_e.exe	1.1	grnf595r02m_e.exe	0.6
Toronto (CMA)	grnf535r02a_e.exe	15.0	grnf535r02m_e.exe	7.5
Windsor (CMA)	grnf559r02a_e.exe	1.8	grnf559r02m_e.exe	0.8
Manitoba	grnf046r02a_e.exe	16.9	grnf046r02m_e.exe	8.1
Winnipeg (CMA)	grnf602r02a_e.exe	3.6	grnf602r02m_e.exe	1.5
Saskatchewan	grnf047r02a_e.exe	31.2	grnf047r02m_e.exe	14.5

Geographic Area	File name ARC/INFO®	File size (MB)	File name MapInfo®	File size (MB)
Regina (CMA)	grnf705r02a_e.exe	1.6	grnf705r02m_e.exe	0.7
Saskatoon (CMA)	grnf725r02a_e.exe	2.1	grnf725r02m_e.exe	1.0
Alberta	grnf048r02a_e.exe	36.8	grnf048r02m_e.exe	18.5
Calgary (CMA)	grnf825r02a_e.exe	5.1	grnf825r02m_e.exe	2.3
Edmonton (CMA)	grnf835r02a_e.exe	6.3	grnf835r02m_e.exe	2.9
Lethbridge (CA)	grnf810r02a_e.exe	0.5	grnf810r02m_e.exe	0.2
Medicine Hat (CA)	grnf805r02a_e.exe	1.3	grnf805r02m_e.exe	0.6
Red Deer (CA)	grnf830r02a_e.exe	0.4	grnf830r02m_e.exe	0.2
British Columbia	grnf059r02a_e.exe	60.3	grnf059r02m_e.exe	44.1
Abbotsford (CMA)	grnf932r02a_e.exe	0.9	grnf932r02m_e.exe	0.4
Kamloops (CA)	grnf925r02a_e.exe	2.9	grnf925r02m_e.exe	2.9
Kelowna (CA)	grnf915r02a_e.exe	1.4	grnf915r02m_e.exe	0.9
Nanaimo (CA)	grnf938r02a_e.exe	1.1	grnf938r02m_e.exe	0.7
Prince George (CA)	grnf970r02a_e.exe	1.3	grnf970r02m_e.exe	0.8
Vancouver (CMA)	grnf933r02a_e.exe	8.6	grnf933r02m_e.exe	3.5
Victoria (CMA)	grnf935r02a_e.exe	2.0	grnf935r02m_e.exe	0.9
Yukon	grnf060r02a_e.exe	1.6	grnf060r02m_e.exe	1.3
Northwest Territories	grnf061r02a_e.exe	1.6	grnf061r02m_e.exe	0.9
Nunavut	grnf062r02a_e.exe	0.6	grnf062r02m_e.exe	0.7

Appendix F: Province / Territory Cartographic Boundary Files

Content

The Province / Territory Cartographic Boundary File for Canada contains the boundaries of all ten provinces and three territories for the 2001 Census. Province and territory refer to the major political units of Canada. From a statistical point of view, province and territory are basic areas for which data are tabulated.

The Province / Territory Cartographic Boundary File consists of polygons representing the Provinces and Territories. Every polygon encoded as part of the land area of Canada has a PRuid (a code to uniquely identify each province or territory) associated with it. The province / territory is available at the national level only. The national province / territory boundary file consists of polygons representing the ten provinces and three territories. There are more polygons than provinces / territories primarily because of the additional polygons needed to represent islands.

A breakdown of the number of polygons by province / territory are provided below for the Province / Territory Cartographic Boundary File:

Province / Territory	Polygons
Canada	5,875
Newfoundland and Labrador	658
Prince Edward Island	12
Nova Scotia	146
New Brunswick	68
Quebec	520
Ontario	251
Manitoba	75
Saskatchewan	59
Alberta	27
British Columbia	529
Yukon Territory	11
North West Territories	286
Nunavut	3,233

Arcs in the file are classified as being either boundary arcs (ARC_CLASS of “BO”) or hydrography (ARC_CLASS of “HY”). To allow users to create better choropleth maps, boundaries are not depicted in the water.

Limitations

The positional accuracy of the Cartographic Boundary Files does not support cadastral, surveying or engineering applications.

The source data used to create the products carried a wide range of different scales. Therefore, the Cartographic Boundary Files will not be precise if plotted at a larger scale than the scale of the source material used in their creation. In particular, the shorelines originally digitized at a scale of 1:1,000,000 (outside census metropolitan areas and census agglomerations) will not support large-scale mapping.

The Cartographic Boundary Files are recommended for local and regional scale mapping. Boundaries can be mapped at scales ranging from 1:1,000,000 to 1:5,000,000 as well as 1:250,000 and greater detail for maps containing data within census metropolitan areas and census agglomerations.

Data quality

Spatial data quality elements provide information on the fitness-for-use of a spatial database by describing why, when and how the data are created, and how accurate the data are. The elements include an overview describing the purpose and usage, as well as specific quality elements reporting on the lineage, positional accuracy, attribute accuracy, logical consistency and completeness. This information is provided to users for all spatial data products disseminated for the census.

Lineage

Describes the history of the spatial data, including descriptions of the source material from which the data were derived, and the methods of derivation. It also contains the dates of the source material, and all transformations involved in producing the final digital files or map products.

Creation of the hydrography layer
Water polygons from both the National Topographic Data Base (1:50,000 and the 1:250,000 maps) and National Atlas (GeoBase Hydrology Level 0) were chosen for the hydrography layer. The larger water bodies from the 1:50,000 and the 1:250,000 maps from the National Topographic Data Base were used to provide reference information within census metropolitan areas and census agglomerations. National Atlas hydrography provided information for the rest of the country. The hydrography was generalized and small lakes were removed from the boundary file.

Creation of the basic boundary layer
A basic boundary layer (without hydrography) was created from the National Geographic Base (National Geographic Base). This digital file consists of polygons with identification codes for dissemination areas, designated places and federal electoral districts.

Creation of the basic boundary layer with hydrography
The hydrography layer was integrated with the basic boundary layer to create one boundary layer with realistic shorelines, internal lakes and rivers. This layer was verified to ensure all the polygons necessary to distinguish dissemination areas, designated places and federal electoral districts were present in the layer. The verification was done against the boundary information on the National Geographic Base as well as information held in the ORACLE tables of the Query Base, a data base maintained within Statistics Canada.

Creation of the boundaries for the Cartographic Boundary Files
Individual boundary files were created by aggregating polygons in the *Basic Boundary Layer with Hydrography*. Dissemination area boundary files were created by aggregating polygons that formed individual dissemination areas. (Any boundaries that were not needed to distinguish dissemination areas were removed from the file). The boundary files were created by aggregating polygons from the dissemination area boundary files.

Attribute information for the Cartographic Boundary Files

Additional information such as the name of each boundary unit was included in the boundary files. This information was derived from the Query Base.

Finally, the files were verified, translated and appropriately labelled.

Positional accuracy

Refers to the absolute and relative accuracy of the positions of geographic features. Absolute accuracy is the closeness of the coordinate values in a dataset to values accepted as or being true. Relative accuracy is the closeness of the relative positions of features to their respective relative positions accepted as or being true. Descriptions of positional accuracy include the quality of the final file or product after all transformations.

The boundaries are derived from the National Geographic Base. The data in the National Geographic Base is stored in double precision. However, the positional accuracy of the features in the National Geographic Base varies. The data storage precision allows features that are next to each other on the ground to be placed in the correct position on the map, relative to each other, without overlap.

The positional accuracy of the Cartographic Boundary Files is based on the positional accuracy of the source material used in its production (the National Geographic Base, the National Atlas GeoBase Hydrology Level 0 hydrography and the National Topographic Data Base). The larger water bodies from the 1:50,000 and the 1:250,000 maps from the National Topographic Data Base were used to provide reference information within census metropolitan areas and census agglomerations. The National Atlas (GeoBase Hydrology Level 0) hydrography was used outside census metropolitan areas and census agglomerations. Some of the smaller inland water polygons were removed from the Cartographic Boundary Files.

Some vertices in the file were removed as a result of line generalization done (based on the Douglas-Peucker algorithm and using ARC/INFO 8.1) with a weed tolerance of 0.1 metres.

Attribute accuracy

Refers to the accuracy of the quantitative and qualitative information attached to each feature (such as population for an urban area, street name, census subdivision name and code).

The attribute data associated with the polygons in the Cartographic Boundary Files were independently verified against the data in the Query Base and found to be accurate.

Logical consistency

Describes the fidelity of relationships encoded in the data structure of the digital spatial data.

Every polygon was verified to have a code indicating whether it represented land or water.

Every polygon was also verified to have a unique identifier for the Province or Territory: the PRuid. Every case where a polygon did not have a unique PRuid was examined. Some polygons did not have unique PRuid. All of these Provinces and Territories consisted of a set of polygons that were separated by water bodies. For example, two islands, each a polygon, may belong to the same province or territory.

Every PRuid in the Dissemination Area Cartographic Boundary File was verified to be in the Query Base as a PRuid value for the 2001 Census.

The data set was tested to ensure that the size of the polygons was consistent with the geographic units being represented. Specifically, very small polygons and sliver polygons were examined. Slivers are defined here as very long, thin polygons.

The following criteria was used to detect slivers:

{(perimeter x perimeter)/area > 1,000 } AND {area < 200,000 meters}

Consistency with other products

The positions of the boundary arcs are generally consistent with those of the Road Network Files and Skeletal Road Network Files. Corrections made to the tolerances in the Road Network Files and the Skeletal Road Network Files may result in differences about of about 1-2 metres between the files.

Hydrography was specially created for the Cartographic Boundary Files to enable thematic mapping at local and regional scales. The hydrography used in the province / territory layer in the Cartographic Boundary Files differs from that used in the Reference Maps. For this reason, minor differences may be noticable between the depiction of hydrography and boundaries.

The hydrography used in the Cartographic Boundary Files was created to be consistent with the roads in the road network files. However, boundary arcs in the Road Network Files (designated by ARC_GROUP of "BO") are those present in the National Geographic Base. This very detailed information, including boundary arcs that for legal reasons are present in the water, were left as they were depicted in the National Geographic Base. The detailed information was also considered preferable for geocoding with the BLOCKuid information in the Road Network Files. However, when mapping the Cartographic Boundary Files (or the Province/Territory Cartographic Boundary layer) with the road network files, users should consider not mapping the RNF boundary arcs (ARC_GROUP of "BO") if they do not want these to fall in the water.

The provinces / terriories found in this file are consistent with those found in GeoSuite and GeoSearch.The land area for various geographic areas present in GeoSuite may not be consistent with that computed from the Cartographic Boundary Files. This is because the land/water areas in the Cartographic Boundary Files are based on hydrography that was specially generalized and created for thematic mapping.

Completeness

Refers to the degree to which geographic features, their attributes and their relationships are included or omitted in a dataset. It also includes information on selection criteria, definitions used, and other relevant mapping rules.

The number of Provinces and Territories as well as their unique identifiers was verified against the information in the Query Base. Comparisons were also made with a set of boundary files derived independently from the national geographic base.

Technical specifications

Each Cartographic Boundary File consists of only one layer of data. The boundaries of the standard geographic areas have been re-defined for thematic mapping purposes by integrating them with hydrography.

File specifications

These are the standard formats in which 2001 Census digital spatial products will be available from Geography Division.

Software formats

All products are available on CD-ROM in the following formats:

- ARC/INFO® interchange format version 8.1
  ASCII interchange file
  File extension: .e00 (spatial and tabular data)
- MapInfo® interchange format version 6.0
  ASCII interchange files
  File extensions: .MIF (graphic data), .MID (tabular data)

Installation instructions

Both the ARC/INFO® and MapInfo® are compressed in self-executable WinZip® files (file extension EXE). Users can uncompress these files by executing them in DOS, or selecting them in Windows® and double clicking on the file icon, or executing them in the RUN dialogue in Windows®.

The road names in the Road Network File contain accented characters. These characters can be seen in UNIX and Windows® versions of ARC/INFO® and MapInfo®. (They ware tested on desktop versions of ARC/INFO 8.1, MapInfo 6.0 and MapInfo 4.5. The accents were also visible in ARC/INFO 8.01 in UNIX.) To preserve accents, ArcToolbox® is recommended for importing files into the desktop version of ARC/INFO 8.1.

File names and sizes

File names are formatted in order to better indicate to the client the source of data, coverage, geographic area, language and file format of the data.

Province / Territory and tracted CMAs / CAs	ARC/INFO®		MapInfo®	
	File name	File size	File name	File size
Canada	gpr_000b02a_e	44.7	gpr_000b02m_e	66.6

Geographic representation

- All files distributed by the Geography Division are in the North American Datum of 1983 (NAD 83).
- The files are available in the geographic coordinate system (latitude / longitude).
- To make this file useful (i.e. to calculate distance) it must be projected.

Record layout and item description

Provinces / Territories record layout:

The following table shows the format of the attributes contained on the boundary files with integrated hydrographic features:

Item Name	Width	Output	Type	Decimals
AREA	8	18	F	5
PERIMETER	8	18	F	5
<File Name>#	4	5	B	0
<File Name>-ID	4	5	B	0
PRename	25	25	C	-
PRfname	25	25	C	-
PRuid	2	2	C	-
PReabbr	10	10	C	-
PRfabbr	10	10	C	-
WATER	1	1	I	-

Item Description:

Item	Description
AREA	Area of the polygon - maintained by ARC/INFO® (item not included in MapInfo files)
PERIMETER	Perimeter of the polygon - maintained by ARC/INFO® (item not included in MapInfo files)
<File name> #	maintained by ARC/INFO® for internal processing (item not included in MapInfo files)
<File name>-ID	maintained by ARC/INFO® for internal processing (item not included in MapInfo files)
PRename	the province or territory name in English
PRfname	the province or territory name in French
PRuid	uniquely identifies a province or territory
PReabbr	the official English abbreviation for the province name
PRfabbr	the official French abbreviation for the province name
WATER	value of "1" for water and "0" for land

The following arc attribute table shows the format of the attributes contained on the boundary files indicating class of arc for cartographic mapping. This is new for 2001.

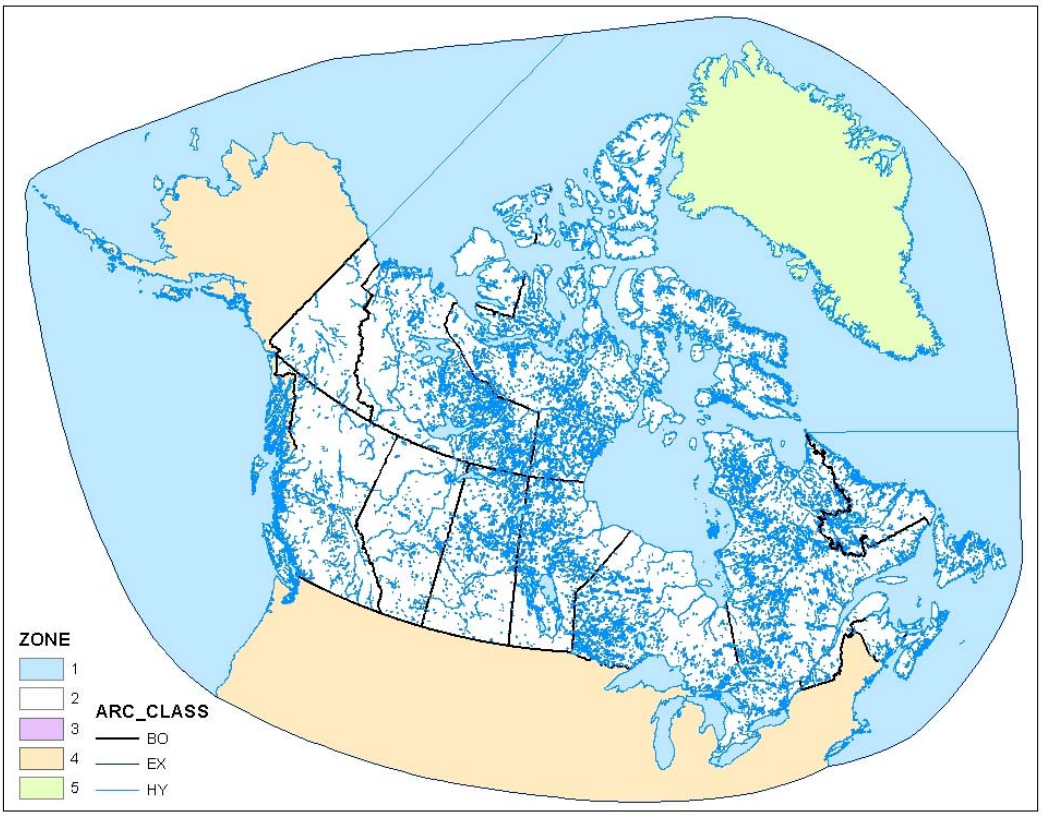
Item Name	Width	Output	Type	Decimals
FNODE#	4	5	B	0
TNODE#	4	5	B	0
LPOLY#	4	5	B	0
RPOLY#	4	5	B	0
LEGNTH	8	18	F	5
<File name> #	4	5	B	0
<File name>-ID	4	5	B	0
ARC_CLASS	2	2	C	-

Item Description:

Item	Description
FNODE#	Area of the polygon - maintained by ARC/INFO® (item not included in MapInfo files)
TNODE#	Perimeter of the polygon - maintained by ARC/INFO® (item not included in MapInfo files)
LPOLY#	Identifier for polygon on left side of the arc (not included in the MapInfo files)
RPOLY#	Identifier for polygon on right side of the arc (not included in the MapInfo files)
LENGTH	maintained by ARC/INFO®
<File name> #	maintained by ARC/INFO® for internal processing (item not included in MapInfo files)
<File name>-ID	maintained by ARC/INFO® for internal processing (item not included in MapInfo files)
ARC_CLASS	value of “BO” for boundary arcs, “HY” for hydrography arcs and “EX” for external arcs

Appendix G: Supplementary hydrography coverage

The supplementary hydrography coverage is provided to allow for the mapping of water and land outside the Canadian land mass. This coverage contains some of the oceans surrounding Canada as well as the parts of the United States of America, part of Greenland and the islands of St-Pierre and Miquelon. This hydrography coverage would enable the shading of land and water appropriately. The following diagram illustrates the extent of the supplementary hydrography:



Item Name	Width	Output	Type	Decimals
AREA	8	18	F	5
PERIMETER	8	18	F	5
<File name> #	4	5	B	0
<File name>-ID	4	5	B	0
PRuid	2	2	C	0
ZONE	1	1	I	-

Item Description

Item	Description
AREA	Area of the polygon - maintained by ARC/INFO® (item not included in MapInfo® files)
PERIMETER	Perimeter of the polygon - maintained by ARC/INFO® (item not included in MapInfo® files)
<File name> #	maintained by ARC/INFO® for internal processing (item not included in MapInfo® files)
<File name>-ID	maintained by ARC/INFO® for internal processing (item not included in MapInfo® files)
PRuid	uniquely identifies a province or territory
ZONE	value of “1” for water “2” for Canada (land), “3” for France (St-Pierre-Miquelon), “4” for surrounding continental U.S.A. and “5” for Greenland.

The following arc attribute table shows the format of the attributes contained on the boundary files indicating class of arc for cartographic mapping. This is new for 2001.

Item Name	Width	Output	Type	Decimals
FNODE#	4	5	B	0
TNODE#	4	5	B	0
LPOLY#	4	5	B	0
RPOLY#	4	5	B	0
LEGNTH	8	18	F	5
<File name> #	4	5	B	0
<File name>-ID	4	5	B	0
ARC_CLASS	2	2	C	-

Item Description:

Item	Description
FNODE#	Maintained by ARC/INFO® (item not included in MapInfo® files)
TNODE#	Maintained by ARC/INFO® (item not included in MapInfo® files)
LPOLY#	Identifier for polygon on left side of the arc (not included in the MapInfo® files)
RPOLY#	Identifier for polygon on right side of the arc (not included in the MapInfo® files)
LENGTH	Maintained by ARC/INFO®
<File name> #	Maintained by ARC/INFO® for internal processing (item not included in MapInfo® files)
<File name>-ID	Maintained by ARC/INFO® for internal processing (item not included in MapInfo® files)
ARC_CLASS	Value of “BO” for boundary arcs, “HY” for hydrography arcs and “EX” for external arcs

File Names and Sizes:

Item	English ARC/INFO®	File Size (MB)	English MapInfo®	File Size (MB)
Canada & International	gint000h02a_e	46.3	gint000h02m_e	77.4

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Geography products and services

This section provides brief descriptions of Geography products and services related to the 2001 Census. For additional details, consult the nearest Statistics Canada Regional Reference Centre.

1. Reference Maps

Reference maps show the location of the geographic areas for which census data are tabulated and disseminated. The maps display the boundaries, names and codes of standard geographic areas, as well as major cultural and physical features, such as roads, railroads, coastlines, rivers and lakes. Over 5,600 reference maps are available for the 2001 Census. Given the diversity in size of these geographic areas, different map scales and map coverages are required to show the appropriate level of detail. Descriptions of each series are provided with the individual catalogue entries below.

National Reference Maps

92F0172XCB Reference Maps – Complete Set, 2001 Census
92F0144XIB Census Divisions, 2001
92F0144XIB Economic Regions and Census Divisions, 2001
92F0144XIB Census Metropolitan Areas and Census Agglomerations, 2001
92F0144XIB Statistical Area Classification, 2001 Census Subdivisions
92F0152XPE Federal Electoral Districts (1996 Representation Order) Reference Map

92F0149XPB Census Division and Census Subdivision Reference Maps

The set of Census Division and Census Subdivision Reference Maps covers all of Canada, by province and territory. The maps show the boundaries, names and codes of census divisions (such as counties and regional districts) and census subdivisions (such as cities, towns, villages, other local municipal entities, townships and Indian reserves). The maps also show the boundaries of census metropolitan areas and census agglomerations. There are 22 maps that vary in scale (ranging from 1:310,000 to 1:3,500,000).

92F0145XPB Census Tract Reference Maps, by Census Metropolitan Area or Census Agglomeration

The series of Census Tract Reference Maps covers all 27 census metropolitan areas (CMAs) and the 19 census agglomerations (CAs) with census tracts. The maps show the boundaries and names of census tracts and census subdivisions, as well as the urban core, urban fringe and rural fringe within the CMAs or CAs. The maps include background information such as rivers, lakes, railroad tracks and provincial boundaries, and other significant features. There are 85 maps in the series, with one to four maps covering each CMA or CA. The map scales range from 1:25,000 to 1:2,000,000, and the maximum map dimensions are approximately 91 cm by 101 cm (36 inches by 40 inches).

92F0146XPB Dissemination Area Reference Maps, by Census Tract, for Census Metropolitan Areas and Census Agglomerations

The set of Dissemination Area Reference Maps by Census Tract covers all 27 census metropolitan areas (CMAs) and the 19 census agglomerations (CAs) that are part of the census tract program. Each map in the set covers one census tract (CT) and shows the boundaries and codes of dissemination areas within that CT. The maps also show census tract, census subdivision, and census metropolitan area or census agglomeration boundaries on a background of detailed street networks and other visible features such as rivers, lakes and railroad tracks.

There are approximately 4,800 maps in this set—generally one map per census tract. The dimensions of each map are approximately 27 cm by 43 cm (11 inches by 17 inches).

92F0147XPB Dissemination Area Reference Maps, by non-tracted Census Agglomeration
The set of Dissemination Area Reference Maps by Non-tracted Census Agglomeration covers the smaller census agglomerations that are not part of the census tract program. Each map in the set covers one census agglomeration (CA) and shows the boundaries and codes of dissemination areas within that CA. The maps also show the boundaries of census subdivisions (municipalities), as well as urban areas, and representative points for designated places. The maps include background information such as rivers, lakes, railroad tracks and provincial boundaries, and other significant features.

There are approximately 100 maps in this set—generally one map per census agglomeration (The maps vary in scale and size; the maximum map dimensions are approximately 91 cm by 101 cm (36 inches by 40 inches).

92F0148XPB Dissemination Area Reference Maps, by Census Division, for Areas Outside Census Metropolitan Areas and Census Agglomerations
The set of Dissemination Area Reference Maps by Census Division covers areas outside census metropolitan areas (CMAs) and census agglomerations (CAs). Each map in the set covers one census division (CD) and shows the boundaries and codes of dissemination areas within that CD. The maps also show the boundaries of census subdivisions, census metropolitan areas and census agglomerations, as well as urban areas and representative points for designated places. The maps include background information such as rivers, lakes, railroad tracks and provincial boundaries, and other significant features.

2. Geographic Data Products

Geographic data products are those that contain 2001 Census population and dwelling counts.

93-360-XPB National Overview Tables, 2001 Census
The National Overview tables provide population and dwelling counts established by the 2001 Census of Canada. The levels of geography covered are Canada, provinces and territories, and other geographic areas including census subdivisions (municipalities), census metropolitan areas and census agglomerations. For selected geographies, the tables provide percentage change in the population and dwellings between 1996 and 2001. Data are also provided for land area and population density. Geographic boundaries are those in effect on January 1, 2001.

92F0150XCB GeoSuite, 2001 Census
GeoSuite is a tool for data retrieval, query and tabular output, with software and data on a CD-ROM. GeoSuite allows users to explore the links between all standard levels of geography and to determine geographic codes, names, and population and dwelling counts. GeoSuite includes a dissemination area (DA) reference map listing that facilitates identification of appropriate DA reference maps.

92F0086XCB Postal Codes Counts
Note: Postal code products for the 2001 Census are currently under review. The planned release for these products is in the fourth quarter of 2002. Until that time, postal codes products containing 1996 Census data will continue to be available.

Postal Code Counts, 1996 Census contains population and dwelling counts for all six character postal codes reported by respondents. The population and dwelling counts are provided by

individual postal code, by forward sortation area (FSA - the first three character of the six-character postal code) and by province or territory. The data are provided with Windows-based software that enables users to perform simple data manipulations such as searching the data set for specific postal codes, importing groups of postal codes for which counts are required and exporting groupings of postal codes. Documentation and reference material are contained in electronic form on the CD-ROM.

3. Spatial Information Products

Spatial information provides the shape and location of geographic features. The boundaries, road network and other features of standard geographic areas are available in digital form for mapping and geographic information system (GIS) applications. These products include Cartographic Boundary Files (CBFs), Road Network Files (RNFs) and Skeletal Road Network Files (SRNFs).

Cartographic Boundary Files, 2001 Census

Cartographic Boundary Files (CBFs) contain the boundaries of standard geographic areas together with the shoreline around Canada and the larger inland lakes, all integrated in a single layer. The coordinates are latitude / longitude and are based on the North American Datum of 1983 (NAD83). The Cartographic Boundary Files for 2001 replace the Digital Cartographic Files produced for the 1996 Census.

Cartographic Boundary Files can be used with Census of Population, Census of Agriculture or other Statistics Canada data for data analysis and thematic mapping (with appropriate software). Geographic codes provide the linkage between the statistical data and the geographic area boundaries. CBFs can also be used to create new geographic areas by aggregating standard geographic areas, and for other data manipulations available with the user's software. The CBFs can be used with the Road Network Files and Skeletal Road Network Files, which provide additional geographic context for mapping applications.

92F0160XCE Provinces and Territories Cartographic Boundary File
92F0163XCE Federal Electoral Districts (1996 Representation Order) Cartographic Boundary File
92F0161XCE Census Divisions and Economic Regions Cartographic Boundary File
92F0167XCE Census Consolidated Subdivisions Cartographic Boundary Files
92F0162XCE Census Subdivisions Cartographic Boundary Files
92F0165XCE Designated Places Cartographic Boundary File
92F0166XCE Census Metropolitan Areas / Census Agglomerations Cartographic Boundary File
92F0168XCE Census Tracts Cartographic Boundary Files
92F0164XCE Urban Areas Cartographic Boundary File
92F0169XCE Dissemination Areas Cartographic Boundary Files

92F0159XCE Population Ecumene Census Division Boundary File, 2001 Census

The Population Ecumene Census Division Boundary File contains a generalized population ecumene based on 2001 Census population density data with at least one ecumene polygon for every census division (CD). It can be used to produce small-scale thematic maps of statistical data.

For the 2001 Census, a population ecumene was defined based on population density criteria at the block level. The resulting detailed population ecumene polygons were generalized and small, non-contiguous ecumene pockets were aggregated to ensure visibility for small-scale thematic mapping at the census division level. When ecumene boundaries are used for dot and choropleth mapping, they give a more accurate depiction of the spatial distribution of data within standard geographic areas.

The Population Ecumene Census Division Boundary File is available as a standard package for Canada free on the Internet or it can be purchased on CD-ROM through the nearest regional office. This file is not a Cartographic Boundary File and it has its own reference guide.

92F0039XDE Forward Sortation Areas Boundary File
Note: Postal code products for the 2001 Census are currently under review. The planned release for these products is in the fourth quarter of 2002. Until that time, postal code products containing 1996 Census data will continue to be available.

The **1996 Census Forward Sortation Areas Digital Cartographic File** is available as a standard package for Canada. It depicts forward sortation area (FSA) boundaries derived from postal codes captured from the 1996 Census questionnaires. Through analysis of the postal codes reported by census households, a single FSA was assigned to each enumeration area (most often the FSA reported by the largest number of census households). FSA polygons were formed by grouping enumeration areas. Therefore, the Census based FSA boundaries are not equivalent to FSA boundaries in use by Canada Post, but are representations created from enumeration areas.

92F0157XCE Road Network Files, 2001 Census
Road Network Files (RNF) contain a road layer for the entire country and a province / territory boundary layer. The road layer includes roads, with road names and address ranges (arc attributes), and geographic codes to identify blocks, census subdivisions, census metropolitan areas / census agglomerations, and provinces / territories (polygon attributes). Address ranges are mainly available in the large urban centres of Canada. The province / territory boundary layer incorporates hydrography (the shoreline around Canada and the larger inland lakes) with the boundaries and the geographic codes. The digital coordinates are in latitude / longitude and are based on the North American Datum of 1983 (NAD83).

Road Network Files are available for Canada, for individual provinces and territories, and for census metropolitan areas (CMAs) and those census agglomerations (CAs) with census tracts.

92F0158XCE Skeletal Road Network Files, 2001 Census
The Skeletal Road Network Files (SRNF) contain selected roads (with road names, but no addresses) that are derived from Road Network Files (Catalogue No. 92F0157XCE). The selected roads are ranked according to four levels of detail. The different levels of detail are suitable for mapping at small to medium scales. The SRNF can be used to provide some cartographic reference features when producing thematic maps with the Cartographic Boundary Files. The positional accuracy of the SRNF does not support cadastral, surveying or engineering applications. The SRNF does not include hydrography.

The Skeletal Road Network Files are available for Canada, provinces and territories, and census metropolitan areas (CMAs) and tracted census agglomerations (CAs).

4. Attribute Information Products

Attribute information products are those that give descriptive information about the features. The attribute files include Postal Code Conversion File (PCCF) and Postal Code by Federal Ridings File (PCFRF).

92F0027XCB Postal Code Conversion File
The Postal Code Conversion File (PCCF) provides a link between six-character postal code and standard 1996 Census geographic areas (such as enumeration areas, municipalities, census tracts). It also provides the x,y (latitude / longitude) coordinates for a point representing the approximate location of the postal code to support mapping.

The PCCF is available as standard packages for Canada, the provinces and territories, census metropolitan areas (CMAs) and some census agglomerations (CAs). A reference guide is included.

92F0027UCB Postal Code Conversion File – Update
The Postal Code Conversion File (PCCF) is updated with new postal codes on a semi-annual basis and is available in January and July. Clients must purchase the Postal Code Conversion File at the initial price; then subsequent updated files (92F0027UDB) may be purchased at the update or subscription rate. The update rate is a flat rate that in most cases is much lower than the initial purchase price. An additional 25% discount on updates is given to PCCF update subscribers. The subscription requires clients to pay in advance for at least one updated file per year until the PCCF reflecting the geography of the 2001 Census is released.

The PCCF Updates are available as standard packages for Canada and the provinces and territories. A reference guide is included.

92F0028XDB Postal Codes by Federal Ridings (1996 Representation Order) File
The Postal Codes by Federal Ridings File (PCFRF) provides a link between the six character postal codes and the federal electoral districts (1996 Representation Order). A federal electoral district (FED), commonly referred to as a federal riding, is an area represented by a Member of Parliament in the House of Commons.

The PCFRF is intended as a tool for use with administrative files containing postal codes. By using the postal code as a link, data from administrative files may be organised and/or tabulated by federal riding. This PCFRF allows a link of more than 680,000 postal code records to the 301 federal electoral districts.

The PCFRFs are available as standard packages for Canada and five regions. A reference guide is included.

92F0028XDB Postal Codes by Federal Ridings (1996 Representation Order) File – Update
The Postal Code by Federal Ridings File (PCFRF) is updated with new postal codes on a semi-annual basis and is available in January and July. Updates released in July provide new postal codes effective January of the release year. Updates released in January provide new postal codes in use in July of the previous year. Clients who purchase the PCFRF (92F0028XDB) at the initial price may then purchase subsequent updated files (92F0028UDB) at the update rate (see Table 13 for details).

The PCFRF Updates are available as standard packages for Canada and five regions.

5. Geographic Services

A variety of services is available, including custom mapping, custom data extraction (geocoding) and the development of custom geography products.

97C0006 Geography Custom Service

If standard geography products do not satisfy a client's needs, the Geography Custom Service is available to produce non-standard geographic products. Examples include alternative packaging of geographic files, special data retrievals, manipulations or merges using any of the geography computer files (postal codes, attribute files, boundary files and road network files). Contact the nearest regional office for details.

97C0005 Custom Area Creation Service (formerly Geocoding Service)

The Custom Area Creation Service (formerly called Geocoding Service) allows users to define their own geographic areas of study (user-defined areas or aggregations of standard census geographic areas) for census data tabulations. This custom geography is produced from the aggregation of blocks, or where necessary, block-faces within the road network file coverage. The custom area files thus created are then passed to Census for data tabulation. Contact the nearest regional office for details.

97C0007 Geography Custom Mapping

Thematic maps and other maps, specially designed to meet customer needs, can be produced. Contact the nearest regional office for details.

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