Catalogue no. 92-155-GIE

Road Network and Geographic Attribute File, Reference Guide

Census year 2006

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Statistics Canada

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Published by authority of the Minister responsible for Statistics Canada

March 2007

Catalogue no. 92-155-GIE
ISBN 978-0-662-45243-0

Frequency: every 5 years

Ottawa

La version française de cette publication est disponible sur demande (nº 92-155-GIF au catalogue).

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?

- The 2006 Road Network and Geographic Attribute File replaces the 2001 Skeletal Road Network File as a comprehensive road network.

- This 2006 Census spatial information product now includes the following levels of geography which are attached to each side as an attribute of the arc: province/territory, census metropolitan area/census agglomeration, census subdivision and census tract.

- The attribute "RB_UID" provides a unique identifier for every arc, replacing the "ARC_ID" and "SOURCE" attributes.

- Road rank is presented as one attribute with four categories.

- Geography Markup Language (GML) format version 2.1.2 available.

Table of contents

1. About this guide

This reference guide is intended for users of the 2006 Road Network and Geographic Attribute File. The guide provides an overview of the file, the methodology used to create it, and important technical information for users.

Section 4, Data quality gives a description of the various steps in the creation of the 2006 Road Network and Geographic Attribute File. 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 instructions, record layout, and item descriptions. See Appendix B for file sizes.

Geographic terms and concepts found throughout the text are described in Appendix C: Glossary.

This reference guide does not provide details on specific software packages that are available for use with the 2006 Road Network and Geographic Attribute File. Users are advised to contact the appropriate software vendor for information.

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Abbreviations

- CCOG – Canadian Council on Geomatics
- DCW – Digital Chart of the World
- EC – Elections Canada
- GML – Geography Markup Language (OGC)
- NGD – National Geographic Database
- NRCan – Natural Resources Canada
- NRN – National Road Network (NRCan)
- NTDB – National Topographic Database
- OGC – Open Geospatial Consortium
- RNF – Road Network File
- RNGAF - Road Network and Geographic Attribute File
- SDI – Spatial Data Infrastructure
- SNF – Street network files (pre-2001)
- STC – Statistics Canada
- USBC – United States Bureau of Census

2. Overview

This guide covers the content, coverage and quality of the 2006 Road Network and Geographic Attribute File created from the road layer coverage in Statistics Canada's digital geographic database, the Spatial Data Infrastructure. The file reflects the Spatial Data Infrastructure road layer content as it existed on January 1, 2006.

The Spatial Data Infrastructure road layer was constructed as a tool to support data collection and dissemination of the Census of Population. Both road features and geographic attributes were selected from this database to create the 2006 Road Network and Geographic Attribute File. This file represents the road network for the 2006 Census and is the base for 2006 geographic products and services.

The 2006 Road Network and Geographic Attribute File contains information such as road name, type, direction, address range and road rank. Address ranges are mostly dwelling-based and occur mainly in large urban centres of Canada. Also included on each side of every road arc are identification names and codes for the following levels of geography:

- province/territory
- census subdivision
- census metropolitan area
- census agglomeration
- census tract

The 2006 Road Network and Geographic Attribute File provides digital line coverage for Canada. There are 14 standard files:

- Canada
- 10 provinces and three territories

The 2006 Road Network and Geographic Attribute File's digital coordinates are in latitude/longitude based on the North American Datum of 1983 (NAD83). The standard product is available in ArcInfo® (.shp), Geography Markup Language (.gml) and MapInfo® (.tab) formats. See technical specifications (section 5) for more details on record layouts and file formats.

Reference date

The geographic reference date is a date determined by Statistics Canada to finalize the geographic framework for which census data are collected, tabulated and reported. The geographic reference date for the 2006 Census is January 1, 2006.

3. How to use this product

Purpose of the product

The 2006 Road Network and Geographic Attribute File is a geographic reference product and geocoding tool for use with the 2006 Census geographic and data products.

It is recommended that the 2006 Road Network and Geographic Attribute File be used as a basis for the retrieval of 2006 Census data for user-defined areas. Users can define their custom areas based on roads within the file. Road arcs within the 2006 Road Network and Geographic Attribute File correspond to the 2006 geographic frame, which facilitates the geocoding process. For information on custom area creation and geocoding services, please contact the National Inquiries line at 1-800-263-1136 or infostats@statcan.ca.

Limitations

Statistics Canada maintains road network file 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, relative positional accuracy takes precedence over absolute positional accuracy. The 2006 Road Network and Geographic Attribute File does not contain street information required for route optimization. For example, data on one-way streets, dead-ends and other street obstacles are not included in the file. Consequently, this file is not recommended for engineering applications, emergency dispatching services, surveying or legal applications.

The 2006 Road Network and Geographic Attribute File contains 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 2006 Road Network and Geographic Attribute File should be recognized for uses other than the mapping, analysis and retrieval of census data. See section 4, Data quality, for information related to the effective use of this file.

General methodology

The 2006 Road Network and Geographic Attribute File is based on road network components extracted from Statistics Canada’s Spatial Data Infrastructure. The Spatial Data Infrastructure serves as the current and dynamic database maintaining Geography Division’s geographic frame over time. Changes to the geographic frame result from events such as road network updates and municipal boundary changes. The resulting database serves as an input to the development of query tools, dissemination products and various mapping applications. The Spatial Data Infrastructure is the source for all 2006 Census dissemination geographic units, geography products and geocoding services.

Content

This product contains information such as road name, type, direction, address range and road rank. Address ranges are dwelling-based and occur mainly in large urban centres of Canada. Also included on each side of every road arc are identification names and codes for the following four levels of geography:

- province/territory
- census metropolitan area/census agglomeration
- census subdivision
- census tract

Comparisons to the 2001 Skeletal Road Network File

Differences between the 2006 Road Network and Geographic Attribute File and the 2001 Skeletal Road Network Files are:

- The 2006 Road Network File contains additional roads, road names and address ranges.
- RB_UID replaces ARC_ID as the attribute which uniquely identifies road arcs.
- Levels of geography now included as an attribute of each road arc: province/territory, census metropolitan area/census agglomeration, census subdivision and census tract.
- Third format available: Geographic Markup Language (GML) version 2.1.2.
- The 2006 Road Network and Geographic Attribute File is not compatible with 2001 Census Geography products. See section 4, Data quality, Consistency with other products, for more details.

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 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

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.

Road layer

The data in the road layer were derived from Statistics Canada's Spatial Data Infrastructure environment based on a copy of the National Geographic Database. The National Geographic Database is a spatial database that contains the road network in Canada, as well as road attributes (name, type, direction, and address ranges). The National Geographic Database was originally built from four main data sources:

- Statistics Canada Street Network Files
- National Topographic Database 1:50,000 and 1:250,000 maps
- Digital Chart of the World 1:1,000,000 maps
- Elections Canada road data

Additional road information was incorporated from a variety of other sources, including municipal maps and road data from private companies. However, the timeliness of the National Geographic Database varies from region to region depending on the source data. Table 4.1 provides details on the distribution of road arcs by source.

Table 4.1 Road arc counts and summed length values by data source

Source	Number of arcs	Arc length (kilometres)
Elections Canada	889,639	855,209
Statistics Canada	458,732	106,526
Other	203,356	127,642
Municipal	190,044	76,194
National Topographic Base 1: 50,000	106,084	96,399
National Topographic Database 1: 250,000	21,709	64,130
Total	**1,869,564**	**1,326,100**

Source: Spatial Data Infrastructure (SDI), June 2006.

Described below are the steps taken to incorporate data from various sources into the 2006 Road Network and Geographic Attribute File:

The 1996 Street Network Files
In census metropolitan areas and larger census agglomerations, the 1996 Street Network Files from Statistics Canada were the primary data source. These files were created from various source maps at different scales, and maintained by the Statistics Canada Geography Division over more than twenty-five years. They contained road names, address ranges and a rich set of road arcs. The maps used to build and maintain these files had varying scales and different vintages. Therefore, the quality of its geometry varies from place to place in terms of absolute positional accuracy.

Information within the 2006 Street Network Files was updated, enhanced, and incorporated into the National Geographic Database during a build phase. Features that were not roads were removed. Streets were geometrically adjusted (i.e., rubber sheeted) to match the superior positional precision of the NTDB. The format of address ranges was not changed, except the type of the values was changed from character to numeric. In most cases, road names in all upper case letters were converted to names in upper and lower case. The length of the field that contains the road names was also increased to accept full names instead of abbreviations.

National Topographic Database
The National Topographic Database, produced by Natural Resources Canada, has a stable and precise geometry and a standardized road classification scheme. In the more densely populated parts of Canada, its scale is 1: 50,000, while in the more northern and sparsely populated areas the scale is 1: 250,000. Unlike the Street Network Files, the NTDB contains no civic address range or road name information. The NTDB served as the source of the road network for most of southern Canada, outside of census metropolitan areas and large census agglomerations that were covered by the SNFs and Elections Canada data.

The NTDB geometry is the adopted standard for the National Geographic Database. All spatial data used in the creation of the NGD were vertically adjusted (rubber sheeted) and edge matched to approach the largest scale NTDB geometry.

Digital Chart of the World
The Digital Chart of the World is a 1: 1,000,000 scale digital map, built primarily for aeronautical charts. It was used in the database to add road geometry to the sparsely populated portion of Canada, mainly in the north. It does not contain road names or address ranges.

Elections Canada Geographic Database
In 1993, Elections Canada started to compile their Geographic Database, using data from the Street Network Files, National Topographic Database and Digital Chart of the World. Paper maps were created for areas not covered by the SNFs and distributed to the Elections Canada returning officers who added the road names with information from the field. Elections Canada updated the road network with new roads and added the road names but not address ranges.

Due to the addition of new roads, the resulting geometry does not always match the initial NTDB geometry. Wherever more recent Elections Canada data would improve the quality and quantity of road information, it was added to the Statistics Canada Street Network Files to form the National Geographic Database. The content derived from Elections Canada is primarily new roads and road names. 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.

Other sources
In addition to digital maps from other federal, provincial, municipal and licensed private sources, portions of the National Geographic Database contain information from Elections Canada Returning Officers (maps for the 38th General Election, held in the summer of 2004), Statistics Canada Regional Offices (1996 Enumeration Area Collection maps), data from Statistic Canada's 2001 Census, and other materials prepared by private companies, such as PLANET, which originates from the New Brunswick real property information system.

Positional accuracy

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.

Absolute positional accuracy

Absolute positional accuracy describes the degree to which the position of features in a geographic database reflects their true position on the ground (i.e., the closeness of reported coordinate values to values accepted as true).

The information present in the Spatial Data Infrastructure road layer is provided for the purposes of statistical analysis and census operations only. The absolute position of roads on the SDI varies with the source files and documents used to build and maintain the database. Therefore, the SDI is not suitable for high precision measurement applications such as engineering, property transfers, or other uses that might require highly accurate measurements of the earth's surface.

During the build phase, the road layer was rubber sheeted to match the position of those on the NTDB (which was used for reference purposes). After the build, the rubber sheeting process was applied to the materials used to maintain and improve the content of the road network. It is therefore expected that these geometrically matched arcs will have a positional accuracy similar to the corresponding reference data used during development of the 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 NTDB/DCW data. For example, in major urban centres 1:50,000 NTDB data were generally used as the reference data. As a result, in these areas, roads that were geometrically matched have a positional accuracy similar to roads on the NTDB data (i.e., approx. ±10 metres). In areas that used 1:250,000 NTDB and DCW reference data, the positional accuracy of roads that were geometrically matched is approximately ±300 metres (NTDB) and between ±2,100 and ±4,300 metres (DCW), respectively.

The positional accuracy of arcs that could not be matched because they were not present in the reference data is not measured. These arcs were digitized on screen from paper maps annotated by Elections Canada's returning officers and Statistics Canada's regional officers. Although accurate in their attribute information and their relative position in relation to other features, the absolute positional accuracy of these roads is unknown.

Absolute positional accuracy is not a requirement for electoral and census processes.

Relative positional accuracy

Relative positional accuracy describes the degree to which the position of features in a geographic database reflects their true ground relationships.

For the National Geographic Database, relative positional accuracy is important. A road must appear in the proper position relative to other roads and physical features.
During the build phase, the dataset was thoroughly tested for relative positional accuracy. The road network was overlaid onto the hydrographical, power line and railroad layers.

Attribute accuracy

Attribute accuracy refers to the accuracy of quantitative attributes and the correctness of non-quantitative attributes. Two road attributes were tested for accuracy: road name (name) and road address range ('ADDR_FM_LE', 'ADDR_TO_LE', 'ADDR_FM_RG' 'ADDR_TO_RG'). Road address range considers the completeness of addressing on individual arcs.

Road name

During the build phase, every effort was made to insure a proper transfer and association of a specific attribute (i.e., name, type, direction, and address range) to a specific geometric feature. This includes the association as well as its accuracy.

Measures on number of road name and address range attributes have been presented in Table 4.2.

Road address range

Two tests were conducted to determine the attribute accuracy of address features on the base. First, the results from the current version of the Spatial Data Infrastructure were compared to the previous version of the Spatial Data Infrastructure within the National Geographic Database in order to identify any increases or decreases in the number of addressable roads and block-faces. Secondly, a check was run on the 2001 addresses to determine which 2006 geographic area they fell into, then those same addresses were compared to the 2006 geographic area derived using a 2001/2006 correspondence file.

Logical consistency

Logical consistency refers to the fidelity of relationships between all variables in a dataset. For example, a road arc that does not have a road name should not have a road type.

During the build phase, the National Geographic Database dataset was thoroughly tested for logical consistency. Any violations of logical consistency were corrected, and 100% of the data are logically consistent.

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

Consistency with other products

The position of the arcs in the 2006 Road Network and Geographic Attribute File is generally consistent with the 2006 Road Network File, 2005 Road Network File and 2006 Cartographic and Digital Boundary Files, but is not necessarily consistent with those of the 2001 Cartographic Boundary Files or the 2001 Road Network and Skeletal Road Network Files.

Completeness

Completeness refers to the presence or absence of features, their attributes and relationships. Many new road features that were not previously found on earlier digital files at Elections Canada and Statistics Canada have been added to the National Geographic Database in order to create a more complete NGD road layer for all of Canada.

Roads

Many roads not present in the 2001 Skeletal Road Network File product were added to the 2006 Road Network and Geographic Attribute File in order to improve nation-wide coverage. Table 4.2 shows the number of road arcs on the 2006 Road Network and Geographic Attribute File.

Table 4.2 Number of road arcs in the 2006 Road Network and Geographic Attribute File

National level	Number of arcs	Arc length (kilometres)	Number of arcs with full address range on at least one side
With road name	1,462,249	688,757	1,054,937
Without road name	407,315	637,342	11
Canada	**1,869,564**	**1,326,099**	**1,054,948**

Source: Spatial Data Infrastructure (SDI), June 2006.

5. Technical specifications

Software formats

The 2006 Road Network and Geographic Attribute File is available for download from the Statistics Canada website in the following formats:

- ArcInfo® version 9.0
  File extension: **.shp**

- Geography Markup Language (GML) version 2.1.2
  File extension: **.gml**

- MapInfo® version 7.0
  File extension: **.tab**

Installation instructions

The ArcInfo®, Geography Markup Language and MapInfo® files are compressed into WinZip® files (file extension .zip).

An additional template (.tem) file is included with the Geography Markup Language files for use with the Java Unified Mapping Platform (JUMP) free GIS data viewer.

The road names in the 2006 Road Network and Geographic Attribute File contain accented characters. These characters can be seen in UNIX and Windows® versions of ArcInfo® and MapInfo®. They were tested on desktop versions of ArcGIS® 8.3 and 9.0 and MapInfo® 7.0 and 7.8. The accents were also visible in ArcInfo® 8.01 in UNIX. To preserve accents, ArcToolbox™ is recommended for imprinting files into the desktop version of ArcGIS® 9.0.

Data descriptions and record layouts

Geographic representation

The 2006 Road Network and Geographic Attribute File is available for download from the Statistics Canada website in the following geographic representation:

Datum:	NAD 83
Coordinates:	Latitude / Longitude

Record layout and item/field descriptions

Table 5.1 Road Network and Geographic Attribute File record layout — ArcInfo® (.shp), Geography Markup Language(.gml) and MapInfo® (.tab) files

Attribute name	Data type	Description
FID	Object ID (4)	Specific to ArcInfo®
Shape	Geometry	Specific to ArcInfo®
Centreline	PropertyType	Shape geometry; specific to Geography Markup Language files
RB_UID	number (11)	Unique identifier of the arc.
NAME	char (43)	Road name associated with the arc.
TYPE	char (6)	Road type associated with the arc.
DIRECTION	char (2)	Road direction associated with the arc.
ADDR_FM_LE	number (11)	Civic address at the FROM node, left-hand side of arc.
ADDR_TO_LE	number (11)	Civic address at the TO node, left-hand side of arc.
ADDR_FM_RG	number (11)	Civic address at the FROM node, right-hand side of arc.
ADDR_TO_RG	number (11)	Civic address at the TO node, right-hand side of arc
PRUID_LE	char (2)	Province or territory code, left-hand side of arc.
PRNAME_LE	char (51)	Province or territory name, bilingual, left-hand side of arc.
PRENAME_LE	char (25)	Province or territory name, in English, left-hand side of arc.
PRFNAME_LE	char (25)	Province or territory name, in French, left-hand side of arc.
PRUID_RG	char (2)	Province or territory code, right-hand side of arc.
PRNAME_RG	char (51)	Province or territory name, bilingual, right-hand side of arc.
PRENAME_RG	char (25)	Province or territory name, in English, right-hand side of arc.
PRFNAME_RG	char (25)	Province or territory name, in French, right-hand side of arc.
CSDUID_LE	char (7)	Census subdivision unique identifier, left-hand side of arc (composed of the 2-digit province/territory code, the 2-digit census division code, and the 3-digit census subdivision code).
CSDNAME_LE	char (51)	Census subdivision name, left-hand side of arc.
CSDTYPE_LE	char (3)	Census subdivision type, left-hand side of arc.
CSDUID_RG	char (7)	Census subdivision unique identifier, right-hand side of arc (composed of the 2-digit province/territory code, the 2-digit census division code, and the 3-digit census subdivision code).
CSDNAME_RG	char (51)	Census subdivision name, right-hand side of arc.
CSDTYPE_RG	char (3)	Census subdivision type, right-hand side of arc.
CMAUID_LE	char (3)	Census metropolitan area and census agglomeration unique identifier, left-hand side of arc.
CMANAME_LE	char (31)	Census metropolitan area or census agglomeration name, left-hand side of arc.
CMAUID_RG	char (3)	Census metropolitan area and census agglomeration unique identifier, right-hand side of arc.
CMANAME_RG	char (31)	Census metropolitan area or census agglomeration name, right-hand side of arc.

Table 5.1 Road Network and Geographic Attribute File record layout — ArcInfo® (.shp), Geography Markup Language(.gml) and MapInfo® (.tab) files (continued)

Attribute name	Data type	Description
CTUID_LE	char (10)	Census tract unique identifier, left-hand side of arc (composed of 3-digit CMA/CA code followed by the 7 character CTNAME).
CTUID_RG	char (10)	Census tract unique identifier, right-hand side of arc (composed of 3-digit CMA/CA code followed by the 7 character CTNAME).
RANK	char (1)	Road rank.

Source: Spatial Data Infrastructure (SDI), June 2006.

Attribute domain values

Road name
The null value is used to represent values of the road arc's name, type and direction that are either missing or non-existent.

Road type
The null value is used to represent values of the road arc's name, type and direction that are either missing or non-existent.

Table 5.2 Road type

Type	Description	Type	Description	Type	Description
< Null >	no type	EXPY	Expressway (E)	PINES	Pines (E)
ABBEY	Abbey (E)	EXTEN	Extension (E)	PLACE	Place (F)
ACCESS	Access (E)	FARM	Farm (E)	PL	Place (E)
ACRES	Acres (E)	FIELD	Field (E)	PLAT	Plateau (E)
ALLÉE	Allée (F)	FOREST	Forest (E)	PLAZA	Plaza (E)
ALLEY	Alley (E)	FWY	Freeway (E)	PT	Point (E)
AUT	Autoroute (F)	FRONT	Front (E)	PVT	Private (E)
AV	Avenue (F)	GDNS	Gardens (E)	PROM	Promenade (F)
AVE	Avenue (E)	GATE	Gate (E)	QUAY	Quay (E)
BAY	Bay (E)	GLADE	Glade (E)	RANG	Rang (F)
BEACH	Beach (E)	GLEN	Glen (E)	RG	Range (E)
BEND	Bend (E)	GREEN	Green (E)	REACH	Reach (E)
BLVD	Boulevard (E)	GRNDS	Grounds (E)	RIDGE	Ridge (E)
BOUL	Boulevard (F)	GROVE	Grove (E)	RTOFWY	Right of Way (E)
BROOK	Brook (E)	HARBR	Harbour (E)	RISE	Rise (E)
BYPASS	By-pass (E)	HAVEN	Haven (E)	RD	Road (E)
BYWAY	Byway (E)	HEATH	Heath (E)	RDPT	Rond Point (F)
CAMPUS	Campus (E)	HTS	Heights (E)	ROUTE	Route (F)
CAPE	Cape (E)	HGHLDS	Highlands (E)	RTE	Route (E)

Table 5.2 Road type (continued)

Type	Description	Type	Description	Type	Description
CAR	Carre (F)	HWY	Highway (E)	ROW	Row (E)
CERCLE	Cercle (F)	HILL	Hill (E)	RUE	Rue (F)
CHASE	Chase (E)	HOLLOW	Hollow (E)	RLE	Ruelle (F)
CH	Chemin (F)	IMP	Impasse (F)	RUIS	Ruisseau (F)
CIR	Circle (E)	ISLAND	Island (E)	RUN	Run (E)
CIRCT	Circuit (F)	KEY	Key (E)	SECTN	Section (E)
CLOSE	Close (E)	KNOLL	Knoll (E)	SENT	Sentier (F)
COMMON	Common (E)	LANDING	Landing (E)	SIDERD	Sideroad (E)
CONC	Concession (E)	LANE	Lane (E)	SQ	Square (E)
CRNRS	Corners (E)	LANEWY	Laneway (E)	ST	Street (E)
CÔTE	Côte (F)	LMTS	Limits (E)	STROLL	Stroll (E)
COUR	Cour (F)	LINE	Line (E)	SUBDIV	Subdivision (E)
CRT	Court (E)	LINK	Link (E)	TERR	Terrace (E)
COVE	Cove (E)	LKOUT	Lookout (E)	TSSE	Terrasse (F)
CRES	Crescent (E)	LOOP	Loop (E)	TLINE	Townline (E)
CROFT	Croft (E)	MALL	Mall (E)	TRACE	Trace (E)
CROIS	Croissant (F)	MANOR	Manor (E)	TRAIL	Trail (E)
CROSS	Crossing (E)	MAZE	Maze (E)	TRNABT	Turnabout (E)
CRSSRD	Crossroads (E)	MEADOW	Meadow (E)	VALE	Vale (E)
CDS	Cul-de-sac (E)	MEWS	Mews (E)	VIEW	View (E)
CTR	Center (E)	MONTÉE	Montée (F)	VILLGE	Village (E)
DALE	Dale (E)	MOUNT	Mount (E)	VILLAS	Villas (E)
DELL	Dell (E)	ORCH	Orchard (E)	VISTA	Vista (E)
DIVERS	Diversion (E)	PARADE	Parade (E)	VOIE	Voie (F)
DOWNS	Downs (E)	PARC	Parc (F)	WALK	Walk (E)
DR	Drive (E)	PK	Park (E)	WAY	Way (E)
ÉCH	Échangeur (F)	PKY	Parkway (E)	WHARF	Wharf (E)
END	End (E)	PASS	Passage (E)	WOOD	Wood (E)
ESPL	Esplanade (E)	PATH	Path (E)	WYND	Wynd (E)
ESTATE	Estates (E)	PTWAY	Pathway (E)	…	…

… not applicable

Source: Spatial Data Infrastructure (SDI), June 2006.

Road 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.

The null value is used to represent values of the road arc's name, type and direction that are either missing or non-existent.

Table 5.3 Road direction

Code	Description
Null	No type
E	East / Est
N	North / Nord
NE	North East / Nord-est
NO	Nord-ouest
NW	North West
O	Ouest
S	South / Sud
SE	South East / Sud-est
SO	Sud-ouest
SW	South West
W	West

Source: Spatial Data Infrastructure (SDI), June 2006.

Civic addresses (ADDR_FM_LE, ADDR_TO_LE, ADDR_FM_RG, ADDR_TO_RG)
A zero "0" is used when an address does not exist or is not known. This applies to all of the following:

ADDR_FM_LE:

The civic address of the road feature found on the left-hand side of the arc at the FROM node.

ADDR_FM_RG:

The civic address of the road feature found on the right-hand side of the arc at the FROM node.

ADDR_TO_LE:

The civic address of the road feature found on the left-hand side of the arc at the TO node.

ADDR_TO_RG:

The civic address of the road feature found on the right-hand side of the arc at the TO node.

Provinces and territories

See glossary (Appendix C) for definition.

Table 5.4 provides the name and corresponding province code in English and French for all provinces and territories.

Table 5.4 Province/Territory code and name in both official languages

Province code	Province/Territory name	English name	French name
10	Newfoundland and Labrador / Terre-Neuve-et-Labrador	Newfoundland and Labrador	Terre-Neuve-et-Labrador
11	Prince Edward Island / Île-du-Prince-Édouard	Prince Edward Island	Île-du-Prince-Édouard
12	Nova Scotia / Nouvelle-Écosse	Nova Scotia	Nouvelle-Écosse
13	New Brunswick / Nouveau-Brunswick	New Brunswick	Nouveau-Brunswick
24	Quebec / Québec	Quebec	Québec
35	Ontario	Ontario	Ontario
46	Manitoba	Manitoba	Manitoba
47	Saskatchewan	Saskatchewan	Saskatchewan
48	Alberta	Alberta	Alberta
59	British Columbia / Colombie-Britannique	British Columbia	Colombie-Britannique
60	Yukon Territory / Territoire du Yukon	Yukon Territory	Territoire du Yukon
61	Northwest Territories / Territoires du Nord-Ouest	Northwest Territories	Territoires du Nord-Ouest
62	Nunavut	Nunavut	Nunavut

Source: Spatial Data Infrastructure (SDI), June 2006.

Table 5.5 Count by province left/right identifier

Province left identifier	Arc count	Province right identifier	Double count[1]
Newfoundland and Labrador / Terre-Neuve-et-Labrador	39,188	Newfoundland and Labrador / Terre-Neuve-et-Labrador	0
Prince Edward Island / Île-du-Prince-Édouard	13,095	Prince Edward Island / Île-du-Prince-Édouard	0
Nova Scotia / Nouvelle-Écosse	77,282	Nova Scotia / Nouvelle-Écosse	0
New Brunswick / Nouveau-Brunswick	66,437	New Brunswick / Nouveau-Brunswick	0
Quebec / Québec	1	New Brunswick / Nouveau-Brunswick	1
Quebec / Québec	417,705	Quebec / Québec	0
Quebec / Québec	12	Ontario	12
Quebec / Québec	10	null (U.S.A.)	0
Ontario	11	Quebec / Québec	11

Table 5.5 Count by province left/right identifier (continued)

Province left identifier	Arc count	Province right identifier	Double count[1]
Ontario	471,272	Ontario	0
Manitoba	98,972	Manitoba	0
Manitoba	29	Saskatchewan	29
Manitoba	4	null (U.S.A.)	0
Saskatchewan	80	Manitoba	80
Saskatchewan	180,399	Saskatchewan	0
Saskatchewan	41	Alberta	41
Saskatchewan	9	null (U.S.A.)	0
Alberta	112	Saskatchewan	112
Alberta	253,853	Alberta	0
British Columbia / Colombie-Britannique	236,688	British Columbia / Colombie-Britannique	0
British Columbia / Colombie-Britannique	37	null (U.S.A.)	0
Yukon Territory / Territoire du Yukon	5,944	Yukon Territory / Territoire du Yukon	0
Northwest Territories / Territoires du Nord-Ouest	5,810	Northwest Territories / Territoires du Nord-Ouest	0
Nunavut	2,548	Nunavut	0
null (U.S.A.)	14	Quebec / Québec	0
null (U.S.A.)	6	Manitoba	0
null (U.S.A.)	5	British Columbia / Colombie-Britannique	0
Total	**1,869,564**		**286**

1. Road arcs that straddle provincial boundaries are counted in both provinces, and therefore do not add up to the national total.

Source: Spatial Data Infrastructure (SDI), June 2006.

Census subdivision

See glossary (Appendix C) for definition.

Table 5.6 summarises and provides the code for all census subdivision types.

Table 5.6 Census subdivision type

Type	Description	Type	Description	Type	Description
C	City/Cité	MD	Municipal district	SÉ	Settlement / Établissement
CC	Chartered community	MÉ	Municipalité	SET	Settlement
CÉ	Cité	MU	Municipality	SM	Specialized municipality
CG	Community government	NH	Northern hamlet	SNO	Subdivision of unorganized / Subdivision non organisée
CM	County (municipality)	NV	Nisga'a village	SV	Summer village
CN	Crown colony / Colonie de la couronne	NO	Unorganised / Non organisé	T	Town
COM	Community	NV	Northern village	TC	Terre réservées aux Cris
CT	Canton (municipalité de)	NVL	Nisga'a village	TI	Terre inuite
CU	Cantons unis (municipalité de)	P	Parish / Paroisse (municipalité de)	TK	Terre réservées aux Naskapis
CY	City	PE	Paroisse (municipalité de)	TL	Teslin land
DM	District municipality	RCR	Rural community / Communauté rurale	TP	Township
HAM	Hamlet	RDA	Regional district electoral area	TV	Town / Ville
ID	Improvement district	RG	Region	V	Ville
IGD	Indian government district	RGM	Regional municipality	VC	Village cri
IM	Island municipality	RM	Rural municipality	VK	Village naskapi
IRI	Indian reserve / Réserve indienne	RV	Resort village	VL	Village
LGD	Local government district	S-É	Indian Settlement – Établissement indien	VN	Village nordique
LOT	Township and royalty	SA	Special area	…	…
M	Municipalité	SC	Subdivision of county municipality / Subdivision municipalité de comté	…	…

… not applicable

Source: Spatial Data Infrastructure (SDI), June 2006.

Census metropolitan area/census agglomeration

See glossary (Appendix C) for definition.

The following table provides a comprehensive list of census metropolitan areas/census agglomeration by unique identifier, tracted/nontracted. Tracted denotes containing census tracts.

Table 5.7 Census metropolitan area/census agglomeration: unique identifier, name, tracted/non-tracted

Census metropolitan area / census agglomeration unique identifier	Census metropolitan area / census agglomeration name	Tracted
001	St. John's	YES
005	Bay Roberts	NO
010	Grand Falls-Windsor	NO
015	Corner Brook	NO
105	Charlottetown	NO
110	Summerside	NO
205	Halifax	YES
210	Kentville	NO
215	Truro	NO
220	New Glasgow	NO
225	Cape Breton	NO
305	Moncton	YES
310	Saint John	YES
320	Fredericton	YES
328	Bathurst	NO
329	Miramichi	NO
330	Campbellton	NO
335	Edmundston	NO
403	Matane	NO
404	Rimouski	NO
405	Rivière-du-Loup	NO
406	Baie-Comeau	NO
408	Saguenay	YES
410	Alma	NO
411	Dolbeau-Mistassini	NO
412	Sept-Îles	NO
421	Québec	YES
428	Saint-Georges	NO
430	Thetford Mines	NO
433	Sherbrooke	YES
437	Cowansville	NO
440	Victoriaville	NO
442	Trois-Rivières	YES
444	Shawinigan	NO
446	La Tuque	NO
447	Drummondville	YES

Table 5.7 Census metropolitan area/census agglomeration: unique identifier, name, tracted/non-tracted (continued)

Census metropolitan area / census agglomeration unique identifier	Census metropolitan area / census agglomeration name	Tracted
450	Granby	YES
452	Saint-Hyacinthe	NO
456	Joliette	NO
459	Saint-Jean-sur-Richelieu	NO
462	Montréal	YES
465	Salaberry-de-Valleyfield	NO
468	Lachute	NO
480	Val-d'Or	NO
481	Amos	NO
485	Rouyn-Noranda	NO
501	Cornwall	NO
502	Hawkesbury	NO
505	Ottawa - Gatineau	YES
512	Brockville	NO
515	Pembroke	NO
516	Petawawa	NO
521	Kingston	YES
522	Belleville	YES
527	Cobourg	NO
528	Port Hope	NO
529	Peterborough	YES
530	Kawartha Lakes	NO
531	Centre Wellington	NO
532	Oshawa	YES
533	Ingersoll	NO
535	Toronto	YES
537	Hamilton	YES
539	St. Catharines - Niagara	YES
541	Kitchener	YES
543	Brantford	YES
544	Woodstock	NO
546	Tillsonburg	NO
547	Norfolk	NO
550	Guelph	YES
553	Stratford	NO
555	London	YES
556	Chatham-Kent	NO
557	Leamington	NO
559	Windsor	YES
562	Sarnia	YES
566	Owen Sound	NO
567	Collingwood	NO

Table 5.7 Census metropolitan area/census agglomeration: unique identifier, name, tracted/non-tracted (continued)

Census metropolitan area / census agglomeration unique identifier	Census metropolitan area / census agglomeration name	Tracted
568	Barrie	YES
569	Orillia	NO
571	Midland	NO
575	North Bay	YES
580	Greater Sudbury / Grand Sudbury	YES
582	Elliot Lake	NO
584	Temiskaming Shores	NO
586	Timmins	NO
590	Sault Ste. Marie	YES
595	Thunder Bay	YES
598	Kenora	NO
602	Winnipeg	YES
607	Portage la Prairie	NO
610	Brandon	NO
640	Thompson	NO
705	Regina	YES
710	Yorkton	NO
715	Moose Jaw	NO
720	Swift Current	NO
725	Saskatoon	YES
735	North Battleford	NO
745	Prince Albert	NO
750	Estevan	NO
805	Medicine Hat	YES
806	Brooks	NO
810	Lethbridge	YES
820	Okotoks	NO
825	Calgary	YES
828	Canmore	NO
830	Red Deer	YES
833	Camrose	NO
835	Edmonton	YES
840	Lloydminster	NO
845	Cold Lake	NO
850	Grande Prairie	NO
860	Wood Buffalo	NO
865	Wetaskiwin	NO
905	Cranbrook	NO
913	Penticton	NO
915	Kelowna	YES
918	Vernon	NO

Table 5.7 Census metropolitan area/census agglomeration: unique identifier, name, tracted/non-tracted (continued)

Census metropolitan area / census agglomeration unique identifier	Census metropolitan area / census agglomeration name	Tracted
920	Salmon Arm	NO
925	Kamloops	YES
930	Chilliwack	YES
932	Abbotsford	YES
933	Vancouver	YES
934	Squamish	NO
935	Victoria	YES
937	Duncan	NO
938	Nanaimo	YES
939	Parksville	NO
940	Port Alberni	NO
943	Courtenay	NO
944	Campbell River	NO
945	Powell River	NO
950	Williams Lake	NO
952	Quesnel	NO
955	Prince Rupert	NO
960	Kitimat	NO
965	Terrace	NO
970	Prince George	YES
975	Dawson Creek	NO
977	Fort St. John	NO
990	Whitehorse	NO
995	Yellowknife	NO
NULL	residual area	NO

Source: Spatial Data Infrastructure (SDI), June 2006.

Census tract

See glossary (Appendix C) for definition.

Road rank

Each arc within the 2006 Road Network and Geographic Attribute File has been ranked according to the following criteria:

Rank 1 – The Trans-Canada highway as identified using road names and the Confederation Bridge to Prince Edward Island.

Rank 2 – Major/primary highways

Rank 3 – All other highways based on type code or name not already part of rank 2.

Rank 4 – All remaining road arcs.

The following table provides the total number of roads by rank for each province/territory.

Table 5.8 Road rank by province/territory

Province/Territory	Rank 1	Rank 2	Rank 3	Rank 4	Total
Newfoundland and Labrador	677	1,600	3,117	33,794	39,188
Prince Edward Island	263	482	1,598	10,753	13,096
Nova Scotia	600	4,908	5,351	66,423	77,282
New Brunswick	731	6,527	3,994	55,185	66,437
Quebec	2,314	18,151	13,140	384,148	417,753
Ontario	3,943	17,496	9,302	440,554	471,295
Manitoba	1,124	5,528	5,398	87,041	99,091
Saskatchewan	1,412	11,298	5,160	162,800	180,670
Alberta	1,352	11,343	9,862	231,449	254,006
British Columbia	2,449	7,387	3,449	223,445	236,730
Yukon	0	728	8	5,208	5,944
Northwest Territories	0	373	3	5,434	5,810
Nunavut	0	46	0	2,502	2,548
Total[1]	14,865	85,867	60,382	1,708,736	1,869,850
National total	**14,865**	**85,784**	**60,381**	**1,708,534**	**1,869,564**

1. Road arcs that straddle provincial boundaries are counted in both provinces, and therefore do not add up to the national total.

Appendix A: Spatial file naming conventions

For the 2006 Census, spatial product file names for files disseminated to clients follow a spatial file naming convention. The geographic area and code, file type, geographic reference date, software type and language are embedded within the name. Standardizing the names of the files should facilitate the storage of compressed files, all having extension .zip.

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

First character: projection of file

g if projection is Geographic (latitude/longitude)
l if projection is Lambert conformal conic

Next three characters: primary geographic area of file

Table A.1 Spatial file naming conventions — geographic area of file

Geographic area/product	English file	French file
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
Census consolidated subdivision	ccs	sru
Census metropolitan area/census agglomeration	cma	rmr
Census tract	ct_	sr_
Urban area	ua_	ru_
Designated place	dpl	ld_
Dissemination area	da_	ad_
Dissemination block	db_	id_
Population ecumene	ecu	eco
Population ecumene national/provincial	epr	epr
Population ecumene census division	ecd	edr
Agricultural ecumene	eca	eca
Road network file	rnf	frr
Road network and geographic attribute file	rgf	frg
International boundary files (part of mainland U.S.A. and Alaska as well as Greenland)	int	int
Supporting hydrography (Great Lakes, St. Lawrence River, oceans, etc.)	hy_	hy_

Next three numbers: geographic code of coverage

Table A.2 Spatial file naming conventions — geographic code of coverage

National, provincial and territorial coverages	
000	Canada
010	Newfoundland and Labrador
011	Prince Edward Island
012	Nova Scotia
013	New Brunswick
024	Quebec
035	Ontario
046	Manitoba
047	Saskatchewan
048	Alberta
059	British Columbia
060	Yukon
061	Northwest Territories
062	Nunavut

Next character: file type

- a if digital boundary file, detailed coverage for large-scale mapping excluding hydrographic coverage
- b if cartographic boundary file, detailed coverage for small-scale mapping
- c if detailed interior lakes hydrographic coverage (polygon)
- d if detailed interior rivers hydrographic coverage (line)
- e ecumene
- f if detailed interior lakes hydrographic coverage – closure lines (line)
- g cartographic boundary file, generalized for desktop mapping
- h additional cartographic international boundary coverage and hydrographic coverage of Great Lakes, St. Lawrence River and surrounding oceans
- l if detailed interior islands (part of hydrographic coverage [polygon])
- r road network files (RNFs)

Following two numbers: 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 2006 Census, the geographic reference date is January 1, 2006.

- 05 geographic reference date is 2005
- 06 geographic reference date is 2006

Next character: file format

a	ArcInfo® (.shp) file
g	Geography Markup Language (.gml) file
m	MapInfo® (.tab) file

Final two characters: language

_e	English
_f	French

Example of the use of the file naming convention

The 2006 Road Network and Geographic Attribute File for Newfoundland and Labrador with English attributes in GML format: grgf010r06g_e.zip

Appendix B: File names, 2006 Road Network and Geographic Attribute File

Table B.1 File name and sizes — 2006 Road Network and Geographic Attribute File

Geographic area	File name ArcInfo®	File size KB	File name GML	File size KB	File name MapInfo®	File size KB
Canada	grgf000r06a_e.zip	223,698	grgf000r06g_e.zip	279,563	grgf000s06m_e.zip	122,578
Newfoundland and Labrador	grgf010r06a_e.zip	4,847	grgf010s06g_e.zip	6,069	grgf010s06m_e.zip	2,690
Prince Edward Island	grgf011r06a_e.zip	2,021	grgf011s06g_e.zip	2,513	grgf011s06m_e.zip	1,026
Nova Scotia	grgf012r06a_e.zip	8,487	grgf012s06g_e.zip	10,494	grgf012s06m_e.zip	5,018
New Brunswick	grgf013r06a_e.zip	7,385	grgf013s06g_e.zip	9,119	grgf013s06m_e.zip	4,313
Quebec	grgf024r06a_e.zip	44,360	grgf024s06g_e.zip	54,984	grgf024s06m_e.zip	26,431
Ontario	grgf035r06a_e.zip	56,404	grgf035s06g_e.zip	70,094	grgf035s06m_e.zip	31,803
Manitoba	grgf046r06a_e.zip	11,934	grgf046s06g_e.zip	14,999	grgf046s06m_e.zip	5,831
Saskatchewan	grgf047r06a_e.zip	25,659	grgf047s06g_e.zip	32,312	grgf047s06m_e.zip	11,661
Alberta	grgf048r06a_e.zip	28,115	grgf048s06g_e.zip	35,144	grgf048s06m_e.zip	15,322
British Columbia	grgf059r06a_e.zip	32,416	grgf059s06g_e.zip	40,682	grgf059s06m_e.zip	16,897
Yukon	grgf060r06a_e.zip	870	grgf060s06g_e.zip	1,096	grgf060s06m_e.zip	520
Northwest Territories	grgf061r06a_e.zip	818	grgf061s06g_e.zip	1,027	grgf061s06m_e.zip	478
Nunavut	grgf062r06a_e.zip	172	grgf062s06g_e.zip	201	grgf062s06m_e.zip	118

Appendix C: Glossary

Adjusted counts
'Adjusted counts' refer to previous census population and dwelling counts that were adjusted (i.e., recompiled) to reflect current census boundaries, when a boundary change occurs between the two censuses.

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

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 are available.

Cartographic boundary files
Cartographic boundary files (CBFs) contain the boundaries of standard geographic areas together with the shoreline around Canada. Selected inland lakes and rivers are available as a supplementary layer.

Census agricultural region
Census agricultural regions (CARs) 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 (CCS) is a group 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 (CD) 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/territory level and the municipality (census subdivision).

Census metropolitan area and census agglomeration
A census metropolitan area (CMA) or a census agglomeration (CA) is formed by one or more adjacent municipalities centred on a large urban area (known as the urban core). A CMA must have a total population of at least 100,000 of which 50,000 or more must live in the urban core. A CA must have an urban core population of at least 10,000. To be included in the CMA or CA, 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 CA declines below 10,000, the CA is retired. However, once an area becomes a CMA, it is retained as a CMA even if its total population declines below 100,000 or the population of its urban core falls below 50,000. The urban areas in the CMA or CA that are not contiguous to the urban core are called the urban fringe. Rural areas in the CMA or CA are called the rural fringe.

When a CA has an urban core of at least 50,000, it is subdivided into census tracts. Census tracts are maintained for the CA even if the population of the urban core subsequently falls below 50,000. All CMAs 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 (CMAs) and census agglomerations (CAs). Census subdivisions outside CMAs and CAs are assigned to one of four categories according to the degree of influence (strong, moderate, weak or no influence) that the CMAs and/or CAs 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 CMAs or CAs. CSDs with the same degree of influence tend to be clustered. They form zones around CMAs and CAs that progress through the categories from 'strong' to 'no' influence as distance from the CMAs and CAs increases.

Census subdivision
Census subdivision (CSD) is the general term for municipalities (as determined by provincial/territorial legislation) or areas treated as municipal equivalents for statistical purposes (e.g., Indian reserves, Indian settlements and unorganized territories).

Census tract
Census tracts (CTs) 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, health and social workers, and educators) initially delineates census tracts in conjunction with Statistics Canada. Once a census metropolitan area (CMA) or census agglomeration (CA) 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 Universal Transverse Mercator).

Cartographic boundary files, digital boundary files, representative points and road network files 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.

Designated place
A designated place (DPL) 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.

Digital boundary files
Digital boundary files (DBFs) portray the boundaries used for 2006 Census collection and, therefore, often extend as straight lines into bodies of water.

Dissemination area
A dissemination area (DA) is a small, relatively stable geographic unit composed of one or more adjacent dissemination blocks. It is the smallest standard geographic area for which all census data are disseminated. DAs cover all the territory of Canada.

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

Economic region
An economic region (ER) is a grouping of complete census divisions (CDs) (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 purpose. Thus, there can be various types of ecumenes, each having their own unique characteristics (population ecumene, agricultural ecumene, industrial ecumene, etc.).

Federal electoral district
A federal electoral district (FED) is an area represented by a member of the House of Commons. The federal electoral district boundaries used for the 2006 Census are based on the 2003 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, postal codes and place of work data are linked to block-face representative points when the street and address information is available; otherwise, they are linked to dissemination block (DB) representative points. In some cases, postal codes and place of work data are linked to dissemination area (DA) representative points when they cannot be linked to DBs. As well, place of work data are linked to census subdivision representative points when the data cannot be linked to DAs.

Geographic code
A geographic code is a numerical identifier assigned to a geographic area. The code is 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 2006 Census, the geographic reference date is January 1, 2006.

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

Land area data are unofficial, and are provided for the sole purpose of calculating population density.

Locality
'Locality' (LOC) 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 Database
The National Geographic Database (NGD) is a shared database between Statistics Canada and Elections Canada. The database contains roads, road names and address ranges. It also includes separate reference layers containing physical and cultural features, such as hydrography and hydrographic names, railroads and power transmission lines.

The NGD was created in 1997 as a joint Statistics Canada/Elections Canada initiative to develop and maintain a national road network file serving the needs of both organizations. The active building of the NGD – that is, integrating the files from Statistics Canada, Elections Canada and Natural Resources Canada – occurred from 1998 to 2000. Thereafter, Statistics Canada and Elections Canada reconciled their digital boundary holdings to the new database's road network geometry so that operational products could be derived.

Since 2001, the focus of the NGD has been on intensive data quality improvements, especially regarding the quality and currency of its road network coverage. There has been considerable expansion of road names and civic addresses ranges, as well as the addition of hydrographic names. Priorities were determined by Statistics Canada and Elections Canada, enabling the NGD to meet the joint operational needs of both agencies in support of census and electoral activities.

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 10 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 point that represents a line or a polygon. The point is centrally located along the line, and centrally located or population weighted in the polygon.

Representative points are generated for block-faces, dissemination blocks, dissemination areas, census subdivisions, urban areas and designated places.

Households, postal codes and place of work data are linked to block-face representative points when the street and address information is available; otherwise, they are linked to dissemination block (DB) representative points. In some cases, postal codes and place of work data are linked to dissemination area (DA) representative points when they cannot be linked to DBs. As well, place of work data are linked to census subdivision representative points when the data cannot be linked to DAs.

Road network file
The road network file (RNF) contains roads, road names, address ranges and road ranks for the entire country. Most commonly, address ranges are dwelling-based and are mainly available in 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 (CMAs) and census agglomerations (CAs), as well as population living in rural areas outside CMAs and CAs.

Spatial Data Infrastructure
The Spatial Data Infrastructure (SDI), formerly known as the National Geographic Base (NGB), is an internal, maintenance database that is not disseminated outside of Statistics Canada. It contains roads, road names and address ranges from the National Geographic Database (NGD), as well as boundary arcs of standard geographic areas that do not follow roads, all in one integrated line layer. The database also includes a related polygon layer consisting of basic blocks (BB) (basic blocks are the smallest polygon units in the database, and are formed by the intersection of all roads and the arcs of geographic areas that do not follow roads), boundary layers of standard geographic areas, and derived attribute tables, as well as reference layers containing physical and cultural features (such as hydrography, railroads and power transmission lines) from the NGD.

The SDI supports a wide range of census operations, such as the maintenance and delineation of the boundaries of standard geographic areas (including the automated delineation of dissemination blocks, dissemination areas and urban areas), and geocoding. The SDI is also the source for generating many geography products for the 2006 Census, such as cartographic boundary files and road network files.

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

Statistical Area Classification
The Statistical Area Classification (SAC) groups census subdivisions according to whether they are a component of a census metropolitan area, a census agglomeration, a census **m**etropolitan area and census agglomeration **i**nfluenced **z**one (strong MIZ, moderate MIZ, weak MIZ or no MIZ), or the territories (Yukon Territory, Northwest Territories and Nunavut). The SAC 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 (CMAs) and census agglomerations (CAs), as well as the population living in urban areas outside CMAs and CAs.

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 (CMA) or census agglomeration (CA).

'Urban core' is a large urban area around which a CMA or a CA is delineated. The urban core must have a population (based on the previous census) of at least 50,000 persons in the case of a CMA, or at least 10,000 persons in the case of a CA.

The urban core of a CA that has been merged with an adjacent CMA or larger CA is called the 'secondary urban core'.

'Urban fringe' includes all small urban areas within a CMA or CA that are not contiguous with the urban core of the CMA or CA.

'Rural fringe' is all territory within a CMA or CA not classified as an urban core or an urban fringe.

Urban population size group

The term '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	to	2,499
2,500	to	4,999
5,000	to	9,999
10,000	to	24,999
25,000	to	49,999
50,000	to	99,999
100,000	to	499,999
500,000	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 D: Geography Markup Language (GML)

Scope

The Geography Markup Language (GML) is an XML encoding for the modelling, transport and storage of geographic information including both the spatial and non-spatial properties of geographic features. This specification defines the XML Schema syntax, mechanisms, and conventions that:

- Provide an open, vendor-neutral framework for the definition of geospatial application schemas and objects;
- Allow profiles that support proper subsets of GML framework descriptive capabilities;
- Support the description of geospatial application schemas for specialized domains and information communities;
- Enable the creation and maintenance of linked geographic application schemas and datasets;
- Support the storage and transport of application schemas and datasets;
- Increase the ability of organizations to share geographic application schemas and the information they describe.

United States Bureau of Census (USBC) Partnership – TIGER/GML

Statistics Canada has committed to working with the United States Bureau of the Census (USBC) to ensure cross-border consistency in our products, and foster the development and application of a common, North American data model.

Like the United Kingdom Ordnance Survey and the United States Bureau of the Census, Statistics Canada has chosen to disseminate data in the Open Geospatial Consortium standard Geography Markup Language (GML) format. This standard allows organisations to achieve maximum compatibility not only of format but eventually of content. In partnership with USBC, Statistics Canada is committed to providing a harmonized North American street network file by 2008.

Example of 2006 Road Network and Geographic Attribute File dataset in GML format

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<wfs:FeatureCollection xmlns:c2006="http://geodepot.statcan.ca/2006"
xmlns:ogc="http://www.opengis.net/ogc"
xmlns:gml="http://www.opengis.net/gml"
xmlns:wfs="http://www.opengis.net/wfs"
xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://geodepot.statcan.ca/2006">
  <gml:boundedBy>
    <gml:Box srsName="EPSG:4269">
      <gml:coordinates>-141.00133294347273,60.000015192925005 -
123.8469079612411,68.93866263164622</gml:coordinates>
    </gml:Box>
  </gml:boundedBy>
  <gml:featureMember>
    <RoadSegment fid="C2006_RF_3239787">
      <rbUid>3239787</rbUid>
```

Example of 2006 Road Network and Geographic Attribute File dataset in GML format (continued)

```
      <name>Teslin</name>
      <type>CRES</type>
      <addrFmLe>103</addrFmLe>
      <addrToLe>125</addrToLe>
      <addrFmRg>100</addrFmRg>
      <addrToRg>146</addrToRg>
      <pruidLe>60</pruidLe>
      <prnameLe>Yukon Territory / Territoire du Yukon</prnameLe>
      <prenameLe>Yukon Territory</prenameLe>
      <prfnameLe>Territoire du Yukon</prfnameLe>
      <pruidRg>60</pruidRg>
      <prnameRg>Yukon Territory / Territoire du Yukon</prnameRg>
      <prenameRg>Yukon Territory</prenameRg>
      <prfnameRg>Territoire du Yukon</prfnameRg>
      <csduidLe>6001003</csduidLe>
      <csdnameLe>Watson Lake</csdnameLe>
      <csdtypeLe>T</csdtypeLe>
      <csduidRg>6001003</csduidRg>
      <csdnameRg>Watson Lake</csdnameRg>
      <csdtypeRg>T</csdtypeRg>
      <rank>4</rank>
      <centreline>
        <gml:LineString srsName="EPSG:4269">
          <gml:coordinates decimal="." cs="," ts=" ">-
128.7071459507831,60.0696218993878 -128.70728792988953,60.07065254876527
-128.7114620412846,60.07052476756945 -128.7113919437467,60.0695205069788
</gml:coordinates>
        </gml:LineString>
      </centreline>
    </RoadSegment>
  </gml:featureMember>
  <gml:featureMember>
    <RoadSegment fid="C2006_RF_3239788">
      <rbUid>3239788</rbUid>
      <name>Liard</name>
      <type>DR</type>
         ... etc ...
      </RoadSegment>
  </gml:featureMember>
</wfs:FeatureCollection>
```

Appendix E: National Road Network (NRN), GeoBase

In order to continue improving the quality and relevance of our spatial infrastructure, Statistics Canada has initiated a long term project in partnership with Elections Canada to migrate the Road Network File to the Department of Natural Resources' National Road Network (NRN) model in time for the 2011 Census of population. Additional agreements with provincial and territorial stakeholders are in the process of being negotiated and will become a source of GPS compliant data with more accurate and timely attribute information. A preliminary version of the GPS compliant Road Network File based on the NRN model, including data provided by our provincial/territorial partners, could be available as early as spring 2008.

The Department of Natural Resources' National Road Network (NRN) is available free of charge from the GeoBase web portal. http://www.geobase.ca/.

National Road Network (NRN) - Description[1]

The GeoBase portal offers access to over 1 million kilometres of accurate up-to-date centerline road network data. The National Road Network, Canada, Level 1 (NRNC1) is the representation of a continuous accurate centerline for all non-restricted use roads in Canada (5 metres or more in width, drivable and no barriers denying access).

The primary data source of NRNC1 was produced with field driven Differential Global Positioning System (DGPS) technology. Additional sources, such as existing accurate photogrammetric provincial and municipal data, were also integrated and updated. During the initial acquisition of the NRN data, efforts were made to utilize and update as much existing authoritative 'closest to source' centerline road data as was possible.

Natural Resources Canada (NRCan), in partnership with several provinces, managed and produced the first version of the NRN. Initial data collection of the NRN was undertaken in the summer of 1999 and was completed in 2005.

The Canadian Council on Geomatics (CCOG) commissioned the Ontario Ministry of Natural Resources and Natural Resources Canada to work together in defining the NRNC1 Standards and Specifications and data model. These documents were then presented for final review and approval to all authoritative data-producing stakeholders throughout Canada. By working together, a consensus was reached in defining the first version of the NRNC1.

The resulting model of the NRN is based on Linear Referencing System (LRS) concepts. This approach allows for the management of geometric representation separate from the attribute information (referred to as an "event" in LRS). However, it is important to note that in order to satisfy the greatest number of road network data users, the data has also been modelled and will be distributed as a conventional road network.

One of the most important features of the NRN data is that each Road Element and each Event (Attribute) will contain a universally unique identifier (UUID), referred to as the NID. The importance of NIDs is quite significant. It will allow users of GeoBase-NRN data to receive, manage and introduce road network changes over time. NIDs will primarily be used to manage changes.

1. Source: Department of Natural Resources, http://www.geobase.ca/geobase/en/data/nrnc1.html.

End-use licence agreement for Statistics Canada's Road Network and Geographic Attribute File, 2006 Census

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   Source: Geography Division, Statistics Canada, Road Network and Geographic Attribute File, 92-155-XWE/F, 92-155-XCE/F, 2006 Census.

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