1991 DIGITAL CARTOGRAPHIC FILES

USER GUIDE

MapInfo® for Windows Format

**Produced by the Geography Division
Statistics Canada**

AUGUST 1993

La version française de ce guide est disponible sur demande

_____

PREFACE

_____

This document is intended to provide the user with an understanding of the 1991 Digital Cartographic File(DCF) products, their uses and limitations.

The Digital Cartographic Files are geographic boundary files for **thematic mapping applications** used by Geographic Information Systems and mapping software packages. The DCF do not include any software or instructions on how to use the product within specific GIS or mapping packages. These products are basic boundary files in a polygon format.

The Digital Cartographic File products discussed in this guide cover the following levels of standard geographic areas:

- • Provinces and territories (PR/TERR)
- • Census divisions (CD) - equivalent to counties
- • Census subdivisions (CSD) - equivalent to local municipalities
- • Census tracts (CT) - equivalent to neighbourhoods

All Digital Cartographic File products were derived from the 1991 Enumeration Area Digital Boundary File base. Detailed information for these files is provided in the _1991 Digital Boundary Files - User Guide_.

Purchasers of a Census Tract Digital Cartographic File will receive an additional file of major streets and some railway features used to define the census tract boundaries. This file, called the Skeletal Street Network File(SSNF), has been produced to provide some cartographic reference features for underlaying the Census Tract cartographic files in thematic mapping applications. A description of Skeletal Street Network Files is provided in the _1991 Skeletal Street Network File-User Guide_.

ARC/Info® is a registered trademark of the Environmental Systems Research Institute

MapInfo® is a registered trademark of Mapping Information Systems Corporation.

Windows is a trademark of Microsoft Corporation.

TABLE OF CONTENTS

_____

1. ABOUT THIS GUIDE
_____

This User Guide is intended for users of any or all of the Digital Cartographic File (DCF) products.

The guide provides an overview of these Digital Cartographic Files including a comparison with the equivalent 1986 product (called CARTLIB), a data quality statement and a glossary of terms. The purpose of a data quality statement is to provide detailed information for users to evaluate the suitability of the data for a particular use.

The _1991 Digital Boundary Files - User Guide_ provides more detailed background information on the digital boundary files used to create the DCFs. In addition, more details on geographic terms can be found in the _1991 Census Dictionary (Catalogue 92-301E or 92-301ED)_.

This User Guide does not provide information on specific software packages for using the Digital Cartographic File products. The user is advised to contact the specific software vendor for information.

This report 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.

_____

2.   OVERVIEW OF THE DIGITAL CARTOGRAPHIC FILE PRODUCTS
_____

2.1   Description

The 1991 Digital Cartographic Files are computer boundary files of selected standard geographic areas. Each Digital Cartographic File includes geostatistical area boundaries that have been modified to follow shorelines and coastlines. In addition some major lakes are included in the files. Digital Cartographic Files are available for each of the following geographic areas:

*   Provinces and territories (PR/TERR)
*   Census divisions (CD) - equivalent to counties
*   Census subdivisions (CSD) - equivalent to local municipalities
*   Census tracts (CT) - equivalent to neighbourhoods

The 1991 Digital Cartographic Files were derived from the 1991 Digital Boundary Files with modifications at the shorelines and coastlines (hereafter referred to as shoreline) and the addition of major lakes.

The x,y coordinates defining the digital boundaries are available in the Lambert Conformal Conic projection. They are provided as a standard product in the MapInfo® for Windows format. They can also be ordered from Statistics Canada in ARC/Info® Export format.

2.2   Purpose of the Digital Cartographic Files

With the appropriate computer software, Digital Cartographic Files provide the framework for **thematic mapping** to support applications such as land use and demographic studies, or social, economic, and market research.

In particular, the shoreline adjusted boundary files were produced to support **thematic mapping** of data from the 1991 Census of Population and Housing and other data sources using Statistics Canada's standard geographic area definitions.

2.3   Geographic Reference Date

All 1991 Census data reflect the census reference date of June 4, 1991. There is also a geographic reference date on which the geographic framework takes effect. This date is earlier than the census reference date in order to give Statistics Canada enough time before Census Day to process the necessary boundary and name changes. For the 1991 Census, the Geographic Reference Date is January 1, 1991. The Digital Cartographic Files reflect the legislative/administrative geographic framework as it existed on January 1, 1991, provided that the information on any changes was

_____

received by Statistics Canada from the provincial or territorial authorities by March 1, 1991.

2.4   Comparison to the 1986 CARTLIB Product

For 1986, a cartographic library of computer files of standard geographic areas, called CARTLIB, was created. Each CARTLIB file included boundaries adjusted to follow shoreline where appropriate, and some major lakes. The primary difference between the 1986 CARTLIB product and the 1991 Digital Cartographic Files is in the methodology used to create the base files on which the shoreline adjustments were made:

The 1986 base files were created by digitizing 1986 boundaries as drafted on map sheets of various scales (CSDs were drafted on the National Topographic Series (NTS) published by Energy, Mines and Resources at scales of 1:50,000, 1:250,000, 1:500,000 or 1:4,000,000 depending on the population density of the CSD and the availability of the maps. 1986 CTs were digitized from the NTS 1:50,000 map series.

The 1991 base files were created by aggregating digital enumeration area (EA) boundaries. The EA Digital Boundary File was created using different methodologies, some automatically, some from an in-house process involving semi-manual procedures, and the remaining through the digitization of boundaries on source maps. Detailed descriptions are provided in the *1991 Digital Boundary Files User Guide*.

Although the sources for the base files for the 1986 and 1991 products differ, except for one specific case described below, the shoreline and hydrographic features in the 1986 CARTLIB products were used for the 1991 cartographic files.

The only major physical feature change is the addition of the north shore of Laval in the 1991 files.

2.5   The Census Geography Hierarchies

The geographic areas included in the Digital Cartographic Files are part of the standard hierarchies used by Statistics Canada.

CSDs can be combined in a hierarchical fashion to form CDs, then provinces/territories, and finally Canada, as shown in the following diagram (from the smallest unit aggregated to the larger geographic units).

CSD -> CD -> PR/TERR -> CANADA

Census tracts (CTs) are delineated within all 25 census metropolitan areas (CMAs) and 14 of the 115 census agglomerations (CAs). The only hierarchical relationship depicted in the digital cartographic files is their aggregation to CMAs or CAs, as follows:

CT -> CMA/CA

―――

3.   GEOGRAPHIC CODES
―――

CSD Digital Cartographic File

Each CSD is uniquely identified by its **Standard Geographical Classification (SGC)** code. The SGC is Statistics Canada's official classification providing unique numeric identification for three types of geographic areas. These are:

-       provinces and territories (PR/TERRs)
-       census divisions (CDs)
-       census subdivisions (CSDs)

The three geographic areas are hierarchically related. CSDs aggregate to CDs, which in turn aggregate to a province or a territory. This relationship is reflected in the 7-digit SGC code:

PR/TERR	CD	CSD
XX	XX	XXX
2 digits	2 digits	3 digits

The 7-digit SGC code is assigned to each CSD polygon.

CD Digital Cartographic File

Each CD is uniquely identified by the first 4 digits of the **Standard Geographical Classification (SGC)** code. These 4 digits provide unique identification of CDs and reflect the hierarchical relationship that CDs aggregate to a province or territory. The 4 digit code is described by:

PR/TERR	CD
XX	XX
2 digits	2 digits

PR/TERR Digital Cartographic File

Each PR/TERR is uniquely identified by the first 2 digits of the **Standard Geographical Classification (SGC)** code.

PR/TERR
XX

―――

2 digits

3. GEOGRAPHIC CODES(CONTD)

CT Digital Cartographic File

CTs are identified by a 6 character numerical name of the form xxx.xx where x is one digit. This form is referred to as the "CT name". These CT names are designed to be unique within the Primary Census Metropolitan Area (PCMA) or Primary Census Agglomeration (PCA) containing the CT. If the CMA or CA does not have any component PCMAs or PCAs, the CT name is unique within the CMA or CA. For the 1991 Census geographic structure, the CT names are unique within a CMA or CA regardless if it contains PCMAs and/or PCAs. This uniqueness may not remain in subsequent censuses as more PCMAs and PCAs are created and consolidated.

In order to identify a CT uniquely within a province or across Canada, the relevant CMA or CA code is provided with the CT name in the CT Digital Cartographic Files.

In the MapInfo version of the CT Digital Cartographic Files, CTs are identified by a 9-character code XXXYYY.YY (including the decimal point). The first 3 characters (XXX) represent the 3-digit CMA/CA code and the last 6 characters (YYY.YY) represent the 6-character CT name (CT "names" are actually numbers).

Leading zeroes in the 6-character CT name and in the 3-digit CMA/CA code must be retained and not left blank. For example, 040.00 is a valid CT name, but 40.00 or 40 are not valid. Often, if the 2 decimal digits are 00, they may not be shown on Statistics Canada's reference maps, but they must be used for processing with digital files which include the CT name.

CMAs and CAs are identified uniquely across Canada by a 3-digit code. Note that the first digit of the 3-digit CMA/CA code is the second digit of the PR/TERR code if the CMA or CA does not straddle a provincial or territorial boundary (as in the case of the CMA of Ottawa-Hull which straddles the Ontario/Quebec border).

The terms CT name and CT code are not synonymous. The former is the numerical name (described above) that is used to identify CTs on maps and in data products, whereas the CT code is a four-digit numeric identifier used to access a CT on Statistics Canada's internal digital files. The CT name is used with the CMA/CA code in the CT Digital Boundary Files (making a 9-character code) with leading and trailing zeroes specified explicitly.

_____

4.   DATA QUALITY STATEMENT

_____

The 1991 Digital Cartographic Files were created by adding hydrographic features to the equivalent 1991 Digital Boundary Files. The user should review the Data Quality Statement contained in the *1991 Digital Boundary Files User Guide* (since the quality of those files has a direct implication on the derived Digital Cartographic Files) and the attached supplement *EA Linkage Errors on the 1991 Geographic Attribute Data Base*.

Details in this document consider only the additional processes required to create the 1991 Digital Cartographic Files from the 1991 Digital Boundary Files.

The source files from which the DCFs are derived are "frozen" at a specific point in time after they are created and verified, and before the creation of any derived files or products (e.g. the DCFs). Errors identified after that date are documented but not corrected. Thus errors identified in the boundaries or codes in the DCFs are not corrected to ensure their "state" conforms to the geographic infrastructure from which the files were built.

4.1   Lineage

Lineage includes descriptions of the source material from which the data were derived and the methods of derivation, including the dates of the source material and all transformations involved in producing the final digital files or map products.

Source Materials for the CSD, CD and PR/TERR DCFs

The CSD digital cartographic boundaries were obtained from the 1991 CSD Digital Boundary File, which in turn were derived from the 1991 Enumeration Area (EA) Digital Boundary File. The CD and PR/TERR Digital Cartographic Files were created by aggregating the CSD cartographic boundaries.

The shorelines and lakes were obtained from the 1986 CARTLIB file, which in turn was derived from the 1981 CD CARTLIB file. The 1981 file was digitized from mylar EMR base maps -- at 1:2,000,000(for the ten provinces) and 1:5,000,000(for the two territories) from a Lambert Conformal Conic projection with standard parallels at 49°N and 77°N. The 1986 file was enhanced by digitizing 1:250,000 NTS maps for shorelines where there was a high concentration of small CSDs; This ensured that all CSD computed centroids were contained within the CSD polygons. Other enhancements included extracting the Toronto,

Montréal and Québec shorelines (digitized at 1:50,000) from the 1986 CT CARTLIB files. Finally, for the national 1991 CARTLIBs, the northern shoreline of Laval was added by digitizing the shoreline from the 1991 Street Network File for Laval. The 1986 and 1991 enhancements also involved projection transformations from Transverse Mercator to Lambert Conformal Conic.

4.1 Lineage(contd)

Source Material for the CT DCF:

The CT boundaries were obtained from the 1991 CT Digital Boundary File, which in turn had been derived from the 1991 EA Digital Boundary File. Refer to the *1991 Digital Boundary File User Guide* for a complete description.

The CT shoreline and lakes were derived from two separate sources. The 1991 Street Network File (SNF) provided hydrographic features for the areas of the CTs covered by the SNF. The SNF hydrography was originally digitized from municipal documents where available (scales varying from 1:1,000 to 1:30,000), or the 1:50,000 NTS map sheets and Ontario Base Maps.

For areas outside SNF coverage, the shoreline was derived from 1986 CARTLIB files. These shoreline features were digitized from the 1:50,000 NTS map sheets produced by Energy, Mines and Resources.

Method of Derivation:

1.   Working in an ARC/Info[®] Version 6.0 environment, the shoreline features were extracted from the 1986 source files described above, the 1991 Digital Boundary Files were "clipped" using the shoreline coverage, and both files were merged together. During this process, boundaries which extended into water bodies were replaced with a more realistic shoreline, and some major lakes were added.

2.   The CSD boundary areas, as depicted in the resulting digital cartographic file, were aggregated through the hierarchical nature of the SGC code to create a digital cartographic file for each CD and PR/TERR. This ensured that the files would match appropriately when overlaid.

3.   The files were then processed through in-house computer programs to determine which individual polygons in the coverages exceeded the 4,000 point per polygon or 8,000 point per geographic unit (if comprised of more than 1 polygon) limitation imposed by the MapInfo[®] software. In the cases where these point limitations were exceeded the number of points was reduced to respect the 4,000 and 8,000 point limitations. An in-house program was executed to ensure that the point limitations were respected and that the overlay compatibility among the CSD, CD and PR/TERR files was retained.

4. Using an in-house enhanced version of MapInfo®'s ARCLINK module, the digital cartographic files were converted from ARC/Info® 6.0 to MapInfo® Windows Version 2.0.

Source Material for the CT DCF(contd)

5. Once the final DCFs were successfully converted to MapInfo®, all polygons representing lakes were processed through a series of MapInfo® commands to remove their topology. This process converted water bodies from polygons with labels to "holes" or non-polygon items. This process allows for the one-to-one matching of the geographic codes associated with 1991 Census data without users having to manipulate datasets to account for lake polygons. Thus the lake "holes" cannot be accessed in MapInfo® (they cannot be selected).

6. At this point, the map tables in MapInfo® contain one record per polygon. The last step in preparing the MapInfo® formatted files was to link geographic units with multiple parts (polygons). This link ensured the value assigned to these multiple polygon units was "counted" only once by the MapInfo® software when calculating frequency tables since there would be only one record per geographic unit, regardless of the number of polygons making up that geographic unit.

7. An additional step was performed on the CT MapInfo® Digital Cartographic Files to provide the CT numeric name in a form suitable for linking to 1991 Census electronic data files. This step was performed in MapInfo®, and concatenated the CMA/CA code and the CT numeric name to provide one field with the combined unique CT identifier.

All processing was done using ARC/Info® Version 6.0 and MapInfo® Windows Version 2.0 in the Lambert Conic Conformal projection.

The CSD file was also subdivided into provincial and territorial files in MapInfo®.

Each of the 39 CT Digital Cartographic Files (one per tracted CMA/CA) were processed separately and independently.

4.2   Positional Accuracy

Positional accuracy is the difference between the "true" position of a feature in the real world and "estimated" position stored in the digital file.

Positional accuracy depends on the quality of the source material used and the process used to create the files (ie. manual drafting, digitizing etc.). No numerical measurements of positional accuracy have been made for these products.

For this report, the "true" boundaries against which the CSD, CD and PR/TERR cartographic files are compared, are those as depicted on the 1991 CD/CSD Reference Maps. The CT cartographic files were compared with the CMA/CA/CT Reference Maps.

4.2   Positional Accuracy(contd)

CSD, CD, PR/TERR Digital Cartographic Files

The cartographic boundaries were visually checked by producing several regional plots (in ARC/Info®) at appropriate scales of both the non-generalized and generalized cartographic files. The CSDs, CDs and PR/TERRs were plotted on the same map, using different colours for differentiating the geographic areas.

The plots of the generalized files were visually compared with the CD/CSD Reference maps. Approximately 50% of the boundaries and codes were checked. All inconsistencies found also existed in the non-generalized files, indicating that the generalization process had not caused them.

Inconsistencies resulted from the use of the EA based 1991 CSD Digital Boundary File and the 1986 CARTLIB shoreline. Even though boundaries extended into water bodies in the Digital Boundary File, because they were originally created at the fine level of detail of the EA boundary (i.e., larger scale), they were more detailed than the 1986 CARTLIB shoreline. This caused either a misrepresentation of a boundary or the creation of an extra polygon which may actually be water, but has been coded to a geographic unit. These inconsistencies were not corrected. Twenty-four such cases were identified along the Newfoundland shoreline, and four in Ontario (around Manitoulin Island). There may also be minor occurrences of these inconsistencies along the B.C. coastline, where a small CSD should appear on the coast, but the DCF places it a short distance inland.

Spot checks were performed on the graphic terminal to determine the correctness of the MapInfo® conversion.

CT Digital Cartographic Files

The ARC/Info® version of the ungeneralized CT cartographic files were plotted and visually checked with the CMA/CA/CT Reference Maps. All tracted CMA/CAs were plotted and all CT boundaries checked. Any discrepancies between the CT cartographic files and the reference maps were further checked with source maps used in-house for census collection. The boundary

discrepancies were minor and occurred in the CMA of Montreal (CMA code 462) on the boundaries of CTs 865, 510 and between 660.01 and 660.02. In these cases, the CT cartographic files matched the CT boundaries as depicted on the source maps. Additional minor boundary discrepancies may occur (e.g., a follow-up check of the MapInfo® converted files with the CMA/CA/CT reference maps for Hamilton CMA identified a small jog in the north boundary of CT 040.00 which was not shown on the CMA/CT map). These boundary discrepancies will not have any impact on the thematic mapping purposes for which these digital files were created.

4.3   Attribute Accuracy

Attribute accuracy refers to the accuracy of the non-positional information attached to each polygon contained in the Digital Cartographic Files.

CSD, CD, PR/TERR Digital Cartographic Files

The 1991 PR/TERR DCF contains a 2 digit PR/TERR code used to identify each polygon in the file. In the MapInfo® table structure, the field is labelled PROV and defined as an integer (no index).

The 1991 CD DCF contains a 4 digit PROV/CD code used to identify each polygon in the file. In the MapInfo® table structure, the field is labelled CD and defined as an integer (no index).

The 1991 CSD DCF contains the 7 digit Standard Geographical Classification (SGC) code (PROV/CD/CSD) used to identify each polygon in the file. In the MapInfo® table structure, the field is labelled CSD and defined as an integer (no index).

To verify the accuracy of the attribute data attached to each of the cartographic file polygons, the 4 digit CD code and the last 3 digits of the CSD codes were plotted in different colours on the ARC/Info® plots discussed under Positional Accuracy. The labels were visually checked with those on the CD/CSD Reference map series.

In the area of Langley B.C. and in Ontario south of Chatham, labels differed from those on the reference maps. In the case of Langley, B.C., the CD/CSD Reference Map was found to be in error (the CSD DCFs depict the correct SGCs) . In the case of southern Ontario, CSD 3536018 and CSD 3536019 in the DCF were found to have their SGC codes reversed. This error was not corrected in the DCF.

CT Digital Cartographic Files

CT codes on the ARC/Info® plots described earlier were checked with the CMA/CA/CT Reference Maps. Subsequent checks of the CT codes in the MapInfo® formatted CT DCFs were made on-screen with the CMA/CA/CT Reference Maps. This was performed by using the AUTOLABEL feature within MapInfo® (with "Allow Duplicates" and "Overlapping Labels"

checked). Where a CT was split into more than one part (e.g. by a river), only one of the parts was labelled using this feature. The other part had to be labelled manually (using the Label tool).

A discrepancy was found in Hamilton. CT number 062.2 shown on the reference map should read 026.02. The label is correct in the Hamilton CT DCF.

No other discrepancies were identified.

The DCFs contain geographic codes attached with each geographic unit.
Note that lakes included in the MapInfo® DCFs do not have attribute (e.g. names) information associated with them. Nor are they counted in the total number of polygons in the files. Nor can they be selected.

4.4   Logical Consistency

Logical consistency describes the fidelity of relationships encoded in the data structure of the digital spatial data (ie. how well elements of the data structure follow the rules imposed on them).

Automated processing through both ARC/Info® software verified that all boundary polygons were topologically correct, that they closed with no overlaps, overshoots or slivers. Lines are intersected only where intended and no lines are entered twice.

The 1991 CSD, CD and PR/TERR Digital Cartographic Files are consistent with each other since the CD and PR/TERR files were created from the CSD boundaries, and the generalization process was designed to maintain the consistency. However, these cartographic files may not be consistent with the CT Digital Cartographic File since different source shoreline files were used.

The lakes included in the DCFs cannot be selected or shaded.

4.5   Completeness

Completeness expresses the degree to which the geographic entities (features) are captured according to the data capture specifications. It also contains information about selection criteria, definitions used and other relevant mapping rules.

Frequency checks were made between the generalized and non-generalized cartographic files to ensure the same numbers of geographic units and parts were included in each file (thus no polygons were lost or created during the generalization process).

Verification of the total number of geographic units was manually performed against established counts (12 PR/TERRs, 290 CDs and 6006 CSDs in Canada). The number of CTs by CMA/CA is provided in the *1991 Digital Boundary File User Guide*.

The set of lakes included with the CSD, CD and PR/TERR cartographic files is not complete, but rather represents 10 major lakes appropriate for small scale thematic mapping. The lakes have no names attached to them in the DCFs, but represent Smallwood Reservoir in Labrador, Bras d'Or Lake in Nova Scotia, Cedar Lake, Lake Winnipeg, Lake Winnipegosis and Lake Manitoba in Manitoba, Reindeer Lake in Manitoba and Saskatchewan, Lake Athabasca in Saskatchewan and Alberta, and Great Slave Lake and Great Bear Lake in the Northwest Territories.

The set of lakes included with the CT cartographic files is more complete for larger scale mapping appropriate at the CT level.

4.6 Other Considerations

- The PR/TERR, CD and CSD DCFs have been created strictly for small scale **thematic mapping** purposes.

- The PR/TERR, CD and CSD DCFs can be overlaid on one another and will match.

- The CT DCFs and Skeletal Street Network products are not necessarily vertically compatible with the PR/TERR, CD or CSD cartographic boundaries since the shorelines were produced from different scales.

- The DCFs may not match exactly when overlaid on the corresponding boundaries in the 1991 Digital Boundary File products due to the additional processing with the cartographic files and the scale of the source files used to create the shorelines and other hydrography.

- The DCFs do not contain, and are not consistent with, the Enumeration Area representative points found on or in other 1991 Statistics Canada geographic products (e.g., 1991 Geography Attribute File, GEOREF). The Enumeration Area representative points may not fall within the appropriate geographic area since the shorelines were generally created at a smaller scale. When a test was performed overlaying EA DBFs on the CSD DCF for Canada, approximately 1,600 EA boundary polygons fell outside the CSD DCF limits for Canada.

- Shoreline included in Statistics Canada's Street Network Files will not match the shoreline in the CSD, CD, or PR/TERR cartographic files since the source documents used different scales.

- All geographic areas in the cartographic files are identified by codes, not names (CTs do not have text names). Names for the other geographic areas can be obtained from other digital products such as GEOREF and the Geography Attribute File, or reference publications such as the SGC Manual.

- The DCFs will not be precise if plotted at a larger scale than the scale of the source maps used in their creation.

_____

5.   TECHNICAL NOTES
_____

1.   In MapInfo[®], the DCF "Browser" tables may show "number of records" = one more than the actual
         number of geographic units (e.g. The CD DCF table indicates 291 records, though there are only
         290 CDs in Canada). This occurs because the first record in the table is empty as a result of the
         conversion process from ARC/Info[®]. The provincial/territorial CSD DCFs show the actual number of
         geographic units as the number of records since they were created from the Canada CSD DCF in
         MapInfo[®] format. Thus when MapInfo[®] legends show the number of geographic units in a particular
         category, the extra record will be counted.

         The user can change this by using the "Pack tabular data" feature within MapInfo[®].

---

6. GLOSSARY OF TERMS

_____

Census Agglomeration (CA)

The general concept of a census agglomeration (CA) is one of a large **urban area**, together with adjacent **urban** and **rural areas** which have a high degree of economic and social integration with that urban area.

A CA is delineated around an urban area (called the urbanized core and having a population of at least **10,000**, based on the previous census). Once a CA attains an urbanized core population of at least **100,000**, based on the previous census, it becomes a **census metropolitan area** (**CMA**).

Census Division (CD)

Refers to the general term applying to geographic areas established by provincial law, which are intermediate geographic areas between the **census subdivision** and the **province** (e.g. divisions, counties, regional districts, regional municipalities and seven other types of geographic areas made up of groups of census subdivisions).

In Newfoundland, Manitoba, Saskatchewan and Alberta, provincial law does not provide for these administrative geographic areas. Therefore, census divisions have been created by Statistics Canada in co-operation with these provinces.

Census Metropolitan Area (CMA)

The general concept of a census metropolitan area (CMA) is one of a very large **urban area**, together with adjacent **urban** and **rural areas** which have a high degree of economic and social integration with that urban area.

A CMA is delineated around an urban area (called the urbanized core and having a population of at least **100,000**, based on the previous census). Once an area becomes a CMA, it is retained in the program even if its population subsequently declines.

Smaller urban areas, centred on urbanized cores of a population of at least **10,000**, are included in the **census agglomeration (CA)** program.

6.   GLOSSARY OF TERMS(CONTD)

Census Subdivision (CSD)

Refers to the general term applying to municipalities (as determined by provincial legislation) or their equivalent, e.g., Indian reserves, Indian settlements and unorganized territories.

In Newfoundland, Nova Scotia and British Columbia, the term also describes geographic areas that have been created by Statistics Canada in co-operation with the provinces as equivalents for municipalities.

The type indicates the municipal status of a **census subdivision**. Census subdivisions (CSDs) are classified into various types, according to official designations adopted by provincial or federal authorities.

Census Tract (CT)

The general concept of a census tract (CT) is that of a permanent, small urban neighbourhood-like or rural community-like area established in large urban-centred regions with the help of local specialists interested in urban and social science research.

Census tracts are delineated jointly by a local committee and Statistics Canada according to the following criteria:

(1) Whenever possible, census tract boundaries must follow permanent and easily recognizable physical features.
(2) The population of a census tract must be between 2,500 and 8,000, with a preferred average of 4,000 persons, except for those census tracts in central business districts, in other major commercial and industrial zones, or in peripheral rural or urban areas that may have either a lower or higher population.
(3) When first delineated, or subsequently subdivided, census tracts must be as homogeneous as possible in terms of the economic status and social living conditions of their populations.
(4) Their shape must be as compact as possible.

All **census metropolitan areas (CMAs)** and **census agglomerations (CAs)** in Canada containing a **census subdivision (CSD)**, i.e. municipality, having a population of 50,000 or more ~~at the previous census~~, are eligible for a census tract program. Once a census metropolitan area or census agglomeration is added to the program, it is retained even if the population subsequently decreases below 50,000. CSDs already within a tracted CMA do not qualify for a separate CT program when they reach a population of 50,000.

CMA/CA Component

Refers to the **census subdivisions** (**CSDs**) which form the building blocks of a **census metropolitan area** (**CMA**), **census agglomeration** (**CA**), **primary census metropolitan area**

(**PCMA**) or **primary census agglomeration** (**PCA**).

6.   GLOSSARY OF TERMS(CONTD)

CMA/CA Parts

The concept of CMA/CA parts distinguishes between central and peripheral **urban** and **rural areas** within a **census metropolitan area** (**CMA**) or a **census agglomeration** (**CA**). There are three CMA/CA parts: urbanized core, urban fringe and rural fringe.

Urbanized core: A large urban area around which a CMA or a CA is delineated. The urbanized core must have a population (based on the previous census) of at least 100,000 in the case of a CMA, or between 10,000 and 99,999 in the case of a CA.

Urban fringe: An urban area within a CMA or CA, but outside the urbanized core.

Rural fringe: All territory within a CMA or CA lying outside urban areas.

Enumeration Area (EA)

An enumeration area (EA) is the geographic area canvassed by one census representative.

Geographic Attribute Data Base

The Geographic Attribute Data Base (formerly called the Census Geographic Data Base or CGDB) is a set of data attribute files maintained within Statistics Canada and which provides (among other things) all the linkages within the various geography hierarchies.

Map Projection

Latitude/Longitude

A system of measuring location on the surface of the earth which recognizes that the earth is spherical.

The latitude measures the angle north or south of the equator from 0 degrees at the equator (normally in degrees, minutes and seconds) to 90 degrees at the poles. For the land mass of Canada, the latitudes range from roughly 42 to 83 degrees north.

Longitude corresponds to the angle (normally in degrees, minutes and seconds) west of the prime meridian which runs through Greenwich, England. For the land mass of Canada, the longitude ranges from roughly 52 degrees to 141 degrees west.

6.   GLOSSARY OF TERMS(CONTD)

<u>Universal Transverse Mercator (UTM)</u>

An internationally standardized grid system which involves dividing the earth into 60 separate zones of six degrees of longitude each. Canada is divided into 16 zones bearing numbers 7 to 22 from west to east. For the UTM, the Transverse Mercator projection is employed (Gauss-Kruger type).

West-east positions (<u>eastings</u>) are measured from a separate point for each zone. Eastings are counted from the central meridian (called the 500,000-metre line), those to the west of it having an easting value of less than 500,000 and those to the east of it having a value greater than 500,000. Eastings are all greater than 0 and less than 1,000,000.

South-north positions (<u>northings</u>) are designated by their distance in metres from the equator. Because Canada's southernmost point is about 4,620,000 metres from the equator, all points in Canada have a northing value greater than 4,620,000.

<u>Lambert Conformal Conic Projection</u>

A map projection which is widely used for mapping Canada on one sheet, since it provides good directional and shape relationships for mid-latitude regions having a mainly east-to-west extent. Standard parallels at 49° N and 77° N are most commonly used, as well as a central meridian at 91° 52° W.

Locations are specified in easting and northing co-ordinates in metres relative to a pre-defined origin.

Primary Census Metropolitan Area (PCMA) - Primary Census Agglomeration (PCA)

The primary census metropolitan area (PCMA) or primary census agglomeration (PCA) concept recognizes the fact that adjacent **census metropolitan areas** (**CMAs**) and **census agglomerations** (**CAs**) are socially and economically integrated within a larger consolidated CMA or CA.

Adjacent CMAs and CAs are consolidated into a single CMA or CA if the total commuting interchange between the two is equal to at least **35%** of the employed labour force living in the smaller CMA or CA, <u>based on the previous census</u>. The original CMAs or CAs are known as PCMA or PCA subregions of the CMA or CA.

Province

Refers to the major political division of Canada. From a statistical point of view, it is a basic unit for which data are tabulated and cross-classified.

6.   GLOSSARY OF TERMS(CONTD)

Standard Geographical Classification (SGC)

The <u>Standard Geographical Classification (SGC)</u> is Statistics Canada's official classification of geographic areas in Canada. The SGC provides unique numeric identification of three types of geographic areas. These are:

-    provinces and territories;
-    census divisions (CD);
-    census subdivisions (CSD).

The three geographic areas are hierarchically related. Census subdivisions (CSD) aggregate to census divisions (CD), which in turn aggregate to a province or territory. This relationship is reflected in the seven-digit code:

Province/Territory	Census division	Census subdivision
XX - 2 digits	XX - 2 digits	XXX - 3 digits

Territory

Refers to two major political divisions of Canada, namely Yukon and Northwest Territories. From a statistical point of view, these territories are equivalent to **provinces**, i.e. a basic unit for which data are tabulated and cross-classified.

7. SUPPLEMENTARY INFORMATION

7.1 Related Geographic Products and Services

The following is a summary of other geographic products and services available from Statistics Canada.

REFERENCE MAPS: There are four types of Reference Maps available:

Enumeration Area (EA) Maps are subdivided into three series: Large urban centres (formerly G13 & G13A); small urban centres (formerly G14 & G16); and rural areas (formerly G12).

Census Division (CD) and Census Subdivision (CSD) Maps show boundaries for census divisions (areas such as counties and regional districts) and census subdivisions (such as cities and towns). Boundaries for Census Metropolitan Areas and Census Agglomerations are also shown.

Census Metropolitan Area (CMA), Census Agglomeration (CA) and Census Tract (CT) Maps show the boundaries of CSDs, CMA/CA parts and CTs. Publications in the Census Tract Profile series contain corresponding maps for each tracted CMA or CA.

Federal Electoral District (FED) Map is a colour map showing the federal electoral districts of Canada according to the 1987 Representation Order.

GEOREF: This is a new diskette product designed for IBM compatible micro-computers. This product is based on the enumeration area (EA) and links EAs to higher levels of Geography. Software is included to allow users to display different standard geographical areas and their relationship to other geographical areas. For example, for any standard geographic area the component EAs can be listed. Or, vice-versa, for any enumeration area its linkage to other standard geographical areas can be shown. It also features 1991 population and dwelling counts, selected land areas, the EA representative point ("centroid") as well as noting which census subdivisions (CSDs) are covered by the Street Network Files (SNFs).

SKELETAL STREET NETWORK FILES(SSNF):
Skeletal Street Network Files (SSNFs) are "thinned-out" street network files containing major roads and railways only (with street names but no address ranges). To define "major" streets, features forming census tract (CT) boundaries were used as a starting point. Where a street is identified as a CT boundary, effort was made to include its non-boundary extension for continuity. Shorelines or other water bodies are not included. Not all features forming CT boundaries were captured in the SSNFs.

7.1 Related Geographic Products and Services(contd)

STREET NETWORK FILES (SNF): These computer files provide the street network for most large urban centres in Canada. They include streets, rail-road tracks and other features, as well as relevant information such as street names and address ranges. Street Network Files are used as the base for a user's geographic application software for mapping purposes or special applications such as transportation planning or delivery services. The user should be aware of the vintages of the individual Street Network Files when considering the particular application.

DIGITAL BOUNDARY FILES(DBF): Digital Boundary Files are available for most levels of standard geography (from the enumeration area up to the province and territory). In combination with the user's appropriate software, these files provide the user with a spatial analytical tool for designing their own geographical areas (by aggregating standard geographical areas), for mapping, and for other data manipulation operations and analysis offered by the user's software.

GEOGRAPHY GUIDE BOOK: In easy to understand language, this publication explains the applications of most of Statistics Canada's geographic areas and their hierarchies . Five brief case studies show the reader what steps to follow in research situations, defines the geographic terms and describes related products and services available.

CUSTOM SERVICE: If the standard geography products do not satisfy a user's need, the Custom Service may be able to produce the product as a special request. Examples include special data retrievals or merges using any of the geography computer files (postal codes, attribute files, boundary files and street network files), special population compilations using basic census collection records, and digitizing user-defined boundaries for a user's own computer software. Some custom mapping is available.

7.2 For further Information

For further information on the Digital Cartographic Files or other products and services available from the Geography division, contact your nearest Regional Reference Centre. If you live outside the local dialing area, call one of the toll free numbers provided in the list that follows:

ATLANTIC REGION

Serving the provinces of
Newfoundland and Labrador, Nova Scotia, Prince
Edward Island and New Brunswick.

Advisory Services
Statistics Canada
Viking Building, 3rd Floor
Crosbie Road
ST. JOHN'S, Newfoundland
A1B 3P2

Toll free service:	1-800-565-7192
Fax Number:	(709) 772-6433

Advisory Services
Statistics Canada
North American Life Centre
1770 Market Street
HALIFAX, Nova Scotia
B3J 3M3

Toll free service:	1-800-565-7192
Local calls:	(902) 426-5331
Fax number:	(902) 426-9538

QUÉBEC REGION

Advisory Services
Statistics Canada
200 René Lévesque Blvd. W.
Guy Favreau Complex
Suite 412, East Tower
MONTRÉAL, Québec
H2Z 1X4

Toll free service:	1-800-361-2831
Local calls:	(514) 283-5725
Fax number:	(514) 283-9350

NATIONAL CAPITAL REGION

Statistical Reference Centre (NCR)
Statistics Canada
R.H. Coats Building Lobby
Holland Avenue
OTTAWA, Ontario
K1A 0T6

If outside the local calling area, please
dial the toll free number for your region.

Local calls:	(613) 951-8116
Fax number:	(613) 951-0581

ONTARIO REGION

Advisory Services
Statistics Canada
Arthur Meighen Building, 10th Floor
25 St. Clair Avenue East
TORONTO, Ontario
M4T 1M4

Toll free service:	1-800-263-1136
Local calls:	(416) 973-6586
Fax number:	(416) 973-7475

PACIFIC REGION

Serving the province of British Columbia
and the Yukon Territory.

Advisory Services
Statistics Canada
Sinclair Centre, Suite 300
757 West Hastings Street
VANCOUVER, B.C.
V6C 3C9

Toll free service:	1-800-663-1551

Local calls:	(604) 666-3691
Fax number:	(604) 666-4863

Serving the provinces of
Manitoba, Saskatchewan, Alberta
and the Northwest Territories.

Advisory Services
Statistics Canada
MacDonald Building, Suite 300
344 Edmonton Street
WINNIPEG, Manitoba
R3B 3L9

Toll free service:	1-800-563-7828
Local calls:	(204) 983-4020
Fax number:	(204)983-7543

Advisory Services
Statistics Canada
Avord Tower, 9th Floor
2002 Victoria Avenue
REGINA, Saskatchewan
S4P 0R7

Toll free service:	1-800-563-7828
Local Calls:	(306) 780-5405
Fax Number:	(306) 780-5403

Advisory Services
Statistics Canada
First Street Plaza, Room 401
138 - 4th Avenue South East
CALGARY, Alberta
T2G 4Z6

Toll free service:	1-800-563-7828
Local Calls:	(403) 292-6717
Fax Number:	(403) 292-4958

Advisory Services
Statistics Canada
Park Square, 8th Floor
10001 Bellamy Hill
EDMONTON, Alberta
T5J 3B6

Toll free service:	1-800-563-7828
Local Calls:	(403) 495-3027
Fax Number:	(403) 495-5318

Telecommunications Device for the Hearing Impaired 1-800-363-7629

7.3 Additional References and Services

In addition to the Regional Reference Centres and depository libraries, Statistics Canada publications may be ordered through your local bookstore or subscription agent. Contact the nearest Regional Reference Centre for a list of Canadian outlets available, or consult the 1991 Census Catalogue (Catalogue No. 92-302E).

Secondary distributors offer data access and analytical support through a variety of consulting and computer-based services not available at Statistics Canada. The names and addresses of licensed distributors may be obtained from any Regional Reference Centre.

Statistics Canada provides digital geographic products which allow computer manipulation of geographic data. A customized retrieval service is available for users who wish to define their own geographic area of study. A variety of data retrieval files and services provide flexibility in selecting a geographic base.

A complete description of available digital files and services is documented in the 1991 Census Catalogue (Catalogue No. 92-302E).

Information concerning Census of agriculture products and services may be referenced in the 1991 Census of Agriculture Products and Services publication, Catalogue No. 92-303, or by calling toll free 1-800-465-1991.

Users with special data requirements may request post-census survey services. Data are made available on microcomputer diskettes for use with spreadsheet software, or on paper output. For additional information, please contact the nearest Regional Reference Centre.

The Dissemination Division is responsible for CANSIM, Statistics Canada's computerized database network and information retrieval service. Users are provided with access to current and historical statistics in various forms including specialized data manipulation and analysis packages, graphics facilities and a bibliographic search service. For more information about CANSIM, contact any Regional Reference Centre.

SUPPLEEMENT 1: EA LINKAGE ERRORS ON THE 1991 GEOGRAPHIC ATTRIBUTE DATA BASE

This supplement documents the errors found on the Geographic Attribute Data Base (GADB). These errors have been identified up to the time of releasing this User Guide or other GEO products that use GADB as a source file.

The Geographic Attribute Data Base is a set of relational files that contain a number of attributes for standard geographic areas (such as names, codes, land area, population and dwelling counts) and linkages between the areas. In particular, GADB defines not only EA linkages to higher level standard geographic areas, but also linkages between all standard geographic areas. GADB is also linked to other census operational data bases. These linkages are used for various processes, such as creating digital boundary files and aggregating EA-level census data. The data bases were "frozen" in March 1992, just prior to the first release of census data. Errors identified after that date cannot be corrected on the data bases without losing the integrity between the many interrelated data bases. Consequently, errors in 1991 Census data resulting from EA linkage errors are documented and released as "Errata" with the appropriate census publications.

The supplement indicates the linkage errors between the various geographic areas, the effective date(s), the correct linkage and population/dwelling counts, and whether the errors were corrected on the Digital Boundary Files.[1] The following tables are included:

Table 1. Linkage Errors Between EAs and CDs.
Table 2. Linkage Errors Between EAs and CCSs.
Table 3. Linkage Errors Between EAs and CSDs.
Table 4. Linkage Errors Between EAs and CTs/PCTs.
Table 5. Linkage Errors Between EAs and UAs.
Table 6. Effect of EA-CSD Linkage Errors on CSD Population and Dwelling Counts

This supplement will be updated as additional errors are identified.

_____

[1] If errors were corrected on the Digital Boundary Files, there may be a discrepancy between these files and
   a boundary file that users create by aggregating EAs and linking EA codes using the Geographic Attribute

File or using other Statistics Canada products created from the Geographic Attribute Data Base.

Table 1. Linkage Errors Between EAs and CDs (as of November 4, 1992)

PROV-FED-EA	PROV-CD Linkage in GADB	Correct PROV-CD Linkage	Corrected on Digital Boundary Files	1991 EA Population and Dwelling Counts	
				Population	Occupied Private Dwellings
61 001 209	61 08	61 06	YES	0	

Table 2. Linkage Errors Between EAs and CCSs (as of December 22, 1992)

PROV-FED-EA	PROV-CD-CCS Linkage in GADB	Correct PROV-CD-CCS Linkage	1991 EA Population Count
35 017 413	35 20 014	35 20 008	253
35 017 465	35 20 014	35 20 008	245
35 017 466	35 20 014	35 20 008	208
48 016 272	48 11 061	48 11 052	0
61 001 209	61 08 098	61 06 097	0

Table 3. Linkage Errors Between EAs and CSDs (as of December 22, 1992)

PROV-FED-EA	PROV-CD-CSD Linkage in GADB	Correct PROV-CD-CSD Linkage	Corrected on Digital Boundary Files	1991 EA Population and Dwelling Counts	
				Population	Occupied Private Dwellings
24 047 163	24 66 055	24 66 025	NO	0	0
24 047 164	24 66 055	24 66 025	NO	171	57
24 047 165	24 66 055	24 66 025	NO	0	0
24 047 209	24 66 060	24 66 055	NO	176	126
24 047 210	24 66 060	24 66 055	NO	196	124
24 047 211	24 66 060	24 66 055	NO	328	219
24 047 212	24 66 060	24 66 055	NO	379	248
24 047 213	24 66 060	24 66 055	NO	347	232
35 017 413	35 20 014	35 20 008	YES	253	132
35 017 465	35 20 014	35 20 008	YES	245	128
35 017 466	35 20 014	35 20 008	NO	208	0
47 001 274	47 12 042	47 12 046	NO	16	5
47 001 275	47 12 042	47 12 046	NO	15	3
48 016 272	48 11 061	48 11 052	YES	0	0
59 020 360	59 15 043	59 15 063	YES	4	2
59 024 165	59 17 045	59 17 047	YES	0	0
61 001 209	61 08 098	61 06 097	YES	0	0

Table 4. Linkage Errors Between EAs and CTs/PCTs (as of December 22, 1992)

PROV-FED-EA	Linkage in GADB		Correct Linkage		Corrected on Digital Boundary Files	1991 EA Population and Dwelling Counts	
	PCMA/PCA or CMA/CA	CT Name	PCMA/PCA or CMA/CA	CT Name		Population	Occupied Private Dwellings

24 015 305	505	841.02	505	841.01	NO	812	256
24 065 127	462	510.00	462	415.01	YES	0	0
24 065 128	462	510.00	462	415.01	YES	0	0
35 013 274	535	260.03	535	263.01	YES	535	326
48 026 023	837	165.00	837	166.00	YES	541	116

Table 5. Linkage Errors Between EAs and UAs (as of December 22, 1992)

PROV-FED-EA	UA Code in GADB	Correct UA Linkage	Corrected on Digital Boundary Files	1991 EA Population and Dwelling Counts	
				Population	Occupied Private Dwellings
48 022 070	1258	0000	NO	4	0
48 022 071	1258	0000	NO	0	0

Table 6. Effect of EA-CSD Linkage Errors on CSD Population and Dwelling Counts (as of December 22, 1992)

PROV-CD-CSD	CSD Name and Type	1991 Population and Dwelling Counts	Incorrect Count	Correct Count	Difference
24 66 025	Montreal, V	Population	1,017,666	1,017,837	171
		Occupied Private Dwellings	464,880	464,937	57
24 66 055	Côte-Saint-Luc, C	Population	28,700	29,955	1,255
		Occupied Private Dwellings	11,672	12,564	892
24 66 060	Hamstead, V	Population	8,645	7,219	(1426)
		Occupied Private Dwellings	3,498	2,549	(949)
35 20 014	York, C	Population	140,525	139,819	(706)
		Occupied Private Dwellings	56,335	56,075	(260)
35 20 008	North York, C	Population	562,564	563,270	706

		Occupied Private Dwellings	204,067	204,327	260
47 12 042	Biggar No. 347, RM	Population	1,086	1,055	(31)
		Occupied Private Dwellings	298	290	(8)
47 12 046	Biggar, T	Population	2,322	2,353	31
		Occupied Private Dwellings	967	975	8
48 11 061	Edmonton, C	Population	No Impact		
		Occupied Private Dwellings	No Impact		

Table 6. Effect of EA-CSD Linkage Errors on CSD Population and Dwelling Counts (as of December 22, 1992) - Cont'd

PROV-CD-CSD	CSD Name and Type	1991 Population and Dwelling Counts	Incorrect Count	Correct Count	Difference
48 11 052	Strathcona County No. 20, CM	Population	No Impact		
		Occupied Private Dwellings	No Impact		
59 15 043	Port Moody, C	Population	17,712	17,708	(4)
		Occupied Private Dwellings	6,201	6,199	(2)
59 15 063	Greater Vancouver, Subd. B, SRD	Population	2,459	2,463	4
		Occupied Private dwellings	963	965	2
59 17 045	Capital Subd. B, SRD	Population	No Impact		
		Occupied Private Dwellings	No Impact		
59 17 047	View Royal, T	Population	No Impact		
		Occupied Private Dwellings	No Impact		
61 06 097	Fort Smith, Unorganized, UNO	Population	No Impact		
		Occupied Private Dwellings	No Impact		
61 08 098	Kitikmeot Unorganized, UNO	Population	No Impact		
		Occupied Private Dwellings	No Impact		