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UNI·CEN Documentation Report 4: Early Postwar Census Tract Digitization Project

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The UNI·CEN Project

Analysis of historical and contemporary Census data is an active area of research. Sociologists, historians, geographers, urban and regional planners, and political scientists have used these data to study the historical development of, and change in, international and domestic migration, urban settlement patterns, inter-group relations, economic change, and political representation. In the United States, United Kingdom, and other countries, projects increased the accessibility of historical Census data by compiling existing digital datasets, digitizing those that exist only in print, and creating modern systems to disseminate them to users.

The **UNI·CEN** (Unified Infrastructure for Canadian Census Research) project follows the example of these international projects. We compiled available aggregate Census data at several commonly used levels of geography for the 1851–2021 period and converted it to a standardized table format. We digitized mapped boundaries, data tables, and geographic coding schemes pertaining to census tracts for the 1951–66 period. We developed a standardized variable naming system and coded the compiled data with it, enabling analysis and visualization of change over time. We also developed a set of geographic linkage tables that enable comparison of places across time despite inconsistent naming and coding. Finally, we have assembled available corresponding digital boundary files and reformatted them to join to the data.

Undertaken between 2018 and 2022, **UNI·CEN** is a project of Western University's **Network for Economic and Social Trends** (NEST). **UNI·CEN** parallels a companion project, the **Canadian Communities Policy Observatory** (https://observatory.uwo.ca), a portal that enables visualization, analysis, and retrieval of place-based data. Both projects are funded by Western University's Faculty of Social Science.

Project Team

Investigators:
- Dr. Zack Taylor, Project Leader and Associate Professor, Department of Political Science, Western University
- Dr. Victoria Esses, Professor, Department of Psychology, Western University
- Dr. Dave Armstrong, Associate Professor, Department of Political Science, Western University

Digitization of census tract boundaries:
- Dr. Christopher Macdonald Hewitt

Digitization and validation of 1951 and 1956 data tables and official lists:
- Dariya Alton
- Michelle Anderson

- Moira Benedict
- Alissa McInnis
- Ishani Vyas

Processing of legacy 1961 and 1966 datasets:
- Dr. Zack Taylor
- Kyle Hendricks

Dissemination location

UNI·CEN Digital Boundary Files are stored on the open-access Borealis Dataverse repository at: https://borealisdata.ca/dataverse/unicen_boundaries. As of this publication, only the **CBF-Harmonized Shoreline** series has been made available.

UNI·CEN Data Tables are stored on the open-access Borealis Dataverse repository at: https://borealisdata.ca/dataverse/unicen_datatables.

UNI·CEN Ancillary Materials: Geographic attribute files (GAFs) and reference materials are stored on the open-access Borealis Dataverse repository at: https://borealisdata.ca/dataverse/unicen_ancillary.

Disclaimer

We have made every effort to verify the accuracy of the boundary files and datasets produced by this project. We ask that users notify us of any errors they discover so that they can be corrected in future versions.

Overview

Up to this point, digital boundaries and associated data pertaining to census tracts have only been available for the 1971 census and later census years. The UNI·CEN project undertook the original digitization from paper maps of census tract boundaries for 1956, 1961, and 1966, and validated an earlier series of 1951 boundaries. The project also digitized associated data tables. The project therefore completes the availability of census tract-level digital boundary files and data tables at five year intervals back to the inception of Statistics Canada's census tract dissemination program in 1951.

The project comprises four components:
1. Digitization and validation of census data tables from print volumes (1951 and 1956)
2. Digitization of census tract boundaries from print maps (1951, 1956, 1961, and 1966)
3. Processing of legacy census tract datasets for analysis and joining with the created boundary files (1961 and 1966)
4. Digitization of official lists of geographic unit names and identifier codes to construct Geographic Attribute Files (1961 and 1966).

Geographical Coverage

Statistics Canada disseminated tract-level data for the following CMAs. The cell values indicate the number of tracts present in the data tables within each CMA in each Census year.

CMA Identifier	CMA Name	1951	1956	1961	1966
001	St. John's		22	21	23
205	Halifax	26	26	31	31
310	Saint John	28	29	29	35
421	Quebec	63	65	83	80
433	Sherbrooke			20	20
442	Trois Rivieres			18	21
462	Montreal	298	352	393	414
505	Ottawa	57	58	84	84
521	Kingston			16	17
529	Peterborough				14
532	Oshawa			17	17
535	Toronto	257	274	337	366
537	Hamilton		72	85	85
539	St. Catharines				20
540	Niagara Falls				12
541	Kitchener			31	35
543	Brantford				15
555	London		32	43	44
559	Windsor	45	48	48	47
562	Sarnia				17
580	Sudbury			22	22
602	Winnipeg	91	91	99	103
705	Regina	10	11	11	26
725	Saskatoon	9	9	17	18
825	Calgary	17	25	28	54
835	Edmonton	18	39	51	67
933	Vancouver	59	106	122	133
935	Victoria	17	23	25	25
	Total tracts (incl. CMA total	**995**	**1,282**	**1,631**	**1,845**
	Total CMAs	**14**	**17**	**23**	**28**

Variable Coverage

More variables were collected and disseminated in 1951 and 1961 than in the "off-year" 1956 and 1966 Censuses. What follows is a summary of variable coverage by UNI·CEN theme code.

Code	Description	1951	1956	1961	1966
agec	Age - By cohort	X	X	X	X
dwam	Dwellings - Amenities	X		X	
dwbd	Dwellings - Number of Bedrooms			X	
dwcn	Dwellings - Condition			X	
dwoc	Dwellings - Occupied by Usual Residents	X		X	X
dwpc	Dwellings - Period of Construction	X		X	
dwrm	Dwellings - Number of Rooms	X		X	
dwtp	Dwellings - Type	X		X	X
edaa	Education - School attendance - Age 15 and over			X	
edca	Education - Highest Certificate - Age 15 and over			X	
eth_	Ethnicity - Ethnic origin			X	
fmc_	Census Families - By Children at Home - All Families	X	X	X	X
fmch	Census Families - Number of Children at Home by Age	X	X	X	X
fmmc	Census Families - By Children at Home - Married Couples			X	
fmsz	Families - Size of Census Families	X	X	X	X
hcov	Households - Shelter Costs - Owner Household - Dwelling Value			X	
hctv	Households - Shelter Costs - Tenant Household Rent	X		X	
hhp_	Households - Persons in Private Households	X		X	X
hhsz	Households - Size	X		X	X
hhtn	Households - Tenure	X		X	X
hhtp	Households - Type	X	X	X	X
icca	Income - Census Families - All Families	X			
ieat	Income - Economic Families - All Families - Total Income			X	
iie_	Income - Individuals - Employment Income	X			
iit_	Income - Individuals - Total Income			X	
imb_	Immigration - Selected Places of Birth			X	
imbc	Immigration - Non-Immigrant Place of Birth in Canada			X	
imct	Immigration - Citizenship			X	
in60	Labour Force - Industry (1960 Classification)			X	
lfaa	Labour Force - Activity - Age 15 and over	X		X	
lfcw	Labour Force - Class of worker	X		X	
lnh_	Language - Spoken Most Often at Home			X	
lnmt	Language - First Language (Mother Tongue)			X	
lnok	Language - Knowledge of Official Languages	X		X	

Code	Description	1951	1956	1961	1966
mars	Marital Status			X	X
oc50	Labour Force - Occupation (1950 Classification)	X			
oc60	Labour Force - Occupation (1960 Classification)			X	
pop_	Population	X	X	X	X
rlgn	Religion			X	
warf	War Service - Forces			X	
wars	War Service - War Served			X	

* Includes variables coded using the standardized UNI·CEN theme nomenclature, which enables longitudinal comparison across census years. The uncoded tables also include more "one-off" variables whose concepts are not included in this nomenclature system. Tables are provided in both formats.

Data Table Digitization and Validation

1951 and 1956

The Statistics Canada printed volumes for 1951 and 1956 were obtained from Archive.org. Page images were downloaded as TIF files, which are of higher quality than the compressed PDF files. The page images were digitized using ABBYY FIneReader 14 for Windows. The files were cleaned and processed using the following procedure:

1. **Harmonize table structure.** The source tables are set up with variables as rows and tracts as columns. The 1951 volumes contain three thematic tables with data for all tracts. The 1956 volumes contain two thematic tables. Each row in the source table is numbered. The digitized tables were cleaned in Excel so that the row numbering and column location was consistent across all sheets, enabling them to be easily merged and appended. Separate pages were then combined so that each CMA's data were on a single Excel sheet.
2. **Clean obvious OCR errors.** The Excel sheet was then checked against the PDF to correct any obvious errors. To facilitate the spotting of errors, Excel's conditional formatting feature was used to identify cells that contained non-numeric characters, including dust and dirt interpreted by the OCR software as letters and punctuation (e.g., periods, colons, semicolons, and apostrophes), or numbers interpreted as letters (e.g., 1 as l).
3. **Reshape and add identifiers.** The Excel sheets were then read into Stata 17 and processed using an algorithm with steps as follows:
   a. A unique variable ID (*varnum*) is generated for each row based on the table and row numbers (e.g., "v0345" means volume 3, row 45).
   b. The table was then transposed so that the rows are tracts and the columns are variables.
   c. The census year (*year*) and modern 3-digit CMA code (*cmauid*) were added as columns.

d. A row type variable (*type*) was created to indicate whether the row pertained to a single tract, a CSD total, or the CMA total.

e. Using the *type* variable, the *csdname* and *ctname* were extracted from the geographic identifier column. Numbered tracts are numbered with integers. Following the post-1971 numbering convention, this value is formatted as a seven digit code with leading zeros and two significant digits, as follows: 0000.00. In all cases, the digits to the right of the decimal are zeroes.

f. Some tracts pertain to entire municipalities or unincorporated areas are not numbered in the source tables. These were numbered consecutively as they appear in the table, starting at 400. (No CMA had more than 399 census tracts in 1951 or 1956.)

g. In some cases where a municipality is divided into multiple tracts there is an unnumbered residual area labelled "other parts." This was given the highest *ctname* code of the CSD in which it is found, but with the suffix ".50".

h. A universal tract identifier code (*ctuid*) was made by concatenating *cmauid* and *ctname*, where *type* = tract, to create a ten-digit code formatted as follows: 0000000.00.

4. **Add flags.** The source tables contain various flags and notes. Numbered footnotes explained missing data and other elements. A "--" (double dash) indicates suppressed values due to sampling error. For columns where these appear, the flag or note number was transferred to a "flag" column (named *varnum* + "f"). Suppressed values are indicated with an "s" and numbered footnotes are indicated by capital letters, such that A = 1, B = 2, and so on.

5. **Create missing totals.** Some variables have implied totals that are not present in the data:

a. In 1951 and 1956, the "marital status" counts pertain to the population aged 15 and over. A new total variable was created that sums the appropriate population cohort counts.

b. In 1951, households and dwellings are considered equivalent. A "total occupied dwellings" variable was created by duplicating the "total households" variable.

c. In 1951, the "years of school" counts pertain to the population aged 5 and over. A new total variable was created that sums the appropriate population cohort counts.

6. **Validation.** The values in each table were validated in two ways:

a. *Geographic (rowwise) checksum:* For count variables, the tract counts for the entire CMA and for each component CSD were summed and compared with the published totals. If there was a discrepancy, the affected rows were manually checked. Where data were suppressed, we would expect the sums to be less than the published totals. If the sum was greater than the published total, the affected rows were manually checked.

b. *Variable (columnwise) checksum:* For count variables that are components of published totals (e.g., male + female = total population), calculated sums were

compared to calculated totals. If there was a discrepancy, the affected rows were manually checked.

    c. *Manual check:* For non-count variables and variables which do not sum to published totals, we undertook an additional round of visual checking.

1961 and 1966

The 1961 and 1966 data were "born digital" and so the data itself did not have to digitized from printed volumes. "User Summary Tape" data tables pertaining to Enumeration Areas (hereafter referred to as "tapefiles") were retrieved in SPSS format from the University of Toronto's Map and Data Library.[1] These had been converted from legacy formats in the early 2000s as part of a broader data preservation project. Some accompanying documentation is available in PDF form. The tables do not contain data suppression or nonavailability flags, nor do they contain explanatory notes.

1. **Constructing the Geographic Attribute File (GAF).** The data tables contained only geographic units' identifier codes, not the names of the units. There is no accompanying Geographic Attribute File (GAF) as exists in modern Census products. For the purposes of this project, we wanted to create a table that located each tract within its enclosing CSD and CD. For more general use, digitizing official lists enabled linkage of district, municipality, and municipal subdivision codes to the units names. PDFs of manuscript "official lists" are available on the University of Toronto's Map and Data Library website:[2]
   - Official grouping of enumeration areas by census tract
   - Official grouping of enumeration areas into townships, municipalities, parishes, cities, towns, villages, etc.

   OCRing was impossible as the formatting of the information in these tables is inconsistent. Instead, we manually transcribed them into Excel sheets so that each geographic unit was on a single row. Notes:
   - The geographic identification codes for Census Divisions, Census Subdivisions, or other units in 1961 and 1966 do not correspond with one another, nor with those used in other census years.
   - The county/division, municipality, and subdivision codes in the official lists do not match codes found in the datasets for the Yukon and the Northwest Territories.

   Nationally unique identifiers were created and modern census codes were added as appropriate. For more information about the geographic coding systems in the source and processed files, see **Appendix B**. In general:
   - *pruid:* Modern two-digit province codes were added.
   - *cduid:* A unique four-digit code for each CD was created by concatenating the following alphanumeric codes: pr (2 digits) + county (2)

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[1] See https://mdl.library.utoronto.ca/collections/numeric-data/census-canada/1961/statistics and https://mdl.library.utoronto.ca/collections/numeric-data/census-canada/1966/statistics

[2] See https://mdl.library.utoronto.ca/collections/numeric-data/census-canada/1961/maps and https://mdl.library.utoronto.ca/collections/numeric-data/census-canada/1966/maps

- *csduid:* A unique seven-digit code for each CSD was created by concatenating the following alphanumeric codes: pr (2 digits) + county (2) + municip (2) + msub (1).
- *cmauid16:* Modern three-digit CMA/CA identification codes were added.
- *ctuid:* Modern-style ten-digit census tract identification codes were constructed by concatenating the *cmauid16* with the tract number formatted with leading zeroes and the trailing suffix (0000.00).

For 1961, we collapsed and exported the transcribed table as a set of Geographic Attribute Files (GAFs) for each primary level of geography (EA, CT, CSD, and CD). For 1966, only EA and CT GAFs were produced. The hierarchy is as follows:

Smaller				Larger
EA	CT	CSD	CMA	PR
			CD	
	FED			

Finally, on an experimental basis, a CSD crosswalk table was created that links 1981 *cduid*s and *csduid*s to their 1976, 1971, and 1961 equivalents based on unit name and population size. While imperfect as names and municipal boundaries change, this enables the geographic linkage of places across time.

2. **Processing of data files.** The SPSS-format data files were imported into Stata 17 and processed using the following procedure.
   a. Enumeration area data were aggregated to census tracts. For count variables, this entailed summing. Non-count variables were averaged.
   b. Geographic unit identifiers were added to the tables (*cmauid*, *ctuid*, *pruid*).
   c. Handling of separate farm/non-farm and urban/rural data: In 1961, some of the source files contain separate totals by sex, farm/non-farm location, and urban/rural. Totals for most combinations were separately calculated when not present in the data. A *loc* field was created that indicates the combination of urban/rural and farm/non-farm:
      - t = total
      - rt = rural total
      - rf = rural farm
      - rn = rural non-farm
      - u = urban (farm and non-farm are summed).

   The 1966 source files contain separate totals by sex and farm/non-farm location. However, the urban/rural size and municipality size variables do not match the codes in the documentation. As a result, the *loc* field cannot be generated as in 1961. Only sex-specific totals are included in the processed tables.

d. Handing of marital status data: In 1966, the population summary files contained separate rows by marital status category by sex and farm/non-farm. These tables were reshaped so that marital status totals appear as columns, as with any other variable.

Note that as a byproduct of this project, aggregated files for 1961 were also generated for CMAs, CSDs, CDs, and provinces. As no CSD boundary files have been digitized for these years, and a highly generalized CD file digitized for the *Historical Atlas of Canada* Online Learning project is only available for 1961,[3] the CSD and CD datasets are not readily mapped. Only census tract, CMA, and province-level files were created for 1966. Nevertheless, the digitization of the 1961 CD and CSD official lists is a necessary precursor for the eventual digitization of the CSD boundaries.

Boundary Digitization

Methods for Creating Census Tract Boundaries

A project at the University of British Columbia digitized the 1951 census tract boundaries in 2013.[4] For the 1951 census year, we validated these boundaries against maps and other sources, including topographic maps, and amended the attribute table to match the format we established for the boundary files we created for the 1956, 1961, and 1966 census years. We also rectified topology issues, including slivers and overlapping polygons.

Boundaries for the 1956, 1961, and 1966 census years were created using the following procedure:
- Page images of the official maps of census tracts printed in volumes produced by Statistics Canada were retrieved from Archive.org and georeferenced using the Statistics Canada road network and census tract boundary files as guides. For consistency with the UBC project, we used the 2006 versions of these files.
- As the printed maps were drafted by hand, some elements were not to scale or were cropped, obscured, and unlabelled. Consequently, we sometimes made judgments as to the location of tract boundaries based on available references. General references are itemized in **Appendix A.** All decisions made are documented in the "comments" field in the attribute table.

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[3] "Census Districts (CD), 1961 Census of Canada." Historical Atlas of Canada Data Dissemination Project, Department of Geography and Planning, University of Toronto Toronto, Canada. Available from: http://geo.scholarsportal.info/#r/details/_uri@=1788985649. The CD identification codes in the Historical Atlas of Canada Online Learning Project file have not been checked to see if they correspond to those in our 1961 GAF.
[4] Brittnacher, Tom, and Paul Lesack, 2013, "Boundary files, 1951 Census of Canada (Statistics Canada)", Data Services Division, University of British Columbia. Available from: http://geo.scholarsportal.info/#r/details/_uri@=2004314904.

- Where the historical tract boundaries corresponded to modern census tract boundaries or aggregations thereof, we followed the UBC project's practice of dissolving 2006 census tract boundaries as appropriate. This was possible for a majority of the tracts.
- Where the printed maps showed tract boundaries aligning with named streets, railway lines, electrical transmission corridors, water bodies, or watercourses, we aligned boundaries with the same features as indicated in the road network file and/or contemporaneous topographic maps.
- Where the printed maps showed tract boundaries aligning with municipality boundaries (but not streets or other identifiable features), the locations of these boundaries were identified with reference to contemporaneous topographic or other available maps. Other references included the 1951 CSD boundary files created by the Canadian Century Research Infrastructure[5] and the 1981 CSD boundary file.[6] (No CSD digital boundary files exist for the 1956 through 1976 census years.)
- Where the historical boundaries crosscut 2006 census tract boundaries, polygons were cut based on the road network file and other available references.
- Inland waterways were not included. If the tract includes an area that is an inland waterway (such as a river, bay, or lakes), the 2006 inland waterway feature layer can be used to remove areas under water, with the caveat that features may have changed over time.
- Boundaries pertaining to core and outlying areas of the CMA shown on separate maps were combined into a single boundary file for each CMA. Typically, tracts in outlying areas of the CMAs pertained to entire townships or other municipal units.

Attribute Fields

Note that the census tract identification codes (*ctuid*) used are those created through the digitization and processing of the data table. They are designed to enable "clean" joining of the data tables to the boundary files. We found several mismatches between the data table and map references. These were dealt with as follows:

- When a tract feature appears on the printed map but there is no corresponding *ctuid* in the data table, it is retained on the map, however there will be no corresponding data for it to join to.
- When a *ctuid* appears in the data table but does not appear on the printed map, we note it in the documentation.

Field	Description	Format
year	Year of Census (1951, 1956, 1961 and 1966).	4 digits
pruid	Province ID code	2 digits

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[5] http://geo.scholarsportal.info/#r/details/_uri@=1695132658
[6] http://geo.scholarsportal.info/#r/details/_uri@=601262098

prname	Province name	string
cmasid_v	Census volume number.	4 digits
cmasid_t	Tapefile number for Census of that year. Pertains to 1961 and 1966 only.	4 digits
cmauid	CMA ID code	3 digits
cmaname	CMA name	string
ctname	Census Tract identification code. *YY* is the last two digits of the Census year (51, 56, 61 and 66).	7 digits 0000.00
ctuid	Unique national CT identification code *cmauid + ctname*	10 digits 0000000.00
catno	Statcan Catalogue number	string
join	Relationship to corresponding tract(s) in the previous census. 1 = same (one-to-one) 2 = merge (many-to-one) 3 = split (one-to-many) 4 = many-to-many 0 = newly created	1 digit
jointo	If *join* relationship is 1 (same) or 3 (split), *jointo* contains the *ctuid* of the corresponding tract in previous census.	10 digits 0000000.00
comments	Provides details about how 2006 polygons were cut to create the boundaries (i.e., sources, road names and water features). No comment was entered if the historical tract boundaries created are identical to or simple aggregations of 2006 tracts.	string

Projection

All census tract files are in the Statistics Canada Lambert Conformal Conic projection. Details about the projection are as follows:

North American Datum (NAD) 1983 Canadian Spatial Reference System (CSRS) Statistics Canada Lambert
- WKID: 3348 Authority: EPSG
- Projection: Lambert Conformal Conic
- False Easting: 6200000.0

- False Northing: 3000000.0
- Central Meridian: -91.86666666666666
- Standard Parallel 1: 49.0
- Standard Parallel 2: 77.0
- Latitude Of Origin: 63.390675
- Linear Unit: Meter (1.0)

Geographic Coordinate System (GCS): GCS North American 1983 CSRS
- Angular Unit: Degree (0.0174532925199433)
- Prime Meridian: Greenwich (0.0)
- Datum: North American 1983 CSRS
- Spheroid: Geodetic Reference System (GRS) 1980
- Semimajor Axis: 6378137.0
- Semiminor Axis: 6356752.314140356
- Inverse Flattening: 298.257222101

Appendix A: Map References

Census tract and CMA boundary maps in printed Census volumes

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e_A_Topographic_Map.MATM&locale=en-CA

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Appendix B: 1961 and 1966 Geographic Attribute Files

1961

The 1961 source data tables contained the following geographic identifiers. Each smaller unit is unique only within its enclosing unit. For example, municipalities are numbered within counties, and counties and districts are numbered within provinces.

Identifier	Description	Format	Example
prov	Province code	1 digit	2 = Nova Scotia
district	Federal Electoral District (1952 Representation Order)	2 digits	05
ea	Enumeration area	3 digits	119
county	County or equivalent	2 digits	05 = Cumberland
municip	Municipality or unincorporated area	2 digits	04
marea	Metropolitan area/major urban area	2 digits	02 = Halifax
ctract	Census tract	3 digits	024
msub	Municipality subdivision	1 digit	J

Procedure:

1. **Province** codes (*prov*) are reproduced in the SSPS file codebooks and accompanying documentation. These were replaced with modern two-digit province codes (*pruid*). Province names (*prname*) were also added.
2. **Federal Electoral District** codes (*district*) were matched to names based on the official representation order and checked against published district population counts. Codes were replaced by modern-style codes with the representation order year and province prefixes. These match the *feduid* codes created for the Cities in Canadian Political Development project. Example: 1952|24|005 = Berthier - Maskinonge - Delanaudiere. District names (*fedname*) were also added.
3. **County** codes (*county*) are equivalent to the modern Census Division (CD) geography. Names (*cdname*) were matched to county codes using the "Official Grouping of Enumeration Areas into Townships, Municipalities, Parishes, Cities, Towns, Villages, etc." PDF file. A unique national four-digit census division code (*cdsid*) was created by concatenating the *pruid* with the *county* code
4. **Municipality** codes (*municip*) are roughly equivalent to the modern Census Subdivision (CSD) geography. Names (*csdname*) were assigned to codes using the "Official

Grouping of Enumeration Areas into Townships, Municipalities, Parishes, Cities, Towns, Villages, etc." PDF file.

5. **Municipality Subdivision** codes (*msub*) have no equivalent in the contemporary Census geographic hierarchy, occupying a position that is larger than the EA but often smaller than the CSD, yet are unrelated to census tracts within tracted urban areas. These are typically used to distinguish urban and rural parts of municipalities or equivalent unincorporated areas, or to distinguish subareas of urban municipalities. Names (*subdiv*) were assigned to codes using the "Official Grouping of Enumeration Areas into Townships, Municipalities, Parishes, Cities, Towns, Villages, etc." PDF file. Two municipal-scale identifiers were created based on these codes:
   a. A nationally unique Census Subdivision identifier (*csdsid*) was created by concatenating the *cduid*, *municip*, and *msub* codes.
   b. For sorting purposes a *code* was created by concatenating *msub* and *municip*.
6. **Metropolitan Area** codes (*marea*) are contained in the SPSS file codebooks. These were replaced by equivalent modern 3-digit CMA/CA codes (*cmauid*).
7. **Census Tract** codes (*ctract*) were concatenated with *cmauid16* prefixes to create a nationally unique, modern-style 10-digit *ctuid* with leading zeroes and a ".00" suffix.

As a result of this work, the GAF file contains the following fields. To illustrate how they are assembled, a "|" is inserted between each component in the "example" column. These do not appear in the GAF table.

Identifier	Description	Format	Example
ea	Enumeration Area code	3 digits	009
district	Federal Electoral District code	3 digits	005
eauid	Enumeration Area UID = pruid (2) + district (3) + ea (3)	8 digits	12|005|009
pruid	Province UID	2 digits	12
prname	Province Name	string	Nova Scotia
feduid	Federal Electoral District UID = RO year (4) + pruid (2) + district (3)	9 digits	1952|12|005
fedname	Federal Electoral District Name	string	Cumberland
county	County or equivalent code	2 digits	05
cdsid	Census Division UID = pruid (2) + county (2)	4 digits	12|05
cdname	Census Division Name	string	Cumberland County
municip	Municipality code	2 digits	04

Identifier	Description	Format	Example
msub	Municipality Subdivision code	1 digit	J
subdiv	Municipality Subdivision name	string	Subdivision C - Amherst - Amherst Shore
csdsid	Census Subdivision UID = pruid (2) + county (2) + municip (2) + msub (1)	7 digits	12|05|04|J
csdname	Census Subdivision Name	string	Amherst
code	Alternate municipal subdivision code (for sorting) = msub (1) + municip (2)	3 digits	J|04
cmauid	Census Metropolitan Area/Census Agglomeration UID	3 digits	205
cmaname	Census Metropolitan Area/Census Agglomeration name	string	Halifax
ctuid	Census Tract UID = cmauid (3) + cname (7)	10 digits	205|0024.00

In addition, a series of attribute fields were created from the source files:

Attribute	Description	Format
munsiz	Municipality Size Group: Population size categories, distinguishing between urban and rural municipalities RURAL-100,000+ A R:30,000-99,999 B R:25,000-29,999 C R:10,000-24,999 D R:5,000-9,999 E R:2,500-4,999 F R:1,000-2,499 G R:LESS THAN 1,000 H URBAN:100,000+ 1 U:30,000-99,999 2 U:25,000-29,999 3 U:10,000-24,999 4 U:5,000-9,999 5 U:2,500-4,999 6 U:1,000-2,499 7 U:LESS THAN 1,000 8	1 digit
rusize	Rural-Urban Size Group: "This code is used to classify the population into	1 digit

Attribute	Description	Format
	rural or into urban size groups at the county, province and Canadian level. In this context all components, rural or urban, of a metropolitan area or of a major urban area are coded to the rural-urban size which applies to the metropolitan area or major urban area as a whole and always have an urban code. Rural (any size) includes incorporated towns and villages of less than 1000 population and not part of a metropolitan or major urban area."[7] RURAL (ANY SIZE) A 100,000 AND OVER 1 30,000 TO 99,999 2 25,000 TO 29,999 3 10,000 TO 24,999 4 5,000 TO 9,999 5 2,500 TO 4,999 6 1,000 TO 2,499 7	
map	Metropolitan Area Part CENTRAL CITY 1 URBAN FRINGE 2 RURAL FRINGE 3	1 digit
csdtype	Type of CSD CITY C TOWN T VILLAGE V INDIAN RESERVE IR All other types are blank	2 digits

1966

Due to resource constraints, we did not comprehensively digitize the national official lists for 1966. Instead, we created a table that includes identifiers and attributes for tracted areas only.

- While the *csdname* was manually entered from the official list, no *csduid* was created. This is however possible as the source files contains a unique municipality code.
- No *feduid* or *fedname* fields were created as the *district* codes in the source files were not readily matched to the representation order table created by the Cities in Canadian Political Development project.

Identifier	Description	Format	Example
pruid	Province UID	2 digits	12

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[7] Statistics Canada, Census of Canada 1961-1966, Information Guide for User Summary Tapes. Page 39. https://mdl.library.utoronto.ca/sites/default/public/mdldata/open/canada/national/statcan/census/1961/doc/cen61-ust61-66.pdf

Identifier	Description	Format	Example
prname	Province Name	string	Nova Scotia
cmauid16	Census Metropolitan Area/Census Agglomeration UID. Assigned based on the official list of metropolitan/major urban area codes in the codebook.	3 digits	205
cmaname	Census Metropolitan Area/Census Agglomeration name	string	Halifax
ctuid	Census Tract UID = cmauid16 (3) + tract number (7)	10 digits	205|0024.00
ctnum	Census Tract numeric code	4 digits	0024
ctname	In central city: Census Tract numeric code. Outside of central city: Place name.	string	Dartmouth
csdname	Census Subdivision Name. This is identical to the *ctname* except that the central city name is included.	string	Dartmouth
cduid	Census Division UID = pruid (2) + county code (2)	4 digits	12|08
cdname	Census Division Name	string	Halifax County

The 1966 GAF also contains attributes. Note that according to the MDL website there are errors in the Municipality Size (*munsiz)*, Rural-Urban Size (*munsiz*), and Municipal Subdivision Code (*munsub*) fields. As a result, only the *map* and *cmapart* attribute fields are included in the GAF. The dropped fields are described in the table below.

Attribute	Description	Format
map	Metropolitan Area Part CENTRAL CITY 0 URBAN FRINGE 1 RURAL FRINGE 2 These codes differ from 1961.	1 digit
cmapart	Where a CMA crosses provincial boundaries, this field contains the *pruid* of the province in which the tract is located.	2 digits
munsiz	Municipality Size Group: Population size categories, distinguishing between urban and rural municipalities. Codebook does not specify ranges. Codes do not match those in 1961.	1 digit
rusize	Rural-Urban Size Group: "This code is used to classify the population into	1 digit

Attribute	Description	Format
	rural or into urban size groups at the county, province and Canadian level. In this context all components, rural or urban, of a metropolitan area or of a major urban area are coded to the rural-urban size which applies to the metropolitan area or major urban area as a whole and always have an urban code. Rural (any size) includes incorporated towns and villages of less than 1000 population and not part of a metropolitan or major urban area."[8] RURAL (ANY SIZE) 1 Urban: 500,000 and over A 100,000-499,999 B 30,000 TO 99,999 C 25,000 TO 29,999 D 10,000 TO 24,999 E 5,000 TO 9,999 F 2,500 TO 4,999 G 1,000 TO 2,499 H Codes do not match those in the source data file.	

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[8] Statistics Canada, Census of Canada 1961-1966, Information Guide for User Summary Tapes. Page 39. https://mdl.library.utoronto.ca/sites/default/public/mdldata/open/canada/national/statcan/census/1961/doc/cen61-ust61-66.pdf

Appendix C: Notes on attribute joining in GIS

Exceptions to matching

The vast majority of tract records in the data tables will join to tract polygons. The exceptions are as follows:

1. **Tracts with no residents.** Several tracts correspond to parkland or industrial zones with no residents. These include, for example, Parc Maisonneuve in Montréal and Toronto's waterfront railway lands. These tracts are retained in the digital boundary files but have no corresponding records in the Census of Population data tables. Similarly, Sudbury tract 0014.00 is shown on the map and included in the digital boundary files in 1961 and 1966, but does not appear in the data tables. While we did not digitize them, Statistics Canada also released counts of locations and receipts of business locations by census tract, which would populate non-residential tracts.

2. **Indian Reserves and unorganized areas.** The printed boundary maps and data tables sometimes aggregate information for Indian Reserves and unorganized areas differently. This occurs in Québec City, Vancouver, and Victoria in 1951 and 1956, and Kingston and Trois Rivières in 1961. In these cases we have created tracts representing the Indian Reserves but no corresponding data exist in the data tables.

3. **Tracts which are outlying CSDs.** In Montreal and Toronto in 1961 and 1966, the data tables include records for tracts that correspond to all or part of outlying municipalities that were not mapped in the Census reports. These tracts are not present in the digital boundary files.

4. **CMA/CA summary records.** In 1961 and 1966, the data tables include totals for the entire CMA or CA. These have the tract suffix 0000.00. Corresponding tracts are not present in the digital boundary files.