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Mapping Methodology

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Introduction

In 2007, the National Association of Friendship Centres (NAFC) embarked on a project called the “Information Program and Service Needs of Aboriginal Population Through a Geographic Approach” (referred to as the “Data and Mapping Project”). The purpose of this project was to acquire demographic information for the service delivery population, identify future programming options, and use this information in communication and advocacy efforts. Focus Corporation supported this research program by providing the NAFC with geographic information systems, graphics, and web development services.

Main Goals

The main goals of the NAFC Data and Mapping Project were to:

- Identify populations residing in each area that is served by existing friendship centres
- Identify each potential service area that lacks access to a friendship centre
- Develop socio-demographic profiles of each population
- Develop a digital database that contains statistical indicators of each population’s demographic, socio-economic, cultural, and housing characteristics, as well as other related quality-of-life measures
- Analyze the service needs of each population
- Identify ways to present and communicate the analysis results in the NAFC’s advocacy efforts

Using Census Data

The census of Canada is the most reliable, informative, and comprehensive source of data about off-reserve Canadian Aboriginal people and where they live. Statistics Canada collects and disseminates all of the information required for the NAFC Data and Mapping Project; however, the standard census products available do not provide the level of information required by this project. In particular, the following aspects of the standard census data products are problematic for this research project:

- The geographic units used by Statistics Canada (i.e., Census Metropolitan Areas, Census Agglomerations, Community Subdivisions (CSDs), and Dissemination Areas (DAs)) do not always logically correspond to the

geographical areas and population numbers served by all the existing (or potentially needed) friendship centres.

- The data products associated with some levels of geography (i.e., DAs) suppress necessary details about the Aboriginal population within them.

Thus, standard Statistics Canada census data products are unsuitable for the collection and analysis of information about Aboriginal populations that might be served by existing and/or future friendship centres. They do, however, provide a good starting point and facilitate the use of Statistics Canada's custom services, which can be used to amass the statistical information required to complete the NAFC research project.

An improved estimate of each existing and possible friendship centre's geographic service area would allow a more accurate evaluation of the populations that reside within them. To define friendship centre service areas, which are also referred to as catchment areas, Focus Corporation developed a methodology that uses commonsensical rules and standard census geography units, namely CSDs and DAs. That same methodology was also used to identify the most logical locations for new friendship centres and their service areas.

Identifying Friendship Centre Service Areas

Since the 1950s, friendship centres have been established in Canadian communities where there is an identified need. Their programs and services have been made available to those who have sought them (www.nafc.ca). Prior to this study, none of the existing 117 friendship centres across Canada (see **Figure 2.1** on page 15) had a strictly identifiable catchment area within which they aimed to serve. Therefore, none had a definable number of potential clients or a reliable picture of who their potential clients are and what types of services demographic and socio-economic data would suggest they need.

As the NAFC expands to provide more services, it needs more information in order to identify which populations might benefit most from a friendship centre and where new friendship centres should be located so they are most accessible to the people who would use their services.

Before census information could be used to define service areas and provide profiles of the Aboriginal populations that live within them, we needed to ensure that each service area would meet the following three requirements:

- People living within a service area would be able to travel to its friendship centre.
- Each service area had to be reproducible across census years.
- Each service area had to be defined in such a way that consistent and comparable data about each could be gathered and analyzed.

Figure 2.1: Friendship Centres Across Canada



The Solution

We sought to locate each friendship centre within a defined census geographic unit. In the densely populated south, we used CSDs, and in the sparsely populated north, we used DAs. Then, keeping in mind our criteria that a friendship centre's service area must be small enough to allow clients to travel to the centre easily, we developed a set of consistent methodologies to identify how far beyond a friendship centre's core region its service area border would reach. In the south, we used a tiered system that included neighbouring CSDs. In the north, we created a fifty-kilometre zone around a friendship centre's core DA. The resulting list of CSDs or DAs associated with each friendship centre was provided to Statistics Canada to produce custom tables of data grouped by our custom-defined service areas. That data was then used to create various service-area-specific products to meet the information goals associated with this research project.

Service Area Methodology

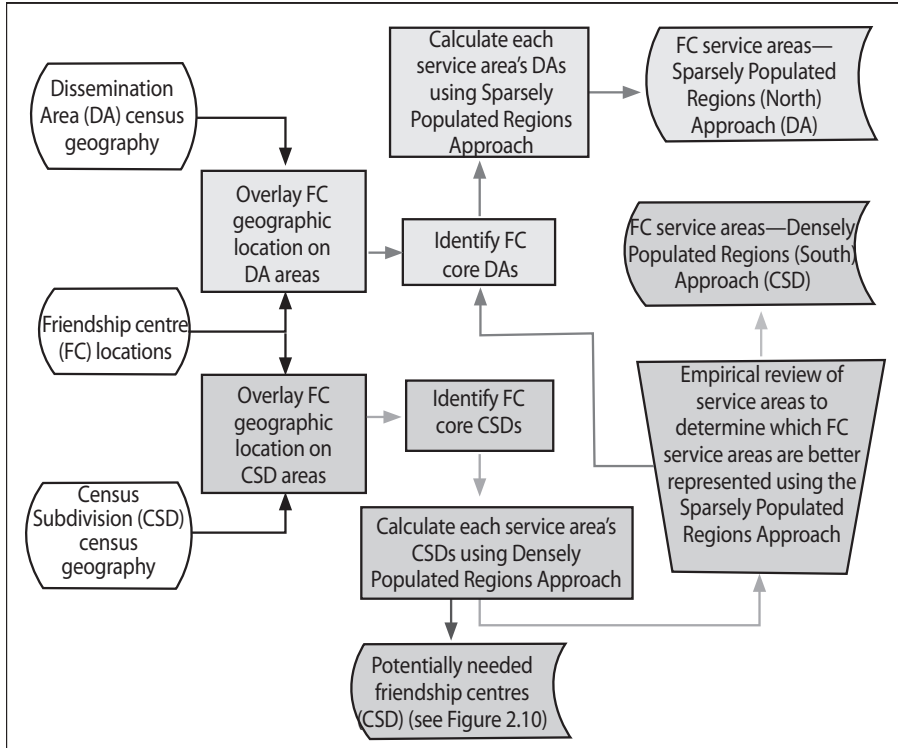
The following restrictions determined our definition of a service area:

- The service area had to be defined using standard statistical areas. CSDs and DAs were used because each provides complete coverage of Canada.
- The service area had to be structured to accommodate the custom statistics data retrievals that were to be performed by Statistics Canada.
- The service area had to be small enough that one friendship centre could reasonably serve its inhabitants.
- Indian reserves and settlements would be included in a service area if the methodology incorporated their geographic area. Even though residents of reserves and settlements are not considered the primary target population of friendship centre services, these areas were not specifically removed from a service area if the methodology naturally included them. Residents do travel to friendship centres to access services. It is important to note that reserves or settlements that did not participate in the census had no census data to include in our research.
- For tracking purposes, we identified the service area of each friendship centre by the unique identification code assigned to the centre by the NAFC.

Defining Service Areas

As the first step towards defining the service areas, we used the location of each existing friendship centre to identify its core geographic unit (CSD or DA). It was our preference to use CSDs as our primary geographic unit because Statistics Canada's data products suppress less information at this level and, in comparison to DAs, CSD geographic boundaries are subject to fewer changes between census years. However, in many cases, especially in sparsely populated northern Canada, CSDs are simply too large to meet our criteria for defining service areas. In such cases, we opted to use the smaller DA, adjusting our methodology accordingly.

Figure 2.2 depicts the methodology workflow used to define service areas.

Figure 2.2: Defining Service Areas (South and North)—Methodology Workflow

Densely Populated Regions (South) Approach

In locations where CSD areas were small enough—typically the case in urbanized areas—we used a tiered approach to identify a friendship centre’s service area. Using a friendship centre’s core CSD as a starting point, we then included in its service area every CSD that touched the core. The final service area consists of the combined geography of the core CSD and any neighbouring CSDs that shared a border with it (see **Figure 2.3** on page 18 for an example of this approach).

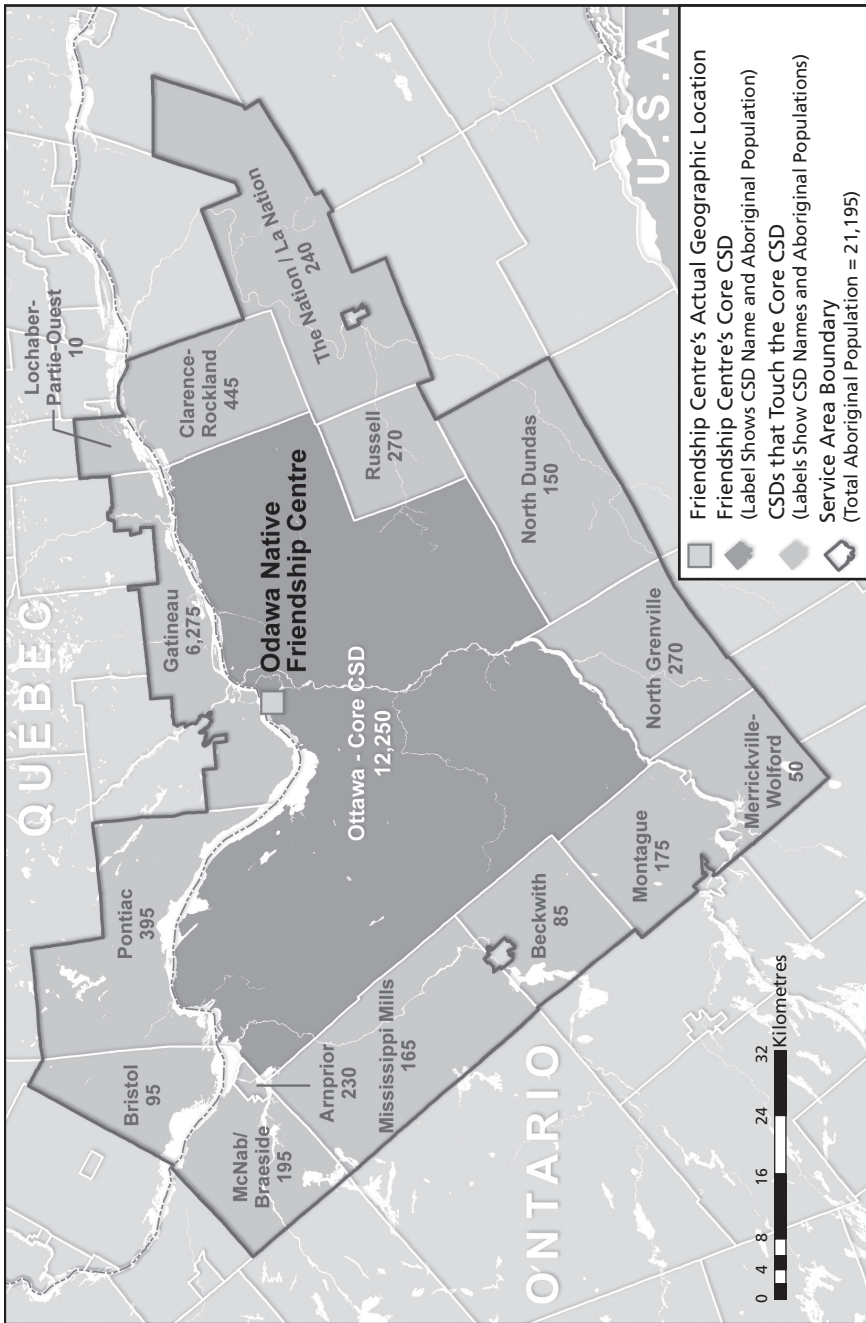
Because this approach was most frequently used in the southern part of the country, it is sometimes referred to as the South Approach.

Sparsely Populated Regions (North) Approach

In locations where CSDs were so large that the tiered approach to identifying a service area resulted in geographies that were too large to meet our criteria, we used the DA in which the friendship centre was located to define its core service area. This typically occurred in sparsely populated areas.

We created a fifty-kilometre buffer zone around the geographic centre of each core DA. For those friendship centres whose service area was defined this way, the final service area consists of the combined geography of the core DA and any

Figure 2.3: Densely Populated Regions (South) Approach—Odawa Friendship Centre (2006 Census Geography)



DA that falls completely within the buffer or has at least 50% of its area within the buffer (see **Figure 2.4**, below). Because this approach was most frequently used in the northern part of the country, it is sometimes referred to as the North Approach.

We used the Densely Populated Regions Approach (South Approach) and the Sparsely Populated Regions Approach (North Approach) to calculate service areas for all of the existing friendship centres across Canada. We assigned to each service area a unique identifier based on the NAFC's friendship centre naming conventions. **Figure 2.5** on page 20 provides the name and location of each service area. **Table 2.1** on page 21 provides the number of service areas calculated using each methodology.

Unique National Service Areas

Together, the Densely Populated Regions Approach and the Sparsely Populated Regions Approach generated a service-area-specific list of CSDs and DAs, and provided a consistent way to compare the service area size and population profiles of individual friendship centres. However, since each service area was defined separately, it was possible that a CSD or DA could be included in more than one friendship centre's service area. This overlap between service areas made it impossible to calculate the total population that is serviced by all existing friendship centres in any one province.

Figure 2.4: Sparsely Populated Regions (North) Approach – Nistawoyou Association Friendship Centre (2006 Census Geography)

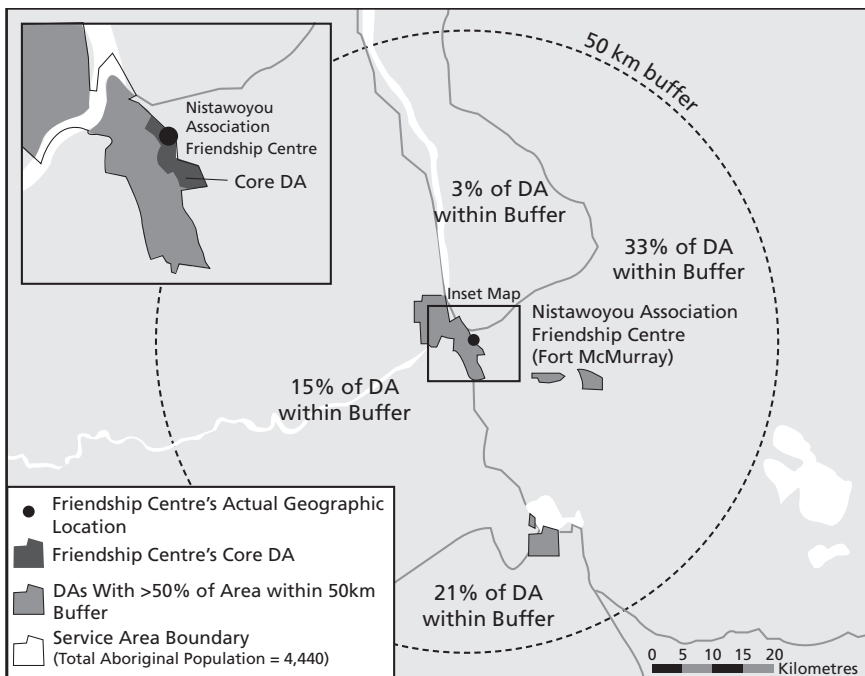


Figure 2.5: Geographic Coverage of All Service Areas for Friendship Centres in Canada



Table 2.1: Number of Friendship Centre Service Areas Calculated Using Each Methodology

	Census Year	
	2001	2006
Densely Populated Regions (South) Approach	48	48
Sparsely Populated Regions (North) Approach	67	68*
Total Number of Friendship Centres	116	117

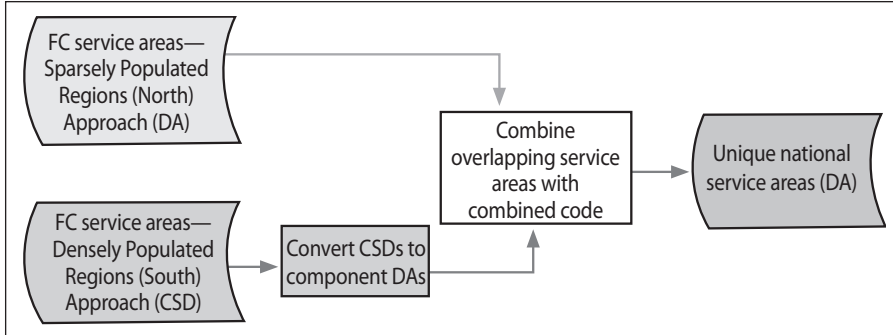
* The Friendship Centre in Sept-Îles was included for the processing of the 2006 Census

To work around the problems created by the overlapping service areas, we determined which geographic areas overlapped and developed a list that included unique and overlapping areas. This comprehensive list of unique national service areas enables review of the total population within individual provinces/territories and Canada as a whole. The unique national service areas were only created for the 2006 census-based geographies. **Figure 2.6** on page 22 depicts the methodology used in this process.

To create the list of unique national service areas, the service areas of existing friendship centres were analyzed at the DA level to produce a list that identified overlapping and unique DAs. The following steps were taken to identify these DAs:

- All south CSD service areas (which were determined using the densely populated regions approach) were converted to the DA level of geography so that service areas throughout the nation would share the common DA-level geographic framework.
- All DAs that existed in more than one service area were identified.
- All service areas that crossed provincial boundaries were identified.
- All DAs were identified using a coding system that describes their service area coverage:
 - a) Unique coverage in the friendship centre province (e.g., F99)
 - b) Service area split between different provinces (e.g., F3-SASK)
 - c) Overlapping coverage between two or more service areas (e.g., F2-F99)

The creation of unique national service areas facilitates different types of analysis. Doing so allows the calculation of national and provincial service area totals. It also provides a way to quantify the amount and type of overlap between friendship centre service areas, thus making the service areas more useful, and facilitates the comparison of the statistics associated with neighbouring friendship centres. **Figure 2.7** on page 23 provides an example of a unique national service area.

Figure 2.6: Unique National Service Areas—Methodology Workflow

Potentially Needed Friendship Centres

When this research program was initiated, there were 117 friendship centres across Canada. At the same time, some non-reserve communities with significant Aboriginal populations did not appear to be serviced by an existing friendship centre. The Densely Populated Regions Approach was used to identify service areas for those communities that might need a friendship centre. These service areas were labelled “potentially needed friendship centre” or “gap community,” meaning there appears to be a gap in friendship centre coverage.

We used three types of information in the first stage of our efforts to determine where new friendship centres might possibly be needed:

1. CSDs that were not included in any existing friendship centre service areas.
2. CSDs that were within existing friendship centre service areas.
3. A list of additional communities that NAFC had identified as potentially needing friendship centres. All of these communities are in northern Canada; many of them have requested that a friendship centre be established.

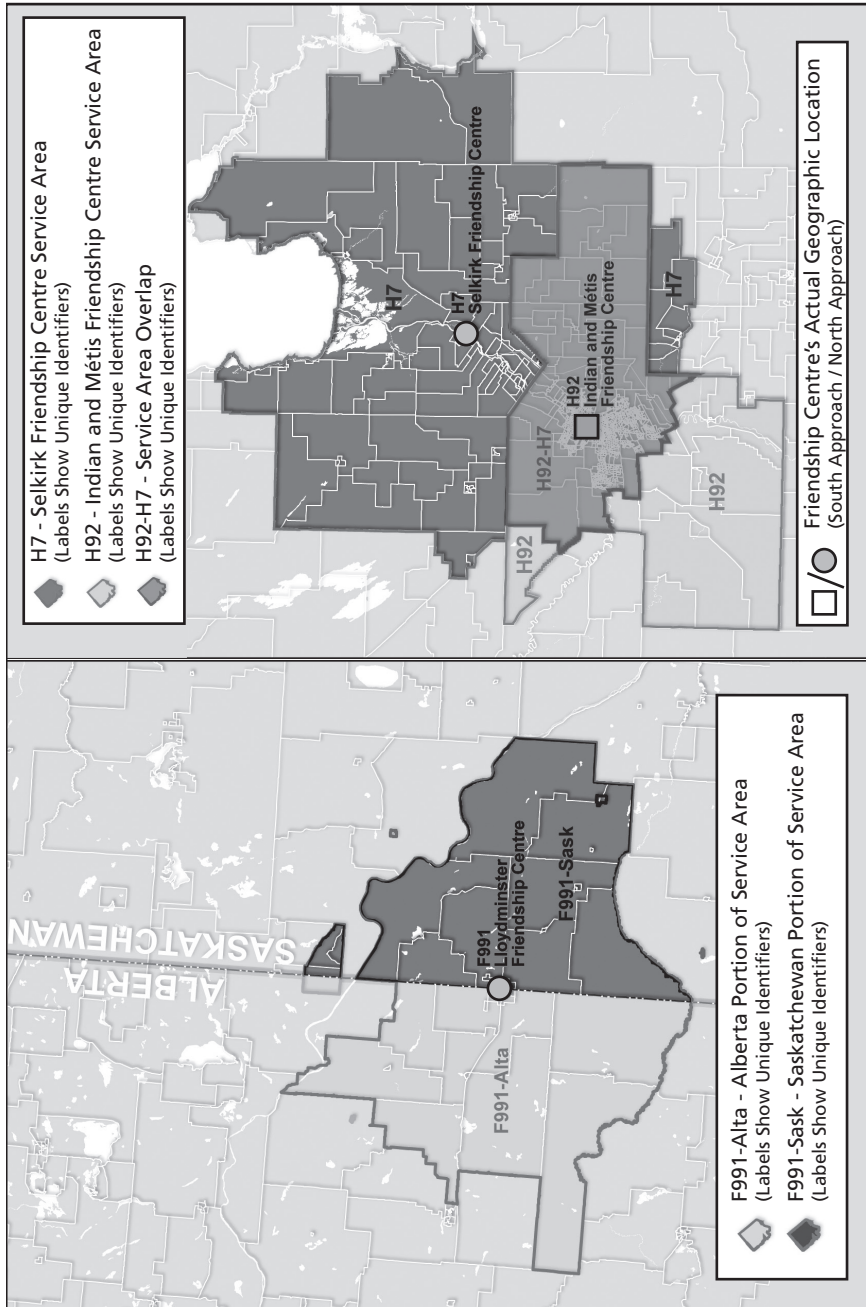
Rather than use DAs to identify service areas that potentially needed friendship centres, we used CSDs because they could provide reliable Aboriginal population counts and had better potential for reliable census data retrievals.

Criteria

Our first stage of inquiry generated a large number of CSDs that might need a friendship centre. To reduce the list to a more manageable size, each of the CSDs on the list had to meet the following criteria:

1. The CSD is a non-reserve/non-Aboriginal community. This was defined as any CSD where the Aboriginal population was less than 70% of the total population.
2. The CSD has an Aboriginal population of at least four hundred.
3. The straight line distance from the centre point of the CSD to the closest friendship centre is greater than 25 kilometres.

Figure 2.7: Unique National Service Areas—Lloydminster, Winnipeg, and Selkirk Friendship Centres (2006 Census Geography)



Further to these criteria, an empirical review of the final list was performed to flag CSDs that most likely do not need a friendship centre. This review involved comparing the CSDs with the coverage of existing friendship centre service areas, including the buffers used to define the service areas in sparsely populated regions. Since this review was subjective and open to discussion, the flagged CSDs remained in the list. Their service areas were still calculated, and they were still included in the list of service areas sent to Statistics Canada. If it is later determined that one of the flagged service areas was incorrectly removed from the maps and reports, it could easily be included again.

The additional communities that the NAFC had identified as potentially needing friendship centres were not subjected to the criteria described above. In most cases, these communities, which are located in northern Canada and have predominantly Inuit populations, had initially been excluded because their Aboriginal population was more than 70% of the total population. All potential service areas were assigned unique identifiers that start with the letters “GAP” and are followed by a sequential number. They were named according to the name of their core CSD. **Figure 2.8** on page 25 shows the locations of potentially needed friendship centres across Canada.

Potentially Needed Friendship Centres Using the Densely Populated Regions Approach

Since the Densely Populated Regions Approach identifies most potentially needed friendship centre service areas at the CSD level of geography, their predefined core CSDs were used to identify their friendship centre’s service area. The locations on the NAFC’s list of potential areas, on the other hand, were identified by community names only. For each of these centres, their community’s CSD became the core CSD for their service area.

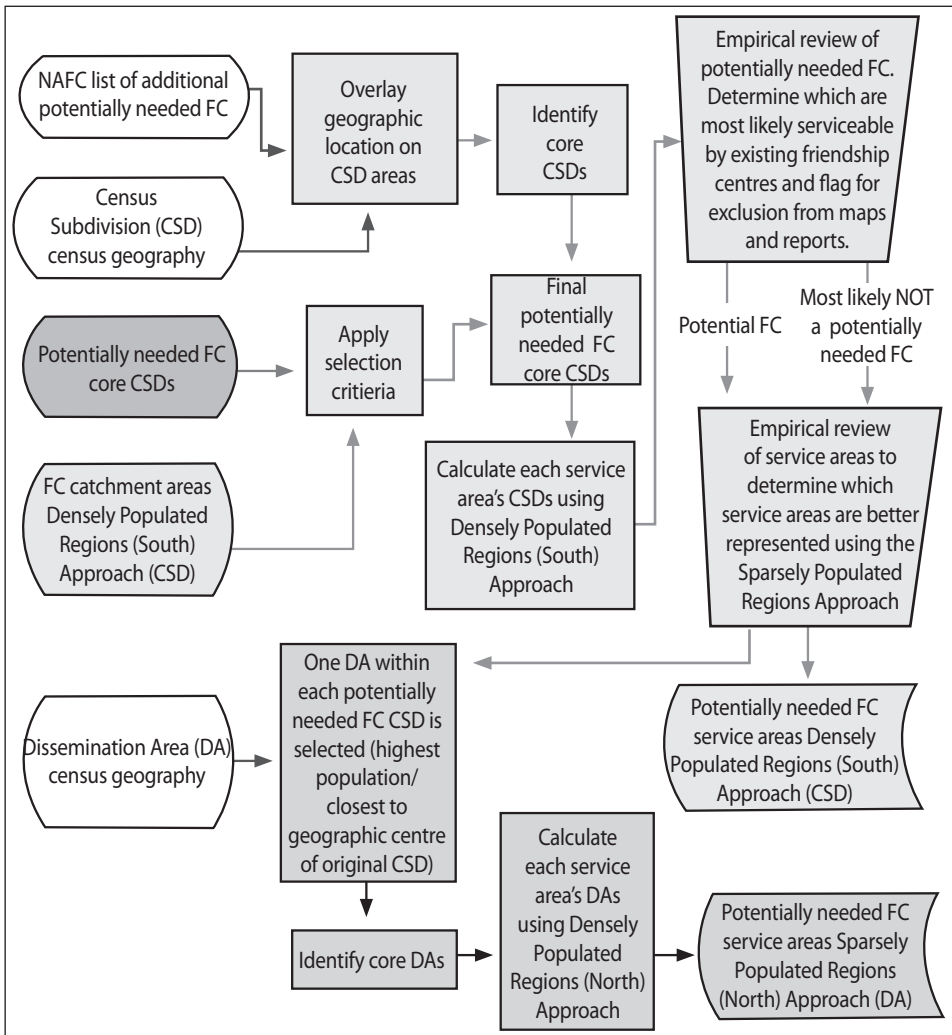
As with the survey of existing friendship centre service areas, a tiered approach was used to identify the service area for those areas where CSD areas were small enough. This approach was mostly used in urbanized areas. **Figure 2.9** on page 26 depicts the methodology used to define service areas for potentially needed friendship centres.

Potentially Needed Friendship Centres Using the Sparsely Populated Regions Approach

For areas where the Densely Populated Regions Approach produced unreasonable results, we used DAs to define the service areas. The process of selecting core DAs for the service areas of potentially needed friendship centres was different from the process of selecting core DAs for the service areas of existing friendship centres. Since the service areas of the potentially needed friendship centres were identified at the CSD level (and there are many DAs in any single CSD), we used an empirical approach to choose the core DA for each service area. In general, the following rules were used to choose an appropriate DA:

1. The DA in the centre of a cluster of high-population DAs would be the core DA. We assumed that the cluster of high-population DAs would represent the most densely populated area of the CSD and, most likely, match the actual location chosen for a new friendship centre. Unfortunately, Aboriginal population, which would have been the best method for choosing a location for a new friendship centre, is not provided at the DA level by Statistics Canada.
2. If there was no obvious high-density cluster of DAs, the DA closest to the geographic centre of the CSD would be the core DA.

**Figure 2.9: Defining Service Areas for Potentially Needed Friendship Centres—
Methodology Workflow**



A fifty-kilometre buffer was created around each core DA's geographic centre. The service area includes every DA that falls completely within the buffer and every DA that had at least 50% of its area within the buffer. Because DAs do not have names, the original CSD identifier was used to create the name of the potentially needed friendship centre service area.

2001 and 2006 Census Years

The service area methodology, including the Densely Populated Regions Approach and the Sparsely Populated Regions Approach, was designed and first implemented using 2001 census geography. Later, the same process was repeated using the 2006 census geography. Every effort was made to minimize changes in service-area coverage between the two censuses so as to maintain comparability. From 2001 to 2006, there have been only minor changes for most service areas in census geography. (The largest changes in service area coverage that resulted from changes in CSD boundaries were found in Montreal (L4), Quebec City (L3), and Charlottetown (N1).) Changes in population and CSD geography increased the number of potentially needed friendship centre service areas in 2006.

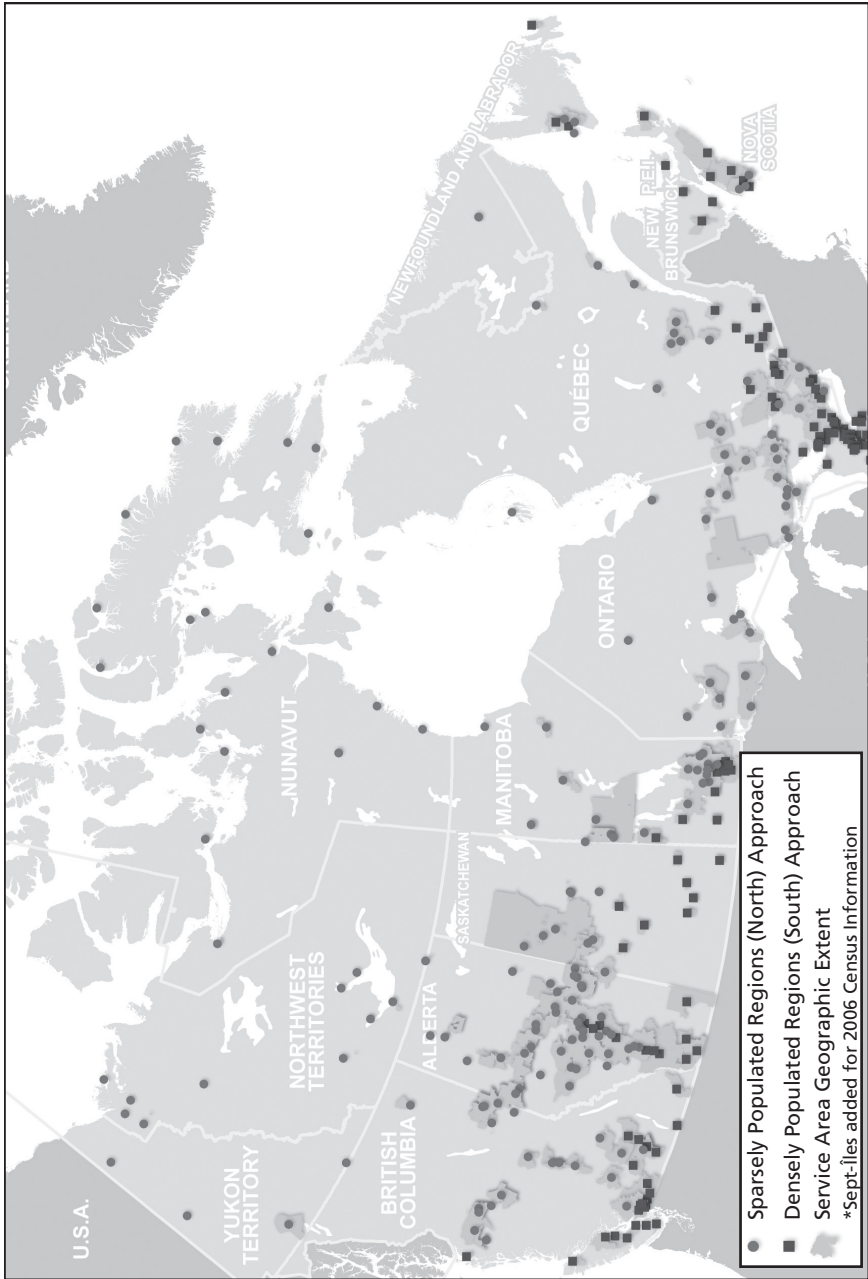
The process of assigning unique identifiers to the 2006 potential service areas included comparing them with the unique identifiers of the 2001 areas. Potential service areas that remained the same were given the same identifier, 2001 "Potentially Needed Friendship Centres" service areas that no longer existed had their identifier retired, and newly created service areas were given new identifiers. **Figure 2.10** on page 28 depicts all service centre areas for existing and potentially needed friendship centres.

Products

The NAFC Data and Mapping Project has produced the following products that can aid in the collection and analysis of information about friendship centres, their service areas, and their clients:

- Custom census tables: Simple lists of service areas for existing and potentially needed friendship centres allow the customized retrieval of census data. In the lists, each service area is represented by its unique code in conjunction with its matching CSD or DA code and grouping. Statistics Canada uses these service-area identifiers to acquire and tabulate the necessary detailed census information for each service area.
- Maps of specific socio-demographic data (e.g., CWB Index scores): Thematic maps of specific themes enable the examination of trends.
- Map application with detailed PDF reports (www.nafc.ca/maps): Static maps indicate the location of each existing and potentially needed friendship centre. By clicking on a centre location, the user opens a two-page report that includes charts and tables that detail some socio-demographic information about that friendship centre's service area. The detailed report also includes a map of the friendship centre's service area.

Figure 2.10: All Service Areas for Existing and Potentially Needed Friendship Centres



Conclusion

The NAFC's Data and Mapping Project has resulted in a comprehensive, accurate, and reproducible method for identifying friendship centre service areas and collecting information about the populations within them with each census.

By using census geographies to identify the service areas of existing and potential friendship centres, the NAFC can use Statistics Canada's custom data products to collect and analyze the information about the populations within them. This information will allow the NAFC to further explore the demographic makeup of its services areas, identify potential service needs and programming options, and create communication products to use to advocate the NAFC movement's objectives.