

## **2006 CENSUS MAP PRODUCTION**

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Getting ready for the 2006 Census: Producing more than a hundred thousand unique maps.

With every census, the Geography Division of Statistics Canada produces a large quantity of maps, including a map series defining the geographic territories used by enumerators when collecting census data. They are conceived in such a way that the enumerators could familiarize themselves rapidly with the extent and limits of their individual territories. These maps have greatly contributed to the success of a census. They are produced with varying scales and page sizes.

Between 40 000 and 50 000 maps used to be produced by cartographers using manual method techniques, which could take years to complete. The first automatically produced census maps were produced for the 1986 census. In 1991 and 1996, all of the maps for urban centre with a population of 50 000 or greater were produced using CAM (Computer Assisted Mapping). This software package was developed using ArcInfo (ArcEdit, ArcPlot), AML, and Fortran 77 technology. In 2001, the Geography Division made considerable changes to its geographic infrastructure. The National Topographic Database (NTDB), including the National Road Network, was implemented. The new base data as allowed all census enumeration maps to be produced automatically.

A new approach will be used for enumeration activities during the 2006 Census.

In response to these changes, the Geography Division re engineered their automated map generation software, taking into account new ESRI technologies (ArcGIS 9.x, ArcSDE, and Maplex). A study was conducted and the Geography Division took advantage of the opportunity to develop CMS (Census Mapping System).

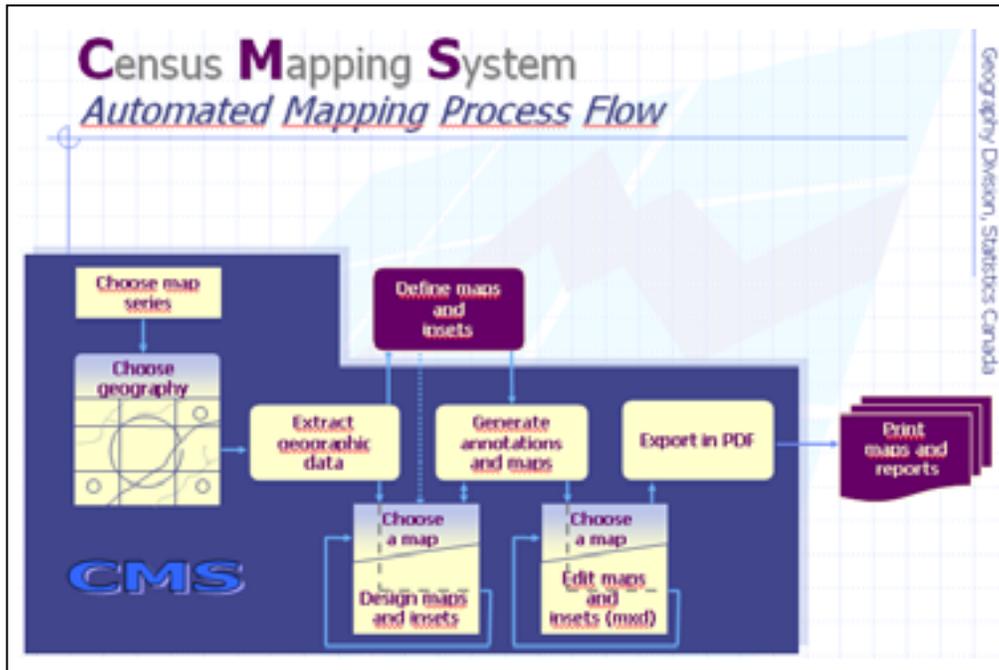
Statistics Canada examined EMRP (Electoral Maps and Reports Production System), in use at Elections Canada. Election Canada also has a need to produce large number of maps, at different scales, and with different page sizes.

Recognising the effectiveness of EMRP, and the similarities between it and the design specifications for CMS, it was used as a base upon which to develop CMS. Conscious of a tight development schedule, Statistics Canada assembled a team consisting of Statistics Canada employees and developers from Intélec Géomatique Inc., who had previously developed EMRP.

The development of CMS consisted mainly of adapting EMRP to the needs of the Geography Division, and the adoption of new technologies such as VB.Net, ArcOBJECTS, Maplex, and the Geodatabase.

Developed in the fall of 2004, CMS has a bilingual interface and modules for:

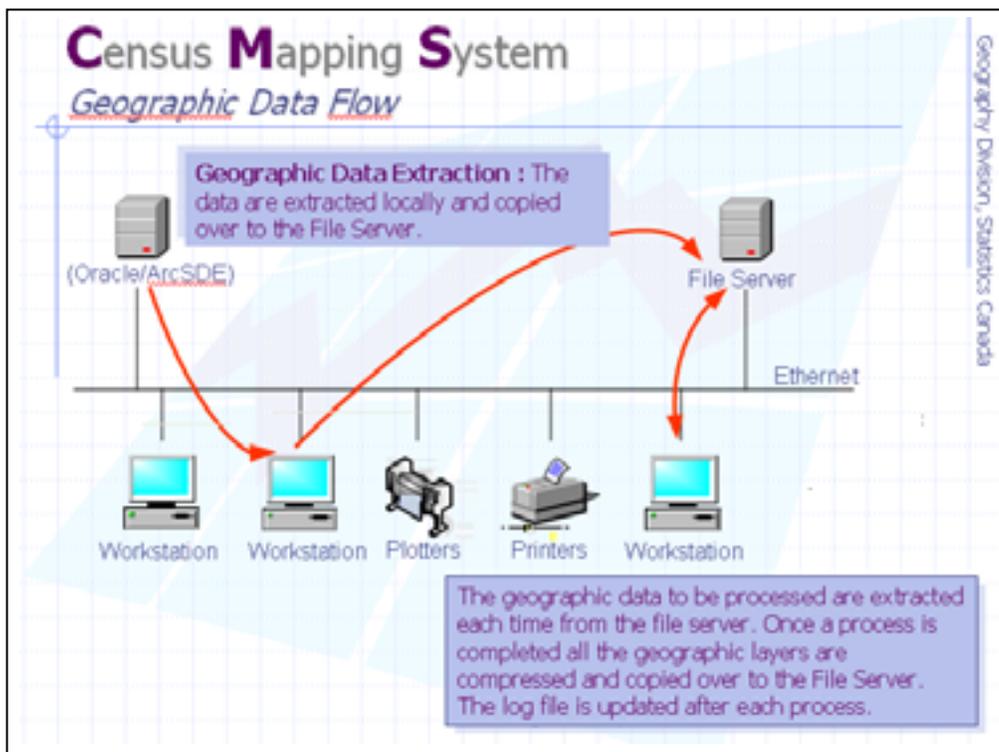
- Extraction and re-projection of NTDB data;
- Automatic scale calculation and map enlargement;
- Visualisation, validation, and modification of scales and map enlargements, on a per map basis;
- Map production and exporting to PDF;
- Map printing;
- Map production workflow monitoring;
- Statistical report generation on a map production quality assurance.



CMS has been used in production since March 2005 and has followed the Geography Division to meet its map production goal. CMS has not suffered any production delays and has in fact allowed the production team to complete its work weeks in advance.

The three series of maps consisted of more than 100 000 maps of urban and rural centres of Canada. These maps were produced, QA'd., packaged, and delivered by a team of less than 10 people over a period of six months. The greatest advantage of CMS is that very few maps required human correction or intervention; the users were satisfied with the quality of the automated maps.

Based on its modular architecture along with a simple Geographic Data Flow, CMS has been easily adapted to produce the official dissemination for the 2006 census.



Despite the recentness of its implementation, CMS is already a success. Its secret?

- A seamless geographic database stored in ArcSDE;
- The use of ArcGIS technology, coupled with ArcObjects and Maplex;
- An efficient and timely technical support from ESRI Canada and ESRI USA;
- And, a great partnership and collaboration between Statistics Canada, Elections Canada, and Intélec Géomatique Incorporated allowed the creation of an experienced team dedicated to the success of the project and product.

This presentation consists of a PowerPoint slide show.