

**USING CENSUS DATA FOR REDISTRICTING**

**IN**

**MINNESOTA**

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## CONTENTS

I	Introduction .....	1
II.	Redrawing the Political Map .....	1
A.	A Good Map .....	1
B.	Deciding Where District Boundaries Should Be .....	1
1.	Accurate Population Counts .....	1
2.	Accurate Political Information .....	2
3.	The Need for Compromises .....	3
C.	Drawing the New Boundaries on a Map .....	3
III.	Improving the TIGER Files .....	4
A.	Cartographic Quality .....	4
1.	Geographic Features .....	4
2.	Feature Names .....	4
B.	Time .....	5
1.	The Importance of Time .....	5
2.	Streets .....	5
3.	City Boundaries .....	6
4.	Precinct Boundaries .....	6
5.	Address Ranges .....	7
6.	Legislative and Congressional District Boundaries .....	7
IV.	The Census Version of TIGER .....	8
V.	Adding Population and Election Data .....	8

A.	Population Data .....	8
B.	Election Data .....	8
VI.	Redistricting .....	8
A.	The Legislature and Congress .....	8
B.	Local Governments .....	9
VII.	Conclusion .....	10

## **I. Introduction**

The purpose of this paper is to explain how the Minnesota Legislature plans to use the Census Bureau's TIGER files and population counts to change the boundaries of Minnesota's legislative and congressional districts following the 1990 census. My aim in doing this is twofold: first, speaking to you as professionals, to make you aware of one of the primary uses to which census data will be put; and second, speaking to you as citizens of a democracy, to make you aware of the political process that will be occurring over the next two years to redraw the political map of the state.

## **II. Redrawing the Political Map**

Redrawing a political map seems like it should be a simple matter. You take a good map of the state, decide where you want the new district boundaries to run, and draw the new boundaries on the map.

### **A. A Good Map**

There are plenty of good maps available, including the highway map produced by the Minnesota Department of Transportation, the highway maps sold by oil companies, and other maps sold by various map companies. In fact, the United States Department of Justice, which expects to review about 5,000 redistricting plans this decade, says that the most common form of map submitted to it during the last decade was a Texaco highway map.

### **B. Deciding Where District Boundaries Should Be**

#### **1. Accurate Population Counts**

But deciding where the new district boundaries should run is a little harder. There are several reasons for this. First is the concept of "one person, one vote." The federal courts have decreed that each congressional district, senate district, and house district in a state must have approximately the same population as every other district of that kind in the state, so in drawing district boundaries, the members of the Legislature need to know the population of each proposed district with some degree of precision.

The standard for congressional plans is that the districts must be "as nearly equal in population as practicable." *Wesberry v. Sanders*, 376 U.S. 1 (1964). This has come to mean that, where there are competing plans, the plan with the lowest overall range, that is, the difference between the largest and the smallest district, wins. Congressional districts across the United States vary in size, but normally are about half a million people. The overall range of congressional districts in Minnesota after the 1980 census was 46 people. The overall range of congressional districts in Colorado was 10 people. You can't get that kind of precision by drawing on a highway map. Why not? Because

the Census Bureau doesn't use highway maps for conducting the census and reporting population. The Census Bureau draws its own maps, using the TIGER files.

One of the main reasons the Census Bureau decided to create TIGER for the 1990 census was to eliminate discrepancies between census geography, as shown on census maps, and census population counts, as shown on tapes and printed reports. In 1980 and before, there were blocks on census maps for which there were no population counts, and population counts in census tables for which there were no blocks on a census map.

A second reason for creating TIGER was to reduce errors in assigning population to the correct unit of geography. In 1980, census counts were often assigned to the wrong block, city, town, or county. Most of these errors were detected in the process of post-census local review, but others only came to light as legislative staff were trying to make the new districts fit within an acceptable overall range. Needless to say, when we in Minnesota were struggling to reach an overall range of 46 people, these discrepancies and errors were cause for some concern.

## **2. Accurate Political Information**

A second reason why deciding where new district boundaries should run is harder than you might think is because legislators like their old districts. After all, those are the districts from which they were elected. If they are going to have new districts, the legislators want to know more about them than how many people they contain. The legislators want to know how those people are likely to vote. They learn that by examining election returns.

Now, the basic unit of census geography is the block; but the basic unit for election returns is the precinct. One of the major additions the Census Bureau has made to its mapping data base as part of creating TIGER is the addition of precinct boundaries. Phase 1 of the Census Bureau's 1990 Census Redistricting Data Program was a cooperative effort with the states to correct and add block boundaries that the states anticipated might be useful for redistricting, and Minnesota was one of the leaders in that effort. Phase 2 was the addition of precinct boundaries. Minnesota was one of the first two states in the nation to finish providing its precinct boundaries to the Census Bureau last fall, and expects to get them back in electronic form as part of the Initial Voting District Codes TIGER file this fall. The addition of the precinct boundaries to the TIGER file will enable legislators to relate data from election returns to census geography and know, not only how many people are in a precinct, but how they have voted in the past.

### 3. The Need for Compromises

When each member acts alone to draw the member's own district with an ideal population and ideal voting behavior, it naturally takes the member some time to evaluate the many possible combinations of census units that might be used to make a district and to decide what is best for the member. But what is best for that member is not necessarily best for the member's neighbors, who may share his outlook and want some of the same census units for themselves. Developing a plan that will satisfy a majority of the members of a body requires a lot of discussion and many compromises between members competing for the same territory, and for their political survival.

In Minnesota, the difficulty is even greater, since two house districts must be nested within each senate district. A plan for house districts must be drawn so that it also secures the support of a majority of the senate members, and a plan of senate districts must be drawn so that it also secures the support of a majority of house members.

#### C. Drawing the New Boundaries on a Map

Once the political process has run its course and the new boundaries have been agreed to, the Legislature needs to be able to draw the new boundaries on a map.

Now, it's true that the Legislature acts by passing a law describing the metes and bounds of the new districts, rather than by enacting a map. But for purposes of explaining a plan to the members who are asked to vote for it and to the state, county, city, and town officials who must conduct elections in accordance with the plan, a good set of maps is essential.

I have been told that, after the 1980 census, Minnesota was the only state in the nation that had a digitized computer map of the entire state that it used for redistricting. When the Senate had agreed on a redistricting plan, we tried plotting it on our computer. We were horrified by the results. We used a pen plotter, which was horribly slow, so we could not possibly take the time to plot more than the borders of the new districts. Borders without the names of the physical features they ran along or the census units they enclosed were worthless in explaining to members what was in their new districts. Back to the highway maps. We tried laying the border maps over highway maps to trace the new boundaries on the highway maps, and found they didn't match. Wrong scale. Wrong projection. Different control points. Different coordinates. County edges did not match. Blocks of water ran along rivers for miles. Block polygons did not close. Not to mention different city boundaries in areas where there had been annexations. It was a major effort to translate the legislative district boundaries created by aggregating census units in our computer system into boundaries we could trace by hand on base maps the members had some faith in.

I never did see a high quality map of the 1982 legislative and congressional districts until long after the Legislature had given up on trying to agree to a set of plans, the three-judge federal court had adopted a set of their own, and the elections were underway. That was a map the Secretary of State obtained from Larry Charboneau's company, Lawrence Mapping and Graphics.

The TIGER files we receive from the Census Bureau will allow us to tie population counts and election returns to census geography, but they will not allow us to assign census units to districts or to plot maps or print reports analyzing those districts without the assistance of software we must purchase from a vendor. And they will not allow us to plot maps of a quality sufficient for presentation to legislators and election officials without substantial additional work to improve the TIGER files.

### **III. Improving the TIGER Files**

#### **A. Cartographic Quality**

##### **1. Geographic Features**

As many of you know, the geographic data in the TIGER files comes from two major sources. In major metropolitan areas, like the Twin Cities, St. Cloud, and Duluth, the Census Bureau started with the GBF/DIME files it had developed for the 1980 census. The GBF/DIME files were a digital cartographic file used by the Census Bureau for collecting and tabulating population counts, and were never intended by the Bureau to produce presentation-quality maps. They featured straight lines, even along rivers and around lakes, and just did not look like maps of "real" geography. Nevertheless, they existed, and the Bureau chose not to re-digitize the areas they covered. Instead, the Bureau hired contractors to digitize the areas around these metropolitan cores until they came to the nearest 7.5-minute quad boundary. This in-between area the Census Bureau calls the "metropolitan area window." See Figure 1 on the next page. From there, the Bureau used the United States Geological Survey's 1:100,000 scale DLG-3 files to build the rest of TIGER's geographic data base.

So, in the seven-county metropolitan area, the central cities, with which most people are familiar, look funny in the TIGER files. The newly-developing suburbs, with which only the locals are familiar, look great, except that they don't include the new streets laid out since the mid-1980s.

##### **2. Feature Names**

The TIGER/Line file contains political boundaries, physical features such as highways, streets, rivers, lakes, railroads, and power lines, and numerical codes to identify them. It does not contain alphabetic names for political subdivisions. Those names will be made available in a separate TIGER extract called the TIGER/GRF-N file

# Metropolitan Area Window

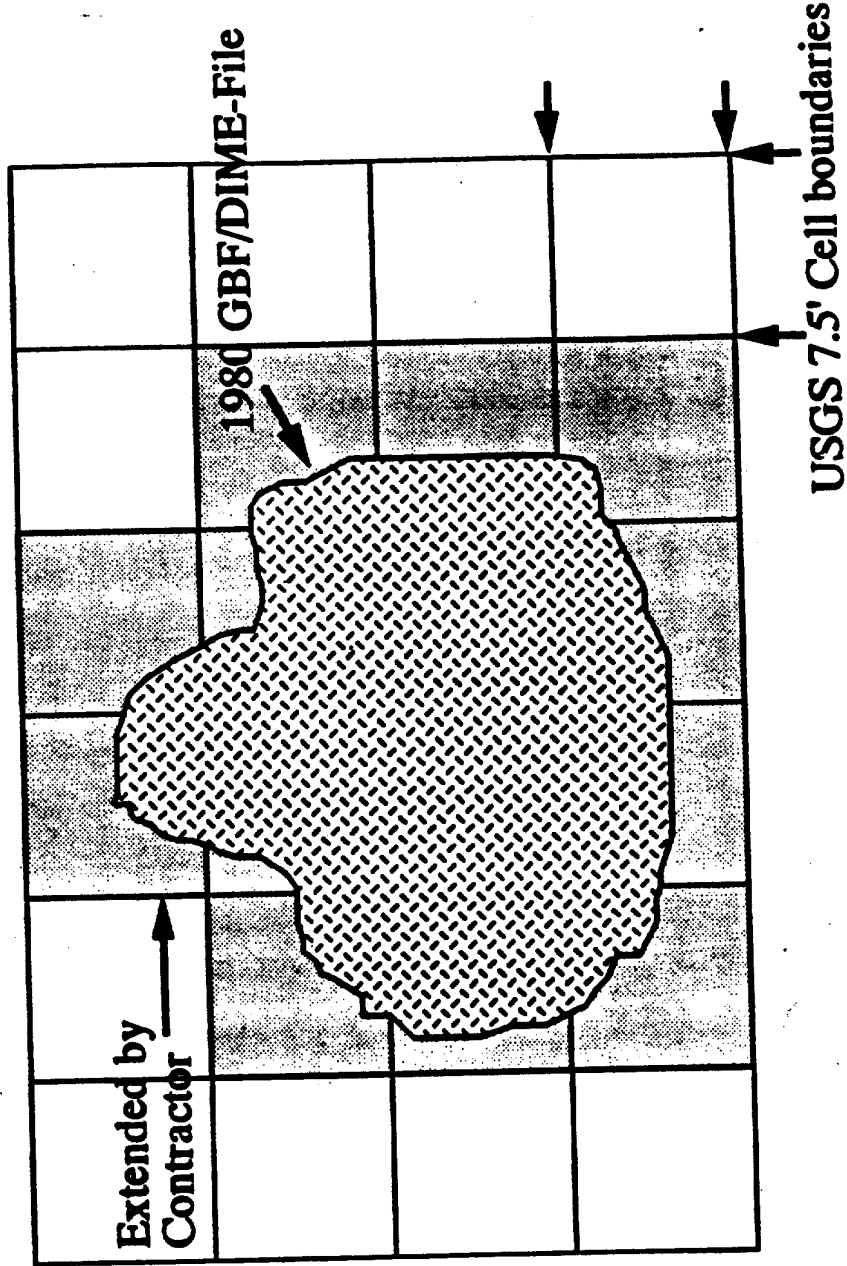


Figure 1. Metropolitan Area Window



(Geographic Reference File - Names). The Legislative Coordinating Commission's Subcommittee on Redistricting is planning to add these names to its redistricting data base.

## B. Time

### 1. The Importance of Time

As experienced users of GIS have come to realize, you can't look at a GIS only as a *geographic* information system; you must look at it also as a *historical* information system. It must consider not only space, but also time. Why is this?

A geographic information system is an expensive proposition. It takes a lot of time and money to assemble. You don't want to throw it away after only one use. You want to maintain it.

But geography changes over time, so you need to be conscious of what *time* the data in your GIS represents.

### 2. Streets

The streets in the pre-census TIGER file represent those that were on the paper maps that were digitized to create TIGER. This means that none of the streets graded since 1986 are in the pre-census TIGER file, and some areas are missing streets graded since 1984, or even since 1982. This is an inconvenience for the Census Bureau, whose enumerators must find the houses on those new streets in order to count the people now living there, as well as for the legislators who draw redistricting plans and know for certain that "that's not what that area looks like!"

Several months ago, when I first talked to Linda Tomaselli, my heart went pitter-pat at the news that she and the Metropolitan Council were planning to improve the TIGER files by updating the streets in the metropolitan area to January 1, 1989, by starting with the Minnesota Department of Transportation's digital street file and rubbersheeting the pre-census TIGER file's streets to it, since that meant that the cartographic quality of the TIGER files might at last be brought up to presentation quality within the GBF/DIME file area, and that we could show on our maps the streets that had been graded up to that date. I hope you all can now appreciate what a major improvement to the cartographic quality of the TIGER file this will be. The Subcommittee on Redistricting has contracted with the Metropolitan Council to provide this improved TIGER file to us for use in redistricting.

Outside the seven-county metropolitan area, the Minnesota Department of Transportation has been digitizing its county map series. The counties adjoining the metropolitan area have been completed and are being kept current. However, the

county maps contain only state and county highways, they do not contain city streets, so city streets outside the seven metropolitan counties have not been digitized and will not be digitized in the near future. MnDOT has been maintaining city streets outside the seven-county metro area only on paper maps, which are updated following each construction season. Any update of the TIGER/Line file of city streets outside the metro area, beyond what is done by local officials as part of the Census Bureau's local review program, will have to be done using the MnDOT paper street maps. This should not be too big a job, since there have not been many new streets added since 1986 outside the metropolitan area and its adjacent counties.

The Subcommittee on Redistricting has contracted with the State Planning Agency's Land Management Information Center to examine the TIGER files for a sample of the 80 nonmetropolitan counties and report on the time and cost required to update and improve the cartographic quality of those TIGER files for use in redistricting.

### 3. City Boundaries

State and county boundaries don't change from one census to the next, but city boundaries certainly do, primarily as a result of annexations. The city of Rochester, as an extreme example, makes 20 to 30 annexations a year! The city boundaries in the pre-census TIGER file represent those in effect as of January 1, 1988. The Census Bureau, through its Boundary and Annexation Survey (BAS), will be updating city boundaries to January 1, 1990, for the Initial Voting District Codes version of TIGER. But the census will be taken as of April 1, 1990. People living in an area annexed by the city of Rochester after January 1 but before April 1 will probably assume they will be counted as part of Rochester's population, but the Census Bureau will assign them to the town they were in on January 1.

The boundaries used by the Legislature for redistricting must coincide with those used by the Census Bureau in order for the population counts to be accurate. So the districts drawn on those old boundaries may unintentionally split newly-annexed areas away from the city to which they were annexed. Avoiding that will be another headache for legislative staff who must work with cities like Stillwater, Farmington, New Prague, and Rochester.

### 4. Precinct Boundaries

Precinct boundaries in Minnesota were "frozen" as of January 1, 1987, to make them easier to track for redistricting. The precinct boundaries on the paper maps used in Phase 2 were those used in the 1988 election. However, since some precinct boundaries "float" with the city boundary when territory is annexed, and the Initial Voting District Codes (IVDC) file will include changes in city boundaries up to January 1, 1990, but not through the 1990 election, the precinct boundaries in the IVDC file will not accurately represent those used at either the 1988 or the 1990 election.

To correct the file to show the precinct boundaries actually used for the 1990 election, it will be necessary for the Subcommittee on Redistricting to consult the files of the Secretary of State to determine which boundaries have changed since 1988, and compare the Phase 2 maps, the maps produced using the IVDC file, and the most recent maps on file with the Secretary of State and the State Demographer showing the boundaries used in the 1990 election. The precinct boundaries in the IVDC file will then have to be manually adjusted forward to create the 1990 boundaries and backward to create the 1988 boundaries. A similar technique will be necessary to create the 1986 and 1984 precinct boundaries.

#### **5. Address Ranges**

The Metropolitan Council staff took considerable pains to update the address ranges in the 1980 DIME file, and included those updates in the files they gave the Census Bureau in 1986. They are updating the pre-census TIGER/Line file address ranges to make them current and to add address ranges in the "metropolitan area window."

Outside the metropolitan area, we assume that address ranges in GBF/DIME file areas date from 1980, and that elsewhere they are simply blank. The Land Management Information Center's examination of the nonmetropolitan counties should tell us more about that. We are still looking for a way to add address ranges to those TIGER files at a reasonable cost.

#### **6. Legislative and Congressional District Boundaries**

The 1982 legislative district boundaries are not in the TIGER files. But the starting point for the Legislature in drawing new districts will be the old ones, so the Subcommittee will be adding them to our redistricting data base.

#### **IV. The Census Version of TIGER**

Before April 1, 1991, and before it delivers to each state the block-level population counts needed for redistricting, the Census Bureau will deliver the census version of TIGER, incorporating the final geography used to tabulate the 1990 census and including all corrections received from local units of government and processed by the Bureau.

## **V. Adding Population and Election Data**

### **A. Population Data**

The census count for the State of Minnesota will be delivered to the President by December 31, 1990. That is the count that will be used to reapportion the 435 seats in Congress among the 50 states. The reapportionment will be delivered by the President to Congress when it meets in January.

The deadline for the Census Bureau to deliver to the states the block-level counts needed for redistricting is not until April 1, 1991. That is when we will load the census data and be able to begin redistricting.

### **B. Election Data**

As I mentioned earlier, while the basic unit for election returns is the precinct, the basic unit for redistricting is the census block. Once the PL 94-171 population data is loaded at the block level, the election data loaded earlier at the precinct level will be allocated to each block in the precinct in proportion to its 1990 voting-age population, so that the voting behavior of each block can be established at least in rough terms. Each of the four caucuses in the Legislature plans to spend considerable effort to improve on this method of establishing likely voting patterns.

## **VI. Redistricting**

### **A. The Legislature and Congress**

The block-level population counts delivered by April 1 will include the total population, population 18 years and over, and counts of whites, blacks, Indians, Asians, and Hispanics.

For redistricting, the census data of primary concern is the total population. In areas outside the seven-county metropolitan area, the total population by county, city, and town is all that will be needed to draw most congressional and legislative districts. Within the metropolitan area, however, there are about 17 cities whose population is likely to be greater than the permissible size of a House district, so they will have to be split in order to meet equal-population requirements. Their neighboring cities may need to be split as well, in order to provide the missing pieces necessary to make each district the right size. Because Minnesota participated in Phase 2 of the Census Bureau's 1990 Redistricting Data Program, we will not only have precinct boundaries on our census maps, we will also be given population counts by precinct. This will help when splitting some cities, but in others it will be necessary to use the block population counts. Census tracts, block numbering areas, and block groups will not be basic units for redistricting, since they are not used for conducting elections.

Seventeen states, primarily in the South and Southwest, which have a history of discriminating against blacks and Hispanics, are required by section 5 of the Voting Rights Act to have their redistricting plans approved by the Justice Department before they can take effect. Those states must use the census data on blacks and Hispanics to draw districts where those racial and language minority groups have a fair chance to elect representatives of their choice. This means drawing districts where blacks or Hispanics are a majority of the population 18 years and over, the voting age population. Other areas with large concentrations of blacks or Hispanics, or of Indians or Asians, where there is a history of racially polarized voting, are required by section 2 of the Voting Rights Act to likewise draw districts that the minority has a fair chance to win.

Minnesota is not a "covered jurisdiction" under section 5 of the Voting Rights Act, and does not have either the large concentrations of racial or language minority groups nor the history of racially polarized voting that would make it a likely subject of section 2 of the Voting Rights Act. But the Legislature and the Court in 1982 both made an effort to use the census data to identify concentrations of blacks, Hispanics, Indians, and Asians and draw districts that would increase their chances of electing representatives from among their minority group. I expect a similar effort will be made with the 1990 census data.

If all goes well, and lightning strikes, it may be possible to complete redistricting by the end of the 1991 legislative session, May 20, 1991. More likely, it will be completed by the end of March 1992, just in time for the election process to begin.

Whether the Legislature adopts legislative and congressional redistricting plans or fails to do so, I assume there will be a lawsuit asking a three-judge federal court to do it better. When that happens, I expect to be in court once again, using maps and reports produced with the aid of the TIGER files to advocate the Senate's position.

#### **B. Local Governments**

Once the litigation is over and the plans are final, it will be necessary to provide them to the Secretary of State and the county auditors and city clerks who will conduct the 1992 election. In 1982, that was done by providing them with copies of paper maps and tables and a legal description of the district boundaries. I assume that the same possibilities exist for 1992. But many local governments now have computer systems that they use for conducting elections, and some have even developed geographic information systems they may want to use to help them cope with redistricting.

Minnesota Statutes, section 204B.14, subdivision 3, requires local governments to establish new precincts within 45 days after the Legislature has been redistricted, but no later than May 10, 1992, so that no precinct lies in more than one legislative district. Cities with wards must redraw their ward boundaries by the same deadline in order to

meet one person, one vote requirements. Other election districts must be redrawn within 65 days after the Legislature has been redistricted, but no later than June 1, 1992.

So the local governments don't have much time to redistrict themselves once the legislative districts are done, and some have inquired about getting redistricting data from the Legislature in electronic form. The Subcommittee on Redistricting has asked the Land Management Information Center to act as a service bureau for distributing electronic redistricting data, at the cost of providing copies, to anyone who requests it. The specifics of when and how that would be done have not yet been developed.

There are at least two kinds of data that could be provided. One would be a simple flat ASCII file of the redistricting plans, in PL 94-171 format, showing the legislative and congressional districts to which each census block has been assigned. That file should be relatively small and readable by any computer system, regardless of the software being used. The second would be the geographic and population data files. They would be much larger and would present more of a problem for various kinds of software to import. But if we can develop a way to convert our ARC/INFO files back into TIGER files for purposes of providing updates to the Census Bureau, we may be able to make the same conversion for purposes of providing our improved TIGER files to local units of government.

The Secretary of State has formed a Task Force on Post-Redistricting Activity to discuss these issues further with local election officials over the next year or so.

## **VII. Conclusion**

I hope I have told you what you wanted to know about using TIGER files for redistricting in Minnesota. If you have any questions, I would be happy to try to answer them.