HCGS

Hill Country Geospatial Solutions

"Worldwide solutions for Texas sized problems."

Team: Mark Parker, Charles Good, Beau Barela, Eric Brotherton, & Justin Holder

Capitol Area Council Boy Scouts

Marketing Analysis

May 5th, 2008

ABSTRACT

Hill Country Geospatial Solutions feel that the opportunity to provide spatially significant answers to our clients' need will provide them with the tools needed to expand their organization. Capitol Area Council's request for spatially relevant data to increase new membership acquisition is an opportune problem in which to apply GIS theory. The approach that was taken by our team focused on areas where Capitol Area Council Boy Scouts were not well represented. To provide a spatial aspect to new marketable areas, HCGS needed to find what spatial representation for new membership could be met. After extensive review, HCGS found the census tract (an area encompassing about 4,000 people defined by the U.S. Census Bureau) was the smallest area they could use that would include all criteria requested by Capitol Area Council in new member demographic variables. This left HCGS with 307 geographic areas in which to apply our analysis in order to find the ideal locations for Capitol Area Council to focus marketing efforts. By projects end, HCGS provided a ranking system to all 307 tracts. This gave a numerical value to each tract in relation to the effectiveness marketing strategies could have in achieving the desired goals. This information was classified into eight classes, providing thirteen census tracts in the top class with scores ranging from 77 to 84 out of 100. These tracts are representative of the most suitable areas for Capitol Area Council Boy Scouts to market for new membership acquisition.

TABLE OF CONTENTS

1. **INTRODUCTION:**

On January 16th, 2008 Capitol Area Council Boy Scouts marketing representative Charles Meade submitted a request for proposal to Hill Country Geospatial Solutions (HCGS). In this request, the Capitol Area Council Boy Scouts expressed a need for three geospatially represented items. The first of this request was the location of new marketing locations for underrepresented youth in their central Texas region. The second request was for a distribution map of their member and meeting address locations. As a final part of this marketing analysis, the Capitol Area Council needed population projections for the years of 2011, 2013, and 2018. On a more specific note, the Capitol Area Council had a high interest in expanding their membership to youth of certain ages and demographics and in areas where they were under represented. These youth classes were to include minority boys between the ages of 5 and 11 in low income and single parent families.

The use of a geographic information system (GIS) is a valuable tool in the identification of potential marketing locations. GIS unlike any other computer system, allows for the combination and analysis of multiple forms of spatial data and attribute data.

2. **LITERATURE REVIEW:**

2.1 BOY SCOUTS OF AMERICA "REACHING THE NEXT MULTICULTURAL GENERATION-REACHING GENERATION X AND MILLENIAL PARENTS

The importance of a good mentor can not be understated; unfortunately thousands of youth across the country have no one to turn to in times of need. The Boy Scouts of America

seek to provide guidance for young children of all ages. Across the United States, the Cub Scout program alone has grown tremendously with nearly eleven percent of all boys in the country involved in the program. On a nationwide scale the Hispanic population account for less than ten percent of all membership (Boy Scouts of America 2007). This statistic has motivated the entire organization to become more involved in the lives of Americans of all ethnicity. In order to connect and pass on information to the Hispanic and other minority communities, the Boy Scout organization must first target areas where marketing can be highly effective. In the United States, the Hispanic population has doubled since 1990 and half of all Hispanics can be found in Texas and California (Boy Scouts of America 2007). Because of this fact, the Boy Scout organization realizes the importance of spreading their message to this community. A high percentage of Hispanic families are first generation American and are therefore completely unaware of the Boy Scouts and their message which makes marketing very important.

2.2 CAPITOL AREA COUNCIL BOY SCOUTS "STRATEGIC PLAN 03-07"

Capitol Area Council Boy Scouts manages an area broken down into 12 districts and that covers 15 counties in central Texas. The organization's main purpose is to achieve more diversity within their members so the program can better relate to all ethnicities in the region. A major contributing factor to the lack of minority membership is lack of knowledge of the program. To spread the word about the Cub Scout organization leaders must know where these potential members are located (Capitol Area Council Boy Scouts).

2.3 "THE LOCATION INTELLIGENCE ENTERPRISE"

HCGS reviewed an article in Directions Magazine by Louella Fernandez titled "The Location Intelligence Enterprise". In the article she introduces the integrated effects geographic

data has on business intelligence. She describes this as location intelligence. Location intelligence is the combination of business intelligence and GIS. This, defined by Louella Fernandez, combines the analytical power of a database with the geographic capabilities of a map. This gives business users the ability to explore and analyze relationships between geographic data and business data attributes. Business data tells you who, what, and when, while the geographic data provide the location. In the case of the Capitol Area Council Boy Scouts, the business attributes are those specific demographic variables they need in new members, and the geographic data for the location that contains these variables.

3. DATA:

3.1 DATA ASSESMENT

Due to the large study area, data consistency was of chief importance. In an attempt to precisely break down the data needed, HCGS made a list of every needed data type. The list as is follows:

- County Boundaries
- Census Tract Boundaries
- Streets
- Census Data
- Capitol Area Council Boy Scouts provided data
- Land Use Parcel Data
- School Locations

HCGS experimented with a number of different data sources in an attempt to locate the most accurate data available. After initial investigation, it was found that the most reliable data would come from six sources. These sources include Capitol Area Council Boy Scouts, Texas Natural Resource Information System (TNRIS), Capitol Area Council of Governments

(CAPCOG), the United States Census Bureau, ESRI demographic data, and the Texas Education Agency (TEA).

3.2 U.S. CENSUS BUREAU/ESRI DATA

The Capitol Area Council wanted to locate children between the ages of 5 and 11 in low income, single parent, and ethnically diverse regions. HCGS decided to obtain the demographic data from the United States Census Bureau. The data available on the United States Census Bureau server allowed HCGS to select, from a table, individual variables for the years of 2000 and 1990. The files downloaded from the server were packaged in a Microsoft Excel document.

After some consideration on the scale to use for the identification of potential marketing areas, HCGS decided to use the data available at the census tract level. Every area in the United States is broken down into five sections.

These sections are arranged as follows:

- State
- County
- Census Tract
- Census Block Group
- Census Block

The census data is renewed every 10 years so the most current data available to us occurred in the year 2000. Because of this we, as a team, were not comfortable using any area smaller than the census tract level for representation of potential marketing areas. Another factor taken into consideration when using the census tract level was the fast development of the surrounding areas. Areas that were farm and ranch land eight years ago are now subdivisions.

Using an area smaller than the census tract level might not have been representative of the area as it is today.

ESRI's demographic data was used for the 3, 5, and 10 year population projections. Using this set of data seemed the most logical choice because ESRI performs their own projections every five years on the census block, block group, and tract level. The use of this data allowed for a more accurate statistical projection then using the 2000 and 1990 census data available from the United States Census Bureau.

3.3 CAPITOL AREA COUNCIL BOY SCOUT DATA

Capitol Area Council Boy Scouts provided HCGS with two Microsoft Excel files containing the address locations of current Cub Scout members and meeting locations within their twelve districts. Both Excel files required extensive data "clean up" for compatibility in a Geographic Information System (GIS). Once complete, the data can be used to geospatially represent the addresses in a visual format.

The Capitol Area Council also provided a digital image of the twelve districts that comprise their managed area. This image required a spatial reference for compatibility in a GIS. The methods used to accomplish this objective are discussed later in this report.

3.4 TEXAS NATURAL RESOURCE INFORMATION SYSTEM (TNRIS)

TNRIS provided the data needed for the basic layers of the area that comprise the Capitol Area Council districts. Streets, county shapes, and census tract shapes were taken directly from their server for entry into our GIS. The data available on this server comes in a compressed shapefile. TNRIS offers the most current street and basic shapefile data available for download.

3.5 CAPCOG (Capitol Area Council of Governments)

The final analysis provided by HCGS was completed on the census tract level that unfortunately has a couple negative affects to the project. A census tract can sometimes be a very large area, which sometimes only gives the Capitol Area Council a general idea of potential markets. To compensate and provide a community based perception of the area, land use parcel data was downloaded from CAPCOG. Commercial property, multi-family residential and single family residential land parcels were clipped from the entire set of data. These three land use types will provide the Capitol Area Council precise marketing locations.

3.6 TEXAS EDUCATION AGENCY (TEA)

School district and campus locations were found from the Texas Education Agencies online server. The data was downloaded in the form of compressed shapefiles and imported directly into our GIS with no additional manipulation needed. The school district locations were used to assist in the drawing of the Capitol Area Council Boy Scout districts. Campus locations were used as an additional suggestion on possible marketing locations.

4. **METHODS:**

4.1 GEOCODING

GIS allows data with a spatial identifier (i.e. address or x-y coordinates) to be referenced with street files. This process, known as geocoding, gives the address or set of x-y coordinates a spatial location in the GIS. This procedure was used to display the location of Cub Scout addresses and meeting locations.

HCGS ran into a problem during the process of geocoding the addresses. Because a physical address is needed to perform the function of geocoding, several of the Scout addresses could not be matched to a street location, but HCGS was able to find actual addresses for meeting locations by using PO Box addresses to secure the problem.

4.2 DIGITIZING

Capitol Area Council Boy Scouts is comprised of a twelve district region. These districts are an important division for marketing and management purposes. No GIS compatible data was available for a geospatial representation of these 12 districts. HCGS took the image provided by the Capitol Area Council and manually traced each district using an editor tool available in ArcGIS. The district boundaries followed a combination of county and school district lines so a comparison of these lines to the Capitol Area Council districts was performed for top accuracy. Both the school district and county boundaries were available in a GIS compatible format and HCGS used the lines to trace out the districts.

4.3 GEOREFERENCING

The digital image of the Capitol Area Council districts had no geospatial representation (no coordinates), and therefore could not be projected in the GIS. To correct this HCGS added spatial data throughout the image by using a method called geo-referencing. Geo-referencing uses an existing GIS compatible data layer to provide spatial data for another image or data set. The district layer created in the section above was used to add the spatial representation to the image. Once completed, the image was compatible and projected on the same level as the other layers and data.

4.4 PROJECTIONS

Population projections of 3, 5 and 10 years were requested by the Capitol Area Council Boy Scouts. None of the HCGS team members had any expertise with population projections and as a result, Dr. Wilson was brought in as an outside statistical consultant. Dr. Wilson provided HCGS with formulas and data sources for our statistical projections.

Population data provided by ESRI was available on the Texas State University servers for the 15 counties in the Capitol Area Council districts. HCGS decided to use this dataset because ESRI compiles there own population projections every five years. Using this data allows for a more accurate representation of the years 2008, 2011, 2013, and 2018. ESRI's data comes at the state, county, census tract, census block group, and census block level. Because the other analysis is at the census tract level, HCGS decided to stay at this level.

Two formulas were needed to perform the projections. The two formulas used are as follows:

- *Growth Rate Formula*: *((Population 2005 – Population 2000) / Population 2000) / 5*
- *Projection Formula: Population 2005* $*e^{rate \cdot time}$

These two formulas were used by importing the ESRI demographic data into Microsoft Excel and applying the growth rate formula to all 307 census tracts. Once completed, the population projection formula was applied to every census tract for the years of 2008, 2011, 2013, and 2018. The end result was an Excel file containing the growth rate and population projections that joined to the census tract data in the GIS.

4.5 MARKETING LOCATION ANALYSIS

        HCGS used the method of trial and error before agreeing upon a method for the
identification of potential marketing locations. Several variables had to be taken into
consideration before performing this analysis.

These variables included:

- Total number of children age 5-11
- Hispanic children age 5-11
- Number of single parent households
- Median household income
- Growth rate
- Current member representation

        The top five of these variables were already packaged in an excel format. HCGS needed
to include the number of members per census tract in the analysis. In order to complete this act,
HCGS imported the geocoded member addresses into the GIS and spatially joined the member
locations to the census tracts. A spatial join allows point data (i.e. addresses or x-y coordinates)
to be counted within a designated area and added the existing layers attribute table. This allowed
our analysts to create an Excel file containing data and an exact count of Cub Scout members per
census tract.

        Once every variable was converted and combined in an Excel file, HCGS created a
classification index to make sense of all the data. This classification index created ranks for
every variable and census tract. Each variable was broken down into five classes and given
values based on our classification index. The list below shows the total points possible for each
of the six variables:

- Total Number of Children – 35 points
- Median Income – 20 points
- Number of Single Parent Homes – 15 points
- Number of Hispanic Children – 10 points
- Growth Rate – 10 points
- Number of Current Members – <u>10 points</u>

                                        100 Points

This classification creates a system where a maximum of 100 points are possible to obtain. The higher the score the more likely marketing in this area will be effective. The complete classification index can be in figure one.

Fig. 1 Ranking System

        Children age 5-11 received the highest weight because ultimately the goal of a marketing analysis is to increase the total membership. Median income was the second highest variable because of the strong inverse relationship between income and minority populations. Single parent households were given the third highest rank because of its importance stressed by our client. Current members, percent growth rate, and number of Hispanic children were all given the lowest weight because these variables were additions to simply help HCGS fine tune specific locations and lower the weight in the top three variables.

Each variable was separated into five classes by the use of natural breaks. The use of Natural breaks was considered most appropriate by means of trial and error and confirmed by Dr. Wilson, our outside statistical consultant. Equal interval and quantile variable separations were tried, both returning results below our expectations. These two means of distribution "clumped" the high values together in a fashion that was not appropriate for our analysis.

HCGS recoded the six variables using SPSS statistical analysis software and the classification index. Once recoded, the results were exported and combined using Microsoft Excel. The variables were added together, providing the total score (out of 100) for each of the 307 census tracts. The Excel file was then joined to the existing GIS census tract file. When imported and joined in the GIS, land use parcel data was over-layed on top of the results to exactly pinpoint potential marketing locations. The parcel data included commercial, multi-family residential and single family residential property.
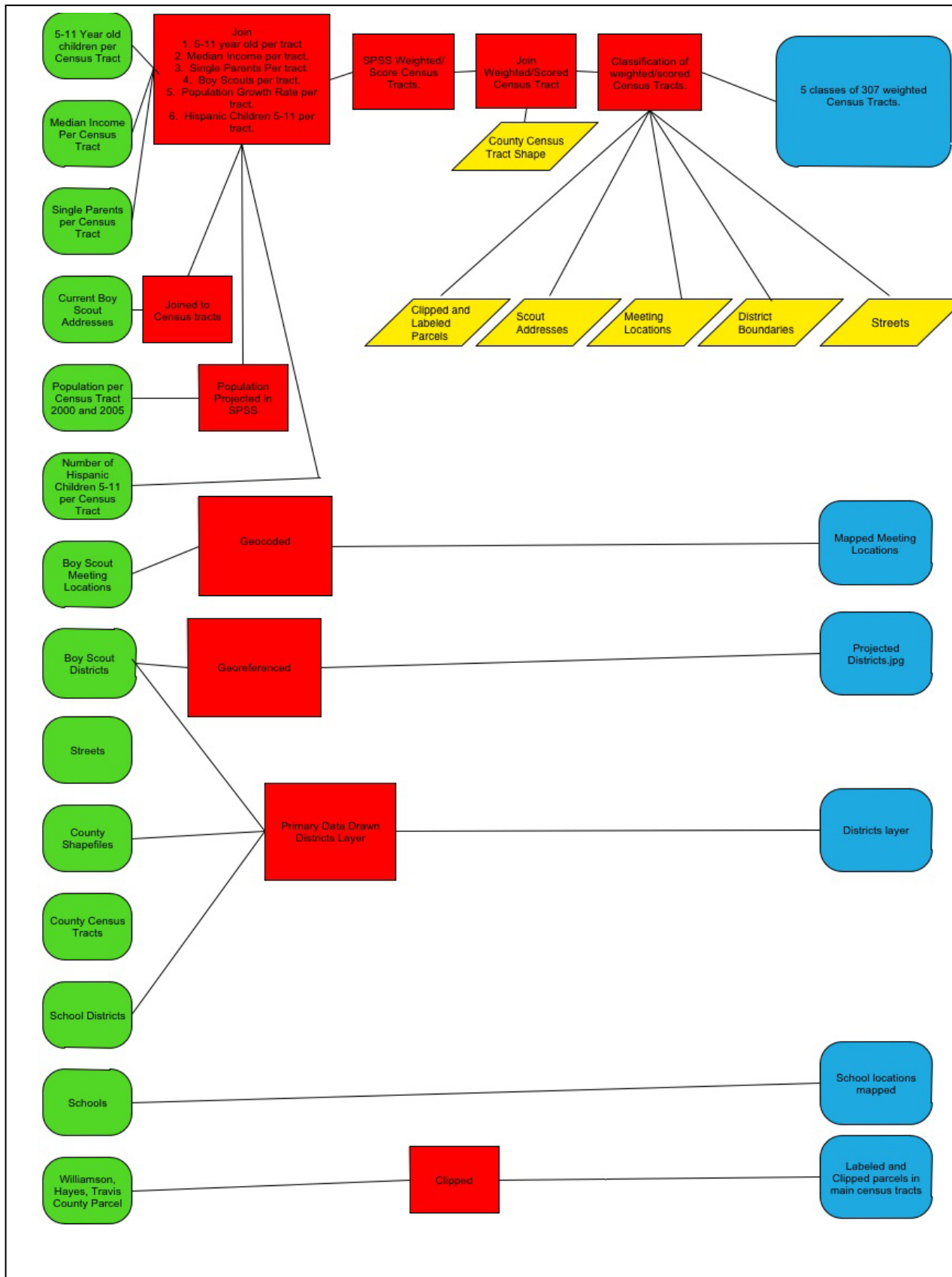
Fig. 2 Methods Flow Chart

5. **RESULTS**

5.1 GEOCODING

Exact point locations were created for the current member and meeting address locations by geocoding the Excel file provided by the Capitol Area Council Boy Scouts. These point locations now show the exact location of Scout meeting and member address locations in the GIS. It's important to note that for various reasons, point locations in a GIS can vary slightly from their real world location. Once the process of geocoding was complete, HCGS matched 88% of the current Cub Scout address locations, and 100% of the meeting location address locations.

5.2 DIGITIZING

ArcGIS was used to manually draw the Capitol Area Council Boy Scouts 12 district management location. The 12 districts follow a combination of school district and county lines so a trace feature located in the GIS was used to follow these lines. One portion of the Armadillo district did not follow a county or school district boundary and therefore had to be drawn free hand resulting in a small amount of discrepancy between this portion of the layer and the actual district boundaries. The end result is a very accurate representation of the Capitol Area Councils 12 districts. See figure three.
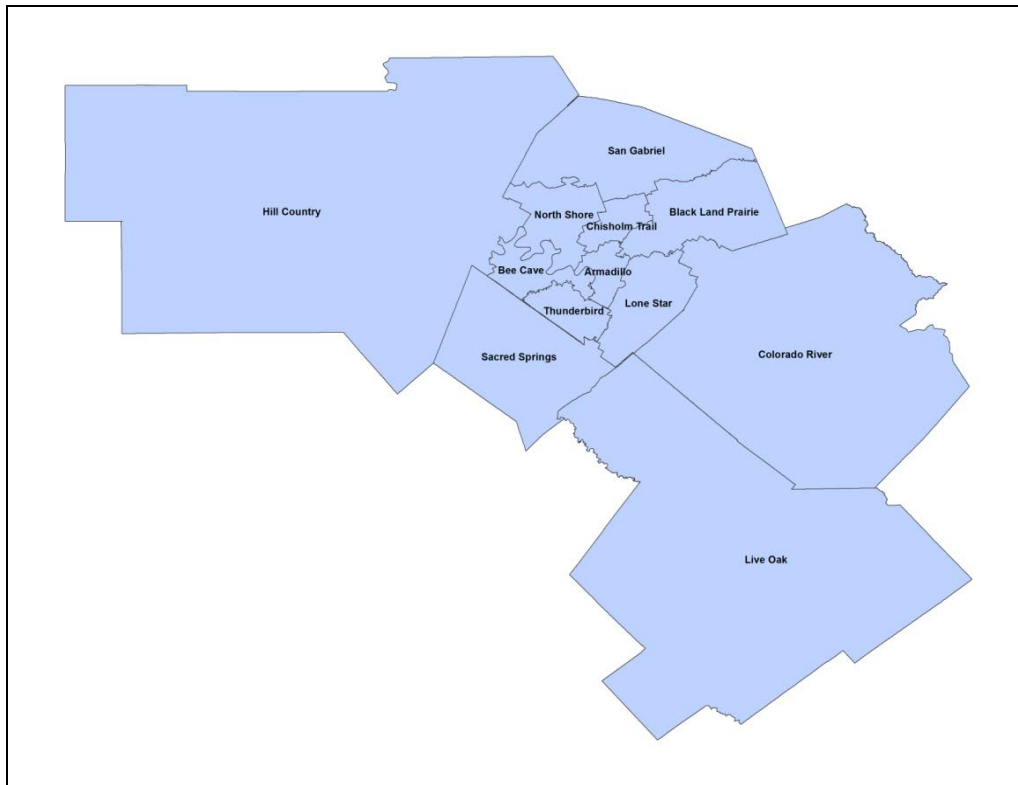
Fig 3 Digitizing

5.3 GEORFERENCING

Geo-referencing allowed for the digital image supplied by the Capitol Area Council to be used directly in a GIS. The 12 district layer created in the section above was used to give a spatial projection to this image. Now, when imported, the districts image occupies the same space as all other data files in the GIS. Figure four is the georeferenced image.
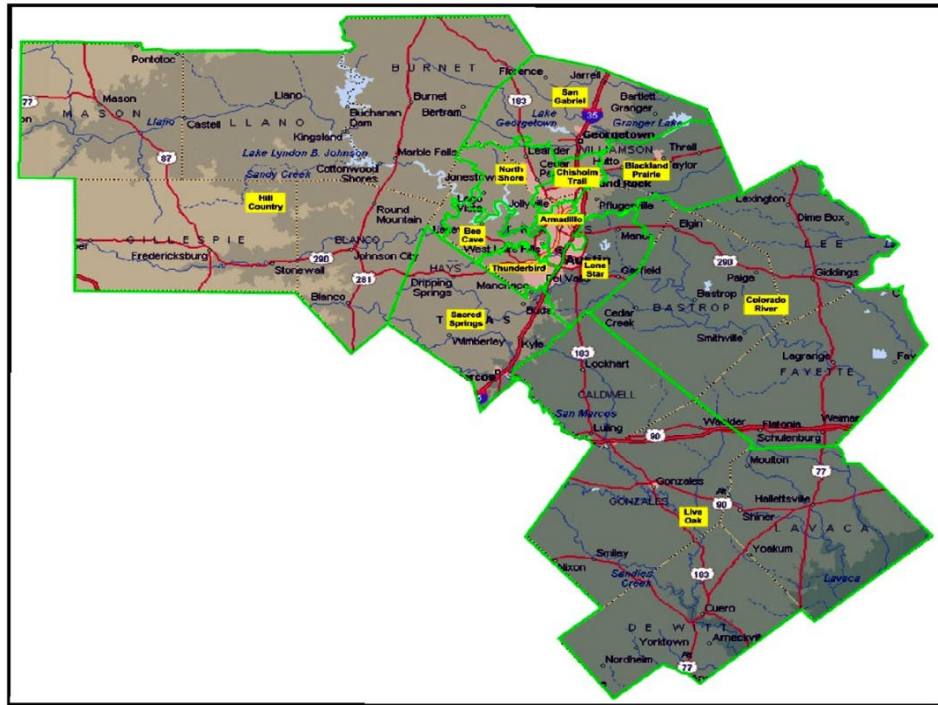
Fig. 4 Georeferencing

5.4 PROJECTIONS

The combination of two formulas allowed for the creation of population projections for the years of 2008, 2011, 2013, and 2018. These two formulas were discussed under the methods section of this report. The growth rate in the census tracts ranged from -1.5 percent to 9 percent per year.

The list that follows displays the minimum and maximum population growth, per census tract, for the designated years.

- 2008
  - 437
  - 25,480

- 2011
  - 432
  - 30,018
- 2013
  - 429
  - 33,477
- 2018
  - 422
  - 45,878

High growth occurred in Bastrop, Hays, Travis, and Williamson County. Negative or slow growth occurred in Mason, Dewitt, Fayette, Gonzales, Lavaca, Lee, and Llano County. Our geo-spatial representations show strong growth along the I-35 corridor and negative or slow growth in the outer of the 15 counties. Figure five is a map representing areas of slow growth and areas of high growth.

Fig. 5 Population Growth

5.5 MARKETING LOCATION ANALYSIS
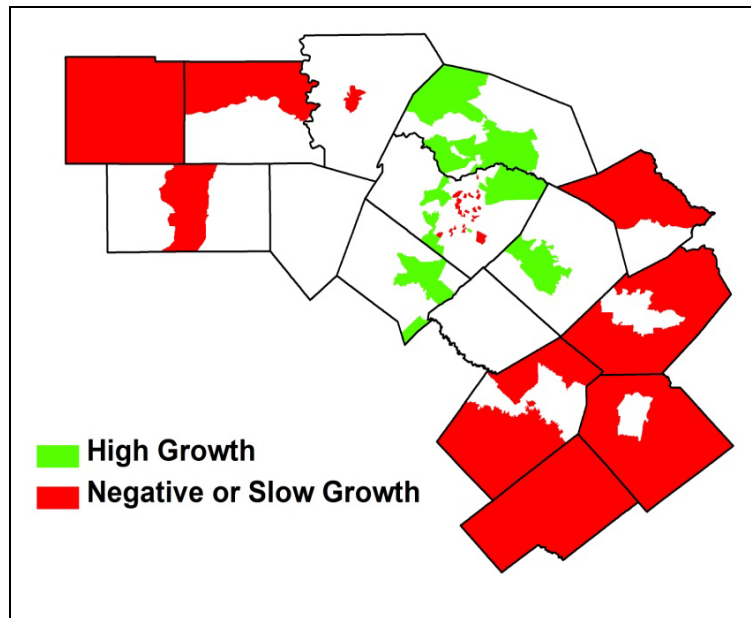
The creation of a ranking system for every census tract within the district allowed HCGS to not only identify specific marketing locations, but also created a score for every census tract.

The higher the score, the more combination of key demographic variables that census tract contains. Table one displays statistics on all 307 census tracts scores from the HCGS classification index.

Mean	54.71
Median	53
Mode	50
Standard Deviation	12.406
Variance	153.914
Skewness	0.268
Kurtosis	0.138
Range	53
Minimum Score	31
Maximum Score	84
Sum	16,795

Table 1 Census Tract Stats

HCGS made a decision to break up the scores received from every census tract into 8 classes using the natural breaks classification. The census tracts from the top class were then separated from the other 307. Thirteen tracts make up the top class. These thirteen census tracts represent areas within the Capitol Area Council Boy Scout district boundaries where marketing will be highly effective. When creating specific maps, land use parcel data was over-layed on the top tracts, pinpointing specific neighborhoods and commercial areas.

6. DISCUSSION

6.1 WHAT MAKES A GOOD CENSUS TRACT

To decide on whether or not our findings are of any use to Capitol Area Council Boy Scouts, HCGS first looks at what makes the best census tract for the desired demographic focus the scouts would like to take in new recruitment efforts. The census tract that would be a good place for recruitment would have a low number of existing scouts. Total children 5-11 in the tract would need to be high, it would be better if the Hispanic population of children 5-11 were high, and hopefully the tract would have a lot of single parent households. Low income would also be good for the type of marketing programs Capitol Area Council Boy Scouts is considering using. The census tract should have at least some growth.

6.2 NUMBER ONE CENSUS TRACT

The census tract encompassing Walnut Creek and Walter E. Long subdivision in the Lone Star District of the Capitol Area Council area (see figure/appendix x) was highest score at 84 of 100. Total children 5-11 in this tract is 724, with 405 of this 724 being Hispanic. The tract has 312 single parent homes, and median income of only $37,111. Nineteen, only two percent of the total Cub Scout age children are already scouts. Seven schools are in the area for the Capitol Area Council to use for marketing purposes, and the census tract has a decent growth rate of 2.8%. This tract serves as a good example of an area where scouting is definitely underserved. The lack of scouting presence could be related to their inability to reach certain demographics sought in the project. Hispanics make up 56% of the Cub Scout age children in this tract and

several single parent homes exist. Approaching Hispanic kids or Cub Scout age kids from single parents in this tract could definitely help with membership in this area.

CAPITOL AREA COUNCIL CUB SCOUT MARKETING ANALYSIS

Area Schools: (Winn, Pecan Springs, Jordan, Decker, Norman, Travis County Jail, Austin Discovery), Score: 84/100, Total Children 5-11: 724, Hispanic Children 5-11: 405, Single Parent Homes: 312, Median Income: $37,111, Yearly Growth Rate: 2.8%, Cub Members: 19, Area Subdivision: Walnut Creek, Walter E. Long

L-1

HCGS
Hill Country Geospatial Solutions

Fig. 6 #1 Census Tract

6.3 NEXT THREE BEST TRACTS

The next three tracts scored tied at 83 of a possible 100 points (See figure x/Appendix x). The statistics for these three tracts were averaged together for reporting purposes, but each tract's individual statistics can be viewed in table two. The average for these three tracts returned very favorable values, similar to our number one rated tract.

Hispanic children make up 66% of the total population of children 5-11 in these tracts, which averages a total of 913 children age 5-11. The tracts have an average single parent

household of 356. The average growth rate is an impressive 4.5%. Only 5% of the total

populations of children age 5-11 are already in the scouting program. The average income for

the three tracts did come in a higher than our number one tract at $43,183, but below the median

household income for 2006, $48,451, reported by the U.S. Census Bureau for Austin. The three

tracts growth rate of 4.5% was higher than our highest scored tract.

Top 4 Census Tracts

	One	Two	Three	Four	AVG (2,3,4)
District	Lone Star	Thunderbird	Sacred Springs	Lone Star	
Subdivisions	Walnut Creek, Walter E. Long	Onion Creek	Goforth	Elroy, Pearce Rd., Garfield	
Score	84/100	83/100	83/100	83/100	83/100
Total Children 5-11	724	950	923	865	913
Hispanic Children 5-11	405	697	603	502	601
% Hispanic	56%	73%	65%	58%	66%
Single Parent Homes	312	451	293	324	356
Avg Income	37111	42115	45052	42392	43183
Growth Rate	2.8%	3.8%	5.9%	3.9%	4.5%
Current Members	19	55	54	45	51
% Scouts	2%	5%	5%	5%	5%
# of Schools	7	9	10	5	8

Table 2 Top 4 Census Tracts

6.4 CAPITOL AREA COUNCIL'S LONE STAR DISTRICT

Two of the top four and another two of the top thirteen scored tracts are in the Lone Star

District. The Lone Star District has the highest

concentration of tracts in the top classification of the

ranking system. HCGS believes it would be best for

Capitol Area Council Boy Scouts to focus their new

member recruitment efforts first in this district. Lots of

potential children in the correct age group from the right

demographic combinations are here with plenty of

schools and some existing scouts to use for a basis for

their marketing campaign.

Fig. 7 Lone Star District

6.5 FURTHER ANALYSIS/IMPROVEMENTS

The largest improvement to this project of course would be lower level (smaller spatial

area) data. The type of demographic data Capitol Area Council Boy Scouts wants for this type

of project will probably never be available at lower levels than Census tract due to privacy issue

that arise from giving that much detail about individuals at the local level. The addition of parcel

information does help define these areas and make the results usable. Parcel data is currently

only available for Travis, Williamson, and Hays counties of the scout's regional area, but as data

becomes available for other counties, HCGS highly suggests Capitol Area Scouts attach this to

their existing data produced here.

With the best census tracts to market defined, a future project HCGS would like to

suggest using their marketing efforts to build a database of finer details for these areas. The

grass roots efforts that will go on in the communities in the census tracts will provide data similar to what has been collected by HCGS. At the census level this can be further evaluated in much the same manner we have done here. The thing to remember in the data collection is to ask the same question of these potential new scouts being marketed to the same questions presented in the Request for Proposal.

7. CONCLUSIONS

7.1 DELIVERABLES

HCGS feels that the deliverables provided in this project will adequately provide the spatial assistance in new member recruitment Capitol Area Council Boy Scouts requested at the beginning of this project. The deliverables are a poster, map book, Arc Reader, data CD, and the website. The areas of the Capitol Area Scout's Districts isolated by HCGS represent a combination of the demographic variables expressed vital by the Capitol Area Council Boy Scouts. They have the results they requested as well as additional deliverables that will provide them the ability to do further analysis.

The project was completed in the allotted time frame and budget. Additional deliverables were added at no additional cost or time. We believe the GIS process to be the best economically and most efficient method the Scouts could have chose to meet their end result expectations.

7.2 FUTURE PROJECTS

Analyze the success rate of marketing in the census tracts that HCGS suggested. Use this data to perform similar analysis as HCGS has at tract level at a more localized level. Capitol

Area Council Boy Scouts can perform even more detailed analysis of their area with properly collected market data.

7.3 SUGGESTIONS

HCGS would like to recommend the Capitol Area Council Boy Scouts use vigilance when using population projection data in combination with demographic variables in their planning. It has been our experience, that as certain demographics increase and decrease in population, their spatial orientation changes. It is likely that as the populations grow according to the projections shown in this report, there will likely be a change in the quantities of the demographics of interest to the Scouts. Aside from this, HCGS does feel it's important to have a growth rate considered in the ranking system.

8. APPENDIX 1 (METADATA)

GEOREFERENCED_DISTRICTMAP.IMG (SECONDARY DATA W/OUT METADATA)

What does this data set describe?

Title:

Hill Country Geospatial Solutions. 2008. Georeferenced_DistrictMap.img

Abstract:

This is an image polygon feature class representing county and school district boundaries of the Capital Area Council Boy Scouts of America region.

Supplemental_Information:

Image obtained from Capital Area Council Boy Scouts of America which was then georeferenced into a raster file. This metadata was created by HCGS and image was given by Capital Area Council for Boy Scouts of America.

1. **How should this data set be cited?**

   Hill Country Geospatial Solutions. 2008. Georeferenced_DistrictMap.img.

   Online Links:

   o \\BEAU\C\Documents and Settings\bebarela\Desktop\Metadata\Make Metadata\Georeferenced_DistrictMap.img

2. **Does the data set describe conditions during a particular time period?**

   Calendar Date: February/2008
   Time_of_Day: none
   Currentness_Reference: publication date

3. **What is the general form of this data set?**

   Geospatial_Data_Presentation_Form: remote-sensing image

4. **How does the data set represent geographic features?**
   a. **How are geographic features stored in the data set?**

      This is a Raster data set. It contains the following raster data types:

      ▪ Dimensions 1040 x 1377 x 1, type Pixel
   b. **What coordinate system is used to represent geographic features?**

Planar coordinates are encoded using row and column
Abscissae (x-coordinates) are specified to the nearest 0.002193
Ordinates (y-coordinates) are specified to the nearest 0.002193

How does the data set describe geographic features?

1. **Who also contributed to the data set?**

   Mark Parker obtained the image from Capital Area Council for Boy Scouts of America and then georeferenced the image into a raster data set.

Why was the data set created?

By georeferencing the image with the counties, the layer now has coordinates for each spot on the map. This allows for other layers created in the future having the same coordinates and scale as this layer created.

1. **How were the data generated, processed, and modified?**

   (Process 1 of 1)
   Dataset moved.

   Data sources used in this process:

   o G:\4427project\12Districts\Georeferenced_DistrictMap.img

   Data sources produced in this process:

   o HCGS

How can someone get a copy of the data set?

Are there legal restrictions on access or use of the data?
Access_Constraints: none
Use_Constraints:

   This layer cannot be modified in anyway by the future user due to the risk of the layer not functioning correctly afterwards. The layer has been traced and then georeferenced to allow for xy coordinates.

1. **What's the catalog number I need to order this data set?**

   Downloadable Data

Who wrote the metadata?

Dates:
    Last modified: 27-Apr-2008
Metadata standard:
    FGDC Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998)
Metadata extensions used:

- [<http://www.esri.com/metadata/esriprof80.html>](http://www.esri.com/metadata/esriprof80.html)

Generated by [mp](mp) version 2.8.6 on Sun Apr 27 16:35:54 2008

12DISTRICTS.SHP (PRIMARY DATA W/OUT METADATA)

What does this data set describe?

Title:

   Hill Country Geospatial Solutions. February-March/2008. 12Districts

Abstract:

   The layer is drawn based on a combination of school district and county boundaries. The original image provided by Capital Area Council provided reference for the new district layers drawn. The county boundary polygon was provided by the TNRIS website that was then used to trace new district lines. The new district lines are slightly modified compared to the original boundary lines created by the Capital Area Council.

Supplemental_Information:

   The original district boundary image is provided by Capital Area Boy Scouts of America. This jpeg image gave reference for how HCGS created their new district boundaries. HCGS imputed the TNRIS county boundary layer and then traced the district lines based

on the jpeg image provided by the boy scouts. The new district lines are revised somewhat compared to the original district boundary lines.

1. **How should this data set be cited?**

Hill Country Geospatial Solutions. February-March/2008. 12Districts.

Online Links:

- o \\BEAU\C\Documents and Settings\bebarela\Desktop\Metadata\Make Metadata\12Districts.shp

2. **What geographic area does the data set cover?**

West_Bounding_Coordinate: -99.484680

East_Bounding_Coordinate: -96.560540

North_Bounding_Coordinate: 31.035010

South_Bounding_Coordinate: 28.813290

3. **Does the data set describe conditions during a particular time period?**

Calendar Date: Feb-Mar/2008

Time_of_Day: none

Currentness_Reference: publication date

4. **What is the general form of this data set?**

Geospatial_Data_Presentation_Form: vector digital data

5. **How does the data set represent geographic features?**
   a. **How are geographic features stored in the data set?**

   This is a Vector data set. It contains the following vector data types (SDTS terminology):

   - ▪ G-polygon (12)
   b. **What coordinate system is used to represent geographic features?**

   Horizontal positions are specified in geographic coordinates, that is, latitude and longitude. Latitudes are given to the nearest 0.000000. Longitudes are given to the nearest 0.000000. Latitude and longitude values are specified in Decimal degrees.

The horizontal datum used is D_WGS_1984.
The ellipsoid used is WGS_1984.
The semi-major axis of the ellipsoid used is 6378137.000000.
The flattening of the ellipsoid used is 1/298.257224.

How does the data set describe geographic features?

12Districts

FID

Internal feature number. (Source: ESRI)

Sequential unique whole numbers that are automatically generated.

Shape

Feature geometry. (Source: ESRI)

Coordinates defining the features.

Why was the data set created?

This layer allows the user to see the twelve district boundaries that have been compiled by HCGS based on the three existing factors in the original jpeg image map. HCGS slightly modified the boundaries given by Capital Area Council for Boy Scouts of America to give a new unique boundary layer.

How was the data set created?

1. **How were the data generated, processed, and modified?**

   (Process 1 of 3)

   Dataset moved.

   Data sources used in this process:

   o   F:\4427project\12Districts\12Districts

   (Process 2 of 3)

Dataset copied.

Data sources used in this process:

- F:\4427project\FinalDeliverables\12Districts

(Process 3 of 3)

Dataset moved.

Data sources used in this process:

- G:\4427project\12Districts\12Districts

How can someone get a copy of the data set?

Are there legal restrictions on access or use of the data?

Access_Constraints:

The original district boundaries provided by Capital Area Council for Boy Scouts of America are slightly different from the district boundary lines compiled in this layer made by HCGS.

Use_Constraints:

Any outside manipulation of this data can cause the layer not to be a credible source of info. We do not recommend any outside users to change the data layer from its original format

---

Who wrote the metadata?

Dates:

Last modified: 27-Apr-2008

Metadata standard:

FGDC Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998)

Metadata extensions used:

- <http://www.esri.com/metadata/esriprof80.html>

FINAL_RANK.SHP (PRIMARY DATA W/OUT METADATA)

What does this data set describe?

Title: Hill Country Geospatial Solutions. March/2008. Final_Rank

Abstract:

Existing TNRIS county census tract shape files were joined with an excel document containing all census and ranking data for the Capital Area Council Census tracts

Supplemental_Information:

The census data was provided by the U.S. census bureau's website. The 15 counties and tract file was provided by the TNRIS website. The excel file containing census bureau information and the TNRIS shapefile was combined to create a new layer.

1. **How should this data set be cited?**

   Hill Country Geospatial Solutions. March/2008. Final_Rank.

   Online Links:

   - \\BEAU\C\Documents and Settings\bebarela\Desktop\Metadata\Make Metadata\Final_Rank.shp

2. **What geographic area does the data set cover?**

   West_Bounding_Coordinate: -99.484755

   East_Bounding_Coordinate: -96.560555

   North_Bounding_Coordinate: 31.034919

   South_Bounding_Coordinate: 28.813300

3. **Does the data set describe conditions during a particular time period?**

Calendar Date: March/2008

Time_of_Day: none

Currentness_Reference: publication date

4. **What is the general form of this data set?**

Geospatial_Data_Presentation_Form: vector digital data

5. **How does the data set represent geographic features?**
   a.   **How are geographic features stored in the data set?**

   This is a Vector data set. It contains the following vector data types (SDTS terminology):

   - G-polygon (307)
   b.   **What coordinate system is used to represent geographic features?**

   Horizontal positions are specified in geographic coordinates, that is, latitude and longitude. Latitudes are given to the nearest 0.000000. Longitudes are given to the nearest 0.000000. Latitude and longitude values are specified in Decimal degrees.

   The horizontal datum used is North American Datum of 1983.
   The ellipsoid used is Geodetic Reference System 80.
   The semi-major axis of the ellipsoid used is 6378137.000000.
   The flattening of the ellipsoid used is 1/298.257222.

   How does the data set describe geographic features?

   Final_Rank

   FID

   Internal feature number. (Source: ESRI)

   Sequential unique whole numbers that are automatically generated.

   Shape

   Feature geometry. (Source: ESRI)

   Coordinates defining the features.

   Shape_Area

Area of feature in internal units squared. (Source: ESRI)

Positive real numbers that are automatically generated.

Why was the data set created?

The layer provides a ranking system for each tract based on series of different factors included in the excel file. This layer allows the user to understand what tracts have higher ranks based on the determining factors put into the tract.

Are there legal restrictions on access or use of the data?

Access_Constraints:

> The different factors included in each tract were first ranked based on importance of the feature in the project. After each aspect was ranked the excel file was then joined based on the location of the census tracts.

Use_Constraints:

> If any outside user manipulates the data outside of HCGS's authority then the layer might not function correctly.

Who wrote the metadata?

Dates:

> Last modified: 27-Apr-2008

Metadata standard:

> FGDC Content Standards for Digital Geospatial Metadata (FGDC-STD-001-1998)

Metadata extensions used:

- <http://www.esri.com/metadata/esriprof80.html>

9. **APPENDIX II. CONTRIBUTIONS OF EACH TEAM MEMBER**

GIS ANALYST: JUSTIN HOLDER

Justin participated with the rest of the team in the initial data collection for the project. He also conducted much of the preliminary literature review for the project, specifically information about our client. He was our in-house expert on the Boy Scouts. Justin's most critical role came in writing all the metadata for all the files created for this project. This meant he had to be aware of all steps at all times in the project's progress to know what to write about the data produced. He also played the lead role in finding the critical parcel data and labeling it for use in displaying the areas of the recommended census tracts. Without this data, our end results would not be as relative to our client's needs as it is now.

GIS ANALYST/WEB DESIGNER: ERIC BROTHERTON

Eric participated in the collection of data at the beginning of the project and soon rolled into a document creation and review role. He was responsible for editing of reports throughout the project and begins writing instruction data for the final deliverables once enough information had been compiled for this step to begin. Eric did the preliminary research on Arc Reader for the team so we could use it in our final deliverables. His main focus in the latter part of the project has been the development of the team web site and compilation of information for the data CD. Eric was essential throughout the project in his insight on "application" snags team members encountered.

LEAD GIS ANALYST: BEAU BERELLA

Beau participated in data collection with the rest of the group and then took all this data and ran. There were few steps throughout the project Beau did not participate in. His individual task

assigned solely to him was the projection of the populations for the census tracts in the Capitol Area Scouts area. He was able to do this as well as provide a growth rate to be included with other demographic variables for market analysis. He processed the data compiled by the team, put it in an excel file, and used the ranking system made by Charles Good to find our results. After completing this, he was put in charge of the final maps to be provided our client. The maps he created were used by the rest of team to build our final deliverables. Beau's expertise with a GIS allowed HCGS to stay ahead of schedule and actually add additional element to our deliverables.

ASSISTANT MANAGER: CHARLES GOOD

Charles, with the rest of the team, started out with data collection. He soon found a talent for reviewing data accuracy and was able to fix a lot of address problems that existed in the data provided by Capitol Area Council Boy Scouts. This greatly increased the accuracy of the geocoding project HCGS performed for the scouts. Charles's next claim to fame came with his idea for the census tract ranking system used to do the final analysis of the data for the project. Charles and Beau assigned a point system to each demographic based on its importance to Capitol Area Council Boy Scouts that, when classified, assigned a score to each demographic in each census tract that could then be added together to provide the 307 ranked census tracts. Charles performed his assistant management duties throughout the project doing a great job of maintaining communications among the team and overseeing overall quality of products produced by HCGS.

MANAGER: MARK PARKER

Aside from his management duties, Mark participated in data collection in the beginning of the project and had a couple of individual GIS tasks he was responsible for. Mark built the file for the districts polygons (digitized) used to represent the spatial orientation of the scout's districts and geo-referenced the original digital image provided by the scouts. He provided the rough draft for all written reports that were then passed on to the team for editing and then finalized by Mark. Mark also made the rough drafts for presentations that were also edited by the rest of the team. Some portions of the project required group work, which was overseen by Mark to maintain consistency with work done within the group.

REFERENCES

Boy Scouts of America. 2007. *2006-2010 Reaching the Next Multicultural generation. Reaching Generation X and Millennial Parents.* Irving, TX. Boy Scouts of America Publication.

Capital Area Council Boy Scouts of America. 2007. *Strategic Plan 2003-2007: Prepared For Today and Building For Tomorrow.* Austin, TX.: Boy Scouts of America Publication.

Capitol Area Council Boys Scouts of America. 2007.

Capitol Area Council of Governments. http://www.capcog.org/ Last accessed 4/24/08.

ESRI GIS and Mapping Software. http://www.esri.com 4/24/08.

Fernandez, Louella. Oct. 04, 2007. "The Location Intelligance Enterprise" Directions Magazine.

Texas Agency Agency. http://www.tea.state.tx.us Last accessed 4/24/08.

Texas Natural Resource Information System. http://www.tnris.state.tx.us/default.aspx Last accessed 4/24/08.

US Census Bereau. http://www.census.gov/ Last accessed 4/24/08.