

SPATIAL CONSULTING SERVICES



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Implementation of GIS techniques for potential improvements in the City of Woodcreek, Texas.

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Spatial Consulting Services

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Summary

The City of Woodcreek was incorporated in 1984 as a Type-B General Law City. In 1989 with a population of 600, the city became a Type-A General Law City and currently has a population of 1300. As the city has increased in population, the needs for the resources of a Geographic Information System (GIS) became apparent. Utilization of the tools offered through GIS systems will benefit the overall organization and execution of city processes. The organization of city planning tools such as zoning and infrastructure maintenance helps to expedite decisions that become increasingly more difficult as the population grows. A GIS system will help the various commissions and committees visualize Woodcreek's area with more data availability in order to perform their duties more effectively. Conveying information through map displays to the citizens of Woodcreek during public hearings can make presentations more productive and effective. By using GIS, any changes to current land use or infrastructure can be updated quickly. GIS has helped plan orderly development for other small cities and governments. Many cities have developed online mapping services that allow for citizens to have access to public geographic data for reference. The City of Nanaimo, British Columbia has integrated some of its public data using Google Earth. This type of interactive mapping service would be beneficial to the City of Woodcreek.

Purpose

The purpose of our project is to build a formal mapping system for the City of Woodcreek by developing a GIS database. This mapping system will display zoning regulations, administrative boundaries, topographic information, and infrastructure status. The system will greatly increase the efficiency of city functions. A GIS mapping system will display the spatial relationships with greater accuracy and functionality than current map documents.

Scope

Our study area will be the central Texas City of Woodcreek located within Hays County. The city limits encompass 686 acres and the ETJ extends one half mile beyond the incorporated boundaries.

Data

Both primary and secondary data will be used for the project. Primary data, collected by SCS, will be the Global Positioning System (GPS) points and digital photographs of the commercial signage located in the city limits and ETJ.

Secondary data, which is compiled by other agencies, will be collected from various state, regional, and local sources. Texas Natural Resource Information System (TNRIS), Capitol Area Counsel of Government (CAPCOG), Hays County Appraisal District (HCAD), and Hays County all have publicly available data online that will be used in the project.

Other data such as older paper maps were provided by the client.

- City Limits (Hays County)
- County Boundaries (Hays County)
- Floodplain data (CAPCOG) *derived from Federal Emergency Management Agency (FEMA)*
- Property Parcels (HCAD)
- Street Centerlines (CAPCOG)
- Digital Imagery (CAPCOG and TNRIS)
- Traffic Signs (City of Woodcreek)
- Road Conditions (City of Woodcreek)
- Fire Hydrant Locations (City of Woodcreek)
- Zoning Information (City of Woodcreek)

Methodology

All data will be collected and prepared using ESRI ArcGIS 9.2 software.

Data Collection

- Primary data will be collected using a GPS unit and Digital Camera
- Collection of city data will be obtained from city officials
- Other data will be collected from online sources with free, publicly available data:
 - www.tnris.org TNRIS
 - www.capcog.org CAPCOG
 - www.co.hays.tx.us Hays County
 - www.hayscad.com Hays County Appraisal District

Data Analysis

- After all data has been collected, we will begin to digitize and Geo-Reference the paper maps obtained from the city. By Geo-Referencing these maps, we will be able to create a database for the traffic signs and fire hydrants point data.
- Data for future and past road repairs will be integrated into the street centerlines layer by creating new attributes in the table.
- The ETJ will be derived from the City Limits file using the Buffer and Erase GIS tools.
- GPS points collected will be linked to the digital photos of commercial signage and incorporated into a GIS file using GPS-Photo link software.
- A zoning map will be derived from the HCAD parcel shapefile and color coded to match existing zoning status.
- 100 year floodplain data will overlay aerial imagery and roads data.

Interactive Map Display

- After all collection and analysis has been completed using ArcGIS 9.2, data will be converted into an appropriate format for use in an online interactive map display.
- The interactive map display and website will be designed using open source software available free of charge.

Budget

Data Collection

Total Hours ([10 hours/week * 2 weeks * 3 consultants] + [5 Hours/week * 2 weeks * 1 mgr.] + [7 hours * 2 weeks * 1 asst. mgr.].....	84	
Hourly Pay	\$35.00	
Total		\$2,940.00

Data Analysis

Total Hours ([10 hour/week * 8 weeks * 3 consultants] + [5 Hours/week * 8 weeks * 1 mgr.] + [7 hours * 8 weeks * 1 asst. mgr.].....	336	
Hourly Pay	\$45.00	
Total		\$15,120.00

System Management

Project Manager

Total Hours	50	
Hourly Pay	\$60.00	
Pay	\$3,000.00	

Assistant Project Manager

Total Hours	30	
Hourly Pay	\$50.00	
Pay	\$1,500.00	

Web Developer

Total Hours	10	
Hourly Pay	\$45.00	
Pay	\$450.00	
TOTAL		\$4,950.00

**Equipment
Costs**

Supplies (\$160/GPS unit * 2 GPS units).....	\$320.00
Maintenance (\$125/workstation * 5 workstations).....	\$625.00
Depreciation ([\$3,000/workstations * 5 workstations] * [4 months/36 months] * 2.5 months equipment will be in exclusive use for project).....	\$4,166.67
Total	\$5,111.67

Data

Purchased Data	N/A
Software License for 10 weeks (ESRI license at \$1500/station * 5 stations).....	\$7,500.00

**Travel
Expenses**

120 miles at \$0.34/mile.....	\$40.80
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**TOTAL
COSTS**

.....	\$35,662.47
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Timetable

Week	1	2	3	4	5	6	7	8	9	10
Data Collection	2 weeks									
Data Processing			2 weeks							
Data Interpretation					4 weeks					
Final Deliverables						5 weeks				

Timeline

Data Collection

- Week 1:
 - Research Woodcreek, TX
 - Meet with Dr. Sally Caldwell, Mayor Pro Tem of Woodcreek, TX
 - Obtain available maps and information from Dr. Caldwell
 - Needs Assessment
 - Prioritizing of project phases and tasks

- Week 2:
 - GPS business signs around Woodcreek and take pictures of the signs
 - Make visual confirmation of placed points
 - Collect required data (roads, boundaries, floodplain data, parcels, etc...)

Data Processing

- Week 3:
 - Digitize street sign map

- Week 4:
 - Digitize street condition map

Timeline Continued...

Data Interpretation

- Week 5:
 - Digitize street priority map for resurfacing needs
- Week 6:
 - Create zoning map for residential and non-residential areas
- Week 7:
 - Update floodplain map
- Week 8:
 - Create GPS map of business signs

Final Deliverables

- Week 6:
 - Webmaster to begin work on website as other project tasks are being performed.
- Week 9:
 - Webmaster to integrate pictures to GPS points of business signs through IMS or Google
 - Finalization of project tasks
 - Creation of Poster
- Week 10:
 - Final report completed
 - Delivery of project to client
 - Team Website completed and made active

Final Deliverables

Upon completion of this project, S.C.S. will provide the city of Woodcreek, TX with all pertinent analysis and research in digital and physical forms.

- Detailed Final Report introducing the specialized formal mapping system created for Woodcreek, TX.
- Professional visualization of all maps created for Woodcreek, in poster format, containing detailed analysis and results.
- Two complete copies of project files in a digital media format (CD or DVD depending on space requirements) containing the following:
 - All data files
 - Metadata files for all data files
 - Final Report in Word and PDF formats
 - Digital copy of final poster
 - PowerPoint representation of Final Project and Final Report
 - Installation file for interactive web display
 - Full copy of Spatial Consulting Services website containing all relevant documents and maps.
 - Instructions on CD/DVD usage, including a Table of Contents for folder and file entries.

Conclusion

The establishment of organized and efficient strategies in relation to a city's master plan, details prioritized ambitions through effective communication. Whether a city is undertaking its infancy, or has reached countless aspirations through conventional means, custom-built GIS applications and services offer exceptional new resources in the pursuit of all ideals. Spatial Consulting Services is committed to honor the principles of Woodcreek, TX by providing professional and exceptional GIS solutions suited for today's needs and well into the future.

Participation

James Thomas

Budget

Timetable

Timeline

PowerPoint Presentation

Final Edits

Chris Faulkner

Methodology - Software

Final Deliverables

Conclusion

Participation

Logo

Paul Kaiser

Introduction

Data

Methodology

Jordan Stanley

Introduction

Methodology

Logan Weller-Alexander

Cover page

Title page

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Methodology