SOLANO COUNTY GRAND JURY
2013-2014

GEOGRAPHIC INFORMATION SYSTEM
(GIS)

Geographic Information System (GIS)
2013-2014 Solano County Grand Jury

I. INTRODUCTION

Geographic Information System (GIS) is a computer based service that is designed to allow all departments of Solano County government, cities, as well as all agencies serving Solano County, to have instantaneous access to all pertinent public Solano County information. The existing information is gathered from all cities and agencies; is then integrated and made available to all potential users. The information is displayed on the users' computer monitor in a layered graphic representation. It incorporates written documents with 3-dimensional photographs of the County and gives the user a visual image of the selected geography of Solano County.

Currently, Solano County is contracting with Pictometry, Inc., an aerial photography supplier. Due to the advancement in pixelization, Light Detection & Ranging (LiDAR), low level fly-overs with multiple cameras operating simultaneously will give complete 3-dimensional pictures. This produces accurate location photographs of buildings, infrastructure elements such as streets, highways, positioning of utilities such as water delivery, fire hydrants, power lines, sewer manholes, and various other elements. The retrieval of this information allows faster response times for police, fire and other emergencies. It is also useful for infrastructure maintenance, property assessments, planning services and many other applications.

The County Resource Management staff wanted a more integrated system that used GIS and improved workflow to better manage County responsibilities such as code enforcement and tracking of permits. In addition, GIS opened new avenues for delivering more effective scheduling and improving the ability to provide information for integrated decision making, faster delivery and a higher efficiency of services. A web-based GIS interface also provides 24/7 public access to services and the ability to handle the reviewing of permits.

Seen as a positive step forward in information retrieval, GIS is a timesaver for those who depend on retrieval of information that has sometimes taken upwards of a week to obtain. Much of the needed information is now available at the click of a computer mouse.

GIS is a computer based platform that allows input of pertinent data from a variety of sources and then merges that data, along with graphics, to form essentially a 3-dimensional view of information and its location. The entire process is done electronically and reduces substantial amounts of research time and possibility of error. GIS also allows input of constantly updated data from the network of participating agencies. GIS usage in Solano County is still in the developmental stage.

The 2013-2014 Grand Jury reviewed the GIS program in Solano County. In spite of the value seen by users of the system, the Grand Jury has determined there are areas for improvement.

II.   METHODOLOGY

- Attended presentation by Solano County on Geographic Information System "GIS" Geographic Matters
- Attended Regional Geographic Information System (ReGIS) Consortium Steering Committee meetings
- Reviewed Section 215, Assessment Map Standards for Manual Systems
- Interviewed Staff from:
    - Solano County Agricultural Department
    - Solano County Department of Information Technology
    - Solano County Registrar of Voters
    - Solano County Office of Emergency Services
    - Solano County Health & Social Services
    - Solano County Assessor's/Recorder's Office
    - Solano County Mosquito Abatement District
    - Solano Transportation Authority
    - City of Rio Vista
    - City of Vacaville
    - City of Vallejo
- Interviewed a Member of Solano County Board of Supervisors

III.   STATEMENT OF FACTS

The ReGIS Steering Committee meets monthly and consists of representatives of Solano County, Travis AFB, City of Fairfield, City of Vacaville, Solano Transportation Authority, Vallejo Sanitation & Flood Control District, Fairfield-Suisun Sewer District, City of Suisun City, City of Benicia, City of Vallejo, City of Rio Vista, City of Dixon, Solano County Water Agency, Solano Irrigation District and Local Agency Formation Commission (LAFCO).

Solano County Department of Information Technology is spearheading the process of building a single website for ReGIS data for the county, cities, and special districts. They are still working out what information is considered pertinent and is shareable by the member organizations and public use.

Neighboring counties using a GIS include Napa, Contra Costa, Lake, Yolo, Sonoma, Alameda, Sacramento, Mendocino, San Francisco and Marin. Neighboring cities using a GIS include Napa, Sacramento, Santa Rosa, San Francisco, San Rafael, Concord, Martinez, Antioch, Pittsburg and Woodland.

Formed in 2000, Pictometry International Corporation (Pictometry) created the aerial oblique business by producing a patented system for image capture (AccuPlus). They then pioneered the use of oblique imagery and measurement analytics across government and commercial sections. Headquartered in Rochester, New York, Pictometry has offices worldwide. Solano County ReGIS acquired the use of Pictometry and finds the data system and program essential and favorable for local use in Solano County.

AccuPlus is a digital imaging process and software program that maps each pixel of a digital land image to geographic locations. Pictometry imagery is captured using the AccuPlus patented system designed to produce orthogonal (straight down views) by capturing the fronts and sides, top and base of an image to retrieve the elevation with the use of 12 oblique aerial angles. These 3-dimensional high resolution images and angles are stitched together showing height and elevation, distance, and pitch, allowing users to have high-resolution direct images of buildings, neighborhoods, landmarks, roads and complete municipalities.

Pictometry provides visual information for Homeland Security, emergency management agencies, first responders (law enforcement and fire), community planning agencies, and transportation departments. This information provides vital benefits for first responders to easily understand the area, distance and surroundings to where they are dispatched.

The first flight contracted between Solano County and Pictometry took place in 2008. An update flight is scheduled to take place in 2014 under a Memorandum of Understanding (MOU) entitled, "*Cooperative County Agreement to Provide Funding for Countywide Aerial Imagery Services*". Participants in this MOU include County of Solano, and the cities of Vacaville, Fairfield, Vallejo, Benicia, Dixon, Suisun, Rio Vista, Fairfield-Suisun Sewer District, the Vallejo Sanitation and Flood Control District, Solano Irrigation District, Solano Transportation Authority, Solano County Water Agency, and the United States Air Force, collectively referred to as "Participants".

The fly-over anticipated for 2013 did not take place. The MOU was not fully executed, as signatures confirming funding were still needed from two agencies. The next time frame for the fly-over is scheduled to take place between December 2014 and February 2015. The aerial flight is done during dormant season of foliage for increased viewing.

The last fly-over took place in 2008.

The Cost Sharing Plan associated with the MOU would cover three flights, one flight every two years during a six year period. Annual projected costs for current participants are:

Participant	Annual Cost	Percentage	Total Projected Costs 6-Year Period
Solano County	$84,193.12	35.01%	$505,158.69
City of Vallejo	28,064.37	11.67	168,386.23
City of Fairfield	16,835.26	7.00	101,011.54
City of Vacaville	15,707.29	6.53	94,243.76
City of Benicia	8,973.19	3.73	53,839.15
City of Suisun	2,239.09	0.93	13,434.53
City of Dixon	3,922.61	1.63	23,535.69
City of Rio Vista	3,922.61	1.63	23,535.69
Solano Transportation Authority	14,430.22	6.00	86,581.32
Travis Air Force Base	4,495.01	1.87	26,970.08
Vallejo Sanitation & Flood Control	14,430.22	6.00	86,581.32
Fairfield-Suisun Sewer District	14,430.22	6.00	86,581.32
Solano Irrigation District	14,430.22	6.00	86,581.32
Solano County Water Agency	14,430.22	6.00	86,581.32
Totals	$240,503.65	100.00%	$1,443,021.96

Additional participants, joining in at a later time, may wish to avail themselves of the data collected and join in on the MOU. At that time adjusted costs would be redistributed amongst the participants.

The Solano County Office of Emergency Services is providing *Fire Run Map Books*, developed by Solano County ReGIS, to local fire and emergency service agencies. A grant was obtained from Homeland Security to fund 120 map books. There is an apparent need for an additional 80 map books. These books are needed in the fire trucks and other emergency services vehicles as a backup to electronic transmission in case of power outages and communication dead zones.

Solano County Department of Agriculture utilizes ReGIS to provide maps as an aid for several activities, e.g. maps to identify spray and planting areas as specific pesticides are used on specific crop varieties. Maps are also utilized before spraying of crops to anticipate wind drift and protect organic crops. Pest control detection, eradication and pathogen outbreaks are easily plotted using GIS map technology. The agricultural department produces the Solano County Farm Trails map depicting farm stands, tasting rooms, and specialty products. The agricultural department mission statement reads: *Promoting public awareness of Solano County agricultural products, and supporting the economic success of our local growers.* The agricultural department is also responsible for weights and measures, creating a map showing the locations of facilities requiring measurement, inspections, certification and compliance.

The Registrar of Voters (ROV) office uses GIS to map precincts, polling places, and political districts. ROV confirms street addresses are accurate and actually exist on voter registration forms and corrects as required. Maps are available through ROV for political districts. Election results maps are also created through use of ROV data by Department of Information Technology-GIS (DoIt-GIS)

The Assessor/Recorder office works closely with Solano County ReGIS staff on parcel maps. Parcel maps in the Assessor's Office are used for assessment purposes only and must follow Assessment Map Standards for Manual Systems, Assessors' Handbook, Section 215. Some symbols used by GIS can be used on parcel maps. Use of licensed surveyors will continue to be required by the State of California Subdivision Map Act when lot line adjustments are made.

Uses of GIS by entities within Solano County include demographic data, hose layouts for fire departments, landscape districts, lighting districts, safe routes for school children, pinpointing areas of high risk communicable diseases and health issues, pipelines, utilities, transportation, schedules for street sweeping and trash pickup in cities, and a myriad of other useful information.

Some upper levels of agency management are not actively supporting and participating in the implementation of ReGIS. Attendance at ReGIS meetings has been less than stellar. Representation of agencies at ReGIS meetings has been by non-management employees who have limited or no commitment authority.

Some cities and agencies have been generous in sharing their data with ReGIS. These entities are generally managed by persons familiar with GIS. Unfortunately, not all agency management is familiar enough with GIS to actively support and participate in the program. Training is available through Solano County Department of Information Technology; however, not all management personnel have participated or encouraged staff to participate in training. Further, there are no user groups available to share information and training.

Solano County offers public access information on Geographic Information Systems through the Department of Information Technology on the County website. Nonetheless, public awareness of Geographic Information Systems and its attendant benefits are limited.

IV. SUMMARY

Solano County Department of Information Technology is spearheading the process of building a single website for ReGIS data for the county, cities, and special districts. They are still working out what data is shareable by the member organizations and the general public. GIS is not just for use by government. It is a mission critical technology in monitoring the changes in our world, our country, our state, and our county and cities.

In all interviews and group meetings with current users of ReGIS, nothing but positive comments were made. Additional data is being collected and integrated, and agency usage is increasing exponentially. The ReGIS system is providing important and useful data at a cost substantially less than the former manual retrieval efforts of the various agencies.

When the 2014 fly-over is completed, the results integrated into the current system, there will be another surge of increased interest and usage by County and City agencies and special districts.

ReGIS technology and data delivery will bring increased efficiency and lower costs to all users. Solano County Department of Information Technology is to be congratulated for its work and expertise in developing ReGIS.

V.   FINDINGS AND RECOMMENDATIONS

Finding 1

The Memorandum of Understanding has not been completed by all agencies which has delayed the scheduling of Pictometry's flyover.

Recommendation 1

Memorandum of Understanding approvals be completed in a timely manner to ensure the flyover in 2014 takes place.

Finding 2

Some upper levels of public agency management are not actively supporting and participating in the implementation of ReGIS.

Recommendation 2

Upper levels of public agency management actively support and participate in the implementation of ReGIS.

Finding 3

Management attendance at ReGIS meetings has been poor.

Recommendation 3

Management attend and encourage attendance by representatives from their agency at ReGIS meetings.

Finding 4

Representation of agencies at ReGIS meetings has been mostly by non-management employees who have limited or no commitment authority.

Recommendation 4

In the absence of management attendance, management appoint and authorize an employee to commit and support ReGIS activities.

Finding 5

There is no user group available to share information on data, methods, procedures and training.

Recommendation 5

User group be formed to share data, methods, procedures, and training.

Finding 6

Awareness of Geographic Information Systems and its attendant benefits is limited.

Recommendation 6

Department of Information Technology schedule and promote public forums to increase awareness to support the Geographic Information System use in Solano County.

COMMENTS

The use of GIS throughout Solano County could further unite the County as a complete community. A positive step by our County is to have individual cities, unincorporated areas, agencies, and districts utilizing information, planning and developing insight and common goals.

REQUIRED RESPONSES

Solano County Department of Information Technology (Findings 1, 5, 6)
City of Vallejo (Findings 2, 3, 4)
City of Fairfield (Findings 2, 3, 4)
City of Vacaville (Findings 2, 3, 4)
City of Benicia (Findings 2, 3, 4)
City of Suisun City (Findings 2, 3, 4)
City of Dixon (Findings 2, 3, 4)
City of Rio Vista (Findings 2, 3, 4)
Solano Transportation Authority (Findings 2, 3, 4)
Vallejo Sanitation & Flood Control District (Findings 2, 3, 4)
Fairfield-Suisun Sewer District (Findings 2, 3, 4)
Solano Irrigation District (Findings 2, 3, 4)
Solano County Water Agency (Findings 2, 3, 4)

COURTESY COPIES

Clerk, Board of Supervisors Solano County
Commander, Travis Air Force Base
Local Agency Formation Commission (LAFCO)