



# CITY OF SANTA BARBARA

## COUNCIL AGENDA REPORT

**AGENDA DATE:** November 24, 2015

**TO:** Mayor and Councilmembers

**FROM:** Information Systems Division, Administrative Services Department

**SUBJECT:** Collection Of High Resolution 3D Elevation/Terrain Data (LiDAR)

**RECOMMENDATION:** That Council:

- A. Approve the expenditure of \$75,000 and authorize the Administrative Services Director to negotiate, subject to approval by the City Attorney, an agreement with Channel Islands Regional Geographic Information Systems Collaborative for the acquisition and processing of High Resolution 3D Elevation/Terrain Data for the City's Centralized Geographic Information System; and approve an additional \$7,500 for contingency costs that may be necessary; and
- B. Appropriate \$82,500 from Information Systems Fund Reserves to the Fiscal Year 2016 Information Systems Budget for this purpose.

### **DISCUSSION:**

The City has been offered an advantageous opportunity to perform a significant update and upgrade to its existing elevation/topographical data set through a partnership with the Channel Islands Regional Geographic Information Systems Collaborative (CIRGIS).

### **Background**

The City's Centralized Geographic Information System includes topographical data, which shows the various elevations and contours of the Earth's surface for the City and surrounding areas. The current topographical data set was acquired in 1995 using field survey technology and has not been updated since then. The data does not extend beyond City limits, although City Water and Fire services often do.

Topographical data is used by Police and Fire, Building and Safety, Planning, Public Works, Airport, and the Waterfront for many purposes, including:

- Evaluating slopes for development purposes
- Visualization of terrains and elevations
- Calculation of hydraulic pressures for sewer and storm water flows
- Emergency management, flood control, and planning

- Evaluation of wild land vegetation

The City is a member of CIRGIS, a non-profit organization that assists local agencies by coordinating the acquisition of geographical data for cost-sharing purposes. CIRGIS has coordinated bi-annual acquisitions of aerial photos for public agencies in Santa Barbara and Ventura counties since 2007. The City first participated in a CIRGIS aerial photo collaboration project in 2012 with significant financial savings.

### **Current Project**

CIRGIS has contracted with vendor Harris Government Communications Systems (Harris) to collect high resolution 3D elevation/terrain data via aircraft with Light Detection and Ranging (LiDAR) technology, prior to the predicted El Niño storm season.

The data that will be collected through the project has many potential applications. The data is expected to be collected by Harris at very high resolution, but licensed to participating agencies at eight points per square meter. This is still a very high resolution, and is considered quality level 1 by the US Geological Society (USGS) and would be more than adequate for current City applications. Data collected by the USGS survey, for example, is only at two points per square meter, quality level 2. The resolution that will be obtained by participating agencies exceeds FEMA guidelines and can be used to provide evidence of damage sustained in declared emergencies. Additional higher resolution data will be available to participating agencies from Harris at an additional fee, if it is ever needed. For example, building outlines could be extracted, providing invaluable information about facilities and potential hazards to Police and Fire, Building and Safety, Planning, Public Works, Airport, and the Waterfront.

CIRGIS conducted an extensive review process prior to awarding this contract to Harris. A Request for Information was sent on April 18, 2014, to 15 vendors nationwide. CIRGIS then sent Request for Proposals on February 28, 2015, to eight vendors. Five vendors responded by the March 31, 2015 deadline. A subcommittee comprised of CIRGIS board members reviewed these proposals and all five vendors were invited to interview. Two CIRGIS board members and a representative from the City of Thousand Oaks comprised the interview panel. The five vendors were evaluated based on 20 weighted criteria. CIRGIS then ranked each company based on technical merit, expertise, past experience, references, and their fee proposal. Based on this detailed analysis, Harris was ranked as first choice and was selected as the vendor.

In order to complete the project, a sufficient number of CIRGIS agencies will need to commit to participation. So far, nine agencies are expected to make a binding commitment prior to the flight. The City is the only potential participant yet identified in Santa Barbara County, with the remainder of the agencies in Ventura County. The flight area will depend on the final participants, but is expected to encompass most of Ventura County and only the City-requested portions of Santa Barbara County.

## City Participation

Harris will process the collected data and deliver the following products to the City, for the area flown:

- Access to the raw data collected, at an eight points per square meter resolution, from the fly-over area in a “Point Cloud.” Additional data can be extracted from the cloud and processed for City use at a later date, for a fee.
- A Digital Elevation Model of the Bare Earth Surface.
- Contour lines to show changes in elevation (topography).

CIRGIS has provided the city with two cost options, based on the coverage area flown.

- A 45-square mile area that covers only the City limits and the area between the airport and the rest of the city, at a cost of \$35,000. (Attachment 1)
- A 108-square mile area that includes the 45-square mile area listed above, as well as the surrounding watershed and wild lands, at a cost of \$75,000. (Attachment 2)

Staff has committed to the 45-square mile area, but recommends the purchase of the 108-square mile data set. This area corresponds to the city’s existing aerial imagery, and includes the Gibraltar dam. The smaller data set would not fully meet the needs of City departments, particularly the Fire Department, which provides mutual aid and wild land management in areas outside the City limits. This data will give them the ability to evaluate vegetation, topographic, infrastructure and structure location to evaluate wild land project locations, impacts and suppression response over a large visual area that currently can only be evaluated on one dimensional aerial photos and topographic maps.

The larger data set is also crucial to operations for the Water division of Public Works as it includes Gibraltar Dam and the surrounding watershed. This data would be critical if the dam or its supporting infrastructure sustained damage during winter storms.

## BUDGET/FINANCIAL INFORMATION:

The opportunity to join the current CIRGIS project at \$75,000 for the full 108-mile square area is expected to be significantly more cost effective for the City than if the City were to conduct its own LiDAR flight project. The City did not budget for this expense in Fiscal Year 2016 and will fund the work from Information Systems reserves. Costs will be charged back to the departments who use the Centralized Geographic Information System database through allocated costs in Fiscal Year 2017. The General Fund portion of the cost is approximately \$44,565.

- ATTACHMENTS:**
1. Map of proposed 45-square mile area of coverage.
  2. Map of proposed 108-square mile area of coverage.

**PREPARED BY:** Maryanne Knight, I.S. Supervisor

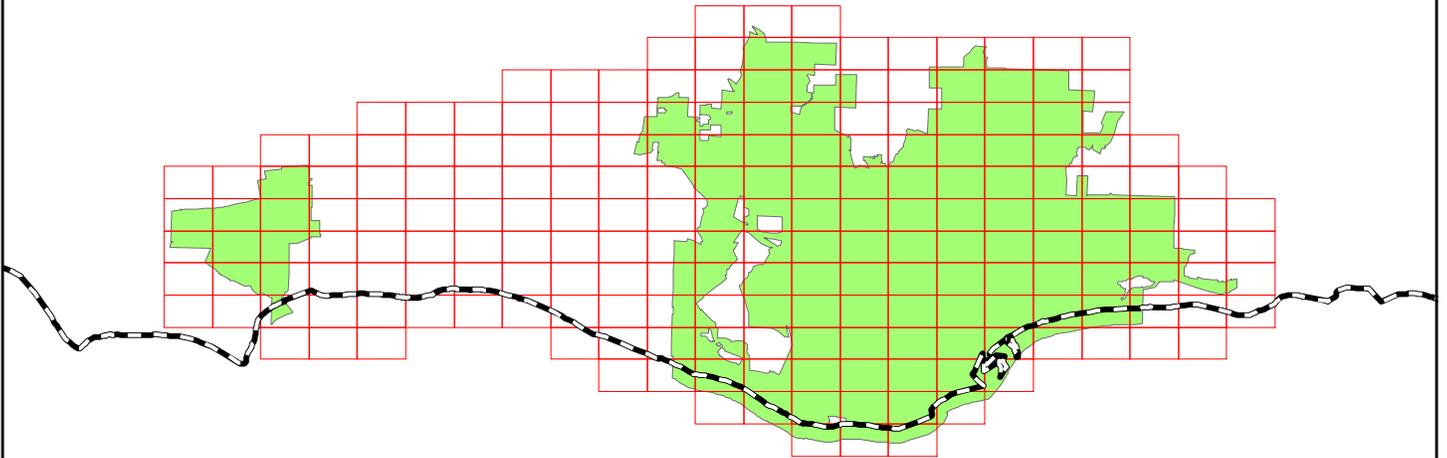
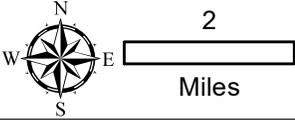
**SUBMITTED BY:** Kristy Schmidt, Administrative Services Director

**APPROVED BY:** City Administrator's Office

# ATTACHMENT 1

## Legend

-  LIDAR TILES
-  CITY BOUNDARY

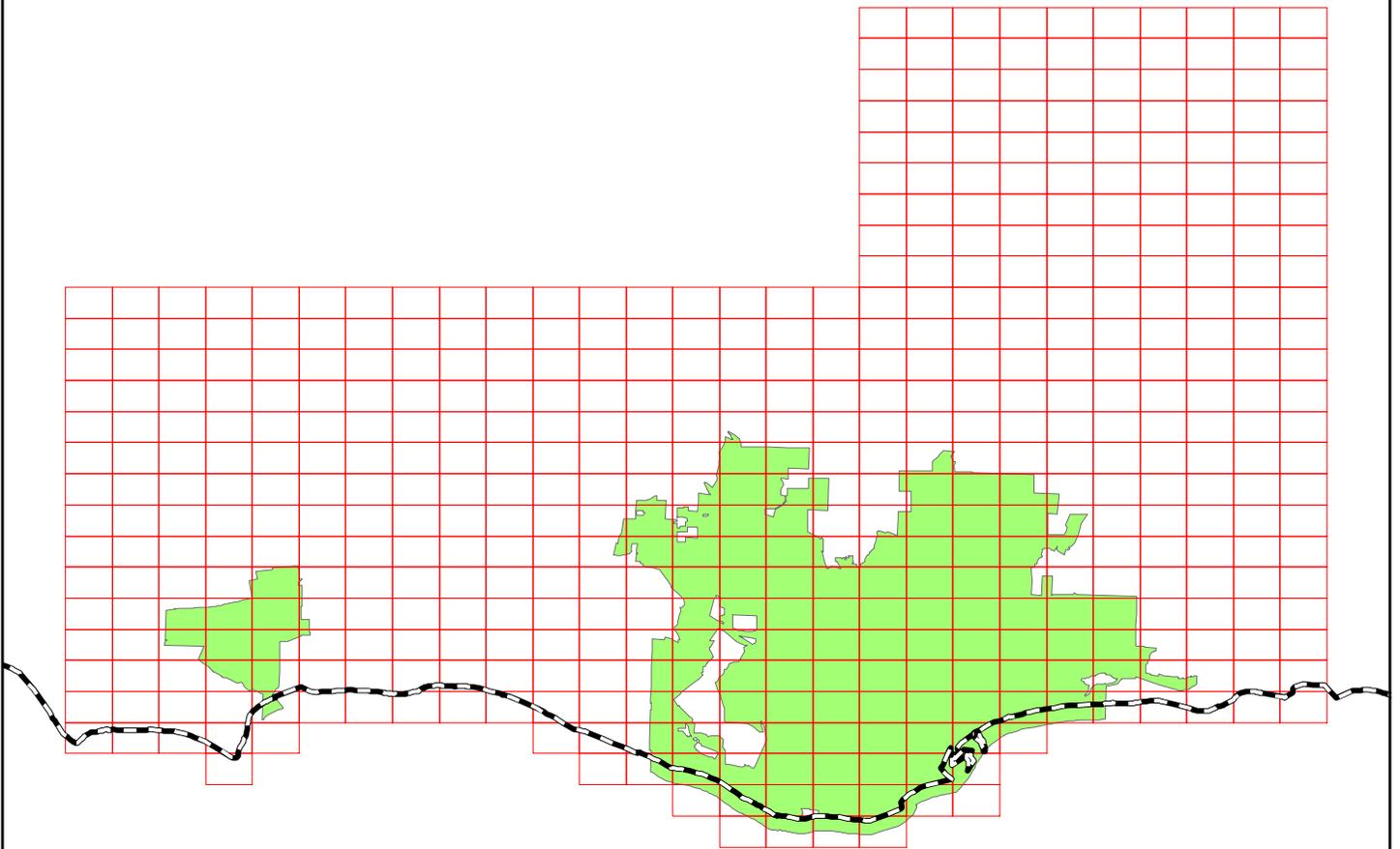
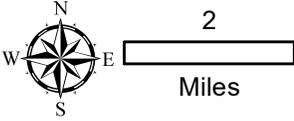


CIRGIS 2015 PROPOSED  
LIDAR PROJECT  
CITY OF SANTA BARBARA

# ATTACHMENT 2

## Legend

-  LIDAR TILES
-  CITY BOUNDARY



CIRGIS 2015 PROPOSED  
LIDAR PROJECT  
CITY OF SANTA BARBARA