



Staff Report

Date: May 24, 2016

To: City Council

From: Valerie J. Barone, City Manager

Reviewed by: Guy Swanger, Chief of Police

Prepared by: James Nakayama, Sergeant, Field Operations Division
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(925) 671-3172

Subject: **Consider appropriating and approving expenditure of Police Department operating funds for hardware and software upgrades to the Leica ScanStation PS40 (Forensic Diagramming Equipment) and associated crime scene and collision diagramming software in the amount of \$121,622.20. (General Fund)**

Report in Brief

In 2013, the Concord City Council adopted Resolution No. 13-38, which authorized the use of asset forfeiture funds to purchase the current Leica ScanStation C10 3D scanner, associated crime scene and traffic collision diagramming software, equipment, and software training. 3D scanners have become a necessary and integral tool in crime scene and traffic collision scene investigations. 3D scanners are able to take millions of point measurements and document the position of items to be analyzed and investigated. The 3D scanner may be used in major crime scene investigations such as homicides, shootings, officer-involved fatal incidents, sexual assaults, and fatal traffic investigations. Accurate three-dimensional measurements can be made using the data captured by the scanner when analyzed through special computer diagramming software.

Over the past three years, technology has moved forward and the capabilities of an upgraded model, the Leica ScanStation PS40, have surpassed the capabilities of our current 3D scanner. The upgraded model is able to scan scenes at a higher resolution, a faster rate, incorporate a high-definition camera into the scan scenes to more

accurately document crime and traffic collision scenes, and operate in darkness and inclement weather while maintaining the ability to capture scenes in color.

Recommended Action

Staff recommends the Council adopt Resolution No. 16-32 (Attachment 2) approving the appropriation and expenditure of police department operating funds for hardware and software upgrades to the Leica ScanStation PS40 (Forensic Diagramming Equipment) and associated crime scene and collision diagramming software in the amount of \$121,622.20.

Background

In 2013, the Leica ScanStation C10, diagramming software, and training were purchased with asset forfeiture funds after authorization by the Concord City Council, per Council Resolution 13-38. The current 3D scanner has been used for homicide investigations, officer-involved shootings, major crime shootings, and fatal traffic collision investigations.

Many of the crime scenes and fatal collision scenes take place at night. The scenes are dark and inclement weather (rain and fog) are present at times. The Leica C10 does not have low-light camera capabilities and lacks the ability to filter interference from rain and inclement weather. While state of the art at the time, the Leica ScanStation C10 takes much longer to perform measurements in comparison to the Leica ScanStation PS40.

Analysis

Annually, the Concord Police Department investigates a significant number of major injury and fatal traffic collisions and crime scenes that include homicides, officer-involved shootings, sexual assaults, and assaults with deadly weapons. It is especially critical that collision and crime scene processing and diagramming be thorough and accurate. Cases are won or lost based on the integrity of evidence collection and scene depiction.

With one scan, the 3D laser scanner can measure items that range from a few inches away to approximately 300 yards. For longer distances, the scanner can be moved to the threshold distance of the first scan. Multiple scans can be taken of a scene. Once the scanned data is collected, it is downloaded into special crime scene and traffic collision diagramming software. With the use of the special computer software, the scene scans are combined to create a three-dimensional and scale rendering of the scene. The collision or crime scene can then be measured from within the software and can be viewed from any angle. Additionally, items that may not have been originally determined to be of evidentiary value will be frozen in the scan for later analysis.

Currently, the Traffic Unit and Crime Scene Investigation Unit use a Leica ScanStation C10 3D scanner for investigations.

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Approval of appropriation of funds for the upgrade of the current LEICA 3D Scanner to the LEICA Scanstation PS40 and associated software upgrade

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Leica has advanced its technology and now produces the Leica ScanStation PS40 which is an enhanced 3D laser scanner with an integrated high resolution / HDR camera with low-light capabilities. The Leica PS40 can record and produce a 360 degree / three-dimensional viewpoint of the traffic collision and crime scenes with tens of millions of factual data points.

In comparison, the current C10 scanner takes 50,000 point measurements per second while the PS40 scanner takes 1,000,000 point measurements per second. The C10 scanner has an integrated 4 megapixel camera and the PS40 has an integrated 700 megapixel HDR camera to take higher resolution images in low-light environments. The PS40 has an internal filter to allow use during inclement weather to take point measurements in the rain; the C10 does not have this feature.

The use of the PS40 scanner in the field will dramatically decrease the amount of time staff spends taking scene measurements in the field, decrease the amount of time road closures are in place, and decrease the amount of time citizens are impacted by police investigations. For example, a high resolution scan and photos with the C10 takes approximately 33 minutes and the same high resolution scan and photos with the PS40 would take approximately 3 minutes. At the highest resolution, the C10 would take almost three hours to complete a scan and photos and the PS40 would take 5 minutes.

Typical scenes require 4 to 8 scans, sometimes more. This decrease in scanning time will translate to an overall decrease in staff time. This will result in a long term cost savings and decrease the overall impact to the community.

The Leica ScanStation PS40 is in use by multiple law enforcement agencies to include: California Highway Patrol, Alameda County SO, Los Angeles County SO, Sacramento County SO, and Oakland PD. The Contra Costa County Sheriff's Office is doing an upgrade of their Leica C10 3D scanner in the near future to the same platform proposed by Concord PD. Having equipment and training interoperability between the Concord Police Department and the Sheriff's Office will be useful in a mutual aid and in the event of equipment failure.

The proposed upgrade cost includes a \$29,835 trade-in credit for the current C10 scanner. This credit has been extended to the City of Concord by the vendor and will decrease to \$14,000 in June 2016 and likely decrease to \$0 next year. A manufacturer training rebate is in effect until the end of May 2016 and if a purchase order for the upgrade is completed, the training costs for the upgraded equipment and software will be included at a savings of approximately \$7,000.

Based on emerging technology and software upgrades, and when deemed necessary by the Chief of Police, the PD will seek to enter into an agreement with an authorized

Leica vendor for software and hardware upgrades to maintain the highest industry standards.

The PD has created a “replacement fund” to forecast the anticipated replacement of certain key pieces of equipment and pre-fund the replacement of these items during the useful product life of such items. One of the items detailed in the replacement fund is the 3D scanner. The anticipated useful life is based upon industry standards, prior experience with the equipment, and availability of continued product support from the manufacturer. The anticipated useful product life of the 3D scanners has been identified to be approximately 3 years.

Specific to the current Leica C10 used by the PD, the scanner and associated diagramming software were purchased in 2013 and have been in use for 3 years. The Leica vendor used by the PD indicated product support (firmware and software upgrades) for the current C10 scanner will only last for another twelve months. The estimated end date of product support, coupled with the current availability of the \$29,835 trade-in credit, and included training credit of \$7,000 are additional reasons to perform the upgrade at this time.

By upgrading to the Leica ScanStation P40, the City will realize a long term and substantial reduction in staffing costs and the upgrade will substantially reduce the time necessary to close roadways and crime scenes thereby decreasing the impact on our community during police investigations. The upgrade to the PS40 will enhance the professional work product of the Police Department that will in turn meet the increasing expectations of prosecutors, juries, and courts.

Additional benefits of the Leica system are listed below:

1. Court and Scientific Validation – Leica is the sole manufacturer to pass the standard of Daubert in federal court under scrutiny. Leica is sole manufacturer with a court decision regarding the data being recognized as “Scientific Evidence.” Leica scanners have been validated as accurate for bullet path reconstruction.
2. Minimum Scanning Distance - The Leica PS40 has a minimum scan distance of 3.9 inches. The ability to scan at close range will allow the system to be set up inside of a vehicle for interior scanning.
3. Maximum Scanning Range – The Leica PS40 has a maximum distance of 270 meters. This range is necessary for large outdoor crime scenes, a Weapons of Mass Destruction (WMD), or Hazardous Materials type of event. Long range capability will capture more area per scan decreasing the time an investigator has to spend in the “hot” zone of an event.

4. NIST (National Institute of Standards and Technology) Measurement Standard - Leica is the only manufacturer that supplies a target pole certified by NIST for accuracy of its length. An item to validate the accuracy of measurements for all scans submitted in court is critical for the successful introduction of the scan as evidence.
5. Eye Safety – The Leica PS40 utilizes a laser which does not require eye protection in and around the area the device is scanning. There is no need for laser safety goggles or erection of safety barriers to protect public. This is critical for outdoor crime scenes where public and officer safety is an issue.
6. Detailed Scans within Scans - Leica is the sole manufacturer which can complete a detailed scan within the existing scan to document a scene in higher definition. No other manufacturer can complete a scan within a scan, as a detailed scan.
7. Ability to Work in Extreme Temperatures – The Leica PS40 is the only device with working specifications between -4 to 122 degrees Fahrenheit.
8. IP (Ingress Protection) Rating – The Leica ScanStation PS40 has an IP rating of 54 for dust and humidity. The PS40 is the only device that is able to work in rain and other inclement weather.
9. Software and Training – The current computer software used to perform crime scene and traffic collision scene diagramming is Cyclone. Current PD staff uses this special software to perform diagram renderings and scene measurements. The software update of Cyclone Register, Publisher, and Survey in this proposed purchase is necessary and specific to the current software used by PD staff.
10. High Resolution Photography / HDR and High Data Point Scan Rate – The Leica PS40 is the only 3D scanner to integrate a high resolution camera (400 megapixels) with HDR photography technology during a scan. The Leica PS40 is the only 3D scanner with a scan rate of up to 1,000,000 data points per second.
11. Interoperability / Mutual Aid – The Alameda County Sheriff's Office, California Highway Patrol, and Oakland PD use the Leica ScanStation PS40. The Contra Costa County Sheriff's Office plans to upgrade their Leica C10 3D scanner to the same platform Concord PD is proposing. In the event of a mass causality event, multiple crimes scenes, and/or mechanical failure, Concord Police personnel will be trained on the same platform as these agencies. Their training and equipment will allow interoperability in the event of mutual aid requests.

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Procurement Process

Pursuant to Concord Municipal Code Section 3.10.080 (Waiver of bidding regulations), bidding regulations may be waived by the Purchasing Officer, except as otherwise provided by law, when there is only one documented and verified vendor for the product or service. Through the Purchasing Officer, the Concord Police Department seeks a sole source purchase of the Leica ScanStation PS40.

This purchase would be made through Precision Survey Supply as they are the only forensic dealer in the United States for the Leica ScanStation PS40 3D scanner with this comprehensive product package. Precision Survey Supply is the only dealer that can provide the equipment, software, training, complete 24 hours a day/7 days a week technical and software support, and one-call integrated hardware, software, and training assistance.

Financial Impact

Sufficient funds exist in the Police Department Operating Budget to support the recommended equipment upgrade to the Leica ScanStation PS40 and required computer software. There is no impact on the existing budget or a burden on the Ten-Year financial plan. Subsequent replacement of the Leica 3D Scanner and annual maintenance costs will be maintained through the PD's replacement fund and normal operating costs.

Public Contact

The City Council Agenda was posted.

Attachments

1. Quote from Precision Survey Supply, LLC
2. Sole Source Letter for Lecia Geosystems Forensic ScanStation

Quote

Precision Survey Supply, LLC
 8628 Utica Avenue, Suite 800
 Rancho Cucamonga, CA 91730

Phone # 909-931-4040 alex@precisionsurveysupply.com
 Fax # 909-931-4009 www.precisionsurveysupply.com

Date	Quote #
4/29/2016	22097

Name / Address
Concord Police Dept Bill Roche 1350 Galindo St Concorde, CA 94520

				Project
Item	Qty	Description	Unit Price	Total
6010383	1	Leica ScanStation PS40 x1 827494 Leica ScanStation P40 Laser Scanner, x1 769625 GVP645, ScanStation C10/C5 transport container, x1 777970 GDF323 Tribrach PRO w/o optical plummet, black, 93975 GEB242, Large Li-Ion Battery 14.8V/5.8Ah for MS/TS/TM50 instruments (4), x1 799185 GKL311 Single Charger Prof 3000. Charger for one Li-Ion battery including AC/DC adaptor and cigarette lighter cable, x1 766567 GEV228, ScanStation C10/P20 data cable, 2.5m, standard ethernet jack to Lemo (8pin). Connects ScanStation C10/P20 with computer, x1 772829 GHM008, Scanner height meter, x1 722045 GHT196 Distance holder for height meter., x1 827778 Leica ScanStation P30/40 Quick Guide, x1 755609 Software CD - Cyclone/CloudWorx, x1 6009442 1 Year ScanStation P30/40 CCP Basic, x1 829115 Leica ScanStation P30/40 System USB Stick, x1 8245739 Leica ScanStation PS40 Public Safety Label	123,915.00	123,915.00T
Thank you for your business.			Subtotal	
			Sales Tax (9.0%)	
			Total	

Quote

Precision Survey Supply, LLC
8628 Utica Avenue, Suite 800
Rancho Cucamonga, CA 91730

Phone # 909-931-4040 alex@precisionsurveysupply.com
 Fax # 909-931-4009 www.precisionsurveysupply.com

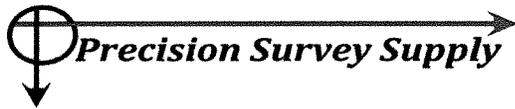
Date	Quote #
4/29/2016	22097

Name / Address
Concord Police Dept Bill Roche 1350 Galindo St Concorde, CA 94520

Project

Item	Qty	Description	Unit Price	Total
6009451	1	1st yr ScanStation P30/P40 CCP Silver consisting of:	5,000.00	5,000.00T
6007859	1	1 yr Hardware Maintenance, 1 yr SW Maintenance, 1 yr Customer Support CCP Basic for Cyclone REGISTER (1 year)	1,500.00	1,500.00T
6007856	1	- Technical Support: Access to software support hotline - Software maintenance: Includes all software updates CCP for Leica Cyclone - PUBLISHER (1 yr)	1,000.00	1,000.00T
6007868	1	Includes: - Technical support by telephone and/or email - Software module updates CCP for Leica Cyclone - SURVEY (1 yr)	1,500.00	1,500.00T
841807	1	Includes: - Technical support by telephone and/or email - Software module updates iStar Fusion	8,500.00	8,500.00T
PSS32234		Customized Pelicase External 12V Battery and Charger Leica Spacer Rod (C10/Pxx) Tribrach Puck 12 month standard hardware warranty C10 ScanStation Trade In Value	-29,835.00	-29,835.00

Thank you for your business.		Subtotal	\$111,580.00
		Sales Tax (9.0%)	\$10,042.20
		Total	\$121,622.20



8628 Utica St, Suite 800 – Rancho Cucamonga, CA. 91786
 909-931-4040 Main / 909-931-4009 Fax / 888-275-3054 Toll Free
 www.precisionsurveysupply.com

May 6, 2016

Concord Police Department
 Bill Roche
 1350 Galindo St
 Concord, CA 94520

Re: Sole Source Letter for Leica Geosystems Forensic ScanStation

To Whom It May Concern:

The ScanStation Forensic P40 3-D laser scanner system manufactured by Leica Geosystems is the only 3-D laser scanning system made which combines all of the features and support infrastructure required to support the investigation mission of the Concord Police Department.

The unique features combined in the system include:

- Safety: No need for laser safety goggles or erection of safety barriers to protect public.
- Scanner: Environmentally enclosed optics with a dust/humidity rating of IP54.
- Scanner: 3-D positional accuracy of a single measurement ≤ 6 mm.
- Scanner: Integrated color HDR digital camera with zoom and real-time streaming.
- Scanner: On-board ability to view target scans in 3-D and to do detailed scans of selected areas.
- Scanner: Ability to multiple Detail Scans within a scan in play list format.
- Scanner: Able to support GPS antenna or survey prism attached to top of scanner.
- Scanner: Hot Swappable battery technology.
- Key accessory: NIST traceable artifact for confirming measurement accuracy.
- Integration: All hardware and software from one source Precision Survey Supply as representative for Leica Geosystems.
- Training: Crime Scene Specific Training and course materials.
- Training: Accident Reconstruction Specific Training and course materials.
- Support: One-call support for all products—scanner, software, and training.
- Support: True 24/7 Precision Survey Supply Technical Support.
- Support: Precision Survey Supply Emergency Response Support.
- Precedent: Trial exhibits created from Leica ScanStation data have a 100% acceptance in U.S. courts.
- Precedent: The Leica ScanStation has satisfied the Daubert standard in a U.S. court.
- Precedent: California Decision where Leica Scan Station Data as scientific evidence in Forensics.
- Validation: Leica scanners have been validated as accurate for bullet path reconstruction.
- Validation: Leica scanners have been court accepted.

Precision Survey Supply holds the sole source for this opportunity and distribution which combines the unique features within the package listed and built specifically for the Concord Police Department. Precision Survey Supply is the sole distributor with the Leica Forensic Scanner for the US.

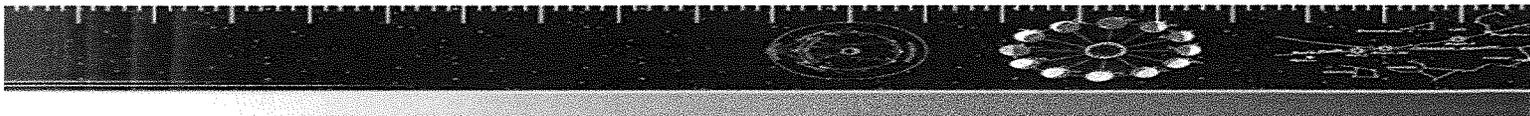
The Leica Geosystems 3D Forensic Laser Scanner is unique from any other manufacturer and can only be combined by Precision Survey Supply:

- Leica is the sole manufacture that publishes their accuracy measurements and provides a diagnostic report for court. Other manufactures do NOT publish their accuracy or measurement of uncertainty.
- Leica has earned the rating of IP54, which means the scanner can be used in increment weather and rain. Other manufactures cannot operate in rain or increment weather.

- Leica is the sole manufacture that has passed the standard of Daubert in federal court under scrutiny. Leica is sole manufacture with a court decision regarding the data deemed as Scientific Evidence.
- Leica is the sole manufacture which can complete a detailed scan within the existing scan to document a crime scene in higher definition. No other manufacture can complete a scan within a scan, as a detailed scan.
- Leica is the sole manufacture where the training has been certified and accredited by IAI (International Association of Identification). No other manufacture has had their training accredited by a governing body.
- Leica is the sole manufacture where the tools and software have been validated and passed the scrutiny of bullet path trajectory for court. No other manufacture has a validation of bullet path trajectory.
- Leica is the sole manufacture which incorporates NIST Targets for laser scanning.
- Precision Survey Supply is the sole distributors which provide 24/7 technical support. Other vendors do not offer 24/7 support for free.
- Precision Survey Supply is the sole distributor which provides the Leica 3D Forensic Laser Scanner in the configuration, service, training, and support as specifically built for Concord Police Department as a one total solution. No other company provides a single source solution for equipment, software, forensic based training, technical support, and service.

This document shall serve as a preliminary executive summary for analysis between the Leica C10 and the P40 3D Laser Scan Station

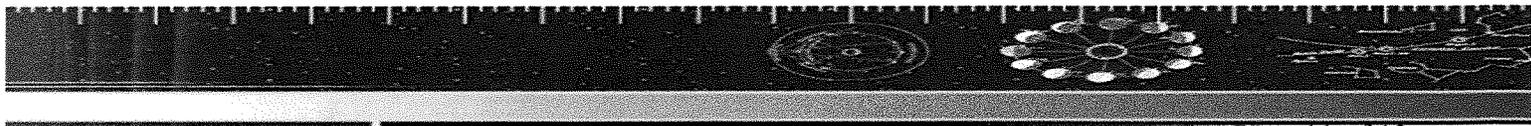
Leica C10	Leica P40
-Time of Flight (TOF) Technology	-TOF Enhanced Waveform Technology
-50,000 Points Per Second	-1 Million Points Per Second
-Integrated Camera 4MP at 17x17 1920x1920	-Integrated HDR Camera 700 MP Dome
-Not I-Star Capable	- I-Star Fusion HDR
-No Low Light Capability	-Low Light HDR
-No Mix Pixel Filtration	-Mix Pixel Filtration
-No Tone Mapping Photography	-Automatic Tone Mapping
-Resolution Settings are set to LOW, MED, HIGH, HIGHEST	-Resolution settings are customizable dependent upon scene size and quality



- | | |
|------------------------------------|--|
| -Detailed Scans one at a time | -Multiple in list form |
| -Direct Download of Data via cable | -Complete integration of data via Cable |
| -No Gigabyte Switch | -Integrated Gigabyte Switch LAN |
| -80 GB Solid State Drive | -256 GB Solid State Drive |
| -External Wireless Router required | -Integrated WiFi Router |
| -External 2.0 USB | -External 3.0 USB |
| -Set Main Menu Interface | -Customizable Main Menu Interface to
One button start |

SCAN STATION TIMES

Leica C10	Leica P40
Scan Speeds:	
Low Resolution: 1:43 Min:Sec	20 Seconds
Photography: 5:53 Min:Sec	1:30 Seconds
Total Scan time with Photos	
Approximately 8 Minutes	Less than 2 Minutes
Medium Resolution: 6:49 Min:Sec	33 Seconds or 58 Seconds
Photography: 5:53 Min:Sec	1:30 Seconds
Approximately 13 Minutes	Less than 3 Minutes





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909-931-4040 Main / 909-931-4009 Fax / 888-275-3054 Toll Free
www.precisionsurveysupply.com

High Resolution: 27:49 Min/Sec 1:30 Min:Sec

Photography: 5:53 Min:Sec 1:30 Seconds

Approximately 33 Minutes 3 Minutes

Highest Resolution: 2 Hours 49 Mins 3:30 Min:Sec

Photography: 5:53 Min:Sec 1:30 Seconds

Approximately 2 Hours 56 Minutes (ALMOST 3 HOURS) 5 Minutes

These times represent each Scan Position. Factor these time decreases across a forensic scene which requires 4 to 8 scans. Overtime costs can be reduced up to 8 hours per investigator per scene using the highest resolution settings and up to 4 hours using high / medium resolution settings. Decreasing the overtime costs by implementing the P Series Scanner is a viable solution for Law Enforcement. At the same time, drastically increasing the quality of the data points collected due to the speed and customizable capture of resolution of data. Pxx Series implements a low light photography solution with the integrated HDR.

Please contact me if you have any additional questions.

Sam El-Said
General Manager
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Precision Survey Supply
909-931-4040 Office
909-241-7422 Cell

