



# City of Grand Island

Tuesday, May 22, 2018

Council Session

## Item G-11

**#2018-144 - Approving Government Services Administration (GSA) Contract Purchase for One (1) Global Positioning System for the Engineering Division of the Public Works Department**

Staff Contact: John Collins, P.E. - Public Works Director

# **Council Agenda Memo**

**From:** Keith Kurz PE, Assistant Public Works Director

**Meeting:** May 22, 2018

**Subject:** Approving Government Services Administration (GSA) Contract Purchase for One (1) Global Positioning System for the Engineering Division of the Public Works Department

**Presenter(s):** John Collins PE, Public Works Director

## **Background**

The Engineering Division of the Public Works Department budgeted for a Global Positioning System (GPS) to be used in daily operations of surveying activities for City projects.

## **Discussion**

The GPS system will continue to enable staff to gather accurate data of City infrastructure location. This system will result in increased productivity and consistent data by reducing the amount of equipment and labor required to collect the same amount of data as conventional practices, and allow multiple crews to work simultaneously. The collection of very accurate satellite shots (latitude/longitude elevation) on City infrastructure will continue to allow improvements to the City as a whole. Trimble equipment is the standard used by the City Utility Department and Engineering Division of the Public Works Department, as well as Hall County. This system will integrate well with the existing technology being used by our partners.

The Public Works Engineering Division currently uses an R8 unit, which was purchased in 2008 and continues to be used in daily field work. Since the purchase of this unit improvements have been made, resulting in quicker and more accurate data collection, as well as the ability to track more satellites than just inside the US. The Public Works Engineering Division has increased from 2 to 4 engineering technicians using this equipment, thus having a second unit for daily use will improve efficiency and allow for continued work should the current unit fail and require repair/replacement.

	<b><i>R8 Unit (current)</i></b>	<b><i>R10 Unit (new)</i></b>
RTK Horizontal	8mm	10mm
RTK Vertical	15mm	20mm
Channels	72	440

Seiler Instrument & Manufacturing Company, Inc. of Omaha, Nebraska is the current State of Nebraska contract holder (#13693 OC) and has quoted this purchase at a total amount of \$22,950.00.

### **Alternatives**

It appears that the Council has the following alternatives concerning the issue at hand. The Council may:

1. Move to approve
2. Refer the issue to a Committee
3. Postpone the issue to future date
4. Take no action on the issue

### **Recommendation**

City Administration recommends that the Council approve the State Bid Award to Seiler Instrument & Manufacturing Company, Inc. of Omaha, Nebraska in the amount of \$22,950.00 for one (1) Global Positioning System (GPS) for the Engineering Division of the Public Works Department.

### **Sample Motion**

Motion to approve the resolution.

RESOLUTION 2018-144

WHEREAS, the Engineering Division of the Public Works Department for the City of Grand Island, budgeted for a Global Positioning System (GPS); and

WHEREAS, said system, can be obtained from the State Contract holder; and

WHEREAS, purchasing such system from the State Contract holder meets all statutory bidding requirements; and

WHEREAS, the funding for such system is provided in the 2017/2018 budget.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that the purchase of one (1) Global Positioning System in the amount of \$22,950.00 from the State Contract holder, Seiler Instrument & Manufacturing Company, Inc. of Omaha, Nebraska, is hereby approved.

- - -

Adopted by the City Council of the City of Grand Island, Nebraska, May 22, 2018.

\_\_\_\_\_  
Jeremy L. Jensen, Mayor

Attest:

\_\_\_\_\_  
Norma Hernandez, City Clerk Pro - Tem

Approved as to Form	▣ _____
May 22, 2018	▣ City Attorney



# Trimble R10

## GNSS SYSTEM

### A NEW LEVEL OF PRODUCTIVITY

Collect more accurate data faster and easier – no matter what the job or the environment, with the Trimble® R10 GNSS System. Built with powerful technologies integrated into a sleek design, this unique system provides Surveyors with a powerful way to increase productivity in every job, every day.

#### Trimble HD-GNSS Processing Engine

The advanced Trimble HD-GNSS processing engine provides markedly reduced convergence times as well as high position and precision reliability while reducing measurement occupation time. Transcending traditional fixed/float techniques, it provides a more accurate assessment of error estimates than traditional GNSS technology.

#### Trimble SurePoint

With Trimble SurePoint™ technology, advanced sensors onboard the Trimble R10 continuously stream pole tilt and heading information that is used to display an electronic level bubble on the Trimble controller screen, allowing surveyors to maintain focus where it matters most. Full tilt compensation allows the survey pole to be tilted up to 15° when measuring, allowing the Trimble R10 to capture points that would be inaccessible to other GNSS surveying systems.

#### Trimble 360 Receiver

Powerful Trimble 360 receiver technology in the Trimble R10 supports signals from all existing and planned GNSS constellations and augmentation systems. With two integrated Trimble Maxwell™ 6 chips, the Trimble R10 offers 440 GNSS channels.

#### Trimble CenterPoint RTX

Trimble CenterPoint® RTX delivers RTK level precision anywhere in the world without the use of a local base station or VRS network.

Survey using satellite delivered, CenterPoint RTX corrections in areas where terrestrial based corrections are not available. When surveying over a great distance in a remote area, such as a pipeline or utility right of way, CenterPoint RTX eliminates the need to continuously move base stations or maintain connection to a cellular network.

#### Trimble xFill

Leveraging a worldwide network of Trimble GNSS reference stations and satellite datalinks, Trimble xFill® seamlessly fills in for gaps in your RTK or VRS connection stream. Maintain centimeter level accuracy beyond five minutes with a CenterPoint RTX subscription.

#### Smart, Versatile

A smart lithium-ion battery inside the Trimble R10 system delivers extended battery life and more reliable power. A built-in LED battery status indicator allows the user to quickly check remaining battery life.

The Trimble R10 system provides a number of communications options to support any workflow. Receive VRS corrections and connect to the Internet from the field with the integrated cellular modem. Using Wi-Fi, easily connect to the Trimble R10 system using a laptop or smartphone to configure the receiver without a Trimble controller.

#### The Complete Solution

Bring the power and speed of the Trimble R10 system together with trusted Trimble software solutions, including Trimble Access™ and Trimble Business Center.

Trimble Access field software provides specialized and customized workflows to make surveying tasks quicker and easier while enabling teams to communicate vital information between field and office in real time. Back in the office, users can seamlessly process data with Trimble Business Center software.

## Key Features

- ▶ Cutting-edge Trimble HD-GNSS processing engine
- ▶ Precise position capture and full tilt compensation with Trimble SurePoint technology
- ▶ Trimble CenterPoint RTX provides RTK level precision anywhere without the need for a base station or VRS network
- ▶ Trimble xFill technology provides centimeter-level positioning during connection outages
- ▶ Advanced satellite tracking with Trimble 360 receiver technology
- ▶ Sleek ergonomic design for easier handling



PERFORMANCE SPECIFICATIONS		
MEASUREMENTS		
	Measuring points sooner and faster with Trimble HD-GNSS technology	
	Increased measurement productivity and traceability with Trimble SurePoint electronic tilt compensation	
	Worldwide centimeter level positioning using Trimble CenterPoint RTX satellite delivered corrections	
	Reduced downtime due to loss of radio signal with Trimble xFill technology	
	Advanced Trimble Maxwell 6 Custom Survey GNSS chips with 440 channels	
	Future-proof your investment with Trimble 360 GNSS tracking	
	Satellite signals tracked simultaneously:	GPS: L1C/A, L1C, L2C, L2E, L5 GLONASS: L1C/A, L1P, L2C/A, L2P, L3 <sup>1</sup> SBAS: L1C/A, L5 (For SBAS satellites that support L5) Galileo: E1, E5A, E5B, E5 AltBOC BeiDou (COMPASS): B1, B2, B3 <sup>2</sup>
	CenterPoint RTX, OmniSTAR® HP, XP, G2, VBS positioning	
	QZSS, WAAS, EGNOS, GAGAN, MSAS	
	Positioning Rates	1 Hz, 2 Hz, 5 Hz, 10 Hz, and 20 Hz
POSITIONING PERFORMANCE <sup>3</sup>		
CODE DIFFERENTIAL GNSS POSITIONING		
	Horizontal	0.25 m + 1 ppm RMS
	Vertical	0.50 m + 1 ppm RMS
	SBAS differential positioning accuracy <sup>4</sup>	typically <5 m 3DRMS
STATIC GNSS SURVEYING		
High-Precision Static		
	Horizontal	3 mm + 0.1 ppm RMS
	Vertical	3.5 mm + 0.4 ppm RMS
STATIC AND FAST STATIC		
	Horizontal	3 mm + 0.5 ppm RMS
	Vertical	5 mm + 0.5 ppm RMS
REAL TIME KINEMATIC SURVEYING		
Single Baseline <30 km		
	Horizontal	8 mm + 1 ppm RMS
	Vertical	15 mm + 1 ppm RMS
Network RTK <sup>5</sup>		
	Horizontal	8 mm + 0.5 ppm RMS
	Vertical	15 mm + 0.5 ppm RMS
RTK start-up time for specified precisions <sup>6</sup>		2 to 8 seconds
TRIMBLE RTX (SATELLITE AND CELLULAR/INTERNET (IP))		
CenterPoint RTX		
	Horizontal	4 cm RMS
	Vertical	9 cm RMS
	RTX convergence time for specific precisions <sup>7</sup>	< 30 min (typical)
	RTX QuickStart convergence time for specific precisions <sup>7</sup>	< 5 min (typical)
	Operating range (inland)	Nearly worldwide
CenterPoint RTX Fast		
	Horizontal	2 cm RMS
	Vertical	5 cm RMS
	RTX convergence time for specific precisions <sup>7</sup>	1-5 min (typical)
	Operating range (inland)	In select regions
TRIMBLE XFILL <sup>8</sup>		
	Horizontal	RTK <sup>9</sup> + 10 mm/minute RMS
	Vertical	RTK <sup>9</sup> + 20 mm/minute RMS

HARDWARE		
PHYSICAL		
Dimensions (W×H)	11.9 cm x 13.6 cm (4.6 in x 5.4 in)	
Weight	1.12 kg (2.49 lb) with internal battery, internal radio with UHF antenna, 3.57 kg (7.86 lb) items above plus range pole, controller & bracket	
Temperature <sup>10</sup>		
	Operating	–40° C to +65° C (–40° F to +149° F)
	Storage	–40° C to +75° C (–40° F to +167° F)
Humidity	100%, condensing	
Ingress Protection	IP67 dustproof, protected from temporary immersion to depth of 1 m (3.28 ft)	
Shock and vibration (Tested and meets the following environmental standards)		
	Shock	Non-operating: Designed to survive a 2 m (6.6 ft) pole drop onto concrete. Operating: to 40 G, 10 msec, sawtooth
	Vibration	MIL-STD-810F, FIG.514.5C-1
ELECTRICAL		
	Power 11 to 24 V DC external power input with over-voltage protection on Port 1 and Port 2 (7-pin Lemo)	
	Rechargeable, removable 7.4 V, 3.7 Ah Lithium-ion smart battery with LED status indicators	
	Power consumption is 5.1 W in RTK rover mode with internal radio <sup>11</sup>	
Operating times on internal battery <sup>12</sup>		
	450 MHz receive only option	5.5 hours
	450 MHz receive/transmit option (0.5 W)	4.5 hours
	450 MHz receive/transmit option (2.0 W)	3.7 hours
	Cellular receive option	5.0 hours
COMMUNICATIONS AND DATA STORAGE		
	Serial	3-wire serial (7-pin Lemo)
	USB v2.0	Supports data download and high speed communications
	Radio Modem	Fully Integrated, sealed 450 MHz wide band receiver/transmitter with frequency range of 403 MHz to 473 MHz, support of Trimble, Pacific Crest, and SATEL radio protocols: Transmit power: 2 W Range: 3–5 km typical / 10 km optimal <sup>13</sup>
	Cellular	Integrated, 3.5 G modem, HSDPA 7.2 Mbps (download), GPRS multi-slot class 12, EDGE multi-slot class 12, UMTS/HSDPA (WCDMA/FDD) 850/1900/2100MHz, Quad-band EGSM 850/900/1800/1900 MHz, GSM CSD, 3GPP LTE
	Bluetooth	Fully integrated, fully sealed 2.4 GHz communications port (Bluetooth®) <sup>14</sup>
	Wi-Fi	802.11 b,g, access point and client mode, WPA/ WPA2/WEP64/WEP128 encryption
	USB v2.0	Supports data download and high speed communications
	External communication devices for corrections supported on	Serial, USB, TCP/IP and Bluetooth ports
	Data storage	4 GB internal memory; over seven years of raw observables (approx. 1.4 MB /day), based on recording every 15 seconds from an average of 14 satellites
	CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 input and output	
	24 NMEA outputs, GSOF, RT17 and RT27 outputs	

COMMUNICATIONS AND DATA STORAGE	
WEBUI	Offers simple configuration, operation, status, and data transfer Accessible via Wi-Fi, Serial, USB, and Bluetooth
SUPPORTED TRIMBLE CONTROLLERS	Trimble TSC3, Trimble Slate, Trimble CU, Trimble Tablet Rugged PC
CERTIFICATIONS	
	IEC 60950-1 (Electrical Safety); FCC OET Bulletin 65 (RF Exposure Safety); FCC Part 15.105 (Class B), Part 15.247, Part 90; PTCRB (AT&T); Bluetooth SIG; WFA IC ES-003 (Class B); Radio Equipment Directive 2014/53/EU, RoHS, WEEE; Australia & New Zealand RCM; Japan Radio and Telecom MIC

- 1 There is no public GLONASS L3 CDMA ICD. The current capability in the receivers is based on publicly available information. As such, Trimble cannot guarantee that these receivers will be fully compatible with a future generation of GLONASS satellites or signals.
- 2 Current BeiDou capability is based on publicly available information. The hardware of this product is designed for BeiDou B3 compatibility (trial version) and its firmware will be enhanced, where possible, to fully support such new signals as soon as the officially published signal interface control documentation (ICD) becomes available. As such, Trimble cannot guarantee full compatibility with future generations of BeiDou satellites or signals.
- 3 Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GNSS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. Baselines longer than 30 km require precise ephemeris and occupations up to 24 hours may be required to achieve the high precision static specification.
- 4 Depends on WAAS/EGNOS system performance.
- 5 Network RTK PPM values are referenced to the closest physical base station.
- 6 May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality.
- 7 Receiver convergence time varies based on GNSS constellation health, level of multipath, and proximity to obstructions such as large trees and buildings. Convergence times decrease significantly when using a "RTX Quickstart" on a previously surveyed point or a known survey control point.
- 8 Precisions are dependent on GNSS satellite availability. xFill positioning without a RTX subscription ends after 5 minutes of radio downtime. xFill positioning with a RTX subscription will continue beyond 5 minutes providing RTX has converged, with typical precisions not exceeding 6 cm horizontal, 14 cm vertical. xFill is not available in all regions, check with your local sales representative for more information.
- 9 RTK refers to the last reported precision before the correction source was lost and xFill started.
- 10 Receiver will operate normally to -40° C, internal batteries are rated to -20° C.
- 11 Tracking GPS, GLONASS and SBAS satellites.
- 12 Varies with temperature and wireless data rate. When using a receiver and internal radio in the transmit mode, it is recommended that an external 6 Ah or higher battery is used.
- 13 Varies with terrain and operating conditions.
- 14 Bluetooth type approvals are country specific.

Specifications subject to change without notice.



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## Sales Quotation

City of Grand Island, NE  
Milt Loeb  
P.O. Box 1968  
Grand Island, NE 68802-1968

**Date Issued:** 04/25/2018  
**Quote Expiration:** 05/25/2018  
**Quote Number:** 00040519

Qty	Part Number	Product Description	Unit Price	Subtotal
1.00	R10-001-60	Trimble R10, Model 60 Includes: Trimble R10 GNSS Receiver UHF Radio Antenna with SMA Connector-(Trimble R10 models with UHF / VHF radio only) Rechargeable Battery (2x) Dual Battery Charger with Battery Slot Inserts and int. Power Supply Quick Release Adapter USB Office Data and Power Y-Cable-(7P Lemo to USB-A Male and Power) USB Field Data Cable (7P Lemo to USB-A Female) Quick Start Guide, Trimble R10 System Poster, Warranty Activation Card, Trimble WEEE Card Trimble R10 Transport Case	\$22,950.00	\$22,950.00
<b>Note:</b>				
<b><u>This is not an invoice:</u></b> Applicable sales tax will apply			<b>Total</b>	<b>\$22,950.00</b>

**Please contact us:**

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Cell: 402-651-9735  
khall@seilerinst.com

Your signature below acknowledges acceptance of terms and conditions of this quote: 00040519. Please sign and return via fax to: 402-896-0197 or return via email to: khall@seilerinst.com

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

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REV 02/09/2018



## Sales Quotation

**Terms: Net 30 Days**

Net 30 upon approved credit. Major credit cards accepted and financing options available.

"This sale, service, or rental is exclusively subject to and governed by the Terms and Conditions of Sale referred to in the related quotation and at <https://www.seilergeo.com/general-terms-and-conditions/> which are hereby incorporated by reference."

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