

# Idaho State University (ISU) Request for Information (RFI)

## Geo-positioning Cooperative Real-time GNSS Network

**PURPOSE AND SCOPE:** This is not an announcement of a Solicitation; it is only a Request for Information (hereafter referenced as RFI), and a request for proposals may or may not result from it. The GIS Training and Research Center (GIS TReC) at Idaho State University (hereafter referenced as ISU), Pocatello, Idaho seeks information and industry capability insights for a “Geo-positioning Cooperative Real-time GNSS Network.” The primary objective of this RFI is to explore approaches to providing a cost-efficient, dependable, long-term source of real-time differential correction for location and positioning across Idaho and Montana. In addition, these approaches will need to provide rigorous integrity monitoring to substantiate absolute accuracy statements and improve control point development and monitoring in both Idaho and Montana. Approaches to this solution are not limited or restricted in any way, but must demonstrate the performance criteria described below. This RFI seeks to identify potential sustainable solution sources from any capable entity including, but not limited to, commercial businesses, both domestic and foreign. ISU will not accept unsolicited proposals related to this announcement.

**BACKGROUND:** ISU’s GIS TReC is a university-wide facility dedicated toward enhancing the geospatial infrastructure and capabilities of Idaho State University and the region. As geospatial technologies continue to advance in sophistication and accuracy, a concomitant need arises to improve positioning and navigation in real-time. Current real-time positional accuracy of  $\pm 0.05$  m is frequently required to support both research and education efforts. While existing base stations offer one solution to this need, they do not provide the necessary level of integrity monitoring or the broad spatial availability of a real-time network (RTN).

Since 2003, the GIS TReC has been working with ISU’s Geomatics Department and Idaho Transportation Department (ITD) toward the proliferation of high accuracy base stations across east Idaho which would ultimately form the foundation of the anticipated RTN. In 2010, ISU GIS Director Keith T. Weber was asked to chair the Idaho Geodetic Control Technical Working Group (GC-TWG) charged with improving positional control throughout the state. Following this in 2011, PI Weber and a multi-state team of investigators was awarded a National Spatial Data Infrastructure (NSDI) CAP grant to develop a business plan for the development and sustainability of a multi-state control point database and RTN. This business plan was submitted to the USGS FGDC and approved in February 2012 and is available for review at <http://giscenter.isu.edu/research/Techpg/capGC/pdf/GeoCoopBP-FINAL.pdf>. This RFI is the next step toward fulfillment of the RTN concept.

### GNSS RTN DATA PARAMETERS

This RFI seeks cost-efficient approaches to providing a dependable, long-term source of real-time differential correction for location and positioning across Idaho and Montana. ISU prefers RFI responses that meet all of the parameters listed below. However, alternatives that do not meet all data and performance criteria will be assessed.

**BASIC FUNCTION:** Network modeled station corrections must be provided to end-users in the field as a web service. In addition, single station solutions should be available to the end-user by offering a broadcast mode to automatically apply the closest reference station to the field user and allow the user to select which station to use in single base mode.

**COMMUNICATION PROTOCOLS:** The RTN software must be able to simultaneously stream the following international, industry standard correction protocols: RTCM 2.3, RTCM 3.1, CMR, and CMR+.

Binex and RT-IGS formats would augment this list favorably as well. The RTN system must support Rinex 2.11 and Rinex 3.0 formats for data exchange and be capable of using current NTRIP protocols for the data streams.

**CLIENT FEATURES:** The selected RTN software must provide the following minimum features to clients/end-users. The RTN software must have the ability for users to:

1. Set epoch rate
2. Visit a web site from a desktop computer to download reference station data for post-processing or project planning purposes.

**END-USER DATA:** Processing results and end-user information including subscription details must be stored in a relational database such as Microsoft SQL Server or IBM DB2.

**HOST/SERVER FEATURES:** The selected RTN software must provide the following minimum features to the host and/or users interacting with the service website. The RTN software must provide the ability to:

1. Filter baseline processing to catch outlier data and reduce uncertainty.
2. Set different elevation masks for each base station.
3. Produce network adjusted solutions at the same rate at which RTK baselines are computed.
4. Produce network adjusted solutions in excess of 10 per second.
5. Apply redundant connection protocols.
6. View network adjusted results up to two years back in time.
7. Automatically disseminate reference station data via a web interface without network operator intervention.
8. Export chart/graphs to jpeg or PDF file format.
9. Export chart/graph data to html and MS Excel file format.

**QUALITY ASSURANCE AND SERVICE LEVEL CONDITIONS:** The selected RTN software will be configurable to automatically send the operator(s) an e-mail when any of the following conditions exist:

1. No data from a base station has been received after a temporal threshold has been exceeded such as one minute.
2. Base station receiver position has moved beyond an operator configurable spatial tolerance.
3. Redundant connection is in use.
4. Server/local disk space is low (operator configurable threshold).
5. When a base station fails, the RTN software must be able to connect to that station at a later date and download files missed during the off-line period.

In addition, the RTN software must be able to support end-user/operator project planning and troubleshooting by calculating total atmospheric electron content and integrated precipitable water vapor using GNSS base station data for improved QA/QC.

**DATA LATENCY:** Post-processing must be enabled for disconnected end-user and these data available within one hour of collection. In addition, the selected RTN software must be able to provide data in near real time with no more than 1 second latency

**TEMPORAL RESOLUTION:** Data must be collected and stored 24-hours per day, 365 days per year.

**DATA ARCHIVING, PRODUCTION, and DISTRIBUTION:** All data shall be archived natively by the RTN software for long-term (two year) retrieval and processing.

**DATA SHARING:** The RTN software must have the ability for operating stations in neighboring states (including those participating in another RTN) to connect to this network.

## **INSTRUCTIONS FOR RESPONDENTS**

ISU herein requests information from organizations interested in providing RTN server software. Although the USGS would prefer that responses meet the criteria set forth above, alternatives that do not fully meet all the data and performance criteria will be assessed. Please provide a response that fully describes potential RTN capabilities that are operational on or before July 1<sup>st</sup>, 2012. ISU shall treat each response as proprietary in accordance with any page markings applied to documents by the responder. Responders are strongly cautioned against blanket exclusions from public disclosure, which may present ISU with difficulty in making any future case for procurement. ISU is only interested in responses from organizations willing and able to deliver RTN software that meets or nearly meets the criteria described above. ISU requests the following information:

1. The identity and nature of the responding organization (e.g., private or public, domestic or international, profit or non-profit) and identity and nature of any collaborating organizations, and the relationship between them;
2. A description and characterization of the GNSS RTN software solution including, but not limited to the criteria and parameters described above;
3. Identification and characterization of the data and/or performance criteria that do not meet the parameters described above, if any;
4. The earliest possible date to provide delivery, the implementation schedule and assumptions regarding the period of delivery, a reliability estimate on software delivery and deployment, and the mechanism for data delivery (e.g. Internet download, DVD, etc.) and deployment assistance (e.g., on-line help documentation, telephone technical support, on-site technical assistance/technology transfer, etc.);

Questions are due no later than 5:00 p.m., April 25, 2012. Questions may be sent via electronic mail to Austin Carter at [cartaust@isu.edu](mailto:cartaust@isu.edu).

**RESPONSE DUE DATE:** Descriptions are due no later than 5:00 p.m. Mountain Time, on May 11, 2012. These may be emailed or mailed to Austin R. Carter at [cartaust@isu.edu](mailto:cartaust@isu.edu), or via U.S. mail to:

Idaho State University, Attn: Austin R. Carter  
921 South 8<sup>th</sup> Street – Stop 8110  
Pocatello, Idaho 83209.

Please be advised that it is the vendor's responsibility to assure ISU receives its submission on or before the specified due date at the specified email address, or via U.S. mail, Fed-Ex, or UPS.

(If providing a printed response, it is requested that an electronic copy also be provided in MS WORD format)

**Format of the Response:** ISU expects that a response of no more than 10 pages would be sufficient to address all the information requested. ISU shall treat each response as proprietary in accordance with any page markings applied to documents by the responder. Responders are strongly cautioned against blanket exclusions from public disclosure, which may present ISU with difficulty in making any future case for procurement. Submissions may be subject to review by experts outside ISU.

**DISCLAIMER:** This RFI is issued solely for information and planning purposes and does not constitute a solicitation. Responses to this notice are not offers and cannot be accepted by ISU to form a binding contract. No reimbursement will be made for any costs associated with providing information in response to this RFI or any follow-up information requests. Respondents needing confidential treatment for any proprietary information they furnish must comply with ISU's confidential treatment regulations. Responses to this RFI will not be returned. Respondents will not be notified of the result of the review.