» **LOCATION-BASED SERVICES** / WIRELESS

Tests Show Tech Can Meet FCC Indoor 911 Accuracy

An independent study of indoor tests of a hybrid wireless location technology was submitted in June to the U.S. Federal Communications Commission (FCC) by wireless location engineering firm TechnoCom. The study demonstrates that existing technologies can satisfy location requirements within the timeframe proposed by the FCC in its draft rule on indoor 911 accuracy for wireless calls, according to True Position, which commissioned TechnoCom to perform the testing.

Wireless carriers have challenged the technical feasibility of the proposed rule, claiming that existing technologies cannot satisfy the proposed accuracy requirements, with a spokesperson for the industry trade association claiming the rule represented "aspirational target setting."

The results filed by TechnoCom disprove those assertions, showing that viable technology exists in the market today, True Position said.

According to TechnoCom's findings, "The outcome is a current overall performance that readily meets the FCC's proposed location performance threshold for indoor wireless E911 at the 67th percentile. The demonstrated performance even comes very close to meeting the 50 meter threshold at 80 percent, which is intended for five years from adoption of the proposed rules."

Other vendors have also submitted

filings to the FCC claiming that their technologies will satisfy the requirements of the rule on the timeline proposed by the FCC.

"These results should prove helpful to the FCC as it moves toward reaching a resolution on its proposed rule on indoor location requirements," said Craig Waggy, CEO of True Position. "We know that accurate location information is vitally important to American consumers, and that the FCC is intent on remedying the lack of wireless indoor location requirements for calls placed to 911 from wireless devices."

The tests were conducted in Wilmington, Delaware, using True Position's commercially available Uplink Time Difference of Arrival (UTDOA) technology standalone, and a hybrid solution consisting of Assisted GPS (A-GPS) and UTDOA technologies.

The FCC has estimated that 10,000 lives could be saved each year if calls made to 911 from wireless phones had accurate location information.

» **LBS** / PERSONAL TRACKING

InvenSense to Acquire Sensor Nav Companies Trusted Positioning, Movea

InvenSense, Inc., a provider of intelligent sensor solutions, has signed definitive agreements to acquire Trusted Positioning Inc. (TPI), an indoor/outdoor tracking company, and context analysis software company Movea. Both TPI and Movea are privately held.

TPI's location tracking technology improves accuracy both indoors and outside by augmenting GNSS and Wi-Fi based location infrastructure. Using inertial sensors such as accelerometers, gyroscopes, magnetometers, and pressure sensors in mobile and

wearable devices, TPI's software platform provides continuous and accurate positioning and also solves the difficult problem of alignment between the user and the mobile device.

The TPI platform provides inertial navigation software solutions for a variety of industries including smartphones, tablets, wearables, in-vehicle navigation, personnel tracking, and machine guidance and control.

Movea provides software for ultra-low power location, activity tracking, and context sensing. Movea's products,

technology, and IP cover a broad range of signal-processing and data-fusion technology applied to consumer mobile (smartphones and tablets), TV interaction, and wearable sports and fitness applications.

Movea is dedicated to context analysis using both motion and audio sensors to determine, for example, a person's state/activity, their energy expenditure, their location, and an athlete's speed and cadence.

The transactions are expected to close by the end of InvenSense's second quarter on September 30.

» **TRANSPORTATION** / AVIATION

Business Aviation Agrees to Promote EGNOS Use at European Airports

The European Business Aviation Association (EBAA) and the European GNSS Agency (GSA) have signed a Memorandum of Understanding to promote the wide use of EGNOS — precision-based navigation (PBN) — at regional airports in Europe, following discussions at the European Space Solutions Conference in Prague in June.

Maintaining all-weather access at secondary and tertiary airports is becoming more and more important for the air transport community with ever-increasing difficulties when it comes to access at major hubs, according to the EBAA.

Business aviation is now in a position to optimize access at more of these regional airports which are often characterized by limited investment or technical innovation on the ground. By improving penetration of EGNOS, the entire air transport value chain will be enhanced, the EBAA said.

"The aviation community stands to benefit greatly from EGNOS because it means safe access to small- and medium-sized airports without the need for expensive ground equipment," said Fabio Gamba, EBAA CEO. "Approach procedures have been published for around 100 airports, which is still a far cry from where we should be. A move towards this technology is well overdue, and this is evident if you compare Europe to the U.S." Gamba said EBAA and GSA are committed to having more procedures published in the future for additional airports.

Most new business aircraft are already equipped to use EGNOS, and

Photo: Lszb29, via Wikimedia Commons

▲ Bern-Belp, Switzerland, is one European airport with published LPV procedures.

operators can start using published LPV procedures immediately, without making any upgrades, after obtaining the operational approval from the authority where the aircraft is registered, according to Carlo des Dorides, GSA executive director.

EGNOS increases accessibility and enables safer approaches to underserved airports also in poor weather conditions.

THE BUSINESS

Patent Issued for Dynamic Location Reporting

LocationSmart has been issued a U.S. Patent for location reporting based on the dynamic status of a user. The patent covers a system and method of determining location for the user, including dynamically determining a status of the user and allowing acquisition of the user's location based on the determined status.

The issued patent (U.S. Patent 8,666,373) enhances LocationSmart's cloud-based, cross-carrier location and interactivity platform that provides location insights through web services application programming interfaces (APIs), the company said.

The patent covers the location reporting of a person based on a dynamically monitored status; for example, when an employee is on the job versus when the employee is on his or her own time. Reporting is responsive to the received location tracking request, based on current status and allowed permissions. LocationSmart said this will help in monitoring and managing mobile workforces.

The patent strengthens the protection and rendering of LocationSmart's services for mobile check-ins and status reporting in the workforce management and transportation sectors, the company said.

Companies use the LocationSmart platform for service assistance, proximity marketing, workforce check-ins, emergency alerting, mobile gaming, and transaction verification.

Remote Patient Monitoring to Reach €19.4B in 2018

Berg Insight estimates that revenues for remote patient monitoring (RPM) solutions reached €4.3 billion in 2013, including revenues from medical monitoring devices, mHealth connectivity solutions, care delivery software platforms, and monitoring services. RPM revenues are expected to grow at a CAGR of 35.0 percent between 2013 and 2018, reaching €19.4 billion at the end of the forecast period.

Savings attributable to payers and care providers will by far exceed this amount as connected-care solutions can allow better health outcomes to be achieved more cost efficiently, according to the report "mHealth and Home Monitoring."

While the healthcare industry is advancing towards an age where connected-care solutions will be part of standard practices, this progress is far from uniform, with growth in the market centered on specific market verticals and regions. "Most of the market growth in the sleep therapy segment has for instance occurred in the U.S. and France, where frequent compliance audits are becoming more common," said " said Lars Kurkinen, senior analyst, Berg Insight. Kurkinen added that the telehealth market benefits from local and regional project financing in several European countries, whereas remotely monitored medication dispensers gain traction among home-care providers in the Benelux and Nordic countries in particular.

The first pharmaceutical companies have recently initiated rollouts of connected adherence monitoring solutions bundled together with specific drugs. Another development is the shift from fee-for-service reimbursement systems to pay-for-performance structures that emphasize cost-effective delivery of quality care. In the U.S., one example of this development is the large number of RFPs for telehealth solutions that are being issued due to hospital readmission reduction programs.

News from the Esri User Conference, July 14–18, San Diego

▲ (From left) Topcon's Sirius Pro is designed for high accuracy mapping using GNSS RTK; Cedar Tree Technologies is a new rugged handheld company founded by Juniper Systems; SmarterBetterCities creates 3D scenarios using its 3D Cities Libraries.

CompassCom Previews On-the-Fly Geofencing

CompassCom gaveEsri User Conference attendees a sneak peek at advanced asset tracking capabilities in the upcoming version of its CompassTrac software powered by Esri ArcGIS technology. Scheduled for release in late summer, CompassTrac 6 provides custom digitizing tools for geofencing applications and map optimization for any electronic device.

The CompassTrac software tool enables Esri ArcGIS users to view the locations and statuses of vehicles and other high-value assets on their GIS map in real time. According to CompassTrac, the new version provides on-the-fly geofence alerts to increase fleet efficiency and improve crew safety,

the company said.

CompassTrac locates addresses and displays vehicle positions, speeds, and heading using selected ArcGIS data layers as the map background, including satellite and aerial imagery, the company said.

The premier upgrade to version 6 is a set of digitizing tools that allows the user to draw a geofence polygon around any feature or area — a street, neighborhood or town — on the GIS map. If any vehicle or asset being tracked by the system crosses the geofence boundary, CompassTrac will automatically send a text or email alert to select users and highlight the vehicle in question on the map display.

Icaros Unveils Oblique Image Viewer, Measuring Tool for ArcGIS

Icaros Inc., a provider of advanced aerial remote sensing and 3D visualization solutions, introduced at Esri UC its Icaros Measurement Tool (IMT), a simple but powerful photogrammetric visualization application based on ArcGIS technologies.

The IMT enables customers working within Esri's GIS environment to view and measure structures in oblique aerial imagery captured by any commercial oblique sensor system, including those from Pictometry, Vexcel/Microsoft, IGI, Leica, Midas, as well as oblique sensors mounted on unmanned aerial vehicles (UAV).0

Scene Sharp Unveils Fuze Go Plugin for ENVI

Scene Sharp USA introduced its Fuze Go Plugin for ENVI at Esri UC. The plugin gives ENVI software users access to Fuze Go MS Sharp, an automated multispectral image fusion software that can simultaneously fuse up to 30 spectral bands of data from inside the ENVI geospatial processing package.

The plugin gives users the option of accessing the Fuze Go MS Sharp software either within the ENVI workflow or outside of it so that fusion can be performed as a stand-alone application. This frees up the ENVI software license for other image processing activities. No GIS or image processing experience is needed to use the Fuze Go tools.

Topcon Adds Cellular Connectivity to HiPer SR, Releases MAGNET Relay for GIS

Topcon Positioning Group has added a cellular modem option for the HiPer SR for GIS receiver.

The integrated modem provides greater functionality for the HiPer SR, enabling the unit to be used as a cellular base station through the MAGNET Relay option. The cellular feature also allows the receiver to provide a connection to existing data collectors that do not contain internal cellular modems, and enables users to obtain Spectrum-RTK (real-time kinematic) and RTK corrections via the Internet. It also allows it to function as a mobile base station as part of

the MAGNET Relay GIS broadcasting service, 'relaying' corrections to multiple rovers.

MAGNET Relay. Topcon also added the MAGNET Relay for GIS to its suite of cloud-based solutions software. The mobile base station RTK broadcasting service is designed to allow subscribers to connect a GNSS base receiver to MAGNET Relay via a cellular connection for high-accuracy RTK corrections.

The RTK base station can be used by up to 10 rovers and allows for data to be collected in the field without the need for post processing.

» **GEOSPATIAL** / IMAGING & UAV

Google Acquires Satellite-Imaging Startup for $500M

Google enhanced its online mapping service by acquiring Mountain View, California-based Skybox Imaging for $500 million in cash. Both Google and Facebook are purchasing satellite and drone companies in an attempt to expand into other market areas, according to industry experts.

One of the ways Google will be leveraging Skybox is in disaster relief and to improve Internet access in remote areas, something the company has been strongly pursuing, according to *GPS World's* location-based services editor Kevin Dennehy.

On its website, the five-year-old Skybox said that it also plans to share in the development of the burgeoning autonomous vehicle market and continue to design its own satellites.
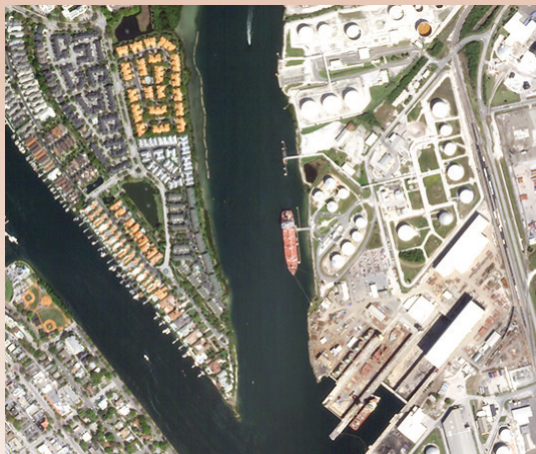
Skybox posted a message about the acquisition on its website: "We've built and launched the world's smallest high-resolution imaging satellite, which collects beautiful and useful images and video every day. We have built an incredible team and empowered them to push the state-of-the-art in imaging to new heights. The time is right to join a company who can challenge us to think even bigger and bolder, and who can support us in accelerating our ambitious vision.

"[Skybox and Google] both believe in making information (especially accurate geospatial information) accessible and useful. And to do this, we're both willing to tackle problems head on — whether it's building cars that drive themselves or designing our own satellites from scratch."

» **GNSS DESIGN & TEST**

EuroGeographics to Create Expert Group in GNSS Positioning

Members of EuroGeographics are creating a European platform for networking, sharing best practices, and exchanging expertise on GNSS positioning.

Plans for the new Positioning Knowledge Exchange Network (KEN) were revealed at the association's recent Extraordinary General Assembly following a proposal by the Head Office for Geodesy and Cartography, Poland. Its focus will include:

- maintaining a network of experts in satellite positioning and navigation
- following the development of relevant technologies and practices
- working on the most effective utilization of Galileo services, and
- developing common standards, policies and guidelines for best practice.

EuroGeographics members will work to agree on roles and joint actions through a cooperation agreement with the European Position Determination System (EUPOS), the Reference Frame Sub Committee for Europe (Euref), and the Council of European Geodetic Surveyors (CLGE). The new Positioning KEN will incorporate experts from all four organizations and will also invite other key players to participate.

» **GEOSPATIAL**

Geospatial Computing Book Published

A new text and reference book, *Geospatial Computing in Mobile Devices,* has been published by Artech House.

The book, written by Ruizhi Chen and Robert E. Guinness, addresses and instructs in geospatial data acquisition, processing, visualization, context detection, and context intelligence. It looks at how recent developments in smartphones enable them to meet many of the demanding requirements for geospatial computing, in terms of computation power, data storage capacity, and memory space.

Topics covered in the 209-page book include:

- Fundamentals of Mobile Positioning
- GNSS, Wireless, and Hybrid Positioning in Mobile Devices
- Mobile GIS and LBSs
- Context Awareness and Reasoning, and
- Future Directions in Mobile Geospatial Computing.

Co-author Ruizhi Chen previously published a cover story in *GPS World* magazine, "3D Smartphone Navigation Using Geocoded Images," and another technical article, "Multi-Sensor, Multi-Network Positioning," also in *GPS World*.

He is a professor and head of the Department of Navigation and Positioning at the Finnish Geodetic Institute. He holds a Ph.D. in geophysics from University of Helsinki. He is the general chair of the IEEE conferences Ubiquitous Positioning, Indoor Navigation and Location-Based Services held in 2010 and 2012, and scheduled this year for November 20–21 at Texas A&M University, Corpus Christi.
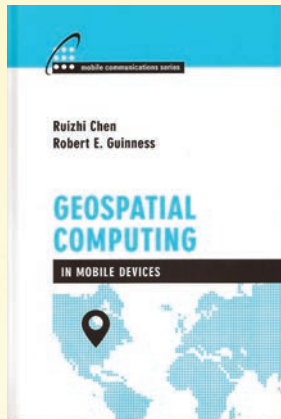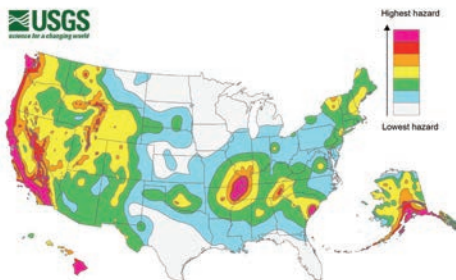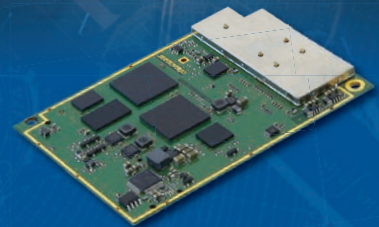
USGS Releases Earthquake Hazard Map

The USGS recently updated its U.S. National Seismic Hazard Maps, which reflect the best and most current understanding of where future earthquakes will occur, how often they will occur, and how hard the ground will likely shake as a result.

While all states have some potential for earthquakes, 42 of the 50 states have a reasonable chance of experiencing damaging ground shaking from an earthquake in 50 years (the typical lifetime of a building). Scientists also conclude that 16 states have a relatively high likelihood of experiencing damaging ground shaking. These states have historically experienced earthquakes with a magnitude 6 or greater.

The hazard is especially high along the west coast, intermountain west, and in several active regions of the central and eastern U.S. The 16 states at highest risk are Alaska, Arkansas, California, Hawaii, Idaho, Illinois, Kentucky, Missouri, Montana, Nevada, Oregon, South Carolina, Tennessee, Utah, Washington, and Wyoming.

THE BUSINESS

» EVENTS

ION GNSS+ 2014
September 8–12, 2014, Tampa, Florida; www.ion.org/gnss/

ION GNSS+ is the world's largest technical meeting and showcase of GNSS technology, products, and services. This year's conference will bring together international leaders in GNSS and related positioning, navigation, and timing fields to present new research, introduce new technologies, discuss current policy, demonstrate products, and exchange ideas.

54th Meeting of the Civil GPS Service Interface Committee
September 8–9, Tampa, Florida; www.navcen.uscg.gov

The CGSIC meeting is held in conjunction with ION GNSS+ 2014. The meeting will contain important updates from GPS program officials and give attendees an opportunity to learn about the broad array of GPS-based applications that are available.

Super Mobility Week
September 9–11, Las Vegas, Nevada; www.supermobilityweek.com

Super Mobility Week is North America's largest forum for the mobile innovations that power the connected life — business, home, health, money, auto, retail, media, networks, and more. Thousands of mobile leaders, companies, and professionals will gather to connect and share leading-edge trends, discoveries, and knowledge.

InterGeo 2014
October 7–9, Berlin, Germany; www.intergeo.de

The 2014 InterGeo Conference and Trade Fair for Geodesy, Geoinformation and Land Management will take place at Messe Berlin. With more than 16,000 visitors from 80 countries, it is a key platform for industry dialogue, covering surveying, geoinformation, remote sensing, and photogrammetry.

ISGNSS 2014 (in conjunction with KGS Conference)
October 21–24, Jeju Island, Korea; isgnss2014.org

"Cloud-PNT: PNT in IoT" is the theme of ISGNSS 2014, and the program will be organized to emphasize this trend.

2014 Trimble Dimensions User Conference
November 3–5, Las Vegas; www.trimbledimensions.com

Trimble's International User Conference addresses innovations in agriculture, construction, civil infrastructure, engineering, government, mapping, natural resources, surveying, telecommunications, transportation, logistics and utilities.

2014 UPINLBS
November 20 –21, Corpus Christi, Texas; upinlbs.tamucc.edu

The 2014 Ubiquitous Positioning, Indoor Navigation and Location-Based Services conference wil cover GNSS-based positioning indoors/outdoors; positioning based on wireless sensor networks, signals of opportunity, acoustic signals, emerging sensors; hybrid positioning solutions; and more.

Security, Spectrum in the Connected Vehicle

Scott McCormick, president of the Connected Vehicle Trade Association (CVTA), talked with *GPS World's* digital editor, Bethany Chambers, about the upcoming Super Mobility Week, the Intelligent Transportation Systems' World Congress, and what to expect in the connected vehicle market.

Bethany Chambers

Will CVTA make any announcements at the shows?

On September 11, at our Summit on the Future of the Connected Vehicle, we'll announce a new service that will benefit collaborative industries. We have our core industries, but there are now insurers, data-mining companies, security companies, all these others that are not in the automotive space that are doing things related to it.

Today, the insurers don't know how to work with the automakers. Neither did the telecoms. They're completely different business models, but they're channel partners. This is not just about a company to hire, but where we can gain utility and expertise.

What will be the hottest topics at Super Mobility Week?

There will be three: privacy, data ownership, and security. Security is the only one that's important, and it's for simple reasons. The United States has no personal privacy data law and it never will. The issue is one that we're not going to solve. Everybody wants to talk but nothing ever comes of it.

The same question with data ownership. Why would my privacy or data ownership be device-specific? It should be device-agnostic. Anytime you transfer data, there are two levels of ownership. Of the data in the connected vehicle, an infinitesimally small amount is related to location or driving behavior. Although we talk about privacy and data ownership, nobody's going to define data ownership.

Security, however, is a huge issue, because once you clear a gateway into the system, it can be breached. I'm not concerned about terrorists, it's more just teens with nothing to do who want to rock the system. I'm most concerned about the insufficiency of the code. There's an average of 43 networks in a car, and while they're not likely going to affect braking, that doesn't mean if you tinker with things long enough you couldn't figure it out and remotely control functions. That's really sophisticated and of very low value to do it to one vehicle.

It's more important to ask if the overall infrastructure is protected. Systems have to be designed to be secure, detectable, and reparable. It's incumbent upon cellular companies to take that responsibility.

What policies will come into play in the next year?

One is very critical. The American Jobs Act is pushing to allow unlicensed devices to use the 5.9 (GHz) spectrum

> Industry's biggest security concern is not terrorists, but teens who want to rock the system, and the insufficiency of connected-vehicle code.

(currently allocated to licensed Intelligent Transportation Systems), and we have conveyed what a bad idea that is. The FCC has tested it in lab conditions, not with hundreds of cars at an actual intersection. This is not like connecting a toaster and refrigerator, this is hundreds of people in the backseats of cars attempting to connect and disconnect (to Wi-Fi). That's the equivalent of a denial-of-service attack. Unless we deal with this soon, it's going to be a real safety risk. The problem is once the spectrum gets reallocated, it's going to be really hard to take it away.

*For full text of McCormick interview, see **gpsworld.com/cvta**.*