New GNSS Developments and the Impact on Providers and Users of Spatial Data Infrastructure

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SUMMARY

The surveying and mapping industry has been revolutionised by the use of Global Navigation Satellite Systems (GNSS) involving satellites, ground stations and user equipment to determine positions around the world. The Global Positioning System (GPS) from the USA is the best-known current system. Russia also runs its own GNSS called GLONASS. Fuelling growth in the next decade will be next generation GNSS that are currently being developed. The USA is modernising GPS, Russia is revitalising GLONASS and Europe is moving ahead with its own Galileo system. Watershed advances in a major technology like GNSS only occur in 20 to 30 year cycles. Therefore, the time is right to explore potential opportunities and issues for our industry.

The first part of the paper outlines how the next generation of GNSS will bring extra satellites and signals to deliver better accuracy, reliability and availability. Extra satellites will bring better performance for all applications and especially where satellite signals can be obscured, such as in urban canyons, under tree canopies or in open cut mines. Modernized GNSS will also deliver significantly better accuracies. For example, the European Union's Galileo system will offer a commercial service that will be capable of delivering 0.1m accuracy. The extra satellites and signals will improve the performance and reliability for all applications right down to the centimetre accuracy techniques used in surveying and geodesy.

The second part of the paper looks at the many implications of these improvements for the providers and users of Spatial Data Infrastructure. For example, when any user can easily position themselves with 0.1m accuracy, they are likely to demand a significantly higher accuracy in the spatial data they use. Another issue is that the European Union's Galileo system is much more open to civilian and commercial involvement and allows for regional and local augmentation to the core system. Such augmentations will be seen increasingly as key parts of future Spatial Data Infrastructure. The multiple systems and level of accuracy will also require more attention to the softer parts of the Spatial Data Infrastructure such as standards and the geodetic reference frame.

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