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A User Needs Analysis for Precise Positioning Services in Australia

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Introduction

The Cooperative Research Centre for Spatial Information (CRCSI) has developed an analysis of user needs for Precise Positioning Services in the Australian states of New South Wales and Queensland. The analysis was undertaken by the author as part of the CRCSI's Project 1.04 on "Delivering Precise Positioning Services in Regional Areas". The executive summary of the report is presented below and the full report is available from the CRCSI web site [1].

Executive Summary

This report investigates the market for precise positioning in New South Wales (NSW) and Queensland (Qld) and the end user requirements for an extended SunPOZ service. In addition, it reviews existing precise positioning services and user preferences for service delivery.

Precise positioning is a technique which uses multiple frequency Global Navigation Satellite Systems (GNSS) receivers to achieve real-time or near real-time accuracy to better than 10cm.

These precision GNSS receivers are mainly used for surveying and the precise control of farm, mine and construction machinery. Several thousand receivers are already in use in NSW and Qld, indeed, Australian companies pioneered the use of precision GNSS in mining and agriculture.

The majority of users in NSW and Qld (and the focus of this report) are engaged in the most accurate form of precise positioning which is typically 2cm horizontal accuracy.

The market value of precise positioning products in NSW and Qld isestimated at $55-70 million in 07/08. There are between 2,500 and 4,000 candidate machines sold each year in the two states. Estimates of the proportion of machines currently equipped with precision GNSS systems range from 10-20%.

Precise positioning requires terrestrial infrastructure to provide a real-time precision GNSS message service to the mobile GNSS receivers. This infrastructure may be local, regional, national or even global.

In NSW and Qld precise positioning infrastructure and their associated services are provided by a mix of private, government and cooperative organisations. There is currently no coordinated policy for the provision of such services in either of the two states.

End users interviewed for this study expressed support for a brand neutral, interoperable, widespread and reliable precise positioning service.

Several interviewees expressed concern at the duplication of infrastructure which has occurred to date and the lack of interoperability offered by some current suppliers.

The largest markets for precise positioning services are engineering construction and agriculture followed by spatial and mining. The number of users and potential users in other markets are insignificant compared to these four over the next 5-10 years.

Performance requirements are broadly similar across the markets with the exception of vertical control. The ability to deliver reliable height corrections to dynamic machines engaged in earth moving is a prerequisite to servicing engineering construction and mining.

Similarly, any precision GNSS service aiming for widespread adoption must support at a minimum GPS/Glonass combinations.

Radio communications are seen as the principle technical challenge to the successful roll-out of precise positioning services. Both geographical coverage and difficult environments (e.g. mines) need to be addressed.

Integrity (i.e. whether the transmissions from satellites are within tolerance to be used in a position solution) is not seen as an important issue today. However, it is flagged as a requirement for the future, particularly in an era of autonomous machines.

The service is required at a 99.9% reliability or better to cover the requirements of all the users. This corresponds to 1-2 minutes of downtime per day.

A brand neutral, interoperable, widespread and reliable precise positioning service is of interest to end users in all the markets. The key to adoption is to continuously provide the service at an acceptable price.

User charges for real-time services today range from "free" (i.e. included in the purchase of the equipment) to over $5,000 per annum.

The level of annual subscriptions which directly compares to owning a reference station can be as low as a few hundred dollars per rover.

In order to justify a higher service price over ownership, benefits (e.g. continuity and interoperability) need to be clearly defined and articulated to the end user.

Opportunity also exists to add value through additional services such as data to support post-processing of positions, a technique commonly used in the spatial sector.

Acknowledgement

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References

[1] www.crcsi.com.au/pages/project.aspx?projectid=89