Australia's Changing Surveying Infrastructure from Marks in the Ground to Virtual Reference Stations

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ABSTRACT

Around the world, surveying infrastructure is moving from being based on networks of marks in the ground to increasing reliance on networks of permanently running GPS base stations. The latest developments see GPS data being made available for real time positioning or for Internet based post processing; all with centimetre accuracy. This paper examines the implications of this increasingly *virtual* nature of our surveying infrastructure, drawing on recent developments and experiences in Australia.

The first part of this paper outlines a GPS network established over the south east corner of the Australian State of Queensland. That network uses the Virtual Reference Station (VRS) concept from Trimble. The network can deliver corrections via the mobile phone network; enabling roving receivers to be positioned anywhere inside the network in real time and with accuracy better than a few centimetres.

The second part of this paper examines the implications of VRS and other approaches, including on-line processing of GPS data via the Internet. Some of the questions that arise include:

- What is the most appropriate approach for a given set of circumstances?
- What are the implications of absolute vs relative positioning in terms of accuracy of the resulting positions?
- What are the implications for maintenance of the geodetic datum in all its dimensions?
- What new opportunities arise from being able to deliver (and perhaps receive) positions in real time?

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