

## ASSOCIATION OF PUBLIC AUTHORITY SURVEYORS

### 2019 GOVERNMENT SURVEYORS DINNER AND GRANT KILPATRICK MEMORIAL LECTURE

Speaker 1 (30 Minutes + 10 Minutes Questions)

Dr Kirco Arsov, Australian Bureau of Meteorology<sup>1</sup>, TAFE NSW<sup>2</sup>, Ultimo

#### TOWARDS PPP-RTK POSITIONING AND IMPACT OF SPACE WEATHER ON ITS PERFORMANCE IN AUSTRALIA

This presentation deals with PPP (Precise Point Positioning) in Real Time Kinematics (RTK) mode. PPP-RTK technique might be understood as concurrent positioning technique to classical GPS RTK. In contrary to classical RTK, here the processing is performed on un-differenced and un-combined observations. We will outline the basic principles as well as explain and assess the impact of the atmosphere (mainly ionosphere) on its performance. PPP-RTK does not require data from reference station. It receives corrections (orbits, clocks, atmosphere and other biases) via Satellite link (SBAS) or via internet. Those corrections are estimated in the network processing scenario from stations net having approximate baselines around 250km.

Furthermore in the context of PPP-RTK, different positioning test scenarios will be introduced and explained. We will explain the data processing chain, national infrastructure development, data processing facilities etc. Regarding performance, main focus will be put on PPP-RTK convergence and ambiguities fixing strategies. A boost in performance by including the ionosphere in the model will be also presented, explained and assessed in the so called closed-loop scenario.

As already mentioned, atmosphere has big impact on PPP-RTK performance. As part of the Australian National Positioning Infrastructure project, a development of high-power atmosphere modelling to support the PPP-RTK positioning is being developed. For this purpose, a 4D ionosphere model furthermore will be introduced and a testbeds to test the PPP-RTK performance development will be introduced.

Last but not least performance of PPP-RTK in presence of ionosphere (magnetic) storm conditions will be assessed and explained. Global ionosphere distribution will be computed based on global set of GNSS data and its impact on positioning will be explained.

[Speaker 2 \(30 Minutes + 10 Minutes Questions\)](#)

Paul N Swan *Sydney TAFE*

**SYDNEY REGION TAFE FUTURE DIRECTIONS**

This presentation will highlight Vocational Education and Training (VET) in the Surveying and Spatial Information Services industry. In particular the Surveying & Spatial Information Services section of Sydney TAFE is undergoing significant structural changes with ONE TAFE. The paper will review of the current programs at Sydney Region TAFE. The national qualifications are presented with particular reference to the subtle changes to the current syllabus and the PATHWAY program for the Diploma of Surveying. The future directions for Sydney TAFE will be considered, including flexible programs, recognition of prior learning or current skills and articulation to tertiary studies at university.

[Speaker 3 \(30 Minutes + 10 Minutes Questions\)](#)

Vincent Ochiel, GIS Manager - WestConnex M4-M5 Tunnel link  
Lendlease Samsung Bouygues Joint Venture.

**THE INTERFACE OF GIS AND SURVEYING IN UTILITIES IDENTIFICATION AND MANAGEMENT  
IN INFRASTRUCTURE PROJECTS.**

Beneath our streets lie complex networks of cables and pipes – but often, the owners of these systems have little idea of their precise nature or location. GIS-based planning and analysis allows utilities to assess and prioritize construction and maintenance activities, ensure regulatory compliance, complete risk and integrity analyses, and better understand customer needs.

Through GIS, utility asset data links directly to other key information providing situational awareness to proactively monitor work orders and emergency shutdowns, and to ensure public safety. The importance of having current information on the location of utility asset has it's challenges and this talk will take you through how some of the current projects in NSW are utilizing GIS technology in liaison with Surveying capabilities for different aspects of Utility awareness.