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Author: Dr. Serge Plattard  
European Space Policy Institute (ESPI), Austria, serge.plattard@espi.or.at

## LOOKING AT THE GOVERNANCE SCHEME FOR THE FUTURE GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS)

### Abstract

By the end of this decade, the global navigation satellite systems (GNSS) landscape should be profoundly changed, moving from today's basically two global systems (GPS and Glonass), to four (adding the Chinese Beidou and the European Galileo) and two regional systems (RNSS), the Indian IRNSS and the Japanese QZSS. About 140 satellites will be beaming tens of dedicated radio signals at definite frequencies but in varying modes, enabling a range of different features destined to 6 billion users, compared to an estimated installed base of GNSS devices of about 3,3 billion in 2015. Such a fast growing pervasiveness of precision, navigation and timing (PNT) services is flowing to almost every sector of human activity, henceforth precisely underscoring the necessity to guarantee the robustness, reliability and sustainability of these indispensable systems. This implies that the GNSS must be compatible, inter-operable, interference free, guaranteeing integrity of signals used in authorized/restricted/safety of life services. Two main drivers support the necessary governance of such systems: i) the different GNSS radio frequency layout complexity, and ii) the worldwide size of market users handling a pervasive commodity whose production could hardly suffer an unpredictable shortage. Governance poses also the ways and means to be put together to protect, toughen and augment GNSS capabilities. Based on informal technical arrangements reached through the International Committee on GNSS (ICG), which first met in 2005, as well as on bilateral agreements among PNT providers, adoption of a GNSS Code of Conduct (CoC) seems to be a reasonable solution to pursue harmonized practices guaranteeing the sustainable functioning and use of the different constellations, together with a transparent access to information. The latest would ensure that any GNSS update or modernization remains in line with the overall de facto system of systems through multi-GNSS receiving capabilities. After mapping out a 2020 GNSS/IRNSS plausible landscape, the paper will detail the content and the modus operandi of a foreseen CoC that could benefit from features of some existing organisations involved in space-based information services. The possibility of having the current ICG transformed into a GNSS Agency ensuring a realistic coordination among the different providers, protecting the prerogatives of each of them, will also be presented.