A High-Level Functional Architecture for GNSS-Based Road Charging Systems

Within recent years, GNSS-based road charging systems have been highly profiled on the policy makers’ agenda. These types of systems are however technically challenging and are considered one of the most complex types of charging systems. To understand the structure and behavior of such road charging systems, it is important to highlight the overall system architecture which is the framework that defines the basic functions and important concepts of the system. This paper presents a functional architecture for GNSS-based road charging systems based on the concepts of system engineering. First, a short introduction is provided followed by a presentation of the system engineering methodology to illustrate how and why system architectures can be beneficial for GNSS-based road charging systems. Hereafter, a basic set of system functions is determined based on functional system requirements, which defines the necessary tasks that these systems must accomplish. Finally, this paper defines the system functionalities; and provides a generic high-level functional architecture for GNSS-based road charging systems.

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