

Communication area map of LoRa in Chikuma city using community bus services

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Internet of Things (IoT) where data of many sensors are collected through the Internet is one of important social infrastructure technologies. Various sorts of regional IoT technologies were developed and expected to be tools for the enhancement of public services and the resolution of public issues in the community thorough use and application of the collected data. We conducted communication environment measurement of private LoRa (Long Range), which is one of the low-power wide area (LPWA) communication technologies in Chikuma city, Nagano prefecture, Japan, using community bus services. In this experiment, we set up LoRa relay stations at three locations in the city: the Koshoku governmental building (the northern part of the city), the Togura governmental building (the southern part of the city), and the Amenomiya drainage plant (the eastern part of the city). In addition, beacon transmitters were installed in the community buses (nine routes in all). The location and time information were transferred from the routes of the buses to the NICT Science Cloud servers in real time through the relay stations. Experimental results are summarized in an area map, indicating that we succeeded in communicating in most of the bus routes and confirmed the possibility of covering the entire city by the LPWA. Even in the insensitive area of this experiment, the communication will become possible by adding several relay stations.

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