

# Bluetooth Research Report

**Objective:** Research the viability of bluetooth functionalities for the mapping of the construction area and the operators and machines inside them.

**Motivation:** It is an efficient technology in the use of battery in comparison with GPS, if it is configured as BLE (Bluetooth Low Energy). It would be useful to locate operators and machines within the construction area. If it is viable, it could simplify the implementation of the application. Moreover, we could avoid using GPS, which is not available always.

**Final decision:** Not viable (for now)

## Conditions and reasons:

- It is not powerful enough for the larger construction sites
- Not all mobile phones could use the application (due to their hardware)
- This technology works better as complementary
- The project team will be working on the app only 2 months

**Justification:** 1 year ago, the last bluetooth technology was Bluetooth 4.1 which only had a range of 10 metres and had limited bandwidth. Recently, Bluetooth 5.0 was released which grants a 50-metre range, better bandwidth and some improved functionalities which would be useful, as BLE (Bluetooth Low Energy). On this way, it would be possible to implement an efficient app which constantly broadcasts the location, and even acts as an amplifier of other bluetooth signals issued by other workers; so it is not necessary an Internet connection or GPS signal.

There are many important reasons why this technology is not finally viable. Even though it was improved, with the current features, some large construction sites wouldn't be covered entirely, something the GPS can always do. Moreover, Bluetooth 5.0 not only requires a software upgrade, but also a hardware update, which only some mobile phones released during the last year have. This makes this option a complementary feature to the GPS. Some years from now, most of the mobile phones will already have the hardware necessary for Bluetooth 5.0 to work. Also, in the cases of construction sites where there aren't access to Internet or GPS, the app could still be used sometimes.

Anyways, our project team will only be working on the app for two months which is not time enough to work on a complementary feature. Therefore, we will focus on the GPS functionality, and we will reconsider using Bluetooth if we finish earlier than expected.