Can we make the location of objects in the physical space as easy as finding items with Google?

Imagine that you can position your little child who started his first days at school in few clicks as you do when searching items with Google. Or, imagine an emergency case where the victims have to be positioned as fast as possible to be rescued. Or, may be you only want to find the closest bus stop, the closest restaurant or pharmacy, etc... One can't expect that sophisticated localization devices will be available to be used for e.g., by your child or by the people who had a severe accident, to report their position. Thus, positioning has to be obtained seemingly and depending on commonly available devices, such as mobile phones, wireless modems, etc... In other words, depending only on the wireless network resources. The commitment to use only the resources of the network to obtain positioning has important perspectives. Most importantly, emergency and security applications will benefit highly from the improved accuracy in location of mobile clients. Furthermore, operators will be able to provide interesting location-based services to their customers as long as they can be reached by a network.

In this thesis, positioning is performed using the resources of a wireless WiMAX network and applied to study area in Brussels. Real life scenarios are considered, where the user can be static, e.g. sitting at home, but also dynamic for mobile users that are biking, driving, using the bus etc... In the case of using the public road network, the map information can also be used to improve the positioning accuracy. A practical study on the accuracy and precision of a GPS sensor, including the obtain of the ground-truth of the reference points, is also provided.