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Tracking via Volunteered Geographic Information

What this chapter will cover:

- How mHealth apps can be used to produce continuous location-based data, or volunteered geographic information (VGI), for researchers.
- The contributions that VGI has made to understanding tourist and recreationalists mobility within urban and non-urban parks.
- The possibility to use this data as a proxy for visitation in some urban settings.
- The limitations of this form of data in terms of accessing data, its limited socio-demographic capabilities and the need to ensure ethical research procedures.

Introduction

Over the past 20 years, the use of location-based tracking has become increasingly popular. The introduction of GPS technology into devices such as phones and watches, and its incorporation into tracking apps, has led to widespread use of apps which track activities, particularly those of a sporting nature. There are now over 318,000 health and fitness

apps – called mHealth apps (Byambasuren et al., 2018) – and it is estimated that 75% of runners now use them (Janssen et al., 2017). Many of these apps contain the ability for users to track their movement and share it with fellow app users – Strava alone has 42 million accounts with 1 million users each month (Haden, 2019), but others include MapMyFitness, Adidas Running, and Google Fit.

Importantly for this book, the data that is produced from mHealth apps is continuous point geo-referenced data that is visualised for the user as a defined route undertaken during a particular activity. This route, and the temporal and spatial aspects of the activity, can be viewed by the user and then released online for their online network to view. Most commonly, it is referred to as volunteered geographic information (VGI). The data that is generated from mHealth apps can be sourced by researchers; this is often referred to as crowd sourcing. Researchers can gather large amounts of data of entire paths taken by individual users, either via gaining consent from individual users to share their routes, or via APIs provided by the app developer which provide access to large amounts of routes and their associated statistics.

VGI provides researchers with great potential to facilitate research that assesses tourists' movement through space and time (Heikinheimo et al., 2017). However, as is the case with single point geo-referenced data (discussed in the previous chapter), research in this space is disparate and tends to focus on one platform at a time, or one context at a time.

The rapid increase in VGI is arguably due to three factors: developments in wearable technology; developments in location based technology that has been integrated into smart phone and watch apps; and an increase in usage of urban spaces for walking, running and biking. The latter is largely due to an increased interest in healthy lifestyles and exercise (Santos et al., 2016; Brown et al., 2014) and presents issues for park managers, including those related to environmental impacts due to overuse and conflicts between different types of users, such as walkers and bike riders (Santos et al., 2016; Norman and Pickering, 2017; Pickering et al., 2011; Rossi et al., 2013). This chapter will explore how VGI data can assist researchers and managers in understanding these issues, along with tourists' mobility.

How mHealth apps work

mHealth applications (apps) are designed to track individuals' speed, distance, elevation, time, plus physiological factors such as heartrate and energy expenditure, when doing exercise. The apps can be placed on individuals' smart phones or watches and then downloaded so that users can view their statistics, along with their networks, should they wish to share their data.

Many companies who have developed these apps make their money from selling the aggregated data of their app users.

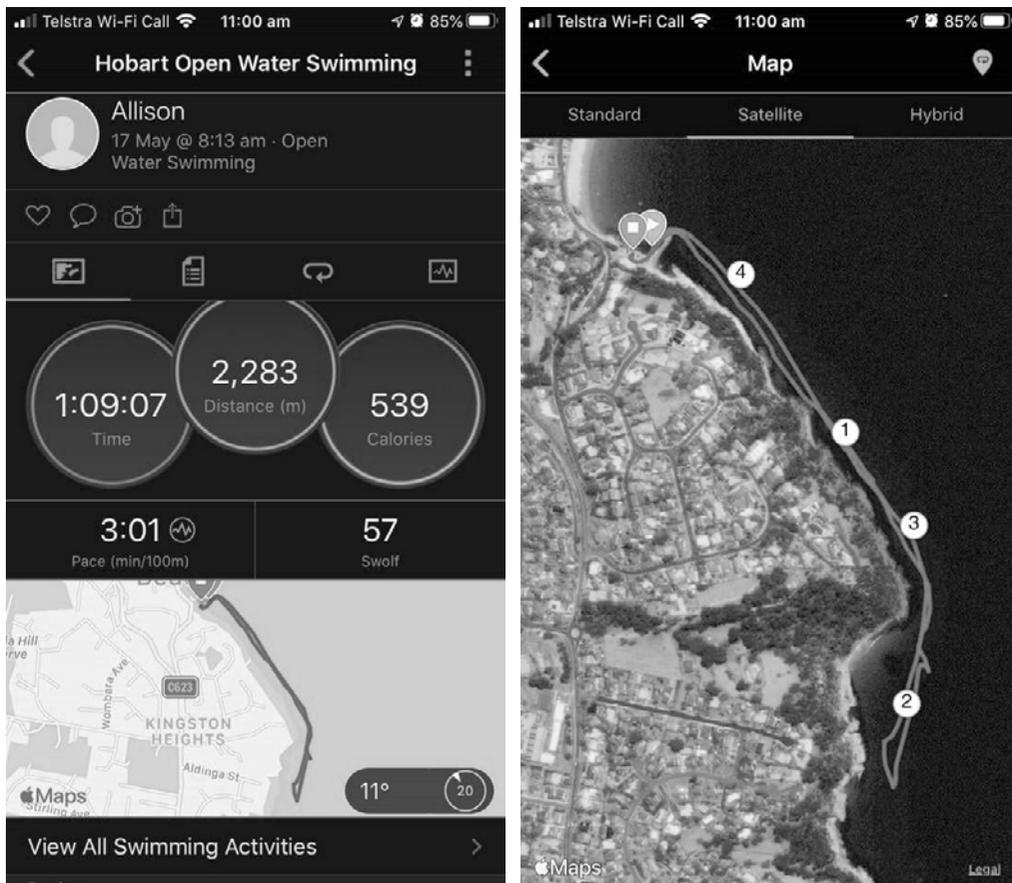


Figure 6.1: Example screen shot of mHealth app Garmin Connect™