**Project Vision:**

A highly configurable GPS geofencing management system with more granular control than currently available solutions, including appropriate privacy features and an API for other software to interact with.

**User stories:**

As a manager of IoT devices, I would like to set custom geofences perimeters of any shape and size so that I can track devices leaving and entering offices or other premises.

As an owner of a business device that will be tracked, I would like to prevent my device being tracked when it is not appropriate (e.g: outside of business hours or sites) to maintain my own privacy.

As an owner of smart-devices, I would like to have a dashboard to track and monitor all of my GPS enabled products, so that I do not have to use several different apps to keep track of my belongings.

**Similar existing products:**

Radar – polygon and circular geofencing with 5m accuracy, they also offer an API to call to get as much information as a user may want from a specific device, or group of devices. They emphasise security and privacy - similar to the idea that I would like to implement.

Woosmap – their USP is time-based geofences, that are used to calculate ETA’s to a certain location (e.g: notify me when device X is Y minutes away from my location). Also offer polygon options, but not as accurate as Radar. One major feature is only storing data on the mobile application, not on a central database.

**Plans for testing:**

It would be unfeasible to have 5-10 devices scattered around Plymouth, so the most feasible method of testing would be GPS spoofing on multiple VM’s, or alternatively, feeding the inbound API GPS data manually, however this would be challenging if I am going to implement safety features such as a token system and/or encryption.

**Existing skills:**

A small amount of database work would be involved, which I have done a module on. The dashboard/application will likely be a webpage, so I will probably lean towards using ReactJS, as I prefer it over traditional frameworks.

**Skills I will learn:**

I do not have much experience with GPS and handling sensitive location data using an API, so I will have to do research into the regulations that my application will have to adhere to, along with research into other safety measures, such as a token system, using timestamps etc.

**Draft Layout (Dashboard)**

**A screenshot of a computer screen

AI-generated content may be incorrect.** **A screenshot of a map

AI-generated content may be incorrect.**

**Key features that other geofencing software does not offer:**

Most solutions offer some of these features but not all of them in the same package. I plan to implement:

* privacy zones that prevent tracking inside (or outside) of certain areas
* optional geofence-only data settings, so that a device will not be tracked, but will only broadcast its status for particular geofences (in or out / entering or leaving) – I need to decide if the calculations should be done server or client side depending on the resource cost of constant checks on a mobile device.
* custom alert triggers for device groups, i.e.: if a device is leaving business premises, alert the manager, or if it is entering a restricted area, alert.