PlotProjects
Geofencing Notifications for apps

The Ultimate Guide To Geofencing For Mobile Marketing

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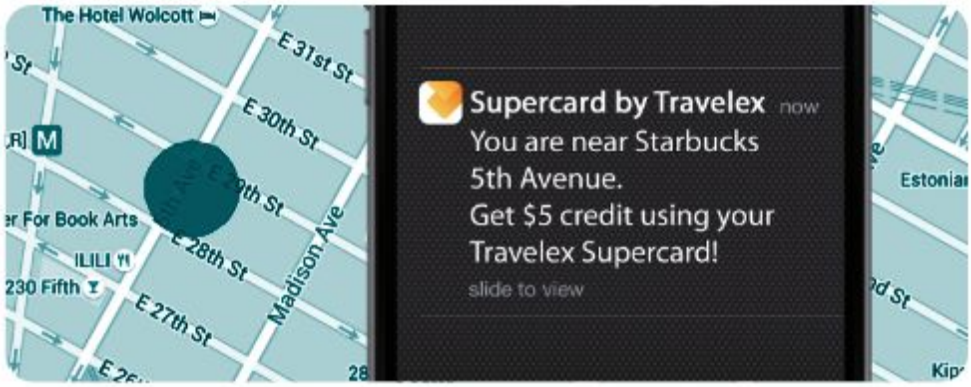
1. Introduction To Geofencing

1.1 What is Geofencing?

A geofence is a virtual fence around a geographic area (like a restaurant or place of business). This virtual fence can be as small as 50 meters or as big as a city. Establishing a geofence and linking it to a mobile device like a smartphone allows you to know when a person has entered or exited the defined geofenced location.

For most businesses, this information is used to trigger a location based push notification to the user, asking them to take an action. For example:

- To claim a discount in a nearby store
- To fill out a feedback form for a restaurant that the user booked at through the app and just ate in
- To receive an alert about an event taking place nearby



Why is this important? By being able to send a highly relevant and timely message to an app user, they are far more likely to engage with your app, take the suggested action. Studies have shown that users are far more responsive compared to other types of mobile advertising such as banners, as notifications are far more personalized and better delivered to the user.

1.2 How Does Geofencing Work?

Geofencing can use GPS, cellular, Wi-Fi or Bluetooth technology. At Plot Projects we use the cellular and Wi-Fi network to triangulate location as it is the most reliable technology and preferable to GPS, as GPS drains the batteries of smartphones very fast.

Using software from a supplier such as Plot Projects, you can easily add this feature to your app and manage your geofences and campaigns via an online dashboard.

The users of either your iOS or Android apps have to specifically opt in to receive push notifications when they download the app in the first instance. Some suppliers require a mobile app to be open for an action to be triggered. At Plot Projects we **do not** have this requirement.

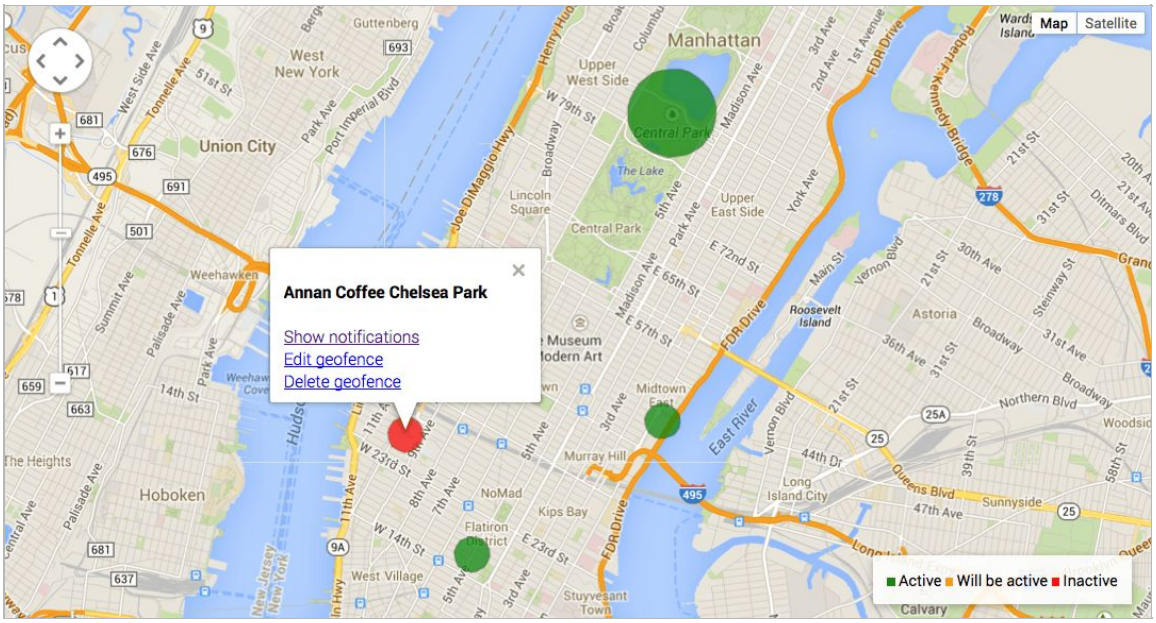


Figure 1: Plot Projects dashboard map showing live geofences in green and inactive in red

1.3 What Do You Need To Start Using Geofencing Technology?

The only requirement for the implementation of geofencing technology is having a mobile app. Geofencing is not available for mobile web pages. After the implementing geofencing technology into your app, you can reach all of your app users when they are at a certain location.

1.4 How To Determine Where To Locate A Geofence?

Many geofencing suppliers incorporate Google Earth in their dashboards, allowing administrators to define boundaries on top of a satellite view of a specific geographical area. Other applications define boundaries by longitude and latitude to define the position of a geofence.

At Plot Projects we use Google Maps to define the location of a geofence. This is the easiest way for customers to create a geofence - they can either search for a location (as you would do normally on Google Maps) or to upload a list (csv or excel) of locations. The latter allows you to create multiple geofences at once.

Once the location is set, you can define the area of your geofence. With Plot Projects this is as simple as setting radius around the location. The radius can be as small as 50 meters. In the future you will also be able to create more complex polygons to cover the area that you want to target.

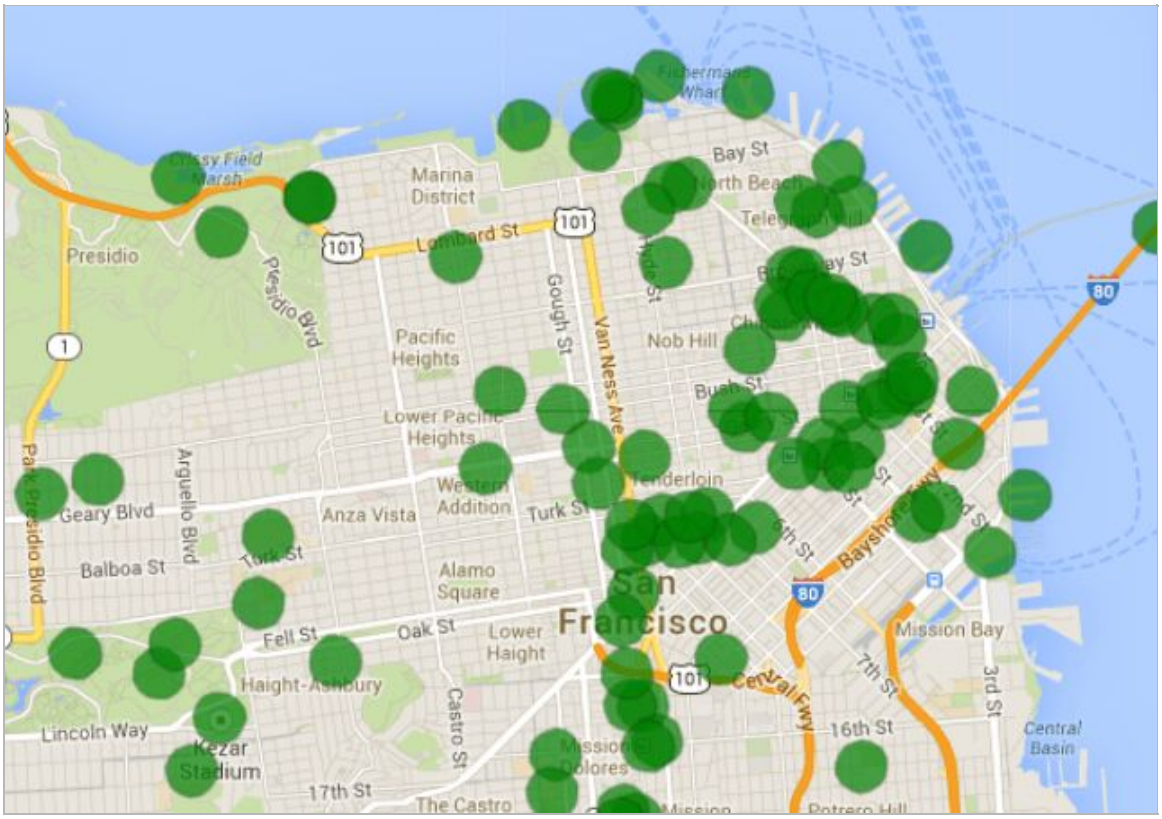


Figure 2: Multiple live geofences in green, showing a large scale campaign in action

1.5 Common Myths About Geofencing

Myth #1: The App Needs To Be On:

With Plot Projects the app only needs to be downloaded by the users. The users however, need to say yes (opt in) when asked if they would like to receive push notifications from your app and if they would like your app to use their location.

Myth #2: Geofencing Drains The Mobile Phone Battery:

Some geofencing providers use GPS for geofencing, which does have the effect of draining smartphone batteries faster. At Plot Projects, because we use cellular and Wi-Fi technology, this is not the case. The Plot Projects technology has been further optimised so that battery consumption and data storage is even more efficient. Plot Projects only stores the most relevant and closest geofences and beacons to mobile device and as the devices move around, the software automatically updates to the most relevant set of geofences.

Myth #3: Geofencing Technology Isn't Accurate:

The accuracy of geofencing technology has been tested and proven to be able to locate devices down to within 10m.

Myth #4: Geofencing Has A Low ROI:

Studies show that the opposite is true, as the CTR for location based push notifications is about 10-20% for retail coupons and restaurants. The CTR for generic push notifications which is just 2% and for mobile banners is 0.01-1%. Other mediums such as advertising on billboards or TV are more

expensive and harder to quantify. Attributing ROI to any medium is difficult, but CTR is a good measure for this.

Myth #5: People Don't Like To Receive Notifications:

Users value relevant and timely information which is exactly what location based notifications offer you. What they don't like it irrelevant ads that are poorly targeted. Get your message and timing right and your users will appreciate it and be impressed!

Myth #6: I Can't Have Lots Of Geofences:

With Plot Projects there is no limit to how many geofences you create as part of your campaign.

Myth #7: A Geofencing Plugin Won't Work With Other Plugins On My App

The Plot Projects plugin is designed to work with and be friendly towards other plugins in your app. So for example, if you wanted to use Plot Projects for geofencing and another company for managing your Beacons campaigns, then there would not be a problem from the Plot Projects side.

2. Geofencing & Beacons

2.1 What Are Beacons?

The terms iBeacon and Beacon are often used interchangeably. iBeacon is the name for Apple's technology standard.

Beacon technology allows both iOS and Android devices to listen for little Bluetooth signals, broadcasted by little bluetooth transmitters called beacons. The beacon is simply broadcasting "I am here and my location is…" These signals, when intercepted by a nearby device, make an app react in a certain way. One way is to allow mobile apps to understand the device's position.

This can also trigger different behaviour inside an app such as push notification. There is also a number of other use cases such as providing product information in a store, welcome information at an entrance or seating information at a stadium.

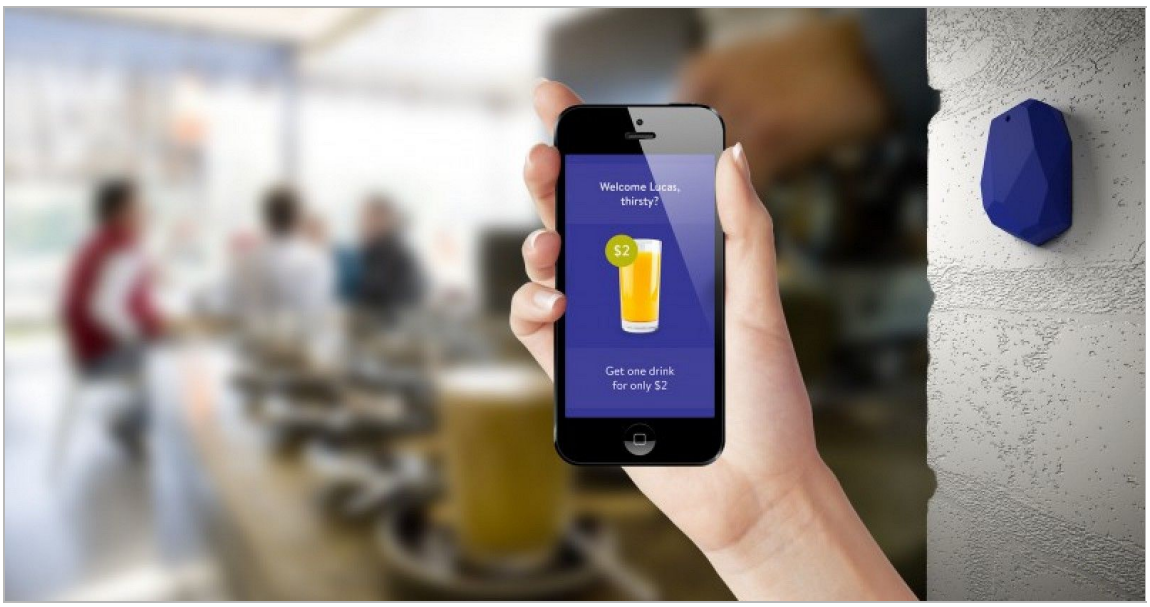


Figure 3: A Beacon is placed in a bar as part of a marketing campaign

2.2 How Geofencing Compares With Beacons?

Geofencing and beacons are both technologies that can be used for location based targeting. They do have their similarities, but both technologies are different in quite a few ways.

	Geofencing	Beacons
Technology	Is dependant on the cellular and Wi-Fi network	Uses Bluetooth which must be activated on the user's smartphone
Location	Operates on a fixed radius relative to a set location	Operates according to the distance away from the beacon. The beacon does not have to be stationary
Static or Mobile	The location of the geofence is static. In the case of Plot Projects, the location of a geofence is fixed based on the location set in the dashboard.	Beacons do not have to be stationary. This can be an advantage or a disadvantage. In certain scenarios it may be helpful to have a "mobile" geofence as it opens up a different set of possibilities
Target Range	The range of a geofence is from 50 to 50,000 meters. This makes it good for covering larger areas such as a city block or even a city	Operates at distances of about 1 to 30 meters. This makes Beacons better for micro locations e.g. points within a store
Maintenance	Is a software solution thus doesn't need any maintenance by the marketer	Beacons are physical objects (hardware). They need to be bought, placed and at some point they will require replacement of batteries
Cost	Costs vary by provider, but are usually based on the number of geofences	Cost of the Beacons and on-going maintenance e.g. replacing batteries

2.3 Enhancing Geofencing Campaigns With Beacons

Geofencing and Beacons are complementary technologies. They can be used together to enhance mobile marketing campaigns. Since geofencing works best on larger distances and beacons on smaller ones, marketing campaigns can be designed to first attract app users to a location using geofencing and then interact with them once inside a location using Beacons.

You can even use Geofencing to alert users to switch on their Bluetooth when they enter a building!

2.4 Common Myths About Beacons

Myth #1: I Can Use Beacons Without An App

Beacons are just bluetooth signal transmitters. The need to work in conjunction with an app to trigger an action, such as a push notification or something else. The main workload is handled by the software program implemented into an app.

Myth #2: Beacons Can Be Used Instead Of “Normal” Geofencing

Because Beacons operate at a smaller range, they cannot replace geofences that can cover an entire city with just one geofence. That would takes thousands of Beacons! If you managed to deploy this many Beacons, since they are powered by batteries, managing all of them would be impractical.

Also the reach of geofencing is much higher compared to Beacons as they need Bluetooth, which is not turned on on all phones. The difference can be significant as some estimates suggest that only 15-30% of people have Bluetooth enabled on their phones.

Myth #3: I Need To Use Software From My Beacon Provider

The Plot Plugin is compatible with Beacons from all the different vendors.

Myth #4:Beacons Are Not Compatible With Other Geofencing Technology

Plot Projects solution has support for both beacons and geofencing, so it’s possible to use geofencing and Beacons in one campaign. Plot Projects also works well alongside other geofencing and Beacon plugins within one app.

Myth #5: It’s Hard To Keep Track Of All My Beacons

The Plot Projects dashboard has a feature that enables you to put Beacons on a map so that you know where they are in the real world.

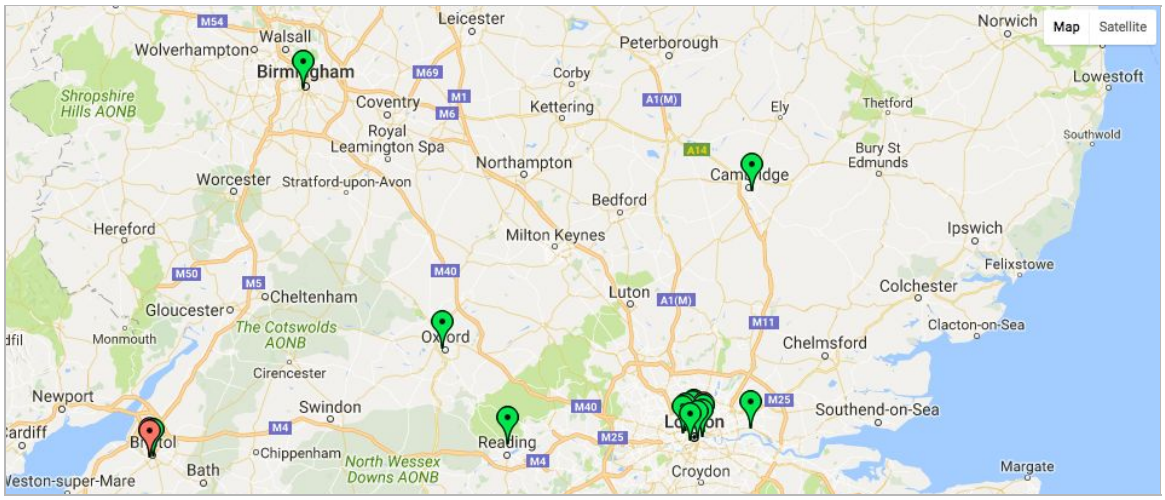


Figure 4: A map from the Plot Projects dashboard showing how Beacon location can be tracked

Myth #6: It Is hard To Manage So Many Physical Beacons

With Plot Projects, Beacons can be managed in a similar way to your geofences. Once you have your Beacons on a map, they are very easy to manage. For example with Plot Projects you can add opening hours to your Beacons. Also, the system keeps track of which time zone a beacon is in, so you can set up just one campaign countrywide.

You can also manage sets of Beacons to make it easier to create, analyze and optimize large beacon campaigns. This reduces a lot of the management work when running campaigns.

3. Introduction to Location Based Notifications

3.1 What Is A Push Notification?

A push notification is a way for an app to send you a message without you actually opening the app. Hence the notification is “pushed” to you without needing you to do anything about it. This is very similar to an SMS or email appearing on your smartphone.

3.2 What Is A Location Based Notification?

A location based notification is an alert message on your smartphone that is triggered when you enter a specific place.

When given permission by the user, apps can obtain the user’s geographical location. As a result, when the user is inside a specified geofence, the app can then trigger a push notification with a highly relevant message, piece of information or a discount.

Some examples of location based notifications are:

- When an user enters a mall, they receive a notification on their smartphone with coupons for stores closeby based on preferences they indicated when they first installed the app
- When an app users arrives at a metro station, they receive a notification on their smartphone informing them that there are severe delays on a specific line. The notification asks the user to open the app to find an alternative route

Here are some examples of notifications themselves:

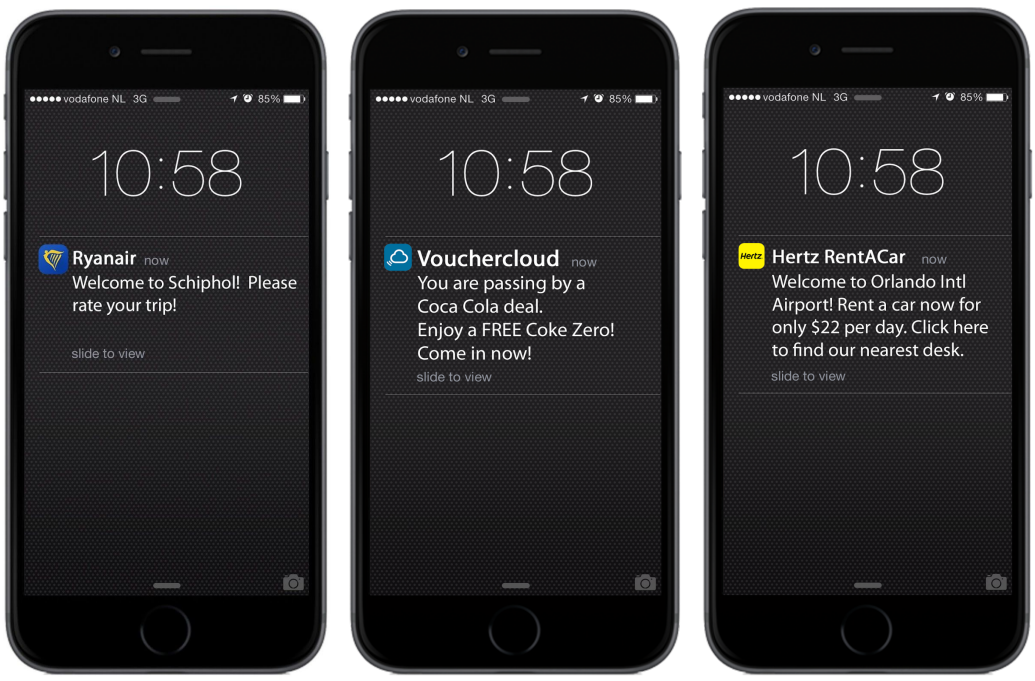


Figure 5: Examples of different types of location based push notifications

3.3 How Are Location-Based Push Notifications Used

The message in your location-based push notification can be anything. Notifications are best utilised when they provide users with information that leads to them taking a certain action e.g. redeeming a coupon. Because you are able to target the app user at a specific location when they enter one of your geofences, you are able to provide them with highly relevant and timely information. This means your app users are more likely to engage with your message and thereby are more likely to take a suggested action.

Some example of how push notifications have been used with geofencing technology are:

- **Capture Real-Time Feedback**

  Gathering user feedback on their experience immediately following a meal, movie or grocery shopping trip is more authentic than waiting for consumers to fill out a survey days later. With geofencing, companies can trigger a few simple questions to appear on a user's smartphone as soon as they walk out of a specified geofence. For example, Ryanair app users are automatically asked a few simple questions on their flight experience as soon as they land at the airport of arrival.

- **Offer Hyper Local Deals**

  Instead of sending emails with coupons, companies can directly send promotions to a consumers' smartphones the moment they enter the vicinity of a retail store or restaurant. The consumer is no longer tasked with remembering to bring the coupon and as the coupon is presented to the user at the most optimum time and in the most optimum location, the redeem rate is much higher.

- **Offer An Order Ahead Service**

  Trigger app users to order as they are approaching a store. This can be very useful for businesses such as coffee shops, where users can avoid queues and waiting time, but ordering and paying for a coffee in advance through the app and collecting in store. It can also mean that customers don't go to a competitor when they see long queue.

- **Provide Relevant And Timely Information**

  Instead of relying on passengers at an airport to search for the check-in desk, departure gate and keep themselves updates on last minute changes, this information can be provided directly to user's phone as soon as arrive at the airport. It provides as much better user experience and can lower the risk of late passengers, which are a major cause of delays.

- **Retargeting**

  You can target people that have visited certain locations previously. By utilising your app user's location history, app administrators can make their mobile targeting a lot more effective. For example, if an app user has visited a store and received a push notification that was not acted upon then you might want them to receive a different message for the second time round.

- **Targeting Competitors Locations**

  You can set up location based notifications for your competitors' locations and try to lure them away to your business!

4. Introduction To Geotriggers

4.1 What Are Geotriggers?

A geotrigger is a ‘ping’ that a mobile device with your app installed sends when it enters a geofence. It works in the same way as a location based notification, but does not send a push notification to the user. This makes it possible for app administrators to collect location data from users without having to send a single push notification.

The range and accuracy of geotriggers is exactly the same as the geofencing notification campaigns that you would create. The range of a Geotrigger is from 50 to 50’000 meters. The accuracy of Geotrigger is about 10 meters.

4.2 What Is Location History?

With a set of geotriggers you can build up a picture of their location history and which geofences they have entered and exited. This can be used to improve targeting of users individually or to build up a larger picture of how all of your app users move across a larger area e.g. throughout a city or how spread out they are across a country.

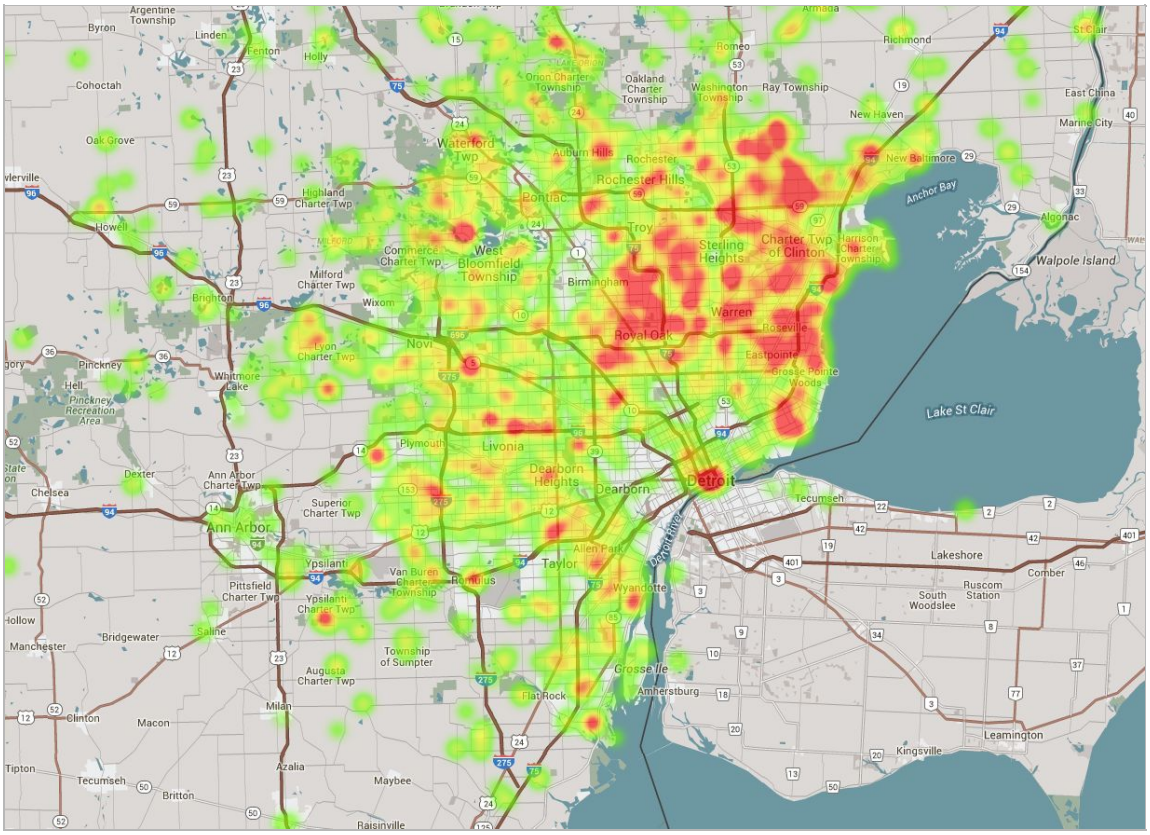


Figure 6: Image of a heatmap for the city of Detroit created by a large number of geotriggers

4.3 How Are Geotriggers Used?

As app administrators thrive on data to improve their user experience and engagement, location based data is also an important component to understand their users' behaviour in the real world.

Businesses such as brick and mortar stores see location data as important for making important business decisions e.g. where should I open my next store.

Geotriggers are an excellent way of collecting valuable location data easily and efficiently.

Some example of how geotriggers have been used are:

- **Track Key Metrics**

  By learning when users enter and exit a geofence, apps can discover how long consumers spend in a certain place such as a bar or store, when they visit and how often they return. Combining these metrics with online activity, purchase information and web browsing can help any business get a better overall sense of consumers purchasing habits online versus in person.

- **Gauge The Effectiveness Of Offline Advertising**

  By incorporating geofences into an advertising campaign, such as a billboard, agencies can find out how effective print ads are by comparing the number of store visits from consumers who saw the ad versus consumers who were not exposed to the campaign.

- **Make Smart Home Apps Smarter**

  Smart home apps can use geotriggers to know when users (and their smartphones) leave their home. The app can then automatically switch to "nobody's home" mode and save on energy.

- **Retargeting**

  You can target people that have visited certain locations previously. By utilising your app user's location history, app administrators can make their mobile targeting a lot more effective. For example, if an app user has visited a store twice, you can wait until the third visit before you give this person a coupon to try to close the sale. This way you are making your mobile marketing efforts more personalised, but spending your budget wisely and not just giving out coupons to everyone.

- **Understand Population Movements**

  By creating multiple geofences throughout an area such a city, you can see over a period of time what people's movement patterns are. You can easily learn things such as what times of day or days of the week people visit a location that you are interested in. By creating heatmaps you can also see the concentration of people at a particular location. This can be useful for improving distribution of your product or deciding where you open a new branch of your business.

5. Why Use Geofencing As Part Of Your Marketing Mix?

5.1 Activate Your Users

People are bombarded with advertising everywhere they go. A lot of advertising is mass marketing and not well targeted. Location based push notification are not only well targeted by location and their timeliness, but apps can also further segment and personalise push notifications using data that they have from user profiles and personal preferences.

Plot Projects technology is specifically designed to use this data to enhance the targeting of marketing even further.

Furthermore, although people download apps, the statistics on engagement are poor:

- One year after downloading an app, only 4% of users continue using the app
- On average every users has 100 apps on their phone. However people only use on average five apps a day
- 26% of people open an app once and never use it again.

If used effectively, geofencing can increase your app usage, leading to higher customer engagement. Recent studies concluded that 70% of consumers find location-based notifications to be valuable and 53% of them are likely to engage with location-based advertising.

But push notifications need to be done properly as irrelevant messages and spamming can have a negative impact. 78% of those who enabled push notifications on their smartphones claimed that they would disable them, or even delete the application if they were unhappy with what they received. By using location and time as targeting criteria, messages become more relevant. Everyone receives a message only when it is relevant to them, and not as part of a mass-target campaign.

“70% of consumers find location-based notifications to be valuable.”

So it’s important to make your notifications relevant and personalised as much as possible. This is where Plot Projects’ expertise can help to build the best possible campaign and to leverage the features put in place to ensure that the right message reaches the right users at the right time and that spamming doesn’t occur.

5.2 Drive Revenue

Users are stimulated when they are offered a discount. 47% of consumers surveyed stated that they would be likely to shop from a retailer that offered promotions when they are nearby.

As a result of building thought out and effective campaigns, Plot Projects customers have achieved an increase in click-through-rates (CTR) of 40% for retail and 33% for restaurants. Comparing this to the CTR for generic push notifications which is just 2% and for mobile banners is 0.01-1%, this is an excellent result!

“Geofencing CTRs: 40% for retail and 33% for restaurants”

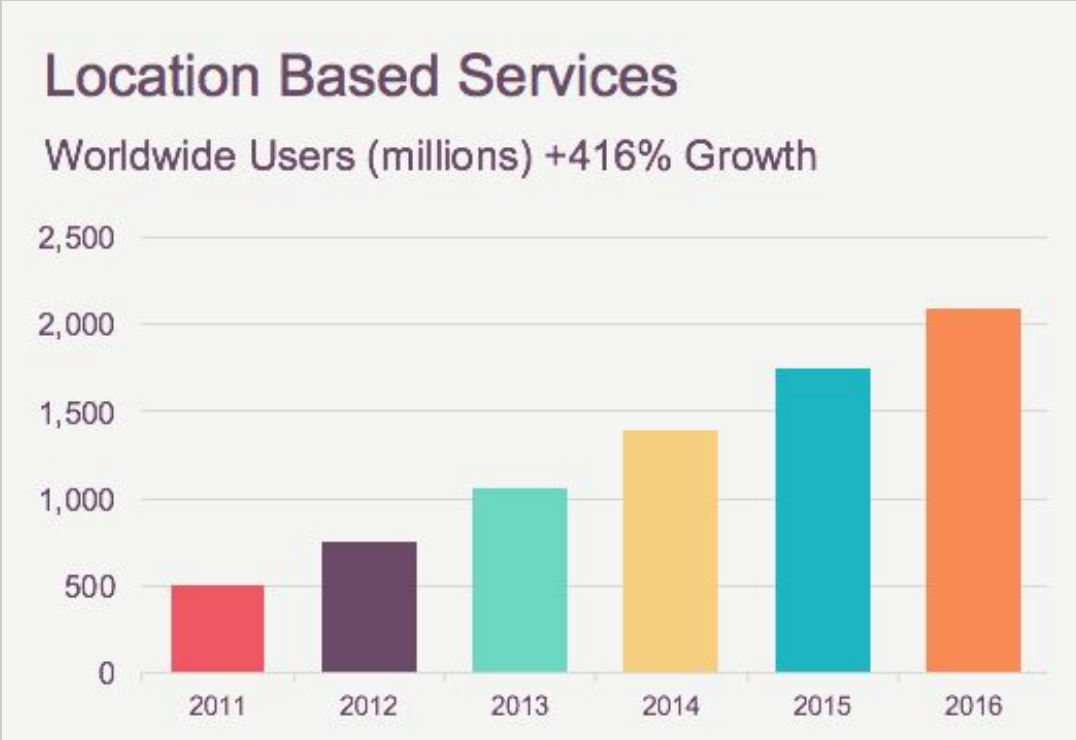


Figure 6: Chart showing strong growth in location based marketing spend. Source: eMarketer

5.3 Leverage Customer Insights

You can collect data on your user's behaviour and location history by using Geotriggers. Since a geotrigger is a 'ping' that a mobile device with you app installed sends when it enters a geofence, you can start collecting location data very quickly and efficiently.

This can include when users enter and leave a geofence, giving you the ability to calculate the dwell time of your users in a particular location that is of interest to you. Since geotriggers can be used in conjunction with Beacons as well, you can collect data that is hyper local.

This data can be used to improve product distribution or to understand people and traffic movements on a large scale, or even to help you to understand how many passers by you have for each billboard that you are advertising on.

Location data can also be leveraged by combining it with your app data or any other data that you have for your business, giving you another dimension to your analysis.

5.4 A Growing Industry

It is expected that the real-time mobile location-based marketing and advertising market will reach $9 billion by 2017. Location based marketing is still a small subset of overall marketing, but it growing fast. It is a great way to stay ahead of your competitors and to build up the loyalty of your users early on, before everyone else catches on!

6. Features To Look For When Choosing A Geofencing Partner

Before getting started with your location based marketing campaign it is important to find out what features to look for when choosing a partner to work with. An average tool versus a great tool can really make a difference to the success of your marketing campaign. Often it is possible to try before you buy, so here is also a checklist for what to look for and why:

6.1 Geofence, Geotrigger & Beacon Management

- Ensure that you have the option to run a variety of campaigns using geofences, geotriggers and Beacons either separately or in conjunction with one another
- Manage sets of geofences and beacons rather an each one individually

6.2 Campaign Management

- Create and manage your own campaigns using geofences, geotriggers and beacons on one dashboard
- Have multiple campaigns, each with an unlimited number of geofences running in parallel. Make sure you can upload locations via a spreadsheet and/or via an API connection.
- Define the locations for your geofences and Beacons - via a google map is best, the radius of your geofence and what times the campaign should be in effect e.g. opening hours of a store or weekdays only
- App cool down and non-resendability tools to ensure that your app users don't receive too many notifications in a short space of time. You don't want to spam your users

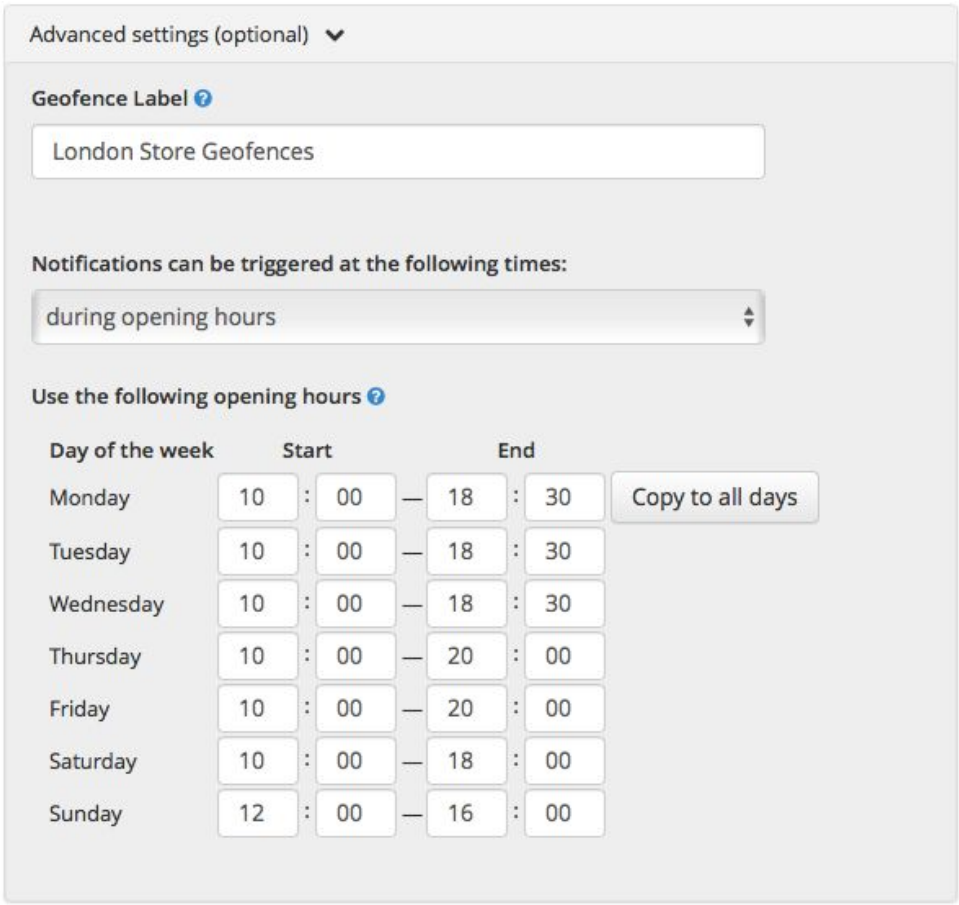


Figure 9: How opening hours can be set so that notifications are only sent when a store is open

6.3 Dynamic Notifications

- Ensure the right message is delivered to the right user, maximising the level of engagement
- Specify exactly where a user is to be sent when they respond to a notification e.g. a webpage or to a specific location in the app
- Use placeholders in the notification message e.g. You are near {geofence name} (this will be replaced by e.g. Costa Coffee in Kings Cross when the message is sent), get 10% off today! This makes the message more personalised
- Send notifications when people enter, exit or linger in a place for a period of time

6.4 Data Collection

- Record a geotrigger instead of sending a location based push notification for when a user enters or exits a geofence. This is useful for creating smoke tests before you start to send push notifications to users
- Collect data to generate detailed population heatmaps! This enables you to harness valuable information about where potential customers are located. Find the next new spot for your business to be located.

6.5 Advanced Segmentation

- A/B testing to test the effectiveness of your messages and/or offers
- Segment notifications based on your users characteristics to increase relevance even further
- Filter notifications to only show notifications that match the preferences of your users

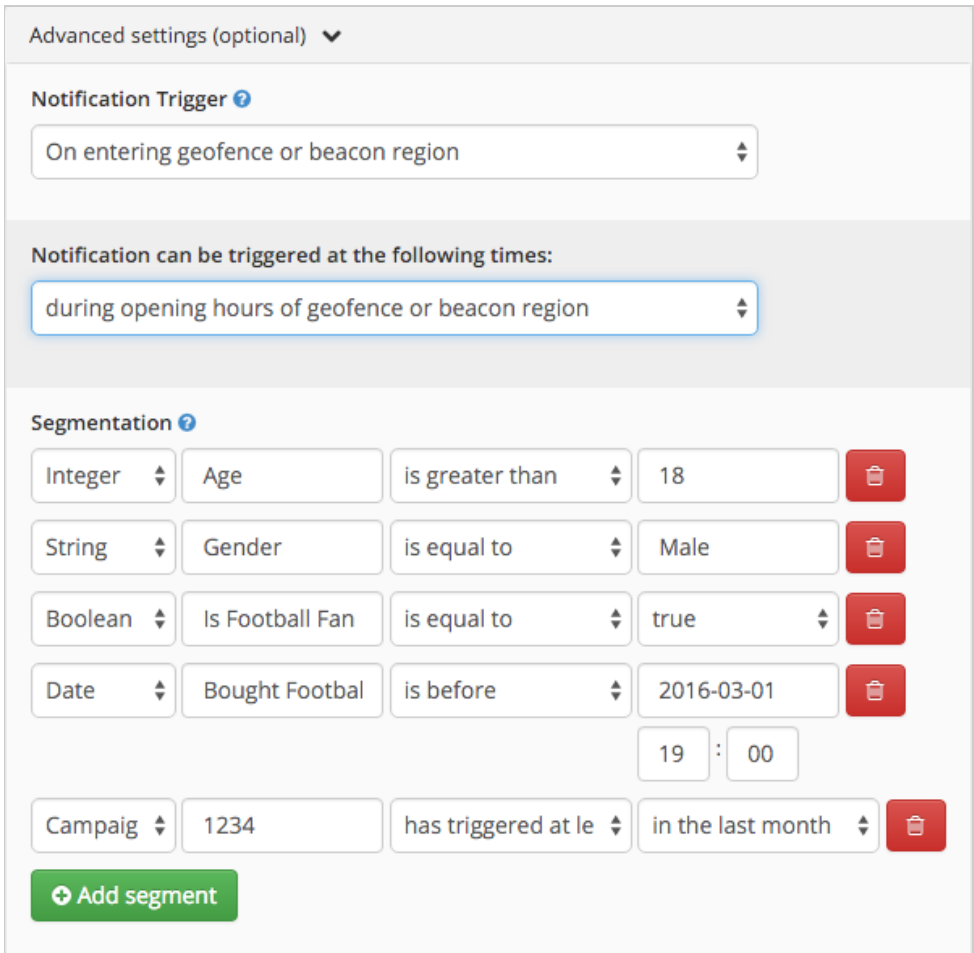


Figure 10: How segmentation can be used to create personalised marketing campaigns

6.6 In Depth Analytics

- Measure the success of your campaigns with click through rates (CTR)
- Get custom reports that are generated for specific campaigns
- Breakdown data to get the information you need and combine with with your own app data. At Plot Projects we provide data via our dashboard API. Data can be easily integrated into other systems for example Google Analytics or Localytics.

7. Build It Yourself Or Buy?

7.1 Why Don't I Build Geofencing Into My Application Myself?

There are various things that app owners need to weigh up when thinking about whether to build or buy geofencing capability, including cost, quality of features and scalability.

Here are some great reasons as to why it is quick, easy, cheap and efficient to use a vendor such as Plot Projects for all of your geofencing needs:

- **Development And Time To Market**

  With geofencing, if you would build it in your own app, you will have to make all of your fences and locations hard-coded into your app. This means that you have to resubmit your app every time you want to add a new geofence, which is impractical. With Plot Projects you don't have to worry about development and the associated costs and can just focus on improving your app and managing your geofencing campaigns.

- **Managing Location Based Campaigns**

  At Plot Projects, we want customers to be able to update their geofences remotely, to change them and to manage large campaigns with ease. We also want to offer control and visibility via a dashboard, that app developers don't have to build themselves. Building a dashboard for users is a big project and is better left to a specialized supplier, while you focus on your app and marketing.

- **Battery Usage**

  If not implemented properly geofencing can lead to faster battery drain. If the user gets wind of this, then they are likely to remove what is causing the problem! Plot Projects technology has been optimised to prevent battery drain over the years and we have built up real expertise in this area.

- **Number Of Geofences**

  By default, iOS and Android only support a limited number of location (20 and 100 geofences and/or Beacons respectively). Using Plot Projects you can get around this limitation to created an unlimited amount of geofences and use an unlimited number of Beacons

- **Scalability**

  By continuously tracking all your users' location and making sure they are 'listening' to all the geofences and beacons that are near them will cause a huge server load. Plot Projects' backend is designed very efficiently and guarantees the smooth running of your location based campaigns even if your user base and number of locations is growing explosively.

- **The Best Expertise And The Latest Functionality**

  Do you have the relevant expertise in location based marketing to build high-converting campaigns? Plot Projects has many years of experience in location based marketing. We know exactly what it is needed for an effective campaign that would help you achieve your marketing goals. Some of the largest apps in the world and the Plot Projects team jointly run hundreds of successful location based campaigns per year for marketing leaders in retail, finance and travel. This allows us to benchmark your campaigns and improve them.

  The world of location based mobile marketing is changing fast and so is our service. Plot Projects is always ahead of developments in the market, whether it comes to new platforms, technology or functionality.

- **Relevancy And Personalization**

  Additional features such as segmentation and personalised campaigns are unique to Plot Projects. Building these yourself would consist of a lot of development work that companies such as Plot Projects have taken to build up expertise on.

- **And Lastly...**

  ...it only takes minutes to get started!