Dublin Street Parking

An application proposal for on-street parking

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Problem | An overview

The process of finding and paying for on-street parking in Dublin is more complicated than it needs to be.

Parking compliantly on Dublin's streets to avoid clamping, means the user must:

- Find an appropriate space with little or no assistance.
- Predict what the duration of their parking will be.
- Navigate a relatively complex multi-zone system.
- Pay using an authorised method.
- Top-up their parking if and when delayed.

The headache is further exacerbated when you consider that Dublin's multi-zone system for on-street parking features:

- Over 50 zone codes,
- Approximately 20 different rates, and;
- 5 possible methods of payment.

If the user is unfortunate enough to be clamped, they must engage with a completely different system to have the clamp removed.

The anatomy of the problem

If you drive a car, logic dictates that at some point you will have to park it.

Rules

To control parking activity, local authorities have regulations in place governing:

- where motorists can park,
- for how long, and;
- at what cost.

User experience

Although it may seem as though these constraints might make parking clear and straightforward, our research indicates that the system operated by Dublin's local authorities can be:

- hard to access (i.e. find parking spots),
- confusing to cost,
- tricky to manage.

Flawed solution

The existing 'Parking Tag' app was originally launched to improve the user experience - but our research (both qualitative and quantitative) shows that confusion and complexity still dog the system, making it difficult for users to navigate.

Our approach

We aim to add functionality while streamlining the system and its processes, for the benefit of both user and provider.

Who is affected and how?

Everyone who drives a car in Dublin is potentially affected by this problem.
Even frequent users, familiar with the system and its quirks, can still get caught out and clamped.

Impact on users

There are number of elements of the current system that have an impact on users, the most obvious of which is that a complex system increases the likelihood of errors, resulting in users being clamped and having to pay an €80 release fee.

Other factors which impact on users include:

- Frustration at having to predict the parking duration - an inexact science at best.
- Overestimating the duration of their parking to err on the side of caution - thereby increasing the cost.
- The distraction of having to check the clock/phone at all times in case they exceed their time limit.
- Being charged for reminder text messages, that should be possible to send as push notifications through the app.
- Frustration at having to check physical signage to confirm information provided by the app.
- Wasting valuable time driving around looking for a free space - no means of flagging these through the app.

There are also ramifications for the providers of on-street parking services - Dublin's Local Authorities. A complex system that users feel could offer more functionality, more efficiently, can turn some off using the service altogether.

Impact on providers

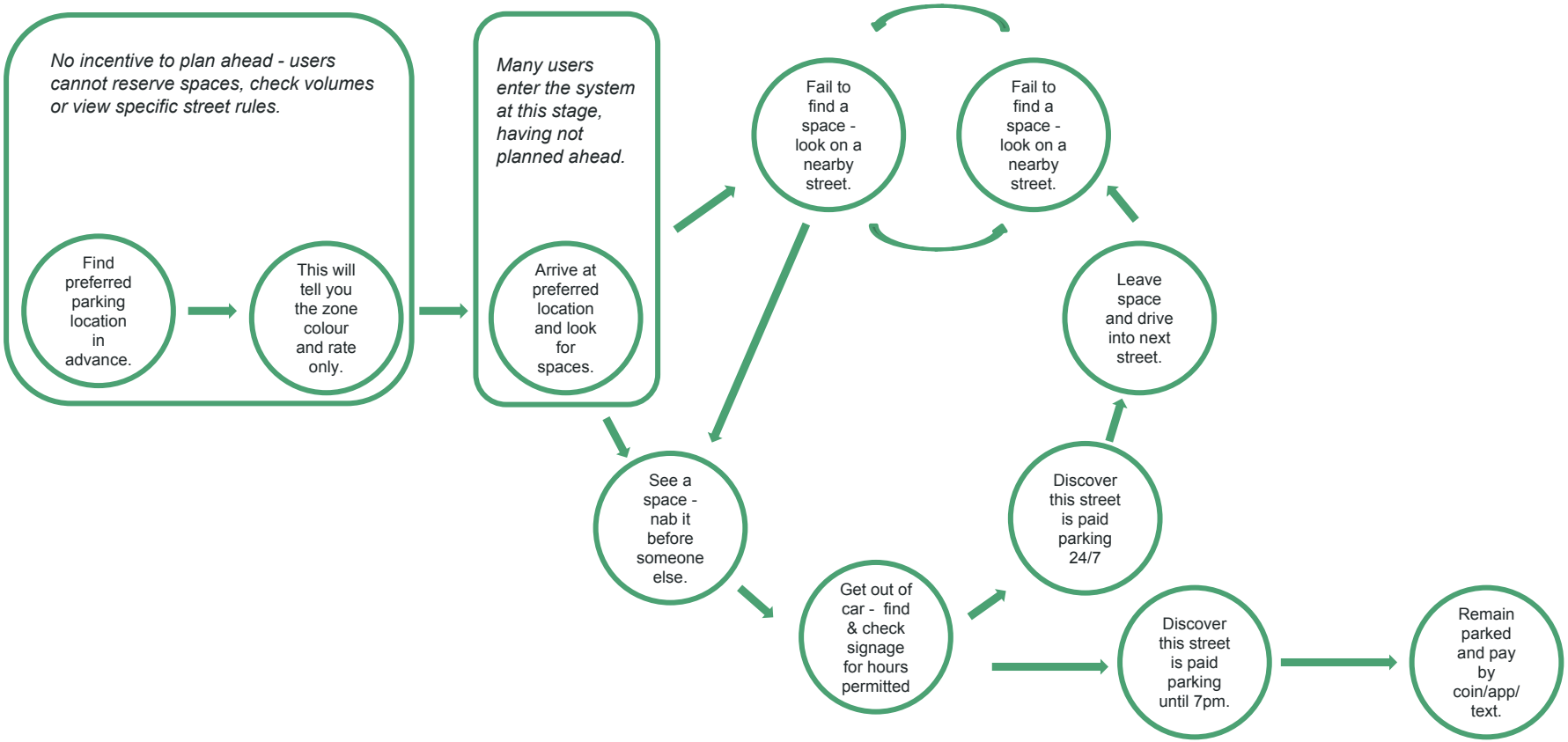
The system is instantly identifiable as a Local Authority initiative and so negative experiences using it, reflect negatively on the Local Authorities themselves.

Although Dublin City Council is in general trying to reduce the volume of cars in the city, official reports and policy documents confirm that they wish to retain a healthy degree of traffic and parking in the city to maintain retail business and generate footfall. A complex on-street parking system will not incentivise people to use it. Assisting motorists to find parking spots is a significant element of this.

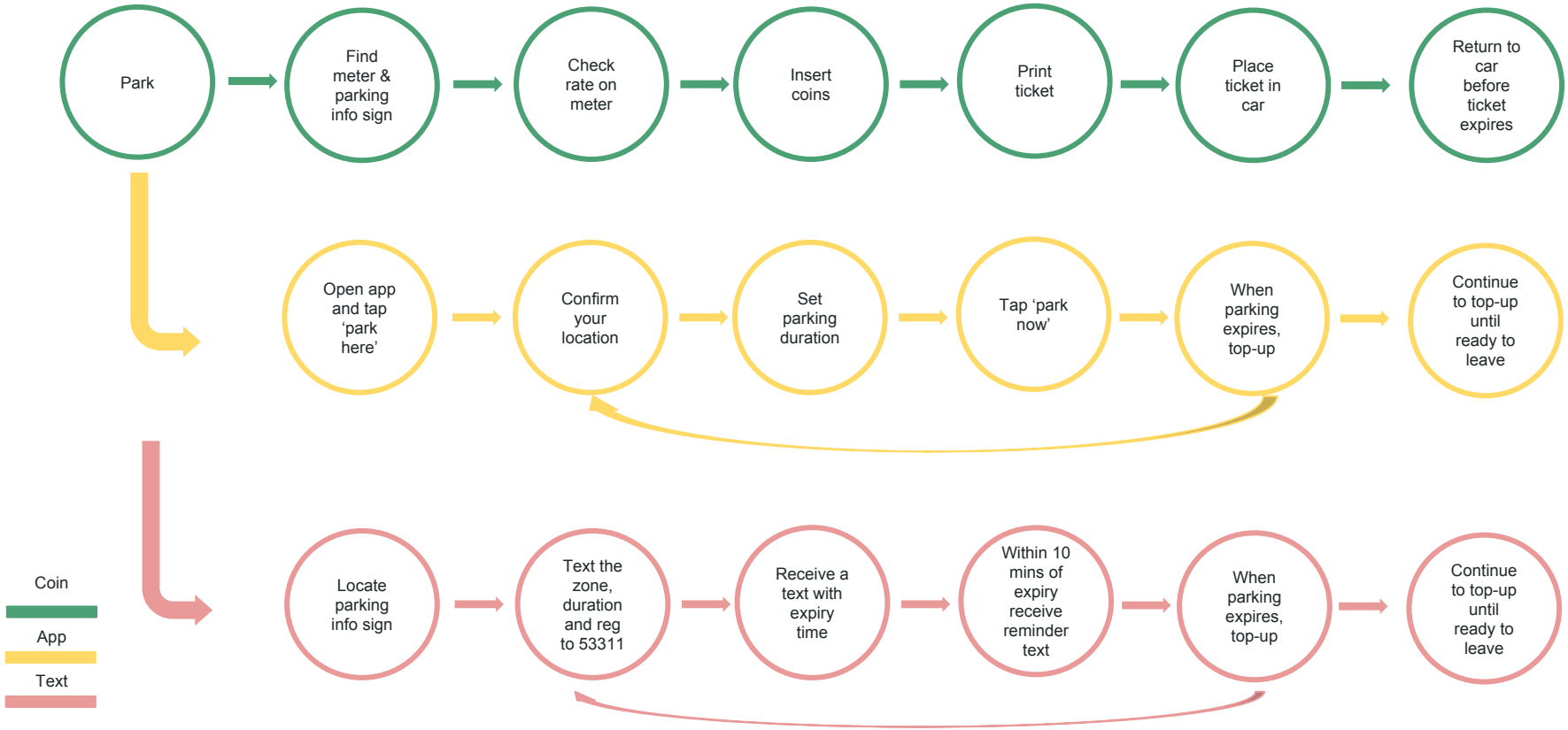
> *"By informing motorists in advance of the core central area, decisions on car parking can be made in a predetermined manner, thus minimising the number of entry routings necessary for vehicular access through the central area."*
> Dublin City Centre Transport Study Consultation Document (Dublin City Council, 2015)

The report targets traffic congestion from people looking to park and aims for improved management systems within the city center. It states how clearly defined routings to car parking spaces will aid drivers' decision making and reduce circulating traffic looking for parking. This will reduce journey times and congestion in the core city centre for private vehicles.

Charting the current system: finding a space



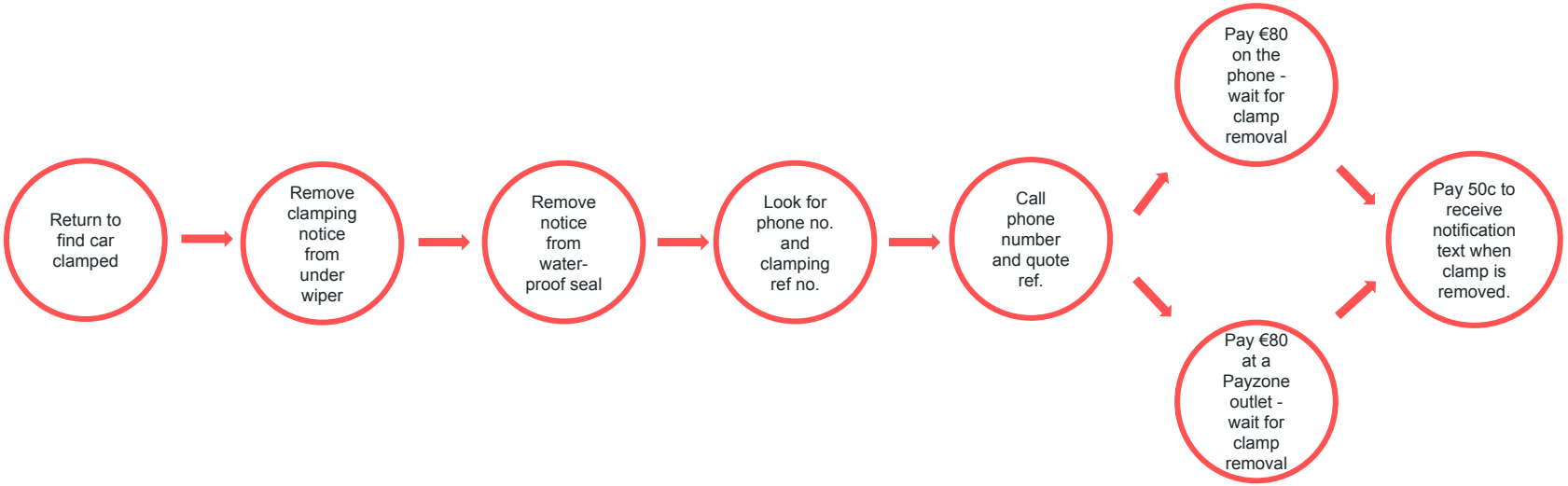
Charting the current system: paying for parking



Charting the current system: getting clamped

Failure to top-up parking when prompted can result in your car being clamped - incurring a fee of €80 for removal.

Authorities aim to remove clamps within 1 hour of fine payment - but this is not always possible.
During our research, we met users who had waited over 2 hours to have their vehicles unclamped.



Key Findings & Insights

- ➔ The system features somewhat siloed processes; finding, paying and clamping.
- ➔ Each process is more complex than it needs to be.
- ➔ Information is provided to users at different stages through different channels.
- ➔ The onus is on the user to seek and sometimes pay for information.
- ➔ The Parking Tag app is a preferable alternative to using coin in meters, but it creates as many problems as it solves.

2. Analysis of Service Providers

- ➔ Parking systems and apps from around the world;
  London, New York & San Francisco
- ➔ Parking systems and apps in Irish cities;
  Galway, Cork, Limerick
- ➔ Key insights and findings

London

On-Street Parking System:

Pay & display schemes and congestion charges for central areas of the city. Street signs indicate local rules. Most streets in central London have parking meters, with the parking bay marked out. Many central London areas operate *'Pay by Phone'* parking only. Residents get permits but getting guest passes can be a hassle often having to go to the local library.

Methods of payment:

- Parking meters
- Pay by phone call systems
- Parking apps

New York

On-Street Parking System:

Alternate-side street parking in Manhattan as streets are cleaned twice weekly. Street signs indicate details. Residents who are extremely possessive of 'their' parking spots. If you are parking in a certain area for the first time, it's best to have a friendly conversation with the other car parkers just to make note of the general policies (official and unofficial) in the area.

Methods of payment:

- Parking meters
- Muni-meter parking card that you can load up in advance and then use as a debit card at many meters
- Parking apps

San Francisco

On-Street Parking System:

SFpark changes meter rates based on parking demand to maintain an average occupancy between 60 and 80 percent; when parking on a street is too full (or too empty), the hourly price goes up (or down) to free up (or fill up) spaces. The goal is to distribute parking more evenly and, more critically, to reduce time spent cruising for a space.

Methods of payment:

- Parking meters with varying rates depending on occupancy
- Parking apps

JustPark

JustPark is a UK based service that allows people to find parking in London. It contains parking from a variety of different sources, including on street parking. JustPark's unique selling point is that it allows people to upload private spaces and make them available to rent, in the same way Airbnb works with properties.

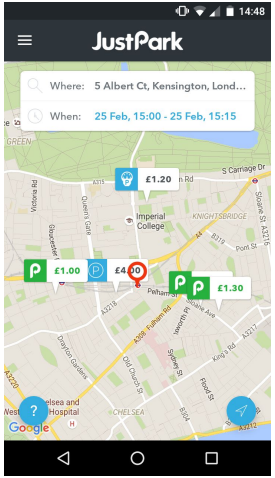


Fig. 1 shows a user searching for parking, using a time and place

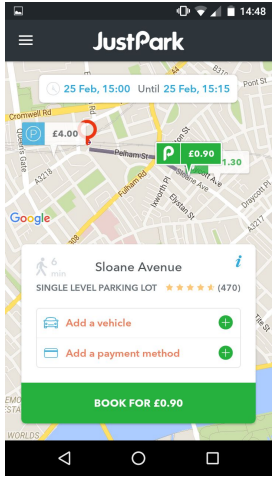


Fig. 2 shows a user selecting a space and paying for it

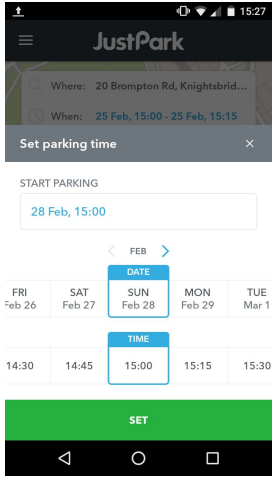


Fig. 3 shows a user inputting the time and date for their search

User flow

Users search for a parking space by entering their desired location, or moving around on the map with the red icon (shown fig. 1). JustPark displays all available spaces in the area, and uses icons & color to show the user the different space types. Users can select their desired parking spot by tapping the icon. This allows them to book and pay for this space.

Analysis

JustPark is highly innovative in its core concept: allowing private parking space owners to easily rent out their spaces. The basic user flow of searching and booking is a common one, and it is found throughout the apps that were tested. This user flow works fine for people who look for parking in advance, but does not for the second use case of driver's looking for parking once they have arrived at their destination. User's would have to find somewhere to stop their car, find their space using the app and then work out how to get there. The app doesn't contain a navigation aid for people who are driving, like a voice GPS system.

Aesthetically, the app has its own distinct, recognisable style. While using google maps as a base for most screens, it accentuates this with distinct iconography, using the 'P' JustPark logo continually to show spaces that would not be available through other services. Overall, it is clean, crisp and modern. It focuses on what the user needs from it: where the spaces are, and how much they cost.

JustPark has some nice interactions, such as the time and date selector shown in Fig. 3. It is simple and intuitive, with minimal input required from the user. A swipe to the left or right will allow the user to input dates and times.

Smooth Parking

Smooth Parking is a US based service that offers real time data on available parking in New York. It focusses on on-street parking, allowing users to see what streets have parking spaces on them. The app overlays data onto a Google map, allowing the user to scroll to search the surrounding area. The app also allows users to save places the have parked. Users are not able to book or pay for parking through the app.

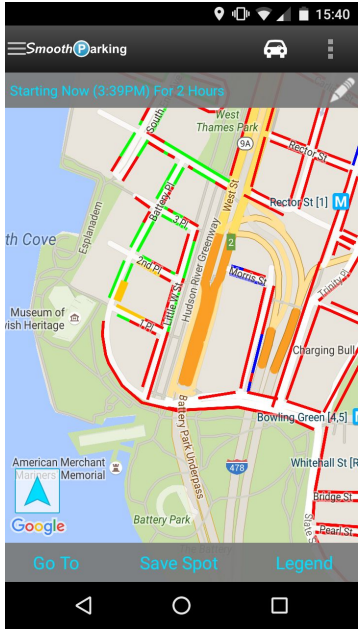


Fig. 4 A user searching for parking by browsing the map. Focusses on user using GPS.

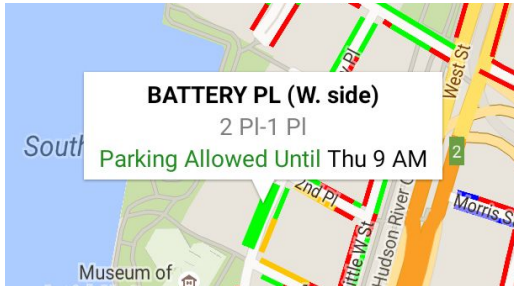


Fig. 5 A user selecting a parking area to view more details about it

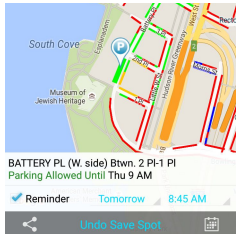


Fig. 6 A user saving their parking spot

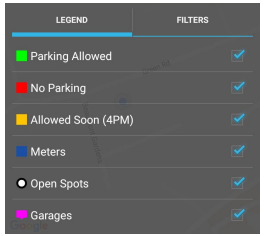


Fig. 7 A user saving their parking spot

User flow

The user flow is a very simple one. The primary focus of the app is relaying data to the user. When the app is opened, the map pans to where the user currently is. This allows them to see where in the surrounding area they are able to park.

Analysis

By design, Smooth Parking is very stripped back, and does not include many features that other parking apps do. Users can not book or reserve parking in the app, nor can they pay for parking. This is by design, and allows Smooth Parking to very effectively succeed in its main aim: inform the user where they are able to park. It achieves this through simple colored lines overlaid onto a map. It is designed for a quick glance, transferring information to the user in as short a time as possible.

While the app effectively completes its main goal, the app suffers from a number of usability issues:

- Colored lines are tappable for more information, but they are very small and difficult to hit
- The details panel (fig.5) that appears on tap also lacks information, like pricing
- It is unclear what function icons and links will do when you tap them (like the car in the upper right corner of fig.4)

Aesthetically, the app looks outdated, and the grey and blue used throughout the menus is reminiscent of early versions of Android and makes reading difficult. The visual design of the app doesn't complement its function - a more stripped back version of the interface would be better, allowing the user to focus on the map and the information it contains.

Parker

Parker is an American parking app that caters to multiple cities, including San Francisco. Similar to multiple other apps on the market, the main view is a map that centers on the user's GPS location. It maps out available parking on the map, and includes both on-street and parking lots. The app does not allow people to book or pay for spaces; it is intended to help people find available parking.

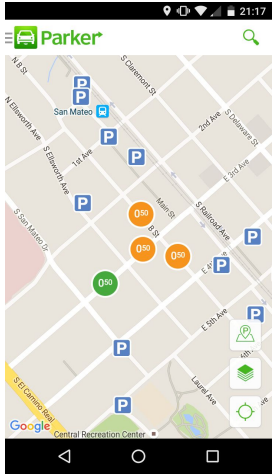


Fig. 8 A user has opened the app, and is shown this screen

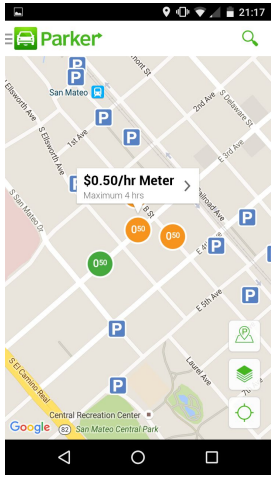


Fig. 9 A user taps a parking icon to find out some information about the space

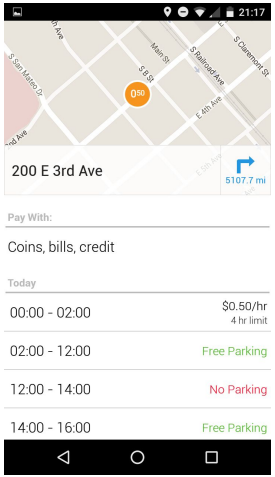


Fig. 10 A user has tapped the popup to display more detailed information about the space

User flow

On opening the app, the user is presented with a map of the surrounding location. They may browse by scrolling around on the map, and select parking by tapping on an icon. The icon displays some basic info (shown in fig. 8) about the parking area. By tapping the arrow, the user opens a menu (fig. 9) that shows more detailed information. The blue arrow symbol transfers the user to Google Maps, where they are given directions from their current position to the parking space.

Analysis

Parker has an unobtrusive interface, making it easy for the user to focus purely on the map. Icons contained within the map lack clarity though, with only some displaying price, and that price being confusingly displayed as '0.50' rather than '$0.50'. It also remains unclear what the colouring of the icons means - possibly the number of available spaces, but this is not stated anywhere. The popup shown in fig.9 also doesn't add much value - the user already knows the price from the icon.

Parker does have some useful functionality, and caters well to the context of the user. By handing the user over to Google Maps for directions, the user can be safely guided by Google's GPS without having to constantly try and look at the app for directions.

Visually, the app is seems light. Use of white across menus allows the user to stay focussed on the information in the map.

Galway

On-Street Parking System:

Pay and Display is the main type of parking available within Galway City. A ticket is purchased from a pay and display ticket machine in advance that entitles you to park on designated city streets or public car parks, for a set duration of time.The pay & display ticket must be clearly displayed/visible on the dashboard of your vehicle.

Galway City is currently calling for a new app to be developed to allow motorists to make the most of the new Parking Guidance Signs in the city. Currently the city has no parking app.

Methods of payment:

- Parking meters

Cork

On-Street Parking System:

Cork City Council operates a dual payment system using ParkMagic pay by phone and a Disc Parking system of payment for parking in Cork City Centre on street. Paid parking applies 6 days a week, Monday until Saturday from 8.30am until 6.30pm. ParkMagic uses a bar coded sticker for verification of payment status.

On arrival in the parking bay dial the ParkMagic parking number (0818 22 03 30) from your mobile phone and input the street number that you are parked on.

Methods of payment:

- Parking meters
- Phone app
- Dial call

Limerick

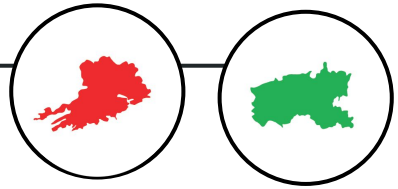
On-Street Parking System:

Limerick City and County Council operates a dual on-street parking payment system that incorporates disposable parking discs and an e-parking payment system.
The system can be accessed via desktop, a phone app, a mobile website or by calling a local number listed on parking signs.

Limerick City and County Council also operates disc parking. Parking discs are available to purchase in retail outlets.

Methods of payment:

- Parking discs
- Phone app
- Phone call



Parking Magic & E Parking

Parking magic offers a number of services related to parking including tolling tags and multi-story car park bookings. While it covers these services in a number of cities it's the main app for on-street parking in Cork City. E Parking is the parking app for on-street parking in Limerick City. From our research it appears that E Parking is essentially Parking Magic repackaged and rebranded by the same company for Limerick City. Apart from logos and branding. Both apps use the same system.

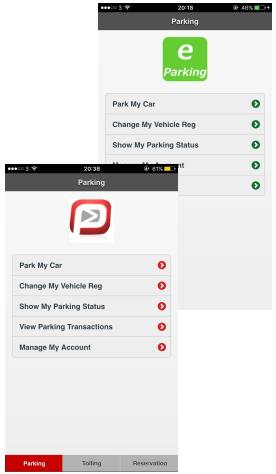


Fig. 11 General overview of user interface. Parking Magic and E Parking are the same app with different logos and colouring for Cork and Limerick

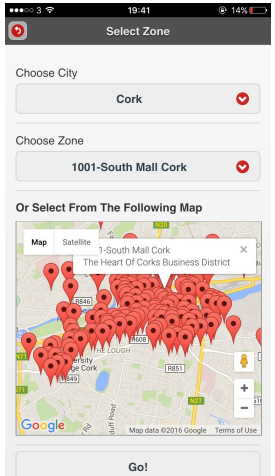


Fig. 12 A user has zoomed in with two fingers to find the pin relating to the street where they are parking

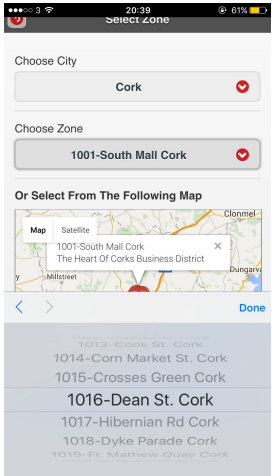


Fig. 13 A user searches for parking street/zone via a drop down scroll wheel instead of on the map

User flow

Opening the app, the user is given a basic screen with options relating to parking a car, checking the status of a parked car or other details relating to parking transactions(fig. 11). Parking a car is conducted via a Google Maps API where the user can select the street pin drop via a 2 fingered zoom in gesture(fig. 12), or via a drop down menu to select the street/zone in which they are parked (fig. 13).

Analysis

Parking Magic (E Parking in Limerick) is a very basic parking application for on-street parking. If suffers from a range of user experience and interface issues from broad illogical flows to overlooked details such as having all currency in dollars. Users top up their account via card however they are given no warnings for a low balance.

The main system of parking a car is a somewhat tedious task. As illustrated in fig. 12 the user must find their parking location amid a myriad of location pins. If the location is known and is selected from the drop down menu, this does not clarify the huge number of pins on screen. Furthermore the touch gestures are too multifaceted for clear navigation with single and dual finger contact both moving, selecting and zooming at the same time.

Visually the app has a poor corporate feel. It has a very basic user interface configuration and a dull design palette of greys with red (for Cork) and green (for Limerick) being the only contrasting colour used for buttons and selections. It feels unimaginative, unpleasant and nearly prototype in its rendering given its basic operation features and content mistakes.

Key Findings & Insights

- ➔ Poor usability very common.
- ➔ Unclear icons and content, leading to user comprehension issues.
- ➔ Little consideration for user context and habits - apps do not consider where and when they will be used, and are not optimized for usage in a car.
- ➔ Clunky, outdated visual designs that do not complement user workflows.
- ➔ Lots of apps lacking streamlined, simple workflows, with tedious input required for a simple task.

3. Parking Tag

- ➔ Parking zones in Dublin
- ➔ The Parking Tag app
- ➔ Payment mechanisms
- ➔ Aesthetics
- ➔ App flows
- ➔ Key insights and findings

Parking Zones in Dublin

The cost of on-street parking in Dublin depends on the 'Parking Zone' you are in. The zone is indicated by a coloured stripe on the streets signs (fig. 14) and on the ticket machine. However these signs are not always visible, obvious or indeed present.

Costs range from the "very high demand" zone (yellow) down to suburban villages (blue). However in the blue zone the local councils set their rates and use codes instead of colours (fig. 15)

The blue zone is not represented on any official Dublin City Council Map (fig. 16) and spans areas too numerous to demarcate on any phone app.

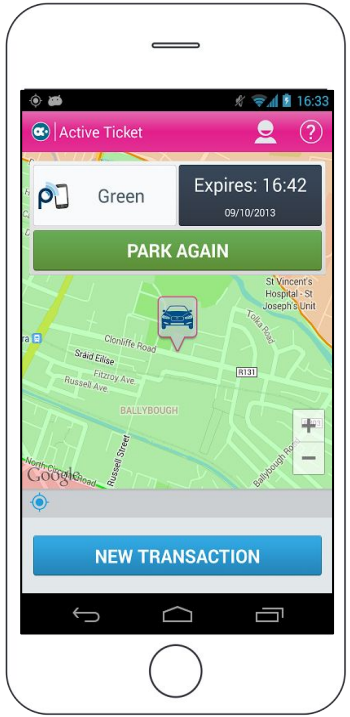
Parking Tag makes an attempt to address these zone boundaries.

Fig. 14 "Yellow Zone" street sign

Fig. 15 "Blue Zone" street sign - note the local authority code "DP"

Fig. 16 Dublin City Council Parking Zone Map

Parking Tag: Dublin's parking app



Parking Tag

Parking Tag is Dublin City Council's app that allows you to register and pay for on-street parking in Dublin and parts of Wicklow. You can create an account and register a payzone ID, debit or credit card to facilitate payments via the app. You can then use the app to log and pay for parking in real time. Parking Tag can also send you reminder texts 10 minutes before your parking expires, however, there is an added cost for this service and you must set it up in your preferences. Once parked, enforcement staff can check if a vehicle is legally parked by searching the car registration plate on their system. Customers with a Parking Tag account can pay for parking via: Text, app, or phone call.

Managing payment

The registered payment method for each account is used to automatically top-up your Parking Tag balance. This means that money is taken from your card and placed in your Parking Tag wallet, from where parking transactions are then deducted. Top-ups occur when your Parking Tag account reaches its nominated low-balance threshold.

Aesthetics

Parking Tag has characteristics of transient and sovereign posture apps. With the exception of the payment confirmation screen, all screens carry Payzone's corporate pink banner. A faint colour map is laid over google maps so users can detect which zone they are in. A light grey background and blue and green buttons complete the majority of the design components.

Parking Tag: Dublin's parking app

A. After registering an account with payment details, the user sets their low balance threshold and selects their top-up amount of choice. You can also set a reminder for alert texts when parking is about to expire.

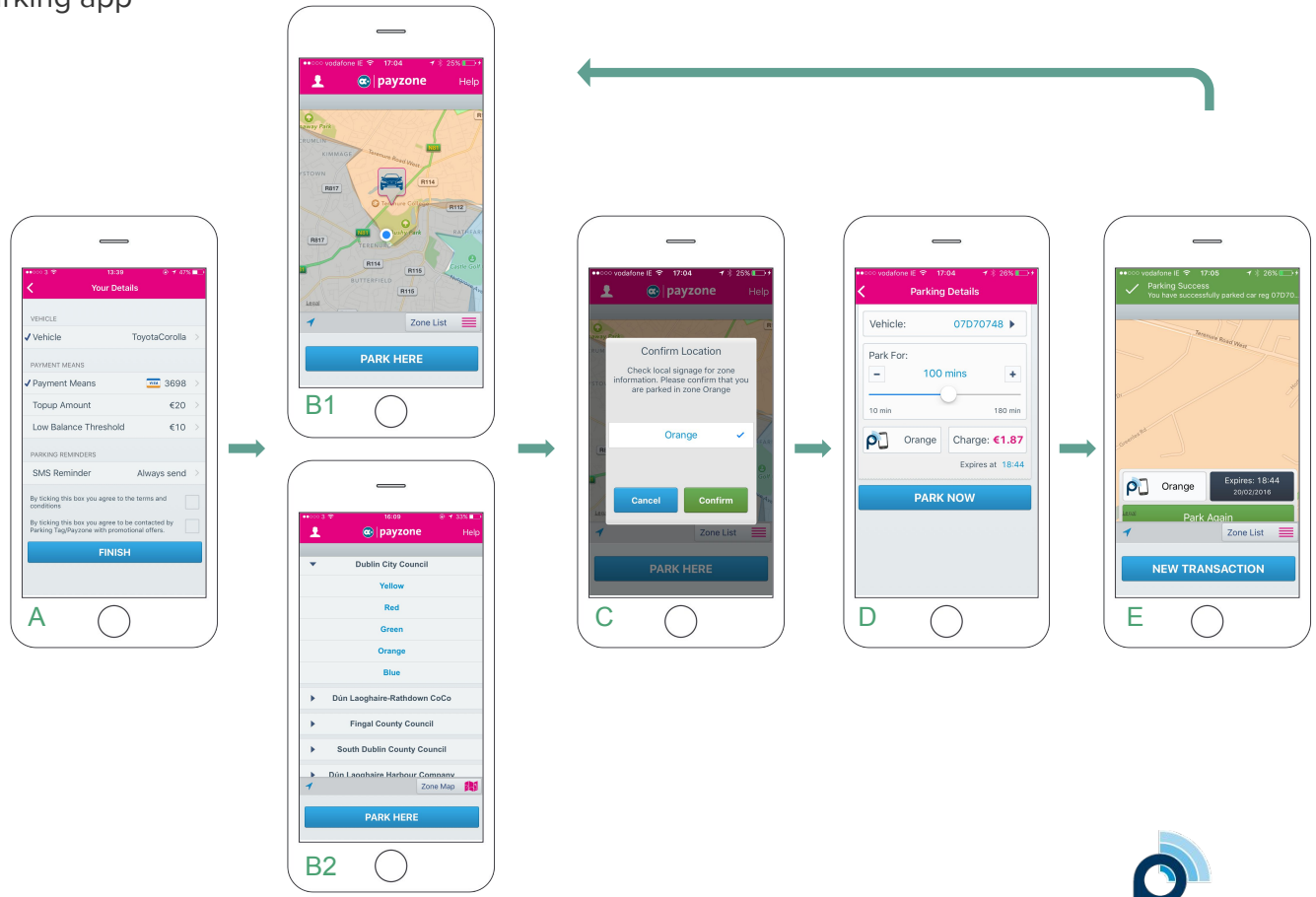
B1. The user finds an on-street parking spot. The app locates them on the map using GPS and they hit the "PARK HERE" button.

B2. If the user is having issues with the GPS they can select "Zone List" and manually select the zone where they are parking.

C. The onus is on the user to confirm that their location is correct as the zone pre-selected by the app is a best guess. The App prompts the user to check local signage to verify their selection.

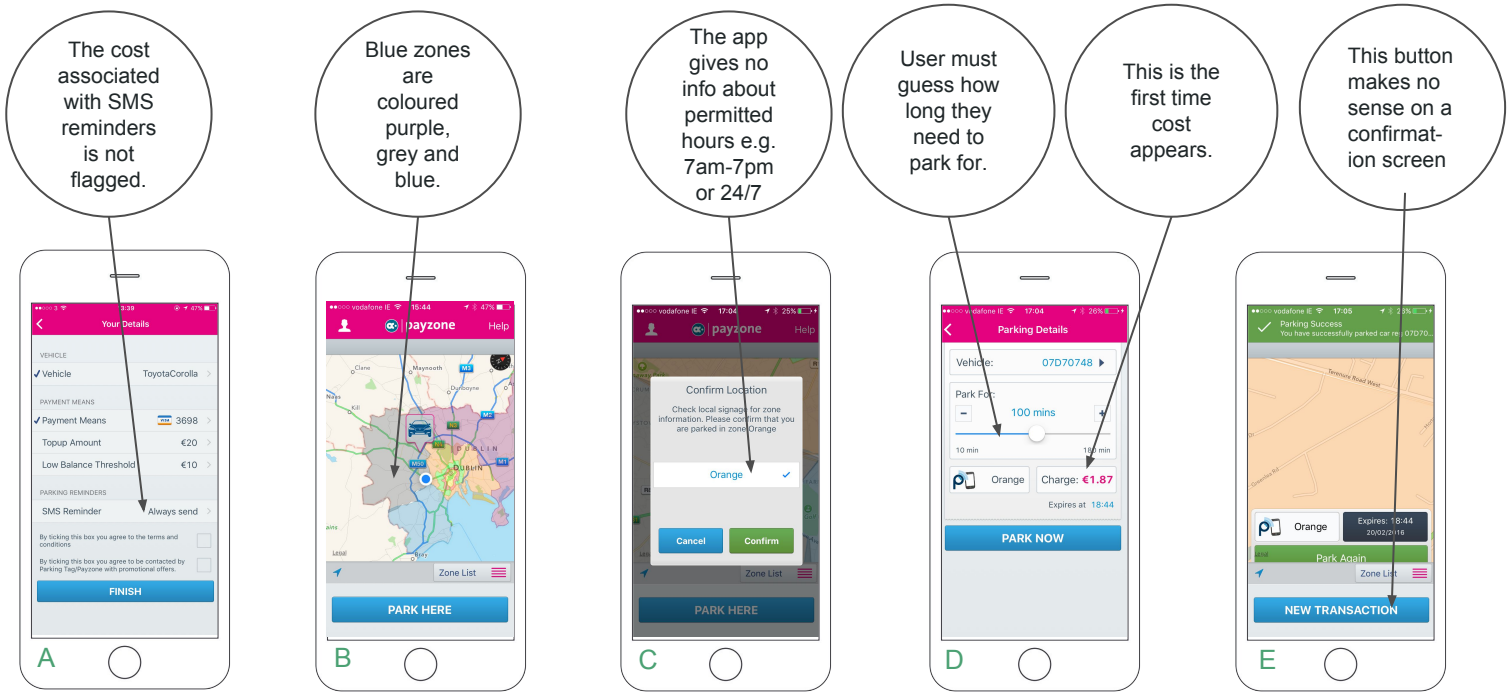
D. The user is given a slider as well as + and - operators to input the desired parking duration. The associated charge is displayed. By tapping 'park now' the user confirms the transaction.

E. Once the transaction is processed successfully, the app displays a confirmation screen detailing the zone and expiry time. To top-up their parking when it expires, they will need to go through the whole process again.



Parking Tag
Greamán Páirceála

Parking Tag: Dublin's parking app



Key Findings & Insights

- ➔ Local authority codes and zones are bloated and potentially confusing.
- ➔ The user must predict how long they wish to park for.
- ➔ There is no push notification on the app to flag for users that their parking is about to expire. Only a paid for text service alerts users.
- ➔ App workflows are convoluted and could be streamlined relatively easily.

4. Interviews & Surveys

- ➔ Qualitative user research
- ➔ Quotes
- ➔ Affinity diagram
- ➔ Survey results and findings
- ➔ Key insights and findings

Interviews | Qualitative user research

We conducted a set of interviews with a range of users - 10 in total - of varying ages, experience and engagement levels with Parking Tag.

Participants were asked questions relating to a number of different areas, including how and when they use on street parking, when they look for parking, if they use any existing parking apps and, amongst other things, awareness of the current parking system for Dublin. Participants were also asked about clamping, if they had ever been clamped, and how they found the process of getting unclamped.

Interviews were kept informal, and did not follow an exact formula. Some aides were used (cards, photos and the existing app), in conjunction with a list of topics to be covered during the interview. The results of the interviews were collated and documented using an affinity diagram, which helped form the basis of the User Model.

Interview aims and focus

The aim of the interviews was to discover user habits and patterns, and allow the formation of concrete user flows. These flows can then be used to build design directions for the prototyping phase.

Observations

Watching interviewees using the app, it became clear that although the initial ‘park here’ screens were navigated with ease, they spent a little more time on the screen where they had to select a parking duration. Users ‘played’ with the slider, seeing just how much more an extra 10 mins would cost, and then an extra 30mins and then back to 10mins. Equally when two interviewees went back to top-up their parking, they were confused to be back at the home screen, meaning they had to conduct a full transaction all over again, rather than just being presented with a ‘top-up’ button for example.

“I never plan parking, I would always just show up to the place and then drive around looking. ”

It was important to establish the context in which users engage with a parking app. Looking for parking once the user has arrived at their location was a common habit, and one that must form a core user workflow. This highlights an issue of context that many of the previously analysed apps did not cater for - how can a user find parking while also driving. User safety must be a priority.

“I always overpay by a Euro or two. I got clamped once before, and it was an absolute nightmare.”

Fear of clamping was a big motivator for participants - it lead many to consistently overpay for parking. A new system must reduce user anxiety around guessing how long they will be parking for, and reduce the likelihood of getting clamped.

“It’s really difficult to find. Knowing where spots are in advance would be amazing.”

This quote highlights a design challenge that must be catered for. While some users do not plan in advance, others do, so there must be two user flows working at the same time, allowing both user behaviours to be satisfied.

Interview notes were collated and grouped into an affinity diagram. These groupings inform the user mental model, and highlight user goals and desires.

Can’t find parking

Many users struggled to find on street parking, and frequently end up driving in circles looking for places to park

Meter Issues

Users struggled to find meters, and often found themselves in a parking space a long way away from any meters.

Self Limiting Users

These users limit themselves within the existing system. They use the same spaces over and over again, and will prefer to stay somewhere that they are familiar with. This is driven largely by an apprehension over where they will be able to park.

Fear of the Clamp

Users will go out of their way to avoid clamping - including parking different places and paying more than they need to.

Existing App Pros & Cons

Divided into two separate sections on the diagram, many users had used the existing Dublin Parking App. Most had both positive and negative things to say. It was hard to gauge the positives, as the alternative for users was no app at all, but negative comments gave interesting insights, e.g. users only top up parking by text, as the app is “too clunky, and takes too long”.

Cost

Users found on street parking very expensive. They also commented on difficulties in finding out the price of parking. Most would simply read it off the meter, after they have already parked. The irony is that in reality multi-storey car parks generally have a more expensive hourly rate, but as many users deliberately overpay for on-street parking to ensure they don't get clamped, it creates the sense that on-street parking is very expensive.

Purpose

Users were asked when they would typically use on street parking. Many had a favourite destination e.g. beside the National Concert Hall. Even if their preferred spot wasn't necessarily convenient for their destination, they were anxious about parking somewhere unfamiliar. There were however many users who parked in a variety of areas for work and/or visiting restaurants or shops in places they were unfamiliar with.

Guess-timation

Unanimously, users had issue with guessing how long they would be parking for. All users overestimated, meaning unnecessary expense.

Preferences

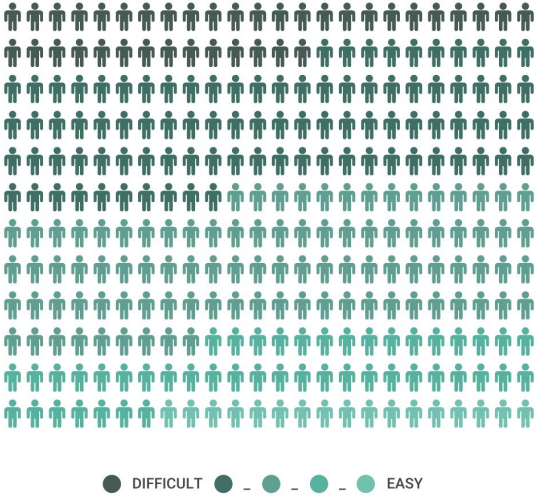
In general users had a preference for one type of parking over another - some preferred the safety of multi-storey parking, while others preferred the ubiquity of on-street parking.

Confusion

A large proportion of users had no idea about current systems in place in Dublin. The app was known by some, but the parking zones and how they correlate to price were a mystery to most.

100 people were surveyed in relation to their current experience with on-street pay & display parking in Dublin. These were our findings.

How often do you use on-street pay & display parking in Dublin?



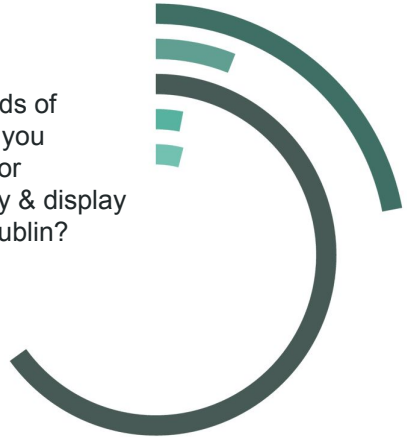
What is your experience of finding on-street pay and display parking in Dublin?

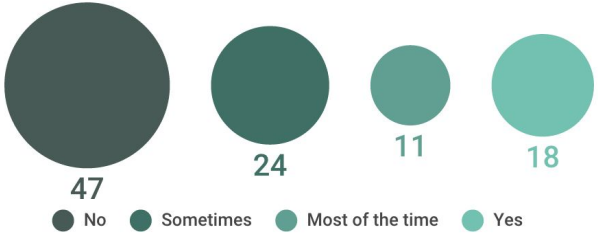
72%

of respondents

found available payment methods frustrating

What methods of payment do you mainly use for on-street pay & display parking in Dublin?





If delayed can you extend payment for your parking easily?

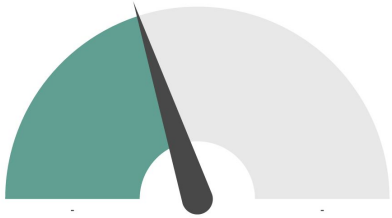
Do you understand the relationship between colour coded parking zones and the cost of on-street pay & display parking in Dublin?

What would be your preferred method of paying for parking?

90%

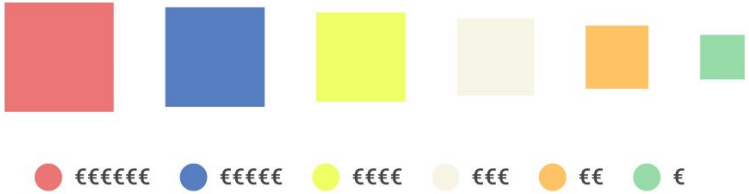
would prefer

a method where you tag-on when you start parking and tag-off when you stop parking.

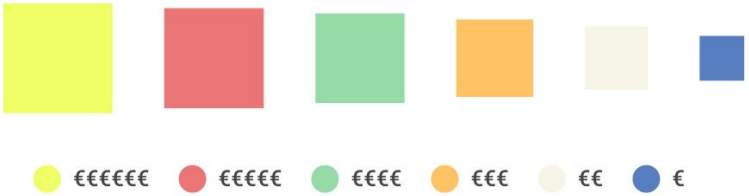


40% of respondents have been clamped in Dublin one or more times. Over 70% found the process of getting unclamped confusing.

Please order the colour coded parking zones from most to least expensive.



Survey response



Correct order

Key Findings & Insights

- Users are frustrated and confused by the current system:
  - Most users do not understand parking zones and codes, and how they relate to cost.
  - Payment also causes frustration; overpaying to avoid clamping vs having to top-up all the time.
- Two use cases emerged repeatedly during interviews; finding parking on arrival at a location, and planning parking in advance of a trip.
- Large preference amongst users for a tag on/off system.
- Lots of users are anxious about getting clamped, and would frequently overpay to ensure they didn’t have to worry about it.

5. Building a new system

- ➔ Insights to act upon
- ➔ Design Direction
- ➔ How the proposed system works
- ➔ Proposed flow of use cases
- ➔ Proposed flow for taggin off
- ➔ POP Prototype
- ➔ Proposed UI
- ➔ Key insights and findings

Building a New System | Insights to act upon

Examining our collated research, a number of frustration points were clear. These were opportunities for us to improve the user experience by streamlining the system and its interface.

Remove the guesswork

Predicting how long users will need to park for is a significant frustration among users. Multistorey car parks require the user to pay at the end of their stay, so why can on-street parking not facilitate the same.

Help the user

Something that came up a lot in research was that of trying to find a space, wasting time driving around and around. Equally there's little or no assistance in the current system for those who wish to plan their parking in advance.

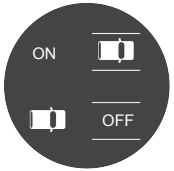
Keep the user informed

Users really need just three pieces of information about any potential car parking space, e.g. zone, rate and hours within which parking is permitted. Some of this information is obfuscated in the current system.

Protect all road users

Driving around looking for spaces, means drivers are distracted and not focused on the road, pedestrians, cyclists etc. putting them and others at risk. Our application will eliminate this distraction by finding spaces for the driver and directing them with technologies whose safety credentials are already proven (e.g. sat nav).

Our proposed solution incorporates technologies available today. It assumes the possibility of future council harmonisation, whereby zones are streamlined, and a one-system for all is implemented. This would give greater clarity to the process of on-street parking in the whole of Dublin County.



Tag on/off

Most users indicated their preference for a tag-on tag-off system for parking, whereby the app is used to begin charging from the moment the user parks in the space, and stop charging when they return (press start, press stop).

The existing maximum stay of 3 hours would be the maximum charge for users who forget to 'tag-off'.

Find a space

This feature uses sensors in each parking bay to send data to the app indicating whether a street has empty bays on it or not.

The user simply opens the app, the GPS locates them and displays streets with spaces in the area.

This is also useful for users planning their parking in advance - they can search or drag and drop the location pin. The colour coded map - green streets for spaces, red for full - instantly communicates where spaces are available.

Guide mode

The only thing harder than finding a space, is finding a space somewhere you're unfamiliar with.

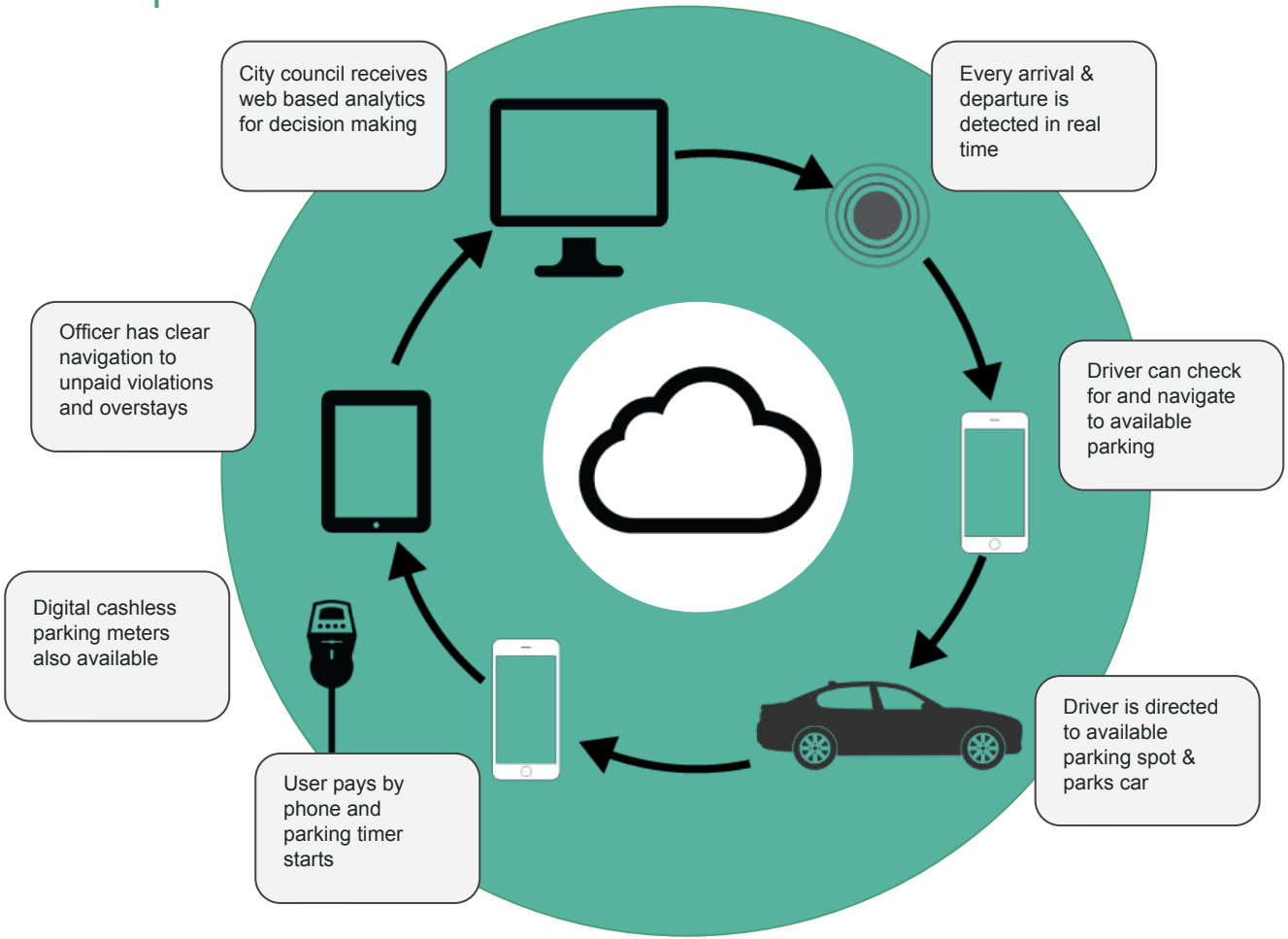
This element of our application utilises phone hardware such as GPS and voice navigation to assist drivers in finding an available parking spot, without having to look at their phone.

This feature lets users search a location and activate 'Guide Mode'. When the user is within 1km of their destination, the app uses speech technologies to direct them to the nearest street with available parking.

Improved Information

In the current system, the user is given very limited information. Using phone GPS, the system knows the exact location and should be able to provide a full set of data about the selected location.

We propose that the app provide the zone, the hourly rate and the permitted hours of parking e.g. 24/7 or 7am -7pm. Our interface prioritises these related pieces of information, presenting them together in a clean and clear graphic style.


City council receives web based analytics for decision making
Every arrival & departure is detected in real time
Driver can check for and navigate to available parking
Driver is directed to available parking spot & parks car
User pays by phone and parking timer starts
Digital cashless parking meters also available
Officer has clear navigation to unpaid violations and overstays

Use case: Plan ahead

Open app → Search by street, venue or drag and drop pin. → Find spaces with info on zones, costs & hours.

Use case: Guide mode

Input a location, select ‘guide mode’ → App will direct you to parking in your chosen location → Park easily on arrival and tag on.

Use case: No fuss parking

See an empty space → Park the car → Tag on to parking system through app

Use case: Find a space

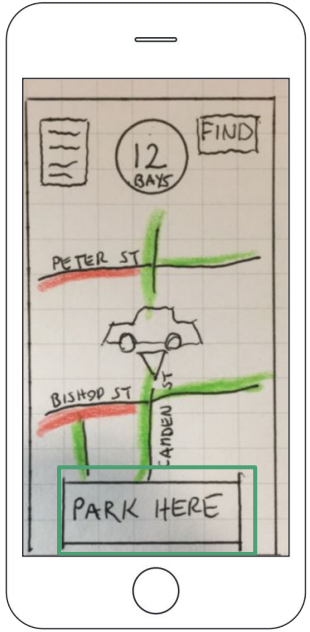
Need to park - can’t find a space. → App displays streets with spaces nearby. → Turn onto one of these streets, park and tag on.

The app will cater to a number of use cases for searching for parking and tagging on to the system, however tagging off the system will be a universal workflow for all user types.

Users will receive a notification from the app when the maximum parking time is approaching. This will also be used as a fail safe if a user has forgotten to tag off the system.

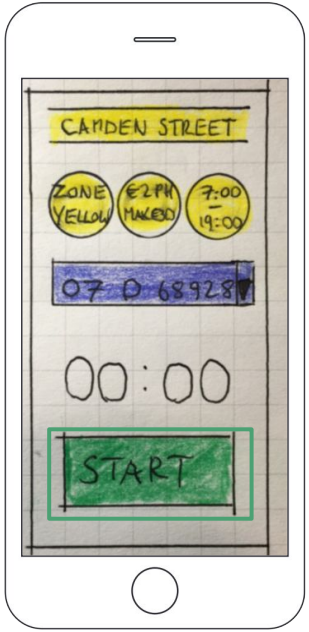
Developing prototype on POP

User Test Video



App Info Tag

If a user scrolls around the map with the car cursor, the Info Tag will dynamically update to show the user information about parking at that location.



App Landing Screen

When opening the app, the user is shown a map with their GPS location. It lists the number of parking bays in their area, and gives options to park now, or find parking for later.

User Action
The user hits the ‘Park Here’ button.

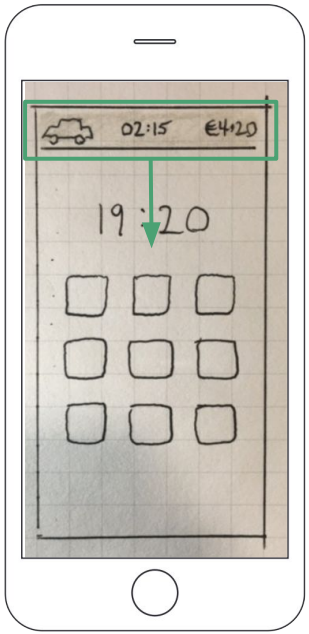
App Begin Transaction Screen

A confirmation screen appears, showing the user details of current parking. It tells the user current zone, price per hour and parking times. It also allows the user to select which car they are parking.

User Action
The user hits the ‘Start’ button.

Developing prototype on POP

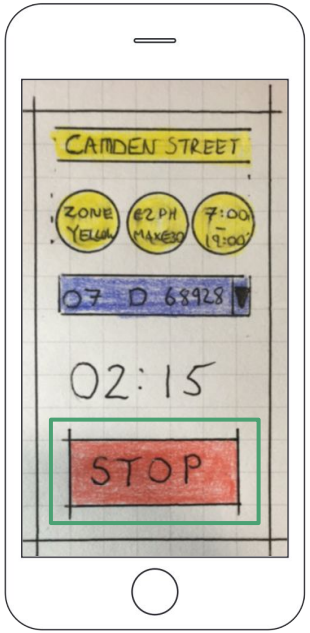
User Test Video



Phone Home Screen

While the user is parked, an icon is displayed in the operating system notification bar. It tracks the user's parking time, and cost.

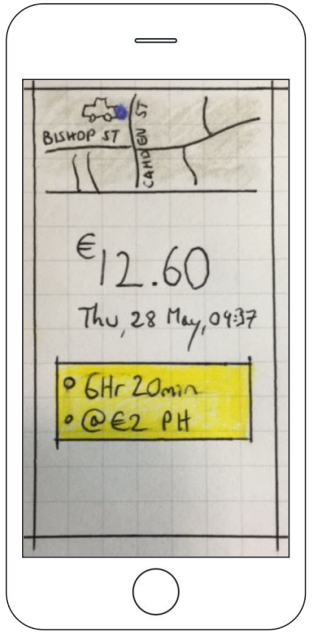
User Action
The user drags the notification bar down from the top of the screen.



App End Transaction Screen

The user is shown the same screen that they started parking from. It now shows how long they have been parking for, and a 'Stop' parking button.

User Action
The user hits the 'Stop' button.



App Receipt Screen

The user is shown a confirmation of the cost of the parking, how long they have been parking for, and the time and date.

User Action
The user exits the app.

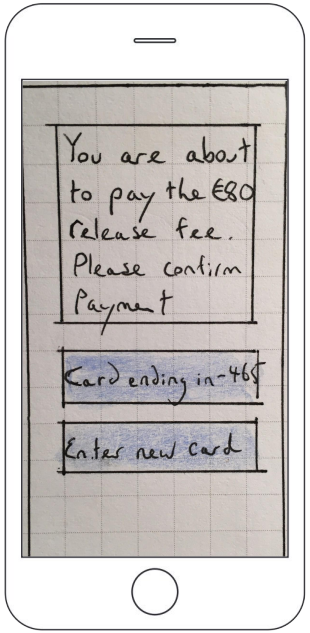
Developing prototype on POP

User Test Video

Car Has Been Clamped

The user has been clamped. They have not paid for parking or have illegally parked.

User Action
The user taps on the release button to pay for clamp release.



Pay Release Fee

The user must confirm that they are paying for the release of the clamp. This can immediately be done by using the same card they registered for parking or via a new card.

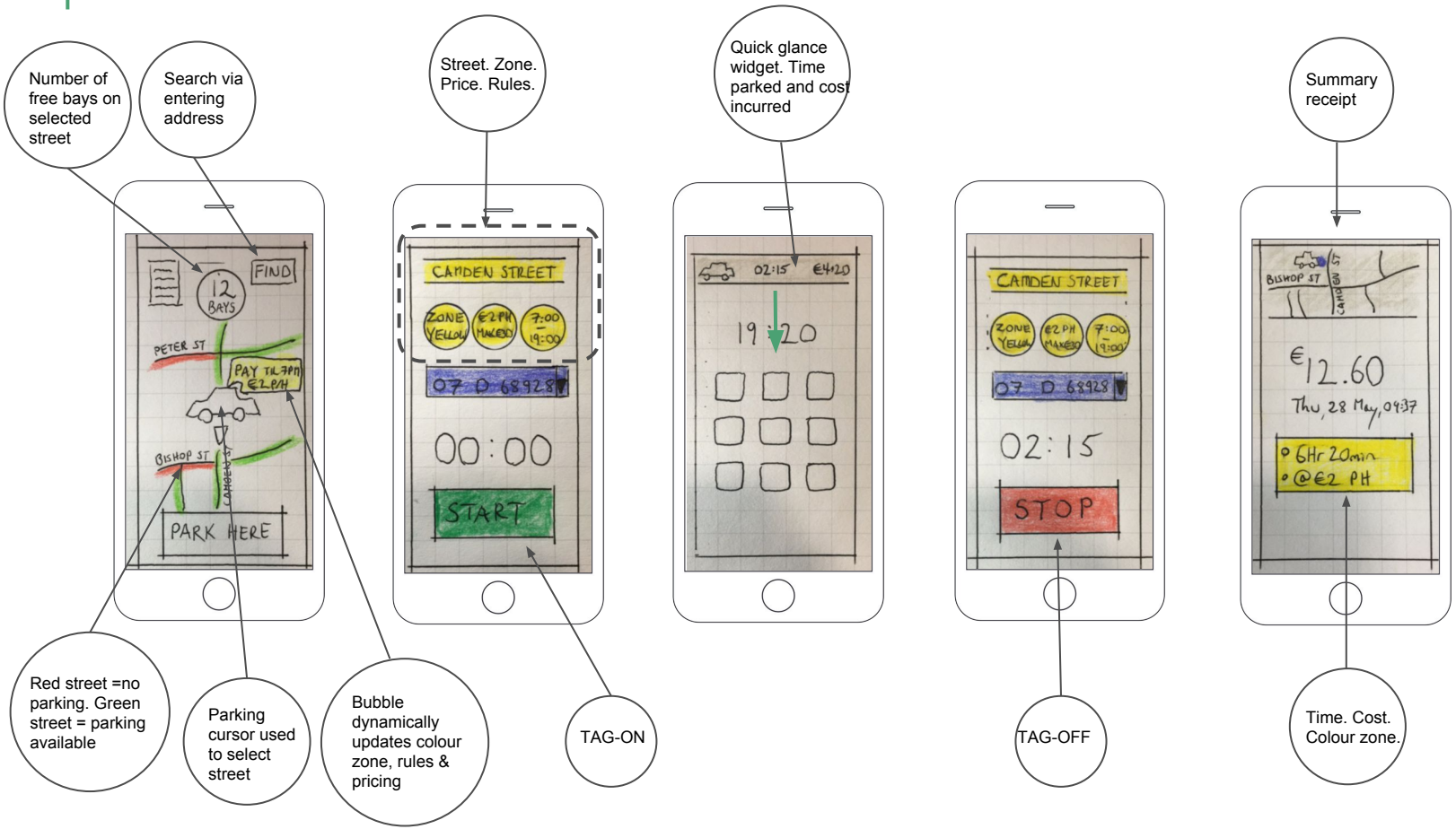
User Action
The user confirms payment via registered card or enters a different card for payment.

Clamp Released

The user is shown a confirmation of the their payment and is given a timer as to when the vehicle will be unclamped. The user can track the clampers on a map to see when they will be at their vehicle.

User Action
The user is given a push notification when the clamp is released.

Prototype | Proposed UI



Key Findings & Insights

- ➔ System developed is largely a closed loop with only some possible edge cases identified.
- ➔ While the application operates in a proposed future system with political & technological advancements, the means and resources to create such a system are available today.
- ➔ ‘Finding parking’ is functionality that facilitates user need from planning in advance to instant requirement for parking.
- ➔ Parking apps used *while driving* need to be hands free - hence our “guide mode” feature.
- ➔ Feedback from user testing with the POP prototype was largely positive.
- ➔ Tag on/off system tested well, as expected from the research.
- ➔ Limitations of POP highlight need for distinguishing buttons from symbols and shapes.
- ➔ POP Prototype

6. User Model

- ➔ An overview
- ➔ Personas
- ➔ Scenarios

User Model | An overview

Having collated and worked through our qualitative and quantitative research, we began to notice patterns of behaviour, shared goals and common points of frustration among users. These insights informed our user personas and their respective scenarios.

Our personas reflect interactions with the existing Parking Tag app, highlighting user's frustrations. The scenarios that follow are written from the perspective of users interacting with our improved version of the app - using new functionality to tackle longstanding issues.

Shona

Park & Shop

Conor

Suburban Dad

Paul

Time is Money

Shona, 25 - Archetypal user

Park & Shop

Shona is a young professional who works hard during the week and likes to head into town on Saturdays to go shopping, meet friends for coffee and just hang out. Although she uses public transport for work, Shona always parks in town on Saturdays because she knows she'll have bags to carry home.

Depending on where she's meeting friends, Shona uses a mix of on-street and multi-storey parking. She likes the fact that with multi-storey there are usually spaces and she could potentially leave her car there until the next day without worrying about fines or being clamped.

However, on-street parking means she can usually park closer to the coffee shop she's meeting friends at and to leave she just has to pull out, whereas in a multistorey she can get delayed behind other cars and inner city traffic when she just wants to go home.

Goals

- ⇨ Instantly understand the zone system and associated costs.
- ⇨ Find a parking space quickly and easily.
- ⇨ Park and then not think about it again until I return to my car.
- ⇨ I want to be confident that I won't get clamped.

Frustrations & Opportunities

Can't relax - being clamped always at the back of my mind.	⇨ Tag on - off system would address this
Often I have to drive around looking for a space.	⇨ Sensor system highlights where there are empty bays, allowing the user to check in advance and voice direct to spaces.
I'm often confused about zones, rates and permitted hours.	⇨ App re-design will flag the zone, permitted hours and associated cost in advance.
I have to park before I can check how much the hourly rate is. I'd like to know how much it is before I commit to the spot.	⇨ Re-order zones into natural colour progression and round current rates up/down to increments of 50c e.g. €2, €2.50 etc.

Behaviours

Frequency: how often do you park?

daily — weekly — monthly

Time: on average, how long do you park for?

20 | 40 | 60 | 100 | 120 | 140 | 160 | 180 mins

Preferred spot: Where do you like to park?

On-street
Camden St
€2.90 p/h

Multi-storey
Brown Thomas
€3.60 p/h

Shona, 25

Scenarios

Scenario A

Shona has made her usual Saturday trip into town. Finished her shopping she's on her way back to her car when she bumps into an old work friend who suggests they grab lunch together.

Knowing her parking will not expire until she 'tags off' in the app, Shona agrees and spends the next couple of hours catching up with her friend - confident that she won't be clamped.

Scenario B

Shona is meeting friends in a restaurant on Camden St before going shopping. It's raining so she wants to park as close to the venue as possible.

Opening the Parking Tag app she drops her location pin to Camden St., the app indicates that it's green as are a number of streets around it.

From this Shona can see there's a lot of available parking in the area. She is confident when she arrives in 15 mins that she'll find a space comfortably.

Scenario C

Shona wants to visit a new boutique she's heard of in Blackrock. She's not that familiar with the area and what parking might be available.

Opening the Parking Tag app she searches for 'George's Ave, Blackrock' and sets it to 'guide mode'.

When she is within 1km of her destination, sat nav technologies in the app guide her to where she will find spaces on her chosen street.

Conor, 32

Suburban dad

Conor recently moved to the Dublin suburb of Templeogue where he lives with his wife and young daughter. He works as a graphic designer in town. Most of Conor's friends live in Stoneybatter and Kilmainham where he plays 5-a side with them most Wednesday nights and goes to the cinema with former flatmates every so often.

Although Conor takes public transport to and from work every day, he finds getting to football and the cinema more complicated - usually involving 2 buses and some waiting around - so generally he takes the car for these events.

Conor tends to park on the street as he knows the area and can generally find a spot. He pays using the app, but finds it hard to estimate the time he'll be parked for. Sometimes he loses track of time on the pitch and misses his top-up text; he's been clamped a couple of times as a result. This means that now he overestimates the time thereby pays more than he needs to.

Conor is unaware that he can also use the app to park in Templeogue - he thinks it's a completely different system and so uses coins and tickets which he finds inconvenient.

Goals

- ⇨ Stop having to overpay to avoid clamping.
- ⇨ Park and then ignore it until after the match or movie.
- ⇨ Use app for local on-street parking too.
- ⇨ Avoid having to use cash and search for meters for all on-street parking in Dublin.

Frustrations & Opportunities

Always having to pay more than I think I'll need just to err on the side of caution.	⇨ Tag on - Tag off system would address this.
Constantly having to check the time or my phone for top-up texts, it's a pain.	⇨ Tag on - Tag off system would address this.
I hate coin meters, I want to be able to use the app no matter what street I park on anywhere in Dublin city and county.	⇨ This already exists but isn't flagged in the current app. Our re-design will allow users to search or drag their location pin anywhere on the map, displaying relative info re: rules, cost etc.

Behaviours

Frequency: how often do you park?

daily — weekly — monthly

Time: on average, how long do you park for?

20 40 60 100 120 140 160 180 mins

Preferred spot: Where do you like to park?

On-street
Dublin 7

€2.40 p/h €1.60 p/h

Conor, 32

Suburban dad

Scenario A

Conor is late for his Wednesday night football. His local knowledge of the area means he finds a space easily enough.

Conor parks and opens the app, checks his location and taps ‘park here’ and then ‘start’. He then heads off to play a match.

Afterwards some of Conor’s friends want to go out for coffee/drink - he takes a quick look at the widget on his phone and sees that he’s already clocked up €6 of parking so he decides to avoid delay and additional parking costs.

Conor returns to his car, opens the app and taps ‘stop’. The final payment is displayed onscreen. Conor exits the app and drives home.

Scenario B

Conor has to collect his son from creche - located near where they live.

He parks on the street nearby and rather than having to search for coins and use the meter, he simply opens the app, checks his location and taps ‘park here’ and then ‘start’.

It turns out the childminder wants to discuss and incident with Conor so he is delayed. However, there is no additional stress as when Conor returns to the car, he straps his son in the back, opens the app and taps ‘stop’.

The final payment is displayed onscreen. Conor exits the app and drives home.

Paul, 43

Time is Money

Paul is a sole trader who makes deliveries and meets clients at a number of premises in the general Dublin area. On-street parking means he can get closer to the businesses, which is useful when he's making deliveries. Paul uses on street parking a lot and is pretty familiar with the system although at peak times it can be hard to find a space.

Sometimes when Paul visits a premises with a delivery, his client will use the opportunity for an impromptu meeting. As much as Paul loves this contact with clients - it can delay him past what he predicted when entering his parking. In moments like this Paul feels he can't keep checking his phone for the time/top-up text because he will seem unprofessional and distracted.

When paying for parking, Paul trusts the information the app provides and doesn't spend time checking local signage. However the current app doesn't provide information on parking permissions (7am-7pm, 24/7 etc.) Paul has on occasion parked in a 24/7 zone without realising it and only paid for parking until 7pm. This resulted in his vehicle being clamped - he can't afford to be without his vehicle for any length of time.

Goals

- ⇨ Avoid interuption during my time with clients.
- ⇨ Detailed and accurate information from the app that I can rely on.
- ⇨ Be confident that my vehicle will not being clamped.
- ⇨ Functionality that assists me in finding a space at peak times.

Frustrations & Opportunities

Having to check my phone - sometimes during time with clients - to ensure my parking hasn't expired.	⇨ Tag on - Tag off system would address this.
The app only shows info on the zone colour and rate. I need info on the permissions that apply to each street.	⇨ Improved DPS and data collection will flag this information pertinent to the street not just the wider zone.
When I'm in a rush to meet a client or make a last minute delivery, I sometimes have to waste time driving around just trying to find an empty space.	⇨ Sensor system highlighting where empty bays are located - allows user to check in advance or directs him to available spaces in real time.

Behaviours

Frequency: how often do you park?

daily — weekly — monthly

Time: on average, how long do you park for?

20 — 40 — 60 — 100 — 120 — 140 — 160 — 180 mins

Preferred spot: Where do you like to park?

On-street
Various locations

€2.90 p/h €2.40 p/h €1.60 p/h

Paul, 43

Time is Money

Scenario A

Paul has a delivery to make to a shop in Raheny. He parks and uses the app to confirm location details and start his parking payment. When he arrives in the store, his client asks him about increasing his order and possibly extending the range of Paul's products that he stocks.

Keen for additional business, Paul spends time with the client, talking him through the options and negotiating a deal. He can give the client his undivided attention because he doesn't have to keep checking his phone or topping up his parking.

When Paul returns to his vehicle, he simply opens the app, taps 'stop' and his parking transaction is over.

Scenario B

A client phones Paul in a panic - they promised to keep a product for a customer and they forgot. They've now sold out and need an urgent delivery to ensure their customer isn't left disappointed. Paul assures them that he'll get there as soon as he can.

Opening the Parking Tag app Paul enters the shop address and sets it to ‘guide mode’.

When he is within 1km of his destination, sat nav technologies in the app guide him to where he will find spaces on the same street. This will save Paul any additional time looking for spaces, allowing him to deliver to the client asap.

Scenario C

Paul is going to meet a potential client in a part of Dublin where he has no business base currently. As he's unfamiliar with the area, he's not sure what parking might be available near his client's office.

Opening the Parking Tag app Paul searches the client's address and can see that it and a number of surrounding streets are coloured green - indicating that there are spaces available.

From this Paul can see there’s a lot of available parking in the area, therefore he is confident when he arrives he’ll find a space comfortably.

Conclusion

Parking is a secondary process - no one drives anywhere with the aim of ‘parking’ it’s just something they have to do to get to where they really want to be.

Unsurprisingly then the user’s mental model of parking is a relatively simple thing - *I see the space, I park in it, I drive out of it when I’m finished*. It’s the superimposed regulatory process that complicates the experience.

Our application strives to mirror the user’s mental model where possible and not to add additional tasks for the user to complete, but rather facilitate them in getting to where they want to be more quickly and more easily.

The parking system in Dublin city and county is complex. There are elements that have clearly been bolted-on rather than built-in, and so it’s no surprise that the existing app has a system image far removed from the user’s mental model.

Our proposed solution incorporates technologies available today. It assumes the possibility of future council harmonisation, whereby zones are streamlined, and one coherent pricing system is implemented. Our research indicates that our solution is both desirable for users and feasible for the authorities involved. Despite initial outlay for parking bay sensors, we are also confident that the solution is economically viable - the easier the system is to use, the more users it will have.

8. Appendix

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