

## Declaration Cover Sheet for Project Submission

### SECTION 1 *Student to complete*

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- suspending a student college for a specified time,
- expelling a student from college,
- prohibiting a student from sitting any examination or assessment.,
- the imposition of a fine and
- the requirement that a student to attend additional or other lectures or courses or undertake additional academic work.

# CARPOOLME MOBILE APP PROJECT



Conall Moore x13521447

# CARPOOLME PROJECT

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## 1 Executive Summary

This is the project report for CarPoolMe project. The document contains the project proposal, requirements plan, elicitation techniques and results, functional and non-functional requirements and the reflective monthly journals for this project.

The project sponsor is a technology entrepreneur who wishes to start a Carpooling business. To attract users towards the service, it was proposed to develop a mobile app. Before this app will be developed, this will require gathering and analysing requirements from stakeholders. I accepted this project as I consider it to satisfy a real business need in relation to transport.

This Carpooling app will enable drivers to show details of their upcoming trips and allow others to become passengers, share the journey and the travel costs. The app will be free of charge, available from iTunes and Google.

## 2 Preliminary Requirements Elicitation

### 2.1 Introduction

This document describes the elicitation techniques that will be utilised to gather the requirements for the development of a new mobile app called “CarPoolMe”.

This project will involve gathering, analysing and documenting the requirements for the new mobile app.

A technology entrepreneur is interested in running a carpooling business. To operate and grow the service, the entrepreneur has requested a carpooling mobile app to be developed.

The initial task prior to developing this app is to gather requirements from stakeholders. The stakeholders involved in this business include people who commute to work, project sponsor, drivers, passengers, students and various members of the public.

Once all the requirements have been gathered and analysed, I will describe them in a requirement specification document.

The primary task of gathering the essential requirements for the development of CarPoolMe will be carried out by using elicitation and analysis techniques.

Distributing surveys will be a method of gathering feedback from customers, this will also assist to focus on the essential requirements.

Observation will be a primary technique, as I will need to gather evidence of people driving on their own to work.

Interviews can be used to gain feedback from stakeholders and to discuss the requirements.

Focus groups can be used to discuss the requirements and for receiving more feedback faster.

Interface analysis can be used to plan on how the system will function and how each stakeholder will interact with it.

The completed requirement specification document will be passed to a developer.

## 2.2 Business Need

A technology entrepreneur is interested in running a carpooling business, as carpooling is not very common in Ireland.

A carpooling service could be a cheap solution for people to travel to work, students to use for travelling to college and for people to book trips and arrange destinations.

Owning a car can be expensive due to costs such as fuel, insurance, service, parking and repairs. People who don't drive generally use public transport and taxis as their primary method of transportation.

Students who attend college within Dublin who live outside of Dublin in areas such as Galway, Cork may wish to save expenses on public transport. CarPoolMe may provide a cheaper, faster method of travelling for example from Galway to Dublin, as students can book trips using the app.

Creating this app will provide another transport choice for people travelling.

Any member from the public must register before becoming a driver. This app will allow them to either to book destinations or long journeys as a passenger.

This App can enable users to consider jobs in areas without access to public transport.

## 2.3 Business Case

### 2.3.1 Overview

The entrepreneur has set a budget to setup the service and develop the mobile app. He will be the project sponsor for this project.

CarPoolMe could develop into a profitable service and could contribute to the creation of a new market.

This app is being developed as a cheap alternate service to facilitate the needs of commuters. This app will enable people such as commuters to carpool and book a ride with a group of people.

Below is a list of potential requirements for CarPoolMe from a brainstorming session with the project sponsor.

### 2.3.2 Requirements

- The app should show the destinations and routes available, so passengers will be able to book a destination and select a route. They will arrange pickup times through the app, which will also display the other passengers who are going to be sharing the journey with them.
- The make, size and model of each car should be displayed on the app.

- Users should be able to view the drivers profile before they choose to join the trip.
- After they select a driver a user will get a notification through their account to notify them that the driver is heading to their pickup destination.
- Drivers could register as a carpool driver online and post their car details such as licence plates, make, model and size of car.
- After the customer views the driver and views the other people sharing the trip or journey, the app will show the time the driver will arrive.
- Drivers will need to be able to view the passengers who are requesting to share the journey, and the driver will have option to approve the passengers.
- Every time a passenger requests a trip or journey from a driver, the passengers profile should display to the driver.
- While they drive to the destination, a web mapping service like Google Maps will be open, to prevent drivers from getting lost.
- Users will be able to pay for the journeys through their accounts on the app.
- At the end of the journey the app should provide the passenger with an opportunity to rate the driver. If the driver receives a good review this will help the driver attract more passengers.
- The app could also display how much fuel was used throughout each carpool journey. This will show the drivers how much fuel they saved while carpooling.
- To make CarPoolMe user friendly, there should be instructions displayed on the app for users to create an account.
- A website will provide additional information and allow users to login and view and edit their details.
- Security will need to be implemented to prevent the app from getting hacked. There should be a login installed in the app for both passengers and drivers.

### 2.3.3 Benefits

This app will be very beneficial for drivers. For example, drivers who share their car through the app will receive revenue to reduce expenses. Fuel, insurance and parking costs will be split between the driver and the passengers who share the car.

- Great time and money saver.
- Share the daily commuting costs.
- Save car ownership costs.
- Share journeys with people.
- Reduce traffic & pollution.

### 2.3.4 Plan

There are various steps involved in this project.

The primary task is to document the requirements into a requirement specification document. This document will subsequently be handed to the app developer.

The developer needs to understand all the requirements prior to developing this app, to prevent confusion from occurring. Requirements will need to be discussed frequently with the sponsor, business analyst and the app developer.

Agile methodology should be used to help build a working version of the app as soon as possible so that it can be tested with the business team. Some requirements may change when the app is used in real tests.

## 2.4 Stakeholders

- Technology Entrepreneur, the Business Owner
- Business Analyst
- Public
- Students
- Passengers
- Workers/Commuters
- Drivers
- App Developer
- System Tester
- Site Administrator

## 2.5 Requirements Elicitation Techniques

Below are the elicitation techniques I intend to use to gather requirements from stakeholders involved in my project.

### 2.5.1 Observation

Observation (Field Research) is my elicitation technique to carry out prior to the others. I will stand over the bridge by the M50 and N11 to collect data from the field in the morning or evening during the day. The purpose of this is to get an estimate of the number of drivers who drive on their own. I will record the number of drivers on a sheet of paper. If most of the drivers are driving on their own, this will show a potential for CarPoolMe to become active.

### 2.5.2 Survey

This can be used for receiving feedback about the requirements from each of the stakeholders. It will also highlight the essential areas where there is high demand.

I will distribute surveys.

Questions for the survey are:

1. What category are you?
  - College student
  - Worker
  - Unemployed
  
2. Do you drive and own a car?
  - I drive and own a car
  - I can drive but don't own a car
  - I drive but lease a car
  - I can't drive
  - I have my driver's licence but unable to afford a car
  
3. How do you typically travel to and from work each day?
  - Public Transport (Bus, Luas, Dart)
  - I walk
  - I cycle
  - I drive
  - I get a lift
  
4. How many days a week do you commute to work?
  - 1-2 days a week
  - 3-4 days a week
  - 5 days a week
  
5. Would you be interested in using a carpooling app to arrange formal destinations to travel to and from work?
  - Yes, but only with family, friends or work colleagues
  - Yes, if I can view the passengers and drivers profile
  - No I would not be interested
  
6. How many days a week do you commute or use any public transport to travel to destinations?
  - One day
  - Two days

- Three days
- Four days
- Five days
- Six days
- Seven days
- None

7. What would be your main reason for carpooling?

- Save fuel, parking, ownership and insurance costs
- To arrive to and from work at a quicker pace
- Can't drive
- To avoid the frustration of public transport e.g. strikes, delays, limited access, slow etc

8. What information do you think this app should display regarding the drivers and passengers?

- Drivers and passengers profile
- Driver licence
- Contact details
- Insurance details
- Model and size of the car
- Destinations and routes via map
- Other (Please state on the last question)

9. Would you consider using CarPoolMe for journeys outside of work? If yes which of the following would you mostly use it?

- No
- Going to Airports
- Weekend Trips
- Trips such as excursions
- Various destinations (shopping trips, travelling into town)
- Going to college within Dublin and outside Dublin (NUI in Galway, Maynooth etc)

10. What type of people would you carpool with?

- Smokers
- Only Males
- Only Females
- Students
- Workers
- I have no preference

11. CarPoolMe will be a major improvement of transportation

- Strongly Agree
- Agree
- Disagree
- Strongly disagree

12. After this app is developed how often would you carpool?

- 1-2 days a week
- 2-3 days a week
- 3-5 days a week
- 5 days a week
- More than 5 days a week
- Never

13. What other features do you think CarPoolMe could have?

### 2.5.3 Focus Groups

Meeting a group of stakeholders to discuss requirements. Potential groups could be students in college and extended family members who commute to work.

### 2.5.4 Interviews

I will interact with the entrepreneur and various stakeholders by interviewing them. This will provide the entrepreneur with an opportunity to decide on which requirements are essential towards the development of CarPool.

I will also interview people who work in offices in Dublin to gather information from them.

#### **Interview 1 - College students/office worker**

Participants: 3 college students, 2 office workers

Time: 1:00pm – 2:00pm, 21<sup>st</sup> March 2017

The purpose of this interview is to gather requirements from a group of college students and office workers prior to developing this app.

1. How do you travel to college daily? Would you consider using an alternative method to public transport?
2. Would you be interested in carpooling with a group of students from your college?
3. Do you own a car? Would you be interested in using CarPoolMe to save ownership costs on your car?
4. What features do you think CarPoolMe should contain?
5. How do you think destinations should be arranged for example would you like to get a lift from your house or go to a certain pickup point?
6. Would you like to see CarPoolMe link up to Facebook to book destinations through Facebook and share reviews?
7. If CarPoolMe had student discount prices available, do you think this could be an alternative method of transport?

#### **Interview 2 – Project Sponsor**

Time: 9:00 am – 10:00 am, 25<sup>th</sup> March 2017

The purpose of this interview is to gather requirements from the project sponsor to develop this app. The project sponsor is also the business owner who has requested this app to be developed. During this interview, I intend to note the requirements from the business owner.

1. What type of functionality or features would you like to have implemented within CarPool?

2. What type of payment system would you like to have implemented on this app? What type of discounts could be implemented for different categories such as students and workers?
3. What kind of communication channels should this system have to enable a group of users to communicate?
4. What information should the driver and passengers account contain? Can any driver register to use CarPool?
5. How should the pickup points be arranged between the driver and passengers?
6. What type of social media channels could CarPoolMe link?

### **Interview 3- Developer**

Time: 9.00 am – 10.00 am, 26<sup>th</sup> March 2017

The purpose of this interview is to gather the basic technical requirements from a developer prior to developing this app. This should provide the developers with an idea of how the app should be developed.

1. What type of code should be used to implement an eco-tracker to display how much fuel has been saved?
2. Is it possible to implement a pre-payment system within CarPoolMe so users can have the option to pay at the start of journeys?
3. What type of security for storing data would be required for this app?
4. Will an API be required to display the number of trips, drivers active or travelling in particular routes on the map? It should show the drivers profile and the destination where the other passengers are heading

#### **2.5.5 Interface analysis**

After gathering requirements, I intend to go over what the interface of the system will look like and to discuss with the project sponsor. This will be done by drafting UML use cases which will show how stakeholders will use the system and the process steps within the system. I will also construct wireframes for the essential components of the app itself.

#### **2.5.6 Acceptance Criteria**

This involves deciding which requirements are essential to deliver an app that meets the stakeholder's needs. I will use a MoSCoW analysis for this technique as it can be used to prioritise the requirements.

## 3 Requirements Elicitation & Analysis Results

### 3.1 Requirements Elicitation Techniques

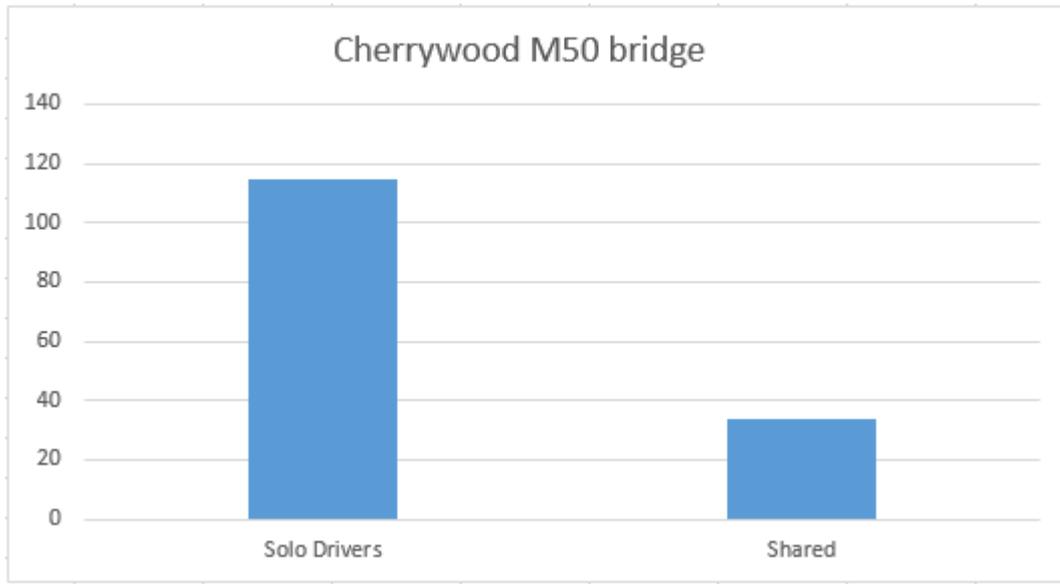
#### 3.1.1 Observation Results

The purpose of observation as an elicitation technique is to identify opportunities for potential improvement in traffic congestion. CarPoolMe could reduce the number of solo drivers on the road if people decide to carpool by using the app. This may also contribute to improving traffic flow.

I carried out this task by doing field research in areas where heavy traffic frequently occurs. This was performed by using discrete observation techniques to count the number of drivers who drive on their own. I stood in an area where I could get an accurate view of the traffic pattern in each area. After this I set a timer and noted down the number of solo drivers and groups passing by. The areas where I carried out my observation techniques were the M50/N11 by Cherrywood, Stephens Green Junction and the M50 bridge in Leopardstown. Offices and industrial areas are located within these areas. The drivers who were observed seemed to be office workers arriving and leaving work and students who may drive to college.

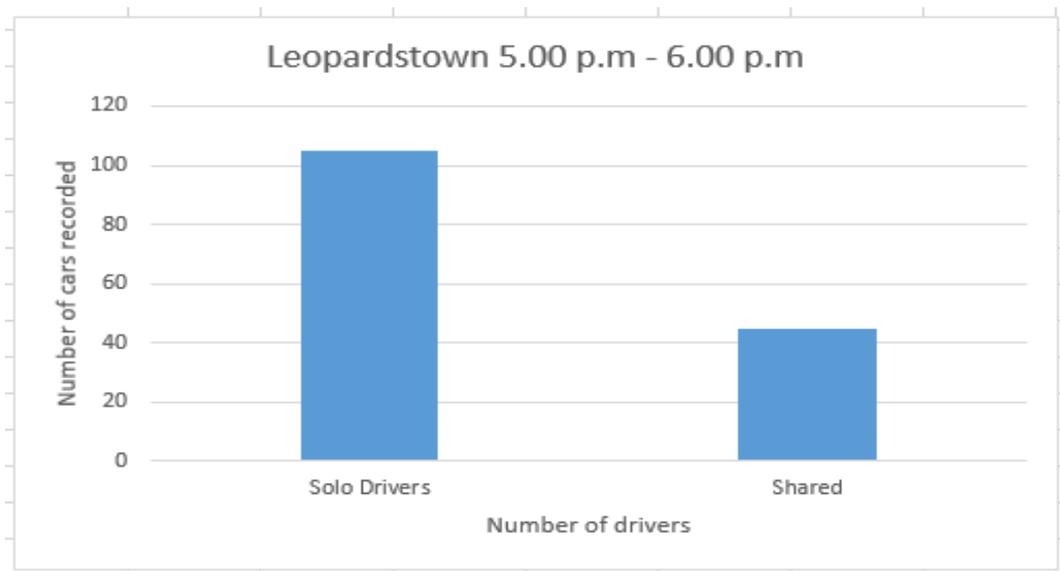
#### **Carried out observation technique in Cherrywood**

I conducted my observation technique in Cherrywood where there is typically traffic congestion and traffic flow at peak times. Traffic congestion occurs in this area at peak times in the morning and evening. This is due to Cherrywood Business Park in the vicinity which contains offices such as Dell headquarters. I stood by the junction from between 5.00 p.m. to 6.00 p.m. to count the number of cars that were passing by. From this technique, I discovered that a vast amount of the drivers were solo drivers. The cars which had passengers seemed to be families, and some work colleagues. However, most people who I recorded in the traffic congestion were solo drivers. This could reduce traffic congestion if the workers in Cherrywood decided to carpool, as fewer cars would be on the road.



### Observation in Leopardstown

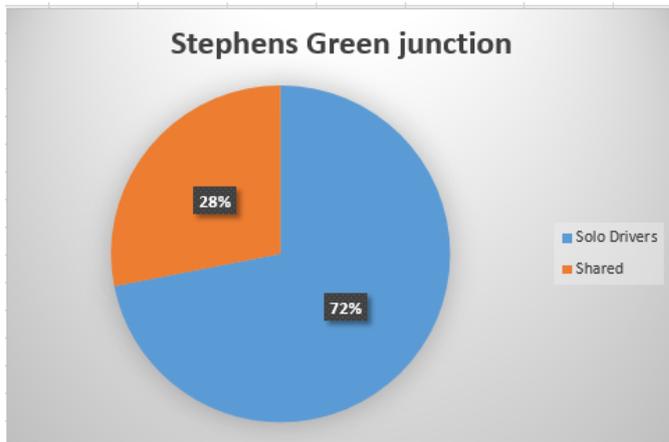
Most of the drivers were solo drivers as shown on my chart below.



### Stephens Green Junction observation

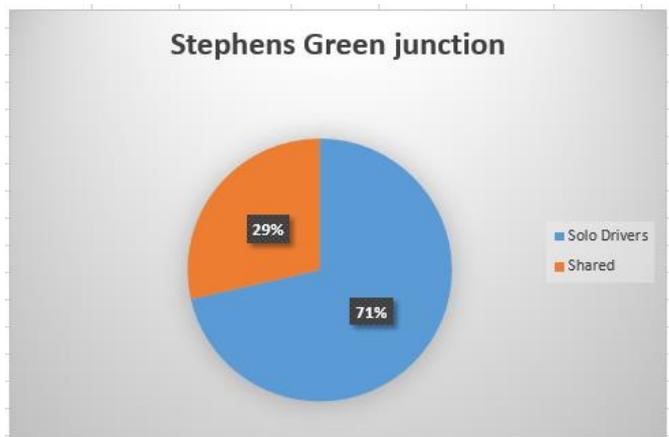
In the morning and evening I recorded the number of drivers coming in and out of town by Stephens Green Junction. There was traffic Congestion in this area due to offices, shopping centres and various businesses located around this area. Public transport and taxis frequently travel through this route. The different categories of transport in this vicinity is a cause of traffic congestion.

0900 - 0930



This time in the day the workers, college students or the general public are generally travelling home from town. Traffic congestion occurs at this peak time daily.

1700 - 1800

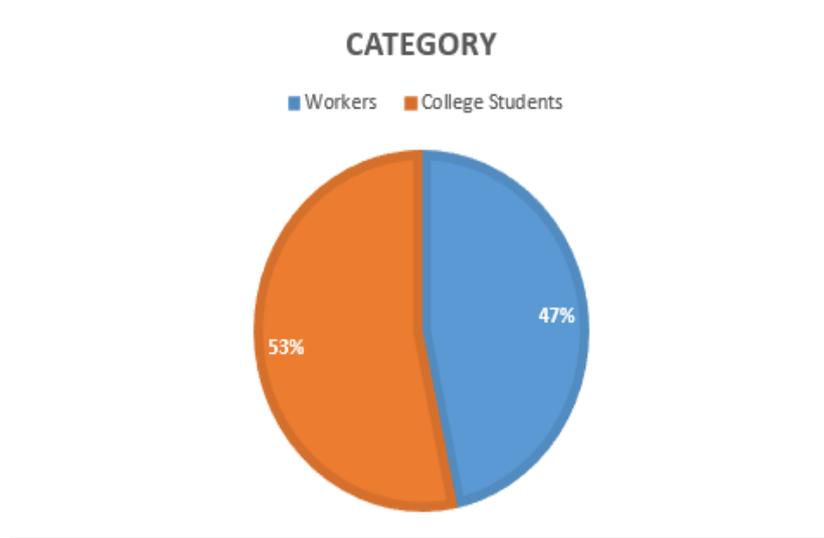


## Conclusion

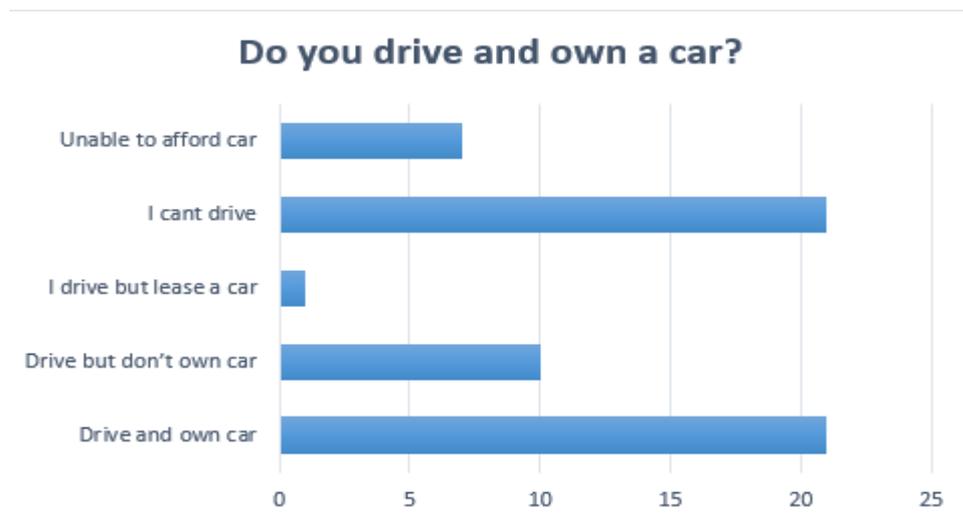
I used this requirements analysis technique to prove that most drivers were driving alone. This occurred in all three of these areas where offices and various businesses are located. For example, in Leopardstown there are offices which employ lots of workers. I believe that if people decide to carpool by using this app it will be a major solution towards traffic congestion in these areas. This could implement traffic flow if workers who live or work in the same area decide to Carpool.

### 3.1.2 Surveys Results

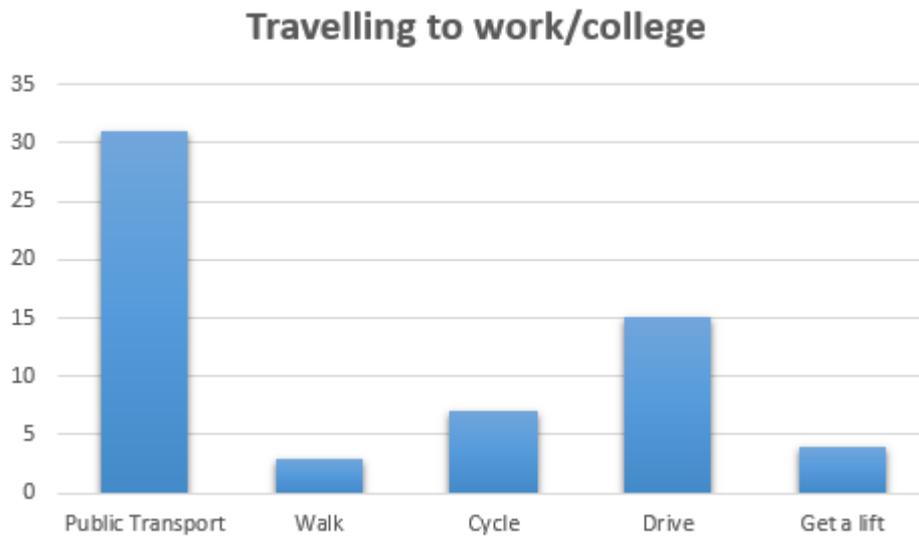
1. What category are you?



2. Do you drive and own a car?



3. How do you typically travel to and from work each day?

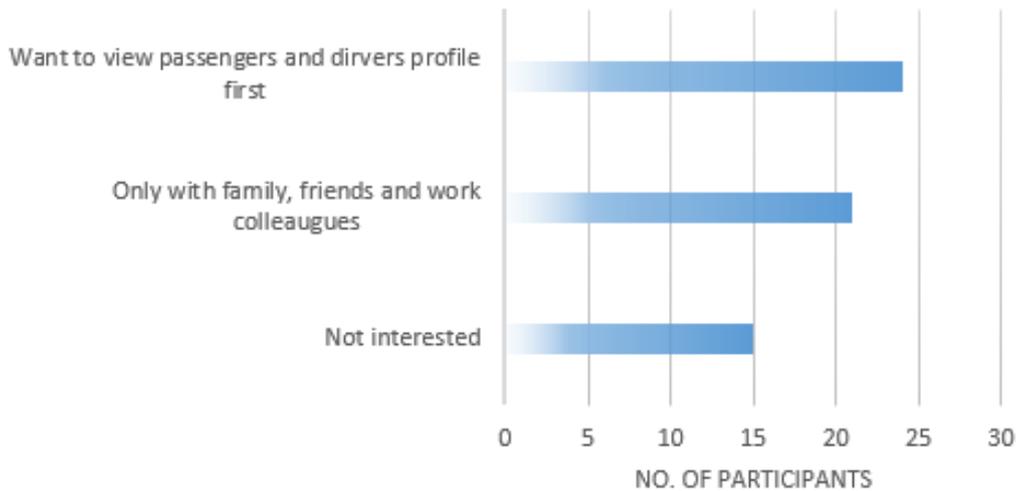


4. How many days a week do you commute to work?



5. Would you be interested in using a carpooling app to arrange formal destinations to travel to and from work?

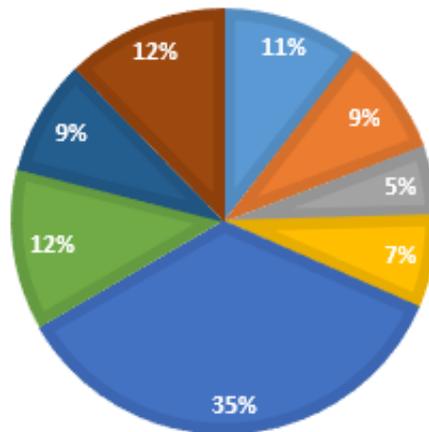
### INTEREST IN ARRANGING DESTINATIONS



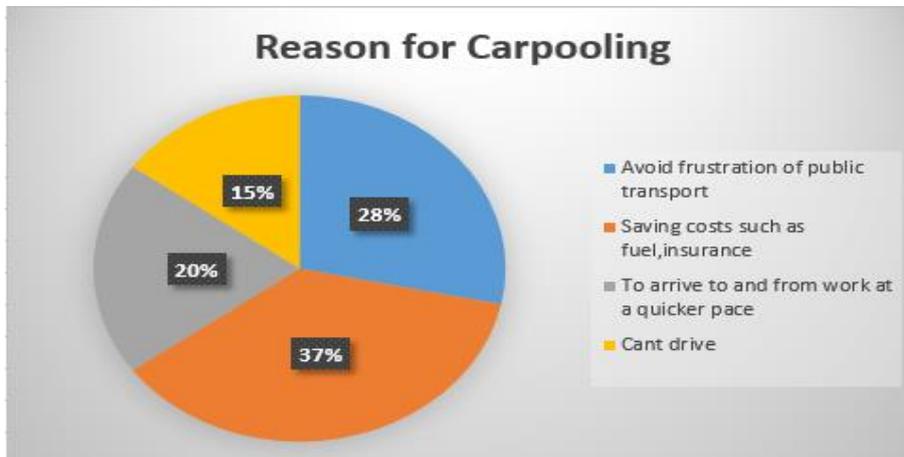
6. How many days a week do you commute or use any public transport to travel to destinations?

### DAYS A WEEK PEOPLE COMMUTE BY PUBLIC TRANSPORT

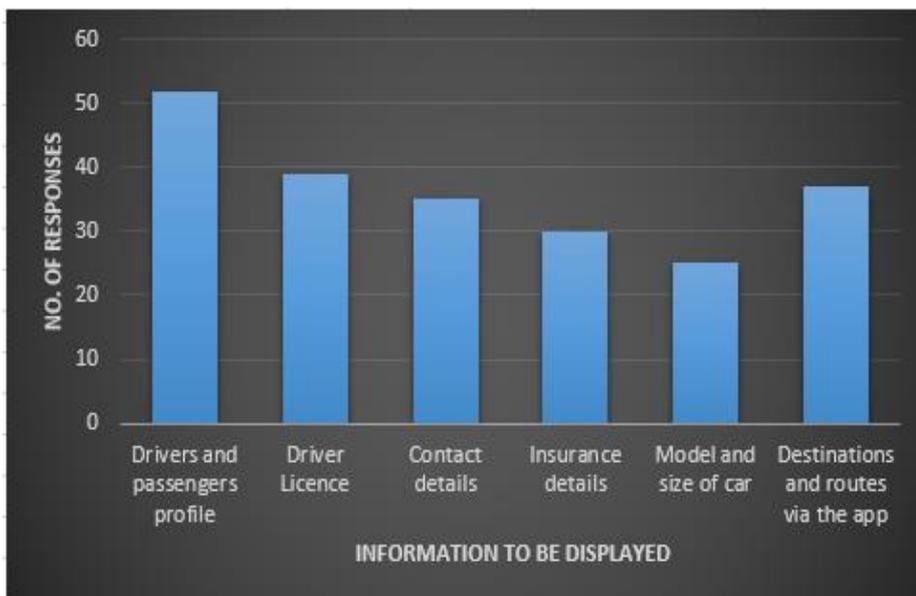
■ one ■ two ■ three ■ four ■ five ■ six ■ seven ■ none



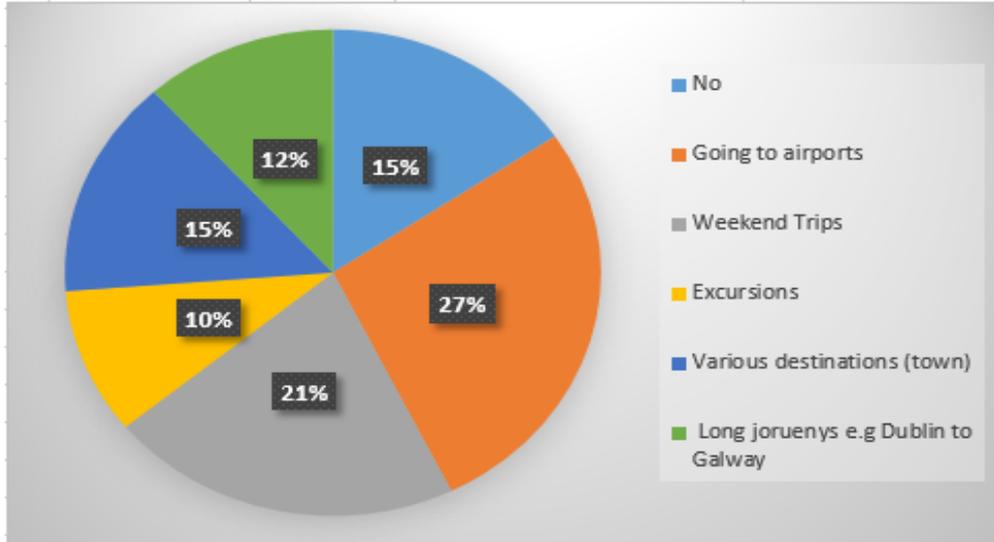
7. What would be your main reason for carpooling?



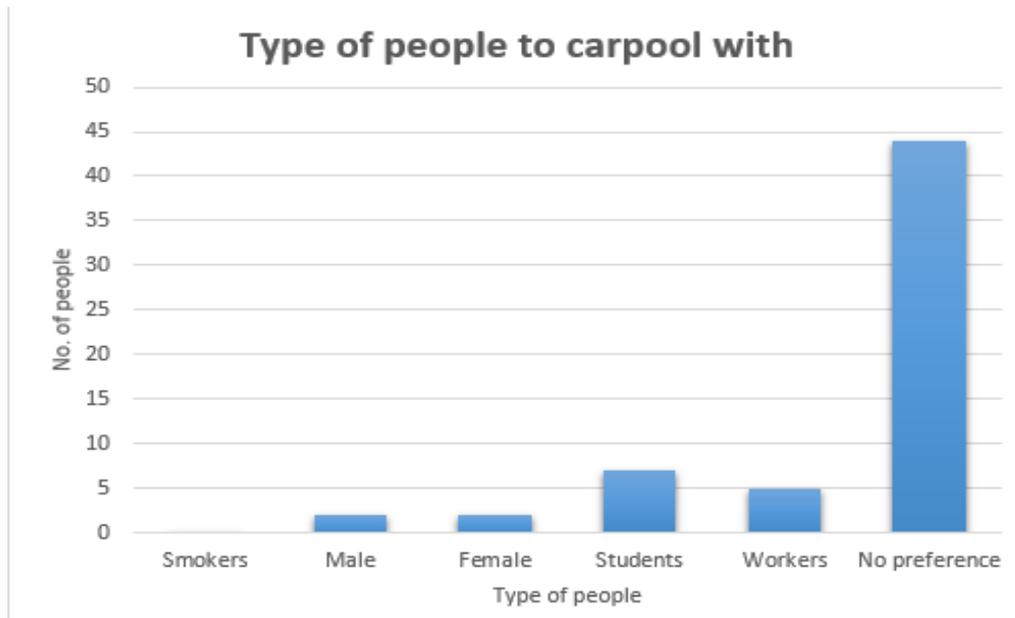
8. What information do you think this app should display regarding the drivers and passengers?



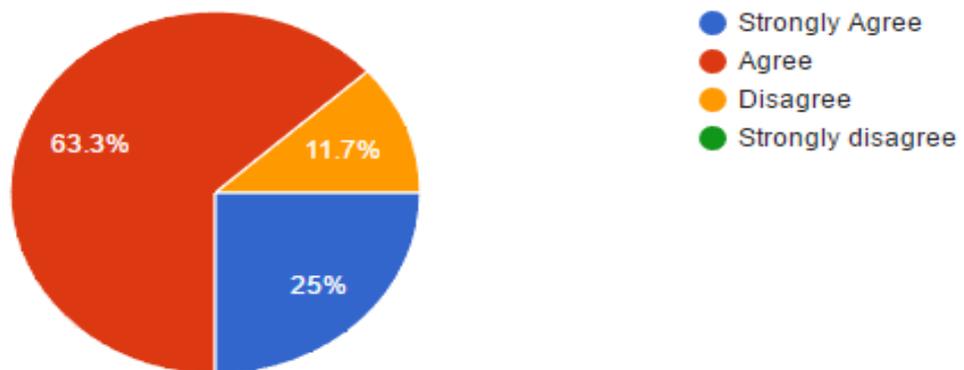
9. Would you consider using CarPoolMe for journeys outside of work? If yes which of the following reasons would you mostly use it?



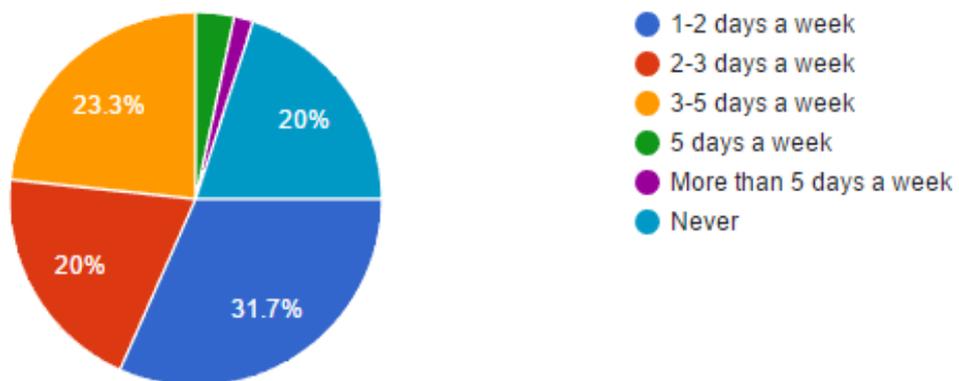
10. What type of people would you carpool with?



11. CarPoolMe will be a major improvement of transport



12. After this app is developed how often would you carpool?



### 13. What other features do you think CarPoolMe could have?

Below are some requirements which were gathered on my last question of the participants of the survey. Some of the participants provided similar requirements which were narrowed down into the fundamental requirements gathered below.

- The app should show the driving duration of the trip
- Price before each journey/ Price estimation system
- Rating system so driver can be trusted
- Payment option and a price guide on the app
- GPS tracking calendar and reminder notifications
- Road traffic news and rating system for the drivers
- Eco tracker to display how much fuel/carbon emissions have been saved in comparison to separate car Journeys to encourage the ecological side of business
- User chooses the pickup location
- Driver/reviews/points system
- Prepay system where service determines the cost based on distance/time
- Show carpool availability in real time
- Membership details on a database
- Real time location data
- To set up a group that other people may carpool with
- Contact info
- Request rest stops prior to long journeys
- Passenger should select pickup point locations
- The app should enable people to arrange trips in advance, so users won't have to search on the last minute e.g. journeys from Dublin to Galway
- A journey calculator to show how much the trip will cost
- PayPal can be used to pay drivers for petrol
- Calendar for availability, Disability usage, markdown of costs (if sharing cost of trip)
- Drivers should be able to register through this app before they can become drivers.
- A feature which enables passengers to top up their accounts with funds.
- Credit card security
- Times on journeys
- The app to be available at any time
- Should be accessible from Facebook

## **Survey Conclusion**

The people who participated in my survey were general members of the public. Most of them were workers and students. The purpose of this survey was to gather requirements and stakeholder's interests in the idea of developing CarPool.

A vast number of participants stated that they use public transport to go to destinations such as work. 60% of the participants commute 5 days a week to work or college. In my survey, most of the participants were interested in using CarPoolMe to arrange destinations to and from work. Therefore, booking return destinations could be a feature within this app.

Only a small number of participants don't use public transport to travel to destinations outside of work. Therefore, CarPoolMe could serve as an alternative method for transportation. Participants stated that they would use CarPoolMe for destinations such as weekend trips and going to airports.

The participants have no preference who they share the journeys with, however most of them require to view the drivers and passengers profile before entering the car.

Most of my participants believe that CarPoolMe will be a major improvement for transportation that they would use regularly.

### 3.1.3 Interviews Results

#### Interview 1 – College students and Office workers

1. How do you travel to college daily? Would you consider using an alternative method to public transport?

Some of the students travel by bus, dart and various types of public transport to College. The students would prefer an alternative method to public transport. I discussed the idea of implementing a carpooling app which can be used for various destinations. They considered the idea to be interesting if return journeys can be implemented within the app.

On the other hand, one of the office workers uses two buses to travel to and from work daily. He considered this routine to be time consuming. Both office workers consider CarPoolMe to be an efficient alternative method towards public transport.

2. Would you be interested in carpooling with a group of students/workers from your college?

The students and workers would carpool with people from college/work or in their vicinity. The students desire to set up communication group within the app if possible. Some of the students would carpool with office workers if there heading in the same route.

Office workers would like to organise carpool groups via the app. The office workers stated that if CarPoolMe is to gain a competitive advantage over public transport and taxis, users must be able to book return journeys.

3. Do you own a car? Would you be interested in using CarPoolMe to save ownership costs on your car?

None of the students own a car due to costs such as insurance, NCT, service, repair, petrol, parking and taxes. Students claimed that those costs prevent them from purchasing a car as it is very expensive for them. However, one student said that if they had a car, they would use CarPoolMe to save costs. By using this app to carpool with people this may enable students to purchase a car as they will share it and use it to save costs. They could each rotate in driving and hosting destinations.

4. What features do you think CarPoolMe should contain?

Rating system so passengers can rate the drivers and the app.  
The app should show the time recorded on each previous journey so the passengers have an estimate of the expected duration.

From the driver perspective, they should be able to view passenger's destination request. The driver can either accept or reject the passengers request. Both stakeholders stated that the system should ensure that the passengers have the correct balance before entering the car journeys.

The app should enable users to book weekend trips.

The students thought that CarPoolMe should also have a logo on the page.

5. How do you think destinations should be arranged for example would you like to get a lift from your house or go to a certain pickup point?

The college students stated that any pick-up point is appropriate for them. If it is possible they would like the driver to be able to pick them up from their house if it's in the driver's home vicinity. They want to be able to view the app to arrange a trip from any pickup point. Booking journeys in advance was highly desired from the students and office workers.

6. Would you like to see CarPoolMe link up to Facebook to book destinations through Facebook and share reviews?

During this interview, we discussed how CarPoolMe could be easily accessible. The students typically use Facebook and WhatsApp as their channels of communication. We all agreed that the app should be accessible through Facebook and users will be able to write reviews about the service. This will be convenient for the office workers also, as they use social media channels such as Facebook and WhatsApp.

7. If CarPoolMe had discount prices available such as student discounts, do you think this could be an alternative method of transport?

The students do not believe that there should be student discounts on destinations for CarPool. However, they were satisfied about the idea of having a cash balance within their account on the app. This approach seems to be affordable for the stakeholders who will use this app. One of the office workers who I interviewed believes that this is a brilliant approach for the app. Instead of discounts they should be able to top up their app with funds. This will save the office workers time and cost on using public transport to commute to work.

## Interview 2 – Project Sponsor/ Business Owner

1. What type of functionality or features would you like to have implemented within CarPoolMe?

During the interview, myself and the Project Sponsor discussed potential features and functionality that could be implemented within CarPoolMe.

The business owner suggested that users should be able to register and login to the app, to create an account. We both determined that it would be convenient if both the passenger and driver had an account on the app. However, the business owner suggested that passengers should be able to search for trips without registering an account. This is to provide customers with an opportunity to try out the app to see if it satisfies their needs. If passengers don't register an account, they will only be able to see a limited amount of details.

The business owner highlighted during the interview that passengers should be able to search for trips from any pickup point. The app must show the number of passengers in a car, estimated cost, distance, duration and expected arrival time. Showing the estimated cost will be an efficient method of ensuring that passengers do not get overcharged for a journey. At the end of the journey it should show the exact duration of each trip so they can compare it to public transport.

The user must be able to see other passengers booked on the specific trip that they are taking. This will provide the passengers with an opportunity to view the other passengers who will be in the same car.

We both agreed that the user should be able to view the drivers profile before entering a car. Passengers may also wish to determine if the driver seems customer friendly and to know the driver's description before entering a car journey.

The business owner said that there should be a rating system implemented within the app to rate the drivers. This will provide other users with reviews regarding the drivers before they select a driver for the destination.

The Project Sponsor stated that a prepayment system could also be implemented within CarPoolMe so users can pay for the journey at the start. After the app shows the estimated cost, the user could either pay before the journey starts or make the payment at the end of the journey.

We agreed the app should be able to provide a refund if the passengers are not satisfied. For example, if the driver takes the wrong turn, drives through areas with heavy traffic or if an accident should occur, the passengers will be entitled to a refund. If the driver does not show up on time to the passengers

pick up point, users will be entitled to a refund if they already prepaid. The passenger has the right to cancel a trip within a certain timeframe.

The business owner would also like to view the reports such as revenue, costs, trip history and user's activity on the app. The purpose of this requirement is to enable the business owner to audit and monitor performance.

- I can register and login (must have)
  - I can search for trips without registering an account – as a guest – but only see limited details (not passenger details) (must have)
  - I can search for trips – by location, date, number of passengers, estimated cost, distance, duration (must have)
  - I can see other passengers booked on the trip I selected (if logged in)
  - I can see driver details (must have)
  - I can get more info from the web site (must have)
  - I can rate the driver (should have)
  - I pay before the journey starts but I can get a refund if necessary (should have)
  - Report showing how many users on app, number of trips, cost, duration, distance (must have)
2. What type of payment system would you like to have implemented on this app? What type of discounts could be implemented for different categories such as students and workers?

The Business Owner outlined requirements for a payment system that will be efficient for CarPoolMe. Credit cards and PayPal could be an alternative method used to pay for destinations, to save users from using cash all the time. Security will need to be implemented within the payment system to protect individuals credit card details.

An efficient method for payment would be enabling users to add money to their online account. Instead of using credit cards or cash for individual destinations the users can top up the balance on their account.

- Credit card,
- PayPal,
- Online account top-up then use some for each trip (like Travelcard)
- Driver will pay a % commission fee for using the service.

3. What kind of communication channels should this system have to enable a group of users to communicate?

Communication channels will be vital to have implemented within CarPool. The communication channels should have access to the internet and SMS messaging tool. This should enable the passengers to set up communication groups, as the business owner wishes to create this as an alternative method of communication. For example, users can arrange carpool destinations with passengers who they shared previous journeys with.

The communication channel should also enable them to communicate with drivers for the journey. This will make it less time consuming on arranging destinations as the user will be able to book destinations through the communication channel and set up a group for other passengers to join. There will be a limited number of passengers which can join a car for a trip. However, there is no maximum number for a communication group.

4. What information should the driver and passengers account contain? Can any driver register to use CarPool?

During this interview the business owner provided requirements for the start-up procedure of becoming a driver within CarPool.

The Business owner states that if any stakeholder or member of the public wishes to become a driver they will need to be approved by the business owner. The potential driver will need to provide details such as driving history, licence, insurance, photo and vehicles to the administration of CarPool. The site administrator will do a security background check on the driver, where they will either be approved or rejected to become a driver. The business owner will receive notification about the new drivers who joined CarPool.

After analysing the data in the surveys that was gathered myself and the business owner discussed what details passengers account need to contain. The essential information will be the contact details such as name, phone number and email. A photo will also be required for their account.

All the personal data will need to be stored in a database that will protect the data. This is to ensure that users personal data is secure and cannot be accessed by other parties or members of the public without permission.

- Driver will need to be approved before becoming a driver – provide details of driving history, license, insurance, photo, vehicle to administrator
- Passenger – some personal details like name, photo, email
- All personal data will need to be stored securely to meet legal requirements and EU regulations.

5. How should the pickup points be arranged between the driver and passengers?

The drivers should provide pick up locations on the app. However, passengers should also be able to suggest additional pickup locations. The passenger should be able to view the drivers profile, other passengers sharing the car, route, car size make and model and the price for the journey via the app.

- Driver will provide pick up locations with trip information.
  - Passenger can suggest additional pick up location and driver will confirm if possible
6. What type of social media channels could CarPoolMe link?

To promote the app and make it easy to access, CarPoolMe could link up to social media sites such as Facebook, Twitter, LinkedIn and Google+. For example, myself and the business owner believe that the most appropriate method of reaching a target audience is by promoting the app on social media. Users on social media sites can register and download the app.

- Mobile App and web site should link to Facebook, LinkedIn, Twitter, etc.

### Interview 3 - Developer

1. What type of code should be used to implement an eco-tracker to display how much fuel has been saved?

The developer suggested an algorithm is necessary to ensure that the eco-tracker can work. It is vital for the driver to provide the details such as the Car Type such as the make and model, Engine Size and Destination distance. After the passenger views the receipt of their payment they should be able to see the amount of fuel saved. For this to work the developer stated that the algorithm will then analyse the Car Type, Engine Size and Destination to estimate how much fuel was saved after each journey.

- The algorithm necessary to do this requires the driver to input details such as Car Type, Engine Size and Destination. The algorithm will then analyse this information to estimate the savings.
2. Is it possible to implement a pre-payment system within CarPoolMe so users can have the option to pay at the start of journeys?

A service like PayPal can be used for implementing a pre-payment method. The developer also stated that it does not have to be a unique payment method as most services use existing payment methods.

- Yes, this can be done using a service like PayPal. You could develop your own service for it but most applications just use existing service.

3. What type of security for storing data would be required for this app?

According to the developer there will be different security required for the variety of data that is to be stored. For example, to protect credit card details of users the app will be vital for this app. Credit card details must be kept confidential so the individual users will only have access to them. A third-party service may be required for storing the credit card details.

The developer stated that a database will be required for implementing security on user login information. The developers and site administrator will need to ensure that the database has the correct information stored. This information includes the users accounts such as balance, destinations and login information. Back- end frameworks can be used to prevent security threats such as SQL injections. The only people who should be able to access and edit the information in the database are the developers, system tester and the site administrator. The business owner may wish to audit the database to view new and existing users and to see whether CarPoolMe made a profit or a loss.

- Security will depend on the data that you are trying to protect. If its financial data like credit card details, you need not worry as much if your using a third-party service. If you are referring to user login information, its best to follow basic standards when developing the database. Using back-end frameworks prevents certain security threats such as SQL injections.
4. Will an API be required to display the number of drivers on the map? It should show the drivers profile and the destination where the other passengers are heading

During the interview with the developer we believed that an API (application programming interface) would be required if Google maps was going to be implemented within CarPool. The developer confirmed that an API will be required to show the number of drivers on the map. API will also enable the drivers to view passenger's location point after they request destinations. An API can be implemented to provide mapping service and track users.

- An API will be needed to provide mapping service and tracking of users. Google maps API is what's needed to provide such a service.

### 3.1.4 Acceptance Criteria

Below are the essential requirements that have been prioritised by the Business Owner.

#### Functional Requirements

Requirement #	As a (an)	I want to	So, that	Raised by	Priority
FR_1	Business Owner	View the amount of money made and trips that were booked, driver commission fees	I can audit business performance	Project Sponsor	Must have
FR_2	Passenger	Search/request destinations through the app	I can see which cars are heading to an area	Student	Must have
FR_3	Passenger	View the drivers profile before getting into a car	To have an idea of what the driver looks like	Student	Must have
FR_4	Passenger	View the vacant seats left in a car	I can determine how many passengers will be sharing the car	Project Sponsor	Must have
FR_5	Passenger	View other passengers before entering the car	I can decide to share the car journey with them	Project Sponsor	Must have
FR_6	Passenger	Select a car from a certain pick-up point	I can select a car from any area	Project Sponsor	Could have
FR_7	Passenger	View the time it will take for the car to arrive	I can know how long I will be waiting for a car	Survey	Must have
FR_8	Business owner	Link the app up to social media sites such as Facebook	Users will be able to download it and increase awareness	Project Sponsor	Must have
FR_9	Passenger	Receive receipts and notifications	I can keep a record of my previous journeys and payments and see the balance left	Interview with college students	Must have
FR_10	Driver	View passengers before journey	I can see their description before journey	Interview with Project Sponsor	Must have
FR_11	Passenger	Book journeys in advance such as weekend trips, Dublin to Galway	I won't have to search for destinations at the last minute	Survey	Must have

FR_12	User	To set up a group that other people may carpool with	I can choose family/friends or colleagues accounts to setup group with	Survey	Should have
FR_13	Passenger	To view a GPS tracking calendar and reminder notifications	I can see the duration of the trip and receive notifications	Survey	Should have
FR_14	User	View contact information	Drivers and passengers can contact each other	Survey	Must have
FR_15	Passenger	Book return journeys	I have my return journey sorted at a faster pace	Interview with office workers and students	Should have

## Login Requirements

Requirement #	As a (an)	I want to/will	So, that	Raised by	Priority
Login_1	User	Register and Login	I can create a profile and account within the app	Interview with students & office workers, Project Sponsor	Must have
Login_2	Passenger	Login and register in the app	I can have an account stored, top up finance and book destinations	Passenger	Must have
Login_3	Driver	Login and register	I can sign up to become a driver to host destinations to save costs on my car	Project Sponsor, Survey	Must have
Login_4	Business Owner	Login	I can audit the activity going on in the app	Project Sponsor	Must have
Login_5	User	View the App without registering an account	I can see what the app is like before I get an account	Project Sponsor	Should have
Login_6	Site Administrator	Logging into the website	He/she can update the site, ensure that the app is working correctly	Project Sponsor	Must have

## Mileage Requirements

Requirements #	As a(an)	I want to/will	So, that	Raised by	Priority
Mileage_1	Passenger	View the amount of fuel used	The amount of fuel/carbon emissions saved in comparison to solo journeys	Survey, Project Sponsor Student,	Must have
Mileage_2	Passenger	View a Journey Calculator	To see how much the trip will cost/can also be used as a prepay system	Survey	Should have
Mileage_3	Passenger	View real time location data	To see the duration of the trip compared to separate car journeys	Survey, Project sponsor	Must have

## Finance Requirements

\*\* Driver will be required to pay a commission fee to the business owner

Requirements #	As a(an)	I want/will	So, that	Raised by	Priority
Finance_1	Business owner	View the cashflow	I can see the transaction, trips and commissions	Project sponsor	Must have
Finance_2	Passenger	Top up my account with balance	I have enough funds to pay for my journey	Project Sponsor, Student	Should have
Finance_3	Passenger	Prepay	I don't have to pay at the end and the journey cost will already be covered when I enter the car	Project Sponsor	Must have
Finance_4	Business Owner, Admin team	Ensure that the commission fee is collected from the driver	The business will receive revenues automatically	Project Sponsor	Must have

## Non-Functional Requirements

### Performance

Requirement #	As a(an)	I want/will	So, that	Raised by	Priority
Performance_1	User	Easy to load	customers will continue to use it	Project Sponsor	Must have

### Security

Requirement #	As a (an)	I want/will	So, that	Raised by	Priority
Security_1	Business owner	Data to be stored in a database	Information about the user profiles and history is kept confidential	Developer, Project Sponsor	Should have
Security_2	Passenger	Receipts and notifications	I have a record of my destinations and payments that were made	Project Sponsor	Must have
Security_3	All	Payment Security is required	Credit card details and payment transactions processed securely	Project Sponsor, Developer	Must have
Security_4	Business Owner	Have a backend framework implemented	To prevent SQL injections within the database and information being stolen	Interview with Developer	Should have

## Availability

Requirement #	As a (an)	I want to/will	So, that	Raised by	Priority
Availability_1	All	The system to be available for use 24/7	Journeys/trips/destinations can be booked at any time	Survey	Must have
Availability_2	User	Ensure that the app is available for iPhone, Android or Windows mobile devices	They can easily download the app	Project Sponsor Interview with Student	Could have

## Usability

Requirement#	As a	I want to/will	So, that	Raised by	Priority
Usability_1	Passenger	Rate drivers and other passengers	other users will know if they are	Survey, Project Sponsor	Must have
Usability_2	Driver	Rate the passengers	Other passengers will know reviews about other passengers before they share the journey.	Project Sponsor	Must have
Usability_3	Passenger	Book return journeys	I can arrange a time for the driver to pick me up at a certain pickup point	Student	Should have

### 3.1.5 Interface Analysis

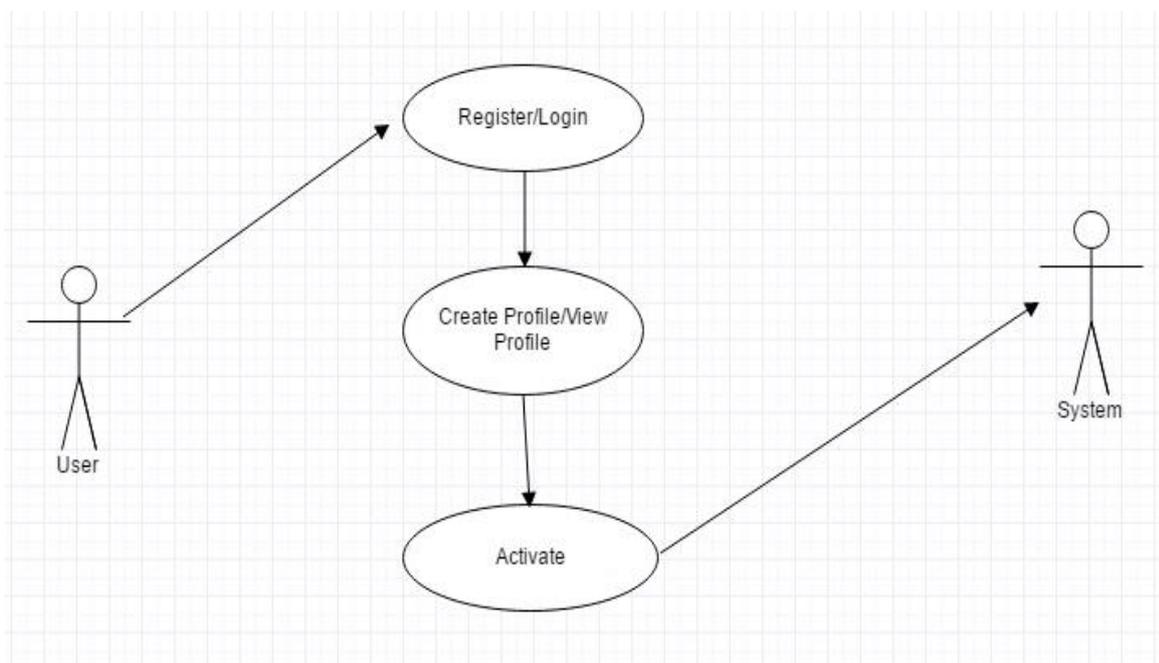
After I gathered my requirements from interviews, brainstorming and surveys I drafted up some UML use cases. These use cases show the relationship between the actors(stakeholders) and the processes of the system for the new app for CarPool. The actors are placed on the outer boundary of the diagram. In the centre the business processes are contained which are used by the stakeholders and the system. The actor on the outer right hand boundary of the diagrams is the operations management team and site administrator who will be responsible for monitoring and auditing the site. The Business Owner may also be in the admin team as he would like to view the activity, trips, bookings and commissions made.

#### Use Case\_1

##### User Login

Requirements Matrix

Requirement	Use Case
Login_1	User Register/Login
Login_2	Passenger registers an account/Login



## Use Case\_2

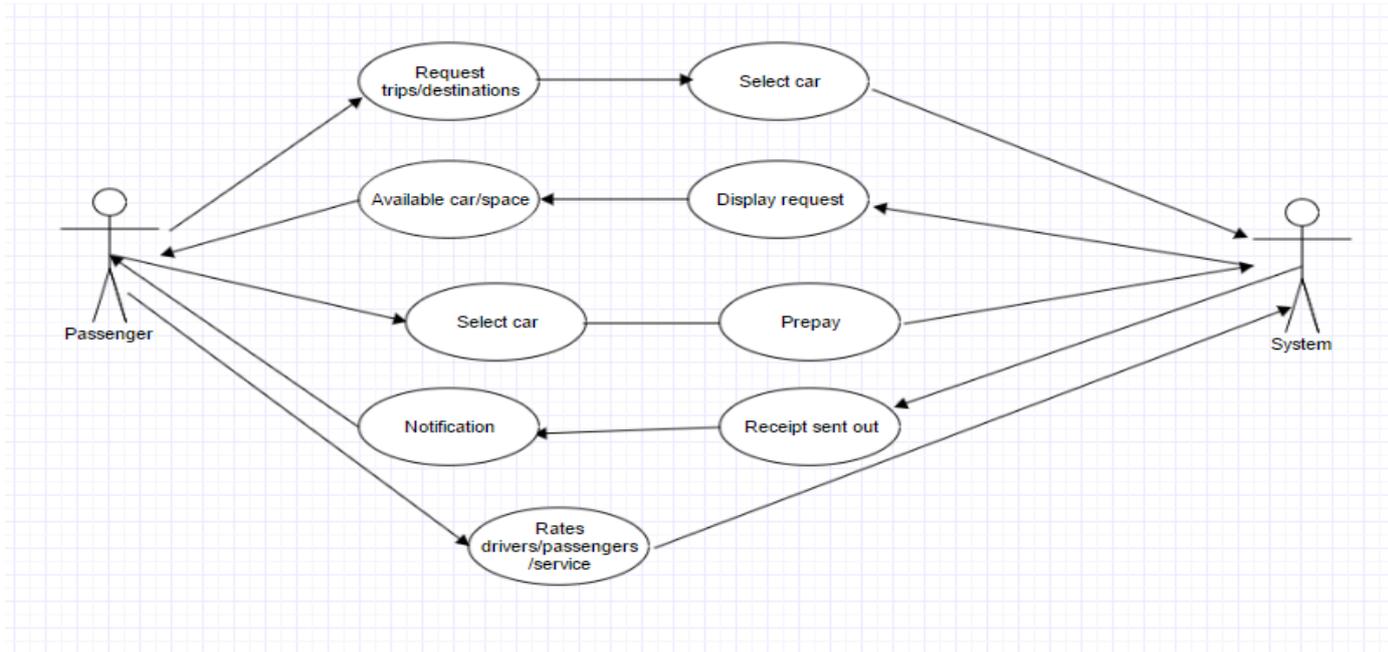
### Passenger Use Case Diagram

Below is the use case diagram which shows the relationship between the passengers and the system. For example, the passenger will only be able to access certain aspects to the CarPoolMe App. The passengers will search for trips and request trips via the app. The passengers will be able to book trips in advance. When they select a car, the request will process through the system. The system will produce the output by displaying the passengers request and providing the details about the available car, space, the drivers profile and the other passengers in the car. Once the passenger selects the car via the app, they can prepay for the journey or pay when they reach the destination. Once they paid it will go into the system which will process the payment. The system will then produce a receipt which will contain the cost of trip, fuel used and duration of the trip. After the driver enters the car the live time will be recorded via the app so they can keep a record of the duration.

The passenger will be able to rate the driver, passengers they shared the journey with and the service at the end of the journey. Below are the process steps where the passengers are only eligible to use.

#### Requirements Matrix Table

Requirement	Use Case
Login_2	Passenger logs into the app
FR_2	Search/request destinations via the app
FR_3	View drivers profile
FR_4	View amount of space in a car
Finance_3	Prepay
FR_6	Select car from pickup point
Usability_1	Rate drivers/passengers and service
FR_9	Passenger receives notifications and receipts.



### Use Case\_3

#### Driver Use Case Diagram

The driver will register and go through the user login process to create a profile. They will need to go through a procedure before they can be accepted as drivers. After the drivers are accepted by the admin team and business owner, their profile account will be stored in the database within the system.

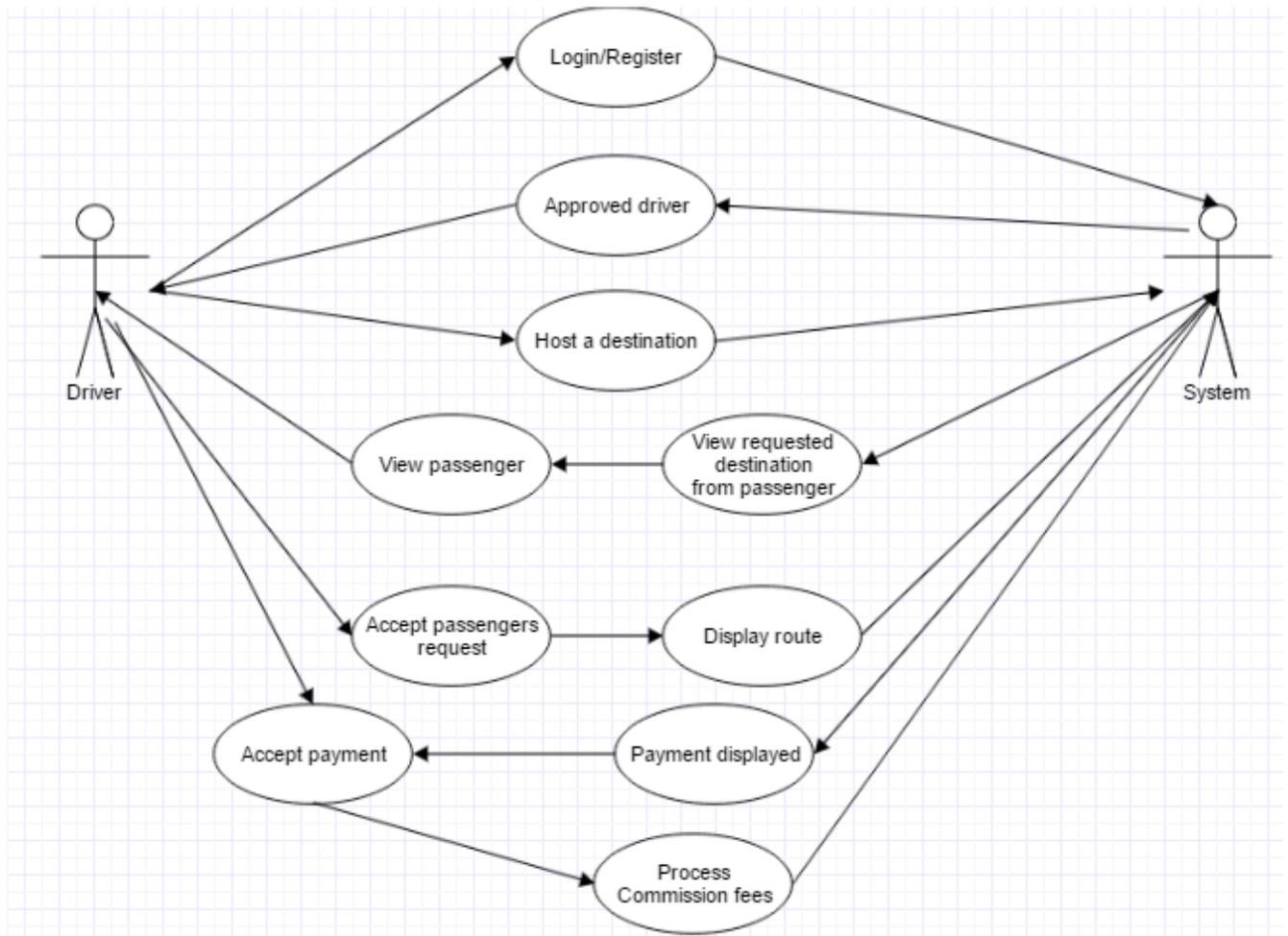
The driver will then be able to host destinations such as weekend trips, excursions or destinations to college or work. After they post a destination route it will go through the system where passengers will be able to view that driver.

The driver will receive the passengers requested destination from the system. This will enable the drivers to view the passengers profile and requested route. They then accept the passengers request and provide the route via the app which will process with the admin team on the other end of the system.

After the customer selects the prepayment or payment method after arriving at destination, the driver must accept. This will ensure that the payment goes through the system and the drivers account. The driver will then be required to pay a small commissions fee which will finance towards the app.

Below describes the relationship of the driver and the system of CarPool.

Requirement #	Use Case 3
Login_3	Login/Register to become a driver and host destinations
Usability_2	Rate the passengers
FR_10	View Passengers
Finance_4	Process Commission fees



## 4 IEEE Requirements Specification

### 4.1 Scope

This app is being developed for the business owner who is the project sponsor in this project. Carpooling is not very common in Ireland; therefore, this app could provide benefits towards stakeholders and could possibly reduce traffic congestion. The business owner believes by developing an app will be beneficial for drivers and passengers to save costs. This app should enable passengers to book destinations including weekend trips and various journeys. The passenger must be able to view drivers route, the drivers profile and other passengers who the passenger will be sharing the trip with. The passenger will also be able to book journeys in advance and organise communication groups.

Drivers will be able to register and become drivers through this app. However, they must provide details such as profile photo, driver licence, make, size and model of the car and ensure that the eco tracker is working efficiently.

Users will be able to top up the balance on their CarPoolMe account so their balance will cover the costs for their journeys.

### 4.2 Functional Requirements

Below are the functional requirements for CarPool.

#### 4.2.1 User Class 1 - Passenger

##### Functional Requirement 1

Requirements Code: FR\_8

Wireframe Location: Log in Page

Link up to Social media

The user should be able to log in to CarPoolMe with Facebook. The app should also connect to Facebook, LinkedIn, Google or twitter. In the Login page CarPoolMe should provide the option to login with Facebook.

Reason:

This will enable the users to easily access the app through social media. The users will be able to view the updates and ratings through the app. They can also use Facebook messenger through the app to set up carpool groups. Due to a vast number of users on social media, this will be very beneficial for increasing awareness.

Priority: Must have

## Functional Requirement 2

Requirements Code: FR\_2

Wireframe Location: Main Page

Search/Request destinations

Passengers should be able to search and request destinations through the app. Destinations may include weekend trips, excursions and travelling to and from work and college.

Reason:

This will enable the passengers to see which cars are available and heading in a direction.

Priority: Must have

## Functional Requirement 3

Requirements Code: FR\_11

Wireframe Location: Main Page

Book destinations in advance.

The passengers will be able to book long journeys such as weekend trips in advance. For example, students who live in Dublin but go to College in Galway, Cork or various parts around the country can book destinations in advance.

Reason:

This is so users have destinations booked and don't have to search for trips on short notice. A car will be available for them well in advance if they are given the option to book destinations in advance.

Priority: Must have

## Functional Requirements 4

Requirements Code: FR\_12

Wireframe Location: Main page

Create communication groups

Passengers will be able to organise carpool teams by setting up communication groups. The project Sponsor stated that these communication groups should be done by SMS tool or WhatsApp could link up to the app.

Reason:

So, that the passengers can choose family members, friends or colleagues by clicking their accounts to set up a carpool team. They may also wish to carpool with a driver or passenger if they travel in the same route frequently. It will also save the user time for determine which other passengers will be going their route.

Priority: Should have

### Functional Requirement 5

Requirements Code: FR\_6

Wireframe Page: Search/Book page

Selecting Pickup-points

Passenger can suggest additional pick up location and driver will confirm if possible

The passenger will be able to request pick-points by viewing the map which should contain all the drivers, routes and other passengers sharing the car. The passenger will enter the pick point address by selecting the area on the app.

Reason:

This is to notify the passenger whether they can be collected from their house or how far they need to walk to a pickup point. The project sponsor suggested that the passengers should be able to select additional pickup points through the app. The driver will then either accept or reject the request.

Priority: Must have

### Functional Requirement 6

Requirements Code: FR\_4

Wireframe Page: Search/Book page

View the vacant seats left in the car.

Reason:

So, the passengers will see if there is space left in a car heading to a particular route.

Priority: Must have

### Functional Requirement 7

Requirements Code: FR\_3

Wireframe Page: Search/Book page

View drivers profile before entering the car.

Reason:

So, that the passenger view a description of the driver before entering the vehicle.

Priority: Must have

### Functional Requirement 8

Requirements Code: Finance\_3

Wireframe Location: Prepayment page

Passengers will be able to pay before they enter the car journey.

There should be a prepayment system within the app that will enable the passengers to prepay for their journeys. Payments by cash, card or balance that should be stored on their account are accepted as payments.

Passengers pay before the journey starts but can get a refund if necessary.

Reason:

This is required for passengers so they pay at the start of the journey. If they are unsatisfied with the service, they are entitled to a refund. They also have the option to pay at the end of the journey.

Priority: Must have

### Functional Requirement 9

Requirements Code: FR\_13

Wireframe Location: Tracker page

While the user waits on the car they should be able to view exactly where the driver is.

This page should show the live time such like a GPS tracker. When the user is in the car they can track the route and duration of the trip.

Reason:

This will provide the user with an estimated time of when they will reach the destination.

Priority: Must have

### Functional Requirement 10

Passengers Payment after Journeys

Reason:

This is an alternate method towards prepayment. The passenger may wish to ensure that they reach the destination safely and that the service was beneficial. They can select the payment method of paying by balance from their account, credit card, or paying by card,

Priority: Could have

### Functional Requirement 11

Requirements Code: Finance\_2

Passengers can top up their account with funds which will serve like a travel card.

Reason:

So, that the passenger does not always have to use cash or credit card for every single journey. If they top up their account with a certain amount it may cover some of the journeys.

Priority: Must have

### Functional Requirement 12

Requirements Code: FR\_9

Wireframe Location: Payment Page

Passenger will receive a notification when they reach their destination

Reason:

To notify them that they arrived at their destination and to provide them with the option to pay after the journeys.

Priority: Must have

### Functional Requirement 13

Wireframe Location: Receipt page

The passengers will then receive the receipt via the app after payment has been made and when they have reached the destination.

Reason:

So, that they can see proof of payment and ensure that the payment transaction was successful

Priority: Must have

#### Functional Requirement 14

Requirements Code: Mileage\_1

Wireframe Location: Receipt Page

The amount of fuel used should be displayed in the receipt page.

Reason:

For users to compare fuel and carbon emissions used compared to solo journeys. This was brought up in the survey and suggested by the project sponsor.

Priority: Must have

#### Functional Requirement 15

Requirements Code: Mileage\_3

Wireframe Location: Receipt Page

The journey calculator which will show the exact time taken for the journey.

Reason:

So, passengers can compare the duration with solo car journeys.

Priority: Should have

#### Functional Requirement 16

Requirements Code: FR\_9

Wireframe Location: Receipt

After the driver receives the receipt CarPoolMe app will show the balance left.

Reason:

So, they know when it will need to be topped up again

Priority: Must have

#### Functional Requirement 17

Requirements Code: Usability\_1

Rating system should be implemented. At the end of the journey the passengers will be able to rate the driver, passengers who they shared the journey with and the service.

Reason:

So other users can view the reviews of a particular driver or passenger before they share a car with them.

Priority: Must have

### Functional Requirement 18

Requirements Code: FR\_15

Return Journeys

Passengers have the option to book return journeys.

Reason:

Some passengers may find it time consuming to search for another driver for a return journey. Return journeys would be appropriate for weekend trips, destination from work and college, or students travelling to College from Dublin to Galway.

Priority: Must have

### 4.2.2 User Class 2 - Driver

### Functional Requirement 19

Requirements Code: Login\_3

Wireframe Page: Host a destination

Driver logs in and registers an account. This will enable them to become a driver after they register an account through the app.

The business owner stated that the driver will need to be approved by the admin team and the business owner himself before they can officially become a driver.

Reason:

When drivers register for an account they will be required to provide details such as make, size and model of the car. Other essential details include drivers licence, insurance and the passengers who are sharing the car with them. This will convince passengers that the drivers are insured and are legally competent at driving.

Priority: Must have

### Functional Requirement 20

Wireframe Location: Drivers Page

The driver must type in the route via the app which will be displayed on Google Maps. This is when they set the price which will show a price estimate to the customers. They will need to provide car details such as make/model, engine size and size of car before the pricing is set.

Reason:

This will provide the passengers with an idea of the cost of the journey. Passengers may also wish to know the fundamental information about the car they will be travelling in.

Priority: Must have

### Functional Requirement 21

Requirements Code: FR\_10

Wireframe Location: Map for Drivers

View passengers before they enter the car via the Google Maps widget/API.

Reason:

The developer stated during the interview that an API is essential to display routes, passenger's profiles and locations on the map. This will enable drivers to view the passengers who have requested a destination from them. The drivers will be able to see the passenger's description, requested destination and pick up point. The driver will then accept the passengers requested route or pickup point. If there is an inconvenience in picking the passenger up at a destination they should click into a nearby location which will notify the passenger about a more convenient pick up stop.

Priority: Must have

### Functional Requirement 22

Requirements Code: FR\_1

Wireframe Location: Payment Page

The driver will be able to accept the payment from the customers. After the driver accepts the payment they will be required to send a receipt to the passengers which contains duration of trip, fuel consumed and balance remaining. Commissions are cut from the driver's payment.

Reason:

This is so the payment is processed and commission is successfully to the business.

Priority: Must have

### Functional Requirements 23

Requirements Code: Usability \_ 2

Wireframe Location: Receipt Page

Driver must be able to rate the passengers

Reason:

This is to provide future passengers with information about the passengers who they drove. In case a passenger views the reviewed passengers over the app, they can decide to share the journey with them.

Priority: Must have

### 4.2.3 User Class 3 – Business Owner

### Functional Requirements 24

Requirements Code: FR\_1

The business owner desires to be to monitor and audit performance of the app with the admin team.

Reason:

The owner and the admin team need to see how many trips were made, commissions received, performance, new drivers joining CarPoolMe and destinations that occurred.

Priority: Must have

## 4.3 Non-Functional Requirement

### 4.3.1 Security Requirements

Requirements Code: Login\_1

Registration/Login

All users who create an account for CarPoolMe must register and create a Login profile containing details such as name, email, profile picture, mobile number and occupation. The users will be required to have a username and a password within the site.

Rationale:

The main stakeholders who will need to login are the business owner, site administrator, drivers and passengers. All these stakeholders have different purpose for logging in. The system will need to ensure that the passwords set can only be changed by the individual stakeholder who set it up. All Login data for users must be encrypted within a database.

Requirements Code: Security\_1

Data must be stored securely

Rationale:

Information such as profile details and credit card details need to be kept confidential, so external users cannot access them or edit them. During the interview with the Project Sponsor we discussed security requirements. The developer suggested storing this type of data in a database of some sort which will be encrypted.

Requirements Code: Security\_3

PayPal could be used as a form of security payment or a third-party service.

Rationale:

Credit card details need to be encrypted within a database so only the owner of the credit cards can use them. The developer stated that PayPal could be an efficient method to use for payment security and for the payment system. This will ensure that the payment successfully goes through to the end user.

Requirements Code: Security\_4

Use backend framework to prevent SQL injections

Rationale

This type of security will prevent data stored in the database from being hacked and stolen. Data will include users profile, information financial details such as balance on their CarPoolMe account and credit card details.

#### 4.3.2 Performance

Requirements Code: Performance\_1

Easy to Load

Rationale:

The app should load within a short amount of time (less than 5 seconds). When the user logs onto the app, they will be brought to the Main Page within 3 seconds. This page will provide users with the options to search, book or host destinations. Creating groups and receiving notifications should also occur on this page.

Requirements Code: Login\_6

Site Administrator must login in and update the app.

Rationale:

The Site Administrator will be responsible for auditing and monitoring the site. This stakeholder will need to login to update the app, run reports, check logs, and ensure that it is working as expected. This stakeholder must notify the Business Owner about errors that may occur within the site and how to implement solutions.

Requirements Code: FR \_7

Time taken for car to arrive

Rationale:

The accurate live time must be functional when the user clicks into to view the duration of the trip and how long they must wait for the driver to arrive at the pick-up point

### 4.3.3 Availability

Requirements Code: Availability \_1

It is vital that the app is available at any time.

Rationale:

If the app is not available customers will lose confidence and won't use the application.

Requirements Code: Availability \_2

Ensure that the app is available in iTunes Store for users who use iPhone devices, Google Play Store for Android and possible Windows Store for Windows devices.

Rationale:

This will make the app easily accessible to download for users.

### 4.3.4 Usability

Requirements Code: Login\_1

All users must be able to login after registering an account. During an interview the project sponsor stated that passengers should be able to use the app without creating an account.

Rationale:

This will provide any members of the public to try out the App before they register an account. However, they will only be able to view a limited amount of information

Requirements Code: FR\_14

View Contact Information

The passengers and drivers should be able to view contact details through the app itself.

Rationale:

This can be done on both pages which will contain the Map. When each of the users click into profile, they should be able to message or contact them by clicking into their profiles. For example, the number should be available on users accounts.

Requirements Code: FR\_5

View the app without registering an account

Rationale:

This will enable users to see if CarPoolMe meets their satisfaction. Users will be able to view the content and layout of the app.

## 5 Appendix

### 5.1 Project Proposal

#### 5.1.1 Objectives

The primary objective for my final year project is to produce a detailed requirements specification document for developing a new carpool app. The App must enable users to carpool and register their car online for car sharing. In order to form this document, I will need to gather requirements from members of the public. After all the requirements are gathered, I will analyse and document them in a detailed requirements specification document.

The main objectives for my final year project that must be fulfilled throughout the project are the following:

- developing the project proposal
- gathering and analysing requirements
- presenting for the midterm presentation
- After the midterm presentation takes place, I will need to submit the final document for my project and present my entire project for the final presentation

The objective for the new App is to provide a fast, convenient transportation service for people to carpool. This will help users save money on taxis and public transport such as buses on a daily basis. The app should contain the following functionality:

- display drivers who carpool
- destinations they travel in
- times the drivers travel
- book destinations
- display passengers who are travelling in the same direction in a certain carpool team
- display carpool teams
- the App must also allow drivers to register so they can upload their details for car sharing.

This app will be a cheap, flexible and fast method for customers to reach destinations without access to public transport. Therefore, it will be very beneficial for people who don't drive or own a car.

I will gather requirements from stakeholders by conducting surveys and interviewing.

I plan to carry out field research to investigate how many people drive on their own. I will stand near a motorway and dual carriageway to collect sample data at various times of the day. I plan to note and record the data. It is essential to know how many people travel by car on their own. If the sample shows most people drive on their own, carpooling may be a cheap solution for them.

In order to carry out work required for this project I will need to create a detailed project plan. I will plan how much time each task will take to keep to schedule.

Various other objectives such as exams and assignments in other modules may impact on my time for the project.

### 5.1.2 Background

CarPool is a new mobile App which is targeted towards members of the public who may wish to save money on transportation. Carpooling is commonly used over in America and various countries in Europe such as Denmark, Sweden and France. It is used in Ireland as customers can organise car share journeys as I carried out research on "[www.carpoolworld.com](http://www.carpoolworld.com)", which operates within Ireland. CarPool will be the first mobile App for Android and iPhone devices.

The main issue is that transportation costs such as public transport, taxis and trains are very expensive especially for people who don't have a car and don't drive. Owning a car can be very expensive due to the expenses such as petrol, parking charges, repairs, car service and insurance. Another issue which tends to arise unexpectedly throughout the year are strikes on public transport such as the recent bus and luas strikes which occurred. Transportation strikes can make it difficult for members of the public to travel to destinations, as heavy traffic can arise due to strikes.

I think my app will be a flexible, convenient and affordable tool for people who commute daily or have to travel long distances for business trips and who don't have access to public transport in certain areas. It will allow groups such as families to use one car, customers can book destinations through the app and could consider pursuing jobs in areas without access to public transport. Drivers could also sign up to the app, to notify customers that they are carpooling.

People who carpool will save money on costs such as petrol and repairs if passengers have a group to share with. If people start to carpool, there will be less cars on the road which will also cut down the carbon emissions, gases and various types of air pollution. Passengers won't have to commute on their own as there will be a team of people travelling with them towards the same direction. For example, if a group of passengers live or work in the same vicinity, they could organise to carpool together over CarPool. This can help the carpooling team save costs on taxis, public transport and insurance from their own cars.

Traffic congestion could be reduced if people choose to carpool as there will be less traffic on the road due to the reduction of cars. CarPool could make this easier and be very beneficial for customer's health, the environment and could be cost efficient. Customers and drivers will also be saving fuel if they choose to carpool, as passengers will pay the driver towards the fuel costs. CarPool could provide drivers with a solution for covering expenses on their cars.

Therefore, this new carpooling app could encourage people to carpool to their jobs. The app could also show how much petrol they saved at the end of their carpool destination.

### 5.1.3 Technical Approach

Once my new project idea got accepted I researched the technologies that could be used to build this App. To get a better idea on how technologies could be used, I downloaded Uber to get a better understanding. Java would be one of the essential languages needed to make this site come live.

Building the App will involve each of these steps:

1) Requirements gathering and analysing:

This will involve meeting a range of people who may be interested in using the new app. Typically they would be people who commute around Dublin and from outside the city. We will discuss how the app should look, content it will contain and what the layout will look like. I plan to distribute surveys to people online using social media. Feedback from the stakeholders will be documented in a report which will go into the requirements document. This could indicate likely success for my App.

2) Prototype design:

After all the requirements are gathered, analysed and met I will construct a wireframe of what the app will look like. I will show the developed prototype of the app to the stakeholders and they may provide feedback about certain areas.

3) API (Application programming interface):

I believe that an API will be a key component required to build the App. It will use geolocation services to pinpoint the carpool drivers on the map. It can also be used to process payments.

4) Communication channel:

The app could contain standard communication channels such as email, SMS, WhatsApp and social network channels such as Facebook, Twitter or Google+. Potential customers and Carpooling teams could use these to communicate and could possibly arrange destinations again in the future. This will save them time from having to search for another car through the app.

### 5.1.4 Special resources required

Below are the essential resources which will be required for this project:

- 1) Carpooling sites to research such as [www.carpool.com](http://www.carpool.com), [www.rideshare.org](http://www.rideshare.org).
- 2) A laptop
- 3) Dropbox to backup and save all project files
- 4) USB device
- 5) BABOK book for the requirements aspect
- 6) An accurate wireframe of how the app will look after gathering requirements
- 7) IEEE requirements documentation template

- 8) Google Forms to run the web surveys
- 9) Microsoft Office

### 5.1.5 Traceability Matrix

Requirement #	As a (an)	I want to	So, that	Use Case #	Wireframe #	Raised by	Priority
FR_1	Business Owner	View the amount of money made and trips that were booked, driver commission fees	I can audit business performance			Project Sponsor	Must have
FR_2	Passenger	Search/request destinations through the app	So, that I can see which cars are heading to an area	Use Case_2	Wireframe_2	Student	Must have
FR_3	Passenger	View the drivers profile before getting into a car	To have an idea of what the driver looks like	Use Case_2	Wireframe_3	Student	Must have
FR_4	Passenger	View the number of vacant seats in a car	I can determine who else will be sharing the car and ensure that there heading the same direction	Use Case_2	Wireframe_3	Project Sponsor	Must have
FR_5	Passenger	View other passengers before entering the car	So, that I can decide to share the car journey with them	Use Case_2	Wireframe_3	Project Sponsor	Must have
FR_6	Passenger	Select a car from a certain pick-up point	I can select a car from any area	Use Case_2	Wireframe_3	Project Sponsor	Could have
FR_7	Passenger	View the time it will take for the car to arrive	I can know how long I will be waiting for a car		Wireframe_3	Survey	Must have
FR_8	Business owner	Link the app up to social media sites such as Facebook	Users will be able to download it and increase awareness		Wireframe_1	Project Sponsor	Must have
FR_9	Passenger	Receive receipts and notifications	So that I can keep a record of my previous journeys and payments		Wireframe_7	Interview with college students	Must have
FR_10	Driver	View passengers before journey	I can see their description before journey	Use Case_3	Wireframe_9	Interview with Project Sponsor	Must have
FR_11	Passenger	Book journeys in advance such as weekend trips, Dublin to Galway	I won't have to search for destinations on the last minute		Wireframe_2	Survey	Must have
FR_12	User	To set up a group that other people may carpool with	I can choose family/friends or colleagues		Wireframe_2	Survey	Should have

			accounts to setup group with				
FR_13	Passenger	To view a GPS tracking calendar and reminder notifications	I can see the duration of the trip and receive notifications	Use Case_2	Wireframe_5	Survey	Should have
FR_14	User	View contact information	Drivers and passengers can contact each other	Use Case_2 Use Case_3	Wireframe_3	Survey	Must have
FR_15	Passenger	Book return journeys	So, that I have my return journey sorted at a faster pace		Wireframe_2	Interview with office workers and students	Should have

Requirement #	As a (an)	I want to/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Login_1	User	Register and Login	I can create a profile and account within the app	Use Case_1	Wireframe_1	Interview with students & office workers, Project Sponsor	Must have
Login_2	Passenger	Login and register in the app	I can have an account stored, top up finance and book destinations	Use Case_2	Wireframe_1 Wireframe_2	Passenger	Must have
Login_3	Driver	Login and register	I can sign up to become a driver to save costs on my car	Use Case_3	Wireframe_1	Project Sponsor, Survey	Must have
Login_4	Business Owner	Login and audit	I can audit the activity going on in the app			Project Sponsor	Must have
Login_5	User	View the App without registering an account	I can see what the app is like before I get an account			Project Sponsor	Should have
Login_6	Site Administrator	Login	He/she can update the site, ensure that it is user friendly			Project Sponsor	Must have

Requirements #	As a(an)	I want to/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Mileage_1	Passenger	View the amount of fuel used	The amount of fuel/carbon emissions saved in comparison to solo journeys	Use Case_2	Wireframe_7	Survey, Project Sponsor, Students, Office workers	Must have

Mileage_2	Passenger	View a Journey Calculator	To see how much the trip will cost/can also be used as a prepay system	Use Case_2	Wireframe_5	Survey	Should have
Mileage_3	Passenger	View real time location data	To see the duration of the trip compared to separate car journeys		Wireframe_5 Wireframe_7	Survey, Project sponsor	Must have

Requirements #	As a(an)	I want/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Finance_1	Business owner	View the cashflow	I can see the transaction, trips and commissions			Project sponsor	Must have
Finance_2	Passenger	Top up my account with finance	I have a certain amount of finance which will cover destinations rather than just paying in cash			Project Sponsor, Student	Should have
Finance_3	Passenger	Prepay	I don't have to pay at the end and the journey cost will already be covered when I enter the car	Use Case_2	Wireframe_4, Wireframe_5	Project Sponsor	Must have
Finance_4	Business Owner, Admin team	Ensure that the commission fee is collected from the driver	The business will receive revenues automatically			Project Sponsor	Must have

Requirement #	As a(an)	I want/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Performance_1	User	Easy to load	customers will continue to use it			Project Sponsor	Must have

Requirement #	As a (an)	I want/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Security_1	Business owner	Data to be stored in a database	Information about the profiles and finance is kept confidential			Developer, Project Sponsor	Should have
Security_2	Passenger	Receipts and notifications	I have a record of my destinations and payments that were made	Use Case_2	Wireframe_7	Project Sponsor	Must have
Security_3	All	Payment Security such as	Credit card details will be kept confidential and the			Project Sponsor,	Must have

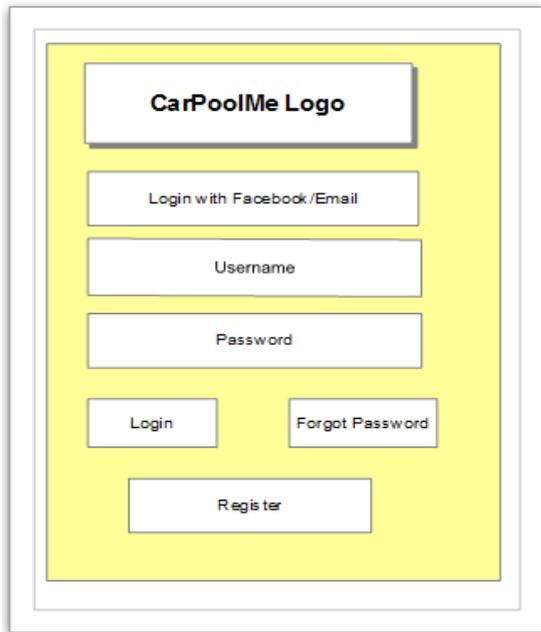
		Paypal or any third-party service could be used	system must ensure that the payment transaction is completed successfully			Developer	
Security_4	Business Owner	Have a backend framework implemented	To prevent SQL injections within the database and information being stolen			Interview with Developer	Should have

Requirement #	As a (an)	I want to/will	So, that	Raised by	Priority
Availability_1	All	The system to be available for use 24/7	Journeys/trips/destinations can be booked at any time at a area	Survey	Must have
Availability_2	User	Ensure that the app is available for iPhone, Android or Windows mobile devices	They can easily download the app	Project Sponsor Interview with Student	Could have

Requirement#	As a	I want to/will	So, that	Use Case #	Wireframe #	Raised by	Priority
Usability_1	Passenger	Rate drivers and other passengers	other users will know if they are	Use Case_2	Wireframe_7	Survey, Project Sponsor	Must have
Usability_2	Driver	Rate the passengers	Other passengers will know reviews about other passengers before they share the journey	Use Case_3	Wireframe_10	Project Sponsor	Must have
Usability_3	Passenger	Book return journeys	I can arrange a time for the driver to pick me up at a certain pickup point		Wireframe_2	Student	Should have

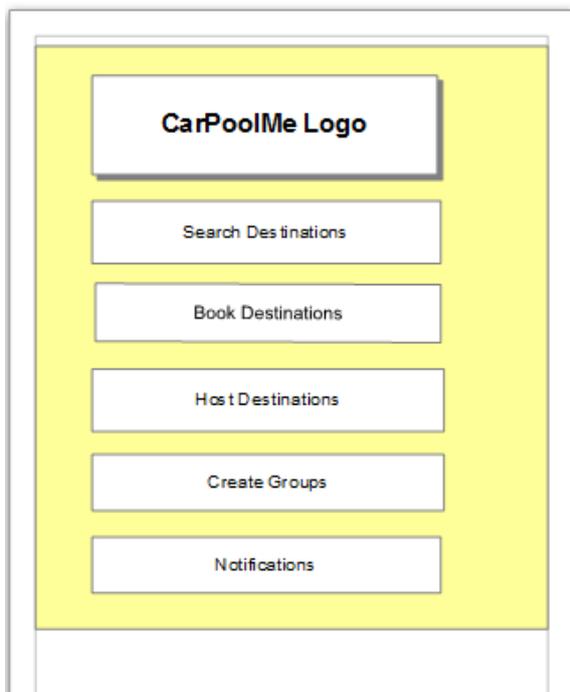
## 5.1.6 Wireframe

### Wireframe 1\_Login Page



A wireframe for a login page. It features a yellow background with a white border. At the top is a box labeled "CarPoolMe Logo". Below it is a button labeled "Login with Facebook /Email". This is followed by two input fields: "Username" and "Password". Below these are two buttons: "Login" and "Forgot Password". At the bottom is a button labeled "Register".

### Wireframe 2\_ Main Page



A wireframe for a main page. It features a yellow background with a white border. At the top is a box labeled "CarPoolMe Logo". Below it are five buttons stacked vertically: "Search Destinations", "Book Destinations", "Host Destinations", "Create Groups", and "Notifications".

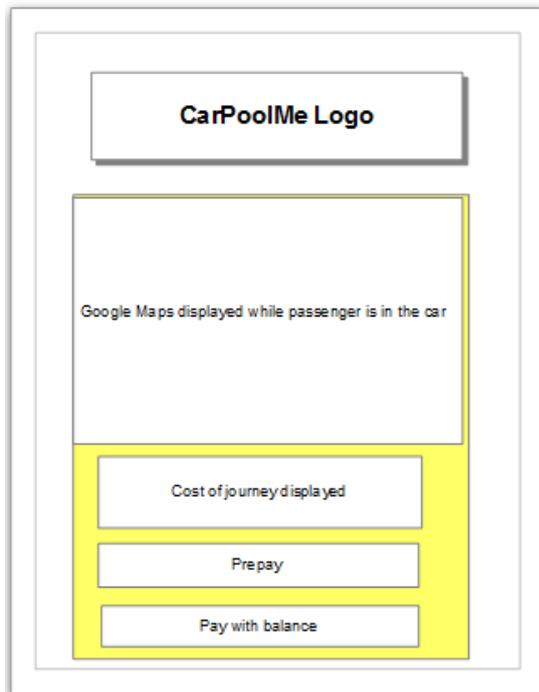
### Wireframe 3 \_ Search/Booking Page

The wireframe for the Search/Booking page is contained within a white border. At the top is a rectangular box labeled "CarPoolMe Logo". Below this is a large white rectangular area labeled "Google Maps". Underneath the map area is a yellow rectangular section containing three white input fields: the first is labeled "Enter address of pick-up point / Select Pick-up point", the second is labeled "Destination", and the third is a button labeled "Pick me up".

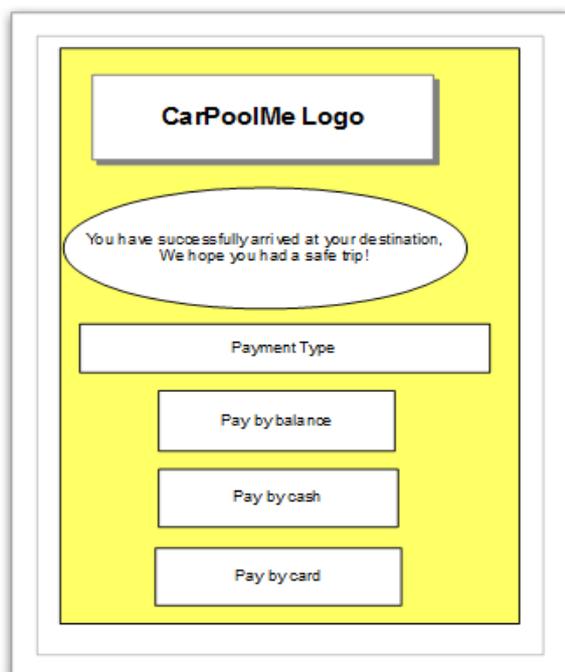
### Wireframe 4\_ Prepayment Page

The wireframe for the Prepayment page is contained within a white border. The entire content area has a yellow background. At the top is a rectangular box labeled "CarPoolMe Logo". Below this are five white rectangular buttons stacked vertically, labeled "Pre-Payment", "Pay by cash", "Pay by balance", "Pay by card", and "Notifications".

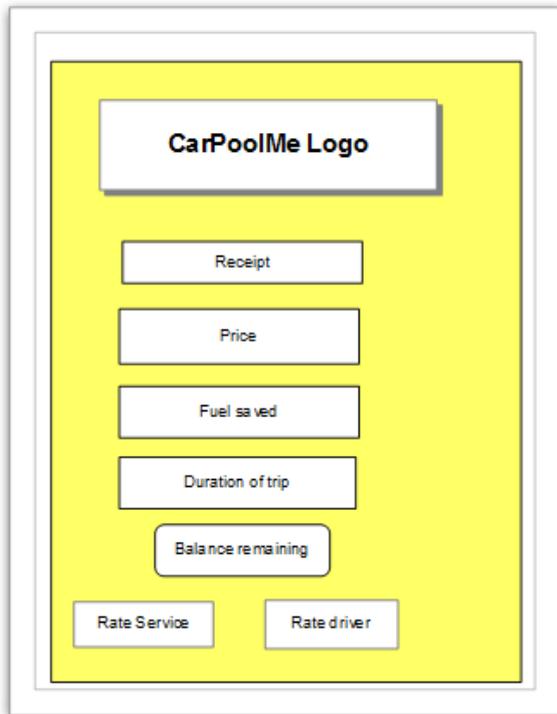
## Wireframe 5 \_Tracker Page



## Wireframe 6 \_ Payment Page

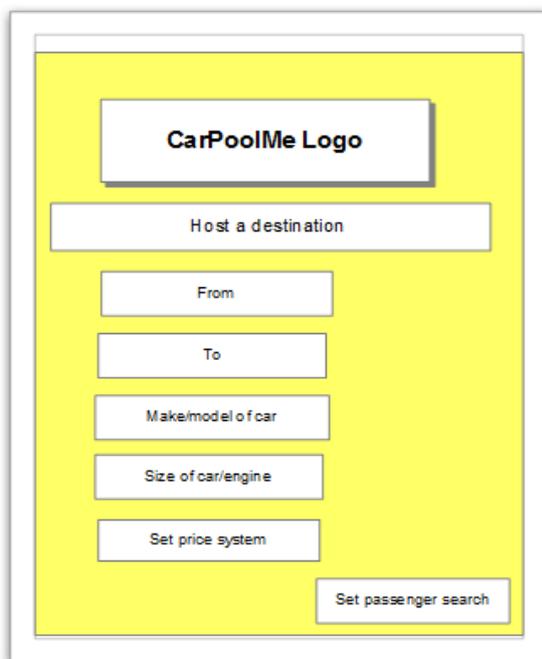


## Wireframe 7\_ Receipt Page



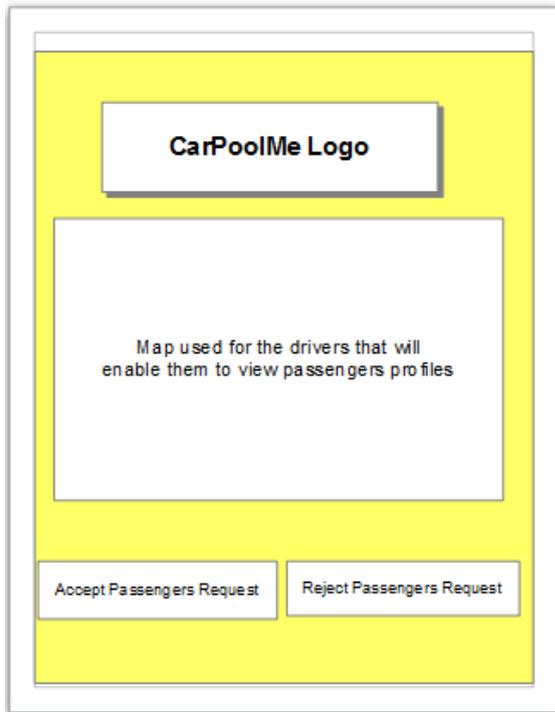
A wireframe for a receipt page with a yellow background. At the top is a box labeled "CarPoolMe Logo". Below it are five stacked rectangular boxes: "Receipt", "Price", "Fuel saved", "Duration of trip", and "Balance remaining". At the bottom are two side-by-side rectangular boxes: "Rate Service" and "Rate driver".

## Wireframe 8\_ Drivers Page

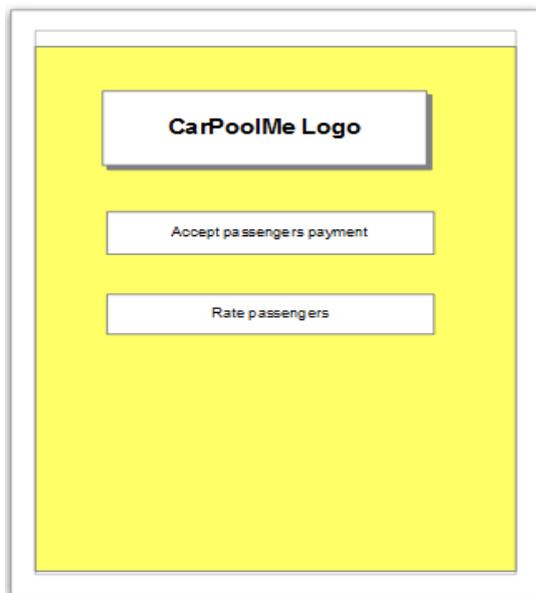


A wireframe for a drivers page with a yellow background. At the top is a box labeled "CarPoolMe Logo". Below it is a large rectangular box labeled "Host a destination". Underneath are five stacked rectangular boxes: "From", "To", "Make/model of car", "Size of car/engine", and "Set price system". At the bottom right is a rectangular box labeled "Set passenger search".

## Wireframe 9\_ Map for Drivers



## Wireframe 10\_ Payment Page

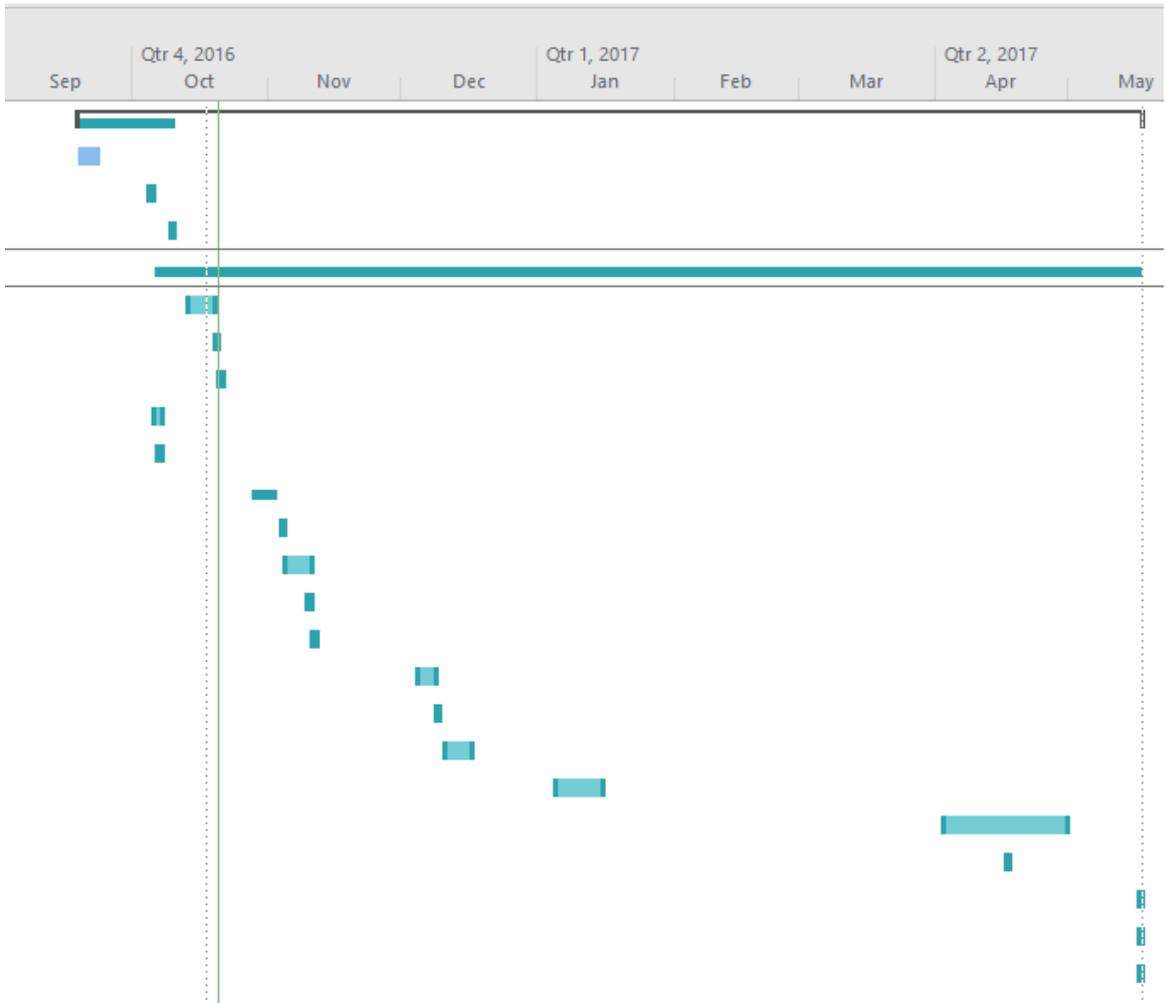


### 5.1.7 Project Plan

Below is a work breakdown structure and a Gantt chart which shows the time schedule for the steps required for my project.

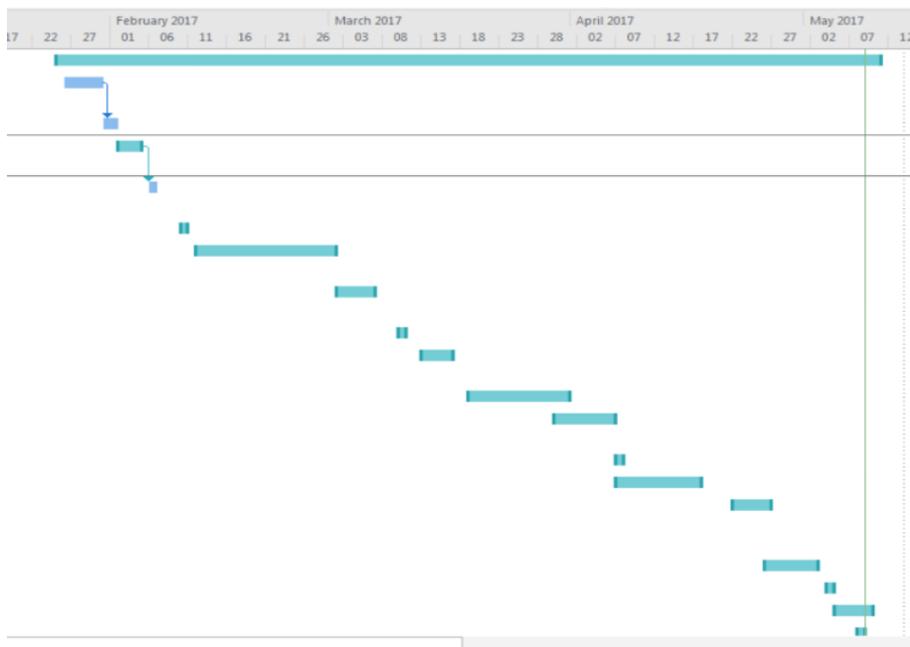
#### Original Plan

Task Name	Duration	Start	Finish
▲ <b>WBS</b>	<b>173 days</b>	<b>Mon 19/09/16</b>	<b>Wed 17/05/17</b>
Project research	5 days	Mon 19/09/16	Fri 23/09/16
Pitch presentation	1 day	Wed 05/10/16	Wed 05/10/16
New project idea finalised	1 day	Mon 10/10/16	Mon 10/10/16
▲			
Draft Project proposal	4 days	Fri 14/10/16	Wed 19/10/16
Review Proposal	1 day	Thu 20/10/16	Thu 20/10/16
Upload Proposal	1 day	Fri 21/10/16	Fri 21/10/16
Create Refelctive Journal	2 days	Thu 06/10/16	Fri 07/10/16
Upload Journal	1 day	Fri 07/10/16	Fri 07/10/16
▷			
Upload journal	1 day	Fri 04/11/16	Fri 04/11/16
Draft Requirement spec	5 days	Sat 05/11/16	Thu 10/11/16
Review requirement spec	1 day	Thu 10/11/16	Thu 10/11/16
Upload Requirement spec	1 day	Fri 11/11/16	Fri 11/11/16
Create Refelctive Journal	4 days	Mon 05/12/16	Thu 08/12/16
Upload Journal	1 day	Fri 09/12/16	Fri 09/12/16
Prep for mid-presentation	6 days	Sun 11/12/16	Fri 16/12/16
Exams	8 days	Thu 05/01/17	Sun 15/01/17
Exams semester 2	21 days	Mon 03/04/17	Sun 30/04/17
Show case materials	1 day	Mon 17/04/17	Mon 17/04/17
Submit final documentation	1 day	Wed 17/05/17	Wed 17/05/17
Software and doc upload	1 day	Wed 17/05/17	Wed 17/05/17
Project presentation	1 day	Wed 17/05/17	Wed 17/05/17



## Updated Plan

Task Name	Duration	Start	Finish
Project	76 days	Wed 25/01/17	Wed 10/05/17
Observation technique	3 days	Thu 26/01/17	Mon 30/01/17
Draft up results	2 days	Tue 31/01/17	Wed 01/02/17
Draft up survey questions	3 days	Thu 02/02/17	Sat 04/02/17
Meet wth supervisor te get approved	1 day	Mon 06/02/17	Mon 06/02/17
Upload Journal	1 day	Fri 10/02/17	Fri 10/02/17
Send out survey and complete	14 days	Sun 12/02/17	Wed 01/03/17
Draft interviews questions	3 days	Thu 02/03/17	Mon 06/03/17
Upload Journal	1 day	Fri 10/03/17	Fri 10/03/17
Analyse techniques carried out	4 days	Mon 13/03/17	Thu 16/03/17
Interviews	11 days	Sun 19/03/17	Fri 31/03/17
Draft Use Cases & Wireframes	6 days	Thu 30/03/17	Thu 06/04/17
Upload Journal	1 day	Fri 07/04/17	Fri 07/04/17
Study for exams	7 days	Fri 07/04/17	Mon 17/04/17
Acceptance Criteria Technique (MoSCoW)	4 days	Sat 22/04/17	Wed 26/04/17
IEEE Document	5 days	Wed 26/04/17	Tue 02/05/17
Complete Report	1 day	Thu 04/05/17	Thu 04/05/17
Review	3 days	Fri 05/05/17	Tue 09/05/17
Create Poster	1 day	Mon 08/05/17	Mon 08/05/17
Submit document	1 day	Wed 10/05/17	Wed 10/05/17
Complete Presentation slides	3 days	Thu 11/05/17	Sat 13/05/17



### 5.1.8 Evaluation

I will be using various techniques for my final requirements specification document. These techniques I plan to use include observation, surveys, interviews and interface analysis.

Implementing these techniques will be very beneficial to developing a detailed requirements document. Once the document has been completed, developers can use it as a solution to developing the app.

## 5.2 Reflective Monthly Journals

### 5.2.1 September

I started my final year of college in NCI back on the 19<sup>th</sup> September. I am doing my honours degree of Technology Management in NCI, specialising in business analysis. I completed my bachelor's degree last year. However, I decided to further my studies by progressing towards completing my honours degree. I have a keen interest in business and how technology is used and managed in business. So, I decided to pick the business analysis stream for my final year.

After attending my first project lecture, I brainstormed ideas for my project. I did this by carrying out online research and searched for trends in the market. When I carried out research, I noticed a gap in the market for mobility and transportation services and thought it could be improved in some way. The sites I used as research were [www.carzone.ie](http://www.carzone.ie) and [www.carsireland.ie](http://www.carsireland.ie), I noticed that customers are unable to lease cars on those sites. I also thought that I could link my site up to a carpooling service. My first initial project idea was a website which allows customers to lease, buy and sell their cars online. I thought this would be an efficient method for people who couldn't afford a car and wanted to save money on purchasing cars. Therefore, I thought this could create a potential growth in the market for leasing and car sharing. My main objectives for this project is to carry out research, draft up a project proposal, analyse and gather the business requirements.

However, I was told by the judges of projects, that my idea was too broad and complicated to carry out on my own. I realised after talking to the director of my course that coding is not my objective for the project, as I am studying the business analysis stream. The requirements specification is my primary deliverable for the project. I intend to do further research on ideas to come up with another idea for my project or narrow down my original idea. I intend to meet with my potential supervisor, to seek advice on new ideas related to my project.

### 5.2.2 October

In the first week of October, I presented my original project idea to a group of judges. They considered my idea to be too technical and broad. Therefore, it was initially rejected, despite it being considered a potential idea. I then arranged a meeting with my supervisor to receive advice to narrow down my project idea. After receiving feedback, I decided to do my project on a detailed requirement spec for a new carpooling app. I chose this idea because I thought that carpooling can be an affordable alternative from public transport and purchasing a car.

During October, I had a group meeting with my project supervisor. He explained what was required for the project and the next deliverable. There was a bit of confusion over the requirement spec that is due on the 11<sup>th</sup> November. We had initially thought that the whole requirements spec had to be completed by the 11<sup>th</sup> November. According to my project supervisor, the requirements plan is the next deliverable due on the 11<sup>th</sup> November. This will be the first draft of the business analysis requirement spec, which is the primary deliverable for my final year project.

This aspect will involve drafting a requirement plan which will highlight how to gather the requirements, stakeholders involved and what elicitation techniques will be used.

I also drafted and uploaded the proposal plan for my final year project. This sets out my objectives, the background and planned duration of the essential tasks required for my project.

For November, I intend to arrange my first individual meeting with my supervisor who was appointed to me. I intend to cover the essential aspects such as requirements spec, document structure and what is required for the midpoint presentation. I will also draft up my Journal for November to record progress.

### **Supervisor meeting**

#### **7<sup>th</sup> October**

At the start of this project there was confusion caused over what was required in the project proposal. My course stream did not have the proper template for the project proposal. Therefore, I met with my supervisor to discuss what content would be required for the proposal if I wasn't building the app. For the technical details, I was advised to write up the requirements techniques and some basic technical details that the app could have. As my project is to write up a requirement specification to hand to a developer.

#### **5.2.3 November**

During this month, I had my first meeting with my project supervisor, which took place on the 8<sup>th</sup> of November. During this meeting, we covered the structure of the project and the techniques for gathering the requirements from stakeholders. The techniques that would be appropriate for my project are observation, surveys, interviews, focus groups and acceptance and criteria. Observation will be a key requirement related to gathering my requirements as my project will require field research to gather evidence.

After discussing requirements and structure of the requirements report, I drafted up a project requirements plan. This contains the business need, business case, stakeholder list, and the various elicitation techniques that I plan to use for my project.

November was a productive month as I uploaded the project preliminary requirements plan on the 18<sup>th</sup> November. However, this month did clash with various assignments due in November. I managed to split my time between completing assignments before deadlines and planning the elicitation techniques for gathering the requirements.

Next Month I plan to meet with my project supervisor to discuss what will be required for the midpoint presentation. I plan to present the elicitation techniques in the presentation, however I will need to show my supervisor the elicitation techniques such as survey questions. After my interview and survey questions get approved I will start gathering the requirements using surveys and interviews. In December, I

will draft up slides to present for the midpoint presentation. I will meet with my supervisor to find out what the slides should contain. I will also need to do further preparation for the exams in January.

## **Supervisor Meetings**

### **8<sup>th</sup> November**

In the first week of November after reading week I had my meeting with my project supervisor. During this meeting, we discussed what was required for the requirements plan and the midpoint project presentation. We also talked about what type of elicitation techniques would be appropriate to use for my project.

### 5.2.4 December

This month, I presented my project idea, planned requirements and what I plan to do next on a PowerPoint slides to the examiners.

I had drafted up a few potential survey questions I could use to gather requirements and presented them to my project supervisor and the other examiner. I had a meeting with my project supervisor before the midpoint presentations took place and we were told that it wasn't necessary to have our requirements approved yet. I was thinking that I could combine interviews and focus groups into one method.

I felt like my presentation went well and was very satisfied with the grade I had received. The examiners were impressed with my idea. I will need to gather requirements, analyse them and implement them into a document. They recommended that I beef up content about stakeholders and that I have a wireframe of how the app will look in my final document. I didn't include a wireframe in my midpoint because I did not believe it was required at this stage as I was only planning on how to gather the requirements.

However, January is a very busy month due to exams coming up. I am currently studying for my upcoming exams which clashes with time to work on this project. However, after I finish the exams I will be able to dedicate more time to this project.

When the exams are over I intend to finish the rest of my survey and subsequently show it to my supervisor to receive approval. After this I will distribute them among stakeholders. I also intend to carry out the field research for my project after the exams.

## **Supervisor meeting**

**2<sup>nd</sup> December 2016**

### Midpoint Presentation

During this meeting, I covered the requirements for the midpoint project presentation. I was told that the business need, case, stakeholder list, functional requirements and time plan were the main requirements.

### 5.2.5 January

January was a very busy month due to exams taking place from the 5<sup>th</sup> to the 14<sup>th</sup> January. After the midpoint presentation took place I was constantly studying within the timeframe leading up to the exams.

After the exams were finished I began to do my observation technique. This involved carrying out field research in locations where traffic occurs near office buildings and work areas. I carried out the observation technique near the junctions of the M50 at Leopardstown and Cherrywood. Observation also took place in Stephens Green. The purpose of this exercise was to note and record the number of drivers on the road within a certain timeframe. I noticed that most drivers in these areas were solo drivers. This provided me with evidence that CarPool could reduce the traffic congestion by enabling the drivers to Carpool.

I added more questions to my survey after I presented my sample questions during the midpoint. My next objective is to draft up the questions on Google docs or Survey Monkey and then distribute them to stakeholders.

I plan to draft up interview questions for the 3 interviews I will carry out with the main stakeholders.

After a standard number of requirements have been gathered using interviews, surveys and the brainstorm session, I plan to do an interface analysis prior to the development of the system. This will involve creating a prototype of the system which will contain a wireframe and use case diagram.

In February, I plan to have my observation technique completed, so I can document and analyse the results in my detailed requirements spec. I will also begin to carry out interviews with the stakeholders. I will arrange another meeting with my project supervisor for next month to get my survey questions approved and to discuss my updated progress.

### 5.2.6 February

During the month of February, I had made more progress on my project. My observation elicitation technique was complete at the start of February. After this I drafted up my survey and interview questions. Once my survey questions were approved by my supervisor, I created the survey on Google forms to distribute the surveys among various people of the public to gather requirements. I conducted a

pilot interview with 2 college students to gather the requirements. The stakeholders who I will interview are the office workers, students and the project sponsor.

After I complete the rest of my interviews I will use the results from the surveys, interviews, observation and brainstorming session to construct a wireframe for the app. The wireframe could be used as part of my interface analysis technique.

March will be a very busy month for me on this project. I will finish off the interviews, create a wireframe for the app and plan to carry out a focus group session. In this session, I plan to show the requirements gathered for each member to view and a prototype of the site. This will be a fast-convenient approach for prioritising the essential requirements.

## **Supervisor meeting**

### **7<sup>th</sup> February 2017**

In this meeting, myself and my supervisor talked about my project, requirements elicitation techniques I will be using and reviewed my survey. My project supervisor seemed satisfied with my survey, however he advised that I send out my current drafted survey as a pilot. This could be used to record feedback from stakeholders.

### 5.2.7 March

March was a very busy month for me as I had two assignments from my modules of Agile Project Management and Business Process Management. These two assignments clashed with time to put in to the project. However, I was satisfied with work carried out as I got enough survey responses and had my observation techniques. I also changed some of my interview questions before I carried out the interviews.

I have completed all my interviews and gathered more requirements for my project. Instead of the focus group I carried out a group interview with office workers and college students to gather requirements. After this I began to construct use cases diagrams as part of my interface analysis technique for my project. This method will show how users will interact with the system and how it will be utilised. I feel like progress is being made, however I will need to be sure to keep on track. My current objective is to prioritise the requirements from my interviews and surveys using a MoSCoW analysis which will be in my acceptance criteria technique.

I felt like the interviews were successful as I gathered more requirements from stakeholders.

Next month, I will try to balance time out with my project as I have the exams in April. However, there is a gap between the two which will provide me with the opportunity to work on the project.

The document is due on the 10<sup>th</sup> may I will need to have it completed by the 4<sup>th</sup> May to do a quality check before submission. A poster will also be required for my project and the showcase. I also need to prepare slides for my final presentation.

## **Supervisor Meetings**

### **7<sup>th</sup> March**

This meeting was very brief with my Project supervisor. We discussed my progress steps over the project and told him about the surveys, observations being complete. I also updated him about the interviews that were going to be carried out. He recommended me to prioritise requirements after each technique. This enabled me to determine the functional requirements for my project.

## **Supervisor Meetings**

### **4<sup>th</sup> May**

During this meeting, I covered the last bits of the Project with my supervisor. I showed him the wireframes I had drafted and he advised me to put the essential 3 wireframes under the interface analysis while the rest should go under the Appendix. We also discussed what was required for the poster, I was told that I can use any images related to my project. However, I will be required to put in the source of the image on the poster if I use images from Google. I intend to show my supervisor the document before I submit it. I was advised to have a project title, description, image related to carpooling and my stand number on my poster.

## Bibliography

<http://babokonline.org/>

[www.carsireland.ie](http://www.carsireland.ie)

[www.carpoolworld.com](http://www.carpoolworld.com)